**Software Requirements Document**

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# Introduction

## Purpose

This doc is wrote for Aucy project, to describe all basic specifications for project. This will describe all requirements including both functional and non-functional

## Document Conventions

* Using *heading* to make title and *normal* to make paragraph
* Titles are capitalized with the first letter of each word and be bold

## Project Scope

### Define the Project Objectives

HASHGRAPH EXPLORERS

Explore and discover the possibilities of building with Hedera technology in this Open track. Designed for those getting started in Web3, experiment and build a basic application that showcases your understanding of Hedera’s core functionalities.

The scope of the Aucy project encompasses the development of an online marketplace and online auction platform aimed at facilitating efficient and secure auction processes for users. The platform will provide a user-friendly interface for both auctioneers and bidders, ensuring transparency and reliability throughout the auction proceedings.

### Identify Stackholders

Hedera

### List of Key Objectives

* **Hashgraph:**
  + Objective: Implement a distributed ledger technology (DLT) based on Hashgraph consensus for maintaining transparency, immutability, and efficient transaction processing within the auction platform.
  + Description: Utilize Hashgraph's unique consensus algorithm to achieve fast transaction finality and secure, fair ordering of auction-related transactions.
* **Decentralized Auction:**
  + Objective: Enable auctions to be conducted in a decentralized manner, leveraging blockchain or similar technologies to eliminate the need for a central authority.
  + Descriptions: Implement smart contracts to automate auction rules and execution, ensuring transparency and reducing the risk of fraud or manipulation.
* **NFT (Non-Fungible Token):**
  + Objective: Integrate Non-Fungible Tokens (NFTs) to represent unique digital assets within the auction platform.
* Description: Enable the creation, auctioning, and transfer of NFTs, allowing users to buy, sell, and trade unique items securely and transparently.
* **Marketplace:**
* Objective: Establish a digital marketplace where users can browse and participate in various types of auctions.
  + Description: Provide a user-friendly interface for browsing listings, placing bids, and managing auction activities, enhancing user engagement and satisfaction.
* **Contract:**
  + Objective: Implement smart contracts to formalize auction rules, terms, and conditions.
  + Description: Automate the execution of auction-related transactions and ensure compliance with predefined rules, enhancing efficiency and reducing operational overhead.
* **Consensus:**
  + Objective: Establish a reliable consensus mechanism to validate and confirm auction transactions across the network.
  + Description: Select and implement a consensus protocol that ensures agreement among network participants on the validity of transactions and the order in which they are recorded.

## Reference

1. <https://docs.hedera.com/hedera>
2. <https://hellofuturehackathon.dev>
3. Responsive Link

# Overall Description

## Overview

Following the beginner track of the Hedera hackathon, this project aims to develop an application with fundamental functionalities such as creating NFT collection, mint NFT, establishing a marketplace, and conducting online auctions. All transactions will be recorded on Hedera's distributed ledger technology, ensuring security and trustworthiness.

## Product Perspective

The Aucy project is designed to integrate with Hedera's blockchain technology, providing a comprehensive solution for creating and managing NFTs, facilitating online auctions, and establishing a digital marketplace. The following sections describe the product's perspective in the context of its integration and operation

### . System Context

**Product Overview:** The Aucy application will serve as a decentralized platform for auctions and NFT transactions. It leverages Hedera's Hashgraph technology to ensure the integrity, transparency, and efficiency of all transactions. The system is composed of several interconnected modules:

* **NFT Creation:** Allows users to create and manage NFTs, which are unique digital assets represented on the blockchain.
* **Marketplace:** A digital space where users can list, browse, and trade NFTs and other assets.
* **Online Auction:** Facilitates real-time auctions where users can place bids on NFTs and other digital assets.

**System Integration:**

* **Hedera Network:** The platform will utilize Hedera’s Hashgraph for transaction processing and consensus. All auction and NFT transactions will be recorded on Hedera's distributed ledger, ensuring transparency and immutability.
* **User Interfaces:** The application will feature web-based interfaces for both desktop and mobile users, allowing seamless interaction with the marketplace and auction functionalities.

### 2.2.2. External Interfaces

**User Interfaces:**

* **Auctioneers:** A dashboard for creating and managing auctions, setting auction rules, and tracking auction results.
* **Bidders:** A user-friendly interface for browsing auction listings, placing bids, and tracking bid history.
* **Administrators:** Tools for monitoring platform activity, managing users, and handling support requests.

**APIs:**

* **Hedera API Integration:** Interfaces with Hedera’s APIs for transaction recording, consensus, and ledger access.
* **Payment Gateway API:** Integrates with payment services for handling transactions related to auction bids and NFT purchases.

### User Experience

**Usability:**

* **Intuitive Design:** The platform will feature a user-friendly interface that is easy to navigate for both novice and experienced users.
* **Accessibility:** Ensuring that the platform is accessible to users with disabilities, adhering to relevant accessibility standards.

**Security and Privacy:**

* **Data Protection:** Implementing robust security measures to protect user data and transaction details.
* **Trustworthiness:** Utilizing Hedera's decentralized ledger to enhance trust and credibility in the auction and NFT processes.

## Product Features

### NFT Creation and Management

* **Create NFTs:**
  + User can mint new Non-Fugible Tokens (NFTs) by uploading digital assets and defining their properties (e.g., title, description, and unique attributes).
  + Support for various digital asset format, including images, video and audio files.
* **Manage NFTs:**
  + User can view their NFTs through profile dashboard (page)
  + Ability to transfer ownership of NFTs between users.

### Digital Marketplace

* **Browse Listings:**
  + Users can explore a wide range of NFTs and digitals assets listed for sale or auction
  + Advanced search and filter options to help users find specific items based on categories price, and other atributes

### Online Auction

* **Auction Creation:**
  + Auctioneers can create and set up auctions with customizable parameters, including start and end times, reverse prices, and bidding increments
* **Real-time Bidding:**
  + Support for live , realtime bidding with automatic updates and notifications to ensure an engaging auction experience
* **Bid Management:**
  + Users can place bids, view their bidding history, and receive notifications for outbid alerts and auction status updates.
* **Auction Closore:**
  + Automated closing of auctions with the highest bidder winning the auction item. Notifications are sent to both the winning bidder and the auctioneer.

### Transaction Management

* **Secure Transaction:**
  + All transactions are securely processed and recorded on the Hedera ledger, ensuring transparency and immutability.
* **Payment Integration:**
  + Integration with payment gateways for handling transactions related to auction bids and NFT purchases.
* **Transaction History:**
  + Users have access to their transaction history, including purchases, sales, bids, and transfers.

## Product Functions

# Specific Requirements

## Functional Requiments

### Connect wallet using Metamask

|  |  |
| --- | --- |
| **Use Case Id** | AUCY\_USC\_01 |
| **Description** | Connect wallet to dapp using *Metamask* |
| **Trigger** | Click connect wallet button on screen |
| **Main Flow** | * User choose wallet type on dialog * Open selected wallet dialog then user start step by step to connect * Connected |
| **Precondition** | Null |
| **Exception** | Display error dialog |

### Connect wallet by Hashpack

|  |  |
| --- | --- |
| **Use Case Id** | AUCY\_USC\_02 |
| **Description** | Connect wallet to dapp using *Hashpack* |
| **Trigger** | Click connect wallet button on screen |
| **Main Flow** | * User choose *Metamask* on group wallet buttons * Open selected wallet dialog then user start step by step to connect * Connected |
| **Precondition** | Null |
| **Exception** | Display error dialog |

### Create NFT Collection

|  |  |
| --- | --- |
| **Use Case Id** | AUCY\_USC\_03 |
| **Description** | Create NFT Collection |
| **Trigger** | Click create button on screen |
| **Main Flow** | * User go to create form (page) * User fill all require fields * User submit |
| **Precondition** | User’s wallet is connected to dapp |
| **Exception** | Can display error dialog:   * Error: Wallet is not connected * Error: Failed to create |

### Mint NFT from collection

|  |  |
| --- | --- |
| **Use Case Id** | AUCY\_USC\_04 |
| **Description** | Mint NFT from collection |
| **Trigger** | Click need to be in collection page, then click mint button |
| **Main Flow** | * User mint |
| **Precondition** | User’s wallet is connected to dapp |
| **Exception** | Can display error dialog:   * Error: Wallet is not connected * Error: Failed to mint |

### Preview NFT

|  |  |
| --- | --- |
| **Use Case Id** | AUCY\_USC\_05 |
| **Description** | Preview NFT |
| **Trigger** | Click need to be in NFT’s page |
| **Main Flow** | None |
| **Precondition** | None |
| **Exception** | Can display error dialog:   * Error: NFT’s page does not exist |

### Placing bids

### Create auction

### Preview auction

### Monitor auction

## Non-Functional Requirements

### Performance

### Security

### Usability

### Reliability