

## ECommerce warranty system using NFTs

Team Name: ***Bit Lords***

Institute Name: **K.J.Somaiya College of Engineering**

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# Team members details

Team Name	Bit Lords		
Institute Name	K.J somaiya college of engineering		
Team Members >	1 (Leader)	2	3
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Batch	2023	2023	2023

# Deliverables for the Project

Users can prove ownership

Decaying Nature of NFT

Soulbound and Transferrable NFT

NFT metadata provides purchasing  
history  
warranty period

Warranty card directly sent to phone

Smart Contracts deployed on Polygon

Gamified Loyalty Construct

User Friendly GUI that doesn't require  
knowledge of Blockchain

# Glossary

- **NFT** :- A non-fungible token (NFT) is a financial security consisting of digital data stored in a blockchain, a form of distributed ledger. The ownership of an NFT is recorded in the blockchain, and can be transferred by the owner, allowing NFTs to be sold and traded.
- **ChallengeBoard** :- A Loyalty Construct Program where Admin can add challenges which users can attempt and complete to earn exciting points and compete with friends
- **Soulbound NFT** : Soulbound tokens are just permanent, non-transferable NFTs, meaning that they can't be given away or taken from your private blockchain wallet.
- **Generative NFTs**: Generative art NFTs are generative art that is created via a smart contract and stored on-chain in the form of an NFT. Retailers and Sellers just have to upload a simple picture of the product and our model has the ability to randomly produce colors, patterns, and shapes organized into an artistically digital artwork to present to the buyers.
- **IPFS** : The InterPlanetary File System is a protocol and peer-to-peer network for storing and sharing data in a distributed file system. NFTs that are generated are saved to IPFS and a hash is returned for the file

# Use-cases for **User's Interface**

1. **Search and View all the Products:-** View through all products listed by Retailers and Sellers
2. **Login or Register into Account:-** Users can login into account with Username/Email and password. They can create a new account using username, phone number , email and password. While creating a new account, users can add 'referral code' shared by their friends
3. **Buy a Product:-** Users can purchase a new product and if the product is assigned with a warranty, a warranty generative NFT is created which is unique to all users and any number of products brought. This NFT have a decaying property. The warranty card with all the purchasing details,serial number and validity is sent to user's phone via SMS and Emails
4. **View all the past order:-** Users can view through all the past orders and warranty cards generated for it

# Use-cases for **User's Interface**

1. **View status and details of a warranty card:-** Users can view their live status and details of Warranty NFT in the blockchain
2. **Transfer the NFT (If warranty is transferable):-** This blockchain function Takes in a source address and a list of transfers to perform out of the source. A transfer consists of a destination address and the token\_id of the token to be transferred.As an output, Blockchain state is updated to reflect the transfer.
3. **Take up a new Challenge from ChallengeBoard:-** Users can view all challenges and attempt a challenge to earn exciting points and badges. These points are shown to users and they can be used to redeem prizes. Compare our ranking in leaderboard and enjoy with friends
4. **Refer to friends and Invite them:-** Users can share referral code via WhatsApp to invite them to platform
5. **Add to Cart:-** Users can add products to their cart

# Use-cases for **Retailer's Interface**

1. **Add a product :-** To add a Product to blockchain and save the metadata regarding that product along with it
2. **Search and View all the Products listed by that Retailer/Seller :-** Retailers can view all the Product details they have added
3. **Create a Warranty NFT Soulbound :-** While adding a product's warranty, sellers can create a soulbound NFT stating that the NFT will remain non-transferable by users.
4. **Create a Warranty NFT Transferrable with setting a limit to number of transfer :-** Sellers can choose to add a limit of transfers on a NFT during resale
5. **Add challenges to ChallengeBoard :-** Sellers can create new challenges to increase user interaction and activity on platform

# The main advantage of our solution

- The application is **extremely secured**, **Scalable** and **Deployment Ready**
- It can help increase the sales of the products through the platform as it provides a new **easy and innovative** way to use NFT's and soulbound NFT's as rewards and warranty systems
- Provides **gamifying** experience and loyalty constructs through our intriguing leaderboards thus ensuring maximum participation of the buyers and keeping them engaged with our platform
- Allowing sellers to use concepts of NFT's without them having much knowledge about them making it **user friendly**.
- In the best interest of the seller concepts of rare and super rare NFT's have been imbibed to maintain enthusiasm and **brand loyalty** among the buyers and thus ensuring maximum sales and use of the platform
- Easy Customization and unique artistic NFTs are generated each time

$$\boxed{253^3} \times \boxed{4} \times \boxed{7} \approx \boxed{460 \text{ Million}}$$

RGB                  Zooming factors                  Algorithms                  unique NFTs

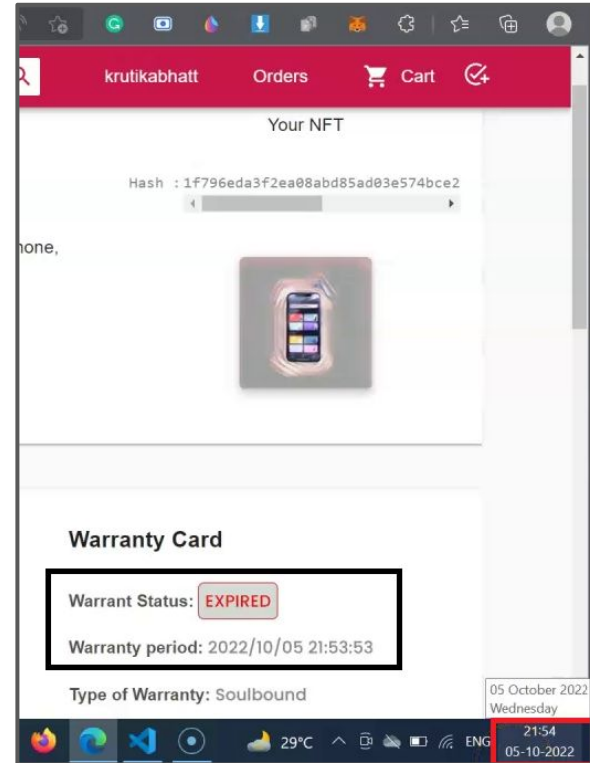
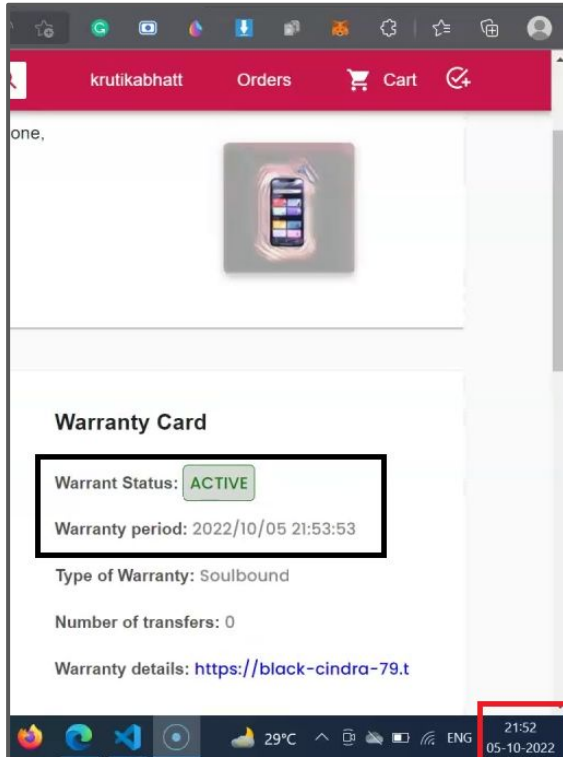


# Solution statement & Implementation

- The NFT as a warranty allows the user to prove ownership of the product
- The meta-data of each NFT warranty helps the user to maintain the previous purchase history price of the item the date of expiration of the warranty and the other underlying details
- Once the warranty expires the user will no more be able to view the NFT anymore as well thus making sure that it decays as soon as the warranty period expires
- The Admin can just update the metadata base image (price,warranty expiration date etc) for the NFT the admin wants to use and leave the rest to our algorithms to modify the image and create rare and super rare NFT's for the base image thus no knowledge of NFT's as such is required by the sellers and brands
- We have used the concept of soulbound NFT's for our loyalty constructs the user will be awarded with a soulbound NFT if the user buys upto a particular threshold or completes a particular task
- We have used leaderboards for gamification the user gets points on buying the items and a leaderboard is maintained of our top users thus providing an amazing gaming like experience to our users
- We have followed EIP-721 standards in our smart contract which helps us to prevent the transfer of SBT's from the Opensea marketplace

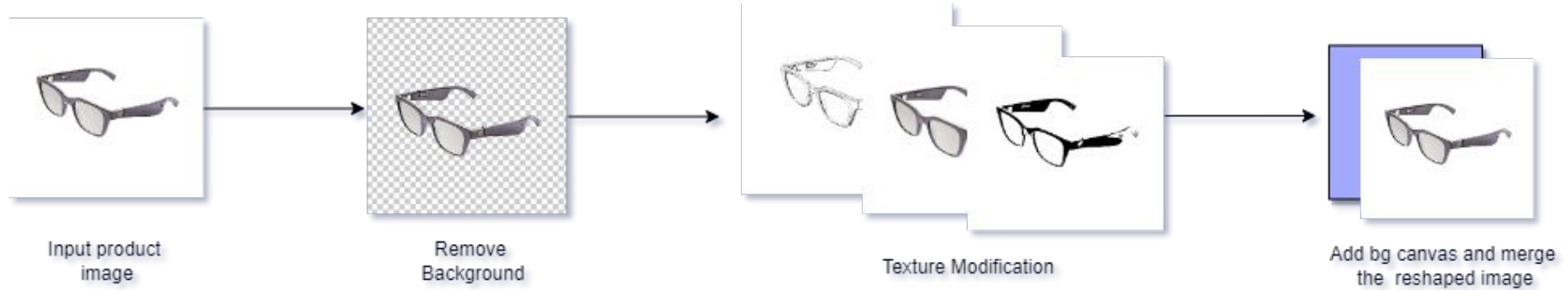
# Decaying NFT's

- Once the Warranty is expired the NFT will be burnt and will no longer be valid and transferable. The condition is checked while retrieving the NFTs

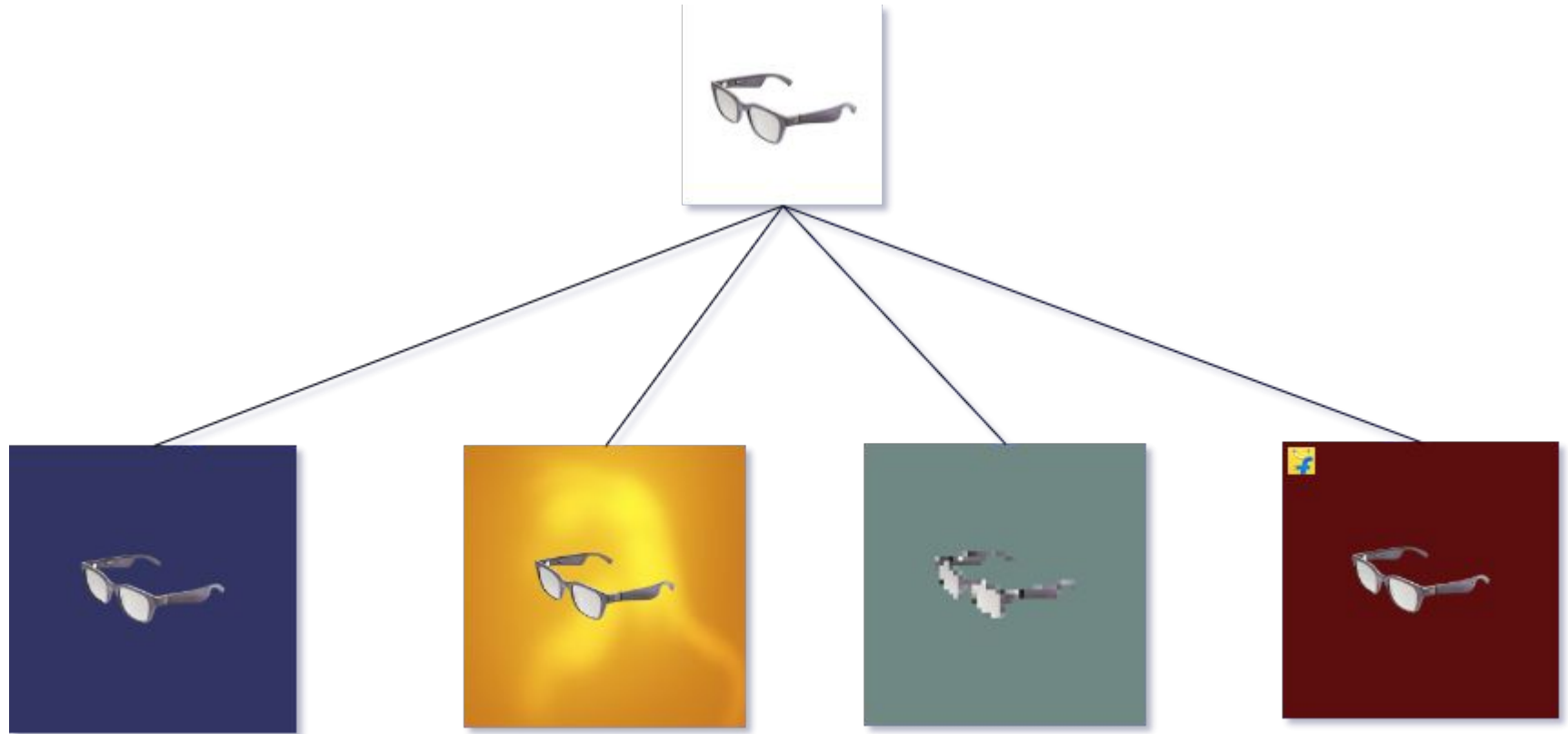


# Generative NFTs

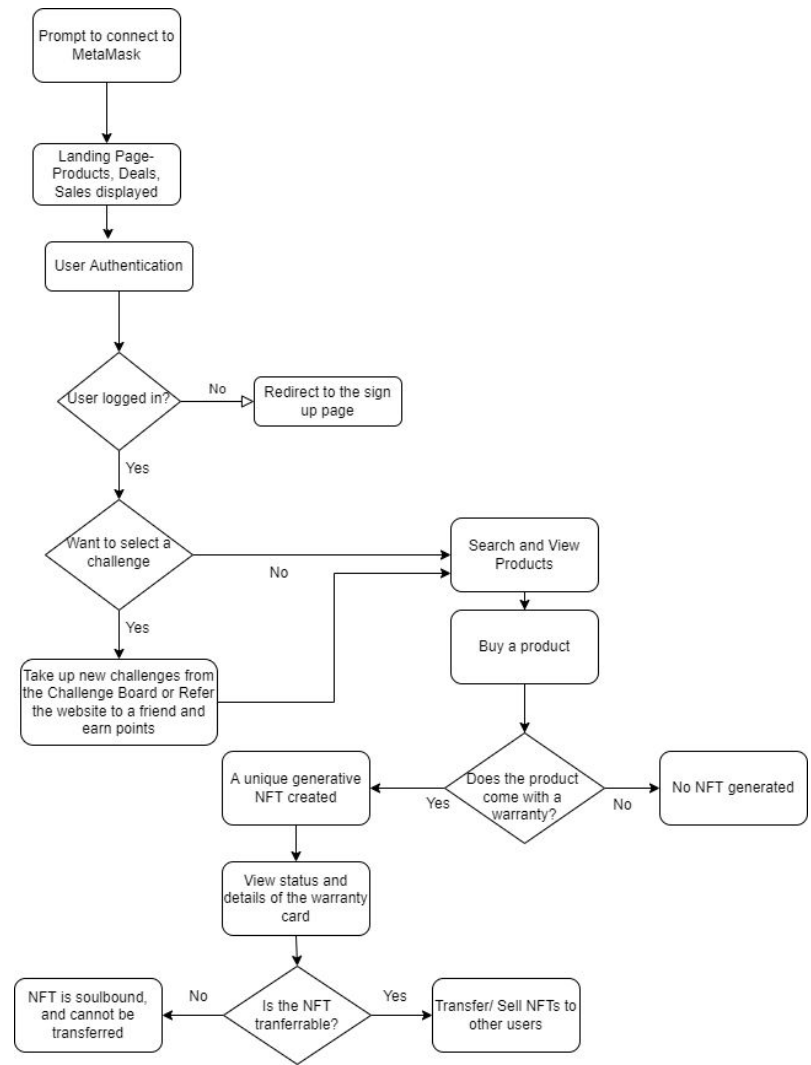
- The generative NFTs allow us to create a lot of NFT artwork from the image of product uploaded by seller. The NFT artwork generated are totally random and can be classified into simple and rare NFTs. This encourages and cultivates interest of collecting and dealing with Digital tokens



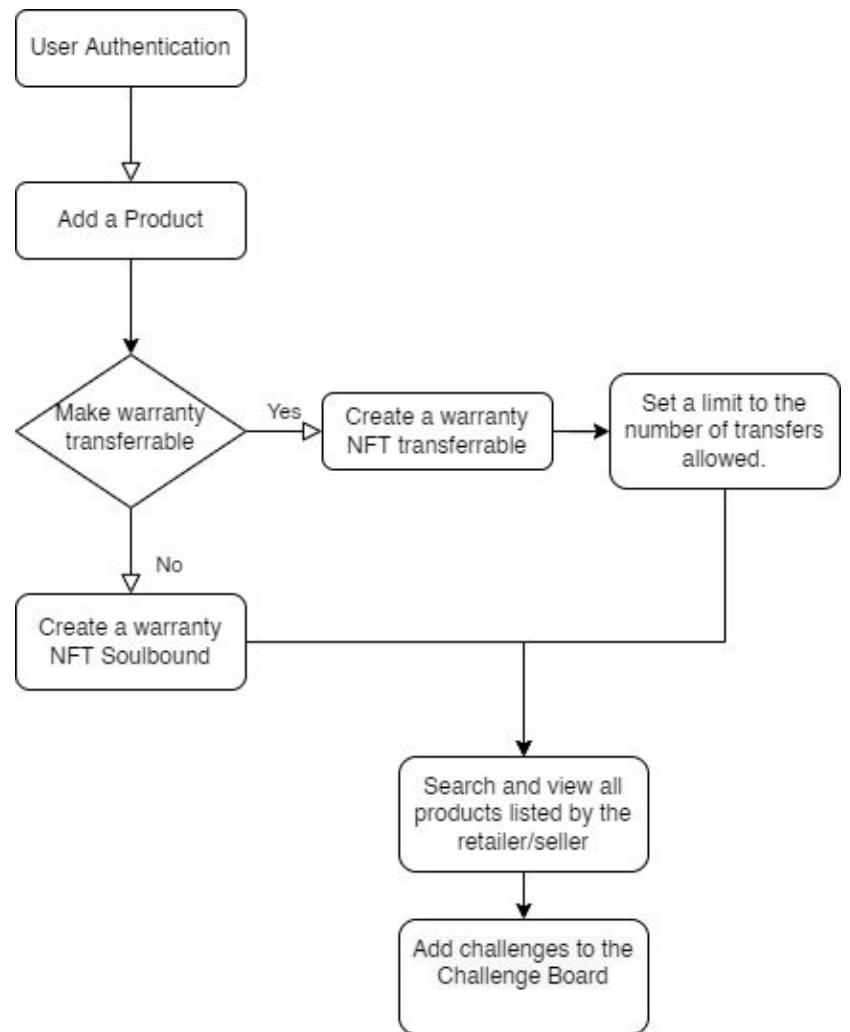
With our model, we can generate artistic, pixelated and NFTs with logo that grabs attention, helps makes a strong first impression, creates brand identity and separates you from competition



# Flow-Chart (User)



# Flow-Chart (Seller)



# Limitations

- Limited Freedom for Retailers to customize the NFTs according to their need. In real word scenarios, there are a lot of fields and conditions on which a validity of a warranty card is decided
- Tracking of advanced services redeemed on the NFT cannot be done or a record is not maintained in current version of application, for example – replacement of products, repairements associated, etc
- Custom awards cannot be given or managed by the administrator. This functionality has to be added
- Once the warranty is set, there isn't any functionality where retailers can update the already assigned warranties to user incase of any modifications or instant cancelling.

# Future Scope

- Allowing users to buy items by redeeming their soulbound NFT's given as a reward in Challenge Board
- Adding the concept similar to supercoins and awarding the user's in the leaderboard with super coins for them to buy items from the online shop on FlipKart
- Allowing the items to be viewed in 3D mode for a better look at the items
- Giving more freedom to the retailers in customizing there NFT's based on their terms and conditions.
- Generative NFTs are derived from a set of operations conducted by the model and are then uploaded to IPFS. In the future scope, the randomization in other image properties like intensity, BGR values, grayscaling, etc will be included to have a more unique NFTs