SOFTWARE REQUIREMENTS SPECIFICATION

for

NFT Sales Dashboard

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1.Introduction

1.1 Purpose

The purpose of this section is to present a detailed description of the platform Musomatic. It will explain the purpose and features of the system, the interfaces of the system, what the system will do, the constraints under which it must operate and how the system will react to external stimuli. This document is intended for both the stakeholders and the developers of the system..

1.2 Project Scope

The music industry is in a state of flux. The demise of the CD and digital downloads in favor of online music streaming has significantly strangled profits particularly for the artists themselves. Artists are struggling to make sense of the mess that is royalty distribution in its present form and find it difficult to keep the fair share of the revenue they generate on existing platforms.With or without the buzz, one of the most powerful and overlooked impacts of NFTs is on the music industry. NFTs have the power to change the game for independent artists by providing a new way to earn an income (while connecting with fans), and this kind of change has been long overdue.

1.3 Technologies and Tools Used

1) VS Code

- Visual Studio Code combines the simplicity of a source code editor with powerful developer tooling,like IntelliSense code completion and debugging.
- First and foremost, it is an editor that gets out of your way. The delightfully frictionless edit-build- debug cycle means less time fiddling with your environment, and more time executing on your ideas.
- Visual Studio Code is a free source-code editor made by Microsoft for Windows, Linux and macOS. Features include support for debugging, syntax highlighting, intelligent code completion, snippets, code refactoring, and embedded Git.
- Visual Studio Code is a source-code editor that can be used with a variety of programming languages,including Java, JavaScript, Go, Node.js and C++. Here we can change the theme,

keyboard shortcuts, preferences, and install extensions that add additional functionality.

- Visual Studio Code's source code comes from Microsoft's free and open-source Software **VSCode** project released under the permissive Expat License, and the compiled binaries are freeware for any use.
- Instead of a project system, it allows users to open one or more directories, which can then be saved inworkspaces for future reuse. This allows it to operate as a language-agnostic code editor for any language.It supports several programming languages and a set of features that differs per language. Unwanted files and folders can be excluded from the project tree via the settings. Many Visual Studio Code featuresare not exposed through menus or the user interface, but can be accessed via the command palette.
- Visual Studio Code can be extended via extensions available through a central repository. This includesadditions to the editor and language support A notable feature is the ability to create extensions that addsupport for new languages, themes, and debuggers, perform static code analysis and using the LanguageServer Protocol
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1.4 Overview

The training and placement management system creates student and company databases. This module allows students to update parts of bio data and invite companies for placements. Student list can be retrieved from the database of the management software on the basis of the selection criteria of the company. Training and placement management module additionally manages interview schedules, student list announcements, records of various training and placement activities and the like. This module of education ERP solution can assign login rights to the department staff.

2.Overall Description

2.1 Product Perspective

This project aims to develop an online automation system that is beneficial for SIM students and companies recruiting SIM graduates. This software has two login portals, one for students and the other for recruiting companies.Students will enter all their personal as well as professional while registering themselves into the system. The students can also control the privacy settings of their accounts. The companies register with their company name, Job title, No. of vacancy, Job description, Job profile, Criteria, etc. The students can view and apply to the companies. The students will also be notified if job ads match with their interests and abilities, provided that they choose to make their information public. 4 The companies can view the list of student profile who have applied to the particular company. An optional requirement is that the system allows users to communicate. The company recruiter of the system, has the access to all the portal. He handles all the logins credentials. The company recruiter can add, delete or edit information when need be. The company recruiter can also generate various reports (personal identity needs to be removed) for SIM management to understand the employability of SIM graduates. All the details are stored in the cloud which is very easy to access for the user any time. As, the project files and a database file will be stored into the Azure cloud (or Amazon AWS), the project will be accessed in the web browser through Azure link.

2.2 Product Function

- Website uses two login portals, one for students and other for recruiting companies.
- Students will enter all their personal as well as professional while registering themselves into the system.
- The students will also be notified if job ads match with their interests and abilities, provided that they choose to make their information public.
- The company recruiter can add, delete or edit information when need be.

● The companies register with their company name, Job title, No. of vacancy, Job description, Job profile, Criteria, etc.

2.3 User Classes and Characteristics

The Users should be able to do the following functions:

● Students will enter all their personal as well as professional while registering themselves into the system and can view the company data.

● The company recruiter can edit information according to their needs.

● The company recruiter can handle all login credentials.

● TPO have to collect the information and manage them manually according to various streams.

2.4 Operation Environment

The Operating Environment used in the project is Windows

2.5 Design and Implementation Constraints

The project operates under a number of design and implementation constraints. Some of these are as outlined below:

Hardware and Software Constraints:

Since the project has been developed entirely using Streamlit ,python, flask and Kaggle DB for frontend and backend, it is largely independent. The project can be run on any platform.

- There is the secondary memory, which is where your files are stored, and a computer can use a Hard Disk to store memory, or a Solid-State Drive (As well as other kinds of Flash Memory). Modern Hard Disks (HDs) can store from around 500 GB to 2TB of data.
- There is also primary memory, which is the memory that stores information that you are manipulating with immediately, when the computer is ON.
- To better understand the difference between primary and secondary, let me give you an example: Suppose you want to edit a photo. Your photo is stored in your Secondary Memory. When you open up your photo in a photo editor, it is loaded on your primary memory, so

that you manipulate it. Then, you apply your favorite vintage filter to it, as well as colors and whatever you want. The edited photo is still on your primary memory.

Then, you are happy with the result, so you click on "Save", that's when your new version of the photo is copied back to your secondary memory.

- Computers use CPU Memory registers, RAM (Random Access Memory), and other resources as Primary Memory. A modern laptop has around 8GB of RAM.
- Another big difference between Primary and Secondary Memory is that Primary memory is volatile. That means if your battery dies while your editing your photo, you'll lose all of your changes, because the Primary Memory can only keep information as long as there is energy. Secondary Memory, on the other hand, can keep your photo for years, even if the computer is OFF.
- An interesting thing I'd like to point up is Swap Space. Let's suppose you have 25 tabs of YouTube videos open on your browser. All of those videos are being downloaded into your RAM memory. Let's suppose you have 2GB, and then all of the videos combined occupy 3GB of memory. You don't have enough memory to hold all of that! When the computer reaches it's RAM limit, it starts using "Swap Space", which is basically storing the excessive data into a temporary location on your HD. HDs are too slow to hold data we are momentarily using, that's why your computer seems sluggish after your open a lot of pages and apps.
- Another place full of constraints in hardware is the CPU (Central Processing Unit). It is where everything in the computer is calculated. Every core of a CPU can only do one operation at a time. Think of operation as something like 1- Get two numbers from memory, 2- Sum two numbers, 3- Show numbers on screen. It has a stack, which you can think of as a line of all the operations wanting to get in. It works with cycles, and with each cycle, one simple operation is done. The CPU Clock is a little device that sends electrical pulses to the CPU, and each pulse, a cycle.
- It seems quite straight forward then: Make the clock tick faster, so that we have more cycles per second, and work on all of the operations on the stack faster. There is a problem, however: You run the risk of overheating your processor, potentially melting down components and having a big headache. Many hardware hackers experiment with this, called

"Over-clocking", and they generally use more expensive cooling systems, like liquid cooling, faster fans, bigger heat dissipaters, etc.

- An approach that has been widely used on the industry is to increase the number of "Cores" on a processor. You probably heard the terms dual-core, quad-core somewhere, since now even smartphones can be quad-core (four cores). So, that way, you multiply your processing power. That doesn't come without obstacles, of course. You need to carefully craft your software to work well with Parallel computing (AKA The art of using multiple processing units).
- One of the biggest challenges for computing today is the size of the transistor, a fundamental component of a processor. Transistors are getting so small, that Quantum Effects are starting to be relevant, as they will play out bigger interference with the functioning of the component. That's a very important constraint for today's industry.
- I'd like to briefly talk about I/O (Input/Output). I/O is basically communication across devices (AKA the thing behind USB stuff). Suppose you have just bought a super cool webcam, with 20 megapixels, 60 frames per second. Of course, the amount of data it generates is large. In that same scenario, your computer is old, and the USB port can only transport 10 frames per second of your beautiful camera. You have a problem there. You won't be able to enjoy 60fps Skype Calls (and remember there are internet constraints as well, to slow it even further). Your computer's I/O is slow, that's a constraint, and even a 4GHZ, Octa-Core Processor, or a 50GB of RAM (I'm exaggerating values here) wouldn't solve that issue.
- As you can see, there can be many constraints coming from many places in a computer. Many of the design decisions that have to be taken will have to take into account many trade-offs of speed, capacity, price, compatibility, etc. You can think of it as a huge equation with thousands, millions of variables, and your job is to find the optimal value for each of those variables.

End User Constraints:

The major constraints for the end user are having a proper internet connection on his computer or mobile. Also he should be familiar with the operation of the application to a certain extent.

2.6 User Documentation

User manual and GitHub link will be available for troubleshooting and help. The user manual will contain detailed information about the usage of the application from a layman's perspective to an expert network/system administrator. The manual shall also be made available online.

2.7 Assumptions and Dependencies

The proposed solution will be designed to work in an enterprise environment. The target environment may consist of wired and wireless links inside the network. The solution has to be self-sufficient and free from any unfamiliar dependencies.

3.External Interface Requirements

3.1 User Interfaces

The user of the proposed system requires that the developed software should be user friendly, have security access, and ensure the privacy of the administrator and produce results in timely manner. The users are not frequently exposed to the training and placement interface to the user must be simple and understandable. The desktop application must be user – friendly and must be in an easy-to-use style . 7 The user must be able to easily switch among various I/O screens. The system is well designed so that it can be easily used by users. The system should be designed in such a way that only authorized users should be allowed to login to the system. The user interface should be as interactive as possible. A user-friendly interface must be provided so that the user can easily interact with the system and comprehend things in a quicker and easier way. The system must provide reliable and up-to-date information. The application should be efficient so that the user does not spend much time in training.

3.2 Software Interfaces

Following is the software used for the flight management online application.

Software used	**Description**
Operating system	We have chosen a Window operating system for its best support anduser-friendliness.
Database	To save the food nutrition which have been searched by the users and tostore user information
Tools/IDE	To implement the project we have chosen Visual Studio for its moreinteractive support.
Platform	Web Application

Technologies and Tools Used	HTML , CSS and javascript

3.3 Communications Interfaces

The system requires HTTPS to communicate with the database. The system and database can be configured to be accessed via any available port. The web based UI is the only means of communication between the user and the system, though the user can directly send an email to the admin in case of any queries through Contact Us Page. The system is accessible through all popular modern web browsers that interact with HTML pages and access metamask.

4. System Features

4.1 System Feature : Authentication

The Authentication involves 2 steps Sign Up for new users and Login for existing users

- In order to Sign up, the user/artist needs to fill the registration form with the required information.
- If registering as seller, then a seller ID is created
- Email verification is carried out to verify the user/artist.
- Users/Artists get connected to their Metamask wallet automatically after successful login in.
- All the information of the User[Artist is stored in a User database.
- Spectator needs to perform the Metamask login to make the browser web3 enabled, but a Buyer has to login by entering the registered email-ID and password.
- If successful, User/Artist can access the application, otherwise he/she will be redirected to the login page with the error message.
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4.2 System Feature : Create NFT module

- The verified Artist can create an NFT of its Song by visiting the Create Page on the application. 14
- The artist needs to fill in the required fields for creation of the NFT and upload the Music file for which he will also pay a gas fee for storing the NFT on the Blockchain (i.e. Polygon N etwork) .
- The following data will be stored and associated with the NFT on the blockchain whenever a new NFT is created.
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4.3 System Feature : Library Module Page

- Users/Artist will be able to see the Trending NFTs and the Recently added NFTs on the Library Page.
- Various functionalities like Searching, Sorting are provided for quick access to the NFTs.

- Various filters options are also available like Genre, Lyrics, Instrument used are also available on the Library Page.
- Users/Artists can visit the Song detail Page by clicking on a specific NFT for more details.

4.4 System Feature : Auction System Module

- Buyer can place a bid for an NFT by visiting the Auction Page on the application.
- The bid is validated through an Auction database and stored in it with the specified details of the NFT and the user.
- After the bidding process is over, the max bid is chosen from the database.
- The user details of the winning bid are processed and a winning message is displayed to the Bidder and the NFT seller/owner.
- Transaction request is generated for buyer, payment is processed and communicated through blockchain
- After payment is processed, the ownership of NFT is transferred to the seller.
- In case, an NFT is sold again, a part of the transaction is transferred to the seller as royalty.
- 3.2.5 Song Info Page Module:

4.5 System Feature :Info Page Modeule

- Page displays detailed information regarding the NFT and creator details.
- Links to other platforms where the song is uploaded is also available like Spotify, Amazon Music, YouTube Music etc.
- Audio Player is also available on the page with a 30 sec song for the demo purpose.
- Sale History modal is also available to see the past owners and creator of the NFT.
- To directly Buy the NFT instead of the Auction system, BUY option is available on the page to buy the respective NFT through Metamask connect

5. Other Non-Functional Requirements

5.1 Performance Requirements

- **Normalized data-** data redundancy should be minimal which in turn reduces the chances of insert, delete and update anomalies.
- **Response time-** the overall time beginning with the user action (click on sign up button after filling up the details), the request going to the server, the response received from the server, and finally the response processing by the application will not take more than 10 seconds.
- **Scalability-** according to intended number of users and the projected load scenarios, the system should be able to serve 50 queries / day (in large part during the peak hours).

5.2 Safety Requirements

Some securities measures are provided to the application account holders such as account holder must give his/her account id and password to login. Other than that security to user's personnel details and photos galleries.

If there is extensive damage to a wide portion of database due to catastrophic failure, like disk crash, recovery method restores a past copy of the database that was backed up to archival storage (typically tape) and reconstructs a more current state by reapplying or redoing the operations of committed transactions from the backed-up log, up to the time of failure.

5.3 Security Requirements

- If a user tries to log into a non-existing account, then the user should not be logged in.
- User login account security-the User should not be able to login if the email id, username or password is incorrect.
- Users create account security-if a user wants to create an account and the desired name is occupied, the user should be asked to enter a different name.

5.4 Software Quality Attributes

- **Availability-** All the services should be available to the user.

- **Correctness-** The list of the products related to a user should be stored correctly.
- **Usability-** The details of products should be self-explanatory.
- **Maintainability-** User should maintain the database and store in updated form.
- **Portability-** The application should be portable to mobile.
- **Reliability-** The system should give 98% correct search results out of 1000 searches during testing.
- **Extendibility-** The application should be easy to extend, code should be written in such a way that it favor’s implementation of new functions.

6. UML Diagrams

6.1 Use-Case Diagram

- This diagram describes a set of actions (use cases) that some system or systems (subject) should or can perform in collaboration with one or more external users of the system (actors). Each use case should provide some observable and valuable results to the actors or other stakeholders of the system.

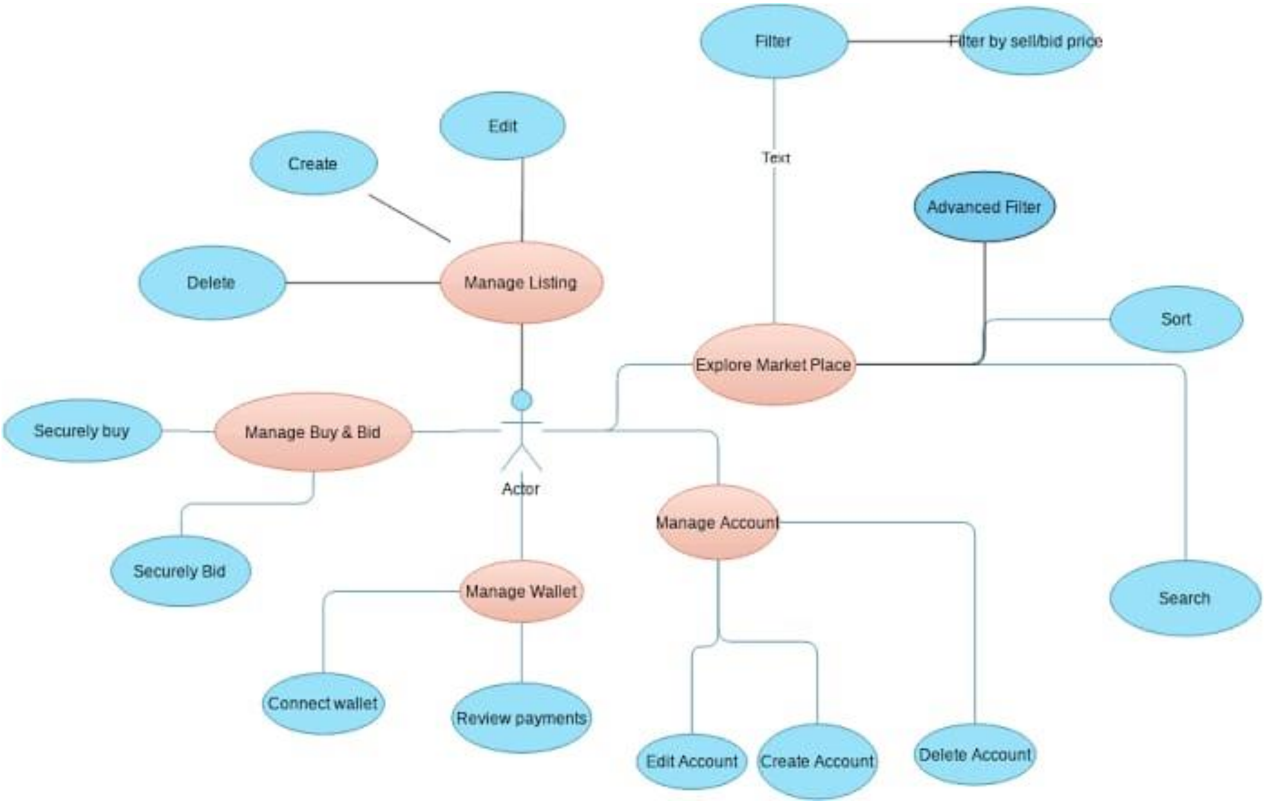

Fig.1.2 Use Case Diagram

6.2 Class Diagram

- A class diagram in the Unified Modeling Language (UML) is a type of static structure diagram that describes the structure of a system by showing the system's classes, their attributes, operations (or methods), and the relationships among objects.

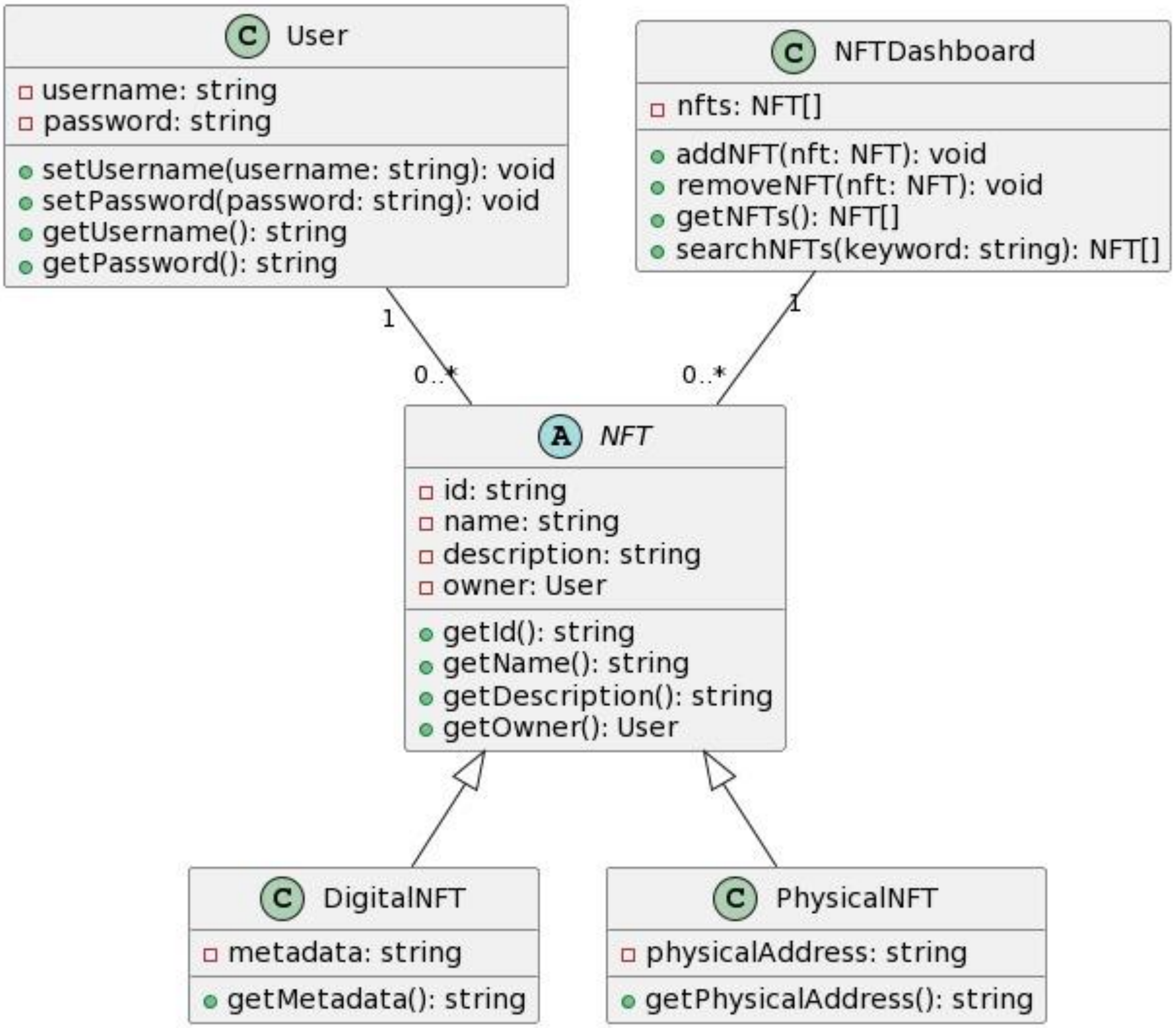

Fig.1.3 Class Diagram

6.3 Activity Diagram

- This diagram describes the dynamic aspects of the system. Activity diagram is basically a flowchart to represent the flow from one activity to another activity. The activity can be described as an operation of thesystem. The control flow is drawn from one operation to another.

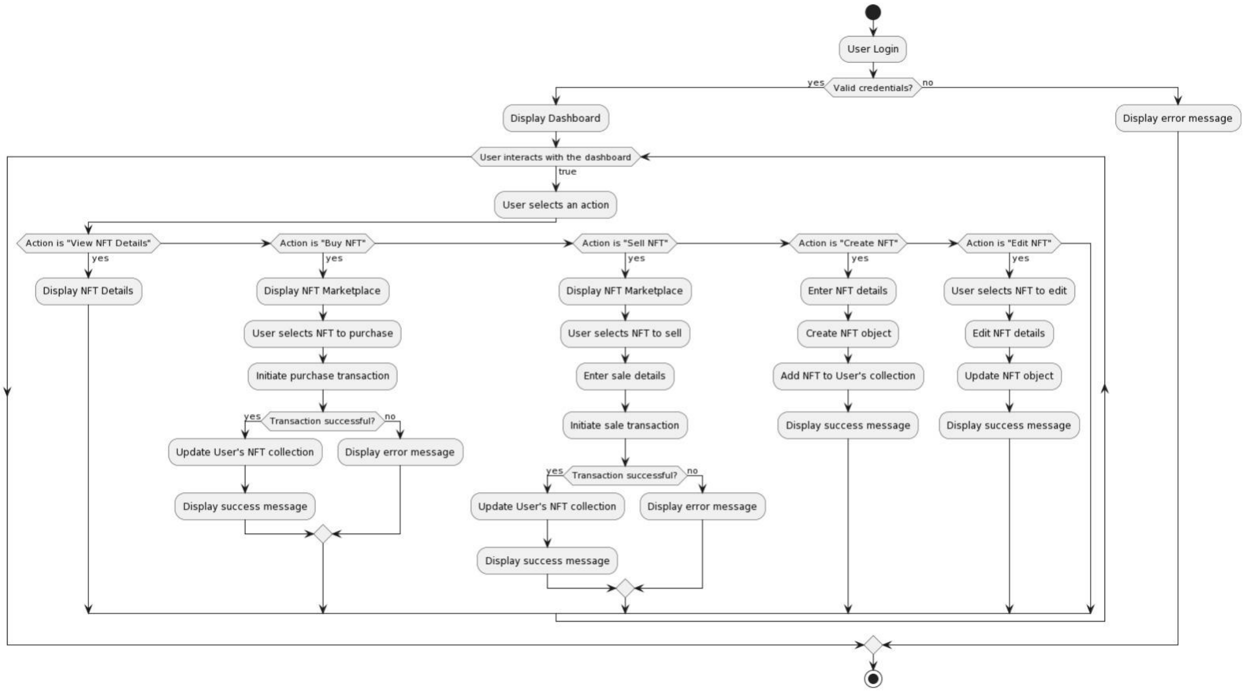

Fig.1.4 Activity Diagram

References

1 . Pressman, R. S., & Maxim, B. R. (2015). Software Engineering: A Practitioner's Approach. 8th edition. McGraw-Hill.

2. Aggarwal, K. K., & Singh, Y. (2007). Software Engineering. 3rd edition. New Age International Publishers.

3. https://consensys.net/blog/

4. https://ethereum.org/en/developers/docs/

5. https://www.ibm.com/in-en/topics/what-is-blockchain

6. https://en.wikipedia.org/wiki/Main Page

7. https://academy.binance.com/en

8. h-tju.:.LLouensea.iQL

9. https://rarible.com