

Mobile First Decentralised Gaming Platform

Project Report Submitted in Partial Fulfilment of the Requirements for
the Degree of

Bachelor of Engineering *in* **Information Technology**

Submitted by

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Department of Computer Science & Engineering
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July 2022

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CERTIFICATE

This is to certify that the work contained in this report entitled “**Mobile First Decentralised Gaming Platform**” is submitted by the group members Mr. Amit Sharma (Roll. No: 19UITE9002), Mr. Anshul Shringi (Roll No: 19UITE9004), and Ms. Nidhi Jain, (Roll. No: 19UITE9026) to the Department of Computer Science & Engineering, M.B.M. University, Jodhpur, for the partial fulfillment of the requirements for the degree of **Bachelor of Engineering in Information Technology**.

They have carried out their work under my guidance. This work has not been submitted elsewhere for any other degree or diploma award.

The project work in our opinion has reached the standard fulfilling the requirements for the degree of Bachelor of Engineering in Information Technology in accordance with the regulations of the Institute.

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DECLARATION

We, **Amit Sharma, Anshul Shringi, and Nidhi Jain**, hereby declare that this project titled “**Mobile First Decentralised Gaming Platform**” is a record of original work done by us under the supervision and guidance of **Dr. Alok Singh Gahlot**.

we further certify that this work has not formed the basis for the award of the Degree/Diploma/Associateship/Fellowship or similar recognition to any candidate of any university. No part of this report is reproduced as it is from any other source without appropriate reference and permission.

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ABSTRACT

This project is a mobile-first decentralized metaverse to socialize and play games together. The aim is to get web3 gaming adopted by the masses for which we have also created a seamless onboarding experience with an in-built crypto wallet for first-time crypto users and gamers. Game developers can build and publish games to earn in a transparent and open economy powered by smart contracts. We will foster a strong DAO community that engages in critical decision-making for the growth of KhoLand metaverse.

The metaverse aims to bring the experience of social and gaming to millions through a mobile-first approach. At its core, the KhoLand metaverse is built around people, their identity in the metaverse, strong social connections, engagement with each other, and tools to promote a creativity-led ownership economy in a transparent and decentralized manner. The users can roam around in their avatars in the metaverse to explore, meet other people, and hang around in the game lobbies. The game lobbies also have games that can be played in a social setup by the users.

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CHAPTER 1

INTRODUCTION

Gaming has been an extremely competitive industry throughout its history, and more often than not the massive returns have been accumulated by only a few even though the space sees the involvement of multiple stakeholders.

A quick look at the industry will tell us that the major transaction volume of money flows primarily between big-name games and their power users leaving individual game developers and thousands of game studios along with millions of players out of the equation. Given the centralized operating model of the existing gaming distribution channels (app stores, direct-2-customer, etc.) the benefits coming out of the growing gaming ecosystem are not equally and freely distributed to everyone involved.

For small-scale game developers and game studios, the key challenge has always been across three major areas viz. customer acquisition, game distribution, and monetization. The current channels either through app stores or via the D2C route incur high customer acquisition costs (CAC). The existing platforms like app stores work like marketplaces thus making the game visibility considerably challenging for small-scale developers. Even after acquisition and distribution are nailed the monetization still hurts given the high take rates that platforms have.

The other major problem that a multitude of game developers and studios face is across payments. Managing smaller amounts of infrequent payments from a global audience is a task that not many would want to own and maintain. The cost incurred in steadily running such systems often supersedes the returns generated.

1.1 Overall Description

The aim of this application is that by leveraging the capabilities of web3 and decentralization we can solve some of these underlying problems of the gaming ecosystem and develop a structure that allows for the benefits to be distributed to all. This is a decentralized metaverse powered by smart contracts that aim to solve some of these problems by enabling the free flow of value and benefits among the community.

1.2 Advantages of the Metaverse

The metaverse in this application will be helpful in the following ways:

- Help game developers in tapping into a userbase connected in a social setup where the primary motive of the users is to have fun and socialize.
- Help game developers solve for distribution by giving them multiple entry points in a decentralized metaverse to reach an audience instead of one search result on a traditional app store.
- Transparency and control of the collected revenue for their games.
- Solution for global scale payments directly baked into the metaverse experience.
- A rewarding play-to-earn program for users to reward them for their time and efforts spent in the metaverse.
- Allow users to build social capital and monetize their network in a meaningful way creating a positive impact for all.

CHAPTER 2

TOOLS AND TECHNOLOGIES

2.1 Android

- **Kotlin**

Kotlin is a general-purpose, free, open-source, statically typed “pragmatic” programming language initially designed for the JVM (Java Virtual Machine) and Android that combines object-oriented and functional programming features. It is focused on interoperability, safety, clarity, and tooling support.

- **Android SDK**

The Android SDK (software development kit) is a set of development tools used to develop applications for the Android platform that has become Apple's biggest rival in the smartphone space.

2.2 Backend

- **NodeJS**

Node.js is primarily used for non-blocking, event-driven servers, due to its single-threaded nature. It's used for traditional websites and back-end API services but was designed with real-time, push-based architectures in mind.

- **Express**

Express is a node.js web application framework that provides broad features for building web and mobile applications. It is used to build a single page, multipage, and hybrid web application. It's a layer built on top of the Node.js that helps manage servers and routes.

- **Typescript**

TypeScript is a superset of typed JavaScript (optional) that can help build and manage large-scale JavaScript projects. It can be considered JavaScript with additional features like strong static typing, compilation, and object-oriented programming.

- **Postgres Database**

PostgreSQL is a powerful, open-source object-relational database system that uses and extends the SQL language combined with many features that safely store and scale the most complicated data workloads. The origins of PostgreSQL date back to 1986 as part of the POSTGRES project at the University of California at Berkeley and have more than 30 years of active development on the core platform.

- **TypeORM**

TypeORM is a TypeScript ORM (object-relational mapper) library that makes it easy to link your TypeScript application up to a relational database. TypeORM supports MySQL, SQLite, Postgres, MS SQL Server, and a host of other traditional options.

2.3 Frontend

- **HTML**

HTML, in a full hypertext markup language, a formatting system for displaying material retrieved over the Internet. Each retrieval unit is known as a Web page (from World Wide Web), and such pages frequently contain hypertext links that allow related pages to be retrieved.

- **CSS**

Cascading Style Sheets (CSS) is a stylesheet language used to describe the presentation of a document written in HTML or XML (including XML dialects such as SVG, MathML or XHTML). CSS describes how elements should be rendered on screen, on paper, in speech, or on other media.

- **Javascript**

JavaScript is a text-based programming language used both on the client-side and server-side that allows you to make web pages interactive. Where HTML and CSS are languages that give structure and style to web pages, JavaScript gives web pages interactive elements that engage a user.

- **ReactJS**

React is a JavaScript library developed by Facebook that, among other things, was used to build Instagram.com. Its aim is to allow developers to easily create fast user interfaces for websites and applications alike. The main concept of React.js is virtual DOM.

2.4 Web3

- **Solidity**

Solidity is an object-oriented programming language created specifically by the Ethereum Network team for constructing and designing smart contracts on Blockchain platforms. It's used to create smart contracts that implement business logic and generate a chain of transaction records in the blockchain system.

2.5 Deployment and Distribution

- **Heroku**

Heroku is a container-based cloud Platform as a Service (PaaS). Developers use Heroku to deploy, manage, and scale modern apps. Our platform is elegant, flexible, and easy to use, offering developers the simplest path to getting their apps to market. Heroku is a cloud platform that lets companies build, deliver, monitor, and scale apps — we're the fastest way to go from idea to URL, bypassing all those infrastructure headaches.

- **Google Play store**

Google Play, also known as the Google Play Store, is where you can download or buy millions of apps, games, and other media onto your Android device. You can find programs for a wide array of interests.

- **Github pages**

GitHub Pages is a static site hosting service that takes HTML, CSS, and JavaScript files straight from a repository on GitHub, and optionally runs the files through a build process and publishes a website.

CHAPTER 3

WORK DONE

In this project, we have used the concept of Web3 to decentralize the metaverse to socialize and play games together. For the backend, we are using NodeJs and the mobile application is developed using Android SDK/Kotlin.

3.1 Metaverse

The metaverse aims to bring the experience of social and gaming to millions through a mobile-first approach. At its core, the metaverse is built around people, their identity in the metaverse, strong social connections, engagement with each other, and tools to promote a creativity-led ownership economy in a transparent and decentralized manner.

The metaverse is structured as a collection of LAND units on top of which GAME LOBBIES are built using KhoLand's builder tools leveraging BUILDING BRICKS. The users can roam around in their AVATARS in the metaverse to explore, meet other people, and hang around in GAME LOBBIES. The GAME LOBBIES also has GAMES that can be played in a social set up by the users. Users can also spend their time in the events hosted within GAME LOBBIES or explore third-party NFT assets showcased by the lobby owners.



Fig. 3.1: KhoLand Metaverse

3.2 Social Connections

Users within the KhoLand metaverse can explore and meet interesting new people within and outside the game lobbies. Users can connect and talk seamlessly with each other on the mobile-first interface and can even play social games once inside the game lobbies.

3.3 Avatars

Any metaverse or a place to socialize is not complete without the tools to empower users to portray the best version of themselves. KhoLand's avatars are the means for everyone to carve out their digital identity in the way they would want to.

3.4 Land and Game Lobbies

The land is the fundamental building block of the KhoLand metaverse. The land is the first element that any user of the KhoLand metaverse will have to buy who wishes to host games, and events, bring in an audience and showcase any third-party NFT assets. Land-owners have the ability to build a game lobby on top of it in which they can host games and other NFT assets. Game lobbies will be the primary gathering place for users of KhoLand metaverse to socialize with each other. The Land and game lobby owner will be the same person who may or may not be a game developer. A game developer can buy their own land and then set up their own game lobbies on top of the bought land to host games and NFT assets to gather an audience. The Land and game lobby owners will have the ability to further extend their presence in the metaverse by buying more of these assets either directly from the platform or from other users on the NFT marketplace. As the metaverse and KhoLand ecosystem grows the owners will also have the ability to combine these assets to build their own estates or districts.

Game lobbies can only be built on top of the purchased land by the users. Game lobbies will be the heart of social connection build-up within the KhoLand metaverse. The users will spend most of their time meeting new people, playing games, and having fun within these game lobbies. The owner of these game lobbies will have multiple mechanisms to incentivize users to spend more time within their lobbies. The KhoLand platform will provide them with basic building blocks to build and reform their lobbies to make them more appealing, strike deals with game developers to host some of the most popular games in their lobbies, and even host events or tournaments to further make the experience of the users more rewarding. In addition to that, the owners can also showcase third-party NFTs within their game lobbies for the users.

3.5 Games

Of the many things that drive social connections for humans perhaps games have been the biggest category to do so for over years. Even before the computers made their way into human societies games were a purely social phenomenon and even before the metaverse came into being games were somewhat operating their own closed worlds. Games are the kingpin of social experiences within KhoLand.

KhoLand provides users with a slew of games hosted within game lobbies that they can play with other people or their friends. The land and game lobby owners host multiplayer and social casual games within their lobbies either created by them or procured from game developers.

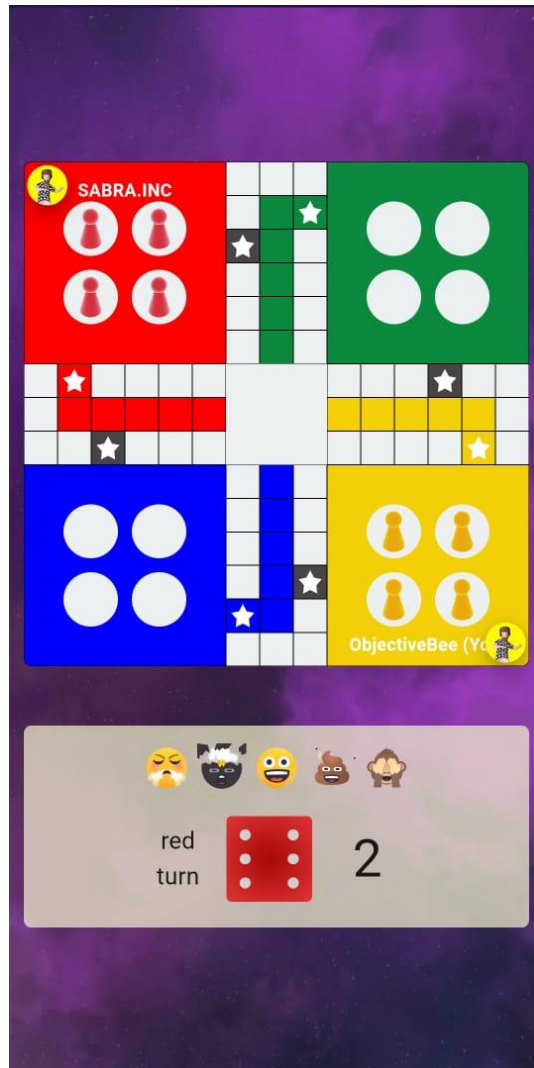


Fig. 3.2: Crypto Games

3.6 Tokenomics

\$KHO token is an essential piece of the larger KhoLand ecosystem. Primarily the token will act as the currency of transaction for various use cases within the KhoLand metaverse. Ranging across buying and selling of NFTs, gaining and redeeming rewards, and any other transaction, \$KHO will be the currency to facilitate all of these. All the

community-driven actions will be enabled through mechanisms arrived at by the community members and \$KHO will be the underlying enabler for all such decisions. To manage these tokens crypto wallet is built into the android application to keep track of the user's cryptocurrency.

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CHAPTER 4

RESULTS

4.1 Landing Page

First page where users first land and gets the option to interact with the main functionality of the app i.e. to play the game and earn token and explore the metaverse. There are also CTAs to discord and telegram channel.

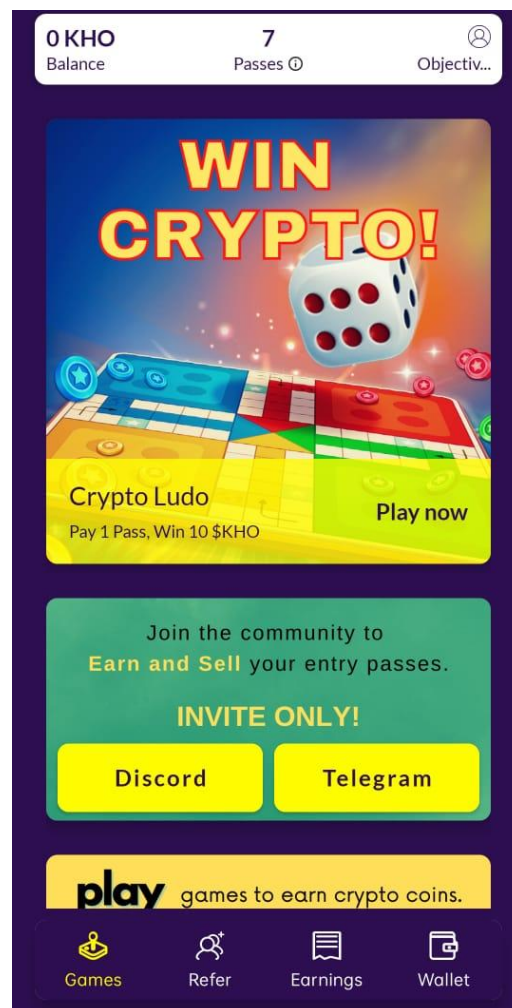


Fig 4.1: Landing Page

4.2 Referral Page

This page contains instructions on how the referral program works. Users can also share the referral code/link with other users to earn passes. The user also gets an option to enter another person's referral code.

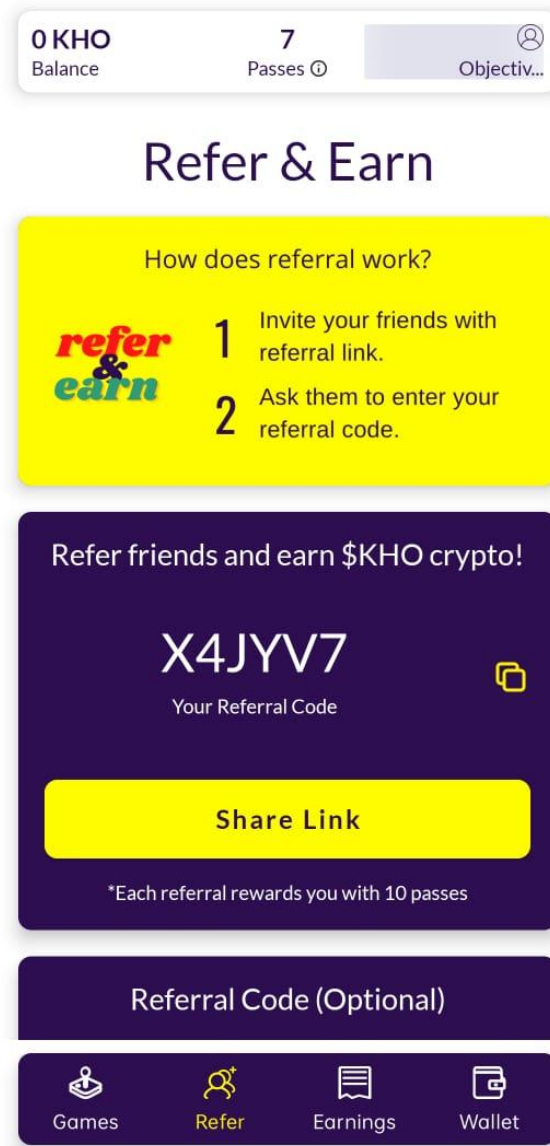


Fig 4.2: Referral Page

4.3 Earnings Page

Details ledger of all the transactions of passes and tokens. Also, an aggregate of total earnings is shown here.



Fig 4.3: Earnings Page

4.4 Metaverse

Metaverse screen where users can interact with other users to play games and express their mood via wassup. There is also an option to navigate to a crypto wallet.



Fig 4.4: Metaverse

4.5 Crypto Wallet

Inbuilt crypto wallet screen where user can see KHO wallet balance. There is also a transactions list that shows KhoToken transactions.

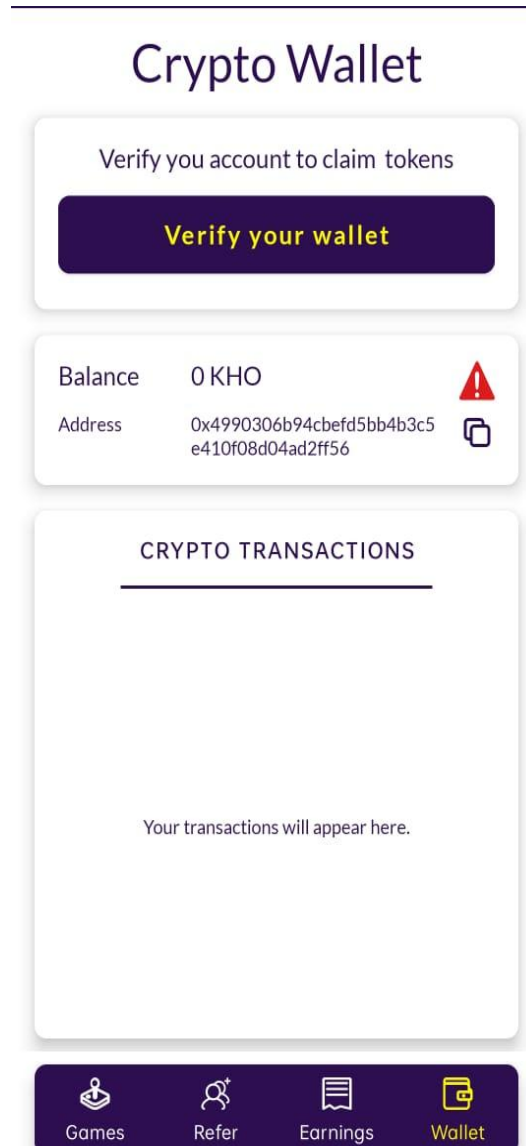


Fig. 4.5: Crypto Wallet

4.6 Games

Ludo multiplayer game to play with other users and earn KhoTokens.



Fig. 4.6: Game

CHAPTER 5

CONCLUSION AND FUTURE SCOPE

5.1 Conclusion

Web3 is the force behind the creator and ownership economy for the coming decade and KhoLand doesn't want its users to lose out on these powerful tectonic shifts. With KhoLand's builder tools users can build super cool game lobbies and other structures over the lands they own. The building bricks are the core enabling elements for builders to customize the insides of their game lobbies and other real estate structures. These tools are created with an aim to provide power to the builders to attract users to spend more time within their real estate creations.

5.2 Future Scope

- The project could take the shape of a truly decentralized economy where there would be true ownership of assets. It would not be controlled by any central authority.
- In the economy indie developers would be benefited by creating games/apps that would be used by users and creators which would in turn help them generate revenue without worrying about distribution and marketing.
- The users would be benefited by playing and earning tokens by playing games and trading NFTs.
- The influencers could make use of NFTs/Games created by other creators to engage their audience and also earn some commission from that.

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