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**CAPSTONE RESEARCH PROPOSAL TEMPLATE**

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**1: Title**

Analysis on the disruptive use of Blockchain technology towards a more sustainable supply chain in the Food sector.

**2: Keywords (5 – 10 keywords)**

*Technology, Innovation, Blockchain, Digitalization, Integration, Logistics, Transparency, Environment, Corporations, Engineering, Tracking, Traceability*

**3: Introduction (200 words)**

Blockchain Technology has gained major acceptance and importance in the last few years, so the aim of this research is to introduce the Blockchain technology concept, and how it will set a change in traditional and cultural food supply chain activities. Nowadays consumers are increasingly demanding the details regarding the products which they purchase, however, there is no way for them to know. So, the supply chain process is incrementally getting complicated in the industrial level due to the multiple channels to market. Traceability is becoming an increasingly urgent requirement and a fundamental differentiator in many supply chain industries including the agri-food sector. In fact, lack of transparency in the supply value of any item prevents supply chain entities and customers from verifying and validating the true value of that item.

In this research, we will be taking a detailed look at the food sector supply chain process and how it can be improved with the incorporation of blockchain technology. As we all know, people today are getting increasingly concerned about the food they eat. They do not have enough details about where a certain product was originally manufactured, or the different steps it undertook in the supply chain process. Blockchain Technology will be able to remove any doubt about the traceability of any products found in the supermarket or anywhere else. Moreover, it’s important for companies to properly manage their supply chain processes extremely well due to their complex schematics. Having an inefficient supply chain system brings in many troubles to companies; from increased logistics cost to their inability to meet customer demand.

This research will therefore demonstrate how to incorporate the Blockchain Technology into a certain supply chain system, as well as its benefits to both the firm and the consumers. The complexities and challenges of Blockchain Technology will also be mentioned, along with strategies on how to implement this new technology to the already existing supply chain system.

**4: Preliminary literature review (5 academic articles)**

**1.** **“The Rise of Blockchain Technology in Agriculture and Food Supply Chains”** by Andreas Kamilaris.

In this Research he mainly discussed the impact of blockchain in agriculture and food supply chain and presented many ongoing existing projects and initiatives as an example and analyzed the projects. Our findings indicate that blockchain is a promising technology towards a transparent supply chain of food, with many ongoing initiatives in various food products and food-related issues, but many barriers and challenges still exist, which hinder its wider popularity among farmers and systems. These challenges involve technical aspects, education, policies and regulatory frameworks.

**2.** **“Blockchain technology and its relationships to sustainable supply chain management”** by Sara Saberi

This research looks into the increase in Traceability in many supply chain Industries and Preparing for blockchain technology adoption in the supply chain to understand the organizational barriers and un organizational barriers. The research clearly proven that Blockchain technology provides transparency and cuts intermediaries from transactions. Also, information is shared among supply chain participants and distortion of information is much less likely through a blockchain technology foundation.

**3**. “**Blockchain in the food Industry” by** Viktor Fersht, Min Zhang, John Spink.

In this research, blockchain technology is explained in detail, and the authors clearly explained how this technology works in the food safety sector. He also explained how the United Nations Economic and Social Commission for Asia-Pacific, (UNESCAP) is prepared to begin a project which incorporates blockchain technology to the Asia-Pacific superhighway. This signifies that this technology can be used in many different sectors, and allows firms to reduce their cost of manufacturing as well as the cost of logistics.

**4**. “**Blockchain-based traceability in Agri-Food supply chain management: A practical implementation”** by Miguel Pincheira Caro, Muhammad salek Ali, Massimo Vecchio, Raffaele Giaffreda.

According to authors, The recent exponential rise in adoption of the most disparate Internet of Things devices and technologies has also reached Food (Agri-Food) supply chains, drumming up substantial research and innovation interest towards developing reliable, auditable and transparent traceability systems. Current IoT-based traceability and provenance systems for Agri-Food supply chains are built on top of centralized infrastructures and this leaves room for unsolved issues and major concerns, including data integrity, tampering and single points of failure. Blockchains, the distributed ledger technology underpinning cryptocurrencies such as Bitcoin, represent a new and innovative technological approach to realizing decentralized trustless systems

5. **How blockchain technologies impact your business model by:** Vida J. Morkunas, Jeannete Paschen, Edward Boon

This article discusses the different parts of blockchain technologies, and how each part plays a big role in a firm's business model. Today, blockchain technology is mostly used in the financial sectors such as Bitcoin and other types of cryptocurrencies. However, like this article mentions, there is little to no use of the blockchain technology in sectors other than financial. The impact of blockchain technology goes beyond the financial sectors (Hughes,Park,Archer-Brown,& Kietzmann, 2019). The use of blockchain technology far exceeds the financial sector, and this is what we will be focusing on in our research paper. This article discusses all the other possibilities that the blockchain technology brings on that have no relation with the financial sector. Today, many people use this technology to trade Bitcoin or other forms of cryptocurrencies as it is very reliable and secure, however, this technology can be incorporated in other sectors such as supply chain management, and this will greatly disrupt business activities in a positive manner.

**5: Research Questions and hypothesis (100 words)**.

1. A detailed case study about the food distribution that takes place in the Blockchain and supply chain management.
2. In what ways does the BlockChain technology improve the Supply Chain process in the food industries?
3. Understanding the food distribution supply chain channel process in the USA.
4. What about the benefits, challenges and future research opportunities regarding BlockChain Technology?
5. How could this complicated technology be integrated into a certain firm supply chain system?
6. How will the implementation of blockchain technology align with a firm's goals or objectives?
7. Is it worth it for a firm to invest in Blockchain? What would be their return on this investment?
8. Is there a correlation between consumer awareness, food safety, and consumer trust?

Scope:

The scope of our research paper will focus on the US food industry market. We will be analyzing the food industry in the US, which amounts to around $5.75 trillion dollars in 2017 (Conway, 2019). The US market is vast and we will have a lot of data and information to work with.

**6: Proposed Research design (200 words)**

This Research will focus on analyzing the growth of the disruptive use of Blockchain technology towards a more sustainable supply chain in the food sector. We will be discussing how Blockchain will transform the food supply chain in the future, enabling greater traceability as well as efficiency to both the consumers and the producers. Today, the supply chain model in the food industry is increasingly getting more and more complicated. The logistics that take place to manufacture a certain product is all over the place. Many ingredients that make up a certain food products come from different countries or even continents, therefore, imagine how complicated it is for a firm to keep track of all these orders. Many times, a firm can’t trace back the trail of a certain product that might be defective, or it might take them a substantial amount of time. With the blockchain technology, every transaction is recorded in the cloud and traceability will be much more efficient and less time consuming.

As for the data collection process, we will be analyzing the food industry sector in the U.S, and to better understand the issue on hand, we will be collecting data on how much the food sectors firms in the US spent of supply chain management, as well as the incurred costs regarding to supply chain mismanagement. From this, we will get a general idea on the average cost of supply chain in the food industry sector, and we will be able to demonstrate how the blockchain technology helps in cutting these costs that greatly impact firms.

**7: Expected Results & implications (100 words)**

What do you think are the potential answers to your research question (problematic), and why is the answer important for managers?

* Talk how the blockchain technology will bring traceability to producers as well as consumers (people buying the food)
* Expected result: prove that a firm will be able to cut down on its supply chain costs with the help of blockchain technology.
* Bring a more efficient traceability system where consumers will be able to track any food they buy in the supermarket and know its origin
* Firms spend billion of dollars on their supply chain and logistics
* Blockchain technology in supply chain will also be environmentally friendly (firms will know i details where their raw material comes from, where a certain problem might come from) and firms can change their supply chain model from the data they get from blockchain.

**8: Academic references (5-10 items)**

1. beyratne, S. A., and R. P. Monfared. 2016. “Blockchain Ready Manufacturing Supply Chain Using Distributed Ledger.” *International Journal of Research in Engineering and Technology* 5 (9): 1–10.
2. Adams, R., B. Kewell, and G. Parry. 2018. “Blockchain for Good? Digital Ledger Technology and Sustainable Development Goals.” In *Handbook of Sustainability and Social Science Research*, 127–140. Cham: Springer.
3. Cao, Q., D. G. Schniederjans, and M. Schniederjans. 2017. “Establishing the Use of Cloud Computing in Supply Chain Management.” *Operations Management Research* 10 (1-2): 47–63.
4. Chkanikova, O., and O. Mont. 2015. “Corporate Supply Chain Responsibility: Drivers and Barriers for Sustainable Food Retailing.” *Corporate Social Responsibility and Environmental Management* 22 (2): 65–82.
5. Costa, C., F. Antonucci, F. Pallottino, J. Aguzzi, D. Sarriá, and P. Menesatti. 2013. “A Review on Agri-Food Supply Chain Traceability by Means of RFID Technology.” *Food and Bioprocess Technology* 6 (2): 353–366.

Books:

1. “The Supply Chain Revolution” by Suman Sarkar.
2. “Blockchain and the Supply Chain”: Concepts, Strategies and Practical Applications by Aljosja Beije, Bhaskar Krishnamachari, and Nick Vyas
3. Food Supply Chain Management and Logistics