A Crowdsourcing Mortgage Platform

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Proposal

We're proposing a decentralized lending network where all monthly transactions and the initial lending process are handled by smart contract. Traditionally, in the home mortgage sector, new house buyers have to request a mortgage from large corporations, which then verify the identity and credit scores of the home buyer, and collect monthly payment and interest per the agreed contract. This process, not only slow in its natural because of the banking system and verification of the home buyer, but also sophisticated due to the housekeeping of various records and transactions. Besides, the power of large banks can often form some kind of oligopoly because they have great control over the interest rate and the intention for lending. The risk of mortgage is also imposed on both lenders - they are the only lenders for a single contract, and the home buyers.

Therefore, we propose a decentralized lending blockchain network operating on the Ethereum platform, where all transactions and bookeepings are handled automatically by the smart contract. The smart contract was activated whenever a home buyer expresses the interest in financing a home. A down payment of 20% of the home listing price was

then paid to the smart contract to initialize the whole lending process. The smart contract then starts a funding period of usually 30-60 days, depending on the amount to the general public. A single or multiple lenders can be engaged in the lending process, where the equity share is calculated based on the lending amount divided by the overall funding sum. The lending auction can be closed under the following two conditions: 1) The funding goal is not met within the funding period 2) The funding goal is met and the smart contract is contacted to handle the next procedures. A full payment of the home listing amount was then paid to the home seller, together with the transfer of home property right. The house asset token is created as the key to the house. Note that the house asset token is the ultimate proof of ownership to the house, as opposed to merely the usage right. House buyer will then be notified of the transfer of house key - the usage right to the house, and start the monthly payment cycle. The monthly payment can consist of various fees and insurance, including the primary mortgage insurance - used to protect lenders in face of the risk of payment default, and interest rate which could either be agreed upon to be the market average or a hybrid of 5-10 year fixed rate followed by the market rate. Every lender will be paid monthly according to their share of the initial offering period.

In several situations, the whole lending contract can be aborted: for example, when home buyer failed to fulfill the monthly payment after 3 monthly of the last payment, which result in a process called foreclosure. In this case, the insurance company will step in as arbitrator and auction the home to pay back the closing amount to the lender/lenders. The optimal situation would be that the home buyer pay back the entire amount of the mortgage within the mortgage period, the house asset token will then be transferred to the house buyer and together the ownership of the house was transferred. The contract is then fulfilled and all the resulting bookkeeping are handled by the smart contract.

The entire system diagram of our crowdsourcing lending network is provided below in **Figure 1**.

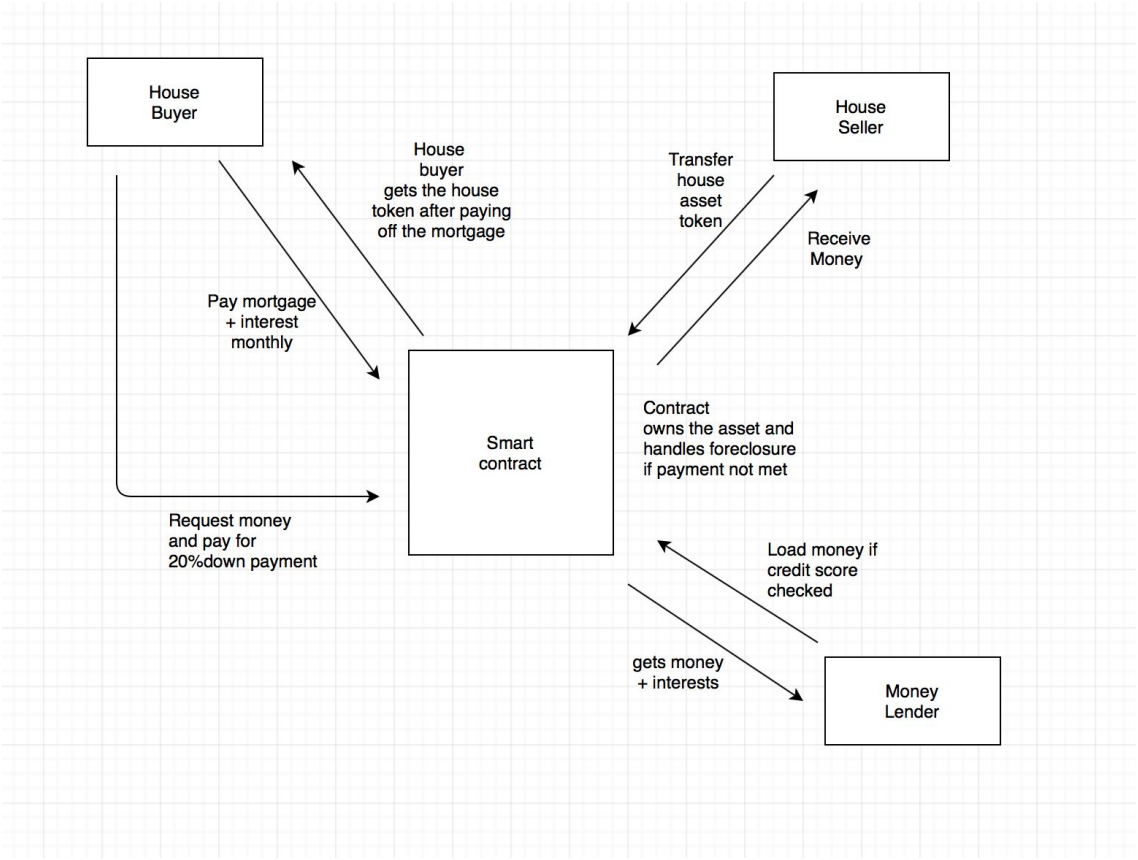

Figure 1: System diagram of the decentralized lending network

Features

Compared to the traditional system of lending, our system has the following major advantages.

1. Multiple lenders can be engaged in the funding process, compared to a single large corporate to dictate the whole mortgage process. The growth of the economy can be shared with ordinary people, instead only to the interest of large corporations.
2. All extra bookkeepings are automated and handled by the smart contract. In the traditional house mortgage scheme, a huge amount of labor and expenses are

spent in the process of verification, recording and transaction handling, our distributed network of smart contract can handle all this trivial tasks with ease on the blockchain network

3. Financial derivatives and other financial products can be created and prosper on this network. The lending equity share of the bidding process, primary lender insurance and even secondary debt of the house buyer can provide great potential for other financial products to be developed and operated in this platform, since again, the smart contract can be used to handle all the bookkeeping of the transaction and share records.
4. Privacy of the house buyer and lender is protected. In the traditional centralized storage of mortgage records. A major leak of information can be disastrous to both the financial institution and the home buyer. However in our system of a decentralized mortgage network, all data are stored distributively and encrypted via the Ethereum blockchain. A perfect balance of privacy and credibility can be achieved in this design of mortgage system.

Further Improvements

Note that our crowdsourcing mortgage network is a simplified version of the real world situations. Some technical implementation details and flaws of the system are recognized and scheduled to be illustrated as the followings:

1. A universally supported verification system. Due to the technical difficulty of implementing a commercial grade authentication system for both house buyers and lenders. We were not able to include the verification process in our smart contract. An ideal implementation would be to use UPort to verify identity and credit score, which is an open identity system for the decentralized web.
2. Several security issues are not prevented in our system, for example the risk of modifying equity shares, validity of the listed houses and verification of the house seller...etc.

All of these are important problems that have to be illustrated in our decentralized platform and we were only able to tackle some of them through our simplified version of an operating reliable mortgage system.

Reference

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2. Investopedia: home mortgage
3. Private Mortgage Insurance - What is PMI?
4. How a Foreclosure Will Affect Your Future