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Digital Transformation: Blockchain and Land Titles

GEORG EDER

VIENNA INTERNATIONAL DEVELOPMENT NETWORK

Georg.eder@vidn.org

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Abstract

Blockchain based land titles have been gaining traction in digital transformation strategies. Three documented case countries serve as comparators for the implementation of such policies. Their respective differences allow for first conclusions in the implementation of blockchain based property rights for policymakers. Factors, such as ease of doing business, the respective local ecosystem and network and institutional reform packages are taken into account and compared. This paper concludes with first recommendations in policy addressing local networks, institutional reform and cost/benefit analyses. The theoretical implications of the paper contribute to discussions on leapfrogging in the context of digital transformation and policy.

The opinions expressed and arguments employed herein are solely those of the authors and do not necessarily reflect the official views of the OECD or of its member countries.

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1. Introduction

Property rights are a stepping stone in international development theory. The World Bank as well as other key international organizations have repeatedly underlined the need for clear property rights, improving governance, and allowing for an improved record and paving the way for the private sector. The most elementary form of property rights are land rights. Biasolo (2017) noted three trends in blockchain for land rights: 1. Public Registries, facilitating the recordkeeping of relevant transactions. 2. Tokenized trading: Property is tokenized and traded. 3. Specific development project ICOs, financing projects through cryptocurrencies.

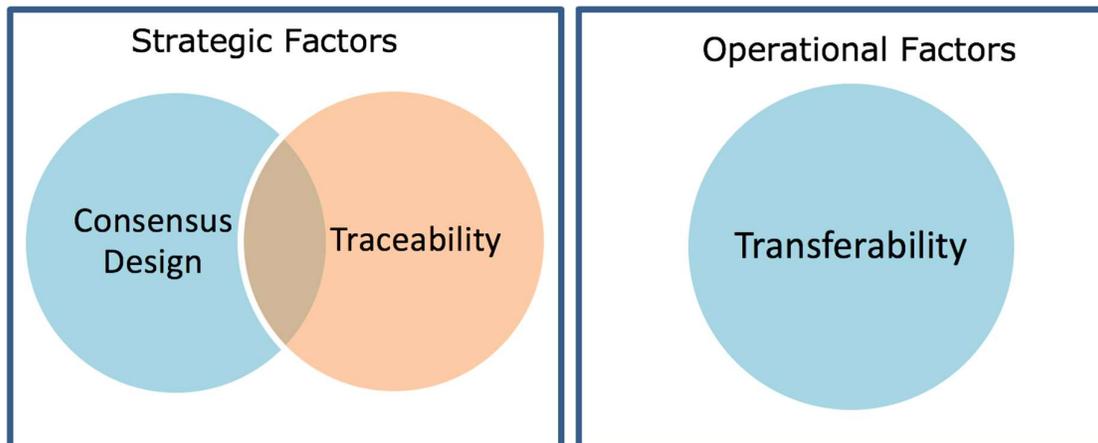
Until now, blockchain-based use cases have been used in the creation of tradeable tokens and cryptocurrencies. With the characteristics described above, the technology also offers the possibility to improve traceability of processes. Thus, the technology can also be found in supply chain tracking, as a recent paper by the World Trade Organization describes and offers key strategic advantages. The technical characteristics of blockchain and DLT prepare the technology for wide scale adoption in increasing transparency and improving governance. The use cases of blockchain have greatly developed since the inception of bitcoin ten years ago.

Now, selected countries are moving towards implementing blockchain-based land registries. Georgia moved towards blockchain enabled land registries in 2016, enabling seamless integration with pre-existing property registries (Shin, 2017), overcoming burdensome implementation processes. In Ghana, Blockchain enabled land registries are a force for industrial development (Aitken, 2016), making property rights immutable and curbing corruption and freeing “trillions of dollars” (ibidem). An experiment in Honduras in 2015 also contributes to the discussion on land titles, blockchain and development.

Integrations of blockchain in the realm of trading properties have also taken shape in other fields. In Dubai, tenants are envisioned to be connected with homeowners, developers, utility companies (D'Cunha, 2017). These developments are envisioned to improve fraud prevention, corruption affecting thousands of investors per year and hopes to draw high net worth individuals into the city. Sweden decided move its land registry to blockchain in 2016, previously, it was already the world's most developed land registry (Biasolo, 2017), facilitating digital signatures, personalized verifications, digital contracts to mitigate risk of incorrect registries and increased trust between actors. The close interaction with public officials controls which information is public and remains private (ibidem). Property rights and blockchain have moved from vision to reality in different environments with different focus points.

Numerous characteristics facilitate the argumentation on behalf of blockchain-based products. These characteristics create two sets of advantages in the management of resources, specifically in the public sector. They are strategic and operational. The strategic aspects of blockchain and property rights underlines two aspects; consensus design and traceability. Thus, creating governance within the means of exchange of a token/unit. This facilitates the traceability of a token, allowing users and observers to

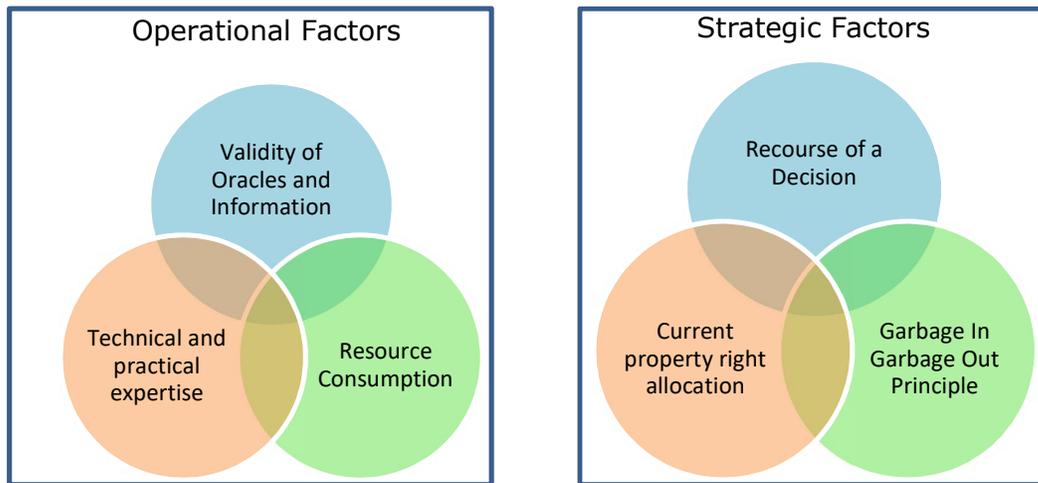
understand and legitimize transfers. The operational advantages lie in the transferability of a unit, allowing stakeholders an exchange and property. These strategic and operational advantages facilitate the implementation of blockchain based land registries. Other scholars, such as Jaques Vos, have also analysed principles of land registry systems, which are complementary to the factors described below.



However, there are still key uncertainties in the implementation of blockchain-based property rights. Similar to the advantages described above, there are equally notions to consider in the implementation. They include, again, operational and strategic factors. As land right registries need to have offline sources of information (i.e. a surveyor, bureaucratic processes, inhabitants etc.) the previously technical and bureaucratic risks are not necessarily eliminated but rather transferred to such sources of information, often referred to as *oracles*. Secondly, as the technology is still new and its acceptance is growing, implementation mistakes will still be made. First movers will encounter difficulties and failures and technical and theoretical expertise is still to grow. Lastly, resource consumption. Experts on blockchain are costly and so is the respective energy consumption of blockchain-based decentralized systems. The current consumption of an established public blockchain, such as the one used in Bitfury's implementation of the Georgian National Registry is highly power intense. In early March 2019, Bitcoin is consuming comparable amounts of energy to Singapore (Digiconomist.com, 2019).

Strategic factors equally come with potential unknowns, including recourse mechanisms in times of dispute. Additionally, as in the case of Ghana, 80% of all land registries are undocumented. This means that reflecting this status quo and its associated registered properties are likely to cause disagreements between legal persons. Lastly, the blockchain-based system is reflective of the Garbage in Garbage Out principle. The quality of the output will depend directly on the quality of the input. Hence, wide scale adoptability needs to be feasible and selected factors need to be taken into account. As McKinsey and company published, the wide scale adoption is often unfeasible in spite of its operational advantages (Carson, et al., 2018). Coindesk, a leading news source for blockchain, also described the difficulties of

adopting land titles on a blockchain (Reese, 2017). In 2018, the World Bank started working on a proof of concept to describe the implementation of blockchain-based land registry systems (Anand, 2018) and the United Nations is equally taking a step in that direction. The implementation of blockchain-based land registry systems needs to be based on sound weighing of pros and cons in the policy realm.



The following three case studies showcase different implementation paths towards blockchain-based systems in land registry. This paper will focus on public land registries as an example of a common goal. The differences in the adoption of blockchain-based property rights systems serves as an example of public digital transformation. The paper is based upon qualitative factors and reporting in discipline specific literature and conclusions relevant for policy are drawn.

2. Ghana

In Ghana, over 80% of land titles lack the documentation to prove ownership (Mwanza & Wilkins, 2018). This allows for facilitated expropriation and fraud. In theory, such practice has been outlawed since 1962. Similarly, the World Bank ranks Ghana with Land Registering Index of 119 out of 190 (The World Bank, 2018), describing the difficulty to register property. One recently published paper notes the inefficiencies of acquiring property in Ghana and the bureaucratic and regulatory hurdles associated (Gyamera, et al., 2016). Additionally, a report by the World Bank in 2013 describes the lack of accountability and lack of transparency as a key inhibiting factor in the development of the Ghanaian land registry. It describes amongst other aspects that the property management and planning is disconnected from the actual population, that planning is usually done without public consultations (Bugri, 2013). Until now, institutional bottlenecks have led to decreased transparency and development in property rights.

One initiative tackling the market has been conducted between the Ministry of Lands and Natural Resources and IBM. A memorandum of understanding outlined the adoption of a blockchain-based land registry system in 2018 amongst Ghanaian implementing partners and IBM. Previous initiatives to put Ghana's land titles on a blockchain have been purveyed amongst others by Bitland, founded in Ghana in 2014, others such as BenBen have equally been growing in the sphere. Broad and effective reform is needed in order to solve the inefficiencies and of land title registries. Until now, several actors have entered the Ghanaian property space. However, given the amount of time that has elapsed since the inception of blockchain-based land registries in Ghana, the effective output is yet to be seen and besides the fact that the Ghanaian government signed the MoU in 2018, little has been seen to support the implementation of blockchain-based property rights. Further results have not been published yet.

Additionally, the Ghanaian Security and Exchange Commission has been hesitant to issue regulation on cryptocurrencies and has encouraged investors to stay away from cryptocurrencies due to the volatility and scams associated with the industry and has actively sought consultations to implement blockchain-based initiatives and cryptocurrencies (Adedamola, 2019).

The Ghanaian experience shows a relatively long history of attempts to put registries on a blockchain in spite of the government's stance to inhibit the trading of cryptocurrencies and is currently working on reform packages to address the technology from the side of the Security And Exchange Commission (SEC) (Mbogo, 2019). However, the implementation of blockchain-based property rights has been part of a greater reform package addressing land titles and registries (Ghanaweb.com, 2018). Although the implementation of blockchain-based property rights has been developing, the implementation of blockchain-related policy is still in the process of being produced.

3. Georgia

Georgia entered the blockchain-based property rights market in 2016, when Georgia's National Agency of Public Registry signed a Memorandum of Understanding with Bitfury, a large, blockchain implementation company. A recent analysis of the projects draws two conclusions (Shang & Price, 2019), the authors underlined the importance of the quality of data as well as the importance of broad engagement with a target group. In 2018, Georgia registered over 1.5 million land titles on their blockchain-based system.

Georgia also purveyed the importance of mining. As described in a World Bank Press Release Georgia is one of the largest contributors in commercial mining, fuelled by low energy prices and tax exemptions (**The World Bank, 2018**). Thus, the implementation of blockchain-based projects has seen traction amongst its population. Additionally, communities, such as the Georgian National Blockchain Agency or the Georgia Blockchain Coalition have equally developed the public discourse on the topic. Additionally, Georgia has considerably low energy prices, facilitating mining (ibidem). The mix of tax incentives, low energy prices and multi-stakeholder engagement reflects the broad societal adoption of the technology.

From a public policy perspective, the Georgian experience has been a part of a broader initiative to attract international investors and to curb corruption. Key indicators, such as the Corruption Perception Index have repeatedly shown Georgia's improvement in the fight against corruption, economic growth has been steady and unemployment remains low (**The World Bank, 2018**) and the World Bank ranks Georgia as the fourth easiest country to register property (ibidem) . As described by Transparency International in February 2019 however, these reports highlight the positive, whereas improved governance and democratic oversight within the Georgian democratic apparatus still offer room for vital reform (**Transparency International, 2019**).

In comparison to the Ghanaian precedent, key differences emerge. Firstly, the importance of education in the implementation process. As Shang and Price (2019) demonstrate, education is a necessary condition for the success of the blockchain-based public project. Furthermore, Georgia has been working with international experts on the topic since its inception. The quality of the data is key in the success and transparency of the project.

4. Honduras

In 2015, the government of Honduras became interested in developing a blockchain-based land registry. Since the mid 2000s, improved property rights were a priority. One avenue to achieve this goal were digitised land records. These attempts were also supported by international donors, such as the World Bank (Graglia & Mellon, 2018). Thereafter, the government raised an interest in the possibility to digitise the country's land registries with US based partners. Factom and Epigraph were granted the possibility to proceed without a bidding process (Graglia & Mellon, 2018). Clouded in political turmoil, the president of Honduras was inflicted in a corruption scandal (Graglia & Mellon, 2018), and the project came to a halt (Rizzo, 2015) as other priorities arose, such as the upcoming elections. One observer noted in the case of Honduras that the previously envisioned Honduran digitised land registry system was criticized for leaning towards business interests rather than indigenous interests (Graglia & Mellon, 2018). Others expressed hopes that the improved property rights could have effects on the security in the country (Chandran, 2017) as the World Bank ranked Honduras 91st globally in the Ease of registering property and 152nd in the enforceability of contracts (The World Bank, 2018). The interest in the technological transformation of property rights in Honduras became a victim of politics and thus the project died in its infancy.

The envisioned project was based on the bitcoin blockchain by Factom and Epigraph. The US based partners mentioned the importance of being at the implementing location and the importance given to the improved coordination with local officials. They highlighted the risks faced by bureaucrats, including job security and the upcoming elections. Secondly, the partners underline the importance of an angel investor for the project (**Graglia & Mellon, 2018**) to be able to provide the means to finance such a large project prior, as financial profitability was foreseen at a disproportionately late point in this project. Thus, highlighting two crucial aspects of the digital transformation strategy, the dependence of local expertise, knowledge and presence, as well as the financial capabilities of the respective partners.

5. Conclusion

5.1 Inclusion and Multi-stakeholder Engagement

Broad, multi-stakeholder engagement is key. Networks, meet-ups, building expertise etc. is important to guarantee the implementation and promulgation of the technology. In Georgia, the fact that several organisations exist that are working on the topic allows for the wide spread adoption of blockchain-based technologies. Additionally, a concerted education approach helped the adoption of the project. Ghana until now seems further behind on that front, in spite of the fact that Bitland was initiated in Ghana considerably earlier than the project in Georgia. Additional tax exemptions further incentivised broader acceptance of cryptocurrencies and blockchain-based products in the Central Asian Country. A multipronged approach with a multiplicity of actors facilitates the adoption of the technology.

5.2 Technology Highlighting Institutional Weaknesses and Leapfrogging

As the Ghanaian and the Georgian experience shows, the implementation of a blockchain-based project is usually nestled in a broader set of reform. The need for a concerted strategy, including all necessary stakeholders is paramount for the success of the project. This means that the technological product cannot resolve a pre-existing institutional malaise, including lack of transparency, corruption and lacking accountability. In contrary, without the institutional tools in place, technological transformation will not deliver on the hopes invested. Hence, the importance of improved governance a priori to the implementation process and thus questioning assumptions of leapfrogging through digital transformation. The case of Honduras underlines the need for stability and improved communication with local stakeholders to be able to mitigate risks.

5.3 Feasibility and Political Risk

The wide adoption of blockchain-based property rights needs to be part of a broader strategy. This also means that the feasibility of the implementation needs to be measured in accordance with an increasing number of categories based upon the experiences and conduct of comparable cases. The implementation needs to take the cycles of profitability into account and the partners' financial robustness. As the example of Honduras shows, one of the difficulties of the implementation process are the politics on the ground in the implementing partner country, where political stability can hamper the development of technological transformation.

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