

PRINCIPLES FOR DESIGNING BLOCKCHAIN SOLUTIONS TO TEXTILE SUPPLY CHAINS

1 INTRODUCTION

The textile industry is persistently associated with scandals involving child labor, poor working conditions, low wages, and exploitation. The industry is also at the forefront of environmental concerns due to its significant ecological footprint (10% of global carbon emissions.) These factors have put increased pressure on the industry to make its supply chain more transparent, visible, and sustainable. Blockchain has emerged as a promising solution to addressing these challenges due to its powerful mechanism for ensuring data integrity and immutability.

2 RESEARCH PROBLEM AND OBJECTIVE

Current attempts to outline frameworks for blockchain implementation have overlooked the formulation of design principles and key features necessary for guiding the development of blockchain applications, particularly within the textile industry. These gaps underscore the need for more focused, context-oriented research that not only develops practical blockchain applications but also directly addresses textile industry-related concerns, such as labor exploitation. This study aimed to outline principles for designing blockchain solutions tailored to textile supply chains.

3 THEORETICAL FRAMEWORK

The theory behind this study is that of design and action proposed by Gregor (2006), which focuses on providing prescriptions to be followed in practice. Accordingly, this study prescribes the method and principles for constructing an IT artifact. Specifically, it prescribes the method and principles for designing blockchain solutions that promote transparency and visibility in textile supply chains. To achieve these prescriptions, this study followed the design science (DSR) guidelines (Hevner et al., 2004) in investigating Fair Fashion.

4 METHODOLOGY

This study followed DSR guidelines and stages, which are: (1) problem identification, (2) definition of objectives, (3) design and development of the artifact, (4) evaluation, and (5) formalization of learning. This study strictly adhered to these procedures in order to minimize biases and highlight the value of DSR in designing blockchain solutions.

5 ANALYSIS OF THE RESULTS AND DISCUSSION

The blockchain solution studied here has evolved to meet the specific challenges of the textile industry. The data revealed that the technology had to be adapted to address the unique requirements of the sector, rather than being applied as a generic solution. This iterative design and development process has yielded valuable insights and lessons that can inform the formulation of design principles, which are grounded in empirical experience and reflect the practical challenges and opportunities encountered in the textile supply chain.

6 CONCLUSION

The design principles proposed here provide guidance on developing and implementing blockchain solutions tailored to textile supply chains. These principles address the specific challenges of the textile industry, offering mechanisms and methods to tackle them. The study demonstrates the potential of blockchain technology to address critical socio-environmental challenges within textile supply chains, contingent upon incorporating features that enhance workplace conditions, facilitate information presentation, ensure data monitoring and verification, and protect suppliers.

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