# Impact of Blockchain technology on the supply chain industry

# Introduction

The topic of this paper is how the Blockchain Technology influences and changes the supply chain industry. After a brief desciption of Blockchain this paper is about how the supply chain management can change with the Blockchain technology. Therafter the paper discuss briefliy possible limits or proplems of Blockchain.

# What is Blockchain

Blockchain is an intelligent decentralized system of "Blocks". So instead of one servercenter or a cloud system the blockchain system consists of an amount of several servers at various locations. In general blockchain is open to everyone. So every partie of a blockchain technology driven market can add information into it. It is possible to limit the participants which can get into it. But on the other side only a few authorized persons are allowed to remove data within the specific system. Blockchain has no single controlling unit. (Abeyratne 2016, 2)

Blockchain has a huge potential, far away from the currencies and financial assets it was only used for in the beginning. Even that Blockchain was invented in 2008 it is still at an early stage of development and has almost endless potential. (Abeyratne 2016, 1)

“The World Economic Forum (WEF, 2015) considers blockchain to be among six computing “mega-trends” that are likely to shape the world in the next decade” (Kshetri 2018, 81)

# Blockchain and Supply Chain

Blockchain can help any participant of a supply chain to have detailed information about the actual status of an ordered product. By now not all information of a complex supply chain are available to all parties. Some are kept in secret and some are just not available. (Abeyratne 2016, 4)

With the Blockchain technology the consumer of a product or a paritcipant of a certain supply chain is able to track the transported good constantly and gets all neccessary information. Supply chain without blockchain technology have some uncertaincies and missing information. Due to many reasons: for example a leck of technology, natural events (not reported), human mistakes or failure of one part:

"Even before reaching the end consumer, goods travel through an often vast network of retailers, distributors, transporters, storage facilities, and suppliers that participate in design, production, delivery, and sales, yet in almost every case these journeys remain an unseen dimension of our possessions." (Abeyratne 2016, 1)

Due to the constant watch of the transported goods products which have to be shipped under certain conditions like a constant temperature can now be observed and controlled carefully. Goods like medicine, fish, meat etc. need to be transported at a certain temperature. Blockchain enables the supply chain management to observe the temperature of every shipment step. In 2016 Wallmart startet a test with IBM to monitor pork shipments between China and the US. Even the supply chain within china. Blockchain enabled the test to reduce the paperwork and tracking of the products from days down to minutes. For example, in the test it verified that the determination of the Pork origin last only 2.2 seconds which before the Blockchain technology took many weeks. (Kshetri 2018, 84)

Maersk compared the usual supply chain with a blockchain tracked one. One of Maersk problems is the amount of Paperwork for one shipment. Within the Blockchain test every signed paper could be uploaded into the supply chain and from that point on every participant of the supply chain could see this paper. It came out that for a shipment between Asia and Europe of refridged goods more than 30 stamps and approvals were required. This included interactions with almost 200 persons. So the loading of a container is quick, but the paperwork is not. This could result in a fast loaded container, but due to the long time for paperwork the goods might spoil. Blockchain speeds all these procedures up and reduces the paperwork inlcuding the storage of the files. (Kshetri 2018, 83)

Furthermore sustainability is getting more an more important for consumers. They want more information about the origin of their products and how they are made? With the Blockchain technology within a supply chain everything is trackable. So if a producer wants to stay within a supply chain he has to give all his information into the supply system. With the help of this transparent supply chain producers the producers are forced to built the goods in a sustainable way. (Kshetri 2018, 87)

# Limits of Blockchain

The Blockchain Technology does not only have advantages or is easy to install in all parts of a possible supply chain.

Supply chains sometimes have a countless number of parties in different countries, with different laws, regulations and insitutions. To implement a blockchain driven supply chain can require a massive amount of time. (Kshetri 2018, 88)

There is a huge gap between the transparent and constant tracking of a shipment to the actual Product, for example a container. While everyone in the supply chain has the information that the container is in an harbour waiting to be shipped to Europe, no one can tell if someone makes a hole in the container and exchange the originally products with drugs. (Kshetri 2018, 88)

Allthough one of the blockchain power is the decentralisation the system is still vulnerable. Only a few companies e.g. IBM run the blockchain technology. So it they are attackted, the supply chain can be destroyed or disrupted. (Kshetri 2018, 88)

Blockchain Technology require computer and the access to the internet. Not every participant of the supply chain have the technology for the change. (Kshetri 2018, 88)

# Conclusion

Supply chains are getting more and more complex because of the increasing complexity of trades and are affected by several events. They can be man-made or caused by nature events. Also scandals like e.g. the Nike child labour scandal in 1996 are part of supply chains and affect them. The consumer of a product is not aware of the various crisis and the actual impacts on their ordered product. Constantly there is a rising demand on a transparent manufacturing and supply chain (Abeyratne 2016, 1–2)

Nowadays it ist not easy to put in and track all information of a good in a supply chain. With the blockchain technology it is possible however there are a few uncertain or debatable aspects.

A positive side effect of the Blockchain Technology can be that consumers and especially producers get a higher social responsibilty due to the transparency of the origin and the circumstances the product is made in. (Francisco und Swanson 2018, 3)

"Blockchain technology is a revolutionary innovation with capability to transform many existing traditional systems into more secure, distributed, transparent, collaborative systems while empowering its users." (Abeyratne 2016 2016, 9)

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