GOVERNMENT EDUCATION FUND DISTRIBUTION AND TRACKING SYSTEM USING BLOCKCHAIN

Main Project Report

Submitted by

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Reg no:FIT20MCA-2070

Submitted in partial fulfillment of the requirements for the award of the degree of

Master of Computer Applications

Of

A P J Abdul Kalam Technological University

FEDERAL INSTITUTE OF SCIENCE AND TECHNOLOGY (FISAT)®

ANGAMALY-683577, ERNAKULAM(DIST)

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DECLARATION

I hereby declare that the report of this project work, submitted to the Department of Computer Applications, Federal Institute of Science and Technology (**FISAT**), Angamaly in partial fulfillment of the award of the degree of Master of Computer Applications is an authentic record of my original work.

The report has not been submitted for the award of any degree of this university or any other university.

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This is to certify that the project report titled ” **GOVERNMENT EDUCATION FUND DISTRIBUTION AND TRACKING SYSTEM USING BLOCKCHAIN** ” submitted by **LAKSHMI C**, **(Reg No: FIT20MCA-2070**) towards partial fulfillment of the requirements for the award of the degree of Master of Computer Applications is a record of bonafide work carried out by her during the year 2022.

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Submitted for the viva-voce held on . . . . *at* . . . .

Examiner :

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ABSTRACT

The government has a lot of work to do for a state or a country. In a country, the government is take care of the funds and other duties. The government has various kinds of fund transactions. A huge amount of transactions take under the state government throughout different fields, and sectors. The state government takes care of different projects, repair, and maintenance work, paying the government employees working under each section, farmer schemes, tribal, education funds, etc. The government faces a huge issue or problem that is corruption from the low level is sometimes impossible to track the whole system and its progress at each stage. Looking at the current system it is very difficult to track the tasks and progress. This project mainly focuses on the education fund and tracking its flow. Education is very important for a student. The youngsters are one of the backbones of the country. The student wants the fund to help with their needs for their future.

Here the proposed system is to distribute and tracking of education funds provided by the state government that travels through each stage of the government process. Here using blockchain technology to ensure the security of transactions. The blockchain is used between the officer and user for the transaction of the fund and that data is stored in the blockchain each data are entered as a block. So it keeps a secure transaction and also has proof. This system provides a crystal clear record of all users connected in the chain. Blockchain is a decentralized, distributed ledger that records digital assets. The blockchain is stored the data as a block so each block is connected to the other with its hash values. So that it cannot change once it is done. It could not access by an outsider.

Contents

Chapter 1

INTRODUCTION

The world is becoming increasingly digital today. Future technology and one of the most promising, technology is called a blockchain. It is a Global-changing technology. Blockchains are now employed in Supply chains, management by ownership, and border crossing Several topics, include payments and cryptocurrencies. There are numerous uses for blockchain technology. The blockchain's primary characteristics are honesty, reliability, data consistency, integrity, security, low price, and quickness. The application of blockchain is increasing in the world. The public sector has the power to significantly alter governance and management. It may sluggish reducing corruption by ensuring complete transparency in the transaction.

The governments need to take responsibility for a huge number of tasks involves in a state. The state government involves a lot of transactions of various tasks. The government involves many funds transferring to various sectors like paying for government employees, new kinds of state projects, tribal welfare funds, education funds, repair and maintenance funds, etc. Education funds are very important these days. Education is a vital part of a person's life. The government faces a huge issue or problem that is corruption from the low level is sometimes impossible to track the whole system and its progress at each stage.

Here proposed system to distribute and monitor education funds ranges from the government authorities as they journey via the authorities system at every stage. Here employ the blockchain era to stable every transaction among the officials and the users. Blockchain is firstly a series of blocks, every report is saved as a block. Each block carries the hash value, preceding hash value, and transaction facts. So it's far secured via the transaction and it maintains facts stable.

Chapter 2

PROOF OF CONCEPT

A literature survey is the maximum essential step in any form of research. Before beginning growing we want to look at the preceding papers of our area where in we're operating and primarily based totally at the look at we will are expecting or generate the disadvantage and start operating with the reference of preceding papers. In this section,we in a short overview of the related work on the Government Education Fund Distribution and Tracking System and the use of Block-chain Technology.

In this paper, the author propose an imaginative blockchain-based IOT engineering to help fabricate an increasingly secure and solid IOT framework. By examining the deficiencies of the current IOT design and the benefits of the Block-chain innovation. We decay and redesign the first IOT design to shape another, multi-focus, incompletely decentralized engineering. Accordingly, the proposed engineering speaks to a huge improvement of the first design, which gives another heading to the IOT advancement[6].This paper provides, through its technique, an itemized examination of the square chain fit in the inventory network industry. It characterizes the particular components of square chain that influence store network, for example, versatility, execution,agreement instrument, security contemplation's, area proof and cost[7].

In this paper, researcher considered about the blockchain applications, we even have to consider the access and privacy challenges though. This allows to maintain crystal clear record with on demand right to transactional data on a need to know basis[1].

The device uses encryption to steady transactional records the use of hashes to hold a block of transactions in a chain way that is maintained and established with the aid of using each node worried to affirm the transaction and store the records in an obvious shape inside the authorities. Even then, with similar enhancements, this blockchain model can offer transparency in all authority's transactions. There could be no discrepancies of any kind.

The existing system is not much porviding a clear details. The operating of governments includes a big quantity of transactions closer to numerous operations that want to be finished all through the states. Different sorts of transactions are going on. The main hurdle that the pinnacle authorities face is the low stage of corruption this is from time to time not possible to music which deprives the stage of progress. Tracking it's far a completely hard project because of the cutting-edge system. In the existing system is transaction and tracking the all transactions of the government and also tracking.

Here propose a system to distribute and track education funds provided by the state government. Track fund transfer through each stage. Here the system makes use of blockchain technology to keep secure the transactions between the Agency and officers that maintain transparency in every transaction. The admin can track the transactions. The amount transferred to the user by the officer at that time the details are stored as a block.This lets in retaining a crystal clean file with on-call for proper transactions records on a need-to-know basis. The device lets in for a complete proof, steady, and real fund allocation and fund monitoring device to assist shape an incorruptible authorities process. Because of the decentralized ledger, all of the transactions may be established and can not be altered. The cash this is launched may be tracked, and anyone and everybody can discover how the cash is being used. Such a blockchain will lessen the continuing corruption It will create a massive effect on the financial improvement of a country.

The objective of the proposed system. Usually, when an education fund is allocated, there is no idea or knowledge about how these education funds are being used, and a large part of it is never shown in records due to corruption.This project is focused on education fund distribution and tracking.To solve this problem, a system has been proposed using Blockchain to provide transparency and secure.No delay in getting the fund.

Chapter 3

IMPLEMENTATION

The Government Education Fund Distribution and Tracking System are a blockchain-based system is for fund distribution and tracking of the flow of funds. In this project main technology used is blockchain. For creating a website here used the python framework flask. And MySQL SQL server is used here for storing the data from the website. Designing portion used HTML, CSS, and JavaScript. Here the entire code is coded in a python programming language. The Pycharm is used IDE here. For implementing blockchain here used the ganache CLI. Each transaction is stored in the blockchain as a contract. The website and the ganache use node.js for communicating with each other. We connect the flask server to the blockchain server inside the ganache CLI. Each contract passes the data. Blockchain is used for securely keeping our data. Each data are stored or recorded like blocks.

For implementing the blockchain installing node.js. When installing the node.js then created the node modules. Inside the node modules, we make the sol file. The sol file is the solidity file for writing the smart contract. Using the command npm install truffle the node modules are created in the system and set the path. After setting the node module folder then make the contract file with the extension of .sol.For this, we use the command truffle init. Compile the file for finding errors then deploy the file. The created node module has folders inside it that ate the build, contract, migration, and test. In the contract folder, there are the contract files. The one file is migration. sol is the default file. Then can make the file for the contract the contract file name is amt. sol the file contains the data that is passed to the blockchain. In the migration folder, the files are the migration file of these two contract files. The build folder has the JSON file of the contract the contracts are taking as the JSON format. The sol file is converting the sol file to the JSON file. Whenever the transactions are done the data are passed into the contract that is stored in the blockchain. The truffle-config.js file has the network details there giving the network details of the ganache CLI blockchain server details.

Then after connecting all these the working of this system is when accepting the inputs from the user then the data are stored in the database. The officer sends the package request to the admin then the admin approves the package request. The packages are available to the user then the user can send a request to the officer. After accepting the request then the user can request the amount then the officer the amount to the user these data are stored in the blocks in the blockchain. When adding the blocks to the blockchain the Ethereum balance in the ganache is reduced. The balance is reduced when the data are passed to it. Sometimes there is any change in the balance it could not decrease because of adding a small amount of data to it.

The main directories included in this are:

Contract directory: Here all the smart contracts are located. We already have a migration contract that handles our migrations to the blockchain.

Migration diretories: Here all of the migration files located. These migrations are similar to other web development frameworks that require migrations to change the state of a database. Whenever we deploy smart contracts to the blockchain, we are updating the blockchain's state, and therefore need a migration.

node modules directory: This is the home of all of our Node dependencies.

src directory: This is where we'll develop our client-side application.

test directory: This is where we'll write our tests for our smart contracts.

truffle.js file: This is the main configuration file for our Truffle project.

3.1 Technologies Used

- Ethereum
- Truffle
- Ganache
- Solidity
- Smart Contract
- SQL Server
- Flask
- PyCharm
- Python

3.1.1 Ethereum

Ethereum is a decentralized, open-source blockchain platform with smart contract functionality. Ether is the native cryptocurrency of the platform. After Bitcoin, it is the second-largest cryptocurrency by market capitalization. Ethereum is the most actively used blockchain. Ethereum is a technology that's home to digital money, global payments, and applications. The community has built a booming digital economy, bold new ways for creators to earn online, and so much more. It's open to everyone, wherever you are in the world all you need is the internet. Ethereum is the main technology used in my project because ethereum is the only blockchain network that can be programmable. We can do our project in the ethereum with this facility.A huge success of Bitcoin raised interest in the minds of several to create their own currencies. Looking at the advantages offered by Bitcoin - a digital currency, people wanted to use the concept of Blockchain in their own applications. People wanted to move out of their physical contracts to smart digital contracts where several issues like repudiation, transparency, security, etc. would be automatically addressed. The outcome of this effort resulted in the creation of Ethereum a popular platform for creating distributed Blockchain applications that support smart contracts.

3.1.2 Truffle

Truffle is a development environment, testing framework, and asset pipeline all rolled into one. With Truffle, you can compile and deploy Smart Contracts, inject them into web apps, and also develop front-end for decentralized applications(DApps). Today, Truffle is one of the most widely used integrated development environment (IDEs) for Ethereum Blockchain. Truffle is the first thing that was installed to start my project. I created a project folder and truffle framework installed using the Command Prompt. Truffle provides lots of supporting file for smooth running of the application.

3.1.3 Ganache

Ganache is a personal blockchain for rapid Ethereum and Corda distributed application development. You can use Ganache across the entire development cycle;enabling you to develop, deploy, and test your apps in a safe and deterministic environment. We can download this software from the website and install. I created a new work space with 10 virtual nodes with 100 Ether for each node. We can rename our work space and save it. Ganache is a test network to create blockchain network. The blocks created can be seen by us in every time when a new one gets added. The transaction data are saved in the ganache in a hashed format which is not readable by others.

3.1.4 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. It acts as a tool for creating machine-level code and compiling it on the Ethereum Virtual Machine (EVM). It has a lot of similarities with C and C++ and is pretty simple to learn and understand. For example, a “main” in C is equivalent to a “contract” in Solidity.

3.1.5 Smart Contract

Smart contracts are simply programs stored on a blockchain that run when predetermined conditions are met. They typically are used to automate the execution of an agreement so that all participants can be immediately certain of the outcome,without any intermediary’s involvement or time loss. This is the next step we have to do write a smart contract.

We have to code the smart contract according to our program. After that we can compile the code with truffle framework.Solc is the compiler used to compile the .sol file. The compiler will also produce the Application Binary Interface (ABI) which you need in order for your application to understand the contract and call the contract’s functions.A Javascript client library will read the ABI in order for you to call on your smart contract in your web app’s interface. You need to deploy your smart contract in order for it to be available to users of an Ethereum network. To deploy a smart contract, you merely send an Ethereum transaction containing the code of the compiled smart contract without specifying any recipients. We can see the change in the ganache after deploying the smart contract. Once the contract is deployed it cannot be revoked by any one. It will be permanently saved in the blockchain network.

3.1.6 SQL Server

SQL stands for Structured Query Language. SQL is used to communicate with a database. According to ANSI (American National Standards Institute), it is the standard language for relational database management systems. SQL statements are used to perform tasks such as update data on a database, or retrieve data from a database.

Some common relational database management systems that use SQL are: Oracle, Sybase, Microsoft SQL Server, Microsoft Access, Ingres, etc.Although most database systems use SQL, most of them also have their own additional proprietary extensions that are usually only used on their system. However,the standard SQL commands such as ”Select”, ”Insert”, ”Update”, ”Delete”, ”Create”, and ”Drop” can be used to accomplish almost everything that one needs to do with a database.

3.1.7 Flask (Python Framework)

Flask is a web framework. This means flask provides you with tools, libraries and technologies that allow you to build a web application. This web application can be some web pages, a blog, a wiki or go as big as a web-based calendar application or a commercial website.

Flask is part of the categories of the micro-framework. Micro-framework are normally framework with little to no dependencies to external libraries. This has pros and cons. Pros would be that the framework is light, there are little dependency to update and watch for security bugs, cons is that some time you will have to do more work by yourself or increase yourself the list of dependencies by adding plugins.

3.1.8 PyCharm

PyCharm is a hybrid platform developed by JetBrains as an IDE for Python. It is commonly used for Python application development.An IDE consists of an editor and a compiler that we use to write and compile programs. It has a combination of features required for developing software.The presence of an IDE makes the development process and programming much easier. It interprets what we are typing and suggests the relevant keyword to insert. We can run PyCharm on Windows, Linux, or Mac OS. Additionally, it contains modules and packages that help programmers develop software using Python in less time and with minimal effort.Further, it can also be customized according to the requirements of developers.

3.1.9 Python

Python is a high-level, interpreted, interactive and object-oriented scripting language. Python is designed to be highly readable. It uses English keywords frequently where as other languages use punctuation, and it has fewer syntactical constructions than other languages. Some of the key advantages of learning Python are:

Python is Interpreted : Python is processed at runtime by the interpreter. You do not need to compile your program before executing it. This is similar to PERL and PHP.

Python is Interactive : You can actually sit at a Python prompt and interact with the interpreter directly to write your programs.

Python is Object-Oriented : Python supports Object-Oriented style or technique of programming that encapsulates code within objects.

Python is a Beginner's Language : Python is a great language for the beginner level programmers and supports the development of a wide range of applications from simple text processing to WWW browsers to games.

3.2 Modules

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3.2.1 Registration

Admin can log in by using username and password. Officer has a username and password given by the admin. The agency can do a new registration using the password and username they log in to their web pages. Admin can add new staff and also edit, and delete. Admin can approve view and agency and also block and unblock agency. Admin can view the complaints and reply to the agency. The admin can approve or reject the fund package sent by the officers. View and approve agency and also block and unblock agency. Officers can add new packages, view the package status, view package requests, and update the status.

3.2.2 Fund Distribution Tracking

Registered agencies or users and newly registered users can view the page after login, viewing packages, and can send the request. Agency can view package request status, send an amount transfer request, and view status. Agency can send complaints. Admin, officers can track the package status is it correctly reached or not, and check the history of the amount transactions to each agency with the date. The admin can view the history of transaction of the amount transferred to the agency by year wise.

3.2.3 Blockchain Storing

In this module, we can see the smart contract working. this is a vital part of the system, a smart contract is written and data that want to store in the blockchain. Connecting the browser and the ganache for the updating and new blocks added to the blockchain. Smart contracts are created and then deployed. The blockchain is updated when the transaction is completed. While the update transfer information that data are recorded in the blockchain. That means the transaction cannot be changed. When accepting the request for a package and the user can request the amount then the officer accepted the amount request the accepting request the amount transaction is added to the blockchain. Adding the blocks that time the Ethereum balance is reduced at every transaction.

3.3 System Architecture

The system works the packages added by the officers and the packages are approved by the admin and the users can send request for the the packages the amount also request to the officers. The officers accept then the officer send the accepted amount to the user then the details are passes to the blockchain.

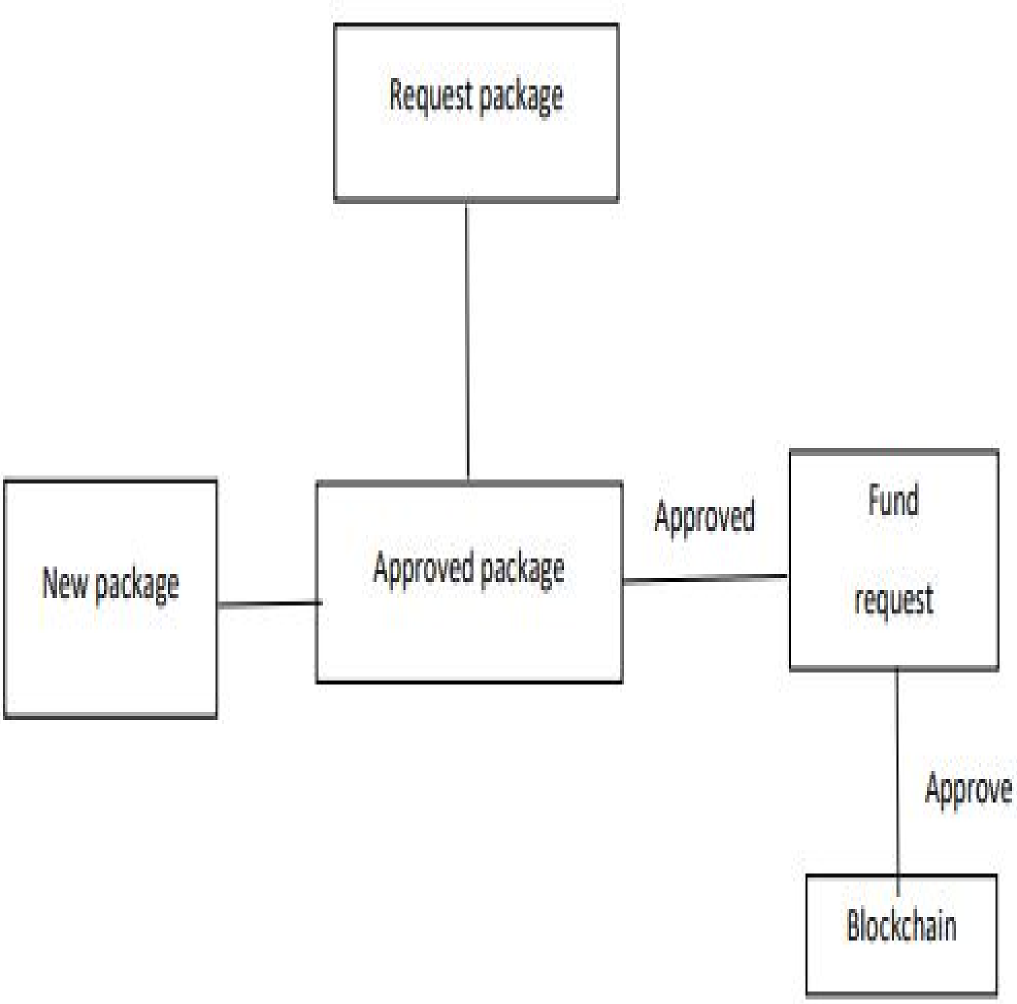


Figure 3.1: System architecture

3.4 Work flow of the system

The workflow shows the working of the system. Showing that the login to the website and request for the package and get approval then the user sends the request for the package to the officer. Then approved the request and the user requested the amount. The amount request accepted then will add to the blockchain.

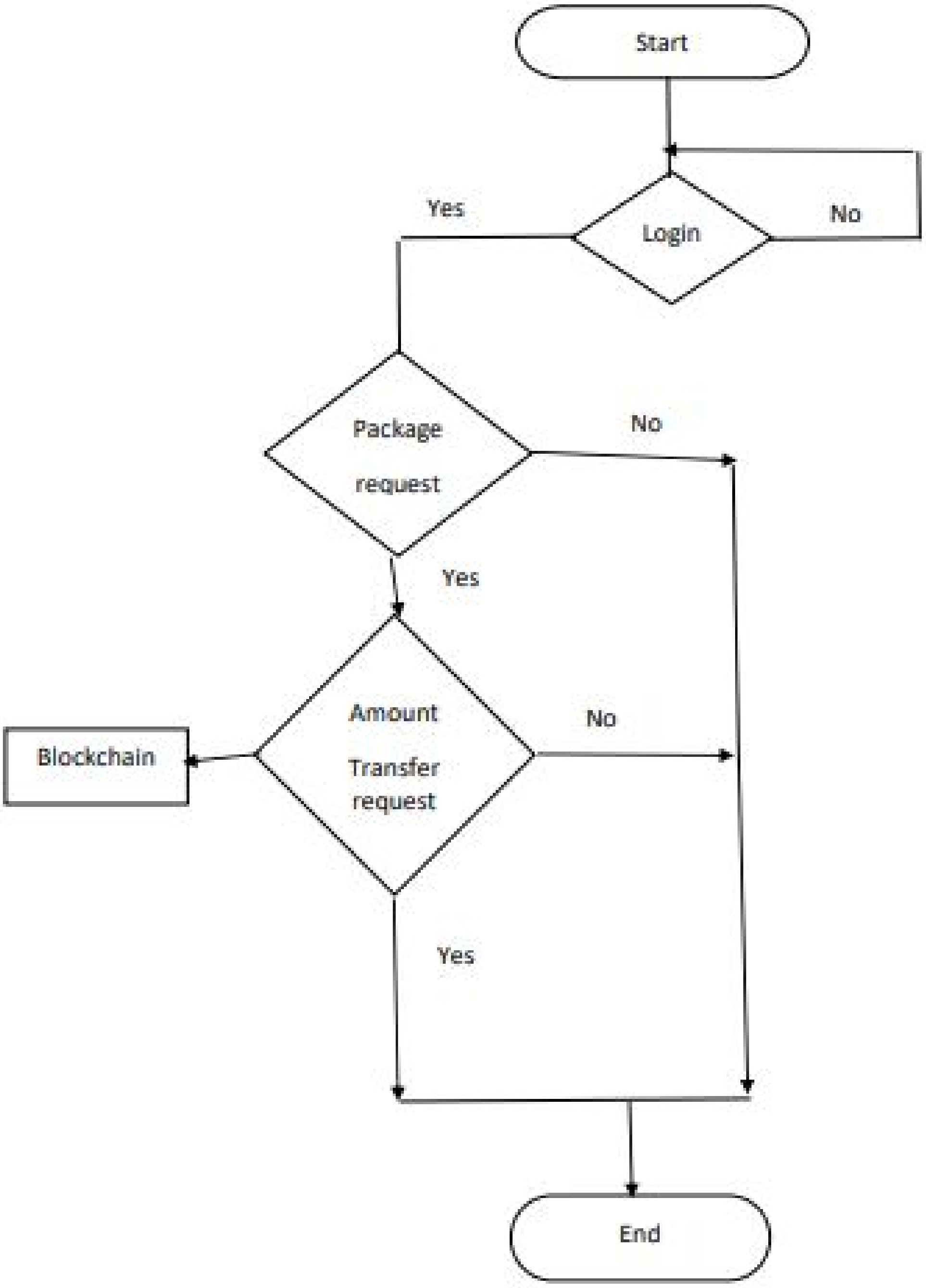


Figure 3.2: Work flow of system

3.5 Data Base

Data is a collection of a distinct small unit of information. A database is an organized collection of data, so that it can be easily accessed and managed. A data base is a collection of inter related data stored with minimum redundancy to serve many quickly and efficiently. The general way is to make information accessing easy,quick, inexpensive and flexible for the user. In data base design several objectives are considered controlling redundancy, ease of learning and use, data dependence, more information at low cost, accuracy and integrity are some of them. The table store the data from the UI and retrieve data from table at the time of need. The table contains the values include the data type include integers , varchar etc.. The table contain primary key, foreign key, unique key. The database is the collection of data so we can use the data for our need. The data requirements is very high for the project.The project include a database . A database is created it's name is govtfund .
There are seven tables. They are:

- Login
- Officer
- Agency
- Package
- Package request
- Transfer amount
- Complaint
- officers
- Pkgtype

3.5.1 Tables

Column Name	**Data Type**
id	int(pk)
username	varchar(56)
password	varchar(45)
utype	varchar(56)

Table 3.1: Login Table

Column Nmae	**Data Type**
agid	int (pk)
lid	int(11)
name	varchar(45)
place	varchar(45)
post	varchar(45)
pin	varchar(54)
phone	bigint(54)
email	varchar(54)

Table 3.2: Agency Table

Column Nmae	**Data Type**
Id	int(pk)
lid	int(11)
fname	varchar(54)
lname	varchar(44)
qualification	varchar(54)
gender	varchar(54)
dob	varchar(45)
place	varchar(54)
post	varchar(45)
pin	varchar(54)
phone	bigint(20)
email	varchar(54)

Table 3.3: Officer table

Column Nmae	**Data Type**
cid	int(11)
agid	int(11)
date	varchar(56)
complaint	varchar(45)
reply	varchar(45)

Table 3.4: Complaint Table

Column Nmae	**Data Type**
pid	int(11)
officerid	int(11)
package	varchar(54)
description	text
status	varchar(54)

Table 3.5: Package Table

Column Nmae	**Data Type**
rid	int(11) (pk)
pkgid	int(11)
agid	int(11)
date	varchar(56)
status	varchar(56)

Table 3.6: Package Request Table

Column Nmae	**Data Type**
tid	int(11)(Pk)
agid	int(11)
req$_i d$	int(11)
amount	varchar(34)
date	varchar(43)
status	varchar(43)

Table 3.7: Amount Transfer Table

Column Nmae	**Data Type**
id	int(11)(Pk)
pid	int(11)
type	varchar(54)

Table 3.8: Package Type Table

Column Nmae	**Data Type**
id	int(11)(Pk)
lid	int(11)
officename	varchar(54)
district	varchar(54)
designation	varchar(54)
officeraddress	varchar(54)

Table 3.9: Officer Table

Chapter 4

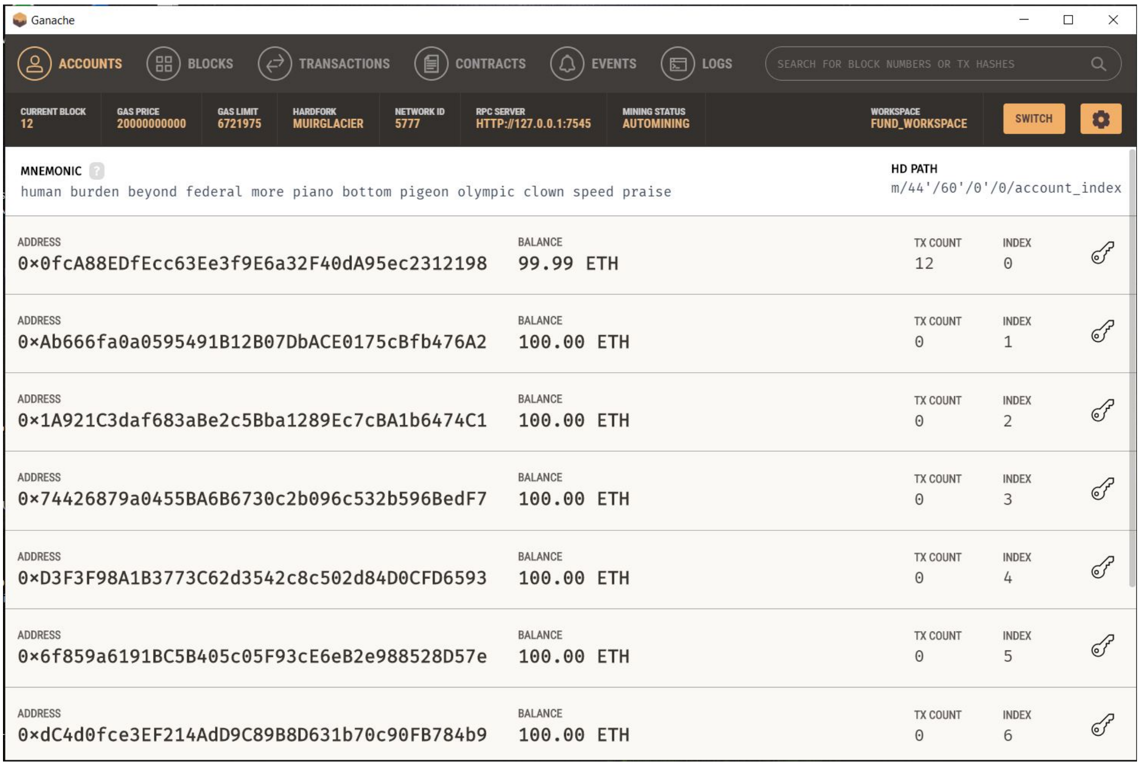
RESULT ANALYSIS

The project was successfully finished on schedule. To safeguard the transaction amount, developing a blockchain-based distribution and tracking system for education funds. It has a clear path that is secure and stored clearly via blockchain. The data are added to the blockchain at the time of amount transfer, making it incredibly secure. blockchain technology can be useful in addressing these issues. The primary objective of the project is to track and secure the money while also ensuring that consumers receive the money in the right quantity. The government's blockchain-based fund distribution and tracking system for education is a user-friendly web application for sending, receiving, and tracking funds.In ganache, we can see that the first wallet address has decreased by 0.01 ETH. This is because every transaction done on an Ethereum blockchain is not free, we have to pay for them to be achieved. This price we pay to make transactions is called gas. this gas is fixed by the blockchain and is applied to all participants using the blockchain.

For Blockchain implementation here used is the ganache. Ganache is used for setting up a personal Ethereum Blockchain for testing your solidity contracts.Blockchain is a shared, immutable ledger that helps the manner of recording transactions and monitors belongings in an enterprise network. One key distinction between an average database and a blockchain is how the facts are structured.

A blockchain collects statistics collectively in groups, referred to as blocks, that maintain units of statistics. Blocks have sure garage capacities and, while stuffed, are closed and connected to the formerly stuffed block, forming a series of facts referred to as the blockchain. All new statistics that follow that freshly brought block is compiled right into a newly fashioned block on the way to then additionally be brought to the chain as soon as stuffed.

Start using blockchain in a transaction it is really helpful for understanding and its keeps secure. And safer, having a clear clarity. No one can change the data inside the block. The data are added to the blockchain at the time of storing the data related to the amount request accepted. The details that stored in the block that are mentioned in the contract. The main objective of the project is to keep secure the transactions between the officer and the user or agent.



CURRENT BLOCK	GAS PRICE	GAS LIMIT	HARDFORK	NETWORK ID	RPC SERVER	MINING STATUS	WORKSPACE
12	20000000000	6721975	MUIRGLACIER	5777	HTTP://127.0.0.1:7545	AUTOMINING	FUND_WORKSPACE

MNEMONIC
human burden beyond federal more piano bottom pigeon olympic clown speed praise

HD PATH
m/44'/60'/0'/0/account_index

ADDRESS	BALANCE	TX COUNT	INDEX
0×0fcA88EDfEcc63Ee3f9E6a32F40dA95ec2312198	99.99 ETH	12	0
0×Ab666fa0a0595491B12B07DbACE0175cBfb476A2	100.00 ETH	0	1
0×1A921C3daf683aBe2c5Bba1289Ec7cBA1b6474C1	100.00 ETH	0	2
0×74426879a0455BA6B6730c2b096c532b596BedF7	100.00 ETH	0	3
0×D3F3F98A1B3773C62d3542c8c502d84D0CFD6593	100.00 ETH	0	4
0×6f859a6191BC5B405c05F93cE6eB2e988528D57e	100.00 ETH	0	5
0×dC4d0fce3EF214AdD9C89B8D631b70c90FB784b9	100.00 ETH	0	6

Figure 4.1: Account details

Chapter 5

CONCLUSION AND FUTURE SCOPE

5.1 Conclusion

While we taken into consideration approximately building blockchain applications.With in addition enhancements, this blockchain version can offer a transparency in all of the authorities transactions. It will create a big effect on the financial improvement of a country or a state.In this full-evidence, stable authorities fund allocation and tracking system, the allocated funds are tracked at every degree till it reaches the beneficiaries. This proposed to help the government to reduce corruption and provide transparency in all transactions.

Because of the features of blockchain-like immutability, evidence of work, and security. It gives the right governance and transparency. It will preserve data of all transactions made. As blockchain era is used the transactions as quickly as made can't be modified and if there is any attempt of tempering, we are able to get to understand about that easily. In addition to stopping human mistakes and delays, it'll assist put off human mistakes.The transaction of data between officer and agency(user) will entered into the blockchain clearly.

5.2 Future Scope

The blockchain technology has a big efficiency for enhancement and applications in many fields. Using blockchain technology increasing the security and transparency.Future scope is adding additional fund distribution and using this system for entire country fund distribution and tracking. This is helpful to understand the flow of transactions. Emerging technology like blockchain is a very vital part when looking at the area of transactions. All the world needs to keep its data and transactions secure and crystal clear of data. The officer and user have to get a flow of the transactions. And the government can access the tracking of the details of the transactions.

In the future, we can add the personal documents of students to keep their details safe and use their data to request the fund whenever they need the education fund. Once the students enter the details then the government can access the details and they can verify the details. Using the blockchain to secure the data. Once we enter the data can not change the details. The system can use for entire transactions of government projects. So we can ensure security and clarity about the transactions. So many countries are using the blockchain for their government transactions. They help to secure the data and improve transparency. The flow of transactions is clear to the user and they can check the details. The blockchain uses then the data is stored more securely than a database. Blockchain using is a secure way to keep the transactions. And also use it for all transactions in government-based projects. The system gives a clear path for the user about the transactions. There is no delay in the process and the transactions.

Chapter 6

APPENDIX

6.1 Source code

6.1.1 webcode.py

```
from flask import*
from flask_mail import Mail
app=Flask(__name__)
app.secret_key=”aaa”
import datetime
from  src.dbconnection import *
import smtplib
from email.mime.text import MIMEText
mail=Mail(app)
app.config[’MAIL_SERVER’]=’smtp.gmail.com’
app.config[’MAIL_PORT’] = 587
app.config[’MAIL_USERNAME’] = ’lakshmicmails4@gmail.com’
app.config[’MAIL_PASSWORD’] = ’fauyrbstwrktailj ’
app.config[’MAIL_USE_TLS’] = False
app.config[’MAIL_USE_SSL’] = True
```

```
from web3 import Web3, HTTPProvider
blockchain_address = ’HTTP://127.0.0.1:7545’
web3 = Web3(HTTPProvider(blockchain_address))
web3.eth.defaultAccount = web3.eth.accounts[0]
compiled_contract_path = r’E:\Main_project\
fund transfer\src\node_modules\.bin\build\contracts\amt.json’
deployed_contract_address =
’0x5929582ECDb017639BEb9dadF1187726f60765D9’

import functools
def login_required(func):
    @functools.wraps(func)
    def secure_function():
        if ”lid” not in session:
            return redirect (”/”)
        return func()
    return secure_function
@app.route(’/logout’)
def logout():
    session.clear()
    return render_template(”login.html”)
@app.route(’/lg’)
def lg():
    return render_template(”login.html”)
@app.route(’/’)
def main():
    return render_template(”index.html”)
@app.route(’/login’,methods=[’post’])
def login():
    uname=request.form[’uname’]
    pswd=request.form[’password’]
    qry=”select*from login where username=%s
    and password=%s”
    val=(uname,pswd)
    res=selectone(qry,val)
    if res is None:
        return ’’’<script>alert(”invalid”);
        window.location=’/’</script>’’’
    elif res[3]==’admin’:
        session[’lid’]=res[0]
        return ’’’<script>alert(”welcome admin”);
        window.location=’/admin_home’</script>’’’
    elif res[3]==’agency’:
        session[’lid’]=res[0]
        return ’’’<script>alert(”welcome agency”);
        window.location=’/agency_home’</script>’’’
    elif res[3] == ’officer’:
        session[’lid’] = res[0]
        return ’’’<script>alert(”welcome officer”);
        window.location=’/officerhome’</script>’’’
    else:
        return ’’’<script>alert(”invalid”);
        window.location=’/’</script>’’’
@app.route(’/admin_home’)
@login_required
def admin_home():
    return render_template(”admin/adminhome.html”)
@app.route(’/agency_home’)
```

```
@login_required
def agency_home():
    return render_template("agency/agency home.html")
@app.route('/officerhome')
@login_required
def officerhome():
    return render_template
    ("ofiicer/officerhome.html")
@app.route('/approveagency',methods=['get'])
@login_required
def approveagency():
    q="SELECT `agency`.* FROM `agency` JOIN
    `login` ON `login`.`id`=`agency`.`lid` WHERE
    `login`.`utype`='pending'"
    res=select(q)
    return render_template
    ("admin/approve agency.html",val=res)
@app.route('/approvepackage',methods=['get'])
@login_required
def approvepackage():
    q="SELECT * FROM `officer`"
    res=select(q)
   return render_template
   ("admin/approve package.html",val=res)

@app.route('/officerreg',methods=['post'])
def officerreg():
    try:
        fname=request.form['textfield01']
        lname=request.form['textfield02']
        gender=request.form['radio']
        dob=request.form['textfield']
        place=request.form['textfield2']
        post=request.form['textfield3']
        pin=request.form['textfield4']
        email=request.form['textfield6']
        phone=request.form['textfield5']
        qualification=request.form['textfield7']
        uname=request.form['textfield8']
        passd=request.form['textfield9']
        id=0
        q="insert into login values
        (null,%s,%s,'officer')"
        v=uname,passd
        id=iud(q,v)
        print(id)
        q1="insert into officer values
        (null,%s,%s,%s,%s,%s,%s,%s,%s,%s,%s,%s)"
        v1=str(id),fname,lname,
        qualification,gender,
        dob,place,post,pin,phone,email
        iud(q1,v1)
        return '''<script>alert("success...");
        window.location='/viewstaff'</script>'''
    except Exception as e:
        print(e)
        if id!=0:
            q="delete from login where id=%s"
            iud(q,id)
        return '''<script>alert("duplicate entry of
        username or phone or email...");
        window.location='/admin_home'</script>'''
@app.route('/pkgrequest',methods=['get'])
@login_required
def pkgrequest():
    q1="SELECT `agency`.`name`,
    `package`.*,`package_request`.* FROM
    `package_request` JOIN `package` ON `package`
    .`pid`=`package_request`.`pkg_id`
    JOIN `agency` ON
    `agency`.`lid`=`package_request`.
    `agid` WHERE `package`.`officer_id`=%s
    AND package_request`.`status`='pending'"
    rr=selectall(q1,session['lid'])
    print(rr)
    return render_template
    ("ofiicer/viewpackagerequestupdatestatus.html",val=rr)

@app.route('/agencyreg',methods=['post'])
def agencyreg():
    try:
        fname=request.form['textfield01']
        place=request.form['textfield2']
        post=request.form['textfield3']
        pin=request.form['textfield4']
        email=request.form['textfield6']
        phone=request.form['textfield5']
        uname=request.form[’textfield8’]
        passd=request.form[’textfield9’]
        q=”insert into login values
        (null,%s,%s,’pending’)”
        v=uname,passd
        id=iud(q,v)
        q1=”insert into agency values
        (null,%s,%s,%s,%s,%s,%s,%s)”
        v1=str(id),fname,place,post,
        pin,phone,email
        iud(q1,v1)
        return ’’’<script>
        alert(”success...”);
        window.location=’/’</script>’’’
    except Exception as e:
        print(e)
        return ’’’<script>alert
        (”duplicate entry of username,
        email,password...”);
        window.location=’/’</script>’’’
@app.route(’/addpackages’,methods=[’post’])
@login_required
def addpackages():
    pkg=request.form[’textfield’]
    desp=request.form[’textarea’]
    q=”insert into package values
    (null,%s,%s,%s,’pending’)”
    v=session[’lid’],pkg,desp
    iud(q,v)
```

```
        return '''<script>alert("added...");
        window.location='/managepackage#about'</script>'''

    @app.route('/amounts',methods=['post'])
    @login_required
    def amounts():
        amt=request.form['text']
        q="insert into transfer_amount values
        (null,%s,%s,%s,curdate(),'pending')"
        v=session['lid'],session['rid'],amt
        iud(q,v)
        return '''<script>alert("added...");
        window.location=
        '/viewtransferstatus#about'</script>'''

    @app.route('/acceptt',methods=['get'])
    @login_required
    def acceptt():
        id=request.args.get('id')
        qry="SELECT `amount` FROM `transfer_amount`
        WHERE `tid`=%s"
        res=selectone(qry,id)
        amt=res[0]
        q="update transfer_amount set
        status='accept' where tid=%s "
        iud(q,id)
        with open(compiled_contract_path) as file:
            contract_json = json.load(file)
            # load contract info as JSON
            contract_abi = contract_json[’abi’]
            # fetch contract’s abi − necessary
            to call its functions
            contract = web3.eth.contract
            (address=deployed_contract_address,
            abi=contract_abi)
            blocknumber = web3.eth.get_block_number()
            d = datetime.datetime.now()
            .strftime(”%Y−%m−%d”)
            message2 = contract.functions
            .add_transferrequest(blocknumber + 1,
            int(id),amt,d).transact()
            print (message2)
        return ’’’<script>alert(”accepted...”)
        ;window.location=
        ’/updatetransferinfo#about’</script>’’’
    @app.route(’/rejectt’,methods=[’get’])
    @login_required
    def rejectt():
        id=request.args.get(’id’)
        q=”update transfer_amount set
        status=’reject’ where tid=%s ”
        iud(q,id)
        return ’’’<script>alert(”rejected...”);
        window.location=
        ’/updatetransferinfo#about’</script>’’’
    app.run(debug=True)
```

6.1.2 dbconnection.py

```
import pymysql
def iud(qry, value):
    con=pymysql.connect(host=”localhost”,user=”root”,
    password=””,port=3306,
    database=”govtfund”)
    cmd=con.cursor()
    cmd.execute(qry, value)
    id=cmd.lastrowid
    con.commit()
    con.close()
    return id
def select(qry):
    con = pymysql.connect(host=”localhost”,
    user=”root”, password=””, port=3306,
    database=”govtfund”)
    cmd = con.cursor()
    cmd.execute(qry)
    res=cmd.fetchall()
    return res
def selectall(qry, value):
    con = pymysql.connect(host=”localhost”,
    user=”root”, password=””, port=3306,
    database=”govtfund”)
    cmd = con.cursor()
    cmd.execute(qry, value)
    res=cmd.fetchall()
    return res
def selectone(qry, value):
    con = pymysql.connect(host=”localhost”,
    user=”root”, password=””, port=3306,
    database=”govtfund”)
    cmd = con.cursor()
    cmd.execute(qry, value)
    res=cmd.fetchone()
    return res
```

6.1.3 migration.sol

```
// SPDX-License-Identifier: MIT
pragma solidity >=0.4.22 <0.9.0;

contract Migrations {
  address public owner = msg.sender;
  uint public last_completed_migration;
  modifier restricted() {
    require(
      msg.sender == owner,
      ”This function is restricted to the contract’s owner”);
    _;
  }
 function setCompleted(uint completed) public restricted {
    last_completed_migration = completed;
  }
}
```

6.1.4 amt.sol

```
pragma solidity >=0.4.22 <0.9.0;
contract amt{
  uint public i_count=0;
    mapping(uint => transfer_request) public inds;
    struct transfer_request{
       uint id;
          uint bid;
        uint tid;
        string amt;
        string date;
    }
    function add_transferrequest(uint _bid,
    uint _tid,string memory _amt,string memory _date)
    public{
        i_count++;
     inds[i_count]=transfer_request(i_count,_bid,
     _tid,_amt,_date);
    }

}
```

6.2 Screenshots

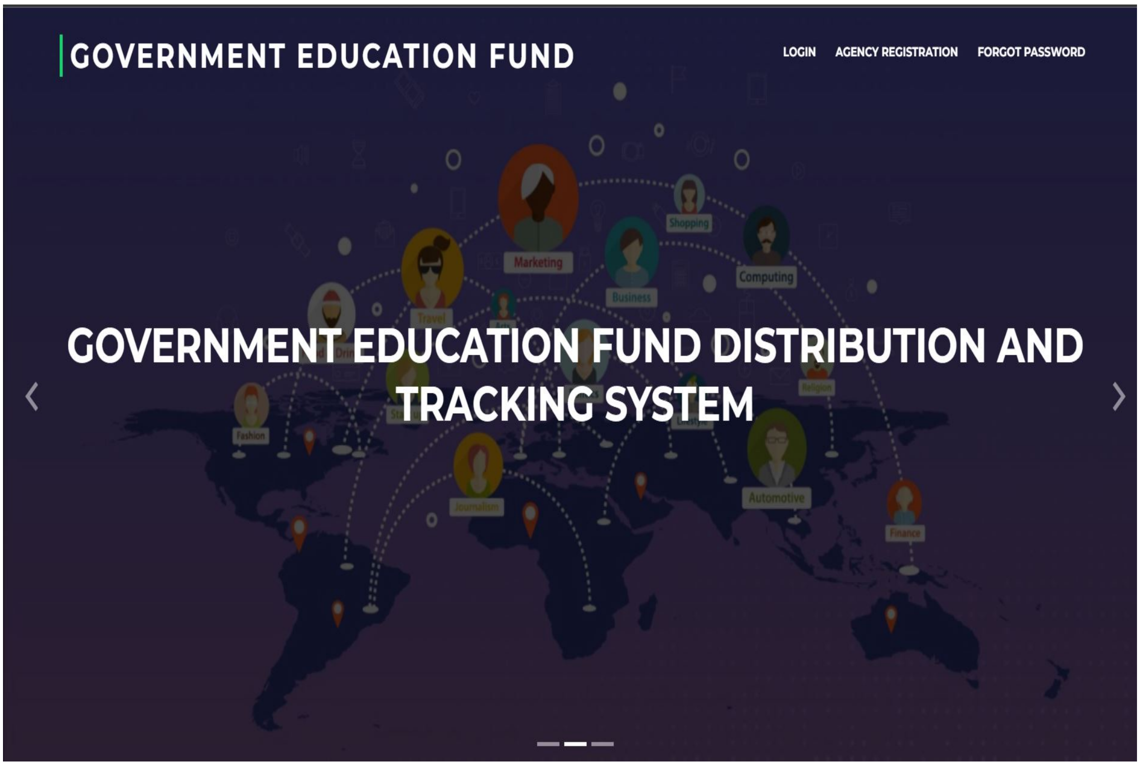
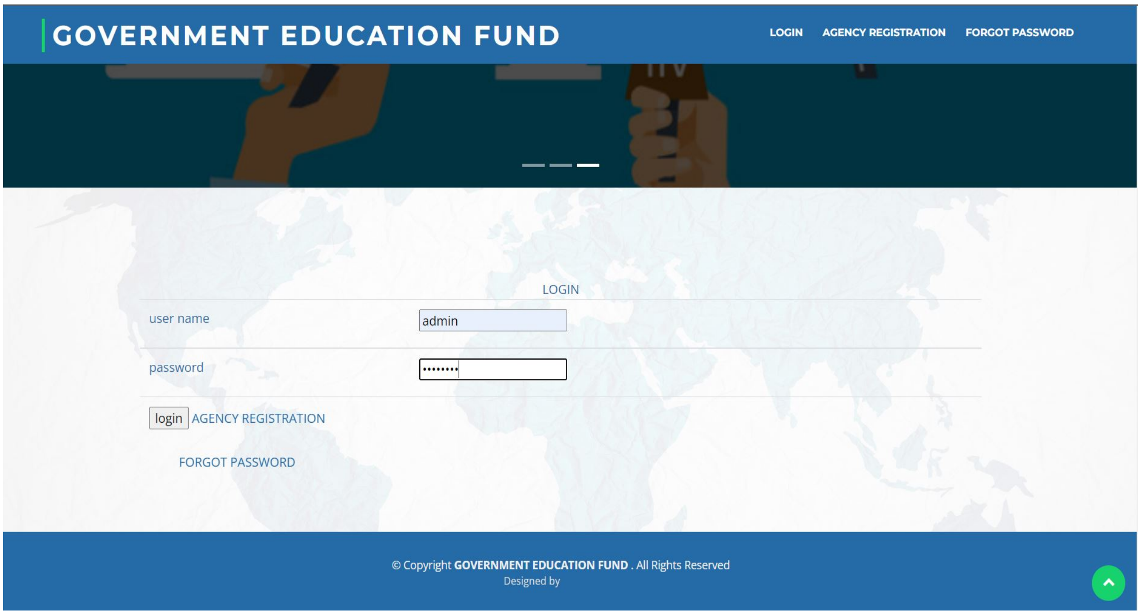


Figure 6.1: Main Home Page



user name: admin

password: ••••••••

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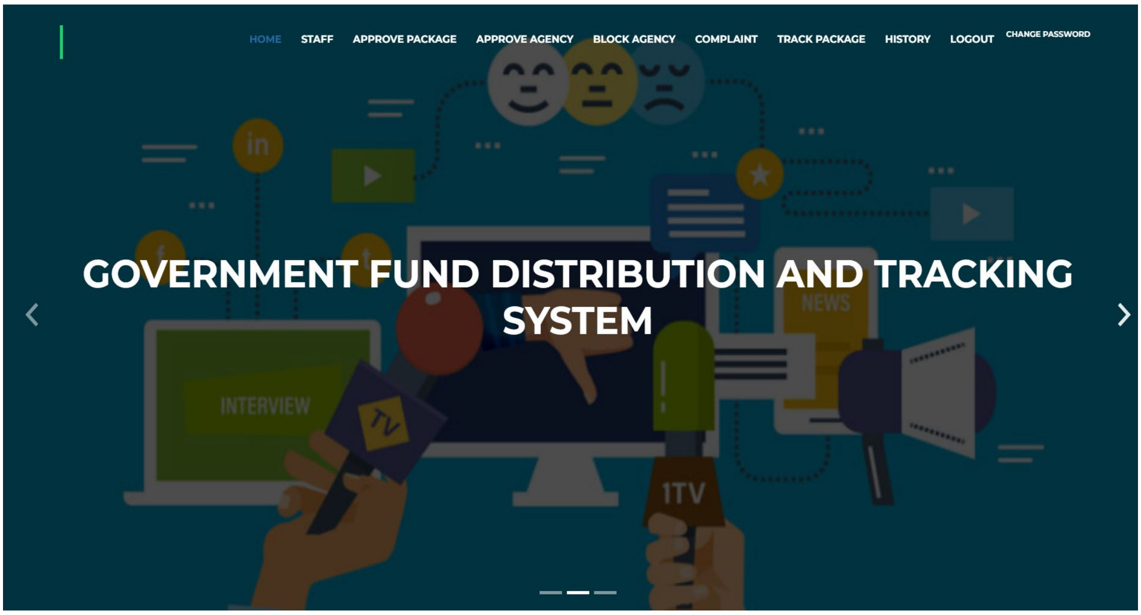
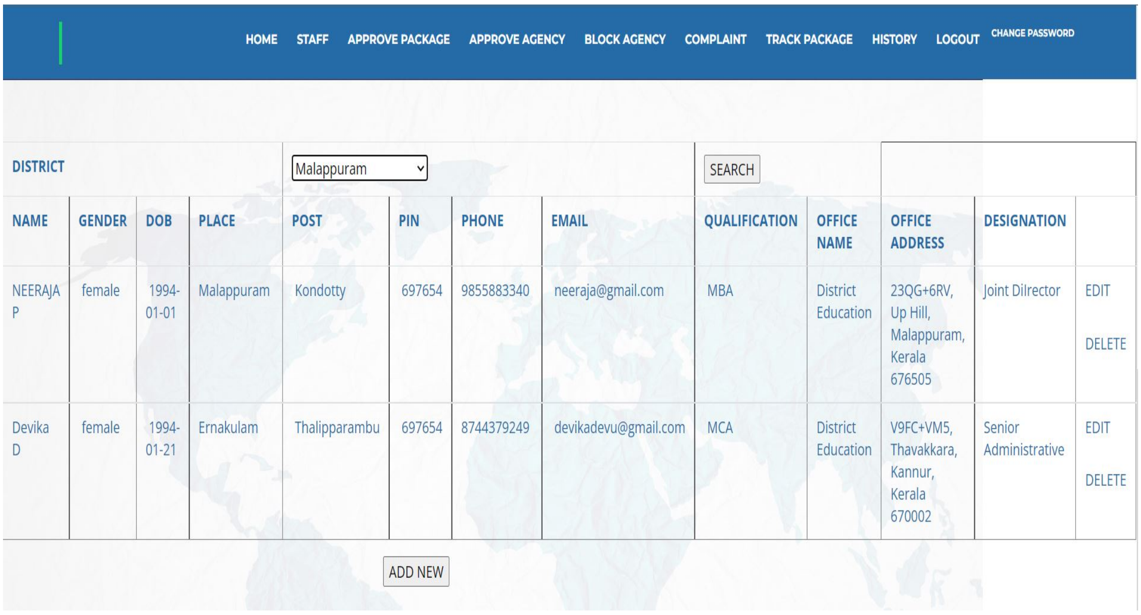
Designed by

Figure 6.2: Admin login



GOVERNMENT FUND DISTRIBUTION AND TRACKING SYSTEM

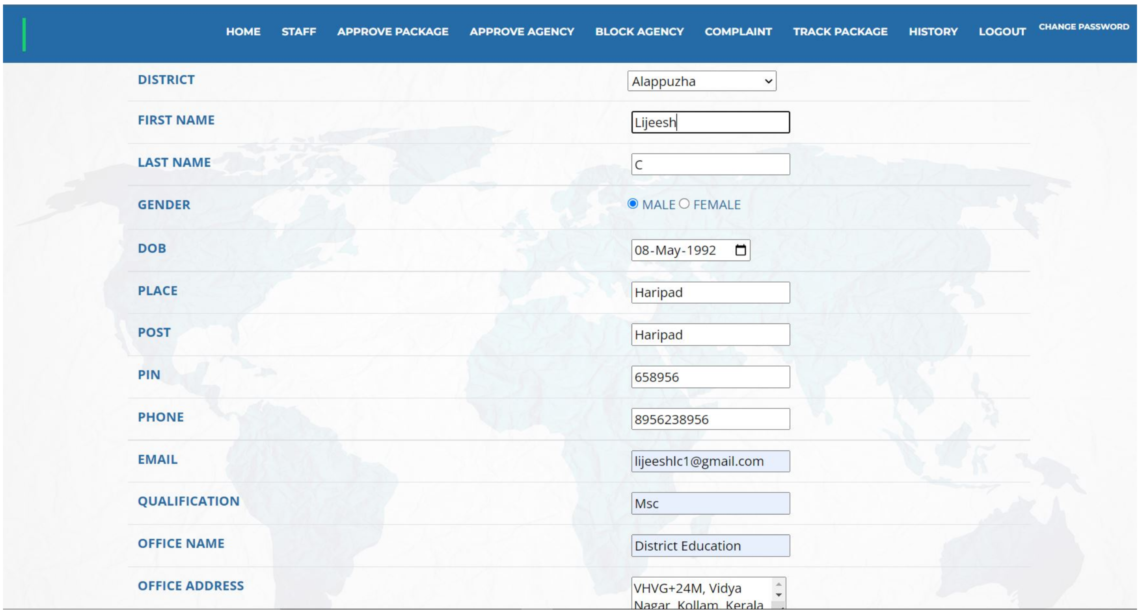
Figure 6.3: Home page of admin



DISTRICT: Malappuram

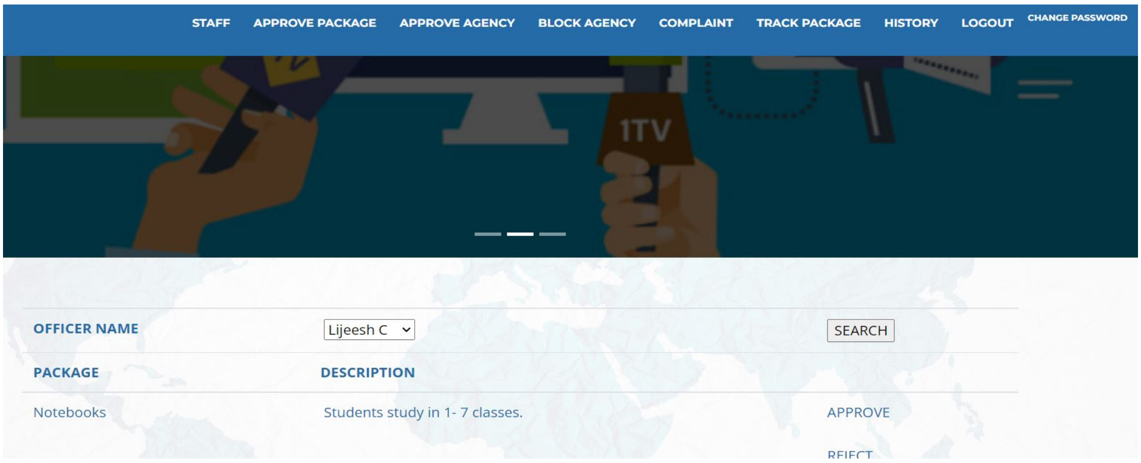
NAME	GENDER	DOB	PLACE	POST	PIN	PHONE	EMAIL	QUALIFICATION	OFFICE NAME	OFFICE ADDRESS	DESIGNATION	
NEERAJA P	female	1994-01-01	Malappuram	Kondotty	697654	9855883340	neeraja@gmail.com	MBA	District Education	23QG+6RV, Up Hill, Malappuram, Kerala 676505	Joint Dilrector	EDIT DELETE
Devika D	female	1994-01-21	Ernakulam	Thalipparambu	697654	8744379249	devikadevu@gmail.com	MCA	District Education	V9FC+VM5, Thavakkara, Kannur, Kerala 670002	Senior Administrative	EDIT DELETE

Figure 6.4: Staff details Page



DISTRICT	Alappuzha
FIRST NAME	Lijeesh
LAST NAME	C
GENDER	● MALE ○ FEMALE
DOB	08-May-1992
PLACE	Haripad
POST	Haripad
PIN	658956
PHONE	8956238956
EMAIL	lijeeshlc1@gmail.com
QUALIFICATION	Msc
OFFICE NAME	District Education
OFFICE ADDRESS	VHVG+24M, Vidya Nagar, Kollam, Kerala

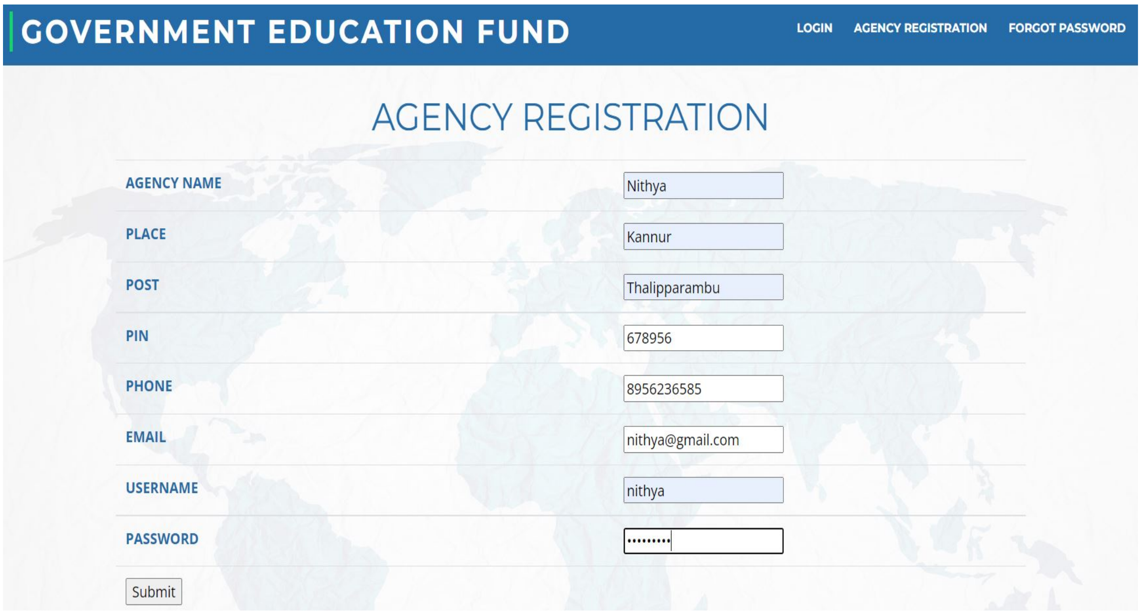
Figure 6.5: Add new staff page



OFFICER NAME Lijeesh C

PACKAGE	DESCRIPTION	
Notebooks	Students study in 1- 7 classes.	APPROVE REJECT

Figure 6.6: Approve package page

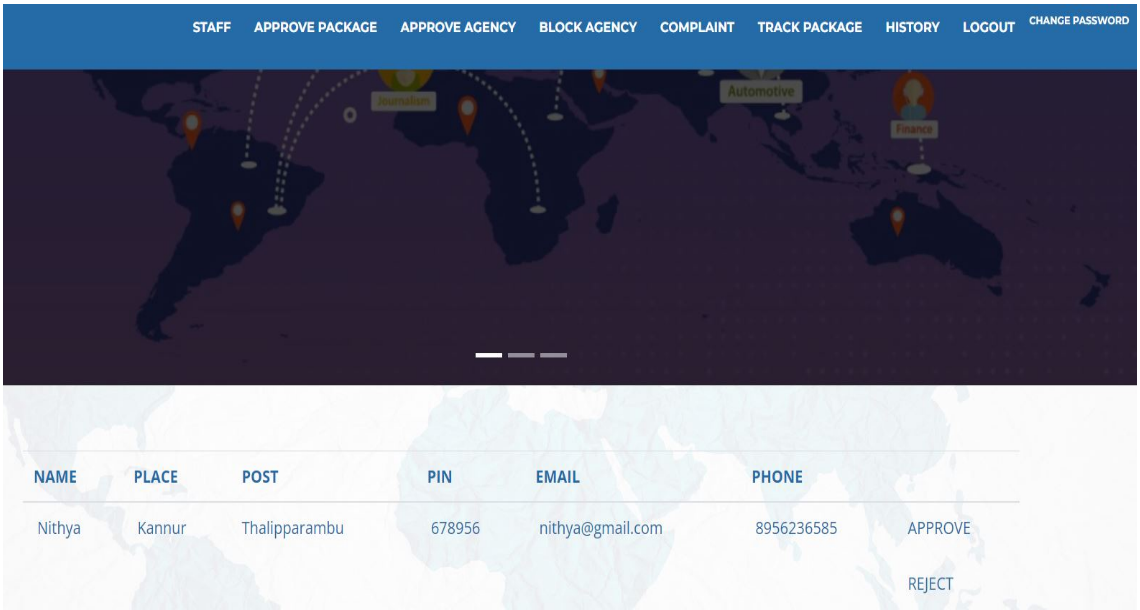


AGENCY REGISTRATION

AGENCY NAME	Nithya
PLACE	Kannur
POST	Thalipparambu
PIN	678956
PHONE	8956236585
EMAIL	nithya@gmail.com
USERNAME	nithya
PASSWORD	•••••••••

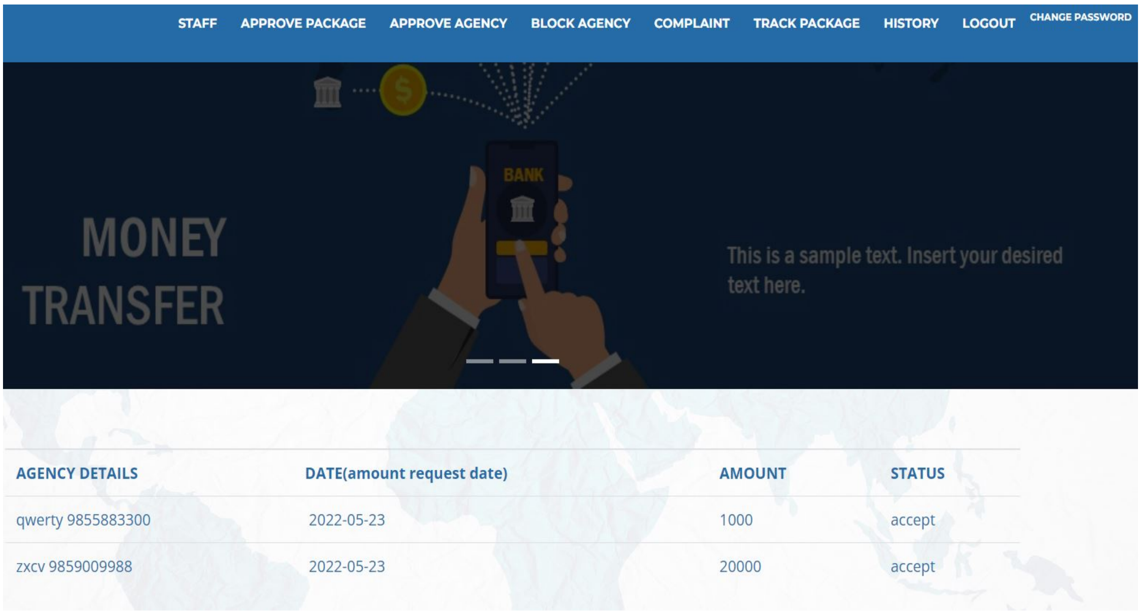
Submit

Figure 6.7: New agency registration



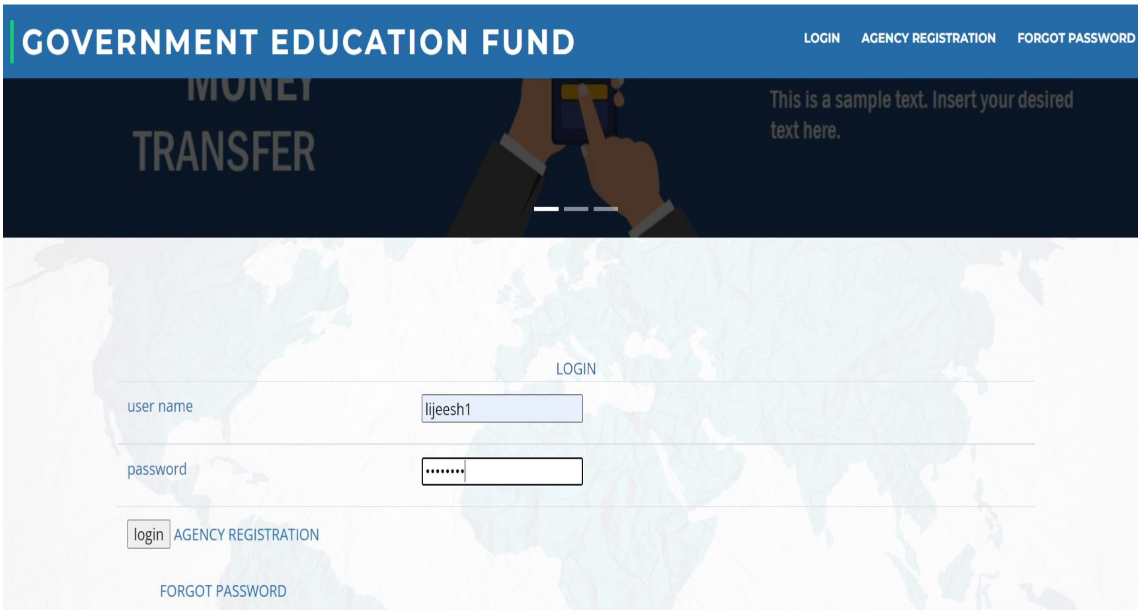
NAME	PLACE	POST	PIN	EMAIL	PHONE	
Nithya	Kannur	Thalipparambu	678956	nithya@gmail.com	8956236585	APPROVE REJECT

Figure 6.8: Approval page for agency registration



AGENCY DETAILS	DATE(amount request date)	AMOUNT	STATUS
qwerty 9855883300	2022-05-23	1000	accept
zxcv 9859009988	2022-05-23	20000	accept

Figure 6.9: Track package in admin page


GOVERNMENT EDUCATION FUND
LOGIN
AGENCY REGISTRATION
FORGOT PASSWORD
MONEY
TRANSFER
This is a sample text. Insert your desired text here.

LOGIN

user name	lijeesh1
password	••••••••

Figure 6.10: Officer Login

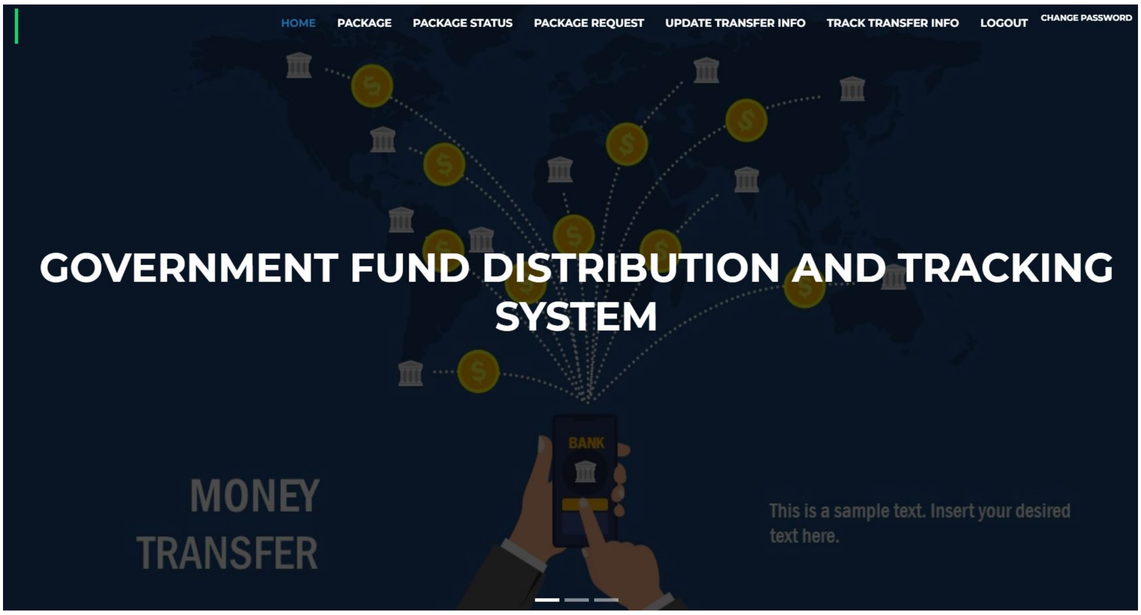
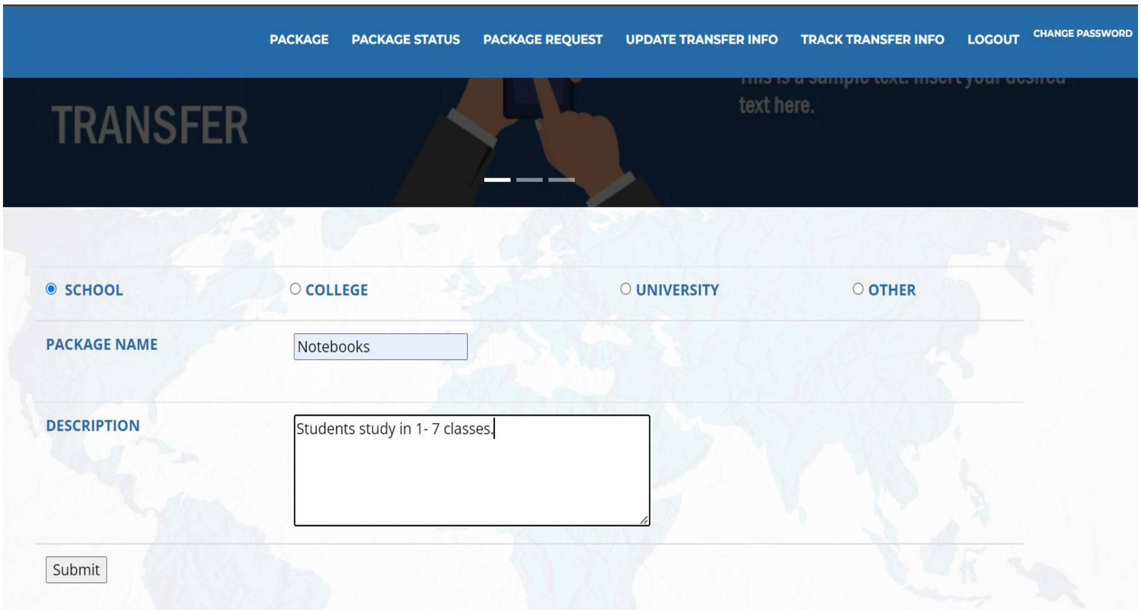


Figure 6.11: Home page of officer

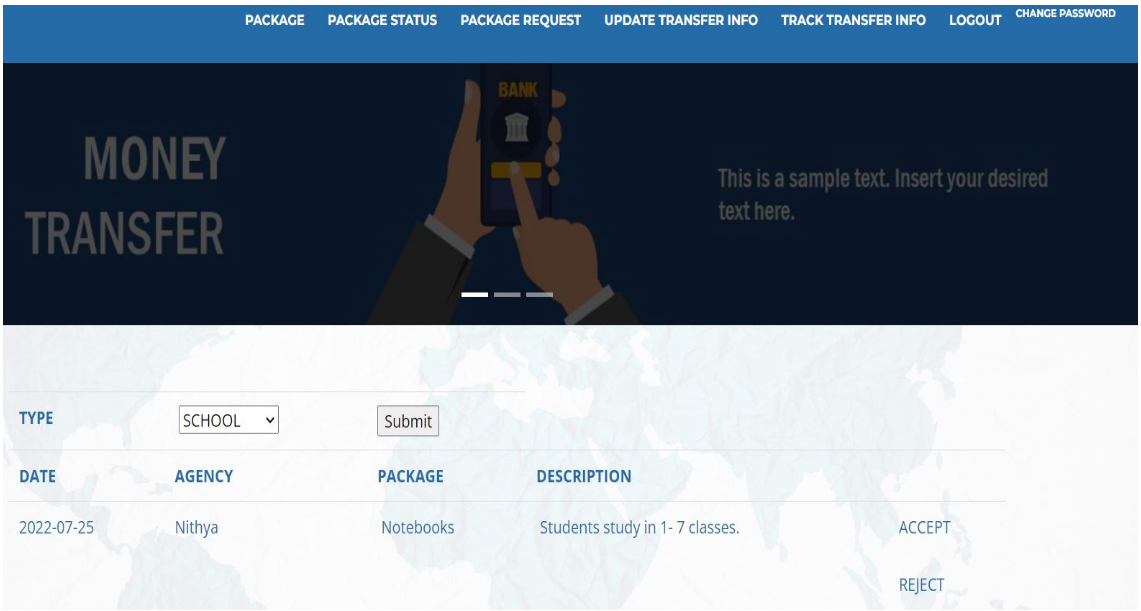


● SCHOOL ○ COLLEGE ○ UNIVERSITY ○ OTHER

PACKAGE NAME	Notebooks
DESCRIPTION	Students study in 1- 7 classes.

Submit

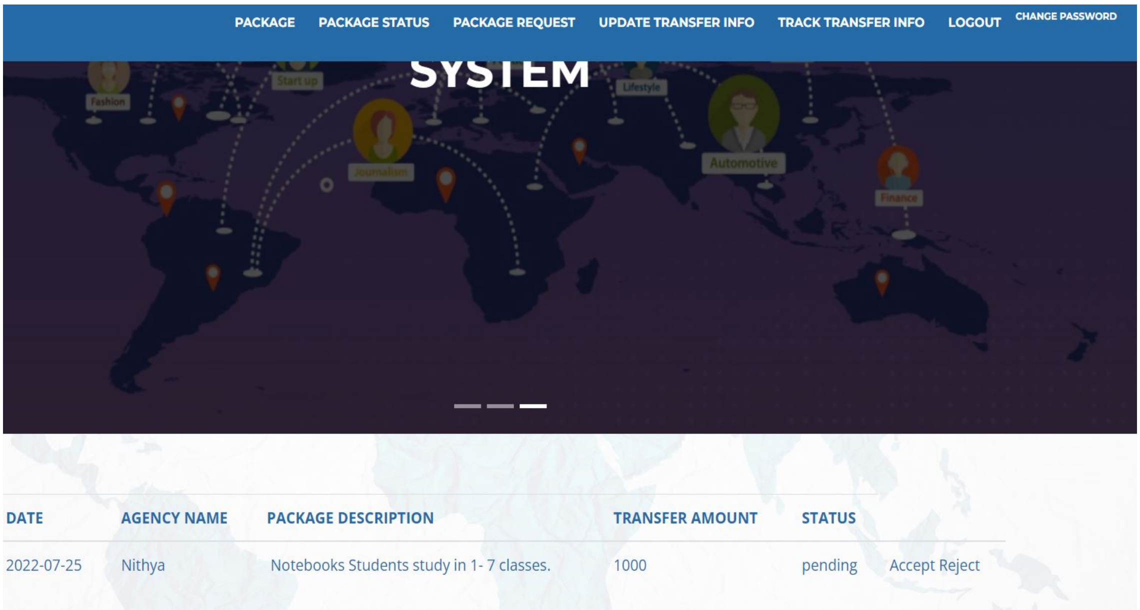
Figure 6.12: Add new package



TYPE SCHOOL

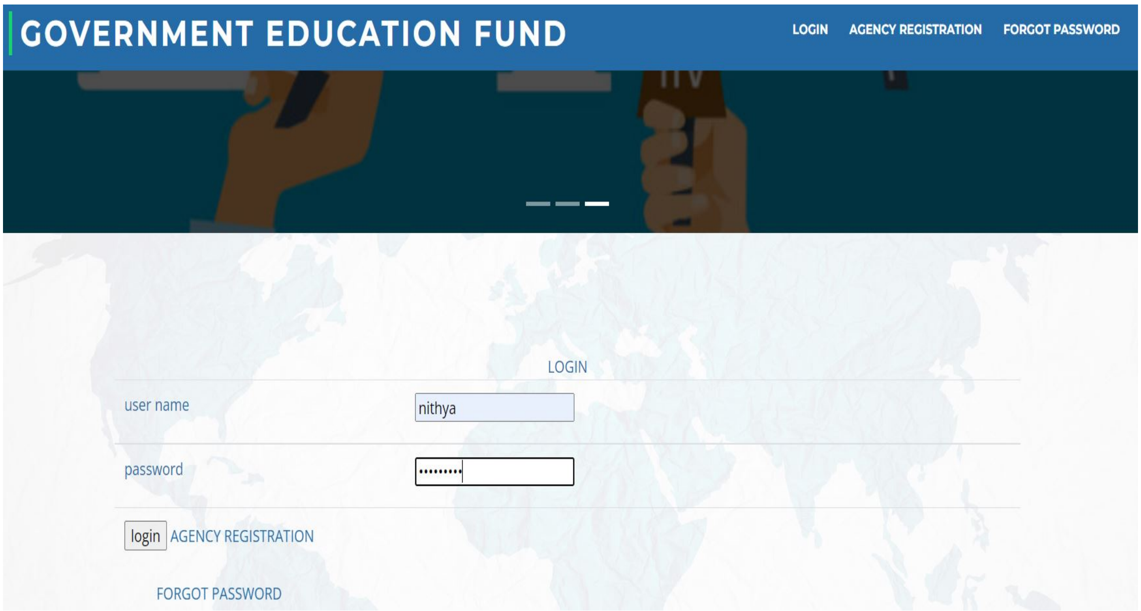
DATE	AGENCY	PACKAGE	DESCRIPTION	
2022-07-25	Nithya	Notebooks	Students study in 1- 7 classes.	ACCEPT REJECT

Figure 6.13: Package request page



DATE	AGENCY NAME	PACKAGE DESCRIPTION	TRANSFER AMOUNT	STATUS	
2022-07-25	Nithya	Notebooks Students study in 1- 7 classes.	1000	pending	Accept Reject

Figure 6.14: Updated information of transaction



user name: nithya

password: •••••••••

Figure 6.15: Login page of agency

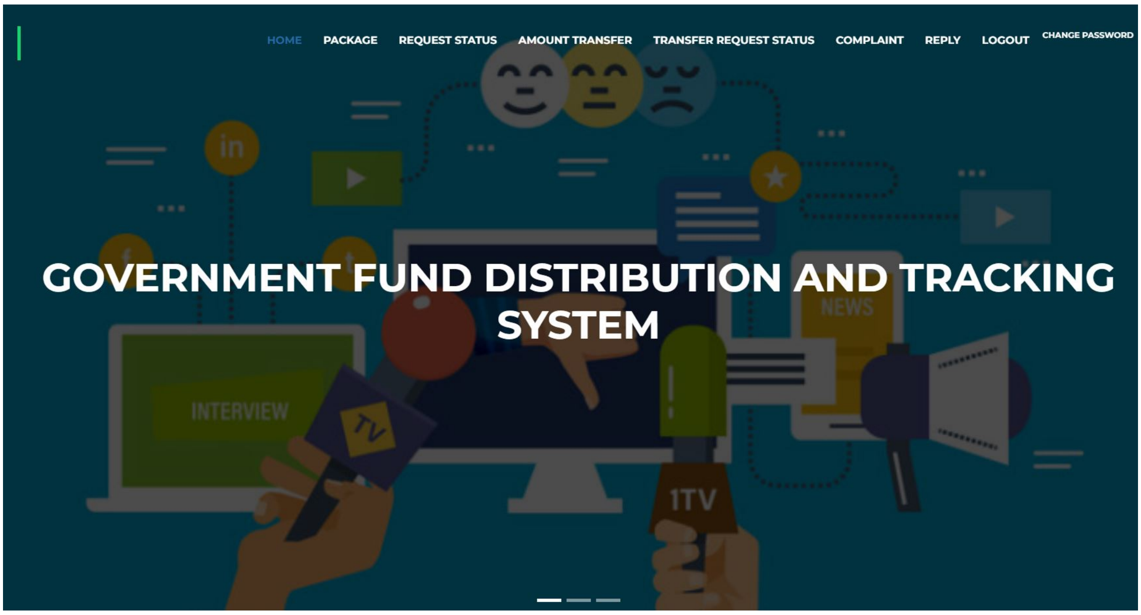
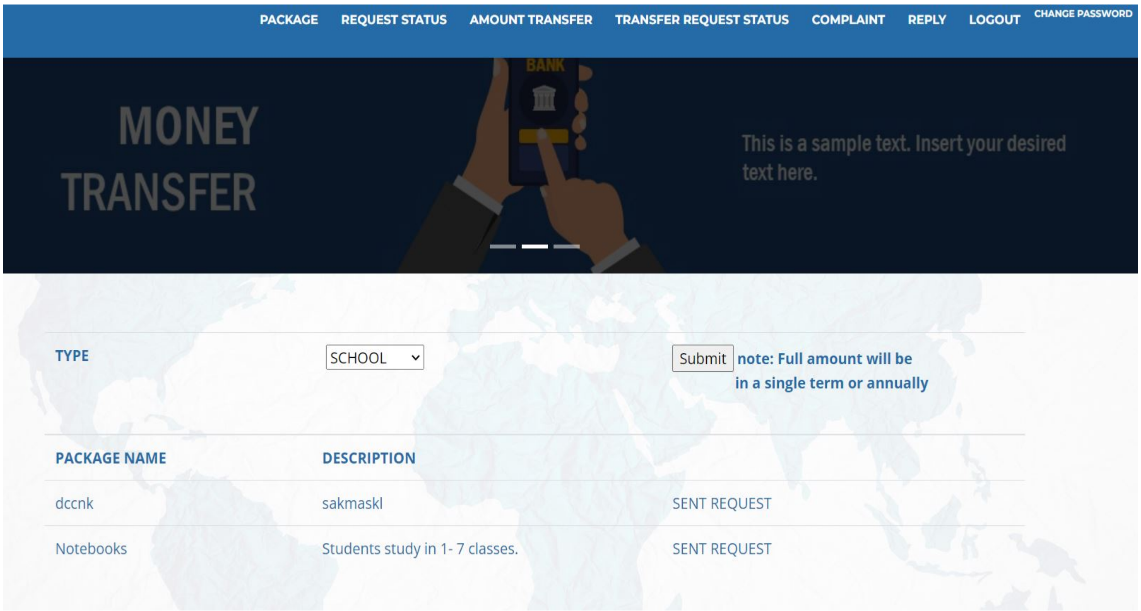
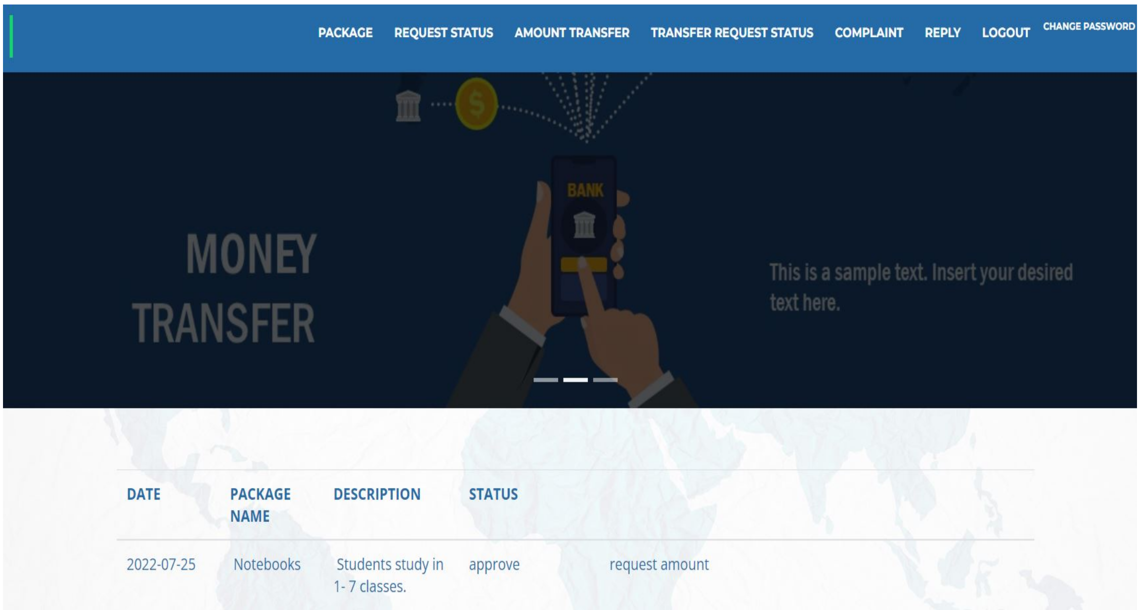


Figure 6.16: Home page of agency



TYPE	SCHOOL	Submit note: Full amount will be in a single term or annually
PACKAGE NAME	DESCRIPTION	
dccnk	sakmaskl	SENT REQUEST
Notebooks	Students study in 1- 7 classes.	SENT REQUEST

Figure 6.17: Available fund packages drop down list wise selected



DATE	PACKAGE NAME	DESCRIPTION	STATUS	
2022-07-25	Notebooks	Students study in 1- 7 classes.	approve	request amount

Figure 6.18: page for requesting amount

Chapter 7

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