


Blockchain for Circular Economy in the Furniture Sector: The Case of Cubo Design S.r.l.

Valentina Arangiaro
Simest S.p.A., Italy

Behzad Maleki Vishkaei
Luiss University, Italy

Pietro De Giovanni

 <https://orcid.org/0000-0002-1247-4807>
Luiss University, Italy & Luiss-X.ITE Research Center, Italy

EXECUTIVE SUMMARY

The research aims at examining the potential use of blockchain technology in the furniture sector's supply chain. To better understand how the furniture sector is articulated, Cubo design S.r.l and its new 4.0 production plant are used as a case study. Cubo design is an SME from Abruzzo active in the manufacture of parts and accessories of furniture. The authors describe the switch the furniture sector has undergone from "old" handicraft production with a high presence of labor and with a significant presence of external suppliers and manual production methods to the new paradigm based on smart factories. From this point, they evaluate the possible and future adoption of blockchain technologies in terms of the benefits the technology could bring to the sector, how it can be combined with 4.0 logic, and what improvements it would create to support the furniture circular economy.

INTRODUCTION

In the last decades, consumers' awareness regarding ethical and environmental issues has increased, thanks to a growingly interconnected and constantly updated world. The European Circular Economy Action Plan identifies circular economy (CE) as an essential element of a broader transformation towards climate neutrality and long-term competitiveness. The main environmental benefits obtained by the companies are resource recovery from waste regeneration and exploitation, resource efficiency, circular inputs, and the reduction in CO₂ emissions (Maranesi & De Giovanni, 2020).

In the furniture sector, with the developing technology, manufacturers turn to customer-oriented production models. So, a traceable furniture chain prototype that develops production focused on customer demands is proposed as an exemplary scenario (Baygin et al., 2020). It is believed that the companies in the wooden furniture manufacturing sector need to react and take action for improving their environmentally related practices and enhance their image as “green companies” in terms of energy saving and wood waste reduction (Daian & Ozarska, 2009). In general, economies of scale and economic incentives are needed to make repair and refurbishment viable. Currently there are weak drivers and underinvestment in the collection and logistics for furniture take-back. Producer responsibility mechanisms are not widely used in the furniture sector (Furn, 2022). As wood is one of the main raw materials being used in this sector and one of the current challenges in the world is deforestation, implementing new technologies that can help this industry to manage wood consumption via reusing, recycling, and controlling the source of the initial materials is a vital step in terms of circular economy.

Based on a report that is published by BioReg in 2020, the wood waste value chain includes steps from generation of wood waste to its valorisation, including transport, collection, treatment and processing. Figure 1 shows the numerous actors are concerned throughout the whole value chain.

Blockchain technology ensures better acceptance among consumers when purchasing refurbished goods, and among firms when using recycled materials (De Giovanni, 2022). Blockchain technology provides a platform for recordkeeping and data-sharing. Digital ledgers, containing records and transactions, are visible to all authorised participants of a network. This visibility increases transparency and traceability (Francisco & Swanson, 2018). Some common benefits of implementing blockchain technology include delivering a transparent, decentralized, secure transaction process that may

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