

P2P Block Chain Business Model; a Possible Solution for Complicated Bureaucracy within the African Continental Free Trade Area

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ABSTRACT

This paper proposes the implementation of the P2P blockchain business model as a possible solution to the problem of complicated bureaucracy in Africa, which could hinder the smooth running of trade activities within the recently launched African continental free trade area. Blockchain technology is proposed to solve some issues of complicated bureaucracy within the new African continental free trade area (AfCFTA). The methodology includes using trade between Central African countries as an example to give an insight on the complicated bureaucracies existing in some African countries, and the reasons why it will be a huge problem for the effective implementation of the AfCFTA.

Keywords: Africa's free trade area, Bureaucracy, P2P, Blockchain technology.

INTRODUCTION

The African Continental Free Trade Area (AfCFTA) became operational on May 30th 2019, and once running fully is said to be the world's largest free trade area since the creation of the WTO, because of the number of countries involved. The main objective of AfCFTA is to put in place a single market for goods and services across 54 countries, make it possible for business travelers and investors to move freely across borders; as well as creating a continental customs union so as to have a good trade flow and attract long-term investment within the continent.

Reasons advanced by the Organization of African Unity for the need to create AfCFTA are many. Africa is highly dependent on the importation of secondary products and machinery and exports so little, and majority of exports are from primary products. Also, differences between major import partners could highly impact the continent negatively, such as

the recent China - America trade frictions. Africa needs to equip itself, build something strong to be able to compete globally and to be able to have a bigger voice at the table when it comes to international trade negotiations. This can only be possible if the continent builds infrastructure, facilitates investments, free movements and trade with every member state within it.

Historically, intra-african trade has been very low over the decades, with total exports amounting to just about 16.6% and imports about 13% in 2017. When compared with about 55.0% in America, 59.4% in Asia, 68.4% in Europe and 7.0% in Oceania, it is clear that Africa has so much to do. Figure 1 tells us more about the untapped potentials in the African continent.

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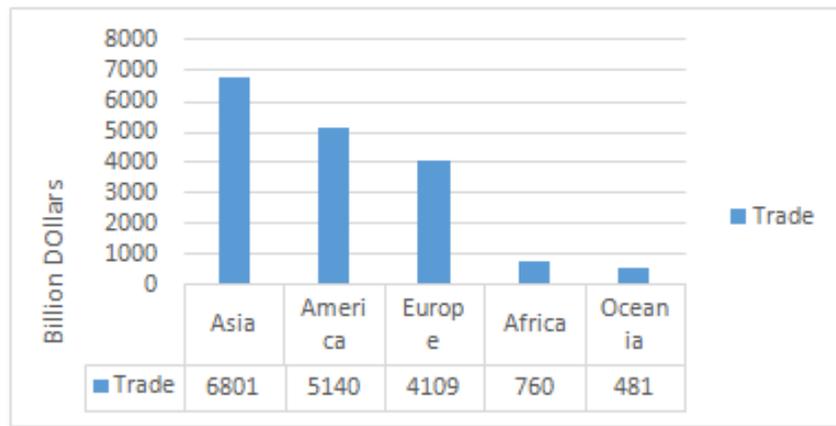


Figure1. Percentage of Intra-continental exports

Source: United Nations Conference on Trade and Development 2019

Figure 2 shows total trade from each continent to the rest of the world. According to the Economic Development in Africa Report, total trade from Africa to the rest of the world averaged US\$760 billion in current prices in the period 2015–2017, compared with \$481 billion from Oceania, \$4,109 billion from Europe, \$5,140 billion from America and \$6,801 billion from Asia.

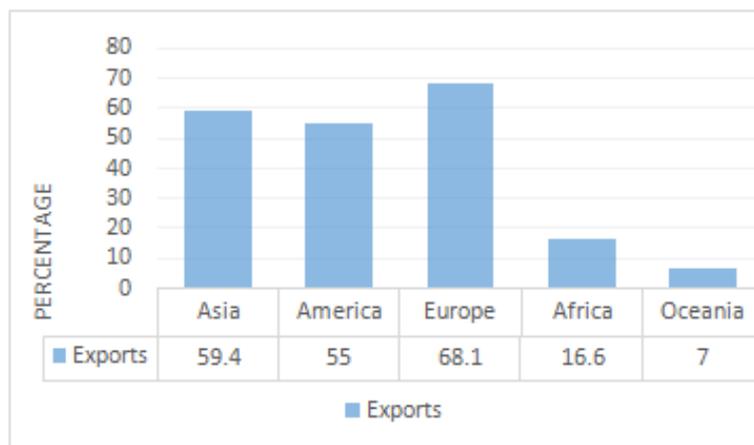


Figure2. Trade data from continents to the rest of the world

Source: United Nations Conference on Trade and Development 2019

It has also been found that intra-African trade, defined as the average of intra-African exports and imports, was around 2% during the period 2015–2017, while comparative figures for America, Asia, Europe and Oceania were, respectively, 47%, 61%, 67% and 7%.

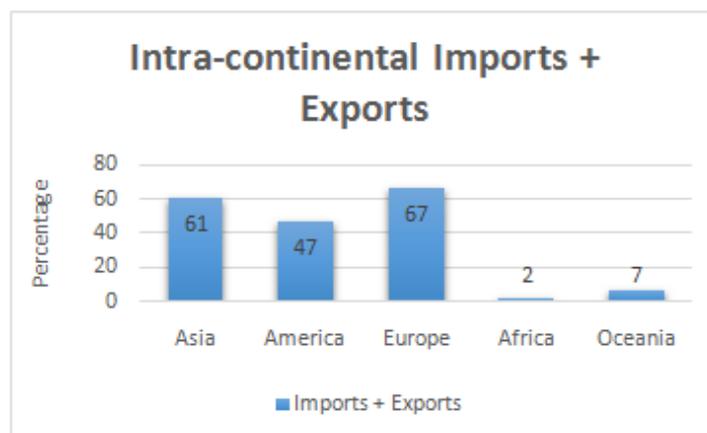


Figure3. Intra-continental total imports and exports

Source: United Nations Conference on Trade and Development 2019

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The AfCFTA will unite 1.3 billion people, create a \$3.4 trillion economic block and usher in a new development era for the African continent. It is projected that if implemented successfully, Africa's consumer spending will be about \$1.4 trillion by the end of 2020, 128 million households will have a discretionary income by 2020, 50% of the population will be living in cities by 2030 and the number of Africans within the working age will be 1.1 billion by 2040. All of these projections are quite exciting, but there is a number of hurdles to be overcome to make it a success.

PROBLEM STATEMENT: COMPLICATED BUREAUCRACY IN AFRICA

Africa¹ that a container from Cape Town (South Africa) to Kigali (Rwanda) would require 56 custom signatures, 84 custom stamps, 83 documents and 28 certificates.

Within Central Africa, there is a huge cost differential in transporting freight between coastal countries (such as Cameroon) and landlocked countries such as (Central African Republic and Chad). This reflects the fact that final destinations in coastal countries tend to be relatively close to the sea, and the costs of crossing an international land border are avoided. For these reasons, freight transport costs to and from Cameroon are among the lowest in Central Africa at \$1,379 per container, even if they remain very high in absolute terms.² The average time to export and import is 23 and 26 days, respectively (table 1). By comparison, the cost and time of trading to and from the Central African Republic and Chad are substantially higher. For instance, it costs \$8,150 to import a container to Chad and \$5,554 to the Central African Republic. The high costs and lengthy delays in trading to and from the

The AfCFTA has been applauded to be an amazing initiative and is predicted to promote African trade, make it more competitive globally and improve the livelihoods of people in the continent. Nevertheless, complicated bureaucracy and inefficient port logistics are some of the issues to be handled.

The level of bureaucracy is extremely high in Africa. According to Ngaire Woods, Dean Blavatnik School of Government at the University of Oxford, it would be impossible to build a value chain across the continent when there are countless customs stamps, customs signatures and certificates to simply move a container from one country to another. She said at the world economic forum on

landlocked countries are due to several barriers in the international corridors. Surface transport costs and travel times in the corridor connecting Cameroon to Chad and the Central African Republic (Douala-Ndjamena and Douala-Bangui) are among the highest in Sub-Saharan Africa.

Achieving effective logistics demands working with other parties in order to optimize the flow of goods, manage financial transactions and complicated documentation. Most parts of logistics processes and transactions are run manually and this in most cases is the reason why it is usually hard to track and trace the origin of goods, or follow up the flow of goods along the supply chain. Figure 4 shows the traditional flow of information in international trade. Usually manual-based entry and paper documentation are used to adhere to custom procedures.

¹© 2019 World Economic Forum on Africa - Africa free trade area is promising, yet full of hurdles.

²Cost measures the fees levied on a 20-foot container in U.S. dollars. For more on the methodology behind the figure on trading across borders see World Bank 2011c.

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Table1. Trading across borders in Central African Countries

Country	Documents required to export (number)	Time to export (days)	Cost to export (\$ per container)	Documents required to Import (number)	Time to import (days)	Cost to Import (\$ per container)
Angola	9	47	2,747	10	71	4,285
Cameroon	11	23	1,379	12	26	1,978
Central African Republic	9	54	5,491	17	62	5,554
Chad	6	75	5,902	10	101	8,150
Congo, Democratic Republic	8	44	3,505	9	63	3,735
Congo, Republic	11	50	3,818	10	62	7,709
Equatorial Guinea	7	29	1,411	7	48	1,411
Gabon	7	20	1,945	8	22	1,955
Sao Tome and Principe	8	27	690	8	29	577

Source: World bank

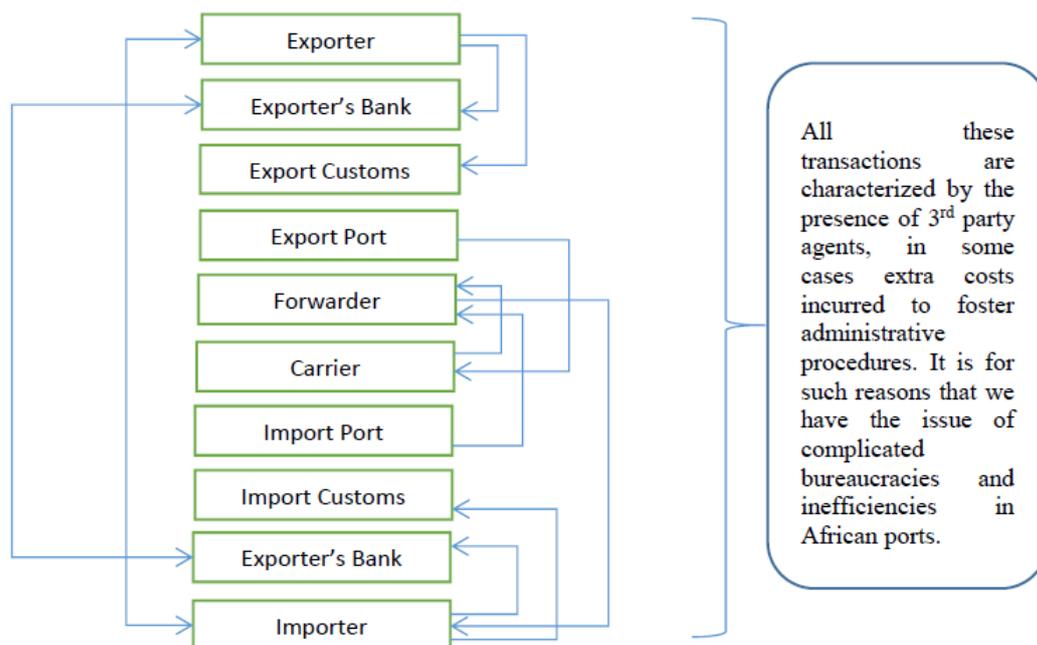


Figure4. The traditional flow of information in international trade

LITERATURE STUDY

A blockchain is a secure, replicated and immutable shared digital ledger. This ledger relies on the consensus of a global peer network to operate. The digital ledger is essentially a series of encrypted “blocks” that are linked together in a public “chain.” (Anagh, Ganapathy and Rajeev, 2019). Modifying the data in one block is impossible without modifying the entire chain and receiving consensus of the entire peer network. This makes

it incredibly difficult to perform malicious activity or falsify data. Once it’s in the blockchain, it’s pretty much in there for good. This technology can potentially be applied to the transportation and logistics industry to correct many inefficiencies.

Logistics is often considered the lifeblood of the modern world, with an estimated 90% of world trade carried out by the international shipping

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industry every year.³ But the logistics behind global trade is highly complex as it involves many parties often with conflicting interests and priorities as well as the use of different systems to track shipments. Therefore, achieving new efficiencies in trade logistics is likely to have significant impact on the global economy (*Matthias Heutger, 2018*). According to one estimate from the World Economic Forum, reducing supply chain barriers to trade could increase global gross domestic product (GDP) by nearly 5% and global trade by 15%.⁴ Blockchain technology can help alleviate many of the frictions in global trade logistics including procurement, transportation management, track and trace, customs collaboration, and trade finance.

With over 50,000 merchant ships⁵ involved in the global shipping industry and multiple customs authorities regulating the passage of freight, a major area of focus for efficiency gains is ocean freight. Blockchain technology has huge potential to optimize the cost as well as time associated with trade documentation and administrative processing for ocean freight shipments (*Markus Kückelhaus, 2018*). One example that highlights the complexities behind ocean freight today is the estimate that a simple shipment of refrigerated goods from East Africa to Europe can go through nearly 30 people and organizations, with more than 200 different interactions and communications among these parties.⁶

THE P2P BLOCKCHAIN BUSINESS MODEL

A peer-to-peer (P2P) network consists of a group of devices that collectively store and share files. Each participant (node) acts as an individual peer. Typically, all nodes have equal power and perform the same tasks. P2P architecture can be suitable for various use cases, but it became

particularly popular in the 1990s when the first file-sharing programs were created.

A P2P system is maintained by a distributed network of users. Usually, they have no central administrator or server because each node holds a copy of the files - acting both as a client and as a server to other nodes. Thus, each node can download files from other nodes or upload files to them. This is what differentiates P2P networks from the more traditional client-server systems, in which client devices download files from a centralized server. Figure 5 illustrates a typical P2P blockchain model.

³<http://www.ics-shipping.org/shipping-facts/shipping-and-world-trade>

⁴http://www3.weforum.org/docs/WEF_SCT_EnablingTrade_Report_2013.pdf

⁵<http://www.ics-shipping.org/shipping-facts/key-facts>

⁶<https://www-03.ibm.com/press/us/en/pressrelease/51712.wss>

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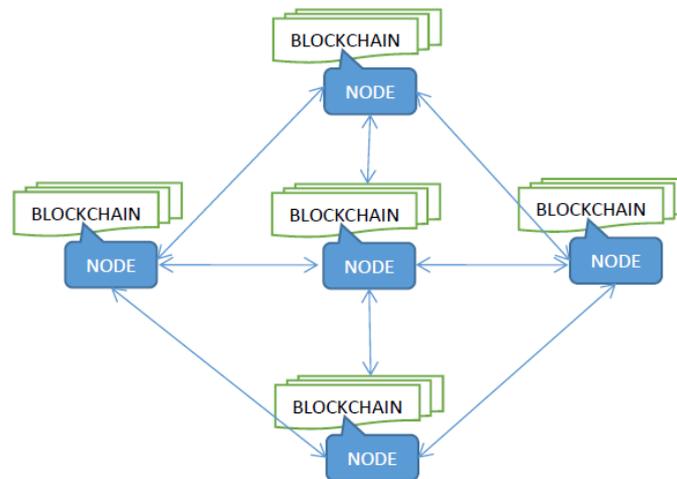


Figure5. Peer-to-peer blockchain network

On P2P networks, the connected devices share files that are stored on their hard drives. Using software applications designed to mediate the sharing of data, users can query other devices on the network to find and download files. Once a user has downloaded a given file, they can then act as a source of that file.

Types of P2P

P2P systems fall in 3 categories: unstructured, structured and hybrid P2P networks.

Table2. Types of peer-to-peer networks

Unstructured P2P Networks	Structured P2P Networks	Hybrid P2P Networks
They do not present any specific organization of the nodes.	They present an organized architecture.	They combine the conventional server-client model with some aspects of the peer to peer architecture.
Participants communicate randomly with each other	Nodes efficiently search for files using the hash function.	It designs a central server that facilitates the connection between peers.
Easier to build, but require higher CPU and memory usage.	Usually require higher set up and maintenance costs.	They tend to present improved overall performance
They are robust against high churn activity, with several nodes frequently joining and leaving the network.	They are less robust when faced with high rates of churn.	They combine some of the main advantages of both unstructured and structured networks
Usually have so many peers and queries are sent to the highest number of peers possible.	They are efficient and present higher levels of concentration.	They achieve a significant degree of efficiency and decentralization simultaneously.

Source: Binance Academy, 2019

P2P Blockchain Business Model Implementation in the AfCFTA context

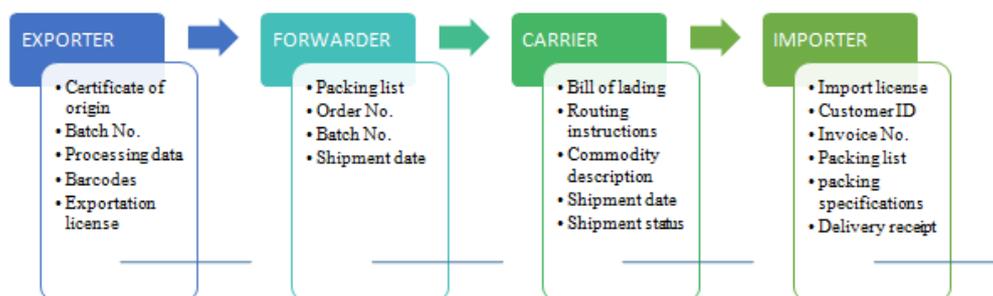


Figure6. Flow of Information in a Blockchain

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P2P blockchain networks operate on cloud technology, which means that information could be accessed from anywhere by any party that has access to the blockchain. Figure 6 above shows the flow of information in a blockchain. Exporters transmit loads to forwarders, forwarders transmit to carriers and carriers transmit to the importer. For every shipment, transactions and documents get executed and saved. Each transaction becomes a permanent ledger record that's easily validated by anyone with access to the chain. Using data from a blockchain, the network members can validate the block or payload of the transaction, creating a transparent and efficient system for managing all documents and transactions involved in the logistics and supply chain process.

Member countries within the AfCFTA will make it successful if the following conditions are met:

1. The standardization of regulations across all ports. This will mean the creation of a customs union, setting and agreeing on general procedures to be adopted by everyone. This will eventually lead to faster clearing of goods, lesser documentation, cut costs involved in imports and exports within AfCFTA member countries, do away with middle men and therefore expose the continent to faster growth.

2. The acceptance of digital payment and settlement platforms to avoid fraud. It is very safe as cryptocurrency blockchains are resistant to government censorship and can't be frozen like standard bank accounts. So it really makes financial transactions secure.

3. Choosing a blockchain business model, work on a plan and effectively implement it. Table 2 shows five steps for implementing a blockchain within the AfCFTA.

Table 2. Steps for Implementing a P2P blockchain model with the AfCFTA.

Steps	Task	Implementation
Step 1	Understanding what blockchain is.	<ul style="list-style-type: none"> - All member countries within the AfCFTA need to be educated on what blockchain really is. - They need to know that this new technology can optimize time, costs and as well improve transparency and build trust in business transactions.
Step 2	Developing a business case.	<ul style="list-style-type: none"> - Taking a deep analysis of the major issue at hand and see if blockchain would provide the best solution to the problem. In this case, we are looking at complicated bureaucracy. - If intermediaries add complexity, if interactions are time sensitive, if interactions are cost sensitive, if transactions interact and there are requirements for verification, then building a blockchain is important.
Step 3	Choosing the type of p2p blockchain to implement.	<ul style="list-style-type: none"> - Deciding if it has to be private or public, centralized or decentralized, permissionless or permissioned, will depend on the type of every business transaction to be effected. - For the case of AfCFTA, a private permissioned blockchain will be suggested since trading involves financial transactions and some information needs to be kept private
Step 4	Designing carefully	Privacy implications, cybersecurity, members' compliance and how to work efficiently using the blockchain will have to be drafted out.
Step 5	Building a managing committee	<p>The members within the AfCFTA will need to have a team of experts from each country that understand how blockchain operates and will set most of the parameters for its application, such as:</p> <ul style="list-style-type: none"> - risks and control measures to put in place. - design governance mechanisms such as auditing and validation. - Setting the rules of participation to make sure the blockchain functions as planned.

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Based on the model in figure 7 and with the standardization of regulations being effective, all the stakeholders involved; that is the importing country, exporting country, the trade regulatory board and African Union central committee will upload valid documents in a blockchain and they will be accessed by all. In this way the services of intermediaries will be cut off, cost incurred in some administrative procedures will be maximized, time will be saved, transactions will

be transparent and trade will slowly gain efficiency.

It is suggested to have regulators to shape emerging blockchain policies and monitor evolving regulation as well. Besides having a regulatory body on how the blockchain will operate, laws on data use and protection will have to be put in place to make sure all trading parties' information are kept secure; and such an approach will depend on every country's internal policies.

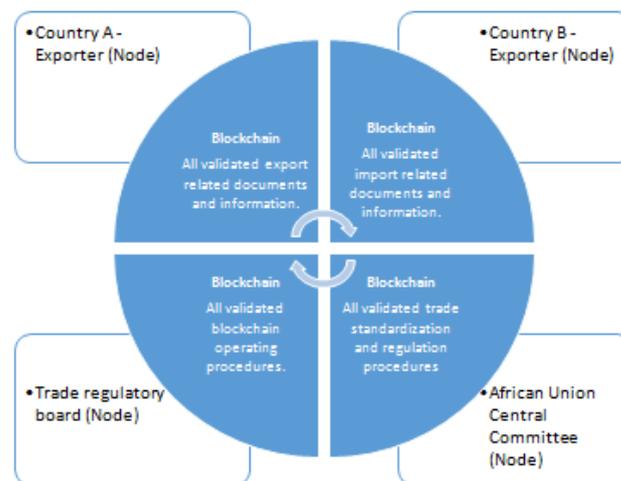


Figure7. Functioning of the P2P Blockchain model

CONCLUSION

The P2P model like every model does not just have advantages, it equally has loopholes. One of the major shortcomings of the P2P model is that distributed ledgers must be uploaded on every single node and not a central server, which makes it require a huge amount of computing and might reduce efficiency because it could take so much time for adoption. Nevertheless, its adoption will be a great deal for the reduction of time spent in bureaucracy and moving goods around the continent.

Other issues at hand that could hinder the quick adoption of the AfCFTA is lack of infrastructure. There is much to do when it comes to energy and surface transportation networks in Africa. It is worth noting that there is an ongoing project called Lapsset, which is aimed at building a railway from Lamo (Kenya), passing via South Sudan, right up to Central African Republic and ending up in Douala (Cameroon). Many of such projects have been lunched and are been executed to facilitate the free movement of goods across the African continent.

PROPOSED AREAS FOR FURTHER RESEARCH

- Rules of origin within the Africa Continental Free Trade Area.
- Optimizing port logistics in Cameroon.
- The belt and road initiative; it's impacts on Sino-Cameroon trade ties.

REFERENCES

- [1] African Union (2018), "Building capacity to help Africa trade better", *African trade statistics yearbook 2017*, Tralac trade law center MPC.
- [2] Anagh N, Ganapathy S.K.V and Rajeev K.R (2019), "Blockchain in transport and logistics", EXL Service.
- [3] Cho, B. J. and Park S. Y. (2017), "Blockchain technology: the 3rd information revolution?", *Asia Pacific Journal of Innovation and Entrepreneurship*, Vol.11 No.1
- [4] Greg Carter (2018), An introduction to blockchain technology in logistics: benefits, use cases & why the industry needs standards; CTO GlobalTranz.

P2P Block Chain Business Model; a Possible Solution for Complicated Bureaucracy within the African Continental Free Trade Area

- [5] Jaime D.M, Yvonne T. (2014), Regional integration in Africa; challenges and prospects, working paper, *United Nations University*.
- [6] Kim Cloete (2019), “Africa’s new free trade area is promising, yet full of hurdles”, World Economic Forum on Africa.
- [7] Landry Signe (2018), “African leaders have created the world’s largest free trade area since WTO - here’s its potentials”, Quartz Africa.
- [8] Markus K. and Keith T. (2018), Blockchain in logistics “perspectives of the upcoming impact
- [11] intra-African trade.
- of blockchain technology and use cases for the logistics industry”, DHL Trend research.
- [9] Richard N. Williams (2018), “Strategies to successfully implementing a blockchain”, *Technology and analytics*, Financial Management Magazine.
- [10] United Nations conference on Trade and Development (2019), Economic development in Africa report; Made in Africa; Rules of origin for enhanced

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Emmanuel Sogbou Kenne, holds a BSc (2009) in Sociology and Management from the University of Buea - Cameroon, an Advanced Diploma (2011) in Human Resources Management and Development from the Institute of Commercial Management - England, a Post Graduate Certificate (2014) in International Trade Law and Development from the Trade Policy Training Center in Africa - Tanzania, a Master’s Degree (2016) in International Economics and Trade from Anhui University of Technology - China and is currently doing a PhD in Logistics and Supply Chain Management at East China Jiaotong University - China since 2018. He is researching on Digital Transformations and its impacts on the logistics industry in Cameroon.

The author has been working in the logistics industry for 6 years, providing procurement logistics services in Asia to clients from mainly Africa and North America.

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