

Certitex: Textile Certified Supply Chain

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1 Abstract

In several areas, the increase in complexity of a supply chain creates mistrust among the participants of the chain itself. This makes it difficult to attribute the cause of potential damage caused to the goods throughout its manipulation flow. Awareness of sustainability and transparency has also grown, becoming an important part of supply chain management. Several previous works on this topic and related ones can be found in [1–5].

2 Goals

As such, the aim of this thesis work is to study a certification platform for textile companies by promoting traceability of goods throughout their supply chain. This study aims to understand how integration of blockchain technology can be done across the entire manipulation stream of a product, to enable tracing and tracking. Different blockchain types will be studied in terms of cost and benefits they bring to the solution. In addition, this thesis work aims to study how artificial intelligence technology can introduce improvements in both traceability, tracking and performance analysis in transport chains and inside the textile factories. Several artificial intelligence technologies have already been integrated with blockchain. This work focuses on using the immutable records provided by blockchain along with artificial intelligence methods to estimate factory performance metrics and improvements as well as the environmental impact of textile goods produced in factories.

3 Tasks

- T1: Review of the state of the art on blockchain and integration of artificial intelligence in blockchain technology; comparison of existing applications of the technology in the field.
- T2: Design and construction of a proof-of-concept blockchain solution for traceability of textile goods;
- T3: Research on how to integrate artificial intelligence to improve the functionality of the built proof-of-concept; exploration of how environmental impact can be traced by using blockchain;
- T4: Implementation of artificial intelligence methods into the previously built proof-of-concept; testing of the solution;
- T5: Write the master's dissertation, technical documentation and a conference paper.

4 Schedule

Task	Start date	Duration
T1	2019-10-01	1 months
T2	2019-11-01	3 months
T3	2020-02-01	2 month
T4	2020-04-01	2 months
T5	2020-04-01	2 months

References

- [1] Tarun Agrawal, Ajay Sharma, and Vijay Kumar. Blockchain-based secured traceability system for textile and clothing supply chain. In *Artificial Intelligence for Fashion Industry in the Big Data Era*. Springer, May 2018.
- [2] Magdi Elmessiry and Adel Elmessiry. Blockchain framework for textile supply chain management. In *Blockchain – ICBC 2018*, volume LNCS 10974, pages 213–227, June 2018.
- [3] Vasco Lopes and Luís A. Alexandre. An overview of blockchain integration with robotics and artificial intelligence. In *Symposium on Blockchain for Robotic Systems*, MIT Media Lab, Cambridge, MA, USA, December 2018.

- [4] Sarah Obser. *Transparency and Traceability in the Textile and Clothing Supply Chain*. PhD thesis, May 2015.
- [5] Youness Tribis, Abdelali El Bouchti, and Houssine Bouayad. Supply chain management based on blockchain: A systematic mapping study. *MATEC Web of Conferences*, 200, January 2018.