A DECENTRALIZED AUCTION HOUSE AND E-MARKETPLACE ON TOP OF ETHEREUM

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Abstract – *This paper describes blockchain enabled Auction House and e-marketplace. Traditional Auction house and e-marketplaces charges commission from users as well as have control over users They can block any merchant on their own wish without permission of merchant. Currently present auction houses charges large commissions. In this paper we're proposing a platform using blockchain where seller can enlist product without involvement of any third party. Our platform provides choices to seller to enlist product in different ways for selling like Direct Sell, Open Auction and Blind Auction. Different buyers can buy different products by different selling options. After comparison of cost using blockchain with online auction marketplace such as eBay it is observed that selling using blockchain decentralized app is cheaper than online options. Each transaction is verified through the blockchain and is recorded to the decentralized ledger. No trusted third parties. The transactions on the blockchain are trackable and irreversible thus buyers and the seller cannot breach the contract. This is the application which remedies all the drawbacks mentioned above.*

***Key Words*: Smart Contracts, Ethereum Blockchain, Truffle, web3.js,**

1.INTRODUCTION

In last few years blockchain technology is gaining recognition as it has the potential to disrupt exiting marketplace, fueled by the entrance of Bitcoin into the mainstream consumer space. Aside from its cryptocurrency applications, blockchains can also be used as a platform to build truly decentralized applications with no central point of failure and no hierarchical ownership of user data. This has significant advantages for data security, privacy, and ownership, as well as the potential to dramatically reduce middle-man costs. The issue of user trust in decentralized applications that run on a blockchain platform is one that has been studied and developed on recently, and it is now possible to build applications that the user can trust with their money.

1.1 Problem Definition

Blockchain based decentralized E-marketplace using self-executed smart contracts to perform credible transactions on decentralized ledger without involvement of trusted third parties.

1.2 Blockchain

The blockchain has the entire capability to deal with and tune the supply chain procedure very efficiently. Blockchain is immutable, less prone to breakdown, has zero scams and distributed, while traditional databases are vulnerable to data tampering and data leakage and there is a possibility of loss due to centered storage.

Our system uses Ethereum blockchain to store all the transaction details done by the users and whole business logic of the system runs on Ethereum blockchain using smart contracts

1.3 Smart Contracts

Smart contract is a self executable code runs on Ethereum Blockchain. Ethereum is the first fully fledged permission less network allowing for Turing complete contracts. It is the earliest and most popular smart contract platform, using proof-of-work (PoW) as a consensus algorithm.

The main currency in Ethereum is denominated ether and, to perform a transaction on the Blockchain, a gas fee must be paid to the network miners. This unit measures the level of computation effort necessary to execute certain operations

2. Literature Survey

First paper describes: How to utilize blockchain technology for creating decentralize marketplace as well as Application is able to perform credible transactions without trusted third party.

Second paper describes: What data flow and architecture required for decentralized marketplace application and Selling on Application is cheaper than existing online options as well as existing in-person options.

Third paper describes: Information about buyer and supplier relationship, decentralized marketplaces, smart contracts, Ethereum etc. Terms to be considered for building application. Increased bargaining power and economies of scale in buyer-supplier relationship.

3. Proposed System

This is online decentralized marketplace which lets sellers list product for sell using different selling techniques and lets buyer buy the product without help of any intermediary. Platform focuses mainly on reducing the cost which is taken from sellers by traditional online marketplaces. Platform eases work of both buyer and seller by reducing the cost for product and making all activity auditable to all users and keeps users data anonymous to avoid data trading.

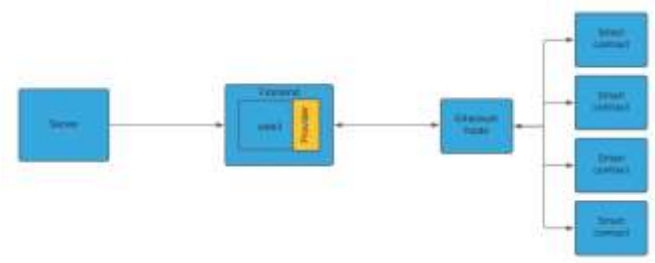

Fig-1 : Architecture Diagram

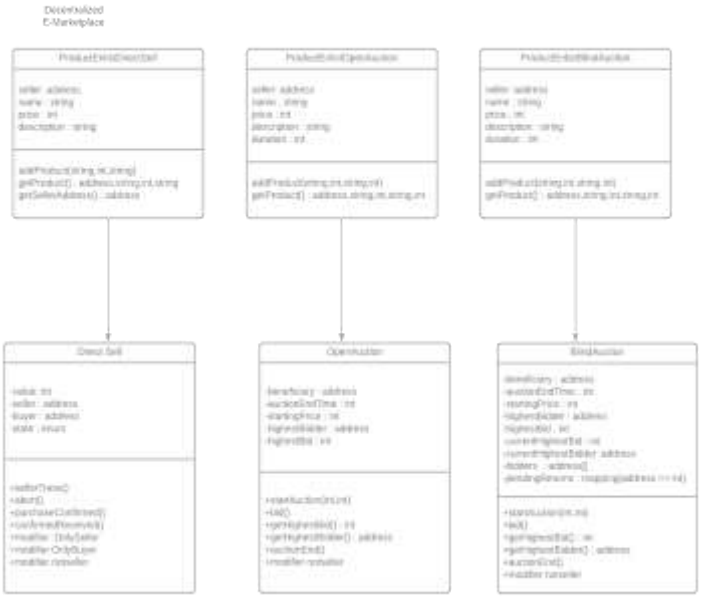

Fig-2 : Class Diagram

3.1 Major Classes

ProductEnlistDirectSell class:

Seller provides the required product information like Name of Product, Price of Product and Description of Product to enlist the product on our platform.

DirectSell class:

Seller initiates the transaction to the Escrow contract and the user who wants to purchase the product have to transfer amount to the Escrow contracts. After receiving the product amount will be transferred to the sellers account from contract

OpenAuction class:

After enlisting the product for open auction seller starts auction for the product. Multiple users can bid on the product using bid functionality of the class. Once auction ends auctionEnd functionality will transfer money to the seller.

BlindAuction class :

After enlisting the product for blind auction seller starts auction for the product. Multiple users can bid on the product using bid functionality of the class. Users will not be able to see the current highest bid and bidder during the auction period. Once auction ends winner of the auction will be displayed and auctionEnd functionality will transfer money to the seller.

3.2 Operational Modules

The following modules are being used in our system, which are being discussed briefly.

Direct Sell Module:

This module covers listing of product using face value from seller. It consists of ProductEnlistDirectSell class and DirectSell class.

Open Auction Module:

In this module Seller can enlist the product on the platform along with auction time. Once auction started different users can bid on the product listed by the seller in the given auction period. Users can see the current highest bid and bidder and accordingly they can bid for the product. Once the auction ends highest bid gets transferred to the seller. It consists of ProductEnlistOpenAuction class and OpenAuction class.

Blind Auction Module:

In this module Seller can enlist the product on the platform along with auction time. Once auction started different users can bid on the product listed by the seller in the given auction period. Users can not see the current highest bid and bidder although they can bid multiple times for the product. Once the auction ends highest bid gets transferred to the seller. It consists of ProductEnlistBlindAuction class and BlindAuction class.

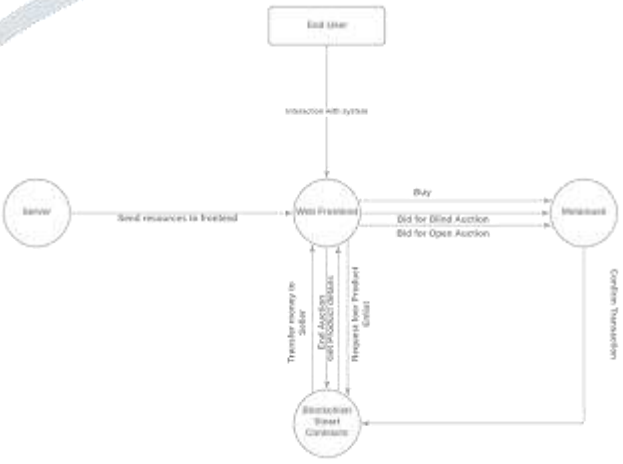

Fig-3 : Data-Flow Diagram

4. Conclusion

There is no mature application for auction house and Decentralized marketplace yet. Number of startups are making their way in this field. For now, it is impossible to predict which of the future applications will be the first to reach the mass adoption, but creating an application running on an Ethereum platform with a simple UI is profitable both for experience gain and the potential it has to compete in a newly emerging field.

This application successfully carries out the part of auction started by the seller by properly distributing the funds to each buyers and seller. Also successfully carries out the transactions occurring during the direct sell instance.

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