Impact of Blockchain technology on the Supply Chain Industry

Introduction

Blockchain is a novel approach in organization and sharing of digital data. It has been defined by Seebache und Schüritz (2017) as follows:

“A blockchain is a distributed database, which is shared among and agreed upon a peer-to-peer network. It consists of a linked sequence of blocks (a storage unit of transaction), holding timestamped transactions that are secured by public-key cryptography (i.e., “hash”) and verified by the network community. Once an element is appended to the blockchain, it cannot be altered, turning a blockchain into an immutable record of past activity.” (Seebacher and Schüritz, 2017 cited in Francisco and Swanson, 2018)

Blockchain has been first introduced by Satoshi Nakamoto for Bitcoin. It was a first approach for a decentralized transaction and data management technology. The fundamental feature of not being able to alter a block after it has been attached to the chain makes it simply impossible to cheat and provides a highly reliable mechanism (Tribis *et al.*, 2018). In the finance sector it is already frequently used. However, thanks to its characteristics of being traceability and reliable it is more and more used in different fields and start-ups (Bocek *et al.*, 2017; Tribis *et al.*, 2018).

Applications

The blockchain technology, although it is a pretty new concept, finds its application in a wide range of areas. Not only is it an effective way to save cost thanks to the removal of intermediaries’ fees but it is also supporting the new customer and consumer friendly perception, where consumers demand detailed information about their products (Tribis *et al.*, 2018; Francisco and Swanson, 2018; Bocek *et al.*, 2017). Various episodes of the use of unethical labour forces or harsh working condition made the demand for transparency increase. Furthermore, consumers do not want to rely only on certificates as Fairtrade, but want to be able to verify by their own (Abeyratne and Monfared, 2016). Those are only a couple of reasons why new start-ups are highly interested in the use of blockchain technology.

Examples of the use of blockchains outside the field of finance are well described in literature. Firstly, fraud detection: The creation of a permanent ledger for diamonds would make it easy for the jewellery consumers to verify the authentication of the diamonds. Furthermore, blockchains can record and store the origin of a product. It could be used for example to guarantee that the fish product purchased is not from illegal netting practices (Bocek *et al.*, 2017; Francisco and Swanson, 2018). Secondly, Identity Management: varies start-ups offer their costumer storage, authentication and integration of biometric data. A prototype allows airline passengers to encrypt and hash their travel documents and to store them on a Bitcoin blockchain. This allows then the airline to check the documents completely decentralized (Bocek *et al.*, 2017). Lastly, Monitoring: A sector with extremely high requirements is among others the pharmacy industry. Blockchain technology can be used to monitor the temperature of the parcel during the transport (Bocek *et al.*, 2017). Furthermore, its excellent traceability makes it a perfect tool to withstand the three mayor threats in this industry: Theft or diversion, introduction of counterfeit medicines, and contamination of medicines (Scott *et al.*, 2018).

A SLR carried out by Tribis *et al.* (2018) shows that there is a worldwide attention towards the blockchain technology. Top three countries with the most publications in this field are spread around the world; with USA the first, followed by Switzerland and China. The most recent research have been studying the following topics: traceability, information security and supply chain finance (Tribis *et al.*, 2018).

Limitations

As the BCT is still in its fledgling stages there are still many limitations to be overcome and gaps to be filled. One of the major gaps is the lack of common standards and regulations. Furthermore, the introduction of the blockchain technology is a complex step. This makes it rather difficult to convince supply chain actors to switch to the new system (Tribis *et al.*, 2018; Francisco and Swanson, 2018). Last but not least, the use of this highly technological system requires a high degree of computerization, which are not be in place in certain countries (Tribis *et al.*, 2018; Abeyratne and Monfared, 2016).

References

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