

A Final Project Report on

BLOCKCHAIN FOR DECENTRALIZED FINANCE

(DeFi)

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ABSTRACT

We know that “Blockchain” is a record-keeping technology in the Bitcoin network for the past few years where it stores data in blocks that are chained together. Now what if a new way of financial infrastructure is built on this technology? Introducing **DECENTRALIZED FINANCE (DeFi)**, a peer-to-peer finance helps in lending and borrowing stable coins that doesn’t involve in any banks, insurances or contracts. Now using this in decentralized way won’t allow a single person to control. They are immutable, meaning the transactions will be stored permanently and is available to anyone who has an internet connection. This works in a way that agreements are carried out by code, transactions will be carried out in a secure way. With this there will be a decent cost reductions, and helps in empowering new business models. This is widely being used for Commercial Banks, exchanges, central banks, etc. where stable coins will be exchanged in respective ways according to the sector.

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1. INTRODUCTION

Throughout the last few years, the advancement of digital assets and their far reaching utilization have been a few of the most talked about points inside the innovative social circle. In the previous decade, we saw digital currency become a term in everybody's mouth, because of the ascent of Bitcoin in 2017. Be that as it may, the most significant takeaway of these occasions is the beneficial outcome it had on blockchain in all, with all the well established organizations on the planet showing interest in executing this technology, particularly for the interaction of resource digitization and tokenization. Decentralized Finance is a blockchain-based financial framework that recently acquired a great deal of foothold. It is a peer-to-peer financial system that is powered by a blockchain system to replicate and enhance the services offered by banks, conventional business sectors, and financial organizations. Decentralized Finance is still in the early stage of its evolution. One year ago, the total value locked in DeFi contracts was approximately \$1 billion, now, as of April 2021, the total value locked in DeFi contracts is over \$45 billion.

The term Decentralized Finance for the most part alludes to an open, permission less, and exceptionally interoperable convention stack based on public smart contract platforms, for example, the Ethereum blockchain. It recreates existing financial services in a more open and straightforward manner. Instead of depending on intermediaries and centralized institutions, DeFi depends on open protocols and decentralized applications. Arrangements are authorized by code, exchanges are executed in a protected and verifiable manner, and real state changes endure on a public blockchain. Accordingly, this design can make a permanent and profoundly interoperable financial framework with extraordinary transparency, equivalent access rights, and little requirement for caretakers, focal clearing houses, or escrow administrations, as the vast majority of these jobs can be expected by smart contracts.

Decentralized Finance brings various advantages using Smart Contracts and disseminated frameworks. As the biological systems develop, sending a financial application or item turns out to be substantially less perplexing and evidently less demanding. For example, numerous Apps are being created on top of the Ethereum blockchain, which gives diminished operational expenses and lower passage hindrances . There are as of now numerous activities gaining ground in the different sub-sectors that include the more extensive DeFi scene. These specific activities have been based on the Ethereum organization, however others have been made or exist on other

permission less blockchains like Bitcoin. By utilizing permission less networks, DeFi makers can make their systems available to anybody who has access to a device and internet. Smart contracts are the backbone of all DeFi applications and protocols. Smart contracts generally refer to small applications stored on a blockchain and executed in parallel by an outsized set of validators. In the context of public blockchains, the network is meant so that each participant is often involved in and verifies the right execution of any operation.

In the figures below we can see the comparison between the total value locked in the DeFi market (**Fig.(1a)**) and the overall cryptocurrency market (**Fig.(1b)**) over the last year. We can see the similarities in both of the graphs because the tokens that hold the value in the Decentralized Finance still behave as normal cryptocurrencies.

Total Value Locked (USD) in DeFi

[TVL \(USD\)](#) | [ETH](#) | [BTC](#)

All | [1 Year](#) | 90 Day | 30 Day



Fig.(1a) Total Value Locked in DeFi Over The Last Year



Fig.(1b) Cryptocurrency Market Over The Last Year

2. DEFI PROTOCOLS (Methods & Tools)

2.1 Uniswap

Uniswap may be a decentralized exchange built on Ethereum's smart contracting protocol to permit anyone to swap ERC-20 tokens directly from their Ethereum wallet. In September of 2020, the company introduced users to UNI, the platform's digital token, of which roughly 60 percent has been allocated to Uniswap users.

Over the past two years, Uniswap has overseen roughly \$20 billion in trades and has been integrated into many interfaces, making it one of the foremost prominent and successful DeFi platforms in existence. On average, daily trades often exceed \$220 million.

Some of the items resulting in Uniswap's present levels of success and adoption include the very fact that it doesn't believe in any fees to garner income. There are not any fees for those that engage in transactions on the platform, and there are not any middlemen required to push transactions through. Thus, the corporate is fully decentralized and everyone trades are permission less. Uniswap has announced that it's looking to distribute approximately one billion UNI tokens through 2024. Roughly 60% of those tokens are going to be given to community members, while just over 21% are going to be provided to employees of the corporate.

2.2 Project Serum

The crypto world's latest decentralized exchange (DEX) is Project Serum. Unlike other protocols involved in decentralized finance, Project Serum is made utilizing a blockchain unrelated to Ethereum. The serum was in testing up through August of 2020 but has since been unveiled to the public for trade use.

One of the unique things about Project Serum is that it's fully permission less, consistent with its website, and it's looking to unravel many of the centralization problems that often appear in the world of DeFi. Traders are liberal to use the exchange at their own will. In addition, the exchange boasts low fees and fast trades, with transactions allegedly taking mere seconds to finish.

Some of the explanations for Project Serum's adoption is that it runs on a blockchain that's completely compatible with both Bitcoin and Ethereum, something that's rarely seen within the DeFi space. This gives Project Serum an enormous advantage therein it allows traders to interact in transactions involving currencies aside from ERC-20 tokens.

The distribution of SRM tokens is as follows: approximately 20% of the total goes to team members and advisors of Project Serum. 22% of the tokens go to project contributors, while 27% are locked away in a partner and collaborator fund. Another 27% goes to an ecosystem incentive fund, while the remaining 4% of tokens attend locked seed and auction purchasers.

2.3 Kyber Network

Kyber Network enables cryptocurrency transactions between various platforms and ecosystems, like Enjin, MEW, Easwap, KyberSwap, and imToken. The network can perform token swaps and convert them to crypto preferred by the user, helping to unravel the difficulty of interoperability.



Fig.(2a) Working of Kyber Network

Dapps can enable people to use their platforms and services with tokens aside from the native token, making Dapps much more accessible to the general public, as many Dapps currently require users to hold the native token.

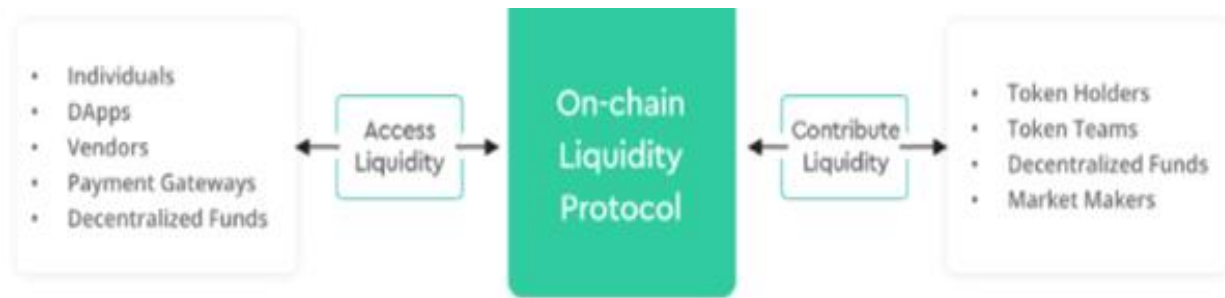


Fig.(2b) On-chain Liquidity Protocol

According to fig.(2b), users store their assets on-chain. Tokens within the pool are available for anyone across any connected platform to use, and Kyber Network users earn a selection from every transaction made using tokens within the pool. Using the pool, instant transaction settlement is feasible, solving the difficulty of slow transaction speeds on congested blockchains and making crypto more viable as a way of buying or transacting.

3. COMPARISON BETWEEN VARIOUS TOOLS AND METHODS (CENTRALIZED FINANCE VS. DECENTRALIZED FINANCE)

Centralized(Traditional) Finance used to be the standard for trading crypto before DeFi came into picture. In CeFi, all orders in the crypto trade are channeled through a central exchange. The funds are managed by responsible people running this exchange. This means you do not owe a private key that gives you access to your wallet.

In Decentralized finance there is no involvement of an exchange. The entire process operates through automated applications that are built on top of blockchain platforms. Furthermore, decentralized finance tries to create a fair financial system in which everyone can participate. A glance on how traditional and decentralized financial system can be seen as of fig 3a.

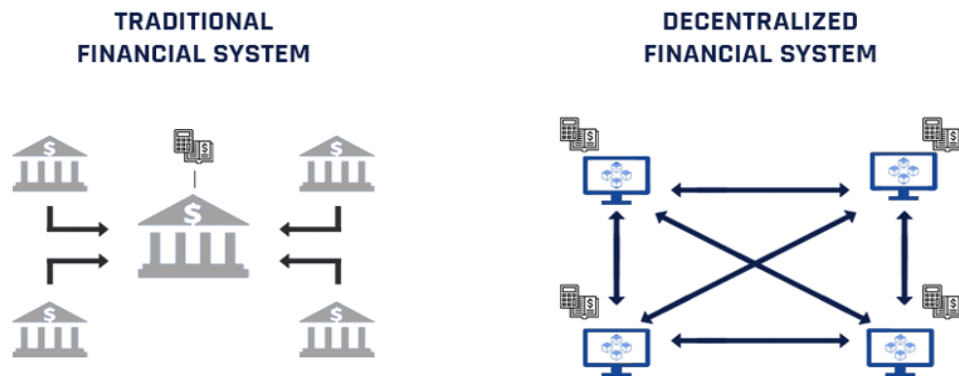


Fig 3a. Difference between Traditional and Decentralized Financial System

KEY DIFFERENCES BETWEEN CENTRALIZATION AND DECENTRALIZATION

- In Centralization Powers and authorities are in hand of high-level management, And Decentralization means dispersal of powers and authorities by the top level to the functional level management.
- Centralization is the systemic authority of central point. Unlike, Decentralization is the systemic delegation of authority in an organization.
- Centralization is the best for a small sized organization and Decentralization is beneficial for the large sized organization.
- Formal Communication occurs in centralized organization where in Decentralization communication happens in all directions.
- The decision takes time in centralization as the concentration of powers are in the hand of a single person where Decentralization is better in decision making.
- In Centralization, there is a burden in top - level management. On the contrary , Decentralization shares the burden of the top level managers.
- When the organization has full control over its management , Decentralization is implemented and when the organization has inadequate control over the management then Centralization is implemented.

4. ADVANTAGES AND DISADVANTAGES

Advantages

Defi is a highly efficient, transparent, and accessible system which enhances any organization's financial infrastructure. All and any transaction can be scrutinized by the public making them accountable, this allows the organization to mitigate risks before they arise and can determine where these risks may arise from.

Defi protocols can be utilized by anyone making it a truly accessible and open system. Defi is also built in a manner that different protocols and applications can be interconnected, integrated or forked to create something new making defi extremely flexible and has a never ending range of possibilities in financial infrastructure.

Disadvantages

Defi despite revolutionizing financial infrastructure has it's own set of drawbacks and risks associated with it. The decentralized system invariably means that organizations have to trust a third party to carry out their transactions which is completely trust based hence extremely risky, although this has been somewhat addressed by using smart contracts there is still a risk of things going wrong, for instance a simple coding error might result in the loss of funds, the smart contracts are only completely comprehensible to the user who understands the underlying protocol as well here chance of misdirection also exists, for instance a decentralized application would request permission to transfer tokens on the user's behalf, this directly puts the entire funds of the user at risk.

We discussed defi having protocols and applications being built in a manner that they could be joined with each other. A disadvantage that arises out of this is that these interactions give way to severe dependencies, a small issue with an existing smart contract could mean a bigger consequence owing to these dependencies. Another concern would be that crypto assets can be used by users who want to stay off the grid and avoid records and monitoring, this arises because regulations on decentralized currency and smart tokens is a work under progress.

5. APPLICATIONS OF DEFI

Borrowing and Lending

The most famous service in the current market is comprised of the platforms and projects that offer approaches to borrow or lend funds made up of a wide variety of assets. In the last few years, DeFi has discovered innovative approaches to allow clients to borrow and lend crypto resources, effectively creating shared, public, and decentralized lending platforms for the blockchain space. Lending in DeFi allows users to generate more revenue by the interest generated by their digital assets and receive a governance token or DAI as an additional incentive. Lending can also help reduce the risks of market volatility. Borrowing in DeFi has a limit on the amount which can be requested based on the different elements such as deposited assets, insurance or even community ratings are all information that can be completely overseen by blockchain by exploiting the security associated with the network.

Asset Management

Another class of administration offered by DeFi is resource management. Investors in the conventional environment have regularly underestimated their situations as they can afford the cost of the dangers and fees involved. In Decentralized Asset management, investment opportunities will be extended to a wider circle of clients for whom the conventional finance model proved restrictive or restricting. Asset management under the DeFi aims to make investing easier and more accessible. Since DeFi asset management has decentralized technology at its center, it boasts increased transparency. Another exciting part of DeFi asset management is the composability feature, implying that the investors can appreciate hyper-customization of their portfolio, with more space for personalization around liquidity, pay, and growth. The most important part is that anyone will be able to manage their investments regardless of location. Some examples of DeFi asset management projects are Ampleforth, DAI, and Augmint.

Data and Analytics

Decentralized finance applications accompany extraordinary transparency for network activity and conditional information. That is the reason utilizing DeFi conventions can help you in data

analytics. The increasing popularity of these applications is prompting the improvement of different dashboards and tools. In general, some of them can even assist you with evaluating any platform risks, track the estimation of your resources and analyze them for the liquidity process. DeFi pulse is a live DeFi tracker, where you can track down all the most recent analysis and rankings of decentralized finance protocols.

Gaming

Decentralized financial applications are available in the gaming industries as well. Using these applications, gamers can now unlock the chance to deal with their in-application buys with no dangers of credit card hacks. These applications presently offer exceptional incentive models, which are difficult to come across in a regular gaming experience.

Prediction Markets

There are numerous applications of decentralized finance exclusively created for prediction markets. In reality, these applications can easily analyze the data and consumer behaviors to effectively predict any changes. Consequently, these applications investigate the circumstance and can offer you the outcomes around the monetary occasion, election results, and even sporting events. Augur is an example of a Prediction market application with no limitations on betting.

Insurance

DeFi is doubtlessly taking over the insurance industry also. Because of the absence of appropriate administration and security, this area deals with contract breaches and false insurance claims. Likewise, the process of insurance claiming takes a ton of time. That is the reason various inventive decentralized applications in this range are utilizing blockchain to ensure and cover agreements and help to smooth out insurance claims quicker.

Payments

The essential use of the DeFi application starts with a peer-to-peer payments system. That is the reason a large portion of the best-decentralized finance applications offers this functionality to all the users. In reality, blockchain technology is all that anyone could need to guarantee a safe and direct association with different clients without requiring any outsiders. In any case, DeFi

payments take it to a whole new level. It's making a more open space for securely sending and getting payments throughout the planet.

6. FUTURE SCOPE AND ENHANCEMENTS

Well, this concept is right now on a high pace to replace the traditional finance methods in terms of - banking, payments, etc. Currently, Defi is in an embryonic stage where several experiments are going on to meet the respective sector's needs and according to experts, they say that approximately 834.3M\$ is currently bolted in DeFi and also parallelly the number of users is increasing with a count of 40,000 per month approximately.

One of the biggest upgrades shifting the paradigm from traditional finance that involves cash management, taxes, etc. Now to avoid this it requires high-level security algorithms to run the complete transaction cycle. With which automatically a number of users will start transitioning to this. Secondly, it has to be user-friendly. Be it any company, if it's user-friendly it's known to have several users as compared to others. DeFi isn't dependent on a centralized infrastructure it only involves peer-to-peer transactions because of which other extravagant costs wouldn't affect the transaction nature which is just like the old-time barter system which involves the exchange of goods among peers.

There must also be protocols set on External data dealing with the smart contracts. Because this may give rise to risk of centralization by creating a chain. So this is one such parameter to be noted. Secondly, it's the scalability factor. The setup must be made in such a way that transactions and trades must be carried out in small scale or even large scale. In-order to achieve this optimum blocks of storage must be implemented.

Coming to improvements, DeFi must primarily focus on transparency because this contributes to system stability and privacy. Secondly, it must not include any central banks or big corporations because this would again increase the tax and unwanted transaction cost. Thirdly, it

must be accessible to every person in an equal way. In the current system, approximately 1.7 billion people do not have access to financial services.

The overall change is not something that comes overnight when it comes to a financial system. So a trusted environment with digital assets, crypto-currencies will have to be set up with a set of regulations. One thing to hope from this is to expect a cheap, fast, secure, and reliable way of transactions that reduces the overload and be useful for people in every sector.

7. CONCLUSION

In our research, we explain the role of blockchain in decentralized finance (DeFi) by going through what blockchain technology has provided as of whole and then explaining the history of centralized finance, which elucidated the need to have a decentralized financial system in the first place. We also highlighted main DeFi protocols and the growth those protocols have gained momentum in the past few months. Those protocols mainly included using Uniswap, Project Serum, and Kyber Network. Financial organizations can be greatly efficient and pellucid due to DeFi. We also showed that despite having many advantages there are some risks associated with DeFi and an in-depth institutional level research regarding the viability of DeFi must be addressed repeatedly in the near future. If both the potential institutional adopters and the largest DeFi platforms on the market make the necessary efforts and compromises to improve on both ends, a gradual transition could be created in a way that the implementation of the systems is not disruptive enough to generate concern in regulatory agencies, but fast enough to keep up with the expected demands of both the institutions and their clients. We also went through several applications that decentralized systems have in finance.

Thus we see that this technology has great potential, there are some stepping stones ahead. Smart contracts can have security issues that may permit for unintended usage, and scalability issues limit the number of users. On the other hand if these issues are solved then DeFi, on a large-scale, can lead to the intended paradigm shift in the financial industry and contribute towards the development of modern financial infrastructure.

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