

Supply chain analytics: a framework integrating machine learning with blockchain technology

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The health care supply chain management is the process of planning, implementing and monitoring a set of interconnected operations to ensure the timely delivery of healthcare service to patients. A variety of organisations participate in the healthcare supply chain ranging from pharmaceutical companies and food suppliers to logistics companies and hospitals. They are linked by upstream and downstream flows of products, services, finances, and information.

The pandemic had highlighted the number of issues already existing in the healthcare supply chain such as the high dependency on certain suppliers and shortage of raw materials and medical devices, leading a national crisis.

The distributed Ledger Technology (DLT), and in particular Blockchain, has already proven its worth in industry such as for the shipping industry enabling all stakeholders to store and share information on shipped item conditions and location. Recently two NHS hospitals have used blockchain to track Covid-19 vaccines. This technology enables data sharing across the supply chain leading to more integrated and efficient operations and enabling the healthcare sector to better face potential future challenges. Integrating machine learning with blockchain technology would facilitate the analysis of supply chain data and detection of undesirable events.

The main aim of this project is to investigate how advanced data analytics methods can be used to make sense of healthcare supply chain data and improve its performance, e.g., greater integration across the supply chain, shorter order-to-deliver cycle time, better demand fulfilment. The second part of this project is to identify the challenges and opportunities of using DLT in the healthcare sector. The third part consists in developing a framework integrating blockchain technology with machine learning.