



# Design of a Competitive Intelligence System for the Meat Sector in Colombia Using Business Intelligence

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**Abstract.** As the economy progresses, globalization and competitiveness in companies, there is evidence of the need to evaluate information, especially external, to transform it into knowledge and make decisions, this allows not only the application of knowledge but the identification of threats and early opportunities of a company, to this study, recognition and application is called competitive intelligence.

The proposed design of competitive intelligence system for the meat sector is developed from the research carried out at University, whose objective is to design competitive intelligence systems that respond to the business sector. Subsequently, the efforts made extend to develop a review of CI models, diagnose the sector, identify information needs, search for sources and collect input information and process the information that has validated sources, whose work generates the system design using Power BI, a well-known Microsoft business intelligence tool.

**Keywords:** Competitive intelligence · Knowledge management · Meat sector · Business intelligence · Decision making

## 1 Introduction

Through the research carried out there is a framework of what competitive intelligence is and how to take it into the context of today; in Colombia the knowledge of this tool is very low compared to other countries, when doing this research the utility of competitive intelligence in a sector of the economy, how it facilitates the identification of the environment and the decision making that helps to increase competitiveness of a sector or company and the importance of using this tool that is being recognized and used throughout the world in various projects and companies.

The in-depth implementation of competitive intelligence in Colombia would help the growth of the country's market sectors, allowing a competitive advantage and international recognition, in addition to this would increase employment, improve

production, quality and create a relationship between companies and the state for national growth as do many countries today.

The objective of this research is to design a model of competitive intelligence system for the bovine meat sector that improves the competitiveness and efficiency of the sector through the study of the environment and timely access to information, facilitating decision making and solving the competitiveness problems that the sector has.

## 2 Competitive Intelligence

Competitive intelligence is the process of obtaining, analyzing, interpreting and disseminating information of strategic value on the industry and competitors, which is transmitted to those responsible for making decisions [1, 2].

Prescott, defines competitive intelligence as “the process of obtaining, analyzing, interpreting and disseminating information of strategic value on industry and competitors, which is transmitted to those responsible for making decisions at the right time” [3].

According to SCIP, the international association of competitive intelligence professionals, this discipline is based on an ethical, systematic and logical program to collect, analyze and manage external information that improves the strategic planning, decisions and operations of an organization [4].

According to studies conducted by Ching Seng Yap, it was found that the practice of competitive intelligence varies according to the type of strategic typologies and concludes that organizations practice competitive intelligence based on the perceived importance of the environment and use it in strategic decision making [5].

From the above it is concluded that competitive intelligence becomes an important tool to provide strategic business value from the external knowledge of competitors and the environment in general.

## 3 The Meat Sector in Colombia

The meat industry is one of the largest volume of sales in the country, this is responsible for producing, processing and distributing meat from different types of animals, especially beef from the hatchery point to centers of consumption, these consumption centers. Most of them tend to be in large markets in different cities of the country such as Bogotá. In the productive cycles there are the primary producers of complete cycle with production destined to the domestic market; primary producers conformed by breeders with production to the domestic market and producers of complete cycle-traditional exporters of fresh and refrigerated meat in integrated process [6]. Part of the meat is dedicated directly to human consumption and the other is taken to various sausage processing industries. The meat industry usually has as final products in the process of the production of frozen meat, minced meat, fresh meat offered in various cuts and various sausages.

There are types of meats that are handled in the industry depending on the type of consumption demanded:

- Canned meats: all meats are usually used for conservation, thus improving their distribution. Conservation techniques include canned and processed meats in different meats. The techniques for this go from drying to the air as it used to be done with a lot of salt, preparation of salted fish and the most frequent freezing.
- Processed meats: they are used for other uses such as the production of sausages. The minced meat is used, which is the noblest part of lean meat and sausages, sausages, instant broths, hamburger meat preparation and others are prepared.
- Fresh meat: this meat goes directly from the slaughter to its wholesale buyers such as supermarkets, restaurants, butchers where they are usually bought for normal daily consumption in families [7].

The meat industry also has other products or by-products that derive from what could be said waste such as meat flour, organ meats, bone meal, protein supplements, tallow among others.

The meat industry also tends to have many wastes causing environmental impacts, since it consumes a lot of energy in the centers such as refrigerators, slaughterhouses and cutting rooms, waste such as viscera and others, the water used to keep the meat in good condition is high, the hairs, the residual blood are almost not used and these are discarded in rivers or pipes and until now there is no definitive and effective solution for it [8].

## 4 Applied Methodology

To design the competitive intelligence system at a sectoral level in Colombia, we work with the following methodology, product of the review of several authors and the specific needs for design.

The methodology is focused in the area of identifying and establishing sectoral strategic needs and preparing the necessary information to design the system. The methodology worked is shown in the following phases (Fig. 1).

### 4.1 Review of Current CI Models

Currently the market and the whole world presents several processes of globalization, there is more competitiveness in the companies so that a constant search for the evolution of the companies is maintained.

A tool that has been used lately in different countries and has developed over time is the Competitive Intelligence, going from the evolution of the Surveillance Technology which has different ways of arriving at the planning of R & D to new and improved methodologies [9], thus reaching the Competitive Intelligence or also known as Strategic, Technological, Administrative, Economic Intelligence, depending on the place being examined, but based on the same objective of improving and increasing competitiveness among companies.

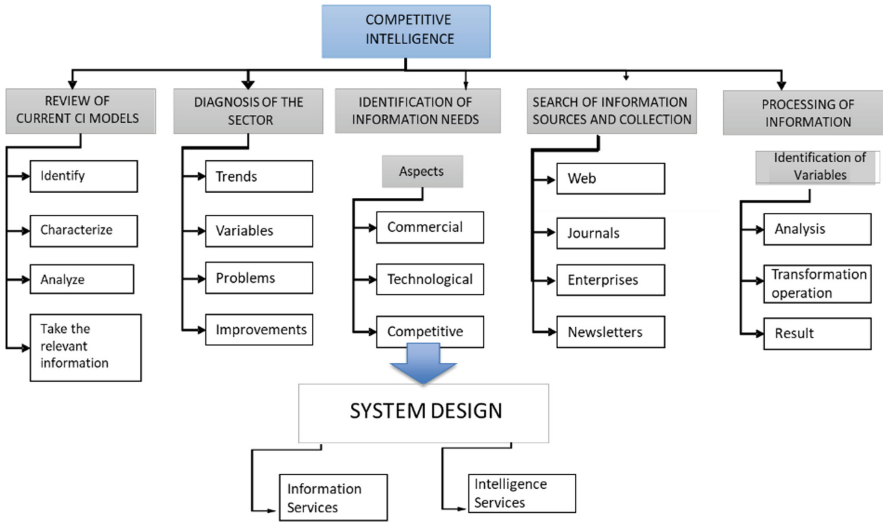


Fig. 1. Methodology. Source: The authors.

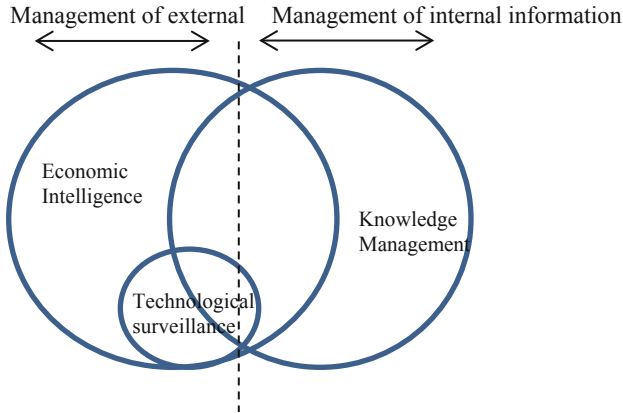
In this part of the research, we examined the literature of some of the most recent authors who speak and have knowledge about competitive intelligence, considering definitions, phases, functions and factors that apply in different countries.

*Tools and Techniques:* Prescott defines six key areas to which the design of an IC unit oriented to support decision-making has to respond: identify an approach or orientation of the CI unit, dimensioning and functions or responsibilities, definition of personnel profiles, definition of products and services to offer, organization of work and, finally, ethics [10, 11].

The stages of Competitive Intelligence configure a cycle that is defined as the process where information is retrieved, united, evaluated, analyzed and made available to those who make the decisions. Competitive Intelligence allows transforming traditional information into a real resource for the decision making [12]. In summary, educational opportunities for relatively young science professionals based on knowledge of management fields are not easy to define. Competitive intelligence (CI) has grown since the early eighties as the focus of information and knowledge management - Competition has increased. Although there has been a naturally healthy evolution of the available offer, not all of CI's educational developments have been positive.

*Methodologies and Phases:* The implementation of technological surveillance and intelligence usually follows a gradual process, both in companies and in other institutions. The commitment of senior management is essential for its success [13] (Fig. 2) and there is different fields of application in the different competitive intelligence concepts.

The Intelligent Competitor is not IC, but a part of it; the added value of the CI is that it takes the associated concepts of the Strategic Planning and the Smart Competitor [15, 16].



**Fig. 2.** Fields of application of the different intelligence concepts. Source: [14]

Competitive intelligence has evolved in recent years and has become a crucial point to integrate internal knowledge management of organizations and external knowledge management.

#### 4.2 Diagnosis of the Sector

To carry out the diagnosis, the main variables with which the sector is measured are identified, as well as the national and international rankings.

An example of a variable is:

$$\text{Extraction Rate} = \frac{\text{Cattle Sacrifice}}{\text{Bovine Inventory}} \times 100$$

Where:

Bovine slaughter which equals the number of slaughter cattle heads in a period of time, usually one year.

Bovine Inventory: refers to the amount of animals in a given space at a specific time.

This indicator is productivity with excellence as long as its analysis is done in conjunction with other indicators such as age, slaughter weight, performance [17].

#### 4.3 Identification of Information Needs

To develop the competitive intelligence system of the beef sector it is necessary to collect all the internal and external information of the sector in order to recognize the environment and identify all the necessary information variables for opportunities for improvement and identification of threats, which we managed to identify through these information needs, that allows us to assess the situation of the beef sector at a regional level, in the country, against competitive countries and in the world.

### 4.4 Search of Information Sources and Collection CI Inputs

Having defined the information needs, we continue with the search stage of this information, through this search we collect all the necessary information currently requested and existing about the sector.

### 4.5 Processing of Information

In the information processing stage, we sought to identify the most important information for the beef sector with respect to what was found in the needs and sources of information.

## 5 Design of Competitive Intelligence System

Thanks to the information collected and needs analysis, the competitive intelligence model of the beef sector began to be formed, which allows us to visualize the previously defined needs through the different variables presented in the previous table (Table 1).

The information that is within the design of the competitive intelligence system was made in the Power BI program where you can interact with all the information through tables, maps, images and graphics.

Below are some of the main boards that have the competitive intelligence system with information from the sector:

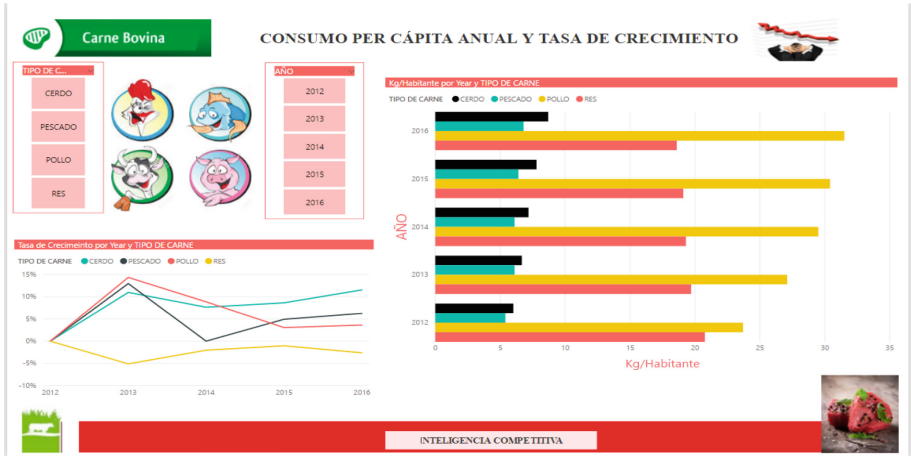
The following Table 1 shows the different actors where regulators are located at the national level and the different associations that exist in the beef sector.

**Table 1.** Actors of beef sector chain. Source: The authors.



The following Table 2 shows the per capita consumption of chicken, beef, pork and fish meat in the country and the growth rate from 2012 to 2016.

**Table 2.** Consumption per capita and growth rate of meats. Source: The authors.



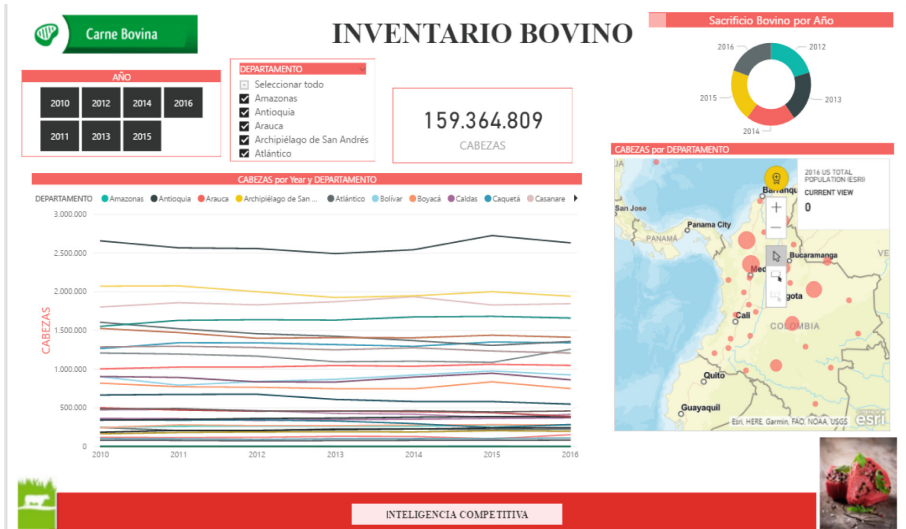
The following Table 3, shows the price of fat steer in the main countries producing meat and in our country and its value from 2012 until 2015, you can also interact with the world map depending on the country you want to see the figures and choose the year.

**Table 3.** Price fat bull in main producing countries and Colombia. Source: The authors.



This board shows the bovine inventory in number of heads in the departments of the country and its variation from 2010 to 2016, it can also show the amount of slaughter heads from 2012 to 2016 and the data on the map according to the department that wants to review (Table 4).

**Table 4.** Cattle inventory in heads per year and department. Source: The authors.



The inventory was also carried out by type of cattle (Males, females or calves) in the departments of the country from 2012 to 2016 (Table 5), in this you can also check the map and locate the department you want. watch.

Table 6 shows the import figures in CIF value (Cost, insurance and freight, port of destination agreed) and exports in FOB value (Port of freight agreed on board) from 2012 to 2016 and its variation, in addition shows the trade balance of these years, where a deficit is evident in all of them, since the value of exports is lower than that of imports in the country.

Throughout this investigation of competitive intelligence in the beef sector in Colombia and other countries we find that:

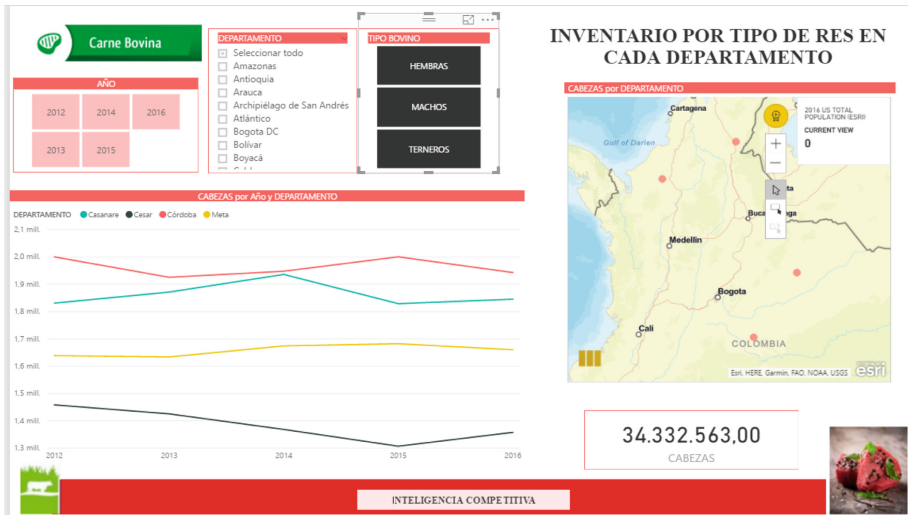
Regarding competitive intelligence:

- The different concepts of competitive intelligence were identified from the authors that define it and the studies that have been done in different parts of the world.
- We recognized the entire beef sector in Colombia and other countries.

Regarding the design of the competitive intelligence system for the beef sector:

- It is a project that can be replicated to the other sectors of the PTP.

**Table 5.** Inventory by type of beef in Colombia. Source: The authors.



**Table 6.** Imports and exports 2012–2016. Source: The authors.



- The use of competitive intelligence systems will improve the competitiveness of the economic sectors of any country.
- It is a challenge for each one of the actors that make up a sector to understand and carry out processes and projects that adequately manage the knowledge of the sector [18] or an option can become competitive intelligence.

## 6 Conclusions

The creation of a competitive intelligence system for the beef sector will allow to identify in an agile and easy way the variables and elements that are affecting the environment of the sector not only nationally but also internationally, allowing easy access to information, making decisions more quickly and preventing threats.

The design of the system allows interacting with the different variables which makes it very graphic, clear, easy to understand and dynamic for any user, employer or consumer. This presented information is a contribution for the projects like PTP (Program of productive transformation) that allows to deepen in the sector, to detect problems, to increase the competitiveness, quality all through the competitive Intelligence.

Too much information that is currently on the web, organize it, filter it, and put it at the service of companies is a knowledge management process that can take a considerable time, but it is worth the investment.

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