# **Dissertation Proposal**

**Research Question: How Blockchain Technology Can Impact Supply Chain**

**Introduction**

In current times the links that are needed for creating and distributing products better known as supply chains have become quite complex. Depending on the specific goods, the supply chain can involve a huge number of stages, different localities, more than a dozen invoices as well as a huge number of middle men. With all these variables being handled from a decentralized system, the entire process then goes on for months on end. Such a systems is delayed by the bureaucratic systems that needs a lot of approvals and signatures.

Blockchain technology comes into the picture to see how these processes can be made fewer and simpler to make the supply chain and logistics industry more effective and faster. Blockchain has special features that have been impacting the industry in the last few years and goes beyond tech information to tech being a useful medium that makes life easier.

Blockchain technology is what encompasses the known electronic payment system of bitcoin. It has evidence of which between the supplier and consumer it’s clear who owns what at any one specific time. This system has succeeded in removing third party entities such as banks, payment providers and other financial solutions.

Blockchain technology was embraced by the world after the 2008 recession that saw banks loose huge amounts of money belonging to their clients. When the first ever bitcoin blockchain came into existence in 2009 very few people knew about blockchain. Early adopters in the society took it up in curiosity and started trading with it and in the last decade the market around this technology has grown to a huge number and is now estimated to be up to USD120 billion.

The fact that blockchain is not built on human trust makes it more fool proof and more secure in cases of financial crisis or uncertainty. Most of the early companies using blockchain technology were willing to delve into the unknown world of cryptocurrency which has become more popular in the last ten years.

**Research Aims**

1. To establish the level of transparency in Supply Chain while using blockchain.
2. To assess how blockchain can resolve problems in the supply chain when it comes to transparency and traceability.
3. To find out the impact of blockchain from the beginning to the end of transport routes.
4. To examine how blockchain information can reduce overall production costs.

**Research Questions**

For the technology side of blockchain innovation.

1. How easy and accessible is it to run a blockchain network?
2. Who is tasked with the responsibility to run the blockchain network?
3. Who gets privilege to access and see the data across the blockchain network?
4. If there’s an issue within the blockchain system functionality, who resolves it?
5. In managing the systems who is the overall in charge and what clout do they have that could compromise the system?
6. How safe is the data put into blockchain systems?

For the supply chain industry

1. When it comes to blockchain what is the level of tech maturity for both the business owners and clients?
2. How complex is blockchain as a system for the middle level business operations?
3. How competent are the teams given the responsibility to run the solution?
4. What is the current uptake of blockchain across the entire industry?
5. What are the differences, similarities of blockchain to other cloud based solutions?
6. For the businesses using blockchain what is the level of efficacy in meeting intended needs?
7. For new businesses to adopt blockchain what would be the gains?
8. How long does it take to design an effective blockchain solution for a business?
9. How much does it cost and is it justifiable?

**Context**

Blockchain is a digital ledger that is used for diverse needs; exchange, contractual, tracking, payments and agreements. It’s an option to traditional modes of running business that incorporate the internet of things for better efficiency.

How it works is that every single transaction is documented on a single block and across many copies of the ledger that are then distributed to a number of computers. This feature makes it very transparent and open to review.

The security of the system is topnotch since each block interlinks with each other. No one can really alter it since there’s no autonomous authority over blockchain making its efficacy unmatched. More so, any records that go into the blockchain can’t be blotted out and can be referred to when needed.

Blockchain makes the workflow around supply chains very smooth and seamless; from warehousing to tracked deliveries to invoicing to instant payments. The way it scales to include all these functions makes it very optimal for running businesses.

For better understanding the underrunning of blockchain it’s crucial to look at some of the UK companies that use this technology. First we have De Beers which is the world’s biggest supplier of diamonds. The stones are effortlessly tracked from Sierra Leone courtesy of small miners upto the point they reach the consumers. For the functioning of this high level supply chain the blockchain combines on Artificial Intelligence and the Internet of Things to capture sensor data throughout the supply chain and track it. Each stone gets a special number; this is the number used every time the specific stone gets to a new stage from the underground mine to the jewelry shop.

Another example in the UK is Provenance which works with its consumers to attain the highest levels of transparency. They do so by supporting manufacturing companies such as Co-op and Unilever that adhere to high standards of environmental sustainability and food safety. In this case, products are tracked from their source to shelves across the country. Each of the goods gets a digital stamp that is used along its journey and it’s this number that is used for verification as it moves in the different levels of the supply chain.

**Research Methods**

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## **In-depth Interviews**

Qualitative methods will be used because they are best suited for an exploratory research. First, use of open ended interviews will provide an opportunity to gain insights into awareness and use of blockchain across a spectrum of different businesses. Second, this method will help assess emerging businesses and their openness to using blockchain. The plan is to have the in-depth interviews with junior and senior business executive and have the interviews audio recorded and later transcribed. The options of doing these interviews are either in person or through digital solutions such as zoom and skype.

## **Focus Group Discussions and Interviews**

Focus groups have been used extensively to explore a range of issues in the business sector. Focus group discussions and interviews have a number of advantages and a few disadvantages. For instance, they are less formal channels of communication and more respondents are open to being part of them. They also encourage participation from people often reluctant to be interviewed on their own and might give the opportunity for participants to speak more freely about negative experiences (Kitzinger and Willmott, 2002).

In cases where we can’t do the focus group discussion in person we hope to do zoom recordings and skype group discussions as well.

## **Secondary Data**

In most cases some of the data can be derived from case studies done about blockchain by different consulting, audit and finance companies over the last few years. Since the advent of blockchain the last couple of years, this is a technology that has been tried and tested. Taking into account different insights and lessons learnt will go along in making our research very effective and upto date.

Primary data collection through semi structured questionnaire which will be administered in multiple number of ways as mentioned above. We also plan to set up a google form that will also go further in helping collects responses from a bigger sample of respondents.

**Secondary Data – A literature review**

We plan to look at the origin of Bitcoin as a way of simplifying how we’re able to understand blockchain technology. This we plan to do effectively by reading material both online, books and select journals. We additionally plan to make use of trusted news articles such as the economist among many others.

Additionally, we hope to delve deeper and look at organizations that have used Blockchain to transform their business operations and business culture. Case studies, reviews and analysis reports will offer insight about this. We will look into content from audit firms such as Deloitte and PWC.

To measure the impact of blockchain it will be of essence we have a look at some information from the securities exchange. Other sources will be derived from financial analysts and finance writers for publications such as the Harvard Business review.

The literature review will also feature a comparative review of how the internet of things has transformed organizations and business in terms of not just efficiency but correlating also with income generated after moving to blockchain tech and adapting to smart contracts.

A few books and eBooks are available about blockchain technology and we plan to use these as a way to build a strong case for the research proposal.

# **Research Outcomes**

1. The level of knowledge and awareness about blockchain as an impactful hack in supply chains and the level of uptake of this innovative technology.
2. Businesses using or considering the use of blockchain in their supply chain of command.
3. Examining the transparency and traceability quotient when it comes to businesses using supply chains.
4. How open the business community is willing to incorporate Smart business strategies and automation into the overall cost of doing business.

# **Likely limitations or potential problems.**

The research covers businesses in the supply chain and logistics industry. The fact that blockchain most times uses new tech ranging from artificial intelligence to the internet of things we foresee the need to widen the scope to more locations within the UK to get adequate information, respondents and insights. Due to covid 19 we might not be able to reach as many as we wanted. We would also have to rely on online information and we can’t make any assessments by physically visiting businesses. We might also lose some authenticity since we won't have any interpersonal interviews.

**Time Schedule**

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| Activities | Month |
| Acceptance of research proposal | May, Week 1 |
| Talks with potential respondents in the area of research | May, Week 2 |
| Developing research tools - research questions and research strategy | May, Week 3 |
| Selecting the samples within the community | May, Week 4 |
| Getting access | June, Week 1 |
| Literature review | June, Week 2 |
| Training enumerators in cases where multiple will be needed | June, Week 3 |
| Case studies | June, Week 4 |
| Validation | July, Week 1 |
| Data collection | July, Week 2 |
| Data entry and analysis | July, Week 3 |
| Dissertation report writing, first draft | July, Week 4 |
| Dissertation report writing, second draft | August, Week 1 |
| Dissertation report writing, final draft | August, Week 2 |
| Submit Dissertation | August, Week 3 &4 |
| Presentation of thesis | September, Week 1 |

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