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Citation

This submission is selected for the Winner award from Pakistan as well as from the Region for SAPIA 2018. This case story presents the use of blockchain for a Framework Agreement (FA) for providing agricultural equipment to 11,000 farmers in Sindh. As compared to manual processing of FA transactions, all transactions, starting from signing a contract to closing a purchase order, are recorded in blockchain. All the required actors are now able to access the transaction records instantly, and track, monitor and follow up on different equipment items separately or together. The use of the blockchain improves transparency, enhances trust in data, and reduces human error. The FA has proved to be effective in distributing technology packages as well as developing database of the small and medium farmers of Sindh.

Summary

In Pakistan, a Framework Agreement (FA) is used for supply of various agricultural equipment on cost sharing basis to more than 11,000 farmers throughout the province of Sindh. The FA has proved to be effective in distributing the technology packages as well as developing database of the small and medium farmers of Sindh. However, the process was being carried out manually from the inception of the agreement until the payment is made to the supplier based on the request and delivery note. Under the FA approach, the quantity of items and the number of beneficiaries is not defined in the contract, making it very critical to record all the transactions between different stakeholders in a trusted database. It is difficult to monitor the process of raising a purchase order to the supplier and tracking the whole process up to the delivery to the farmer. This is a challenge and raises concerns of improper distribution of equipment to farmers. After conducting brainstorming sessions on how to solve this problem using emerging technologies, the World Bank Blockchain lab agreed with the client to create a contract and a purchase order application on blockchain as a working prototype that integrates with a live reporting dashboard. With this, all transactions, starting from signing a contract to closing a purchase order, are recorded on the blockchain. All the required actors are now able to access the transaction records instantly, and track, monitor and follow up on different equipment items separately or together based on their delivery status through the live dashboard that is integrated with the blockchain.

SAPIA 2018 WINNER

SAPIA182301 – PAKISTAN

Prototype for Implementation of Framework Agreement via Blockchain

(This article is a summarized version of the submission entitled "Prototype for Implementation of Framework Agreement via Blockchain" made by Mr. Hidayatullah Chhajro, Project Director, Sindh Agricultural Growth Project, Karachi, Sindh, Pakistan, for the South Asia Procurement Innovation and Good Practice Awards.)

In Pakistan, a Framework Agreement (FA) is used for supply of various agricultural equipment on cost sharing basis to more than 11,000 farmers throughout the province of Sindh

The consensus mechanism being used in this Ethereum blockchain is Proof-of-Authority (PoA), which eliminates the computing power needed for mining as used in Proof-of-Work consensus mechanism

Exploring the new technology and trying it for project operation will unleash great potential for success

Challenge(s) Addressed

The real challenge addressed is a trusted database with real-time information from different stakeholders. Blockchain does not depend on a central authority but restricts copying for FA to record transactions and get real time data of the farmers, which streamlines the process of procurement, improves transparency, enhances trust in data, and reduces human error. This data will be available to all the parties concerned. The implementation also has security benefits where the data is secured in the encrypted database and no single party can control the flow of information. In this regard, it may be noted that the blockchain technology is not new or untested in the market. It is a combination of already proven, tried and tested methods which help the users to own their data and maintain their privacy, security and freedom.

Impacts

Currently, there is no real-time data to track the agricultural equipment supply process. The whole cycle/process of issuing the purchase order to supplier, receiving the equipment from supplier, then delivering this equipment to farmers, and finally getting delivery confirmation from a farmer is scattered between manual and electronic forms. The absence of data linkages across the full procurement cycle increases the level of errors and incorrect reporting, which eventually reduces trust on the data. There is a great opportunity to record the complete process of equipment financing procurement on an immutable distributed ledger. With this ledger, each actor's actions would be recorded in real-time, and it can be viewed at any given time without compromising on data integrity by the participating actors.
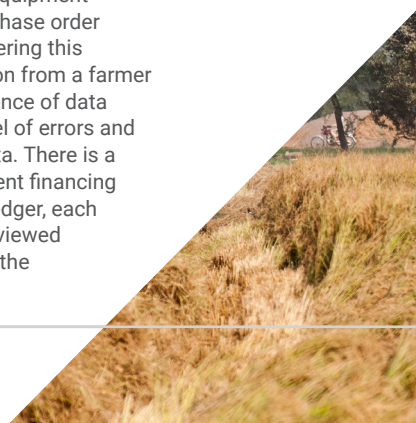
Level of Innovation/Good Practice

Blockchain vs traditional MIS: The traditional MIS systems provide a centralized design where one entity is in control of the system and other entities using the system depend on that entity to provide transparency and integrity of information maintained by the system. This requires all other entities to trust one entity. Blockchain, however, provides transparency, integrity and immutability of the information without requiring entities to trust each other, or to even select a central control entity. The World Bank's Blockchain Lab team applied the "Blockchain Fit" framework developed by the lab to this challenge. This framework helped the team analyze whether Blockchain was a good fit for this challenge and helped us clarify the benefits of blockchain over traditional systems. The challenge focused on bringing transparency to the business transactions. Therefore, the team decided to use a permissioned Ethereum blockchain, which allows for transactions that are visible to all entities who have access to the Ethereum blockchain. The consensus mechanism being used in this Ethereum blockchain is Proof-of-Authority (PoA), which eliminates the computing power needed for mining as used in Proof-of-Work consensus mechanism.

Replicability and Sustainability

There are many projects in public sector that use FA approach for contracts where the quantity and the actual users/ beneficiaries are not defined. The use of Blockchain can help in implementing the FA-based activities in a more transparent manner. This will bring more accountability and monitoring of actual implementation and ensure that funds are utilized for intended purpose. The idea can be easily replicated to the activities under FA approach whether it is used for construction, education and skills or in healthcare. The blockchain platform transactions under FA will be an ideal combination for meeting the fiduciary requirements. Based on the use of this prototype, the World Bank Blockchain lab recently received a request from Kenya Education Unit to apply the same methodology in the context of the challenges they are facing around lack of transparency. Pakistan Government's top priority is to improve the Governance structure in the country: more transparent systems can bring trust into the current environment as part of a broader e-government
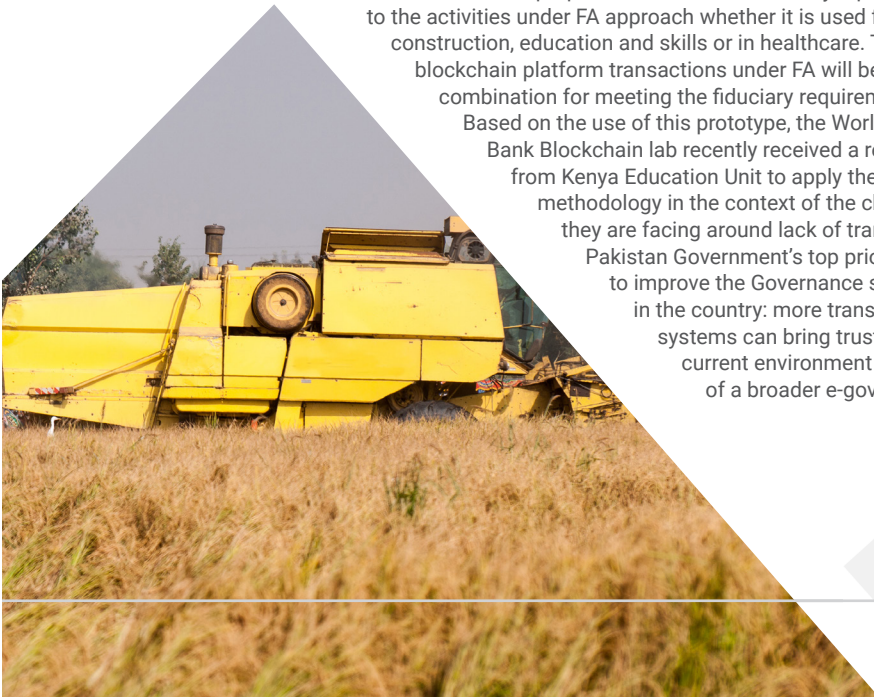
initiative. This is a step towards achieving this dimension and there is a great interest of Government in rolling out the prototype in the field. There is also a challenge fund opportunity available at the World Bank – Disruptive Technologies for Development (DT4D) for which the team intends to apply to roll out this project in the field.

Lessons Learned

Technology based solutions, especially blockchain, are sometimes perceived as a challenging task to implement. Therefore, it is good to develop use case, prototype, test the results and then take an informed decision to go with a full implementation in the field. There is great potential in these new technologies. However, due to lack of knowledge and understanding, teams are reluctant to try it. Exploring the new technology and trying it for project operation will unleash great potential for success.