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Moving Beyond Paperwork: Blockchain in Public Sector

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Abstract

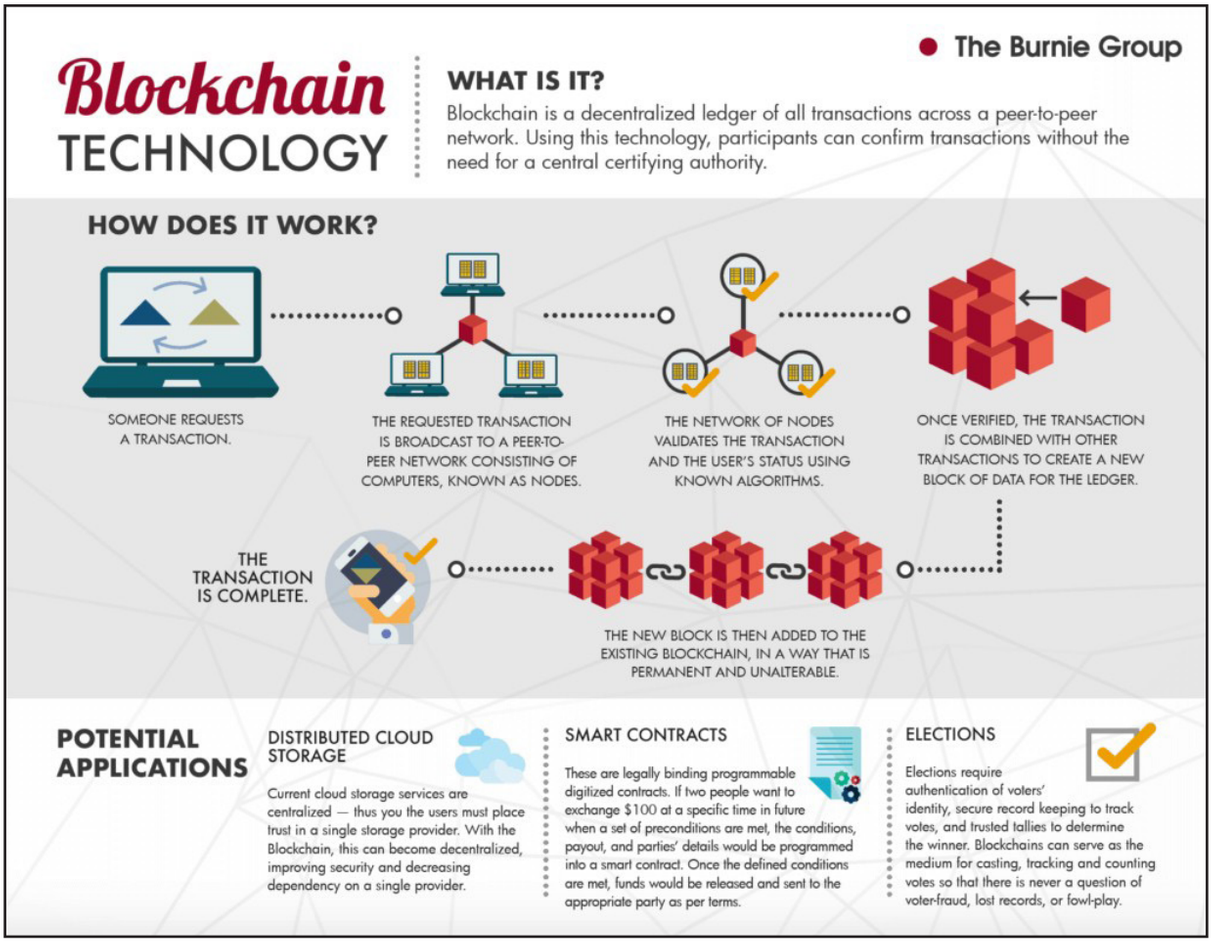
The purpose of this research paper is to focus on the granular assessment at use-case level of the opportunities of blockchain in the public sector. Blockchain is a secure, shared, distributed ledger that can redefine the nature of transactions and transform global administration and economy. As governmental documentation requires extensive paperwork that involve intermediaries and centralized ledgers, the system remains untrustworthy, tedious, expensive and inefficient. Moreover, a significant challenge for the public sector involves the lack of effective traceability and transparency. The establishment of a trusted identity becomes a problem due to forgery, expensive background checks and enormous paperwork necessary during verification. The paper also aims on how governments or public sectors can utilize blockchain - a distributed and secured ledger, which can improve security, data transparency, documentation and rate of inspection. Blockchain can prove to be a technological platform for various public sector use-cases like - tax collection and reporting, identity management, digital currency, public procurement, voting, land registry, government records etc. In each of the mentioned cases, blockchain has the potential to create value regardless of the type of record keeping or transaction involved which will help governments and public sectors to build trust and transparency and thus changing the way to deliver for the citizens.

Keywords: Blockchain, Public Sector, Distributed Ledger, Consensus, Land Registry, Voting, Digital Certificates Value, Monetary Value

1. Introduction

From barter to bitcoin, with time, the way we trade and exchange value has evolved in our society. Blockchain, being the latest of all, is expected to transform not just monetary transactions, but the idea of exchanging of all kinds of digital pieces of information. In its most literal sense, blockchain is just a chain of blocks. However, not in the traditional sense of those words. In this context, "blocks" are the digital information and "chain" is the public database that the "blocks" are stored in (Danial Daychopan, 2016).

Blockchain, although a term that is not alien to none, is a concept that is yet to be comprehended by majority. This complex concept consists of different technologies, where each one is as important as the other and makes it the revolutionary concept that it is. Let's take the example of Google Docs. Before the Google Docs era, we worked on Microsoft Word which required a lot of back-and-forth. If it was a document that multiple people had to work on, the others had to wait for the one who was working on to send it to them, edit or add comments on it and send it back. However, with Google Docs, anyone who has access to the document can edit and collaborate with others working on it in real-time. The changes made by one cannot be denied, but is seen by everyone. This is precisely how blockchain works. Whereas in this context, instead of a shared document, it's a shared ledger that all the involved parties have access to. And the changes made within it can be verified by everyone in that network.



Source: https://burniegroup.com/infographic-a-look-at-blockchain-technology/

Fig. 1

2. Blockchain With a Real-World Analogy

- *The Central Parking System Analogy:* A simple real world analogy of a parking lot system will help in demystifying this foundational technology. Take an example of a big parking space built by a private company which can accommodate 500 cars at a time. Note that the parking space has a single main gate which stays locked and is only opened when a car enters or exits. A deeper analysis into this analogy will help in understanding various facets of blockchain (Siddharth M, 2016).
  - *Price:* The parking space is built by a private company, and the owner of the parking space bears the operational and maintenance expenses. Hence, the private company rents out the parking space with very high rental charges.
  - *Security:* Since there is only a single main gate for for entry or exit, any trespasser or burglar who manages to cross this main gate can access any of the cars parked in the parking space.
  - *Limit:* The total accommodation limit of the parking space cannot exceed. If there is a need for accommodating more than 500 cars, the private company has to build a new parking space.
  - *Trusted:* As a rental charge is levied for using the parking space, the car owners trust the company for the security and reliability.
  - *Centralized:* The cars are parked in a single parking space with a single main gate for entry and exit hence the parking space can be considered as a centralized system.
- *The Distributed Parking System Analogy:* The above mentioned parking system analogy can be modified

to understand a different point of view the system. Consider there are 500 houses in the city and each of these houses have two garages. One of the garges of each house has one car parked in it (those 500 cars that were earlier parked in the centralized parking) and the other one is empty. The owners of these garages plan to rent out the empty garage thus solving the problem of accommodating more number of cars than before. To understand the outcome of this modification various parameters can be analysed similar to the previous analogy.

- *Price:* The parking space is now owned by individuals, planning to rent out the other garage. Since the parking space is small and the owners didn't plan to rent out the garage when built the rental charges would be comparatively cheaper. Moreover, the operational and maintenance costs incurred to the owners would be lesser compared to the single large parking space.
- *Security:* The cars are parked in different garages. Even if the trespassers or burglars manage to open the garage, they can access only one car that is parked in the garage. Thus increasing the level of security in a distributed parking system.
- *Limit:* The total accommodation limit of the parking space cannot exceed. If there is a need for accommodating more than 500 cars, the private company has to build a new parking space.
- *Trustless:* The lack of a central authority control ensures that in the distributed parking spaces, there will be certain rules set by all the participating garage owners for renting out their places.
- *Decentralized:* As these parking spaces are distributed throughout the city, it can be considered as a decentralized parking.

3. Will Blockchain Transform the Public Sector?

The unique design of the blockchain makes it ideal for situations requiring security, transparency and collaboration. The blockchain is thus seen to have limitless potential, especially in public sector, because of these traits. The public sector, federal, state and local governments are flooded with data. The growing need for adoption of exponential technologies on a large scale is encouraging countries across the globe for experimenting with multiple use cases of blockchain technology. However, a major challenge for government organizations is to understand how to apply the technology to optimise their services. The starting point for this could be by looking at the specific pain points in the current processes. Next step would be to identify ways to optimise these processes by leveraging the blockchain technology. Once the vision is set, it should be formalized into use cases to design solutions.

The influence of blockchain in the public sector is mostly going to be behind the curtains. But it is expected to bring efficiency, security and speed to varied range of services and processes in the public sector. Storage of static information, i.e., record keeping is a critical action when it comes to public sector. Timely updation of records, ensuring adequate security, managing the access to these records, immutability, transparency, secure storage and preservation of data are paramount to areas in the public sector where information has to be stored across different systems or databases. Thus, it is necessary to select the right use cases to come up with viable business case to project the solutions on a larger scale (Mckinsey, 2018).

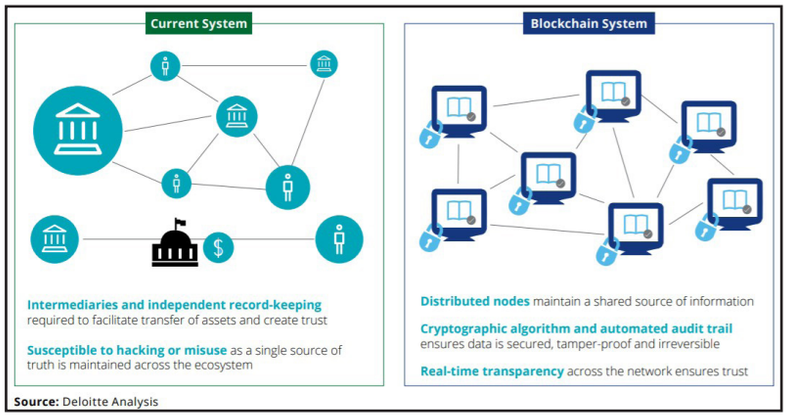


Fig. 2: Traditional Database vs Blockchain-Based Distributed Ledger

- *Land Registry:* Land is one of most valued assets and source of investment for various organizations, registered institutions and even individuals. Land ownership being a highly priced asset it has been the crux for various frauds and crimes. Land registry is a critical procedure that needs intense verification and authentication. In the absence of a transparent and effective land registry system, land ownership, land title transfers, deeds, notary etc. will not be able to provide critical protection to the land owners or buyers (Jamie B, Théo B, Angela H, 2018). The following explains the crucial pain-points in the current land registry process:

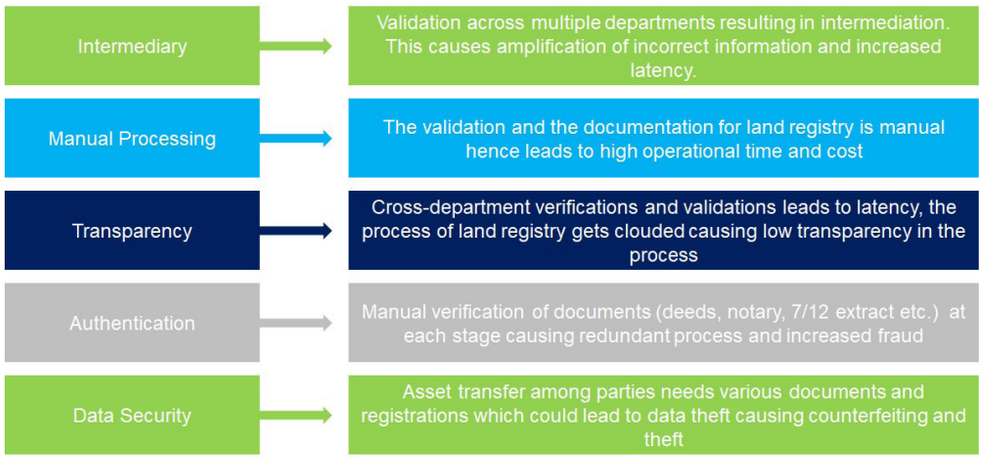


Fig. 3

Blockchain can prove to be an effective technology to vanish the pain-points of the land registry procedure. The 'proof of process' and 'proof of existence' features enable blockchain to be the apt technological inculcation in the public domain. A decentralized system can reduce the intermediate departments and processes, increasing trust and efficiency by reducing operational time and cost. The traceability feature of blockchain we provide visibility of all land title exchanges and thus reducing civil cases related to property conflicts. Blockchain being tamper-proof ledger, counterfeiting documents would be difficult enabling the the land registry being more transparent and authentic.

- *Voting:* Voting is one of the fundamental elements in forming a government. Due to the criticality, the voting procedure (from registration of citizens to declaration of results) must be highly transparent. Conducting elections on national or regional level could be cumbersome and challenging. The following explains the crucial pain-points in the current voting process:

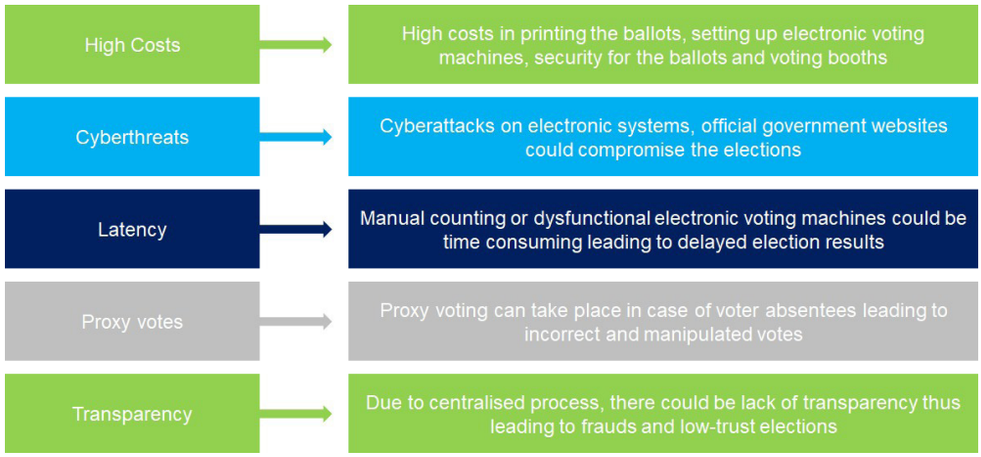


Fig. 4

With the inculcation of blockchain technology citizens can cast votes in the similar way as they perform other transaction. Citizens can initiate secure voting, validate the casted vote and even verify the declaration of results. A blend of anonymous vote-casting, identity management using digital method, personalized ballots etc. can make voting more transparent and efficient. Operational costs are reduced due to blockchain, thus saving government's expenditure for elections. Enhanced security and authenticity of votes can be achieved by using blockchain. Blockchain will enable citizens to vote remotely and thus leading to increased participation and reduction in proxy votes.

- *Digital Certificates:* Citizens use e-cards or digital copy of identity cards (government, official etc.) while interacting with e-commerce, government agencies, banking sites etc. Third party institutions/ agencies use these digital copies for remote verification or online transactions. Unverified or counterfeited documents can lead to identity theft or misuse of documents for frauds. The following explains the crucial pain-points in the current digital certificate authorization process:

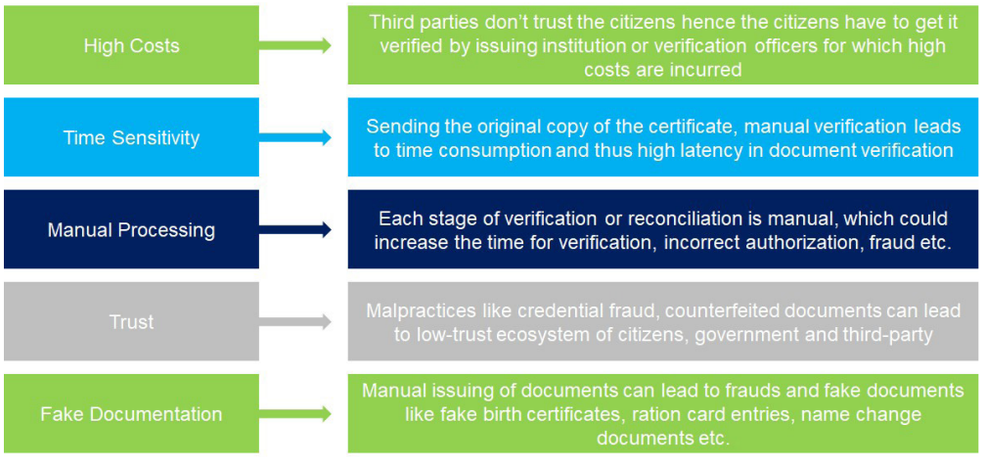


Fig. 5

Advancements in blockchain technology will enable citizens, government and third parties to store and retrieve verified digital certificates anywhere and anytime. The hash of the issued certificate will be stored immutably. The certificate would be signed by the issuer digitally and the hash will be stored in the blockchain. Blockchain will ensure that the citizens are the sole owners of their credentials irrespective of the issuing institution. Blockchain technology will enable verification of documents almost real-time thus reducing the time and cost. Fake documentation, misrepresented documents, misuse of credentials can be reduced by adopting blockchain due to its tamper-proof feature. Blockchain is immutable and hence the certificate issued can be used any number of times in the future (Deloitte, 2017).

4. Conclusion

The broad applicability and its transformative potential thus makes blockchain technology worthwhile to venture the plethora of possibilities in the public sector. Evidently, a blockchain based solution to its current alternative could improve the existing situation in terms of efficiency and could potentially reduce or entirely eliminate frauds (Mckinsey, 2018). A granular assessment on the proposed use cases showing the impact vs feasibility plot is given below:

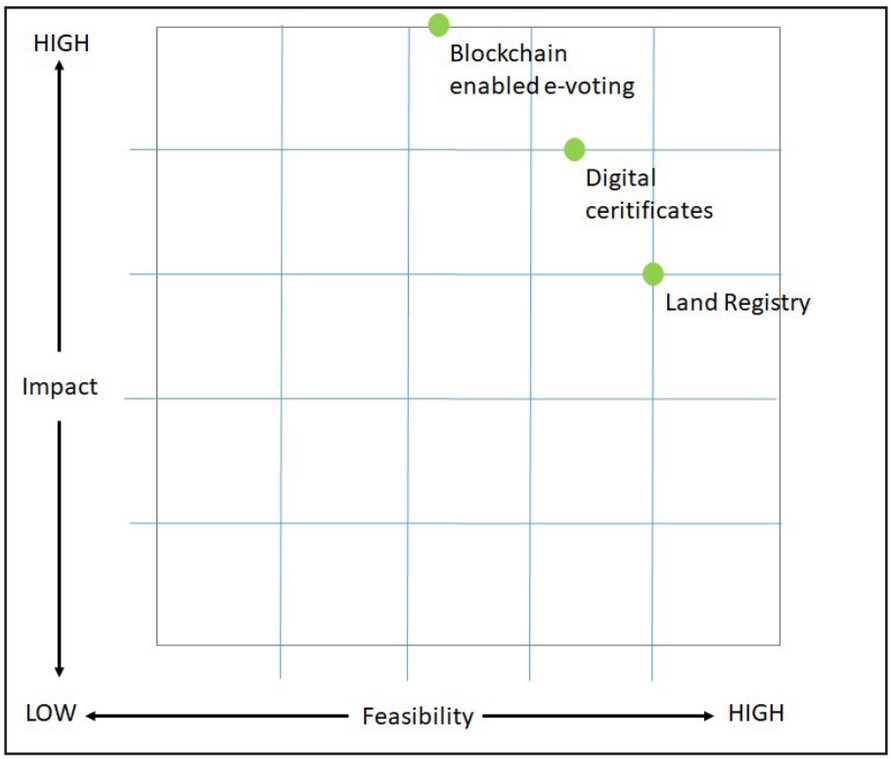


Fig. 6

With the right platform and necessary guidelines in place, if the government works as a facilitator, providing an enabling environment to interested players, successful implementation of blockchain is in the near future. However, there is a need for industry enabling initiatives like roadmap initiatives defining use cases to be explored over a period of time, encouraging start-ups to conduct pilot testing through regulatory sandbox, building an ecosystem to accelerate the adoption of blockchain, etc. by the government. Though large scale applications in the public sector may still look like a long shot, it is quite possible that the public sector will experience the impact of blockchain very soon.

References

Daychopan, D. (2016). Barter to bitcoin - History of money and the blockchain. Retrieved from https://medium.com/@DDhopn/the-only-security-in-this-world-is-a-reserve-of-knowledge-not-money-so-said-the-industrialist-69fef9011074

Deloitte. (2017). Will block chain transform the public sector? Retrieved from https://www2.deloitte.com/insights/us/en/industry/public-sector/understanding-basics-of-blockchain-in-government.html

Deloitte. (2017). Block chain technology and its potential in taxes. Retrieved from: https://www2.deloitte.com/content/dam/Deloitte/pl/Documents/Reports/pl_Blockchain-technology-and-its-potential-in-taxes-2017-EN.PDF

Berryhill, J., Bourgery, T., & Hanson, A. (2018). Guide to block chain technology and its use in the public sector. Retrieved from https://www.oecd.org/gov/innovative-government/oecd-guide-to-blockchain-technology-and-its-use-in-the-public-sector.htm

Humenansky, J. (2018). The impact of digital identity. Retrieved from https://blockchainatberkeley.blog/the-impact-of-digital -identity-9eed5b0c3016

Mckinsey Digital. (2018). Block chain explained: What it is and isn't, and why it matters. Retrieved from https://www.mckinsey.com/business-functions/digital-mckinsey/our-insights/blockchain-explained-what-it-is-and-isnt-and-why-it-matters

Siddharth, M. (2018). Beginner's guide to blockchain - Explaining it to a 5 year old. Retrieved from https://hackernoon.com/beginners-guide-to-blockchain-explaining-it-to-a-5-years-old-772caac6ae97