MINISTRY OF EDUCATION & TRAINING

HOCHIMINH CITY UNIVERSITY OF TECHNOLOGY

BASIC-PROJECT

Topic: BLOCKCHAIN E-WALLET

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Class : 18DTHQA1

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Contents

I. Reasons to choose a theme

There are a lot of technologies in development right now. Banking services are also digitalized. For that reason there are scams. We feel BlockChain is a solution to prevent that behavior. So we started to come up with ideas for Block Banking project.

II. Technologies used

1. What is BlockChain?

is blockchain technology, which allows secure data transmission based on an extremely complex encryption system, similar to a company's ledger, where money is closely monitored and recorded all transactions on the peer-to-peer network.

2. What is FireBase?

A platform for mobile and website application development, including simple and powerful APIs without backends or servers.

Help programmers shorten deployment time and scale the application they're developing.

A cloud-based database service. Accompanied by an extremely powerful server system of Google. The main function is to help users program the application by simplifying operations with the database.

It is a versatile and extremely secure service. Firebase supports both Android and IOS platforms

III. Scope of research

The scope of our research is the basic transactions. How BlockChain works and FireBase.

IV. Research methods

The team has 3 members, of which the team leader will be responsible for writing the code for the project, while the other 2 members are responsible for finding information and supporting the leader. After the demo application we conduct tests and repairs, and we also enhance the security of the project. So the 3 of us will receive an equal amount of knowledge and skills.

V. Main project content

1. Technology

1.1. Programming language

The main programming language used in the project is java.

Java is one of the object-oriented programming languages. It is used in developing software, websites, games, or applications on mobile devices. Java was developed by James Gosling and colleagues at Sun MicroSystem in 1991.

1.2. Support tools

1.2.1. Android Studio

The main tool that our team uses to implement the project is Android Studio with Java language.

Android Studio is a software that includes different toolkits used to develop applications that run on devices using the Android operating system such as smartphones, tablets ... Android Studio is packaged with a set of tools that includes a code editor, debugger, performance tools, and a build/deploy system (including a simulator to simulate the environment of a phone or tablet device on a

computer) that allows programmers to develop quickly applications from simple to complex.

1.2.2. Libraries and APIs

Use java's basic libraries.

Use the FireBase API.

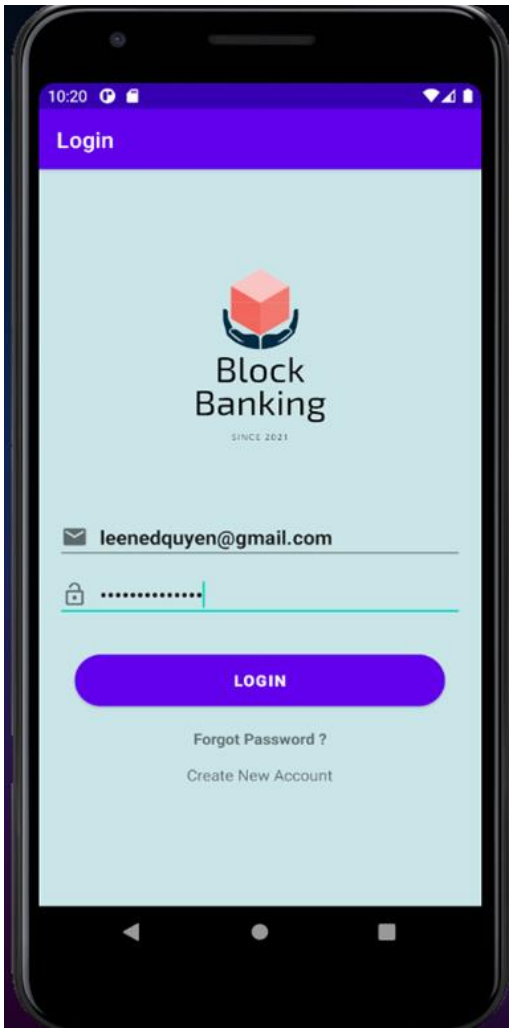
2. Information about the Block Banking

2.1. Ideas and inspiration

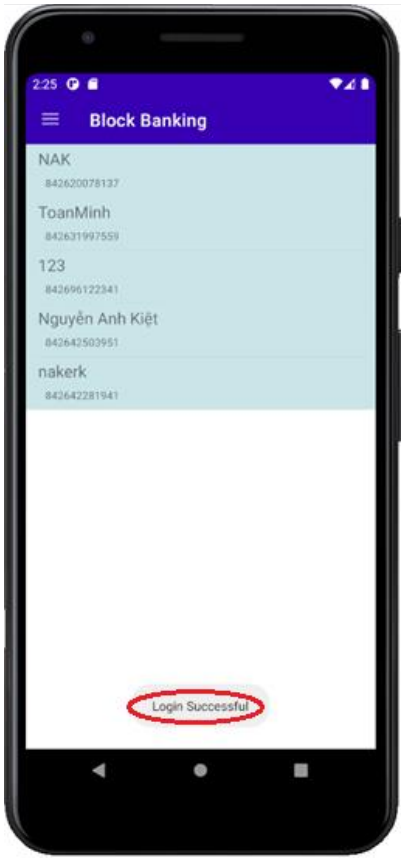
Get ideas from the needs of using money transfer and security safely.

2.2. Interface presentation

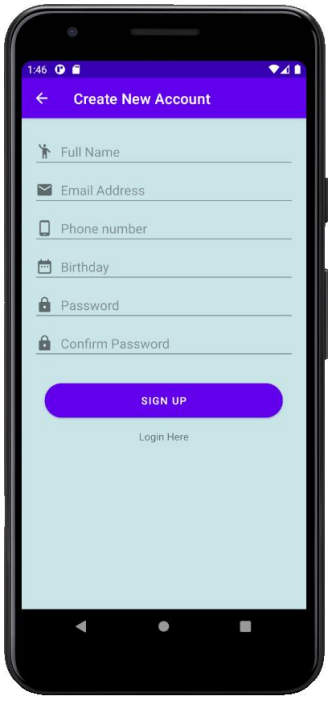
Sign-in interface



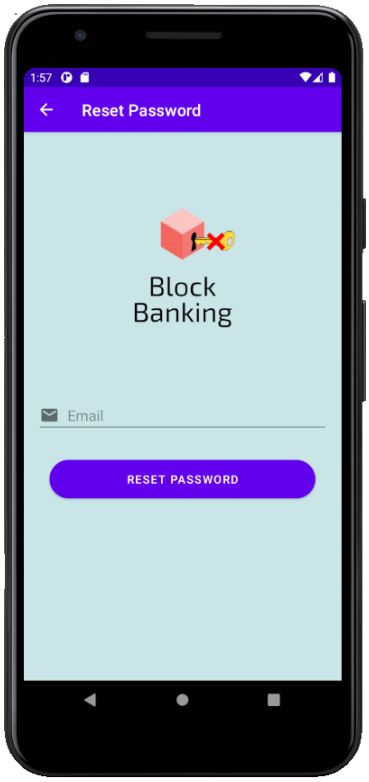
Successful logon interface



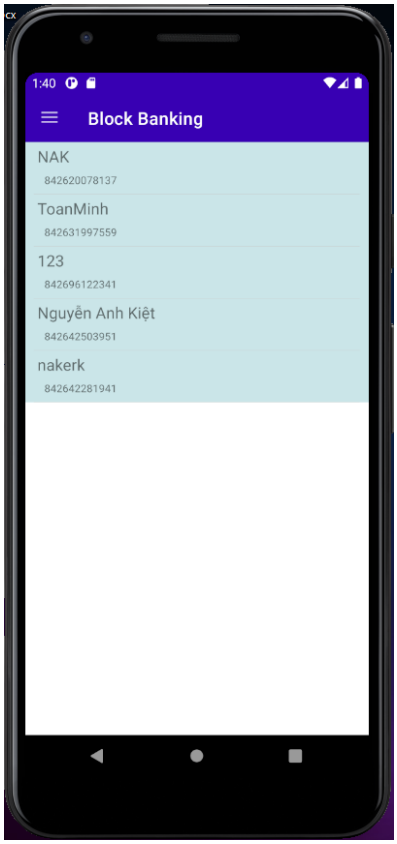
Create account



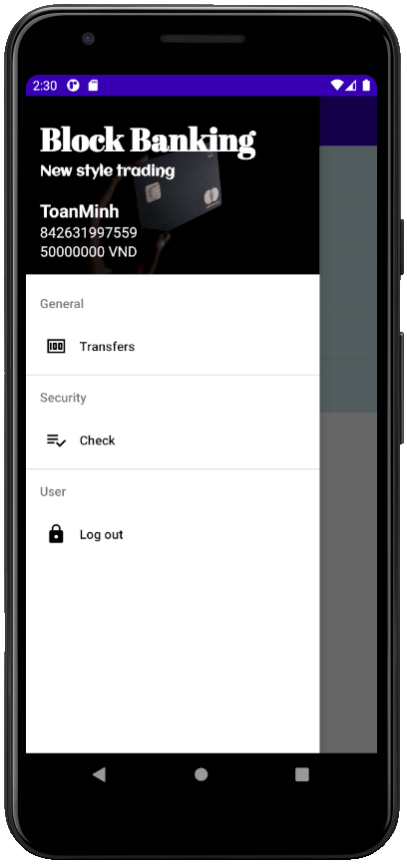
Forgot Password



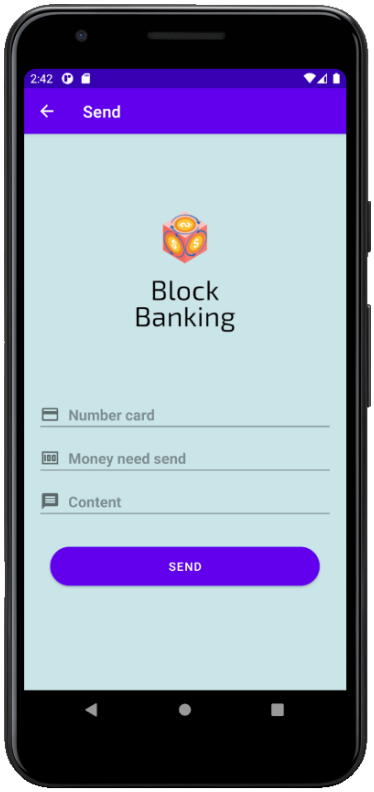
List user



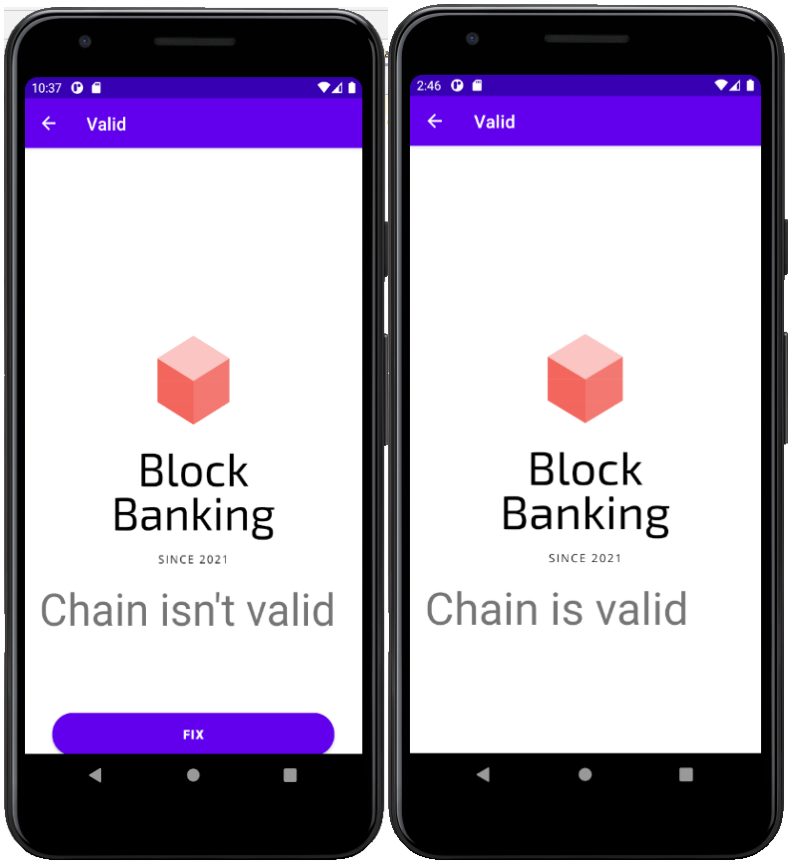
Menu


2:30
Block Banking
New style trading
ToanMinh
842631997559
50000000 VND
General
Transfers
Security
Check
User
Log out

Send


2:42
Send
Block
Banking
Number card
Money need send
Content
SEND

Anti-hacking



2.3. Algorithms used in projects

Hash calculation algorithm: converts all data to Hash.

```
public String calculateBlockHash() {
    String dataToHash = getTimeStamp() + getPreviousHash() + getData().getMessenger()
            + getData().getMoneySend() + getData().getNameSend() + getData().getNameTake();
    MessageDigest digest;
    String encoded = null;
    try {
        digest = MessageDigest.getInstance("SHA-256");
        byte[] hash = digest.digest(dataToHash.getBytes(StandardCharsets.UTF_8));
        encoded = Base64.getEncoder().encodeToString(hash);
    } catch (Exception exception) {
        exception.printStackTrace();
    }
    return encoded;
}
```

Use the doTranbsaction algorithm: avoid overwriting each other when two people transfer money into a account.

```
private void Send(User s, User t, String money) {
    long mo = Long.valueOf(money);
    databaseReference.child("Users").child(s.getUid()).runTransaction(new Transaction.Handler() {
        @NonNull
        @Override
        public Transaction.Result doTransaction(@NonNull MutableData currentData) {
            User users = currentData.getValue(User.class);
            if (users == null){
                return Transaction.success(currentData);
            } else {
                users.setMoney(s.getMoney()-mo);
                currentData.setValue(users);
            }
            return Transaction.success(currentData);
        }

        @Override
        public void onComplete(@Nullable DatabaseError error, boolean committed, @Nullable DataSnapshot currentData) {

        }
    });
    databaseReference.child("Users").child(t.getUid()).runTransaction(new Transaction.Handler() {
        @NonNull
        @Override
        public Transaction.Result doTransaction(@NonNull MutableData currentData) {
            User usert = currentData.getValue(User.class);
            if (usert == null){
                return Transaction.success(currentData);
            } else {
                usert.setMoney(t.getMoney()+mo);
                currentData.setValue(usert);
            }
            return Transaction.success(currentData);
        }

        @Override
        public void onComplete(@Nullable DatabaseError error, boolean committed, @Nullable DataSnapshot currentData) {

        }
    });
}
```

3. Advantages and disadvantages

3.1. Advantage

All users will be publicly traded, thanks to BlockChain technology that the system is almost impossible to attack. even if attacked, the transaction history is saved thanks to block chain technology, which makes it easier to track down perpetrators. The system also avoids shady transactions.

3.2. Shortcoming

Users will feel uncomfortable because their personal assets are made public.

The limitation of BlockChain is that data introduced over time will be hugely space-consuming to store.

VI. What we learned in the project

We know how java works for Android. It is important to know what is needed in a money transfer application that we did not know before that it is very important or even know about its existence, typically doing it all against hacking in the safest way.

After this project, we can improve from discussing, distributing time appropriately, forging more carefully to find memories, knowing what we are about.

VII. Project plan

1. Introduction

1.1 Project overview

- The project in this document is the development of an electronic wallet using Blockchain technology designed with the specific goal of providing this technology to individuals or organizations in the banking sector so that they have the ability to manage and invest in virtual currencies and promote business activities on this model.
- This project is divided into 3 phases:
  - ✓ Phase 1: Get Requirements and commit customers request.
  - ✓ Phase 2: Design, development this App and make a test with each task.

- ✓ Phase 3: Setup App to public, system information security and future system maintenance.

1.2 Project deliverables

Phase	Description	Date
Approach	Preliminary Project Management Plan	20/3 – 21/3
Phase 1: Requirements Analysis and Design	▪ Virtual System Design ▪ Database design ▪ UI/ UX design	22/3 - 31/3 1/4 - 15/4 16/4 - 22/4
Phase 2: Development	▪ UI Test Case ▪ Implement GUI to create new blocks. ▪ Complete BlockChain blockchains ▪ Integration FireBase Test Case ▪ Connect with DataBase RealTime ▪ Apply the available links for login ▪ Manage & create importance for user ▪ Decentralize users	23/4 - 25/4 26/4 - 30/4 1/5 - 7/5 8/5 - 10/5 11/5 - 15/5 16/5 - 18/5 19/5 - 20/5 21/5 - 22/5
Phase 3: Testing and Maintenance	▪ Deloy E-Wallet ▪ Apply security method ▪ Fix bug ▪ Maintenance, Upload Plan ▪ Report	23/5 - 30/5 1/6 - 10/6 11/6 - 14/6 15/6 - 17/6 18/6 - 20/6

2. Managerial process

2.1 Management objectives and priorities

Team leadership will maintain the responsibility of maintaining and containing the project schedule and ensuring that all work items are completed and on schedule. Leadership is also responsible for the creation of all deliverables and scheduling/ running meetings.

2.2 Assumptions, dependencies, and constraints

Assumptions for the project are that, through the members of the team, sufficient knowledge in the areas of Java programming, communications and project management is available. BlockChain e-wallet App can be run on web browser and all system a smart phone running the Android OS version 1.6 or greater.

2.3 Risk management

No	Risk	Monitoring and Controlling
1	Security	Use a Firewall to block unwanted traffic coming from untrusted IP sources or containing unsecured components.
2	Requirement change	Client will be made aware, in advance, of the amount of change that can be accommodated within the term of the project.
3	Accidental loss of valuable information	- Most of the work will be done using online collaboration tools, including version control software, and the resulting documents stored

		online to minimize the chances of loss of information. - Copies of work not stored online will be kept by all team members.
4	Failure to meet deadlines for deliverable.	Setup milestones in advance of the final due date for each deliverable.

Project lead agency **Project manager**

(Signed and sealed) (Sign)

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COMMENTS OF THE LECTURER

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Lecturer's comments:

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