# Meeting

## Tipuri de date/context

- awareness, gamification

- consum de apa, profil/clustering

Piata libera de energie, idee similara pentru apa

## Categorii consumatori

Categorii de contracte/utilizatori (e.g. venit fix/variabil, etc)

Consumul pe intervale de timp, timing + volum

Indicatori socio-economici, date suplimentare: venituri, ocupatie, locatie

## Clustering

Dupa mai multe criterii

## Rewards

Rolul validatorului

Nivel apreciere (confirmari de la validatori), raportari, scor, statistici

Specificatii pentru crowdsensing

Bonificatie prin blockchain, criptomoneda

ONG: x puncte, plantez un copac

Game asset/blockchain: sell, trade

Cine plateste GAS fee-ul? (ethereum)

TODO: scenariu de reward, regulile jocului

# NFT

A non-fungible token (NFT) is a unit of data on a digital ledger called a blockchain, where each NFT can represent a unique digital item, and thus they are not interchangeable.

Non-fungible tokens or NFTs are cryptographic assets on blockchain with unique identification codes and metadata that distinguish them from each other. Unlike cryptocurrencies, they cannot be traded or exchanged at equivalency. This differs from fungible tokens like cryptocurrencies, which are identical to each other and, therefore, can be used as a medium for commercial transactions.

Much of the current market for NFTs is centered around collectibles, such as digital artwork, sports cards, and rarities.

Perhaps the most famous use case for NFTs is that of cryptokitties. Launched in November 2017, cryptokitties are digital representations of cats with unique identifications on Ethereum’s blockchain.

<https://www.investopedia.com/non-fungible-tokens-nft-5115211>

NFTs can be used to unlock specific rewards/medals, e.g. 10 issues reported, 3 months worth of data collected from IoT sensors.

NFTs do not seem like a good currency, e.g. collecting points (each point has the same value) on a blockchain and then selling the points to stakeholders (autorities, NGOs)

Moreover, NFTs mostly run on a proof-of-work blockchain, which is less energy efficient than a proof-of-stake blockchain. This has resulted in some criticism of the carbon footprint for NFT transactions and makes it a less than optimal solution for Smart Cities.

However, some more modern NFT technologies, like Flow, already use proof-of-stake and can have much less energy usage. Cryptokitties has plans to migrate from Ethereum to Flow.

Maybe a cryptocoin that can only be sold to stakeholders would be a better choice for points/score-based rewards. A private blockchain such as Fabric would be a good fit for this, where the nodes are distributed among the stakeholders.

|  |  |
| --- | --- |
| S  Represent unique items within blockchain  Endless development possibilities  Can be adapted to any blockchain | W  New, incomplete standards  Complex operation  More susceptible to hacks (everything is managed by smart contracts) |
| O  Revenue stream for gaming, sports and technology  Owning the "real-world" asset | T  New technology, tricky, time consuming  More simplification needed |

<https://ccoingossip.com/what-are-non-fungible-tokens-nfts/>

# Fabric

<https://medium.com/coinmonks/beginning-with-the-hyperledger-fabric-241b54859476>

In a crypto-currency network, the coins you possess are your assets. In Bitcoin, it is called Bitcoin itself, and in Ethereum it is called Ether. Transactions happening in these networks involve sending and receiving those coins.

As Blockchain is not only about exchanging coins, Hyperledger Fabric allows you to define a custom asset. For example, a vehicle could be an asset for an automobile manufacturer. The vehicle will have several attributes with values, which are termed as a state for that asset. Any change in this state is regarded as a transaction, which is recorded in the ledger.

Hyperledger Fabric provides a blockchain network with a modular architecture and consensus protocols that do not require a native cryptocurrency. Ethereum offers a structured and innovative option for writing smart contracts for decentralized applications, and then interacting with those smart contracts through libraries. This code pattern illustrates how Ethereum tools — like Solidity for writing smart contract and web3.js library for interacting with smart contracts — can be used in a blockchain application with a Hyperledger Fabric network. The pattern provides steps for deploying Fabric locally with Ethereum Virtual Machine (EVM) and creating a proxy for interacting with the smart contract through a Node.js web application.

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| --- | --- |
| S  Permissioned blockchain (as opposed to public blockchains which are permission-less), no anonymous users, authentication  Different roles: client (invokes transactions), orderer (updates transaction data), peer (receives updates from orderer, commits to leger), endorser (validates authenticity)  Modular architecture  Performance and scalabiliy: no POW  Database support (LevelDB, CouchDB), rich query capability | W  Lack of proven use cases  Lack of know-how/programmers that can use it  Less secure consensus algorithm (than POW) |
| O  Permissioned blockchain, managed by the stakeholders  Increased level of trust between the stakeholders | T  May be less trusted by the actual users/not complete transparency  No incentives to keep the network secure (may not be neccesary) |

<https://www.devteam.space/blog/pros-and-cons-of-hyperledger-fabric-for-blockchain-networks/>

# Fungible vs Non-Fungible tokens

|  |  |
| --- | --- |
| **Fungible** | **Non-Fungible** |
| Interchangeable | Non-interchangeable |
| Uniform | Unique |
| Common | Rare |
| Divisible | Non-divisible |

“Fungibility is a good or asset’s interchangeability with other individual goods or assets of the same type.”

Now, let’s suppose you borrow your friend’s car. Will she be ok with you returning some other car to her? What if you break up her car and return her the engine, wheels, doors, etc.? You’ll be lucky if she doesn’t file a complaint against you!

Non-fungibility is a desired asset when your token is a collectible and gains its values from its uniqueness.

<https://blockgeeks.com/guides/fungible-vs-non-fungible-tokens-what-is-the-difference/>