A Look at the Literature Review of the Impact of Industry 4.0 on the Logistics Processes of the Food Sector in Barranquilla

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Abstract. Industry 4.0 or fourth industrial generation, is well known as the Internet of Things (IOT) which is a means of communication for humans that will allow us to have many intelligent systems for business that help the collection and use of data in the cloud, this will bring us many improvements for the search for solutions in manufacturing and logistics processes. That is, with the advent of this industry, technology has played an important role in the modernization of logistics processes. Digital platforms have allowed the distribution processes of goods to become faster, more efficient, reliable and economical. This Industry 4.0 is an excellent strategy to implement in the food sector of Barranquilla, since it meets the basic needs in relation to logistics, such as the high need for transparency and integrity control along the supply chain (right products, at the right time, place and right quantities and at a good price) which greatly benefits food companies since this fourth industry helps to adapt to the needs of customers, to improve the distribution of products and to be more efficient in delivery times.

Keywords: Suppliers · Supply chain · Technology · Blockchain

1 Introduction

Through the different resources and strategies that industry 4.0 offers us, we find a number of applications that have allowed us to evolve, we implement the investigation of industry 4.0 within the logistics processes in the food sector in Barranquilla, focusing our research on the optimization of these resources for the common good. Industry 4.0 has been one of the most relevant technologies for these years, that is why we seek to know and learn how beneficial these technologies can become in the aforementioned sector. In view of this, its importance lies in the fact that it can supply people in its totality and provide great information to each of the companies that would use it to solve problems faster and more efficiently. Therefore, the efficiency of 4.0 technology can be of great benefit to these food companies, as it would reduce the price of different fields that are developed as the production, delivery time and product development.

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Considering that it is an advanced technology, we have to know how would be the process for the implementation of some of its tools, as it would be the Big data; since it is the main source that is applied in this industry for the elaboration of each of the tasks that we want to implement. Through this research, we managed to know how important it is to have a great team that projects and drives our knowledge, supplying our needs and embracing a future full of technology that would allow us to be competent human beings and able to be at the height of industry 4.0; the new digital era. thus leading us to enter an industry 4.0 in an active society full of technology, a society enabled and prepared to meet their own needs through technology. The fourth industrial revolution prepares us and introduces us to a new world full of technology; in order to instill in us knowledge that allows us to create strategies to make our lives easier. From the above, the objective is set in supplying the basic needs in relation to logistics such as control and transparency in industry 4.0; such as creating intelligent systems for businesses that help the collection of food to find improvements in the database for the manufactures and distribution of goods efficiently in the industry and evaluate the implementation and efficiency of the company in the productivity processes in the food area.

2 Industry 4.0 in the Food Sector

Industry 4.0 and the food industry [1] have advantages that the fourth industry has, the technological advances that it has are incorporated by companies in developed countries. And in them, support programs have been implemented for the adoption of these new technologies. There are similar actions in developing countries. The food industry is also integrated into these trends. This has been done because through the use of these technologies, companies improve their quality, reduce processing and delivery time to customers, as well as product customization. Therefore, it is very important to take into account the implementation of these technologies because in the food industry there are many changes in different aspects: in consumption patterns, in tastes and preferences, in quality and sanitation requirements, price, among other aspects. It is therefore important for companies to be aware of all the technological advances that enable them to be flexible and respond quickly to consumer needs or preferences and to changes in consumption patterns in order to remain and grow in the market. Effects generated by the application of logistics 4.0 in the supply chain of the food industry sector in Colombia. The growth of the Colombian food production industry which is considered of weight in the economic sectors, since in recent years it provides almost 21.23% of the Manufacturing GDP and 2.83% of the total GDP that forms a duo with logistics 4.0 creating a strong sector that forecasts an important economic positioning of the nation in Latin America.

Among these tools is the Big data that is used to improve the logistics movements of the warehouse. Data that can come from various sources. The most common data sources are: Vehicle diagnostics, Traffic and weather data. Although there are also some challenges with logistics 4.0, one obstacle is the infrastructure in Colombia, this is with problems both in roads and railways, ports and airports, which has caused the country to be positioned in this area at lower levels compared to other countries in Latin America and the rest of the world. The new paradigm of Industry 4.0 and its application to the agri-food industry [2]. Here they took as a reference a company in the food sector, focusing

on this industry, to analyze the new opportunities and challenges, since in order to meet the new expectations, industrial organizations need an automated process to deliver plant information to a higher corporate level in an accurate, standardized, efficient and secure way. To this end, industry relies on so-called technology enablers. Industry 4.0 has all these characteristics. So, in order to relate this technology to the food company that was used as an example, the first thing to do was to identify the problems that the company has:

1. Demand prediction Predictive maintenance Energy management: The development of new ICT-based systems and tools makes it possible to improve energy efficiency in all sectors, optimize and improve energy management, active demand management and electric mobility. Incorporation of industry 4.0 in the primary link of the dairy chain in the department of Cundinamarca [3]. (Cundinamarca, June 5, 2019) Incorporation of industry 4.0 in the primary link of the dairy chain in the department of Cundinamarca. [Online] http://repositorio.uniagustiniana.edu.co/handle/123456789/848 The Colombian dairy subsector has grown in recent times thanks to industry 4.0, expanding as an important exporter, although it is still far from the world leaders it has been positioning itself. Constantly, the world dairy subsector is changing, any movement of the world powers has an impact on the country.

Because of this, it is essential that the subsector be more competitive in order to be able to satisfactorily face the current obstacles in a globalized world. To this end, it is believed that the sector should maintain a good relationship with the state, consolidating and strengthening its ties in order to reach agreements that ensure better sustainability while the sector lays more appropriate foundations that allow an increase in efficiency, productivity and quality. Aspiring in the future to be one of the leading countries in the world.

Determinants of the financial structure in the manufacturing industry: the food industry [4] determinants of the financial structure in the manufacturing industry: This article aims to determine the mechanisms and firm-specific variables of the financial structure of firms belonging to the food industry in Mexico during the period 2000–2009. A clustered ordinary least squares econometric analysis is developed to identify these variables, which shows that tangible assets are the main variable that these firms consider to define their financing decisions.

From Industry 4.0 to Agriculture 4.0: Current Status, Enabling Technologies and Research Challenges [5, 6]. From Industry 4.0 to Agriculture 4.0: Current Status, Enabling Technologies, and Research This article shows how the industrial revolutions have transformed agriculture, where productivity has improved and where a reform is expected to promote the fourth agricultural revolution. It also shows the production patterns, processes and the supply chain, where 5 technologies are discussed, some of them are: robotics and artificial intelligence. This article was conducted for the purpose of new research opportunities.

From industry 4.0 to society 4.0, there and back [7, 8]. From industry 4.0 to society 4.0, there and back. This article discusses the links between digital society, digital culture and Industry 4.0. More precisely it examines the change that workers are subject to, along with the organization of work, smart digital factories. In the article they wanted to

highlight that the elements of Industry 4.0 are widespread in addition to the factory, in society, which are not only technological elements but also cultural. For it is a transformation that contributes to the integration of digital communication technologies (digital media) in industrial processes, reinventing products, services and production methods.

Industry 4.0 in the digital society [9]. Industry 4.0 in the digital society. In this one, they address the issue of the technologies that Industry 4.0 has and the impact of its arrival, highlighting that many of the technological advances that form the basis of the fourth industry are already used in the current factory of what is known as Industry 3.0, but when the new 4.0 model is implemented in its entirety, we will see a very large transformation in production, everything will become a fully integrated, automated and optimized production flow, and will lead the factory to greater efficiency and productivity. The traditional interrelationships between suppliers, producers and customers will undergo major changes, as will the relationships between humans and machines. Some of the Industry 4.0 technologies that in the article were shown as in a diagram and showed a connection between all, are: Autonomous robots, simulation, horizontal and vertical integration, Internet of things, Cybersecurity, Cloud computing, augmented reality, Big data.

Human food, pig farming, industry 4.0, analytics, internet of things, big data, sensors. With the technological advances as a result of industry 4.0 in the food sector has shown that in the world there is a need to produce food to meet the demand of the growing population. Animal protein is the most bioavailable food source (best assimilation) for the human body due to its contribution of essential amino acids. Estado de la Industria 4.0 en el sector alimentario andaluz [10]. The food industry is important in the economic system of Andalusia, as it stimulates its advantages and potentialities, which enhances opportunities for improvement.

Industry 4.0 is a necessity for the industry in general that seeks to redesign a smart factory with advances in the field that incorporate greater flexibility and individualization in manufacturing processes.

Industry 4.0 Internet of Things. In this article we talk about the beginnings of the industry 4.0 that were in Germany exactly in the year 2011 and well in a few words they describe it as an intelligence factory since it is achieved that all processes are interconnected through the internet of things as it is also known to this industry 4.0 and it is a process that points to what would be the next level of the industrial revolution since it will be able to drive fundamental changes that are at the height of the first, second and third revolution [13]. In this case, this fourth industry will represent an evolution of the industry, all by merging the factory with the internet, through the design and implementation of intelligent components. In short, it can be said that the main objective of Industry 4.0 is to ensure that machines remain interconnected, analyzing information and designing new business models and manufacturing systems on their own.

Industry 4.0 in logistics processes. In this article they start by defining industry 4.0, they expose it as a technology that includes digitization, interconnection and cloud computing [11]. They also highlight that, the Internet of Things promises far-reaching payoffs for companies, logistics operators, their customers and end consumers. These benefits

extend across the entire value chain, including warehousing, operations, freight forwarding, among others. The connected industry 4.0. This article emphasizes the implications of industry 4.0 in aspects of the economy and all those results that digital transformation can bring for industrial companies [12]. They detail the significant difference that this industry has had in relation to the past ones, in that those three revolutions introduced greater or lesser improvements in the productive processes along the value chain and, nevertheless, none of them demonstrated the transforming capacity that the interconnection of machines [15], products, suppliers and millions of consumers implies; and on the other hand, because the transformation that is taking place has as distinctive signs also the great speed with which it is developing and the framework of integral connectivity in which it is taking place [16].

Industry 4.0 in Latin America: A roadmap for its implementation. In this we mention the application that this technology has in different countries, in which, Europe, USA, and countries of the Far East as their large companies lead this implementation according to automation standards [14]. A different case in Latin America, more specifically in small and medium enterprises, which have problems ranging from ignorance of the technology, rigid business structures, training of human resources, lack of standards, which creates a great risk for them in their incorporation.

That said, the purpose for them was to establish a route that can be followed for the implementation of Industry 4.0 and for this the following elements must be followed: Motivators, enablers and knowledge.Análisis del sector lechero y aplicaciones tecnológicas de la industria 4.0

3 Methodology

The method of the project is framed within the research line of Operations Management in terms of the study of the thematic axis of supply chains from the perspective of the insertion of technologies in organizational logistics processes. From a process of observation and direct analysis to determine the factors that influence decision-making on the absorption of 4.0 technologies in the case of the food sector in the city of Barranquilla. Based on the above, a three-phase research process is proposed:

i) It begins with a general characterization of the companies studied taking as a reference the analysis of vertical and horizontal integration systems in the framework of industry 4.0. This is a snapshot of the current reality of the object of study.
ii) Then, by means of the computer package and the use of the statistical tool, the factors and variables under study in this project are established.
iii) The factors that allow evaluating the impact of Industry 4.0 technologies and that have a significant impact on the logistics processes of the food sector in the city of Barranquilla are quantitatively established.

4 Expected Results

With the analysis and data obtained in the research in the food sector, it is intended to obtain 3 very important elements for the benefit of the companies, which are:

i) Optimization at the moment of distributing food quantities.
ii) The quality that is realized in the logistic process for the distribution of food products.
iii) The time saved by each one of the machines and strategies according to the indicators drawn for the sector.

5 Conclusions and Discussions of Information Analysis

Industry 4.0 or better known with the Internet of Things (IoT) presents new ways of seeing different things for the digitization and growth of this in the food sector, incorporating new technological advances in underdeveloped countries, these technologies have made companies have an improvement in product quality.

Taking with them the big data tools that help us to improve the logistic movements of the warehouses, we can mention that this technology has helped different countries such as Latin America, Far East countries, among others.

Further on the financial structures in the manufacturing industry has as a mechanism to develop econometric analysis of clustered ordinary least squares that allows us to identify these variables, which shows whether these samples are the main variables that consider determining the decisions of a company.

Continuing with this, industry 4.0 in the food and manufacturing sector has as its current state, great challenges in productivity and the supply chain, which is reformed from the 4th industrial revolution and is bringing with it great technologies that include robotics, artificial intelligence, among others; with advances in the field that incorporate greater flexibility and individualization in manufacturing processes.

In conclusion, society, digitization culture and logistics 4.0, examines the changes that can be in a company with intelligent technology, beyond touching it is worth noting that not only the technological elements are important for society, but also the culture, as this helps us to get to transform processes, which contribute to the integration of technology of industrial means, reinventing products, services and production methods.

Finally, all interconnected processes can be achieved through the internet of things, due to this can achieve a great change in the industrial revolution. If it continues in this way, it can be said that IoT promotes far-reaching rewards for companies, logistics operators, their customers and end consumers.

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