Chapter 19
Blockchain in International Trade Documents Management Using NAHP Technique:
Case of Kapikule and Istanbul Border Customs

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ABSTRACT

This study aims to explore the potential of blockchain technology in digitalization of documents used in foreign trade processes and to embody the advantages it can bring to customs clearance processes. The work is in two stages. In the first stage, the authors examined the document flow between the parties in customs clearance processes through three different digitalization scenarios using blockchain technology. They have come to the conclusion that rapid adaptation to innovations based on blockchain technology in the field of document management in international trade customs clearance processes is advantageous. In the second stage, they analyzed the priorities of the rational decision-making process with the NAHP method. The main challenges facing the transition to new technology are the need to train staff for new systems, the need to develop and improve new internal processes, the time spent reaching agreements with trading partners in the transition period, and the alignment of technological developments with legislation.

1. INTRODUCTION

Differences between countries, especially in the level of technological sophistication, the richness of natural resources and the commodity prices have increased the need for foreign trade. In 2019 world economy, the total foreign trade volume reached 25 trillion US\$, 19.4 trillion US\$ of which consisted of trade in goods and 6.1 trillion US\$ portion of trade in services in 2019 (UNCTAD, 2021). The WTO reports that world trade volume has grown by nearly 300 times over the half-century from 1950 to 2020. Even though there is a significant growth in foreign trade volume, business processes are still very traditional and complex. In a typical international trade finance transaction in the traditional form, dozens of documents circulate between approximately 20 parties many times and a total of more than a hundred pages of paper documents are used for a single transaction (Law Commission, 2022).

Blockchain is one of the most important digitalization technology and has many features to bring innovations to traditional foreign trade systems. These features can be listed as decentralization, anonymity, auditability and immutability (Zheng et al., 2017). Thanks to Blockchain applications based on distributed ledger technology, it is possible to create original electronic documents that cannot be copied peer-to-peer (P2P), whose data source can be guaranteed without the need for a trusted third party (Mihajlov et al., 2019). Thanks to these features, blockchain technology have the potential to offer many advantages such as transparency, reliability and time and cost savings needed in the traditional form of foreign trade ecosystem. International institutions, especially the World Trade Organisation (WTO), World Customs Organisation (WCO), United Nations Conference on Trade and Development (UNCTAD), Organisation for Economic Co-operation and Development (OECD) and International Chamber of Commerce (ICC) expect blockchain technology to have serious effects in the fields of trade and logistics and are actively working in these fields. One of these initiatives, the Intelligent Technology and Trade Initiative (ITTI) was organized in 2017 by the World Trade Organization (WTO). ITTI, where academics, negotiators and business leaders came together, agreed that both blockchain and augmented intelligence (AI) have the potential to increase commercial exchange (WTO, 2017). It is predicted that using blockchain and AI technologies will decrease intermediaries in foreign trade and increase confidence (ICC Brasil, 2018). Particular attention is paid to the idea of transitioning to electronic documents under the revised Kyoto Convention and through the Recent Framework Agreement on Facilitating Cross-Border Paperless Trade in Asia and the Pacific (Shope, 2022).

The main purpose of this article is to investigate the potential cost and time-saving effects of the use of blockchain technology in digitalization processes in international trade. For this purpose, the possible advantages in practice were tried to be embodied by estimating the application of blockchain technology in the field of international trade through scenarios and it was aimed to contribute to the field in this respect. Three different scenarios (partial digitalization, intermediate digitalization and full digitalization) were created regarding the digitalization of foreign trade documents using blockchain technology and the change was measured in comparison to the current situation. The reason for examining digitalization in three different scenarios is the possibility of involving foreign trade stakeholders in digitalization processes at different levels. In the literature, the innovations that blockchain technology will bring are mostly discussed in the theoretical dimension. The most important contribution of this study to the literature is the implementation of digitalization scenarios at different levels over real customs clearance procedures and the concrete presentation of the advantages that can be provided.

The remainder of the article is organized as follows. In section two, the need for digitalization and examples of blockchain technology application in foreign trade processes were given. The digitalization

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