

Traceability of recycled packaging using blockchain technology

How can one ensure the composition of recycled fibres in a cardboard or containerboard package if it is not possible to verify it optically or chemically? This novel study aims to increase understanding of blockchains potential to support sustainability practices of the cardboard and containerboard packaging industry.

Consumers of today demand sustainable options when purchasing items. Furthermore, European legislation demands that 85 % of all packages made out of paper, cardboard or corrugated paper has to be recycled. Thus, producers in the cardboard and containerboard packaging industry want to, and are sometimes forced to, increase the amount of recycled fibers in packaging, but there is no way to confirm the actual composition of fibers by examining the individual material optically or chemically. Blockchain is often argued to be able to help increase transparency through supply chains. Thus, this thesis explores if blockchain technology can offer the value chain a viable solution to improve traceability of recycled cardboard and containerboard packaging.

The results of the studies indicate that neither the usefulness of implementing a blockchain solution nor the ease of using the technology is high enough to implement a blockchain solution for tracking recycled fibres in the cardboard and containerboard packaging industry today as only two out of the three most important drivers for blockchain adoption are present. Most importantly the main driver, lack of trust, was not identified within the industry as actors heavily depend on mutual trust. Compared to products in industries where blockchain solutions have been thought of as useful before, not many similarities are shared with cardboard or containerboard packaging. The technology itself is complex and there is an absence of common standards to use when implementing

the technology. It would demand a great amount of effort and education to understand the possibilities of the technology since there are no available large scale success cases from other supply chains to learn from.

There are conflicting viewpoints as found by this study whether the choice of recycled fibers over virgin fibers does guarantee a more sustainable alternative. The sustainability is to a great extent dependent on what type of energy source that is used when producing the paper as well as the mode of transport and the proximity to the supply. Furthermore, the study identifies that there is a potential ambiguity regarding metrics of environmental impact and how it is derived through the value chain. As a result, the contribution of this thesis suggests further research of BCT and its applicability in storing sustainability metrics, as for example carbon footprint, an area which may be expanded outside the cardboard and containerboard packaging industry.

The thesis consists of a thorough explanation of the industry for cardboard and containerboard packaging, certification as well as blockchain technology. Additionally, there is an extensive literature review identifying drivers, opportunities and challenges with blockchain technology in a supply chain context. The literature review helps to verify earlier academic attempts to understand blockchain's potential in a supply chain context.