

**BLOCKCHAIN-ENABLED SUSTAINABILITY IN THE FASHION INDUSTRY:
MAIN BENEFITS OF PRODUCT TRACEABILITY AND ANALYSIS OF
CUSTOMERS' PERCEPTION**

Sara Diodati, Università degli Studi di Milano¹
Lawrence Cabrera, Università degli Studi di Firenze²
Riccardo Rialti, Università degli Studi di Siena³
Lamberto Zollo, Università degli Studi di Milano⁴

ABSTRACT

The fourth industrial revolution has re-designed completely the way in which businesses operate, causing disruptive change in technological and cultural paradigms which contributes to the upcoming of new services and new technologies. Among these, blockchain has been one of the most relevant, thanks to its capability of storing any type of transaction. Given its great potential, the interest for blockchain has been growing significantly over the years and it has since been applied in many fields, from supply chain management to improve goods traceability (Yu, Wang, Jin, Li & Jiang, 2019), moving to healthcare, to better off patient data sharing operations (Cyran, 2018), guaranteeing the privacy of sensitive data.

Nowadays, current research on blockchain largely revolves around the different ways it can be employed. However, with the growing interest of users (Clarke, Jürgens & Herrero-Solana, 2020) and the fear for the increasingly evident consequences of the climate crisis, new worries arise that may be tackled with blockchain. The fashion industry is part of the areas of concern, due to its evolution in the past decades. The switch from mass production to mass customization to satisfy any customer's desire has led to the so-called fast fashion, which requires producing large quantities of garments, at the expense of product quality and durability. Considering the whole lifecycle of clothes, the apparel and footwear industries are responsible for 8-10% of the global carbon emissions, due to their extended supply chains and energy-intensive production, exceeding aviation and shipping industries combined (European Parliament, 2021). Moreover, these numbers are expected to grow in the future if nothing is changed (NIST, 2022). According to a study of BCG about secondhand market (BCG, 2022), such concerns have changed the perspective of many consumers, as they have started to prefer second-hand fashion over fast fashion brands, mainly due to the ethical and sustainable uncertainty of the production process.

In this challenging scenario the blockchain technology presents new ways to track materials as it appears to be a possible solution to fill this 'trust-gap' in the fashion industry. Today, it is possible to provide customers with all information related to a manufacturer or a product, from the beginning of the creation process until the final purchasing user's decision (Agrawal, Sharma, & Kumar, 2018), allowing to verify the movement of goods

¹ sara.diodati@studenti.unimi.it

² lawrencepaul.cabrera@studenti.unimi.it

³ riccardo.rialti@unimi.it

⁴ lamberto.zollo@unimi.it

in real-time. With a clear comprehension of the origins of a label, customers may trust sustainable labeling more and it can lead to the setting of a new starting point.

Hence, understanding users' perceptions about blockchain and its application in the fashion industry becomes relevant to identify new possible strategies; the decision whether to purchase a traced cloth instead of a common label might be determined by the transparency and trust of the tracking system and the technology behind it. Transparency and traceability are set to be key for long term advantage over competitors, providing customers with all means to make a sustainable and conscious choice every time they buy new items (Rwazi, 2024).

In this regard, this study aims at exploring the opinion and concerns of common consumers about blockchain, in order to detect the level of knowledge of users and to test their perception about the environmental situation. Data was collected through an online survey in October 2023, using an Alteryx workflow to analyze the information collected. The results from 162 participants show how significant the environmental situation is for young consumers, representing 41% of the sample responding to the survey, more stressed and affected by eco-anxiety than other generations (Hickman et al., 2021). Gen Z is the main supporter of second hand and vintage clothes as they are well aware of fast fashion's destroying effects (ANSA, 2022). Moreover, it is evident from the results that consumers do not have a clear idea about blockchain technology and the way distributed ledger could help in keeping track of dresses and materials, in order to verify how each piece is produced. Nevertheless, Gen Z considers itself open and ready for new innovative technologies to be applied in all economic sectors according to the answers collected. The findings of this study provide significant suggestions on how to fill the knowledge gap of young consumers about this technology, for instance with the help of education. Meanwhile, the fast fashion industry should evaluate the application of blockchain technology as a new strategic approach to create a stronger communication channel with sustainability-conscious customers.

Keywords: Blockchain, Sustainability, Fashion, Digitalization, Blockchain-enabled sustainability

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