



## Problem Statement Title

Blockchain-based: Loyalty and Rewards Program

Team Name: 686157-U1YF68V6

# Team members details

<b>Team Name</b>	<b>686157-U1YF68V6</b>		
<b>Institute Name/Names</b>	<b>Indian Institute of Technology (Indian of School of Mines) Dhanbad</b>		
<b>Team Members &gt;</b>	<b>1 (Leader)</b>	<b>2</b>	<b>3</b>
<b>Name</b>	<b>Avishek Kumar</b>	<b>Anurudh Kumar</b>	<b>Sundaram Anand</b>
<b>Batch</b>	<b>2024</b>	<b>2024</b>	<b>2024</b>

# Why Blockchain?



# Problem Breakdown

## Defining Token Characteristics

To build a robust loyalty points system on the blockchain, the initial step involves carefully structuring the token economics. This entails specifying the value and quantity of loyalty tokens to be issued. Simultaneously, it necessitates the establishment of a well-defined governance framework to oversee daily treasury operations. These governance rules will dictate the creation, distribution, and management of tokens, ensuring a transparent and equitable ecosystem.

## Optimizing Transaction Settlement

Another pivotal challenge is streamlining the settlement process, enhancing efficiency, and bolstering trust between brands and e-commerce platforms. The ultimate objective is to facilitate seamless and instantaneous transactions using loyalty tokens. This streamlined process will not only simplify business interactions but also bolster the system's security and reliability by recording all transactions on the blockchain.

## User-Centric Experience

This platform will empower customers to effortlessly oversee their loyalty points, explore available rewards, and track their overall progress. The interface must offer a user-friendly dashboard that clearly presents earned loyalty points and transaction history while enabling straightforward redemption.

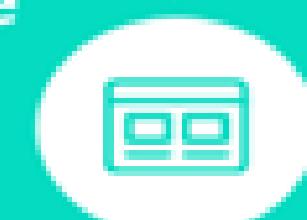
## Architecture components



Digital wallets  
Users upload a digital asset and fill in the metadata

1

NFT marketplace app



Front end



Smart contracts



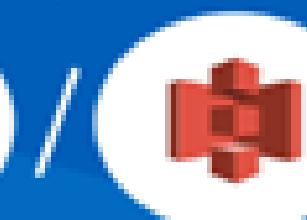
Back end



Database  
(LevelDB)



IPFS



AWS S3

2 The metadata verified and sent to an external data storage

3 A unique identifier is assigned to the asset and an NFT is minted



## Techs and services



Infura.io



Ethereum



ETH Gas Station API

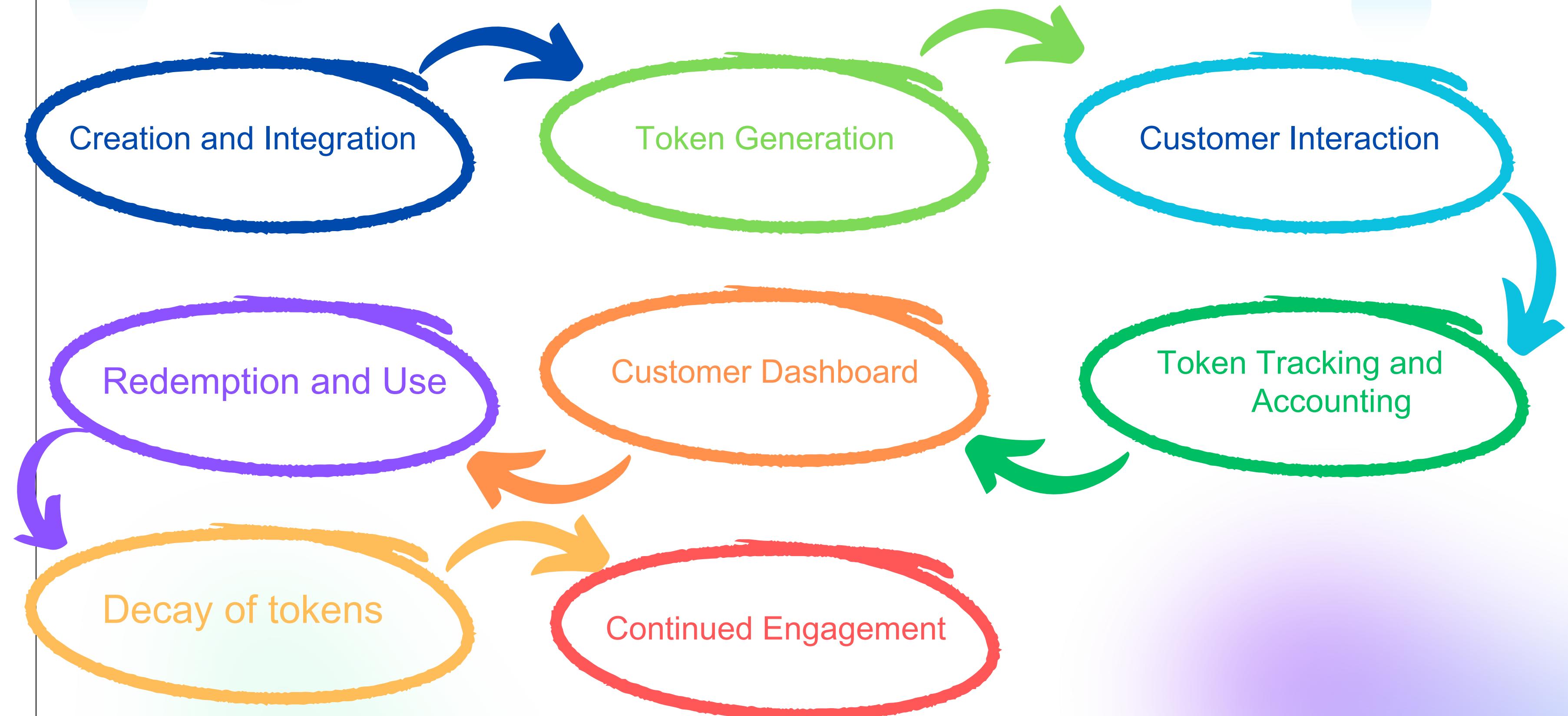


CoinMarketCap



4 The NFT is added to the blockchain

# The Algorithm of solution



# Glossary

- Generation of Loyalty Points as Fungible token (FSC).
- Value of 1 Flipkart Super Coin (FSC) = Market value \* Fluctuation \* (1-Matic)
- Retailers can issue tokens for specific brands and merchants in a transparent way
- Double spending is prevented using Proof of Work and Proof of Stake
- Each successful referral earns the referrer 50 FSC tokens.
- Decay function =  $\exp(-\alpha*t) * (N*B*H*86400)/(D*2^{32})$ , where N is hash rate, H = Hash rate (hashes / second) D = Difficulty (Reference for values below) B = Reward per Block (Reference for value below)  
N = Number of days/month (default = 30)  
S = Number of seconds per day  
 $\alpha$  = Decaying rate  
t = time in seconds  
( $S = 60 * 60 * 24 = 86400$ )

01

## Rewarding sections

Consumers are rewarded on transaction of some predefined large value or selected items.



02

## Decaying fungible token value

If users don't use tokens Customers shop on the website and accumulate tokens based on their purchases, referrals, engagement with the site, and other qualifying actions.

03

## View transactions

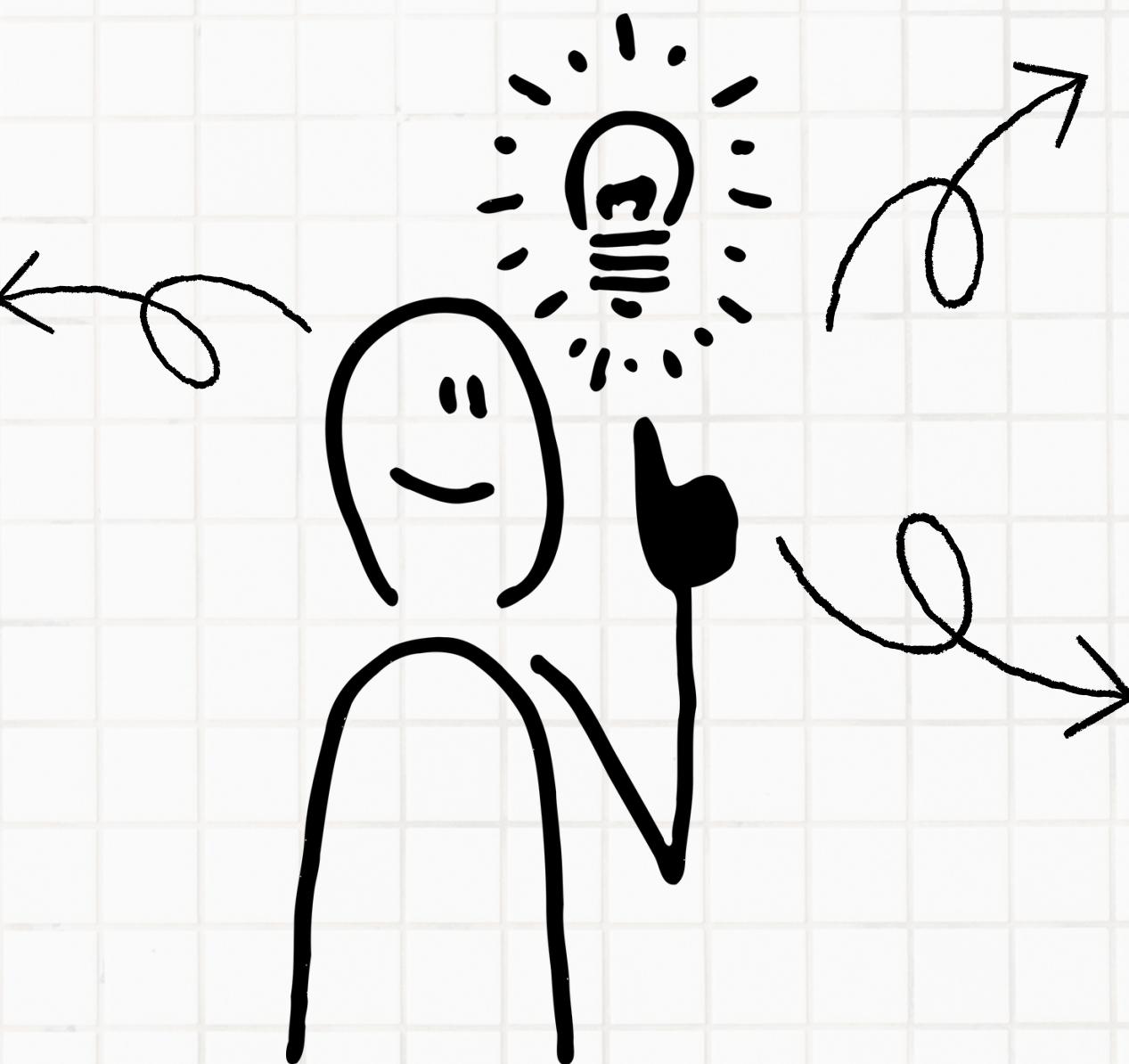
Customers can see all their previous done transactions

# USE CASES

05

Cross-Platform  
Use

Enable customers to use the tokens earned on your ecommerce platform in partnership with other platforms, extending their utility and enhancing cross-platform engagement.



04

Gamified  
Experience

Players can earn, trade, and spend tokens within the game's ecosystem.

06

Tokenized  
Content

Offer premium content, guides, tutorials, or industry insights that can be unlocked with tokens, encouraging users to engage and learn more about your products.

# LIMITATIONS



## High transaction fees (Gas Fees):

The cost of processing transactions on a blockchain network can be high, especially for small transactions as we have implemented this project on Ethereum blockchain network. This could make it difficult for ecommerce businesses to offer competitive prices.

## Slow transaction speeds:

Blockchain networks can be slow to process transactions, especially during peak times. This could lead to delays in order fulfillment and customer satisfaction.

## Regulatory Challenges:

The use of fungible tokens as loyalty rewards might encounter regulatory hurdles, as they could potentially be classified as financial instruments, subjecting them to additional compliance requirements.

# Future Scope

- Integrating with Flipkart using API.
- Shifting from etherium blockchain to polygon blockchain for computational efficiency and less transaction fees
- Transparency and Trust: Our project can provide transparency in the supply chain, enabling customers to trace the origin and journey of products. This can be particularly appealing for products like organic food, luxury goods, and electronics, where consumers demand authenticity.
- Scalability and Performance: Overcoming blockchain's scalability limitations will be crucial to handle the high transaction volumes of e-commerce platforms effectively.

*Flipkart*



**GRID**

5.0

*Thank You*