American International University-Bangladesh (AIUB)

Department of Computer Science
Faculty of Science &Technology (FST)
Fall 19_20

Metro Rail Ticket Management

A software Engineering Sec: **B** project submitted

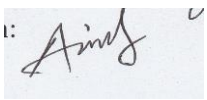
By

ASHARI,MD.ABU MUSA AL (17-33225-1)
OISHY,MARISHA ISLAM (17-35510-3)
HASAN,MD.NAHID (17-355273-3)
OISHI CHOWDHURY (18-36807-1)

The project will be Evaluated for the following Course Outcomes

CO3: Choose appropriate software engineering model in a software development environment		Total Marks
Content Knowledge	[5Marks]	
Argumentation	[5Marks]	
Evidence of Argumentation	[5Marks]	
Completeness, Spelling, grammar and Organization of the Answer	[5Marks]	
CO4: Explain the roles and their responsibilities in the software project management activities		Total Marks
Project Background Analysis	[5Marks]	
Project Role identification	[5Marks]	
Responsibility Description	[5Marks]	
Completeness, Spelling, grammar and Organization of the Answer	[5Marks]	

Corporate Personnel Name:MD. ARIF HASAN
Company: DATASYS LIMITED
Designation: CTO
Contact Details: 01737881431
Sign:



ACKNOWLEDGMENT

I take this occasion to thank God, almighty for blessing us with his grace and taking our endeavor to a successful culmination. I extend my sincere and heartfelt thanks to our esteemed guide,Mr.Saju,for providing us with the right guidance and advice at the crucial junctures and for showing me the right way. I extend my sincere thanks to our respected faculty ***ABHIJIT BHOWMIK***. Last but not the least, I would like to thank my friend *RISHAT, MD. AL-SAMIUL AMIN* for the support and encouragement he have given us during the course of our work.

Ashari,Md.Abu Musa

Oishy,Marisha Islam

Hasan,Md Nahid

Chowdhury Oishi

ABSTRACT

This is an integrated service which provide all information about the metro rail and it's routes for public. The proposed system is a web based application which provides information regarding timings, routes, fair.

This system manages public feedback about services through it's complaint management system. This system also contains an online ticket recharge module where users can recharge their smart cards online through the site.

There is also an superadmin module where superadmin can add stations, trains, routes and also update the fairs. The admin is a panel consisting of a group of authorized person.

TABLE OF CONTENTS PAGE

Chapter 1
Introduction

The Government of Bangladesh intends to improve the public transport system in Dhaka by constructing additional metro lines. This project preparatory technical assistance (PPTA) will assess the findings of the Revised StrategicTransport Plan (RSTP) for Dhaka and recommend and prepare a priority metro project for investment by ADB. The RSTP is expected to be completed in 2021. The PPTA will prepare pre-feasibility studies including cost-benefit analysis to decide on the priority interventions in consultation with the government and define the scope for detailed design to be prepared under the proposed TA loan, scheduled for approval in 2017. Hopefully metro rail will be start in 2021. So we need the tickets management.

This system manages public feedback about services through it's complaint management system. This system also contains an online ticket recharge module where users can recharge their smart cards online through the site.

There is also an admin module where admin can add stations, trains, routes and also update the fairs. The admin is a panel consisting of a group of authorized persons.

1.1 OBJECTIVE

The objectives of the projectare as follows:

1. Users can register complaints through the site.
2. User login page where users can recharge tickets online.
3. Users can view metro timetable.
4. User can also view the fair details and the route map.
5. An superadmin login page where superadmin can add stations, trains,routes , update fairs and even add a new admin.

CHAPTER 2
SYSTEM ANALYSIS

System analysis is the process of gathering and interpreting facts, diagnosing problems and using the information to recommend improvements on the system. System analysis is a problem solving activity that requires intensive communication between the system users and system developers. System analysis or study is an important phase of any system development process. The system is viewed as a whole, the inputs are identified and the system is subjected to close study to identify the problem areas. The solutions are given as a proposal. The proposal is reviewed on user request and suitable changes are made. This loop ends as soon as the user is satisfied with the proposal.

2.1 EXISTING SYSTEM

- When online systems is not implemented any changes in fair, timings etc when updated ,the details of these things are only available at the stations.
- When there is no computerized system then for recharge purposes the users need to travel to the stations and also sometimes even need to stand in large queues for recharge purposes.
- When online system is not implemented the complaints are reported in files. The files are always lost due to some human errors.

2.2 Solution to the Problem:

Metro rail ticket management system is an online system which helps the user to create their account for online recharge , it also have a reporting system in which users can register their complaints online. They don't need to cute tickets everyday because after registration management give a smart card.By visiting the site the users can get metro time table. Other than that by entering the source station and destination station the users can get all sorts of information about metro arriving and departing from the stations.

Improvement in Control and performance The system is developed to cope up with current issues and problems of the metro rail. The system helps to make a complaint online , display metro timetable ,recharge tickets online.

- Save time:

  User is able to see details of metro time table and even the user can complaint online and recharge tickets online there by saving his valuable time.

- Easy to Use :

  A person with just an internet connection and a device can do things such as complaint and view metro details very easily.

- Easy to learn:

  A person can easily use this application. Once the take the smart card they didn't need so book ticket daily.

- Easy to understand:

  After registration user have to request for smart card then they have to recharge the card. User can see the balance in their accounts.

- User safety:

  Provide accurate information to the user for taking necessary decisions.

- Easy to payment :

  After the user take the smart card they can easily payment by they are Bkash, Master_card,Visa, American_express and using they are phones.

- Easy to use smart card:

  This feature allows the user to recharge their metro card online, there by saving their valuable time. Users need to login with their card number and password and can recharge their tickets online. It also allows them to view their balance and journey history.

- Efficiency :

  Information can be collected, processed and communicated more quickly and efficiently. Systems ensure that right information reaches the right person at the right time.

- Reliability:

  Since systems are free from boredom and tiredness, they work constantly on data to produce more reliable outputs.

- Tracking system:

  In smart card there will be a chip for track the person. The chip track here he/she traveling details and the location .

CHAPTER *3*
FEATURES

3.1 Features:

- The system should be designed in such a way that only authorized people should be allowed to access some particular modules. In the system there are 3 types of user Super Admin,Admin,User.
- In Super admin login page where admin can add stations, trains,routes , update fairs and even add a new admin.The records should be modified by only Super admin and no one else.
- System must be able to retrieve information when required by admin.
  Admin can warning that person but only super admin can delete the user.When the user registration for a account , admin give a smart card.
- A new user have to registration before enter the app.User have to give NID or passport number for verification. User fill up registration form with details.User id is provided when they register.Unique user id for everyone.User login page where users can see the rail timetable and payment details .Users can register complaints.User can see their profiles , account balance, recharge the ticket online.User can give feedback .Users can enter the source station and destination stations .The smart card use as a ticket.The card have to be recharge.The user must be able to logout after they had finished recharging or after viewing the balance or journey history

- All the user details are store in the database.Super admin can see the data if in emergency.
- A smart chip put inside in the smart card it can be also track the person. Also the data enter the account by this.

- When customer punch the card to enter into the platform , it will count as a starting point and when the customer will reach the destination and want to go outside then he/she have to punch again to get exit from the platform and it will be count as a fare of his journey.
- Once the customer pay his payment , then automatically there will be check that is he/she has that amount to make the full journey again , if it is not then he/she will get a notification for this and also will get a request to recharge his card for further trip .
- Users to view the fair and route map. Users are required to enter the source and destination station, when they enter the data then the system will display fair details and the route map.
- If they don’t have money in the card so they can take emergency balance from account . But after recharge the balance will be taken from account.

CHAPTER 4
SYSTEM DESIGN

4.1 Use-case Diagram :

case:

In this software there are three types of user Super admin, admin and customer. At first the customer have to login the page for him or her user_id or password if they are already member they can enter the account. If they are not new, so they go to the registration page. And fill up all the details. Now the customer become member. Now the member can log in into the account and see the account details and see the rail time table. Then management give a smart card. Then the customer can recharge the smart card online through Bkash, MasterCard, rocket and Visa. Now the customer start to traveling. In the Traveling period if he or she has any complaint about someone. Then he/she can report.The report is verified by admin and the super admin will take action.

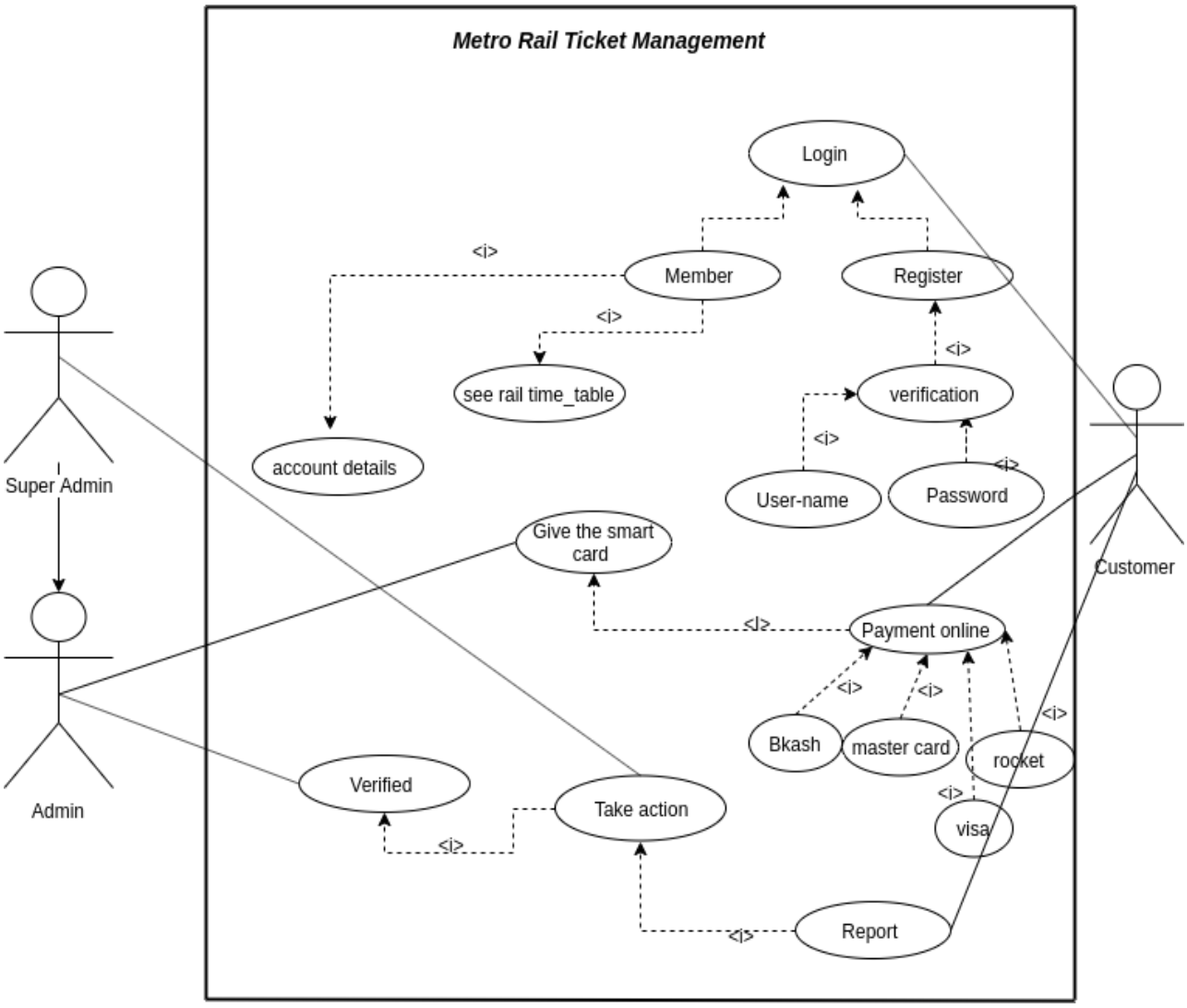


Fig:4.1

4.2 Activity diagram :

When a customer login in the system. Database will verified her/him. If he/she is verified then he/she can enter the account. If he/she is not verified then go to the registration and fill-up the registration form with details. Then he/she can login and enter in her/his accounts. After getting verified management gives the smart card. They can recharge the smart card by their several online accounts. In their account they can see the ticket price, profile, time schedule, number of seat. When the customer enter the platform,swipe the card and the time of journey will be saved in the account. When they reach the destination they swipe the card again and the departure time will be saved in the database. Management will take the ticket price from the account. If the customer don't have sufficient balance then the emergency balance will be automatically applied. After the next recharge the management will adjust the emergency balance with the account. Then the customer can see the update in their account. If the customer want to report someone, he can report from there account. Admin verified that person and Super admin take action again then. After a several time they can logout from they are account.

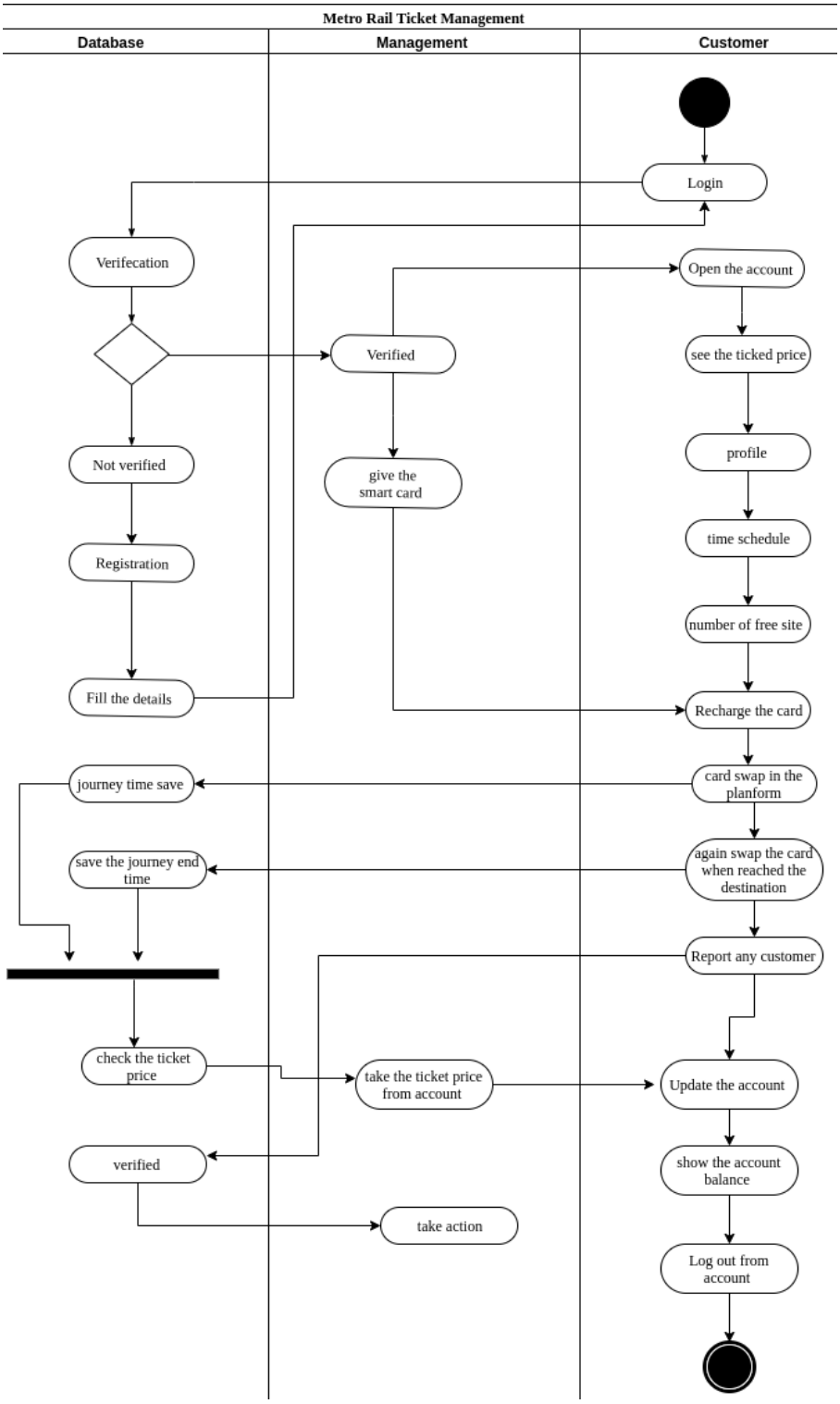

Metro Rail Ticket Management
Database
Management
Customer
Login
Verifecation
Open the account
Verified
see the ticked price
Not verified
give the smart card
profile
time schedule
Registration
number of free site
Fill the details
Recharge the card
journey time save
card swap in the planform
save the journey end time
again swap the card when reached the destination
Report any customer
check the ticket price
take the ticket price from account
Update the account
verified
show the account balance
take action
Log out from account

Fig:4.2

4.3 Class diagram:

In this Class diagram there are many classes such as super admin, admin,user,Metro,Smart Card,fare and a rule classes which is manage. In super admin class there are super admin id,name,phone,address, email. The super admin can add admin station hi also can delete admin user and edit role. In admin class there also have admin name,id phone,address,email. He can add user report and he can get permission from super admin to do something. In user class there have user id,name address,user number, payment and user email. In Metro class there have Metro name, destination,seat,Metro number in Metro class there operation are add metro and deleted metro. In Smart Card there have smart card id,number. Smart Card shows the card details in for class there have for ticket details destination and type. In for it can be add station and also add station manage is the sub_classes in managed there have manager id, email,address. The manager class is connected to the metro, Smart Card and fair class if in there class change or update ine thing the manage rule class manage all the things.

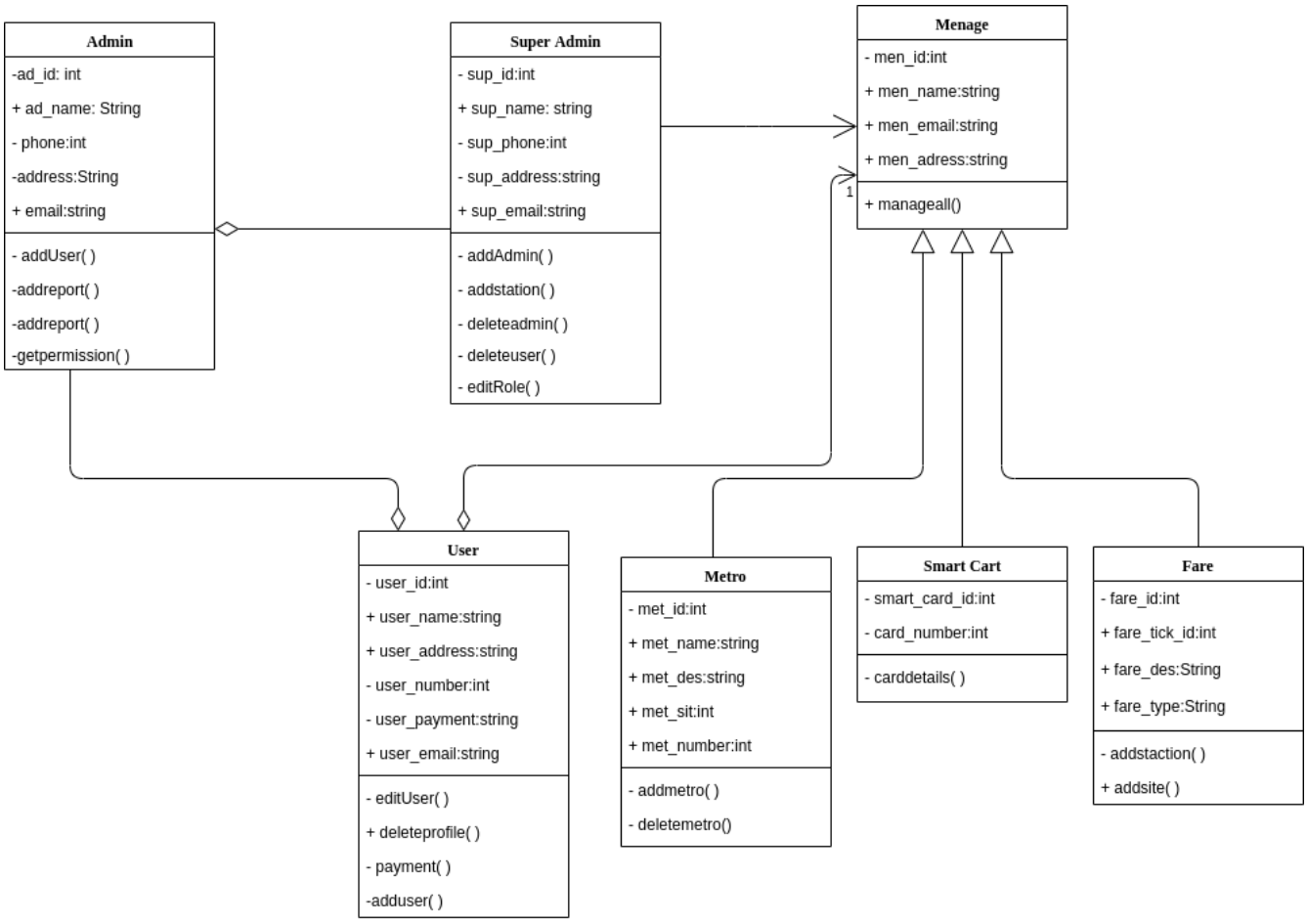


Fig:4.3

4.4 E-R diagram:

There are three type of user Super admin , admin, customer. Super admin can assess all the page or stage . Super admin have sup_name, address, phone_number, email, and quince sup_ad_id, sup_user_name. Admin have also name, number,email,address and quince ad_id and user_name. A customer have also name , phone_number, address,email and a quince user I'd and user name. Super_admin, Admin and customers connected with login. There metro, fare , smart_card and report those are connected with manage. Metro have also met_name, met_I'd,met_num, available sit. Fare also have fare_tckt_id, fare_type,fare_desc. smart card also have card_id,card_num and chips. There smart card have also connects with the routes. Routes have routes_num, rout_des. Report have also own report_id, message, c_id.

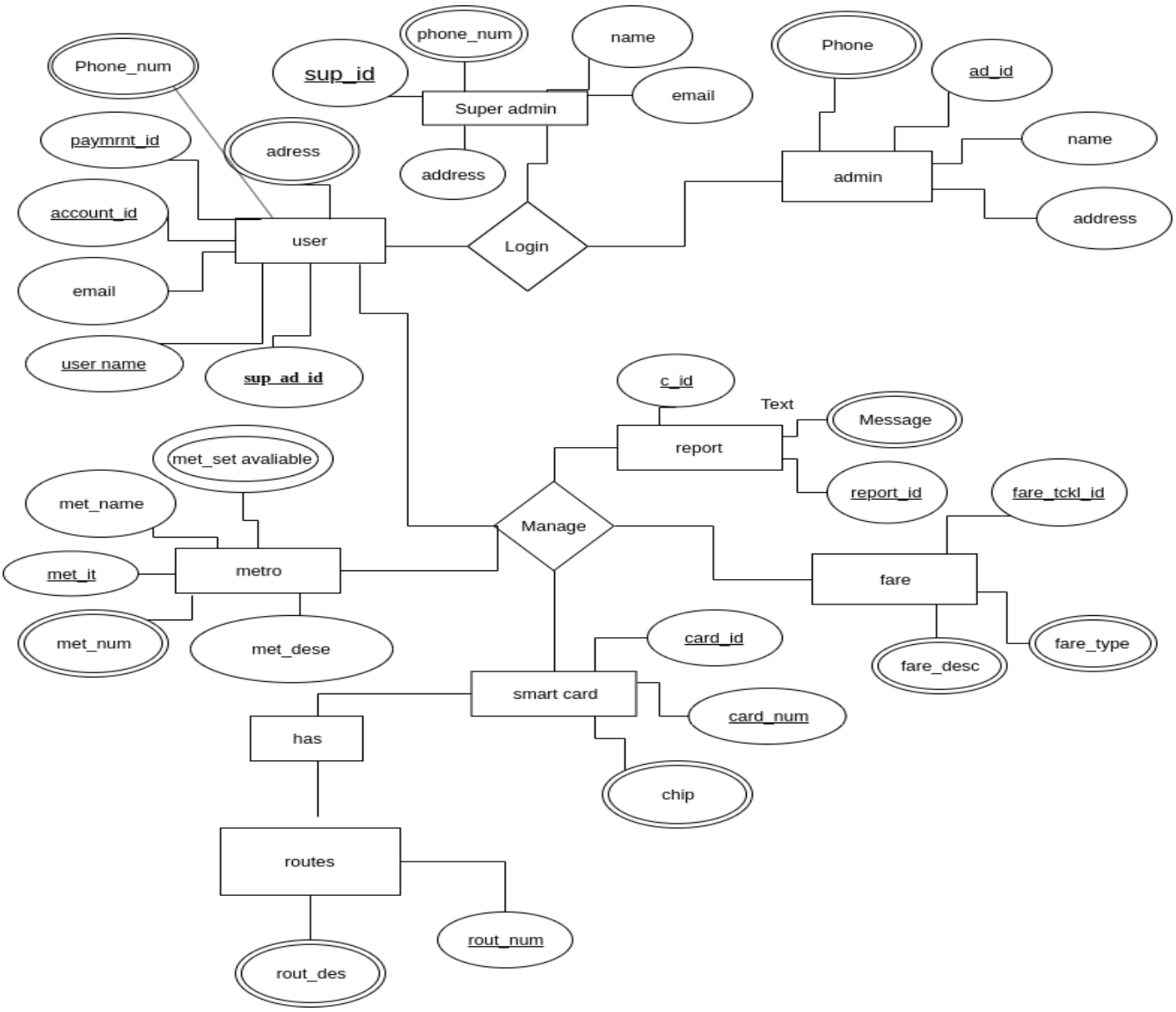


Fig:4.4

CHAPTER 5
DEVELOPMENT

5.1 SOFTWARE DEVELOPMENT LIFE CYCLE:

Some methodologies are sometimes known as software development life cycle(SDLC).Likes

1. *Waterfall*
2. *Prototyping*
3. *Incremental Development*
4. *Iterative Development*
5. *Agile*

Now my project I want to use prototyping model.

5.2 Prototyping model:

A prototype is a version of a system or part of the system that's developed quickly to check the customer's requirements or feasibility of some design decisions.

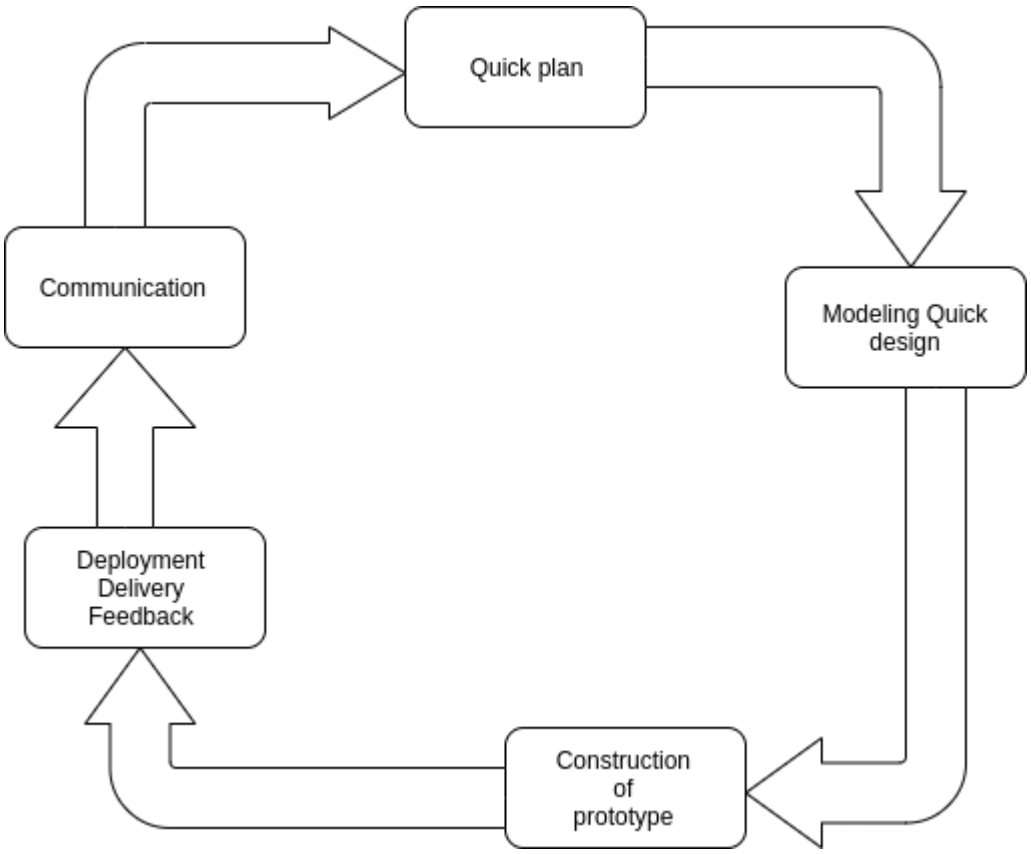
Normally prototyping model is useful when a customer or developer is not sure of the requirements, or of algorithms, efficiency, business rules, response time etc. But in my project I know the requirements clearly but it was a new project so I want to make some demo of it so I can sure about the efficiency,business rules, response time ect.

If a developer developed some features and user can used it and give feedback so it will be better to make a efficient software.

5.3 A software prototype helped:

1. Prototype can help with the elicitation and validation of system requirements.
2. It allows the users to experiment with the system, and so, refine the requirements. They may get new ideas for requirements, and find areas of strength and weakness in the software.
3. The prototype is developed, it may reveal errors and in the requirements. The specification maybe then modified to reflect the changes.
4. In the system design, a prototype can help to carry out deign experiments to check the feasibility of a proposed design.

5.4 Prototyping:



5.5 Why I use prototyping model:

1.**Establish objectives**: The objectives of the prototype should be made explicit from the start of the process. Is it to validate system requirements, or demonstrate feasibility, etc.

2.**Define prototype functionality**: Decide what are the inputs and the expected output from a prototype. To reduce the prototyping costs and accelerate the delivery schedule, you may ignore some functionality, such as response time and memory utilization unless they are relevant to the objective of the prototype.

3.**Develop the prototype**: The initial prototype is developed that includes only user interfaces.

4.**Evaluate the prototype**: Once the users are trained to use the prototype, they then discover requirements errors. Using the feedback both the specifications and the prototype can be improved. If changes are introduced, then a repeat of steps 3 and 4 may be needed.

Prototyping is not a standalone, complete development methodology, but rather an approach to be used in the context of a full methodology (such as incremental, spiral, etc).

So I want to use prototyping model in my project.

CHAPTER 6
PROJECT ROLE

6.1Project Role Identify:

1.Project Manager: Oishi Chowdhury
2.Developer: Md Nahid

3. Developer:Marisha Oishi
4.Testing and maintenance:Arid Rahman

6.2 Responsibility description:

Project Manager: He is responsible for communication with client. He is also responsible for getting exact requirement to build up software. After getting requirement he, starts to design and analysis the system. He also keeps track of the developer if they are doing their projected work in schedule or not. He is accountable for whole software development process along with this he is also responsible for project estimation and project scheduling.

Developer: Software Developers Direct software programming and development of documentation. They monitor functioning of equipment to ensure system operates in conformance with specifications. A typical day for A Software Developer look like this: Manage information technology projects or system activities.

Tester: Software testers are involved in the quality assurance stage of software development and deployment. They conduct automated and manual tests to ensure the software created by developers is fit for purpose and any bugs or issues are removed within a product before it gets deployed to everyday users.

Maintenance: A software developer is also responsible for daily basis software updates and maintenance.

CHAPTER 7
ESTIMATION

7.1 Project Estimation:

Software cost and effort estimation will never be an exact science. Too many variables – human, technical, environmental, political can affect the ultimate cost of software and effort applied to develop it.However, software project estimation can be

transformed from a black art to a series of systematic steps that provide estimation with acceptable risk. To achieve reliable cost and effort estimation, a number of potions arise:

1. Delay estimation until late in the project
2. Base estimation on similar projects that have already been completed
3. use relatively simple decomposition techniques to generate project cost and effort estimates.
4. Use one more empirical models for software cost and effort estimation.

Human estimation:

1. Number of external inputs (EIs): input transactions that update internal computer files
2. Number of external outputs (EOs): transactions where data is output to the user, e.g. printed reports
3. Number of internal logical files (ILFs): group of data that is usually accessed together, e.g. purchase order file
4. Number of external interface files (EIFs): file sharing among different applications to achieve a common goal
5. Number of external inquiries (EQs): transactions that provide information but do not update internal file

7.2In my project :

EIs: password,Id, login/logout (3)

EOs: User information, payment information, timetable (3)

EQs: Connection to database,location track (2)
ILFs: payment information, journey or destination time and distance, ticket price(3)

ETFs ⟶Css, Php,Java(3)

Information domain value	Count	Average	FP
External input(Els)	3	3	9
External output(EOs)	3	4	12
External Inquiries(EQs)	2	3	6

Internal logical files(ILFs)	3	7	21
External interface files (EIFs)	3	5	15
			Total: 63

The value adjustment factor based on response to the question are stated below:

Factor Impact	(0-4)
Backup and recovery	3
Data communications	4
Distributed processing	2
Performance critical	2
Existing operating environment	2
Online data entry	1
Input transaction over multiple screens	3
Master files updated online	4
Information domain values complex	2
Internal processing complex	1
Code designed for re use	0
Conversion /installation in design	3
Multiple installation	1
Application designed for change	2
Total :30	

Now

$$FP = \text{count total } [0.65 + 0.01 \times \sum(Fi)]$$
$$=63 \times \{0.65+(0.01\times 30)\}$$
$$=59.85$$

7.3Resource Estimation:

In this project we will use following things as resources:

1. Pc ($350)
2. Microprocessor($150)

3. Photoshop($50)
4. visual studio ($20)
5. Oracle ($50)
6. Adobe illustrator($100)
7. Internet($100)
8. Rent ($150)
9. Generator($200)

Total resources cost =$1170 per month

7.4Time Estimation:

We used COCOMO model to estimate our necessary time to do this project. Our project is Organic.
So therefore:

Software Project Type	Coefficient <Effort Factor>	P	T
Organic	2.4	1.05	0.38
Semi-detached	3.0	1.12	0.35
Embedded	3.6	1.20	0.32

coefficient=2.4
P=1.05
T=0.38
SLOC=100000
Effort = PM = Coefficient<Effort Factor>*(SLOC/1000)^P
=2.4*(20000/1000)^1.05 = 55.75

Development time = DM = 2.50*(PM)^T
= 2.50*(55.75)^0.38= 11.52 hour

Required number of people = ST = PM/DM
=55.75 / 11.52 = 5

As, we are only 4 member in this project and among them 2 are developer,so it will take around 7 month to develop this project.

7.5Cost Estimation:

Total Resource Cost: $1170
We have 4 employee in this project so their salary:
Developer = (2*500) = $1000
Project Manager = $600
Testing and Maintenance = $500
Total Salary: ($1000 + $600 + $500) = $2100 (per month)
So, Total Cost = ($2100 + $1170) = $3270(per month)

7.6Budget Estimation:

total budget=(Cost +Profit)*month
=($3270+$800)*6
=$24420

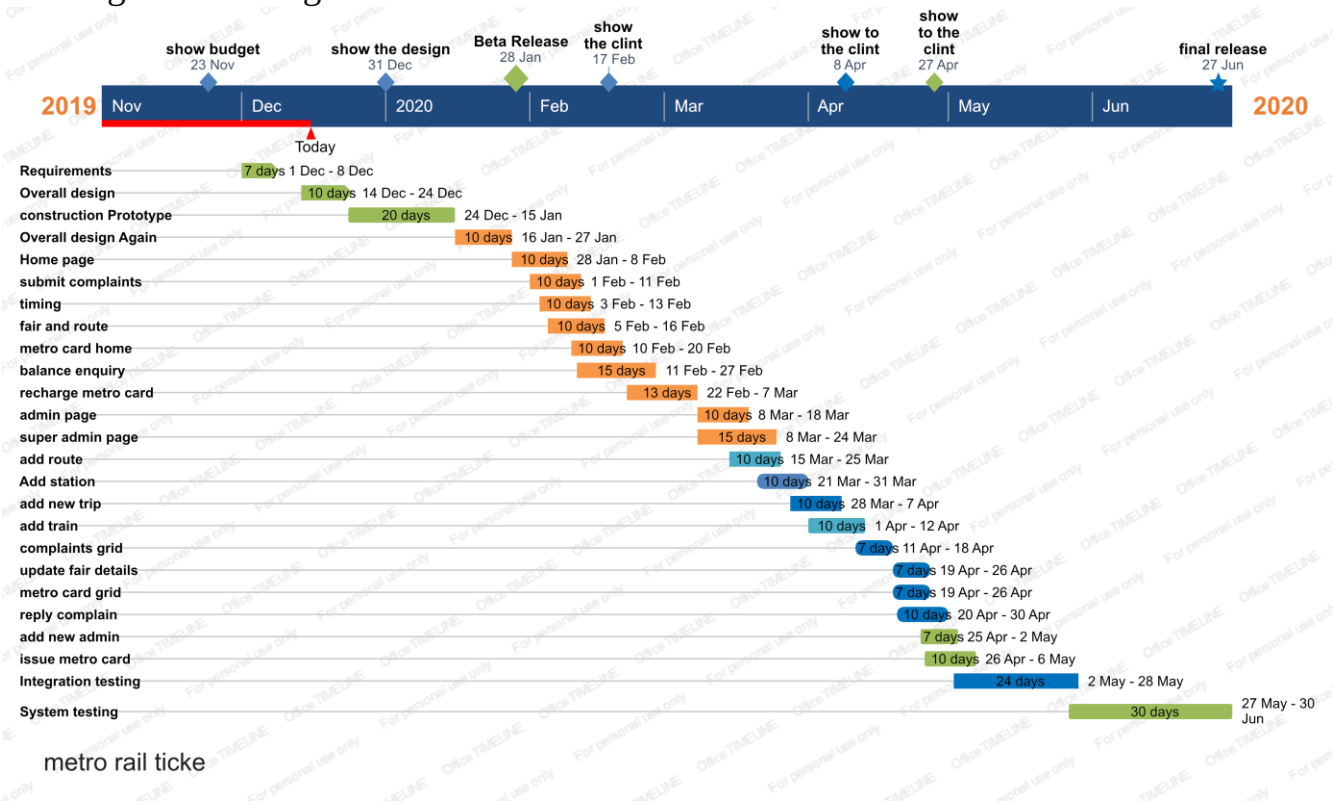
CHAPTER 8
SCHEDULING

8.1Project Scheduling:

As a project manager I have to make a time line chart for fixt the time.

8.2TimeLine Chats :

1: Requirement
2: Overall design
3: Construction prototype
4: Deliver and feedback/Beta release
5: Overall design again
6:Submit Complaints
7: Home page
8: Fair and route
9: Timing
10:Application for metro card
11: Metro card home
12:Balance enquiry
13:Recharge metro card
14:Admin page
15:Super admin page
16:Add route
17:Add station
18:Add new trip
19:Add train
20:Complaints grid
21:Update fair details
22:Metro card grid
23:Reply complaint
24:Add new admin
25:Issue metro card
26:System testing
27: Integration testing



ref:1

CHAPTER 9
RISK MANAGEMENT

9.1Risk Management:

Name	Topic	Probabi…	Impact	Score	Asso
lack of training tool	tools	40	54	2160	
size estimate may be sig…	interfac…	30	62	1860	
less reuse than planned	unexpec…	20	53	1060	
Less number of users th…	harmful	20	29	580	
team member need trai…	not muc…	20	50	1000	
Funding will be lost	Funding…	15	21	315	

ref:2

9.2Risk impact:

RE=(40%*2160)+(30%*1860)+(20%*1060)+(20%*580)+(20%*1000)+(15%*315)

=$1997.5

9.3Risk Reduction Leverage:

$$\text{Risk Reduction Leverage} = \frac{(\text{Risk Exposure Before} - \text{Risk Exposure After})}{\text{Cost of Risk Reduction}}$$

CHAPTER 10
CONCLUSION

The project entitled Metro Rail Ticket Management was completed successfully. The system has been developed with much care and free of errors and at the same time it is efficient and less time consuming.

The purpose of this project was to develop a web application for metro rail management . This project helped us in gaining valuable information and practical knowledge on several topics like designing web pages using html &css, usage of responsive templates, designing of android applications, and management of database using oracle . The entire system is secured.

Also the project helped us understanding about the development phases of a project and software development life cycle. We learned how to test different features of a project. This project has given us great satisfaction in having designed an application which can be implemented to any nearby shops or branded shops selling various kinds of products by simple modifications.

There is a scope for further development in our project to a great extend. A number of features can be added to the system in future like watch me module, each Superadmin having separate permissions.

REFERENCES

1.https://online.officetimeline.com/app/#/file/18ab8152-2cb4-4fad-8188-8c5396867166/gantt-view

2.https://planhammer.io/project/5defd68fedf09d440a836bdd/show/risk