CIS 6930 – Blockchain Technology and Applications

Term Project Proposal, 30th Sep 2020

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1. Project Title : Crowdfunding in an agricultural Marketplace

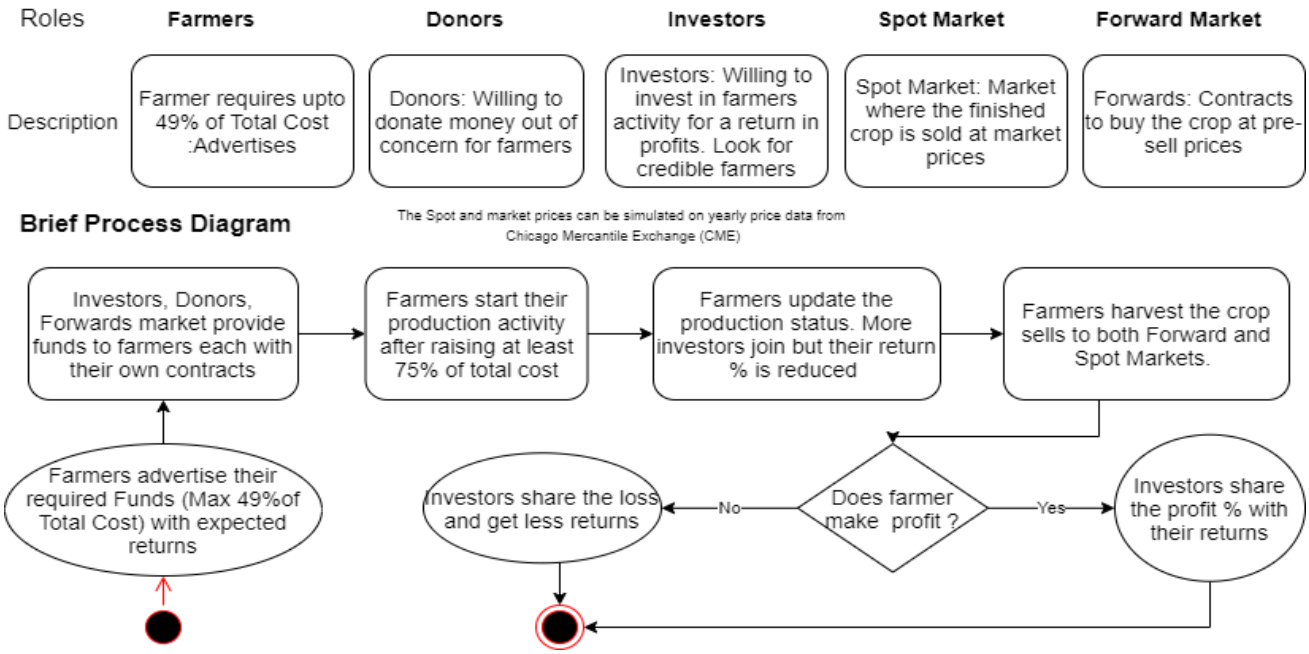
2. Project Background and brief description:

In developing agrarian economies, farmers bear most of the brunt arising from inefficient practices. Recently, India has passed a farm bill which is touted to be a landmark policy change as it restructures the way Indian farmers conduct their business. It is proposed to reduce the complexities around sale, pricing and storage of farm produce. In this setting, we plan to **employ blockchain to build a transparent marketplace where farm produce can be tracked till it reaches consumers**. The farmers can be rated based on their previous history of delivering produce to the marketplace. This rating is used by consumers to decide funds for farmers to cultivate their potential produce and if possible, even derive some profit if the market price allows such.

The project will involve farmers to register details for the potential agricultural crop and required funding on the public ledger. This information together with the farmer's profile rating based on his/her previous accomplishments will help consumers to fund the farmers activity and in return they can buy the products at a reduced price or even command some profit if the product is sold elsewhere.

3. Intended Application Process Flow:

The underlying application smart contracts are intended to capture the following process flow.



4. **Project component and Tools:**
   a. A blockchain based marketplace with information on farmers profile
   b. Smart contract to store ratings and other information and distribute tokens related with this information
   c. Lightweight Client for storage and retrieval of details for consumers. A feedback mechanism providing credibility ratings to farmers based upon their accomplished tasks and delivered returns
   d. Front end components describing user operations

   Tools:
   a. **Truffle (**https://www.trufflesuite.com/**)**
   b. **Solidity** (https://solidity.readthedocs.io/en/v0.7.1/)
   c. **Geth(**go-ethereum), (https://geth.ethereum.org/)
   d. **Ganache** (https://www.trufflesuite.com/ganache)
   e. **Web3** javascript and Front-end Libraries (https://web3js.readthedocs.io/en/v1.3.0/)

5. **Project Timeline and distribution of duties:**

Dates	Project Component	Primary Owner (R)	Secondary Owner (C)
01st Oct- 15th Oct	Initial Brainstorming, Tech stack tutorials, planning, contouring of functionalities	Abhijeet, Mukul	Abhijeet, Mukul
15th Oct- 30th Oct	Smart contracts, Back-end implementation in solidity	Abhijeet	Mukul
01st Nov-10th Nov	Front-end functionalities	Mukul	Abhijeet
10thNov- 20th Nov	Aggregation, collation, testing	Abhijeet, Mukul	Abhijeet, Mukul
20th Nov -25th Nov	Testing and Final Touches	Abhijeet, Mukul	Abhijeet, Mukul

6. **Comparable decentralized systems:**

The systems as envisaged above is a superimposition of blockchain solutions in crowdfunding over decentralized supply chain solutions. We have surveyed a number of popular applications in these categories, carefully evaluating their strengths to arrive upon a suitable use-case for our considerations. Some of these solutions are

   a. **Supply Chain**

      Provenance**:** DORÆ**,** NextPakk, ShipChain, Zego, Project Provenance
      Logistics and Shipping: OriginTrail, Eximchain, SKYFchain, Blockhead Technologies,
      Supply chain Finance: ZERO1 CAPITAL, CargoCoin, Tradeline,CargoX

   b. **Crowdfunding** : Kickstarter, Wefunder, StartEngine, RealBlocks, Meridio, QuantmRE

7. **References:**

[1]. Ju Myung Song et. al. , Applications of Blockchain to Improve Supply Chain Traceability,7th International Conference on Information Technology and Quantitative Management (ITQM 2019)

[2].Petri Helo and Yuqiuge Hao, Blockchains in operations and supply chains: A model and reference implementation, Computers & Industrial Engineering • October 2019.

[3]. R Notani, “Can Blockchain Revolutionize the Supply Chain?,” May 2018, SupplyChain 247. http://www.supplychain247.com/paper/can_blockchain_revolutionize_the_supply_chain.

[4]. https://provenance.sawtooth.me/. Traceability Blockchain.

[5]. Ashari et. al. 2020. “Smart Contract and Blockchain for Crowdfunding Platform”. International Journal of Advanced Trends in Computer Science and Engineering, Volume 9, No.3, May - June 2020.

[6]. Starkenmann, Olivier. (2017). Implementation of a Crowdfunding Decentralized Application on Ethereum, Masters Thesis, (https://www.researchgate.net/publication/320710747_Implementation_of_a_Crowdfunding_Decentralized_Application_on_Ethereum)