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Decentralized Finance (DeFi)

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Topics we will cover

- What is Defi - slides 3- 5
- CeFi Vs DeFi - slide numbers
- Evolution of Finance - slide numbers
- Core construct of DeFi Ecosystem - slide numbers
- Uses/Benefits of DeFi - slide numbers

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What is Defi?

- An assortment of financial instruments or applications that leverage the blockchain technology.
- A formidable change from the existing traditional and closed financial markets as it uses smart contracts that allows for seamless, transparent and trustless transactions.
- Its implementation means no intermediaries like banks or brokerages, who charge fees for providing this service.
- DeFI is accessible to everyone!The users would maintain complete control over their assets and interact with

Features Of DeFi

- **Permissionless** -Any individual could access DeFi solutions through an internet connection and a crypto wallet, irrespective of the geographical boundaries

- **Programmability –** An opportunity for accessing smart contracts with higher chances of programmability in DeFi could help in automatic execution

- **Transparency -** Every transaction has to be broadcast to other users on the network in the case of the public Ethereum blockchain. All the users should verify the transaction broadcasted to them

- **Immutability-** With the assurance of safe and secure data transmission without any unauthorized modifications, DeFi could offer the assurance of integrity for all transactions.

- **Interoperability** -With the assurance of safe and secure data transmission without any unauthorized modifications, DeFi could offer the assurance of integrity for all transactions.

Non Custodial - developers and product teams could also leverage the traits of DeFi for customization of the interfaces and integration of third-party applications.

DeFi Infrastructure

Building Blocks of DeFi Infrastructure

Blockchain	Cryptocurrency	Smart Contracts
The framework on which everything is built	Token of values, information storage	Automating transactions, creating ecosystem

Blockchain

- The reason that DeFi is possible today is the blockchain. It is the pillar on which the decentralised economy has been established.
- Every change is packaged into an update called a “block”. These “blocks” are chained together cryptographically to allow for an audit of all prior history.
- Blockchains work on either proof of work protocol or proof of stake. PoW protocol states that the longest chain of blocks will be the truth, given the computationally-intensive lottery to determine which block to add.
- Once a majority amount of blocks attest to the truthfulness o a block, then the transaction will be processed by the requisite blocks and the transaction will be appended to the ledger

Cryptocurrency

- Cryptocurrency is the most popular form of blockchain technology.
- It is responsible for bringing the blockchain to the masses and showing the potential of decentralized finance to the masses.
- Cryptocurrency manifests as a token on the blockchain, that is scarce in nature. It is not duplicable.

The most popular example of a cryptocurrency network is the Bitcoin blockchain, which mostly exists as a payment network right now. It has spread across the world, settling transactions in real time with no intermediaries or censorship. While its successors do offer better technological alternatives and enhanced functionality, it has the largest network

The Smart Contract Platform

Smart contracts refer to code that can create, edit, and transform arbitrary code or tokens on the blockchain that it is a part of. It allows the user to encode rules and create contracts that can undertake specialised functions.

In the way that a Bank would have a vertical for loans, a smart contract platform can act as a backend to give out loans and undertake swaps. Consolidated smart contracts act as Decentralised applications, which are the building blocks for the Decentralised finance ecosystem.

A smart contract means instantaneous and automatic enforcement of whatever specifications the blockchain possesses.

It also eliminates any centralised entity from being in control, which may act maliciously in a worst-case scenario.

These contracts are not only limited to finance, but also have applications in data management, such as categorising and cataloguing data, or gaming, where they may mandate certain traits in a videogame character to ensure its compliance with the rules and limits of the game.

Ethereum is the most popular platform for smart contracts. One unique feature that may be a caveat to some, is the existence of the ‘gas fee’

The gas fee is like a transaction fee.

DeFi vs CeFi - Differences

	DeFi	CeFi
Funds Custody	User has full authority over fund's custody	Outside of user's custody
Security	DeFi isn't accountable for funds	Vulnerable in case of security bridges on the exchange
Available Services	Trading (Margin, Derivatives), Borrowing, Lending, Payments	Trading (Margin, Derivatives), Borrowing, Lending, Payments, Flat-to-Crypto
Personal Information	No need to share personal information	KYC process
Risk Factor	Security depends on the technology itself; faulty code can put funds at risk	CEX bear the responsibility for security, plane to hacker attacks
Market Cap	$16 billion'	$324 billion''
Customer Services	NA	Provided by major exchanges

Efficiency

Centralized Financial (CeFi) systems become inefficient and expensive as the amount of money and the volume of transactions increases. There is a high degree of friction in the transfer of money.

DeFi solves this issue by reusable clearing houses are all-time bound and volume bound and prone to slowing down t smart contracts and dApps that are specifically designed only to undertake one function. There is no need for a third party like a clearing house or a third-party financial institution to handle the money.

Access

- CeFi systems are shackled to physical and political lines. Banks and financial institutions may be limited by the country they are in. Often, banks do not build branches in underserved areas such as small towns or villages. As a borrower, CeFi institutions may often discriminate based on various socio-economic factors.

- However, DeFi gives the unbanked, and lower echelons of society, access to financial services. This can only have a positive impact on the global economy as small businesses have access to loans, mortgages, bank accounts, and lines of credit. More importantly, these services would be available at favorable terms.

Opacity

- CeFi, modern banks are notoriously opaque institutions. Stories are common where individuals were rejected for loans for seemingly no good reason. Access to credit and other facilities is often blockaded by highly bureaucratic processes that often seem to function inconsistently and inefficiently. There is zero transparency in the process.

- DeFi completely solves this issue through the presence of smart contracts. All parties are aware of how funds will be deployed across the lifetime of the contract. As everything is transparent and crowd-sourced, smart contracts substantially ease the threat of legal burdens and bring peace of mind to all those who participate in the market.

Control

- In the modern world, it is common to hear news from all countries about how seemingly third-party institutions have a very high degree of impact on the entire population.

- DeFi overcomes these issues by giving control of the actual market operations to protocols and smart contracts. Due to their intrinsic transparent nature, it is difficult to create sudden changes in how transactions are controlled.

Control Interoperability

Traditional financial products are not compatible with each other. This can be seen in cases where a store does not accept a certain kind of credit card provider, due to a lack of the requisite machine, or the unavailability of the provider in that country.

DeFi completely sidesteps this issue by having shared frameworks that can be endlessly iterated upon, without any central body governing which individual has the right to work on improving the product in the first place.

Evolution Of Finance

Traditional Financial System

You (Sender) — Your Bank — Bank of Receiver — Receiver

Dcentralized Financial System

You (Sender) — Receiver

Origin of DeFi

- In today's world, the relatively seamless transfer of money is sometimes taken for granted.
- The 21st Century economy of goods and services has expanded tenfold because of how easy it is to transfer payments for services and goods across borders and time zones, disregarding any inertia in the process because of factors like currency denominations across countries, or working hours at some centralised institution.

Finance 1.0

This is the traditional financial system, which began with the establishment of banks and fiat money. We enter the finance 1.0 era, when people began putting their money in banks because they believed banks were more secure than their homes. People began to earn a return on their investment (ROI) by putting their money in the bank, believing that this was the ultimate financial system that we could have.

Slow transactions, long queues, high transaction fees, time-consuming, the possibility of error (as things were controlled by humans), problems with borderless transactions, robbery, scams, and other issues with finance 1.0 became apparent over time.

There was no technology in finance 1.0, and all paperwork was handled by humans. The records were kept in register books, which had the risk of being lost or damaged.

Finance 2.0

After technology meets finance 1.0, finance 2.0 emerges. Now that everyone has a mobile phone and access to the internet, they can manage all of their financial activities such as money transactions, balance inquiries, complaint registration, money requests, account opening, and so on.

Many types of third-party payment network processors or payment gateways, such as PayPal, Visa, MasterCard, and others, have been introduced in the era of finance 2.0 to make sending or receiving a payment easier, more convenient, and possible from home.

The financial system is still not open to the public or under their control. It still has a lot of flaws, such as a centralised system that stores all of the user's data on a centralised server, which often leads to data leakage. Users must pay money in the name of different transaction/processing fees/charges, and users have no control over the money in the bank. The bank has the ability to freeze or invest user funds at any moment in order to generate a profit.

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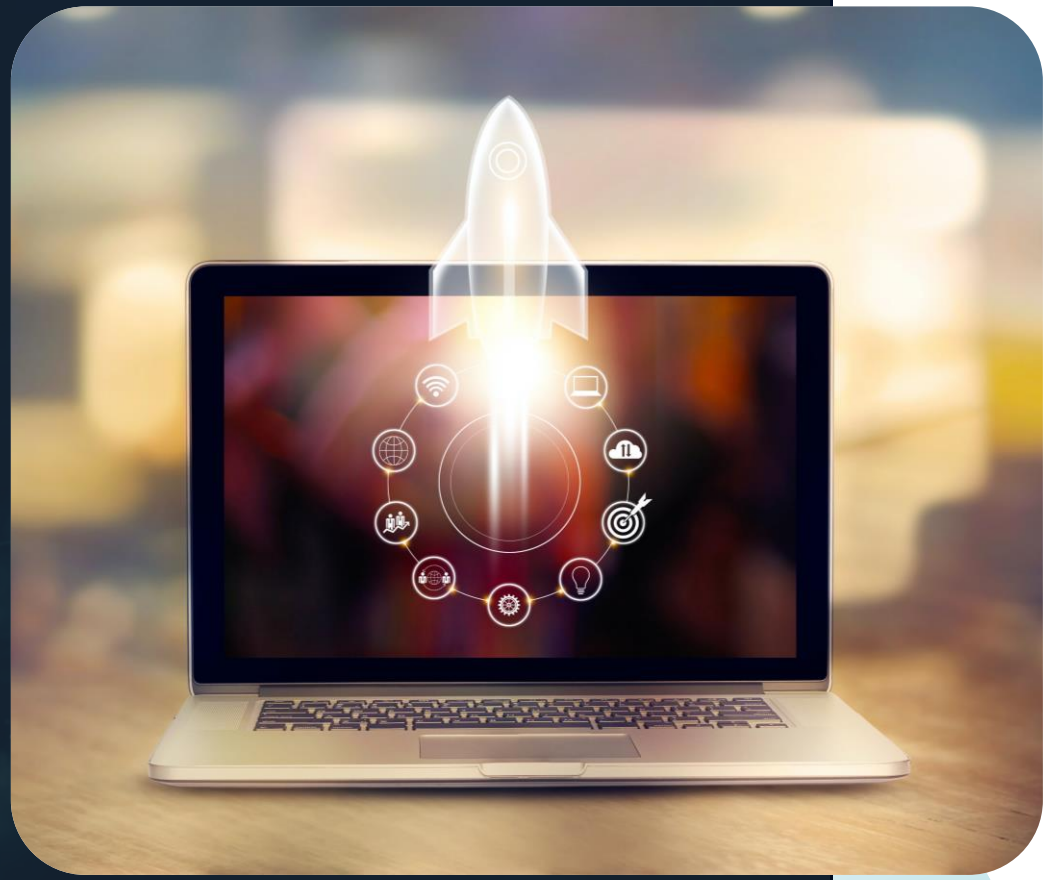
Finance 3.0

- Finance 3.0 is an open financial system that allows customers more power and minimises or eliminates the intermediary, fees, charges, and penalties, among other things. Finance 3.0 is a permissionless system that is not bound by geographical boundaries or social groups.

- To power finance 3.0, we can embrace blockchain technology, which can provide a finance 3.0 system with scalability, transparency, security, and other benefits.



Modern Financial Technology

High transaction costs, middlemen, and exorbitant fees are often seen as modern problems. However, these issues have persisted for decades at this point, and banks and financial institutions understand that their mechanisms are often inefficient and bloated.

About 50 years ago, there was no clear mechanism for the conversion of foreign currency. Banks had to find intermediaries in other countries who would have an incoming transaction in the desired currency in order to obtain the currency they needed to fulfil their liabilities. These profits were known as ‘spreads’ and were often the primary driver of the profitability of banks in that era

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How DeFi Is Being Used now

DeFI is making its way into a wide variety of simple and complex financial transactions. It's powered by decentralized apps called "dapps," or other programs called "protocols." Dapps and protocols handle transactions in the two main cryptocurrencies, Bitcoin (BTC) and Ethereum (ETH).

While Bitcoin is the more popular cryptocurrency, Ethereum is much more adaptable to a wider variety of uses, meaning much of the dapp and protocol landscape uses Ethereum-based code.

Bitcoin

Initial digital currency initiatives like CyberCash and the SET Architecture all failed due to various problems relating to centralised certificate issuing authorities, undermining the point of the technology.

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The paper presented a Peer to Peer system that is truly decentralised, utilising the concept of a blockchain. The key innovation of BTC was to combine the idea of the blockchain with a consensus mechanism called Proof of Work that aimed to produce an immutable ledger.

Ethereum

Ethereum is another cryptocurrency, often treated as number two on the crypto totem pole in terms of market capitalization, right after Bitcoin. It is a logical extension of the application of BTC.

It can control assets, data, and assets, and codify interactions between all these elements and participants. As long as the blockchain exists, the application continues to run, free of external influence. This capacity defines Ethereum as a smart contract platform. This feature must make it apparent why Ethereum is often used in various NFT projects.

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Core Construct of DeFi Ecosystem

Transaction

Every transaction that occurs on the blockchain is an atom. The foundation of every application, every contract, is a transaction. The initiation of a transaction is the fundamental means of exchanging information on the blockchain.

A single transaction is initiated by one individual, but it can interact with hundreds of dApps before it is effectively “concluded”

Fungible Token

- Fungible Tokens are the cornerstone of the flow of transactions of ETH on the blockchain. The Ethereum blockchain token interface is ERC-20.
- Equity Token - It is a token that represents ownership in certain underlying pools of assets.
- Utility Tokens -. Utility tokens are fungible tokens that are required to utilize some functionality of a smart contract system or that have an intrinsic value proposition defined by their respective smart contract system.
- Governance Tokens - Governance tokens are similar to equity tokens in the sense that they represent a percentage of ownership. Instead of laying claim to a pool of assets, governance token ownership applies to voting rights and exerting influence.

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Non- Fungible Token (NFT)

- In a technical sense, NFTs are different from fungible tokens because of the fact that they comply with the ERC-721 standard.
- As a result of this trait, they are important to the DeFi space. They can act as ‘deeds’, as proof of ownership for various projects and assets.
- The possibilities are endless.

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Custody

- Custody refers to the ability to escrow or custody funds directly in a smart contract. This is distinct from a direct debit of tokens from a user’s balance.
- It is similar to how when using prepaid wallets to book cabs via ride-sharing apps, the app often deducts some of the wallet amount as an escrow.

It gives protection to the company in the case of bad actors.

Incentives

Incentives in DeFi are very important to ensure that the system functions smoothly and positive behaviour is the natural outcome. Miners are incentivized to process transactions, and developers are maintaining their dApps.

Incentives can be of any form, but in the context of tokens, incentives can be stated as staked incentives and direct incentives. Staked incentives apply to a balance of tokens that are custodied in a smart contract. Direct incentives apply to users within the system who do not have a custodied balance.

Swap

A swap in the crypto space is very similar to how currency swaps work in the foreign exchange market. It is simply the mechanism for the exchange of one token for another.

The primary benefit of swaps in the DeFi context is that there is no reliance on custodians such as physical forex exchanges to make sure transactions go through. Users have full control over their assets.

The swap goes through only when the exact conditions are met.

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Collateralized Loans

The system must aim to restrict bad actors and defaulters, given the inter-dependability of various subsystems, any debt-related collapse can quickly shut down things across the entire ecosystem.

Requiring collateral contractually prevents a counterparty from defaulting and provides natural insurance against such a situation occurring.

Flash (Uncollateralized) Loans

One of the primary draws of DeFi that aims to exponentially increase access to capital is the flash loan. A flash loan is an instantaneous loan paid back within the same transaction. A flash loan is similar to an overnight loan in the traditional financial ecosystem. However, the main draw here is that repayment is required within the transaction and the same is enforced by the smart contract.

Evolution of Decentralized Changes

- These platforms struggle to implement Know Your Customer and Anti-Money Laundering checks because no one organization verifies the kinds of data that are often provided to centralized platforms.

- Since these platforms still need users to sign blockchain messages to transfer money off of them, even those that do allow user deposits are exempt from the regulations that apply to custodians.

- These days, decentralized exchanges allow users to lend money to earn interest passively, borrow money to leverage their holdings, or supply liquidity to earn trading commissions.
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Benefits Of DeFi

- Immutability
- Permisonless
- Transparency
- Self- custody
- Interoperability
- Programmability

Access Stable Currencies

- Cryptocurrency volatility is a problem for lots of financial products and general spending.
- The DeFi community has solved this with stable coins. Their value stays pegged to another asset, usually a popular currency like dollars.
- Coins like Dai or USDC have a value that stays within a few cents of a dollar. This makes them perfect for earning or retail

Borrowing with Privacy

- Today, lending and borrowing money all revolves around the individuals involved. Banks need to know whether you're likely to repay a loan before lending.
- Decentralized lending works without either party having to identify themselves. Instead, the borrower must put up collateral that the lender will automatically receive if their loan is not repaid.
- This allows you to borrow money without credit checks or handing over private information.

Access to Global Funds

- When you use a decentralized lender, you have access to funds deposited from all over the globe, not just the funds in the custody of your chosen bank or institution. This make loans more accessible and improves the interest rates.

Tax Efficiency

- Borrowing can give you access to the funds you need without needing to sell your ETH (a taxable event). Instead, you can use ETH as collateral for a stable coin loan. This gives you the cash-flow you need and lets you keep your ETH. Stable coins are tokens that are much better for when you need cash as they don't fluctuate in value like ETH.

Flash Loans

- Flash loans are a more experimental form of decentralized lending that let you borrow without collateral or providing any personal information.

- They're not widely accessible to non-technical folks right now but they hint at what might be possible to everyone in the future.

- It works on the basis that the loan is taken out and paid back within the same transaction. If it can't be paid back, the transaction reverts as if nothing ever happened.

Dataset Use Cases Of DeFi

The different features of DeFi protocols make them suitable for various DeFi use cases such as,

- Asset management
- Decentralized Autonomous Organizations (DAOs)
- Lending and borrowing
- Gaming
- Insurance
- Decentralized exchanges
- Data and analytics
- Margin trading
- Staking
- Tokenization

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