

Blockchain Technology  
(Use cases, Regulations,  
Applications)  
(Oct 11, 2022)  
Dr Dhiren Patel

# **Appropriate Regulation' Needed Over Crypto, Government Report Recommends (USA) – Oct 3, 2022**

- Report by Financial Stability Oversight Council, USA
- Ensuring Responsible Development of Digital Assets
- Digital assets a potential risk to the stability of the U.S. financial system if their scale or interconnections with the traditional financial system were to grow without adherence to "appropriate regulation."
- very significant shocks and volatility within the crypto-assets system – in the last year
- report concludes that crypto-assets, including stablecoins and cryptocurrency exchanges, need more regulation

# Why?

- Currently, the global cryptocurrency market capitalization is \$1 trillion, down from \$2.2 trillion at the same time in October 2021, a loss of \$1.2 trillion...
- Prices driven by speculation rather than fundamental economic use cases
- Crypto tokens associated with entities with "risky business profiles and opaque capital and liquidity positions."
- risk of concentration (centralization) of key services and vulnerabilities (the market is not so decentralized; industry is populated by large, concentrated intermediaries!!)

# **a dramatically different regulatory regime for crypto?? (Oct 2021)**

- Coinbase called for a single "digital first" regulator to oversee the crypto industry
- replace the patchwork of agencies overseeing the industry
- Digital Asset Policy Proposal
- include a new registration process established for marketplaces for digital assets (MDAs) and appropriate disclosures to inform purchasers of digital assets

# different regulatory regime for crypto

- Coinbase's proposal comes at a time of unprecedented scrutiny of the crypto industry in Washington, DC and growing exasperation at the slow pace and complexity that has characterized the crypto regulatory process—a process that has seen federal agencies like the SEC and CFTC squabble over jurisdiction, and a flurry of investigations by state regulators as well
- it's unlikely that existing agencies, including the SEC, would be willing to surrender their oversight power and nor is it clear if there's an appetite among states for the federal government to pre-empt their current roles in consumer and investor protection

# Disclosure-based regulation

- Disclosure-based regulation was resoundingly successful in developing efficient, safe capital markets over the course of the 20th century. However, traditional forms of disclosure are not well suited to web3 platforms and protocols, which historically have been highly transparent, open source, and auditable.

# FATF



- The Good
- In describing who may qualify as a VASP and therefore must surveil their customers, the new guidance removes all references to persons merely “facilitating” or “governing” transfers and instead focuses, as we asked, on persons with “control of VAs [Virtual Assets].”
- The Bad – Travel Rule (the "travel rule," which requires financial institutions to record and report information about senders and receivers of electronic fund transfers worth at least \$3,000, as it applies to crypto transactions. That's been clarified to apply to transfers between VASPs, but not transfers to a private wallet).
- The Ugly – too long document

# web3 Policy Hub

- We need an internet that can help us retain leadership in a world of increasing competition, unlock opportunity for the millions on the margins of the innovation economy, and enable people to take control of their digital lives.
- The solution is web3—the third generation of the internet—a group of technologies that encompasses digital assets, decentralized finance, blockchains, tokens, and DAOs. Together, these tools enable new forms of human collaboration.



# Web3

- web3 is a better way to build digital platforms that are directly accountable to their users.
- Too many of our digital systems are broken. They leak data and leave too many people behind. web3 platforms are decentralized, democratized, and far more resilient and inclusive.
- web3 creates new modes of participatory, accountable governance, improves auditability, and introduces technologies to balance the competing needs for transparency and individual privacy.

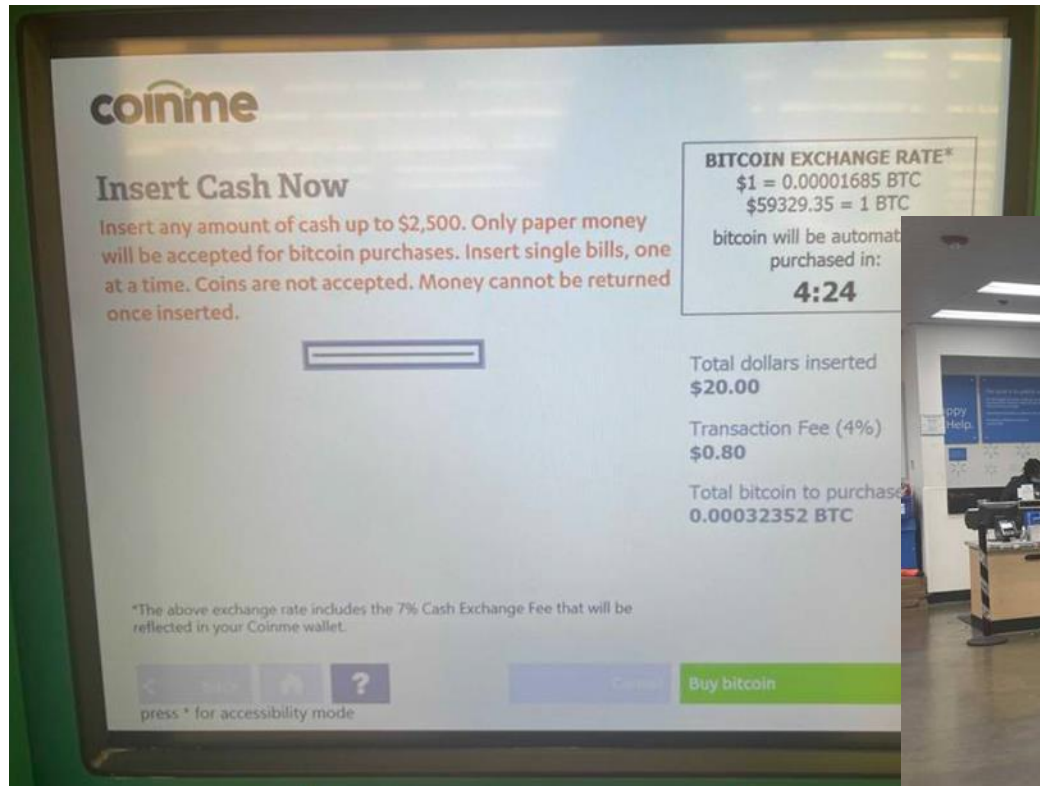
# Why? (Oct 3, 2022 discussion - FSOC)

- The Council recommends increasing the enforcement of existing regulations and closing regulatory gaps, including increasing capacities related to monitoring, supervising, and regulating cryptocurrency activities.
- to mitigate the risks of digital assets while realizing the potential benefits

# Walmart Has Begun Hosting Bitcoin ATMs (2021)

- offering bitcoin through 200 of its Coinstar kiosks in a tie-up with crypto ATM firm **Coinme**
- allows its customers to use cash to purchase bitcoin
- The ability to buy bitcoin is enabled by Coinme, a crypto wallet and payment firm that specializes in bitcoin ATMs (BTMs)
- After inserting bills into the machine, a paper voucher is issued. The next stage involves setting up a Coinme account and passing a know-your-customer (KYC) check before the voucher can be redeemed. The machine charges a 4% fee for the bitcoin option..
- While large-scale BTM rollouts could bode well for adoption, there are concerns about money laundering

# BTC ATMs



# **withdrawal of USD cashing BTC??**

- Video – BTC ATM (Hermes – Los Angeles)
- File- withdrawal...
- While every Bitcoin ATM is able to accept cash and buy cryptocurrency, only some are able to sell cryptocurrency, allowing you to withdraw cash.

# the Politicizing of a Technology

- NFTs Will Disrupt Any Industry That Lacks Transparency
- Web3
- use cases for NFTs are beyond art, and NFT memberships and rewards programs are with high potential

# Facebook delves further into the virtual world

## Facebook → Meta (2021) (MVRS)

- a company that prioritizes profit over user safety
- Google → Alphabet (2015)
- Facebook said that the company's metaverse will support non-fungible tokens (NFT) in a possible boost to the Ethereum protocol, where the digital collectibles format has thrived.
- “This will make it easier for people to sell Limited Edition digital objects like NFTs, display them in their digital spaces and even resell them to the next person securely,”
- with the rebrand, the company was consolidating all of its payments and financial services units and products, including Facebook Pay, under the Novi brand.

# Metaverse

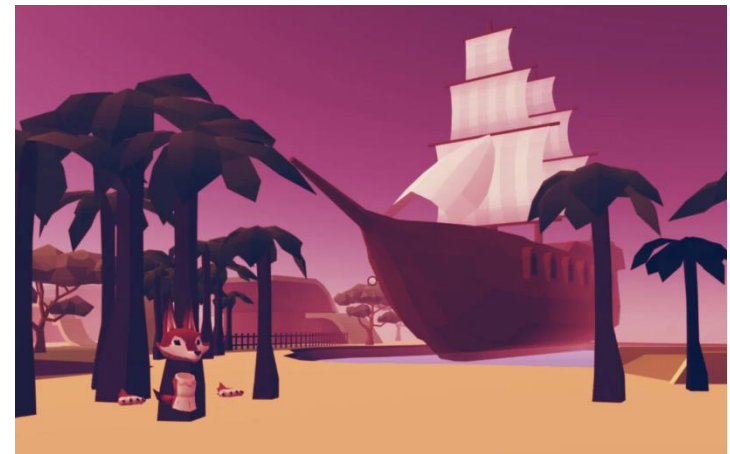
- What is the metaverse? It's a term that we hear often in the crypto industry, especially as decentralized projects attempt to create future online worlds and experiences free from the oversight and control of centralized entities—like Facebook, for example.
- Essentially, the metaverse refers to shared online spaces in which users—represented by 3D avatars—coexist and interact together.
- Metaverse will also help change the nature of work, and afford new digital economic opportunities to users around the world. It's similar in a sense to how DAOs, or decentralized autonomous organizations, are being built to disrupt traditional companies.



# Metaverse

- The metaverse isn't a single product one company can build alone
- Just like the internet, the metaverse exists whether Facebook is there or not.

# Metaverse-related digital assets (examples)



- Facebook's rebrand to 'meta' (in a bid to "bring the metaverse to life") has driven the prices of metaverse-related assets up in Oct 2021
- MANA, the token powering the browser-based video game Decentraland—a kind of hybrid of Minecraft and Second Life
- SAND, the native token for The Sandbox, a community-driven metaverse where users can make their own NFT gaming worlds.

# Metaverse

- The metaverse describes a new incarnation of the internet, where the two-dimensional surfaces of today's web have been replaced by immersive 3D virtual reality environments.
- The metaverse proposed by Facebook in its keynote address - a place of social interaction and commerce. Virtual environments might include meeting or exercise rooms. Recreation might take the form of 3D online shopping, gaming, or live music events.
- Crypto community has pioneered both fungible and non-fungible digital assets, and inserted them into 3D open-world contexts like Decentraland and The Sandbox!!

# Microsoft Makes Metaverse Move After Facebook's Meta Makeover (1 Nov 2021)

- Microsoft has announced 3D avatars and immersive virtual environments for meetings
- After 30 or 40 minutes max in a meeting, it was very hard to stay engaged and focused
- All of our products, including our apps, now share a new vision: to help bring the metaverse to life.  
(Zuckerberg)
- The metaverse is understood as a persistent virtual universe where users can interact with each other as digital avatars. These virtual environments can be used for social interactions, gaming, or even work.

# Metaverse

- Microsoft will use AI to listen to a person's voice and use that to animate their avatar.
- In the metaverse, you'll be able to do almost anything you can imagine—get together with friends and family, work, learn, play, shop, create
- will be able to teleport instantly as a hologram to be at the office without a commute

# Stablecoin

# System with resilience and safety

- DAI Stablecoin
- over-collateralized design means that each \$1 of DAI in circulation is backed by more than \$1 in another cryptocurrency.
- The specific ratio can vary depending on which cryptocurrency you use to mint, with more volatile or less-established cryptocurrencies commanding a much higher ratio.
- Having more collateral than there is DAI circulating keeps the system from falling apart should crypto markets swoon and dive

# DAI, USDT, USDC

- This design is quite different from that of Tether's USDT and Circle's USDC.
- These are centrally collateralized off-chain
- People will give U.S. dollars to a custodian like Circle, and then they will mint USDC against that. This IOU (**I owe you**)(registered warrant – (redeemable) payable when funds available or at stipulated date!!) can then be later redeemed for the U.S. dollars that they originally deposited



# Terra – LUNA - UST

- In May 2022, UST, which at the time enjoyed a market cap of \$18.6 billion and the title of the fourth-largest stablecoin on the market, imploded, wiping out investors globally
- Unlike Tether and Maker's DAI, UST was an "algorithmic stablecoin," backed by a unique burn-and-mint mechanism tied to Terra's governance token LUNA.
- To mint 1 UST, users first needed to buy LUNA and then swap \$1 worth of the token, effectively "burning" it and removing it from circulation.
- They could move in the opposite direction, too, burning 1 UST for \$1 worth of LUNA.

# UST collapse – "stablecoin" that was not very stable

- This mechanism gave speculators an arbitrage opportunity. Each time UST dropped below \$1, for example, users could buy the discounted stablecoin for, say, \$0.98, swap it for \$1 of LUNA (as per the protocol's design) and then sell that \$1 to pocket the \$0.02. Obviously, it's only pennies, but large holders could turn a pretty profit leveraging this mechanism at scale.
- As BTC fell from \$39,700 to roughly \$28,900 in the span of three days (May 2022), UST's market cap collapsed to just over \$1 billion
- Today, UST trades at \$0.03 and has a market capitalization of a little over \$304 million
- It was a giant axe that harmed a lot of well-intentioned projects in the space.

# Food for Thought

- maintaining the permissionless, decentralized protocol “at its core” (Risk – crypto volatility) or go to collateral with a real-world assets or funds or stocks or trade receivables!!
- The value of Luna Classic, LUNC, is up over 70% for the week and up over 44% for the month, hitting \$0.000365 mid Sunday (2 Oct 2022)
- As impressive as the relative numbers are, the price is a far cry from its \$100 price in April 2022

# white hat hacking

- A white hat hacker is typically a cybersecurity vigilante who finds vulnerabilities in code and exploits them, typically in order to claim the bounty for doing so
- Hacker Corben Leo found a critical vulnerability in [@opensea](#) this weekend (Sept 26, 2022) and reported it through [@Hacker0x01](#). They fixed the issue within 3 hours of reporting and in less than 12 hours they had triaged, reproduced, patched, and awarded a sizable bounty (\$100000)
- We also want you to retest, and will give out additional retest fees to cover gas fees!!

# Burning of Tokens

- “Burning” a token means sending it to a cryptocurrency address that isn’t controlled by any user.
- This effectively removes coins from the circulating supply, which typically accelerates price action

# DAO

- Ukraine DAO—a decentralized autonomous organization (DAO) that has so far raised millions for Ukraine's defense and relief work since the start of the Russian invasion
- setting up of "Iran DAO" to support Iranian women, many of whom have been protesting against Iran's islamist regime (since the death of activist Mahsa Amini in police custody on Sept 16, 2022).

# Web3 new projects

- **Shegby**
- A DAO of locals worldwide who earn by helping travellers
- a DAO of Locals who have exceptional knowledge, skills and experience to help Travellers and earn money (millions of jobs worldwide)



# ExactBuyer Search

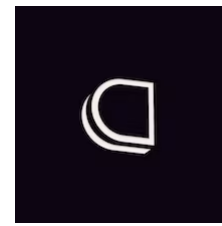
## (AI Powered Business Search Engine)



- ExactBuyer is the first-ever search engine specifically built for sales, recruiting, and marketing teams to help them find their perfect customers, ideal hires, partners, or acquisition targets by searching the way they speak.
- semantic search engine built for prospecting teams that want to book better meetings, build deeper relationships, and hire the right candidates
- **Examples for finding professionals:**
  - \* Data engineers who know python and used to work at Microsoft
  - \* Founders of crypto companies who used to work at Google
- **Examples for identifying target companies:**
  - \*Top cookware brands in North America



# Continuum

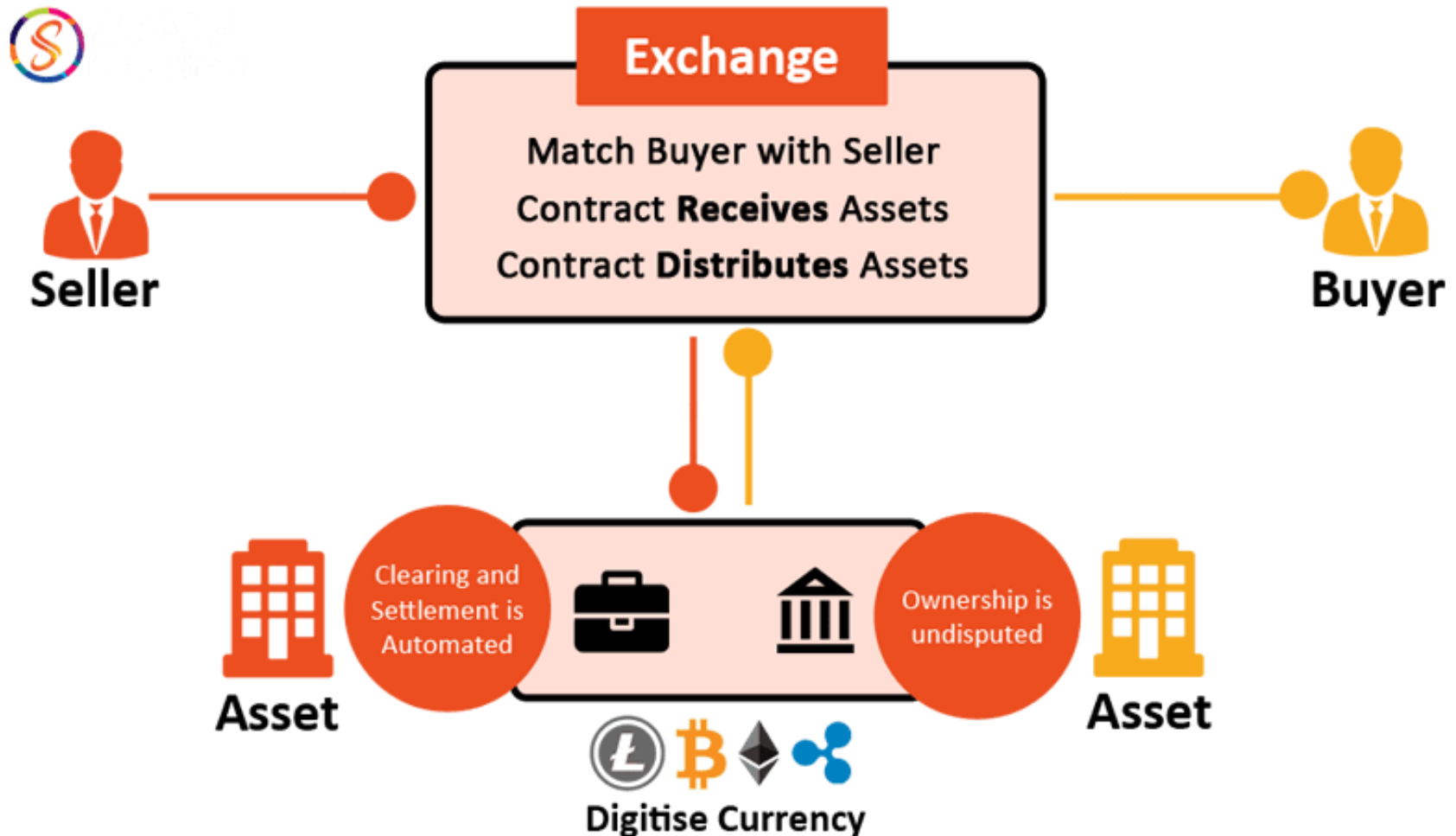


- Get paid in crypto & NFTs for learning courses from experts
- the world's first learn-to-earn social education app
- Education is expensive. It can be hard to make a living while studying.
- Companies which profit from an educated workforce, are the logical party to carry the cost.
- This platform is FREE for learners and content creators. Better than that, they actually reward learners with crypto and proof of completion NFTs for finishing courses and engaging in discussions. The purpose is to create a self-sustaining ecosystem of educators, learners, and mentors at all stages of their journey.
- Revenue into the system is from brands looking to build awareness of their technologies and related products

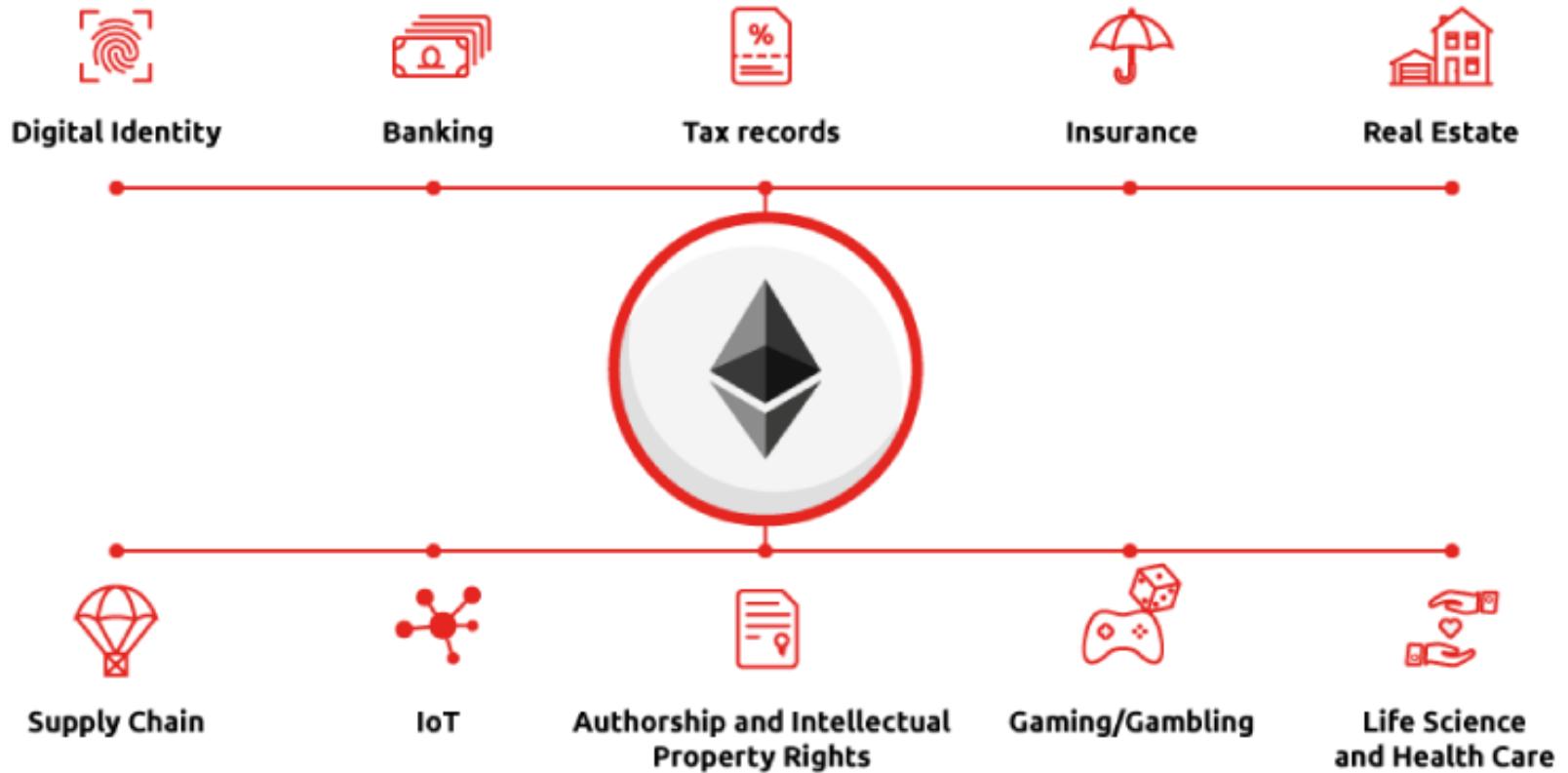
# Smart contracts

- Smart contracts are digital transaction protocols that utilize the blockchain to enforce an agreement automatically while doing away with any third party
- Identity Agreement, Contract Conditions
- Code Business Logic, Blockchain
- Execution and Processing
- Network Update

# Smart contracts – resolving ownership and complicated agreement conditions



# Blockchain Smart contracts: Use cases



# Blockchain Use cases

## Potential Blockchain Use Cases



### Financial Institutions

- International payments
- Capital markets
- Trade finance
- Regulatory compliance & audit
- Anti-money laundering & know your customer
- Insurance
- Peer-to-peer transactions



### Corporates

- Supply chain management
- Healthcare
- Real estate
- Media
- Energy



### Governments

- Record management
- Identity management
- Voting
- Taxes
- Government & non-profit transparency
- Legislation, compliance & regulatory oversight



### Cross-industry

- Financial management & accounting
- Shareholders' voting
- Record management
- Cybersecurity
- Big data
- Data storage
- Internet of Things

# Blockchain in Education



Your Balance:

0

SEND

RECEIVE

Home

Transaction...

Profile



Share this QR code to receive coins

Dhiren Patel



Your Balance:

899290

LBSNAA Blockchain - Developed by VJTI Mumbai

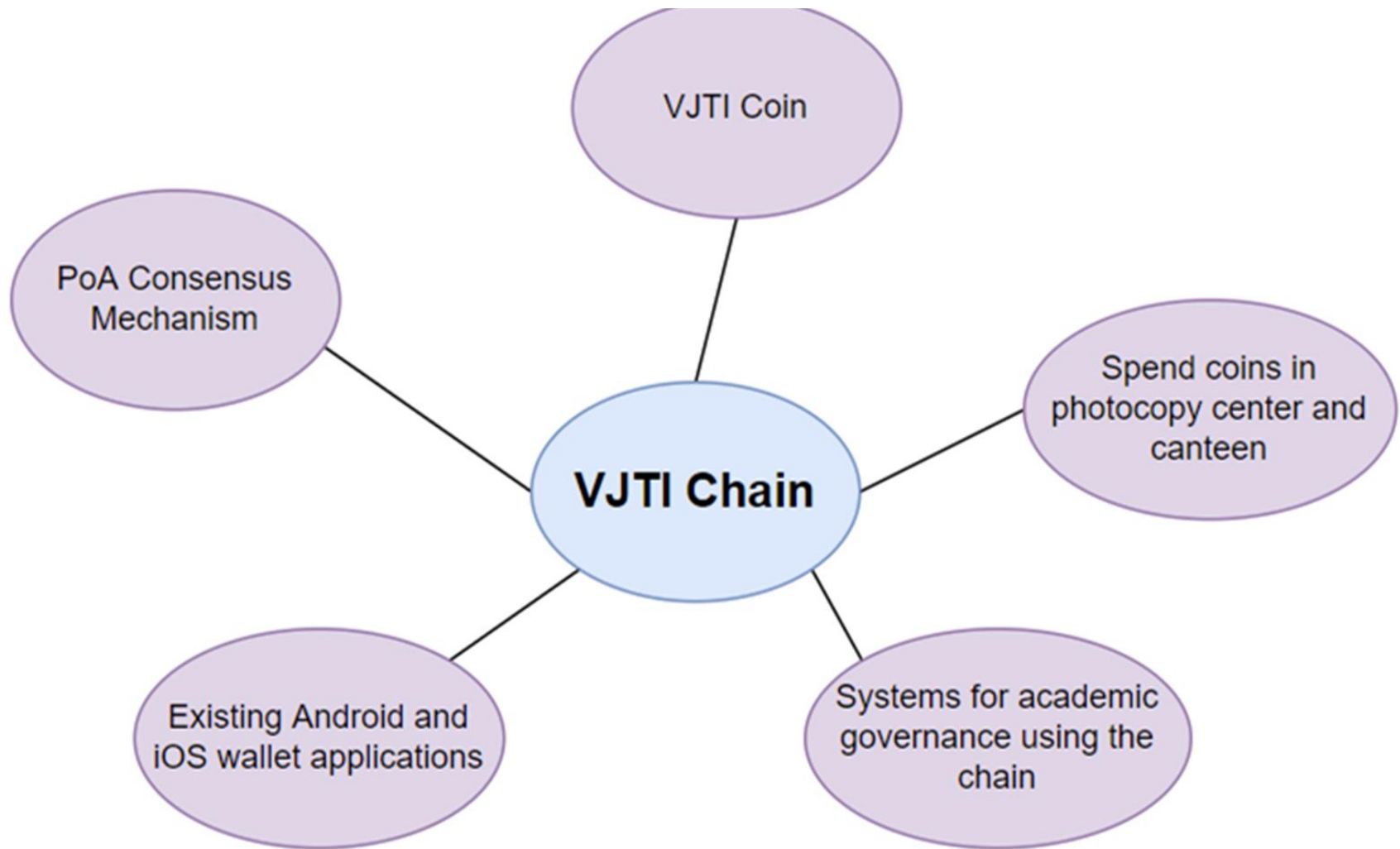
Home

Transaction

Profile

# Campus Blockchain (Circular Economy)

## Student Incentivization System



## For Students

- *Import account with your secret key credentials or Register yourself with generating a new key pair*
- *Create a new application for your achievement, submit a certificate for verification and select a faculty that will verify your application*
- *Receive VJ Coins as reward upon faculty approvals, Rewards can be spent in the Canteen, Library, etc*
- *View your pending/approved/rejected applications*
- *Check your wallet balance in profile and Download credentials from your profile section*



# Blockchain in Sports - WorkFlow

## Crowdfunding For Sponsorship

Athlete X requires sponsorship  
(A campaign is posted for the athlete on the site)

Investors/Organizations/Scouting Agency invest in the athlete using crypto or fiat currency, which goes to the athlete X.

If Athlete X performs well, which attracts sponsors and endorsement deals and earns  $Y$  amount.

If Athlete X fails to generate the revenue, then the investors face a loss.

Some% of  $Y$  is returned to the Investors/ Organizations/Scouting that invested in the campaign (As a result, the original invested sum is recovered)



## Fan Token And Loyalty

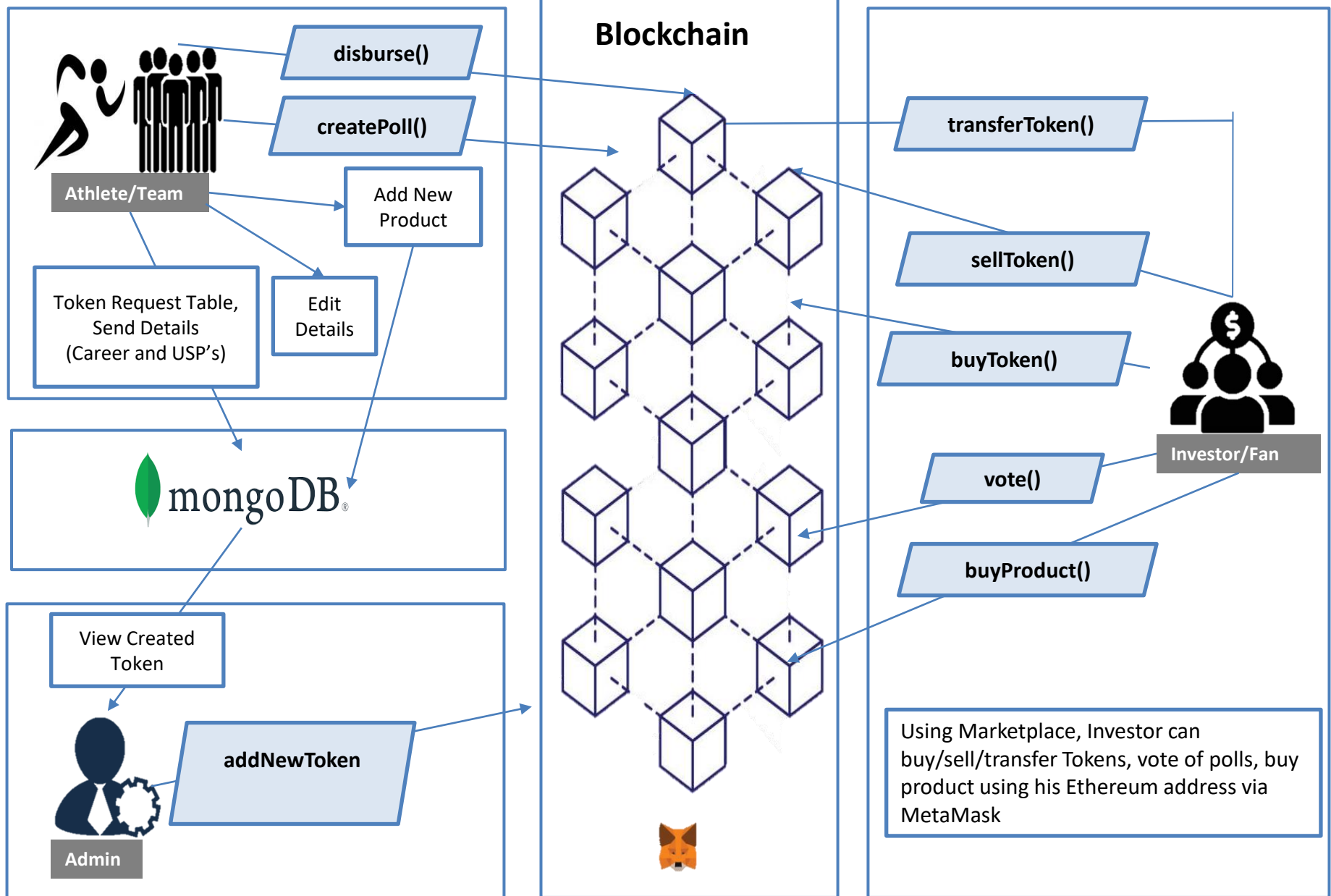
Fans register on the application, buy our cryptocurrency in exchange of fiat currency

Club/Team/Athlete wants to collaborate (A token is to be created with a initial tokens to be distributed in a given time frame/FCFS, published on the application)

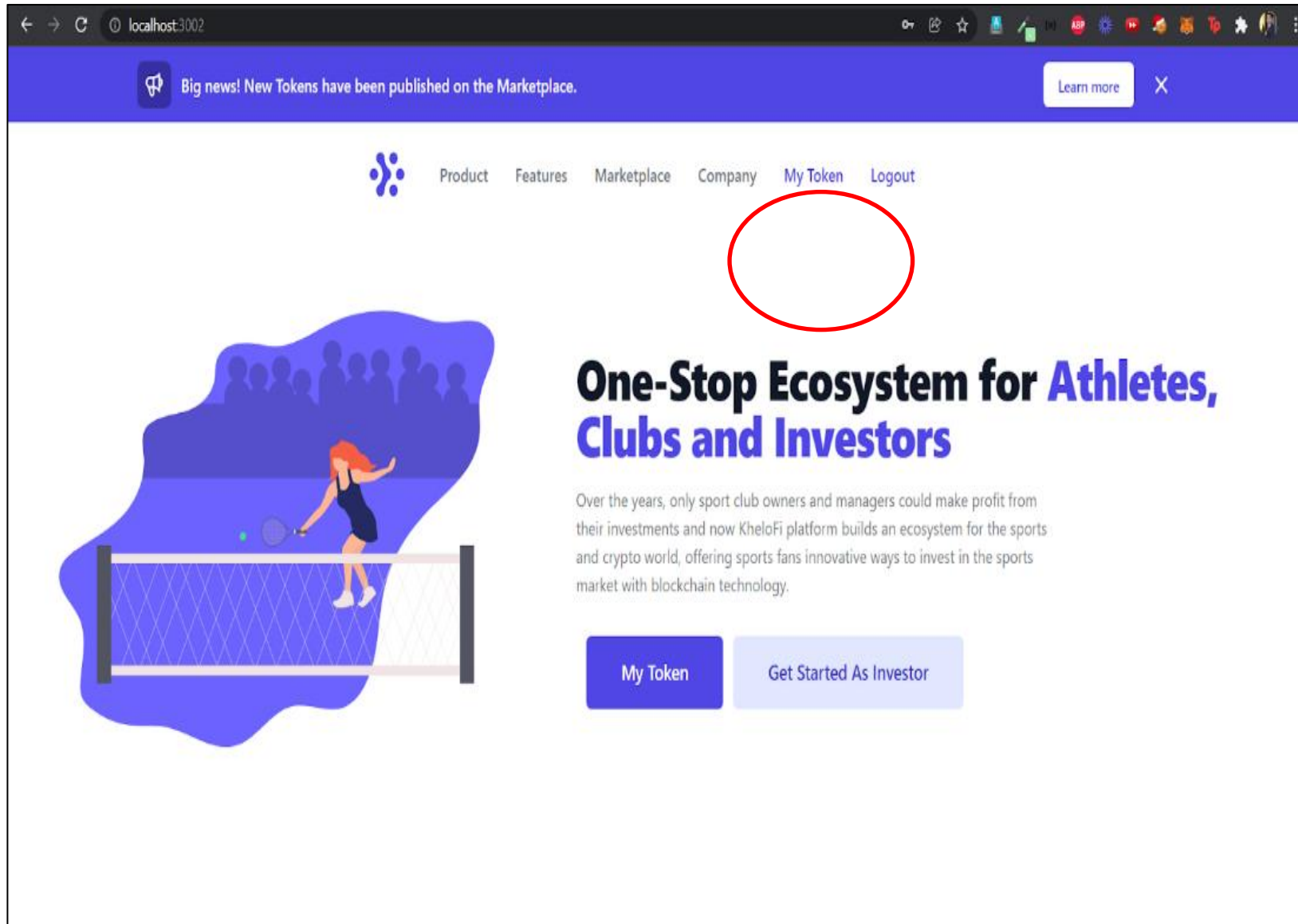
Fans buy these tokens in exchange of the cryptocurrency or fiat currency

Fans get signed merchandise, right to vote on team decisions, tickets for matches, entry to meet & greet events, etc., in exchange of Fan Tokens

# System Architecture



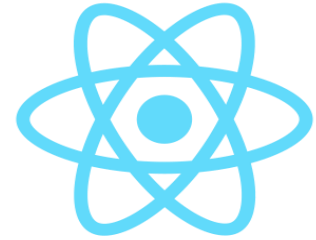
# KHELO-FI Dashboard



# Technology Stack



TRUFFLE



React JS



METAMASK



IPFS



SOLIDITY



mongoDB®

# Use Case: Supply Chain

- Global supply chains are inefficient, poorly tracked, and sometimes exploitative.
- E.g. Paperwork can account for substantial cost of container transport, and products are frequently mis-labeled.
- Create a shared IT infrastructure that streamlines workflows for stakeholders along the supply chain.
- Blockchain platform can facilitate accurate asset tracking, enable enhanced licensing of services, products, and software, and ultimately improves transparency into the provenance of consumer goods, from sourcing all the way to the point of consumption.



## E.g. Farm to plate

- the scope is to provide producers, buyers, sellers, and consumers to come to one platform and promote food supply chain transparency
- Transform food supply chain system with Blockchain
- Consumers trust brands that offer 100% transparency on the food journey including product content, food safety process, allergens, and ingredients information.

# Farm to Plate

- With all this information on a Blockchain, there is a stronger sense of accountability, transparency, and real-time access to trusted information.
- The information and data stored on **Farm to Plate** are immutable and thus can be trusted, which helps strengthen the quality management process of the produce

# designed with Global Food Supply Chain Standards

- Participants can access relevant information that follows a global standard to assure food quality and provides consumers a complete overview of the food journey to enhance brand equity
- QR code scans at each transaction point are recorded on a blockchain that allows tracing locations and activities. Thus damage or spoilage occurrence is identified faster with accuracy.



## Permissioned Blockchain

- Only authorized participants
- Participants are known and trusted
- Secured

## Data on a need-to-know basis

- Data stored privately when needed
- Authenticity of data ensured
- Flexibility to determine which data to be private

## Modular Architecture

- Plug and play mechanism
- Adherence to consensus protocols, certificate authorities, cryptographic protocols
- Easy integration

## Multiple Language Support

- Supports Go, NodeJS, Java, Python
- Developers don't need to learn new languages
- Easy adoption

## Open-source

- Available free - no additional cost to host on this platform
- Minimizes cost of adoption of Farm to Plate
- A strong community dedicated to improving performance daily

## Deterministic Consensus Algorithm

- Accessibility of participant consensus
- Faster addition of the block to the ledger
- Elimination of bureaucracy

# Other use cases (Govt.)

- Property and Land records
- Covid Certificates
- Disbursement schemes
- Health records
- Tax data (Property tax, Vehicle tax, License fees etc.)
- Education records (migration certificates, leaving certificates, marksheets, eligibility, domicile etc.)

# Explaining Blockchain

- **Blockchain** – underlying technology of **Bitcoin**
- **Bitcoin requires Wallets** – (Addresses – public key), based on ECDSA
- **Block validation (Mining)** – based on SHA256, Proof of Work (Puzzle), Difficulty Leading bits 0
- **Transactions** (Address In, Addresses out, Amount out, Amount in) – Verified
- **Algorithmically Controlled** Coin (finite) Supply (Scarcity - consensus)
- **Difficulty adjustment** (every 2 weeks – 2016 blocks), Halving (every four years)
- **Immutable Distributed Ledger** – Record keeping, Trust
- **Smart contracts** – self executable chain codes – with external triggers
- **Decentralized Finance** – automated banking operations (Lending, Borrowing, DAO)
- **NFT** – digital **Proof of Ownership** – anything can be tokenized (Patronizing Art)
- More than 2T USD locked in, Payment, **Store of Value**, , Sacrosanct records

# **Tether Eliminates Commercial Paper From Reserves in Transparency Push (14 Oct 2022)**

- Commercial paper is unsecured, short-term debt issued by a corporation.
- Tether has eliminated over \$30 billion dollars of commercial paper without any losses, a proof of how Tethers' reserves are conservatively and professionally managed. Tether has also increased its direct exposure to US Treasuries by more than \$10 billion in the last quarter.
- as part of Tether's ongoing efforts to increase transparency, with investor protection at the core of the management of Tethers' reserves
- (Earlier this year, rumors circulated that a portion of Tether's commercial paper portfolio was "85% backed by Chinese or Asian commercial papers and being traded at a 30% discount." )

# Proof of Reserves

- Proof of reserves is a way to verify that a platform holds enough assets to match their users' deposits.
- Proof of Reserves enables the reliable and timely monitoring of reserve assets.
- Proof of reserves is completed by a third-party auditor that creates a snapshot of all of the company's balances to show transparent “proof” that the crypto company has enough assets to cover its liabilities at any given time
- Proof of reserves uses blockchain technology to publicly verify a crypto company’s on-chain assets.

# PoR

- **Proof of Reserves (PoR) in Demand After FTX Collapse!!**
- Proof of reserves (PoR) is a step in the right direction for any crypto company, ensuring that customer funds are safe and proving (cryptographically) that the company has sufficient liquidity.
- Proof of reserves employs a secure data structure known as a Merkle tree (or hash tree), which aggregates the total of all customer balances without exposing any private information.
- The total aggregate data is accessible via the Merkle root.