COMP4801

FINAL YEAR PROJECT

2017-2018

PROJECT PLAN

A Marketplace for Data Exchange and Access to

Global Workforce powered by Blockchain

Topic
Blockchain Research and Implementation

Student

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Background

Society runs on Data in the 21st century. Big data has always been a hot topic no matter in the technology field or in the commercial area. Especially when Artificial Intelligence (AI) and machine learning has come under the spotlight and became a buzzword in the 21st century. There are more organizations seeing the potential in AI and started investing in this technology. Big data is critical in such technology as a large pool of training and testing datasets is the fundamental of machine learning. With the rising number of AI and machine learning development projects, big data would without doubt maintain continuous growth in demand.

Apart from the growing needs in AI and machine learning, big data is always desired in different businesses. Take our tech giants like Google and Facebook as examples, they use big data in spotting user behaviors and preference to show different advertisements. These activities are not new, most companies have their own data and they continuously seek for new data for commercial use either getting it by themselves or buying from others.

Now, there are centralized data marketplaces available for different parties to trade for data such as DataMarket, Factual and Microsoft's Windows Azure Data Marketplace. However, there are concerns in using these centralized data marketplaces as companies are worried about who controls the data during the transactions. From this, it is seen that a need for trusted data exchange is raised.

Apart from this, although technology has been very powerful in this century where data could be obtained easily through computer systems, there are still many tasks and work that human can perform more effectively than computer system. Amazon saw the demand in tasks that require human intelligence and offered Amazon Mechanical Turk, which is a crowdsourcing Internet marketplace for work that requires human

intelligence, in 2005. In mTurk, there are requesters, user that want tasks to be done, putting up human intelligence tasks (HIT) onto the marketplace, and workers, user that complete tasks, choose HIT they want to complete. mTurk provides requesters access to a global and on-demand workforce, and workers a new channel to earn money whenever it is convenient for them. However, mTurk is a marketplace with Amazon as a middleman between requesters and workers where Amazon charges too much for at least 20% of the reward requesters are paying to the workers. It is believed that a platform with less influence from middlemen would be desirable.

A marketplace that avoids trust problem together with minimal charges in transactions is desirable. Blockchain technology is believed to be the best solution now to cater needs in these two areas concurrently.

Why Blockchain?

Blockchain is a safe transaction ledger database that is joint by all parties participating in an established, distributed network of computers. It records and stores all transactions that happens in the network, and such transactions are immutable and transparent. Thus, it eliminated the need for a "trusted" third party to handle transactions. Therefore, users would not need to worry about trust when using blockchain. At the same time, blockchain reduces middleman fee. Currently, to get the reward from mTurk would involve Amazon to store reward balance, then transfer to the bank through agents like Visa and MasterCard after converting into money balance. Using blockchain, middleman like Visa and MasterCard is no longer needed, banks could also be eliminated if cryptocurrency is used as reward. Through eliminating middleman, cost is reduced, thus a lower fee could be implied.

Objective

The objective of this project is to create a platform powered by the blockchain technology where users could send and receive data securely. The platform would contain functionalities to allow users to put their data for sale, it will also allow user to request for task to be completed and to complete task requests, which is similar to Amazon Mechanical Turk.

There are two main components in the platform for this project:

- Marketplace for data exchange: users could put data onto the marketplace for sale and users could also buy data from the marketplace.

- Marketplace for tasks requests: users could put up task requests that require human intelligence and other users could choose what tasks they want to complete in the marketplace to obtain reward.

At the end of the project, a system with user interface will be completed together with logics in blockchain implementation.

Methodology

As Blockchain is the core technology to be adopted in this project, the platform will be built using Ethereum, where smart contract will be designed and implemented to control transactions in data exchange.

Since data exchange is the major activity carried out in this platform, there will be a huge amount of data flying within the platform, and large chunk of data needed to be stored through this platform. To satisfy the principle of decentralization, these data will not be stored centralized in the platform, decentralized storage will be implemented.

The platform will not store data onto the blockchain, instead, large objects of data will be stored through distributed storage. Currently, there are protocols and services available in the market for distributed object storage and distributed file system. In this project, viability of Swarm, Storj and IPFS will first be considered in the implementation of distributed storage, decision in adoption of distributed storage technology will be finalized later after thorough consideration.

Besides, as the platform involves transactions that needs rewards, such as rewards for completing tasks and rewards for selling data. For instance, it is decided to use cryptocurrency in the reward system.

At this moment, more consideration in adoption of technology and the system design is needed.

Schedule and Milestone

Major Stages in the project

Preliminary Research: Understand basic concepts of blockchain for the final year project, and understand what technologies could be involved in developing the system.

System Analysis: Identify use cases in the system and identify technical challenges to be overcome

System Design: Design the system together with the consideration in what technologies to be adopted in different components in the system

Development: Implementation of the system design and build the platform, system component such as user interface and smart contract logics will be implemented

Testing: Construct internal UAT and test for any existence of system bugs

Deployment: Completion of the platform and ready to be deployed

Schedule

Timeline	Milestone
Early Sept	Begin Preliminary Research
Late Sept	Complete Preliminary Research
Early Oct	Begin System Analysis
Mid to Late Oct	Begin System Design
Late Oct	Complete System Analysis
Mid to Late Nov	Begin Development
Late Nov	Complete System Design
Early Mar	Complete Development Begin Testing
Early Apr	Complete Testing and Finetuning
Mid Apr	Ready for deployment