

Blockchain within Logistics: a SWOT analysis

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Abstract: The industry 4.0 is already developed in many sectors and business. In recent years, some technologies of this trend have appeared in our society providing new business models and improving the effectiveness and efficiency for processes.

One of these technologies is Blockchain, a distributed database of records that have been executed among participants. It is believed that this technology could revolutionize business and redefine logistics. However Blockchain is an emerging technology and it is still at an early state of development.

The objective of this Master Dissertation is to understand what Blockchain is and to measure the impact of this technology in logistics, analyzing the possible limitations and applications and considering professional judgement. Moreover, this work provide a framework to identify the Blockchain opportunities in the logistics industry and helping managers to know where they can implement it in their processes.

The methodology of this work involved three stages: (1) analysis of the literature review to establish the technology basis and the current applications in logistics; (2) The implementation of a SWOT analysis according to recent studies; (3) testing the SWOT analysis using an online interview aimed at experienced business in logistics and cibersecurity.

Keywords: Industry 4.0, Blockchain, Logistics, Supply Chain, SWOT analysis

1 - Methodology

During this work, a methodology to measure the impact of Blockchain's implementation in technology companies, particularly in the logistics field, will be created. First it is needed to set the definition of logistics in general terms and to make an explanation of the activities included in it, delving into new business models which have emerged in recent years applications.

Two different databases have been used: Google Scholar and Web of Science. The goal was to find papers from different years and authors to display the progress in the logistics sector and to give a truthful vision. The keywords used were logistics, logistics-business and logistics- management.

Specifically, since this work will focus on analyzing a new industry trend which is called "Blockchain" it is needed to define the framework of its appearance, the Industry 4.0. It consists of several trends

and technologies; however, this work tries to deepen on Blockchain technology. The main reason to choose this technology is because it is considered to be useful for many companies in their daily operations but most of them do not have a clear knowledge about it and, nowadays, it is not yet fully or partially implemented in their processes.

Therefore, at the beginning it will be explained what is the Industry 4.0 and the main trends and technology which composed it. In this case, it has been selected a wide number of papers related to the topic but it has been filtered and analyzed the most relevant depending on the content or the used language being more than 50 papers analyzed. The keywords which have been used for the filtering were: Industry 4.0, Industry 4.0 applications, Industry 4.0 logistics, Industry 4.0 challenges.

Then, it will be realized a study of Blockchain, analyzing its main applications and benefits as well as its challenges and disadvantages. With all that, it will be formed an overview on the current state of technology and it will proceed making an analysis based on the strengths, weaknesses, opportunities and threats. In this case the keywords used have been Blockchain, Blockchain-Logistics and Blockchain applications.

Moreover, it has been developed a SWOT analysis with the purpose of achieving reliable information about the strengths, weakness, opportunities and threats of Blockchain. With this information it will be easier to know how could be the impact of Blockchain in logistics. The keywords used were Blockchain principles, Blockchain and supply chain, Blockchain strenghts, Blockchain opportunities, Blockchain weakness, Blockchain threats and Blockchain SWOT. Finally, an interview for companies that have implemented this technology in their activities will be created. This methodology try to achieve a realistic view about the impact that has caused this technology and the verification of the study conducted.

2 - Problem Definition

In recent years, the logistics sector is experiencing great advances with the introduction of new ways of working and optimizing processes (Pineiro de Lima et al., 2016). Blockchain is a new technology which is transforming current models into distributed platforms characterized by a common consensus among different parties. This technology has shown great potential in some areas where it has been implemented, such as finance, banking and healthcare. However, several studies have been carried out to investigate the applications and uses of this technology, but it is not yet known exactly if it will bring long-term benefits.

In this work we try to study the technology and its possible beneficial used in the logistics field. It is intended to inform about its benefits but also to alert about its risks and threats, providing a broad spectrum and being as objective as possible. Thus, we want to evaluate the potential of

implementation within logistics.

Moreover, the scope of the research is not limited to the recent studies analysis. It is aimed to provide a realistic vision about Blockchain and try to study in depth this technology, therefore not only analyzing the knowledge provided by other authors but also doing a SWOT analysis and an interview for putting up our own investigation.

3 - Literature review

3.1) Logistics

Different definitions for Logistics have been published throughout the years but it is considered that the one definition could be "Logistics is one of the parts encompassed in the management of the supply chain and it interacts with the flow and product information along it."

That is why there is not only one definition for contextualizing and understanding what is logistics.

Nowadays, logistics is not analyzed taking into account separate activities or processes. It is trying to integrate all the activities into a whole process. This way of managing logistics is called integrated logistics (Inda, 2014). Here, we will identify the main activities in logistics management:

- Supplier Management
- Transportation Management
- Fleet management and equipment
- Materials and inventory management
- Orders management
- Planning supply and demand

3.2) Industry 4.0

Nowadays, activities are developed with the presence of technology as a main tool to make them possible. Thus, it is a new way to organize, execute and implement processes in daily life. The largest applications of information technology have changed the organization of business and those changes are known as "the Fourth Industrial Revolution". This term has become a new paradigm around the world and many people discuss the impacts that it would have in the future (Freeman and Soete, 2008).

Industry 4.0 is known as "The digital transformation of manufacturing" and involves the use of technologies that can

increase the efficiency, quality, safety and ergonomics of industrial processes and infrastructures (Lasi et al., 2014).

In this study, we will identify and define the main areas that we have taken in consideration:

- Digital information: the data collected, processed and analysed from digital information, allows making better decisions and forecasts.
- Automation: In recent years, the automation of processes is managed by machines. Besides, it is important to note that it will seek to diminish the costs of possible human mistakes.
- Intelligent manufacturing: it is a fully integrated flow that synchronizes the production phases, by generating an increase in productivity, performance and sustainability
- Connectivity: the customer is informed and connected all the time, knowing the information required by the product, presenting challenges to suppliers and generating new business opportunities. This connection allows the ability to link and communicate with other computer systems and enabled all employees to discuss team issues in real time.

Industry 4.0 offers a new vision based on technology. It will transform the business models, connecting the product to an integrated and transparent supply chain.

3.3) Blockchain

3.3.1) Definition

Blockchain is referred to as the system that enables decentralized data storage and transfers it without any other intermediary system. This is an emerging technology developed for use in a wide range of applications and industries. It consists of a record of digital transactions using ledgers distributed beyond the control of centralized organizations. It aims to eliminate the risk associated with intermediaries, instability

and even interruptions of privacy. It also seeks to end piracy as it is able to track all transactions (IBM, 2017).

3.3.2) Types of Blockchain networks

There are different mechanisms of consensus and exchange of information (Buterin, 2015), which originate three types of networks: public, private and federated. Blockchain as a public network allows anyone at any time, as well as access to the information platform. Thus, the platform itself is self-managed reducing costs and maintenance administration. The public network is open to any participant space while the private network requires approval to enrol. Bitcoin and Ethereum are types of public networks. They have a lower speed, because they distribute information in countless open and public users books, contrasting to speed of the private network which is faster as it is limited to a number of members (Haferkon et al., 2015).

Furthermore, private Blockchains are only available to the number of participants that interact with the system and create changes within. They are used to further enhance security by restricting access to certain participants. The main applications offer data management and auditing.

In addition, there is also a federated network, which is a combination of public and private networks. In this case, the level of privacy protection is very similar to the private network, but a set of nodes are responsible for verifying the transaction processes.

3.3.3) Blockchain advantages in Logistics

Logistics management is an essential part of the supply chain where all processes meeting the needs of customers are integrated. Currently it is known for its key role in managing such technology optimally and improving its overall performance. Therefore, companies should know how to apply the latest techniques in their processes.

The application of the techniques is not an easy task. To understand the functioning of the supply chain is necessary to unite all the stages that make up the delivery of the product to the customer. Moreover, not only the manufacturing and distribution stages

are crucial to achieve high efficiency in the company, but also the quality of the product should be optimal and delivery time previously agreed. Therefore, good coordination and organization of work in the workplace is essential, while developing tools to address the proper functioning of crucial issues.

One of the strategies used by companies using this technology is creating a competitive advantage over other companies in the sector. However, caution must be taken for the introduction of differentiation in any of the characteristics of the service or product. They should analyze the availability, production capacity, economic impact and selecting the right technology to achieve favourable results.

Currently, the Blockchain technology is expected to help the logistics sector to update their procedures and activities efficiently. That is why they want to achieve consolidation and standardization in the coming years to ensure a successful implementation in companies. Development initiatives that have been carried out so far revolve around various activities and are reaching a level of increasing interest (Liang, 2017).

Blockchain allows time for the allocation and resources for the different actors in the system with accurate and immutable record. Therefore, traceability of products in the supply chain are being explored usefully, reaching to identify the product at any point in the process by verifying the quality and storage conditions. Thus, the current system would be transformed to a much more robust level of auditory and enhancing the authenticity and collaboration.

3.3.4) Challenges

Despite all the benefits described above, Blockchain also faces challenges still to be resolved as a result of its high complexity and its newness. One of the most important challenges is the large capacity data that the system must have, being able to implement individual transactions to the general systems, updating that information in real time and sharing common data to a large number of computers. Furthermore, Blockchain is composed of several

applications with different utilities and it is necessary to know the compatibility of these applications depending on the characteristics required. On the other hand, the decentralization of the system allows users to deal with specific and personal data autonomously. That is why governmental organizations could exert some pressure to establish legislation that somehow controls the type of data that is handled and its legality (Zheng et al.,2016).

4 - SWOT analysis

4.1) Introduction

The SWOT analysis started being used in 1960 (Learned et al.,1995). In 1963, a business policy conference was held at Harvard, where the SWOT analysis was examined and discussed concluding that it represented a breakthrough in strategic planning (Panagiotou, 2003).

For this reason, the SWOT analysis has been chosen as the most convenient method in terms of studying Blockchain technology.

4.2) Definition

SWOT analysis is a strategic planning tool to identify positive and negative factors that promote or inhibit the implementation of a technology in society. It is believed that it is a useful way to observe a technology potential. Moreover, this method could help organizations to take a decision about the introduction of Blockchain in their activities. In addition, it is used as a tool that defines the strategy to be followed analyzing the strengths, weaknesses, opportunities and threats represented by the technology (Dyson, 2004). It is intended to analyze the environment in search of opportunities and threats and the internal situation in search of strengths and weaknesses (Ghazinoory,2011). In addition, it is also expected to compile and reduce the information drastically, focusing on the most relevant one (Helms, 2019).

In terms of using the SWOT analysis to assess the use of Blockchain in the logistics sector, it is important to define what are the considerations made in its use.

4.3) Review of Published SWOT papers

SWOT papers have been selected according to a variety of evaluation criteria. The first one based on collecting SWOT Blockchain analysis with generalist studies, in order to observe the differences or similarities between them. In addition, as the fundamental objective is the analysis of the current situation of Blockchain and the impact in logistics, most of the articles are published in the recent years with the purpose to have a realistic view of the Blockchain's current situation.

It was decided to focus the study on papers published in specialized journals since it is considered that this media collect relevant information and summarize the key concepts, facilitating the accomplishment of the SWOT analysis.

Moreover, the following keywords were used: Blockchain principles, Blockchain and supply chain, Blockchain strenghts, Blockchain oppportunities, Blockchain weakness, Blockchain threats and Blockchain SWOT. It was checked that these words appeared in the title, abstract or also in the keywords.

To conduct this literature review, databases have been searched and papers that have been published, up to the end of 2018, were recognized. These main databases were:

- Web of Knowledge
- Google Scholar
- Harvard Business review

In total, 10 articles have been selected and analyzed. However, the information inside them is linked to other previous published and referenced articles. Therefore, this analysis is based on a greater number of articles collected by reference, being more than 30 analyzed papers.

The years of publication of the 10 papers are between 2016 and 2018, with three articles published in 2016, three articles published in 2017 and four articles published in 2018.

4.4) Conclusion

After collecting the different SWOT points from different authors, it can be concluded that there are clear characteristics of

Blockchain which appear all of them papers analysed.

On the one hand the main **strengths** are the **descentalization, transparency, immutability and verification**. These properties form the technology basis.

Particularly, one of the main new advantages is the **absence of a centralized organization** to control the structure and process, providing a consensus mechanism to ensure the nodes transactions, which is called the "descentralization" aforementioned. There are many authors who emphatise with this property like Risius et al. (2017), Aste et al.(2018), lansiti and Lakhani (2017) and M.Niranjanamurthy et al. (2018).

Moreover, another important feature is the **quality of the data**, being complete, consistent, and widely available. In addition, the technology aims to eliminate the discrepancies caused by the veracity of the data. In this case Victoria Lemieux (2017) supports that the benefit is that the information is replicated in each node and if the system fails, the information is not lost. Laskowsk et al.(2016) and Babich et al. (2018) also maintain that Blockchain has a robust system when occurring the failure of individual nodes. In addition lansiti and Lakhani (2017) ensure that records of the value and assets exchanged are permanently entered in all ledgers.

It is assumed that Blockchain **is harder to withstand malicious attacks** as all the information is available in each node and the participants must verify the transactions. Therefore, if a failure appears in a node, the information is not lost. However, it is true that some authors alert the problem of an **excessive control** by an organization or business as Victoria Lemieux (2017) or Di Matteo et al. (2018) who claims the excessive concentration. This fact could cause false records and a perception of an unreliable system to the rest of the members.

In addition, Blockchain could also contribute to **improve the economy** of a business. First of all, **improving the transactions speed** and diminishing **the operational cost** as Atzori, Marcella (2016), Babich et al. (2018) and lansiti and Lakhani (2017)

assure. Furthermore, it is possible to **automate** process and operations by giving some compliance conditions as Gatteschi et al.(2018), Risius (2017) and M. Niranjnamurthy'B et al.(2018) mention in their articles.

It was found other strengths as the **capacity** of using Blockchain in many **different sectors** as Yli-Huumo J et al. (2016) and Babich and Hilary (2018) take in account or the innovate solution in terms of product tracking by Kim et al. (2016).

On the other hand, the **opportunities** are related to factors that are not well established at this moment and could be achieved over a medium or long term.

The first one is the purpose of creating a system where all the members can observe and verify the complete process. This fact implies that the agents involved should introduce **information in real time** about the product. Babich and Hilary (2018) ensures that Blockchain could transform the industry into a faster transaction system. In addition, Iansiti and R.Lakhani (2018) assert that Individuals, organizations, machines and algorithms **would freely transact and interact** with one to another. In this way, the customers will be able to know where is the product and when it will be available, **improving their satisfaction** as M.Niranjnamurthy (2018) make certain. Moreover, the system would become **simpler** and **easier** to coordinate.

Nevertheless, Blockchain not only could be used for sharing information with other companies or agents but also it could be a **great internal data-base** for a business, not having to share reliable information with other agents and decreasing the problem of excessive information. This opportunity is described in Yli-Huumo J et al. (2016) and Iansiti and R.Lakhani (2017).

Gatteschi et al. (2018) claim the possibility **to store** a huge amount of **data**, providing the past transactions and recording past actions into a blocks. They also say that the members would have an individual control of the information.

Moreover, other opportunities which have been found were the **Innovation** and **cost reduction**, with the implementation of smart contracts by Victoria Lemieux (2017),

the **Improvement with the coordination, visibility and validation** of orders by providing accurate information on sales and used resources by Babich and Hilary (2018) and the **use with other key technologies** by T Di Matteo et al. (2018) and M.Niranjnamurthy B et al. (2018).

As this technology is not completely established, it is **difficult to separate strengths and opportunities**. For example, the validation system improves the transaction security, nevertheless, currently it is still somewhat confusing and non-well established. Therefore, it could be considered as a threat too.

However, Blockchain also presents some **weakness and threats** that obstruct the implementation in business.

First of all, one important weakness is the **technology maturity** as Kim et al. (2016), Iansiti and R.Lakhani (2017) and M.Niranjnamurthy et al.(2018) set forth. Blockchain has not achieved a great level of maturity capable of giving confidence to companies and individuals. Moreover, the possible benefits of this technology can not be verified until a few years.

Victoria Lemieux (2017) speaks about the **insufficient control** and **preservation of long-term information** which are other presented issues in this case of study. Therefore, **privacy and security** could be damaged with networks where everyone can be introduced to manage the data as Gatteschi et al. (2018) present in their study and also M.Niranjnamurthy et al. (2018)

Moreover, as this system is decentralized, there is **not an intermediary** to contact in case of loss users or system shutdown. This fact could also cause **incoordination and a lack of latency**, recording different information and introducing false physical state of an asset according to Gatteschi et al. (2018) and Victoria Lemieux (2017).

The **scalability** and the need to consume huge amounts of **electricity** represent a challenge for Blockchain as it requires using wide bandwidths to do the transactions in real time, connecting all the participants and updating the data continually. It has been observed that many articles warn of this problem as Yli-Huumo J et al. (2016) who say that Blockchain

could have **problems of size and bandwidth**, Babich and Hilary (2018), Gatteschi et al.(2018) and Di Matteo et al. (2018). Therefore, Blockchain was created to be used in big companies where a lot of data is managed.

Furthermore, it does not have a unique protocol to standardize the system and this **lack of standardization** generates controversies and uncertainty according to Risius and Spohrer (2017).

Another weakness is the **inability to modify** transactions once validated as Kim et al. (2016) ensure. **The absence of a mechanism that relates the records of the chain to business activity** (Babich and Hilary, 2018) or even the achievement of get the **same results with well-mastered technologies** (Gatteschi et al. 2018).

Finally, there are some current **threats as excessive control and concentration** by an organization controlling most of the nodes and the **excess of no useful information** which could do difficult to find the useful one (Victoria Lemieux, 2017).

False records are difficult to eliminate and some members could not want to introduce in the system confident information (Gatteschi et al. 2018). In addition, **customers** have to trust in this system without any human interaction and exposing yourself to possible failure in the algorithms system (Risius and Spohrer, 2017). In addition, **Suppliers could not want to participate** in the system for having to share information (Gatteschi, 2018).

Possible fakes, the possibility of **failure** in the system and the **vulnerability** to many types of attacks are other threats mentioned by Babich and Hilary, 2018.

In the logistics sector Blockchain could be applied for many applications. The strengths above mentioned could also contribute to generate great changes in the business models and processes but also the weakness have to be considered.

5 - Interview

5.1) Introduction

A qualitative method has been selected to verify the results of the SWOT analysis: an interview.

The interview is a technique of data selection where the participants can express their own opinion about one topic.

Nevertheless it is a interesting method to obtain some insights into the attitude, knowledge and participants position about Blockchain. Moreover with this method it is possible to study subjective viewpoints in different social groups. The aim may be to generate hypothoteses for later studies but also the interpretation of other past studies as, in this case, SWOT analysis (Uwe Flick, 2009).

Another advantage of this method is the economical and timely data collection.

Usually the interview is a quick way to obtain specific data. However, It is true that in this case it has not been an easy task to receive the interview as business have to take time doing it and sometimes it is complicated for them.

The participants have been selected according to some criterias such as business area , Blockchain knowledge and relation with logistics.

In this section the participants have to interact with the interviewer in different ways. They not only have to answer questions, but also classify the main factors extracted from the SWOT analysis. Moreover, they have the opportunity to answer openly making specific considerations.

The interview allows to make an specific analysis of Blockchain and its impact in logistics as it has been made to observed the opinion of different companies according to their own experience.

5.2 Definition

The first focused interview was developed in 1940 by Robert Merton who was one of the most influential sociologists in the United States. The original aim of the interview was to provide a basis for interpreting significant findings (Uwe Flick, 2009).

The concept of qualitative method analyzes the whole discourse between the subjects and the relation of meaning for them, according to cultural, ideological and sociological contexts. In other words, it investigates why and how a decision was made. It could be extended at this work, knowing why a company has implemented Blockchain or why not, for example.

Moreover, qualitative research is primarily exploratory research and it is used to uncover trends and dive deeper a problem.

5.3 Structure

The structure of the interview is divided into the following parts:

First of all, in the first part, it will be proposed several questions with the purpose of knowing what is the main activity of the company and the occupied position by the interviewee. The objective of these questions is to study whether depending on the scope of the company or the interviewee position the knowledge or opinion about Blockchain is different.

In addition, during the first questions it is intended to find out if the interviewee has a specific and rigorous understanding about this technology or he has only heard general information about Blockchain. If the interviewee is an expert in relation with this technology and the company is already using Blockchain it will be possible to obtain a lot of valuable information about the real strengths and weakness of this technology and the current use in a business.

However, if the interviewee is a person who only has general Blockchain notions we can interpret what is the position on Blockchain and what is also the opinion about it.

Despite this, the last questions have been proposed to be answered by companies that have implemented the technology in their processes or activities. The first questions aim to be conscious of the time

that the company is using Blockchain and the main reason why they implemented it in the past. It will then be asked for the differences between a traditional database and Blockchain as several authors in the SWOT analysis insure that there are no relevant differences.

However, one of the most important value of the interview is to know about the benefits and the use of Blockchain with other technologies making an integration and working together. Some questions have the protection and cybersecurity as the main topic as these aspects are one of the most controversial in the SWOT analysis. Finally it is inquired if the interviewee believes that Blockchain could change the way of carrying out activities and processes in logistics.

In the second part it is intended to study the critical factors extracted from the SWOT analysis which are decentralization, transparency, immutability, quality of the data, automation, cost reduction, visibility, validation, privacy, security and vulnerability. The interviewee has to select the choice which reflects his opinion about the most important Blockchain's factors that could impact in the business and in logistics, as well, being one the less important, five the most important factor and NA (not applicable). This part pretends to identify the most relevant factors in the scope of the company and also in logistics.

In Part C a SWOT analysis classification is made. The interviewee has to classify the critical factors into strengths, weakness, opportunities and threats, being able to mark two at the same time if he considers as correct.

Finally in the last Part ("Part D"), a section has been created for own considerations or aspects about Blockchain.

5.4 Results

The companies agree with the idea that the main benefits of Blockchain are immutability, reliability, longevity, integrity and transparency. However, the main drawbacks are related to recognition of the law and unstable regulatory state.

In addition, all the participants are in agreement that Blockchain is more reliable

than a traditional database as it is a decentralized system, which makes difficult to falsify information. They hope that international rules, policy and procedures for authenticating papers and transactions will be established in the future.

Moreover, they agree with the idea that it could be used in logistics focusing on the application of authentication but also the ability to track the product from the initial to the final stages.

In part B they have to select the most important Blockchain factors depending on the impact in their business and what they think about logistics.

On the one hand, referring to the impact on the company in general, decentralization, transparency, immutability and validation are the most voted by the companies. Security is also voted as one of the significant factors but not with a five rating but also a four. Privacy, quality of the data and automation are the factors with a lower score, from 1 to 2 depending on the company. Moreover, cost reduction and visibility are not applicable according to the business.

On the other hand, they don't think that these factors are equal to logistics, therefore the results are not the same and the score is different in some factors. First of all, they consider that decentralization, transparency, immutability and security are the main factors to this area, providing them a five score. Automation, visibility and validation are the following ones with a three score. In this case, privacy has a 2 score and cost reduction and quality of the data only a one. Vulnerability is not applicable in the logistics area according to the participants.

In part C, they have to classify the factors as strengths, opportunities, weakness or threats. They agree that decentralization, immutability and security are strengths of this technology. Transparency and validation are between strengths and opportunities. Visibility and cost reduction are considered as opportunities by the companies. However, they think that automation is the main weakness. The same thing not happen with the rest of the

factors. There are discrepancies in what participants suppose. Quality of the data and privacy are considered as a opportunity, but also a weakness and threat. Finally, vulnerability is understood as a opportunity but also a threat.

Therefore, it can be affirmed that strengths and opportunities are clear for the participants but in the negative factors they have different opinions.

5.5 Limitations

The discussion about the final results should be complemented by limitations' analysis.

It is understood that limitations are the factors which make the research restricted. In addition, they could influence the final results and conclusions. Clarifying these limitations one can be able to understand the focus and the reliability of the work.

One of the main limitations of this study is the sample size, being too small (composed by three companies). Therefore, a larger sample would result in more rigorous and truthful results, reducing the error margin.

There are two reasons why it has happened. The first one is related to the companies and the second one is related with the technology. On the one hand, it is very difficult to find a company who wants to participate in this kind of activities as they do it voluntarily and not getting any direct profit or direct benefit from it. On the other hand, as Blockchain is an emerging technology, it is complicated to meet someone who really has a deep knowledge about it.

Therefore, we are aware of the need for this study to continue for being complemented and also updated with more candidates over the time.

6 - Conclusion

After the study carried out throughout the work it can be made some conclusions about the impact of Blockchain in logistics.

First of all, the aim of this study was to understand this technology and identify the use and possible applications of Blockchain in logistics.

On the one hand, the decentralization of the technology generates trust in the network participants. As it has been observed in the

interview, one of the strongest points of this technology is the absence of a central controlling entity which provide customers security and reability.

On the other hand, much faster transactions could be carried out with a higher level of security. These transactions would be immutable over time and would have an indeformable record of them. In addition, the use of smart contracts would be a necessary tool in companies related to logistics changing the way of doing processes and activities.

The possibilities of this technology extend to many areas and factors and would affect business models.

Therefore, it is concluded that the impact that Blockchain could have in the long term in the logistics sector is very high, managing to transform the sector and helping to improve times and operations and increase the transparency of the supply chain.

There are certain challenges associated to the implementation of Blockchain as it is a emergent technology which no many business have already instaled. In addition, it is not a easy task to insert and implement this technology and get profit in a short period of time. Blockchain will have to become not only more scalable but also durable as well.

However, Blockchain will be more and more attractive tool to perform the logistic sector, as a way of get a competitive advantage. Moreover, there is a lot of opportunities to provide valor to the customer with this technology.

These conclusions have been determined taking into account the previous studies, the SWOT analysis and the final interview.

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