

Blockchain Technology for Agriculture Development

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Abstract - During the national blockade to curb the spread of COVID-19, it became clear that many activities can easily be done online. Over the last decade, Indians have embraced technology in a greater way than ever before. IUCBE report shows that 264 million internet users are from rural areas. By utilizing these massive people's power on the internet we can solve the many problems of farmers. The Amazon one-stop platform where, anyone can buy anything at any place at any time. In the same way we developed a one-stop platform for the farmers where they form groups, use the machinery, make use of the govt. Schemes, use the marketplace, cold storage for the crops. From the birth to the end of crop i.e. growing to market in the single roof within their place with a single hand. The goal of the project is to increase farmers' profit margins by minimizing the interference of middlemen and directly connecting with the institutional buyers.

Keywords: Block chain, Agriculture, IUCBE, AWS, Amazon web service.

I. INTRODUCTION

The technologies we used are

1.1 Blockchain

A blockchain is a decentralized, distributed and often public digital register that is used to record transactions on numerous computers so that all data records involved cannot be changed retrospectively without changing all subsequent blocks.

1.2 Amazon web service

Amazon Web Services (AWS) is a subsidiary of Amazon that provides cloud computing platforms and APIs upon request for individuals, businesses, and governments on a pay-per-use basis. Together, these cloud computing web services offer a range of primitive abstract technical infrastructures and distributed computing tools and building blocks. One such service is Amazon Elastic Compute Cloud, which allows users to have a virtual group of computers at any time over the Internet.

1.3 Smart contract

Smart contracts enable credible transactions without a third party. One of the best things about blockchain is that it's not a decentralized system that exists between all authorized parties, and that you don't have to pay any intermediaries (intermediaries) to save time and conflict.

II. MODULES

Our Project includes the following modules:

2.1 Registration

The most important information that farmers must provide for registration is proof of the country. He / she must submit the land register form ("pani"). The government will authenticate the farmer by checking the details of the country. After the information has been stored in the smart contract [Smart contracts are self-executing contract states that are stored in the blockchain. Smart contracts are self-executing contract states that are stored in the blockchain and are not controlled by anyone and therefore everyone can trust.] Blockchain is a tamper-proof registry that is perfect for registration. Blockchain disrupts the use of incorrect documents and therefore improves the credibility of any agreement. Every person registered via blockchain technology becomes unique.

The data that is to be stored on a blockchain is actually customized into the form of transactions, to be able to store it. The blockchain does not allow for data to be appended in a transaction and stored, the data is stored in tiny amounts on the chain by using addresses.

Register->Government->Smart contract

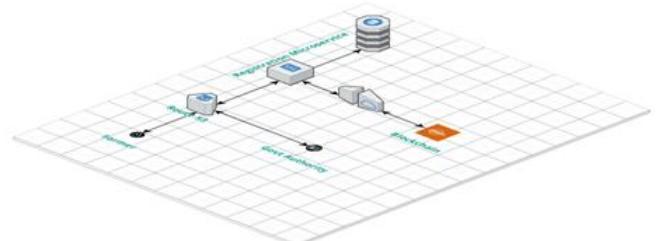


Figure 1: Farmer registration module

2.2 Group formation

The farmers registered, now they can form a group and can cultivate the crops in unity and co-operation for individual development. If they don't find any of the groups nearby they can create a one and develop it. The new farmers who are willing to join this group to send a request to the group. The group members will decide whether to accept you as a group member are not.

Until and unless you are not a part of the group you will not be getting any of the facilities.

Recommended group->not available->create new group
Recommended group->Join request->accept/reject

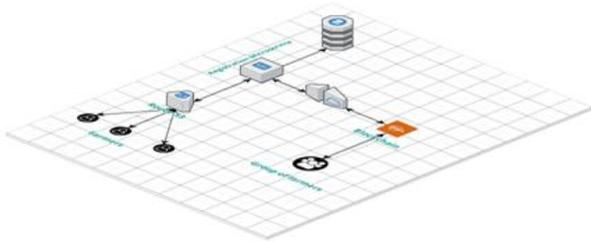


Figure 2: Group formation module

The data of the group is stored in the blockchain the Key generated will be used in the future steps for getting all the services.

2.3 Soil testing

The first step in cultivation to check soil fertility. Farmers will get the soil test lab information in the group recommendation. This way they will easily get the soil care facilities. They will receive soil health cards.

Soil test lab->connect->soil health care->track the status->soil test dashboard

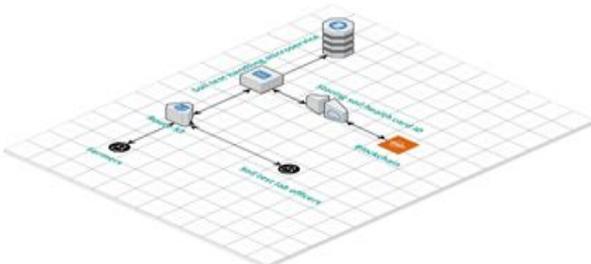


Figure 3: Soil health module

2.4 Financial support

Financial support is one of the crucial tools that any farmer can provide. A supposed security guarantee for a

blockchain system is “decentralization”. If the copies of the blockchain are kept in a large and widespread network of nodes, there is no weak point for an attack, so the financier can no doubt trust it.

Financial support->investors/bank
loan/government/industries upon agreement

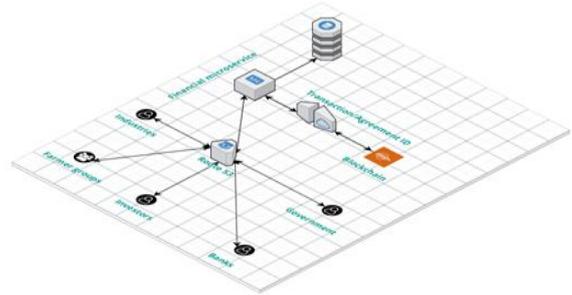


Figure 4: Financial module

2.5 Machinery service

Farmer or a machinery provider will register in machinery service by providing the machines information. It will also authenticated by government.

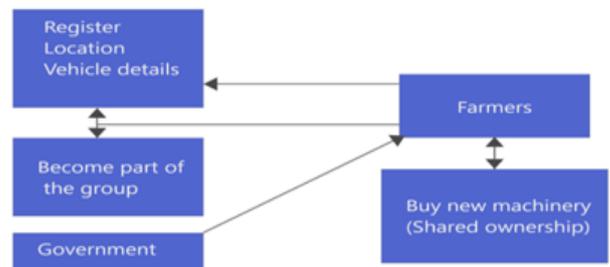


Figure 5: The machinery module

2.6 Seed and fertilizer providers

The seed and fertilizer providers can also register by providing the government-issued license. The government will authenticate and approve the providers to sell online. They also recommended in the group based on the location.



Figure 6: Crop provider module

Seed and fertilizer providers -> register->government->approves

2.7 Marketing

APMC or Private Marketing Corporation can ask the farmers group to sell their crops in their area .Finally the group will decide where to sell. In this way the farmers may not worry about the marketing.

2.8 Storage

When prices are low the farmers without any alternative path they have to sell the crops. Instead, they can store it and sell...So we integrated the Storage facility in our project. The farmers' group will store the crops when the price is less in government or private storage place. When they see the price hike they can sell at that time.

There are hundreds of storage places in Karnataka itself. So this will be helpful for the farmers.



Figure 7: Farmer throwing the grown crop

2.9 Crop insurance

The farmers will grow but due to drought and other natural calamities, the crops may be lost in that situation the farmers are unable to pay the debt and earn for their households. The government introduced much insurance for the farmers. The crop insurance module is also included in the project so that they can claim their insurance.



Figure 8: Crop insurance module

2.10 Share

Ok how will the profit be distributed among the farmers? It's according to the percentage of their land in the group. for example if Group A is having 50 acres of land a farmer with 2 acres of land in that group A will get 4% of the profit.

Immutability of data, Records, and Tracking secured through cryptography, unique tokens, Identity verification makes the Blockchain Trustworthy.

III. RESULTS

The snapshot of our project is shown below which represents the project work in detail.



Figure 9: Landing page

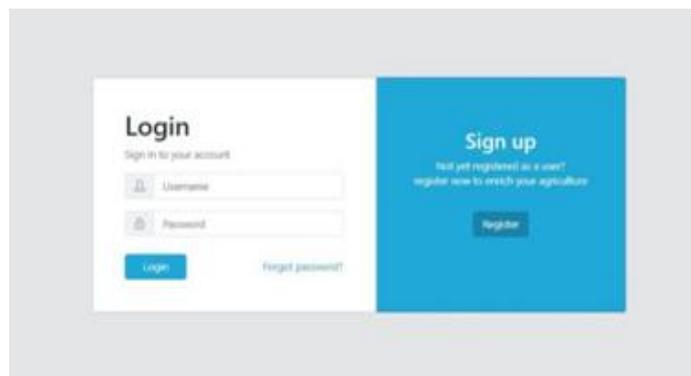


Figure 10: Login page



Figure 11: Profile

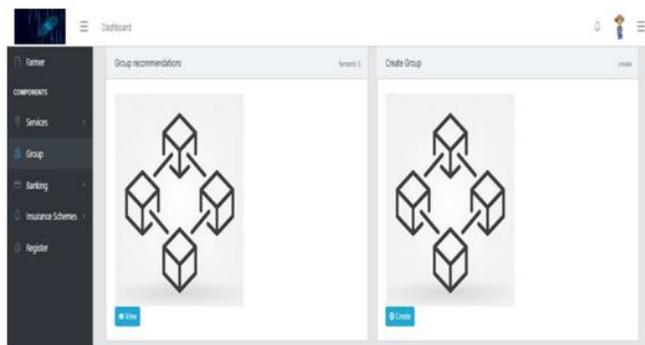


Figure 12: Group recommendation

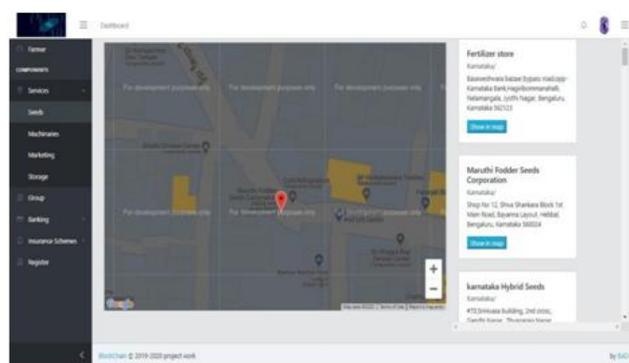


Figure 13: Fertilizers near the location

IV. CONCLUSION

E-NAM to help farmers, traders, and buyers with online trading, Bharat Market for Retailers, KRISHI KALYAN ABHIYAN for soil health cards, PMKISAN scheme for financial support. AP government is willing to use blockchain inland record registration. The government of India is using every platform to help farmers’ retailers and traders. If we integrate all the platforms in the single roof Blockchain then it will boost the Productivity of the country.

Lack of transparency in credit history and agreements are some of the significant problems confronting between smallholders and financial inclusion. Today, financial services

do not only allow smallholders to invest in farming but also don't help them in resolving liquidity constraints. As a result, it becomes challenging for buyers to pay farmers, restricting smallholders to sell crops at comparatively lower rates. With the blockchain, the agricultural financing process becomes more transparent and fair, but enables access to joint control.

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