Metro Rail Management System

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***Abstract*—**
The system manages public feedback among services through its complain management system. Thus the system will also be containing an online ticket recharge module where users can recharge their metrocards online through the site .There is also an admin module where admin will be able to add trains, stations and counter. The admin should be a panel consisting of a group of authorized persons.

***Index Terms*—Database Management System, MetroRail, Train, MetroCard, Ticket, Recharge, Complaint, Helpline, Route etc.**

I. Introduction

This is an integrated service which provide all information and services about the metro rail and its routes for public. The proposed system is a web based application which provides information regarding timings, routes. This system manages public feedback about services through its complaint management system. This system also contains an online ticket recharge module where users can recharge their metro cards online through the site. There is also an admin module where admin can add stations, trains, routes. The admin is a panel consisting of a group of authorized persons.

In existing system there are flaws which really makes it an important issue to develop it. Some of the information cannot be collected, processed and communicated more quickly and efficiently. Current working systems doesnt ensure that right information reaches the right person at the right time.

The proposed system is designed to eliminate the disadvantages of the existing system. The proposed system MetroRail Management System is mentioned for tracing the problems in the existing system. Increased efficiency and reliability, easier Access. Easy to use, provide accurate information to the user for taking necessary decisions, accuracy-The information will be correct, accurate and unambiguous, 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, accessibility, usability and understandability, the options used can be easily accessed, used and realized.

The rest of the paper is organized as follows:
Section II presents the related works in MetroRail Management System ,
Section III demonstrates the present scenario while
Section IV describes the features, conceptual design and implementation along with the work flow of our proposed approach.
The over all discussion has been added in Section V.
Section VI discusses the limitation and future expansion of our system. Finally, Section VII concludes the paper.

Message in a metro: building urban rail infrastructure and image in Delhi, India [1]

ER Diagram 1.

Fig. 1: Metro Rail Dhaka

II. Literature Review

Following points should be maintained in this section:

According to Sreedharan (2002), Indian cities and their residents have had little experience with metro or commuter rail systems. While cities such as Mumbai and Chennai have urban mass rapid transit systems, the only direct experience with metro development that

the country does have is in Calcutta, which has been plagued by safety concerns, stifling traffic tieups during construction, and low ridership. Focusing specifically on Delhi, the historical lack of an effective urban commuter rail system has meant that nearly all mobility for the citys inhabitants has been road based (Chopra, 1994). This has created an increasingly chaotic traffic situation. On any given road (including major highways), cars, trucks, buses, motorcycles and mopeds compete for space with three wheeled autorickshaws, bicycle rickshaws, horsedrawn carriages, donkeydrawn wagons, humanpulled carts and pedestrians. Not surprisingly, this state of affairs has resulted in extreme congestion, road accidents and air and noise pollution.[1]
We borrowed some concepts from this project to implement our system.
In Bangladesh, Metro Rail is being constructed for the first time. There is no existing metro rail database system now.

Advantages : Efficiency - Information can be collected, processed and communicated more quickly and efficiently. Systems en- sure that right information reaches the right person at the right time.
Disadvantages : No message system among staff is not added in this system. Metro Card recharge system is not online base.

III. Present System

In Bangladesh, Metro Rail is being constructed for the first time. There is no existing metro rail database system now. But we are working on an existing metro rail management system in India. The system is not fully functional or automated. The system is also web based like ours. But in the present system, data redundancy is seen in the database. Also there is no different log in panel for different types of authorized staffs. All the management system is not online based. Staffs can't manage the whole system through the website. It is mainly focused on public benefits like ticket purchasing, recharging smart card online etc.

IV. Proposed System

The proposed system is designed to eliminate the disadvantages of the existing system.The proposed system Metro Rail Management System is mentioned for tracing the problems in the existing system :-

- Increased efficiency and reliability,
- Easier Access.
- Easy to use
- Provide accurate information to the user for taking necessary decisions.
- 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.
- Accessibility, Usability and Understandability
- The options used can be easily accessed, used and realized.

A. Conceptual Design

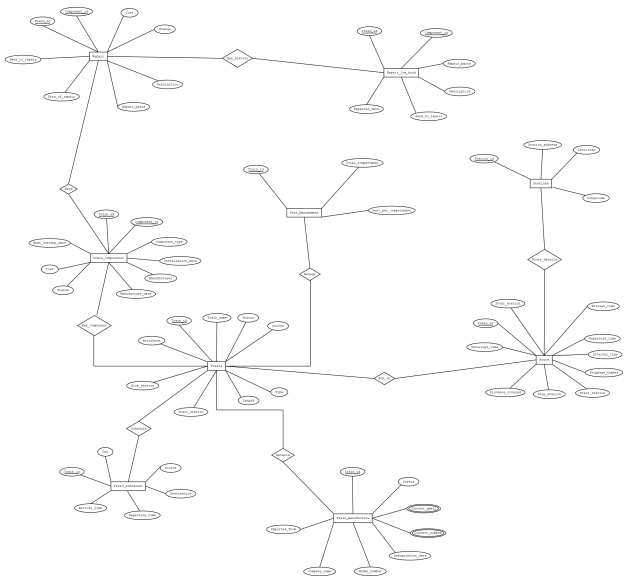

Fig. 2: Trains Module

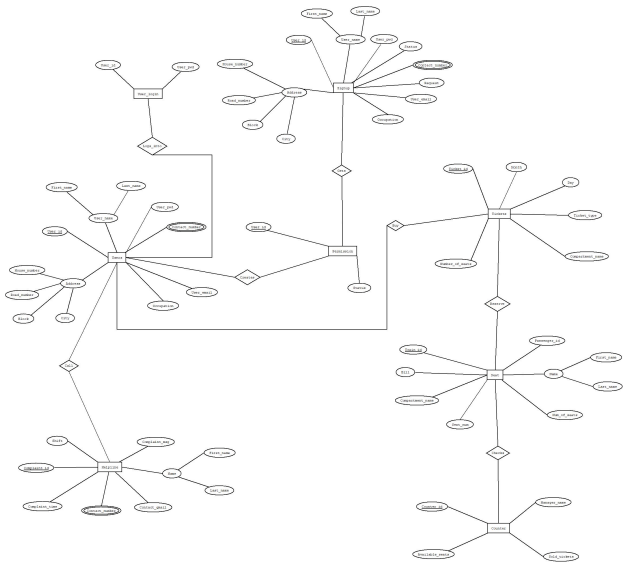

Fig. 3: User Login Module

B. Development of the System

HOMEPAGE

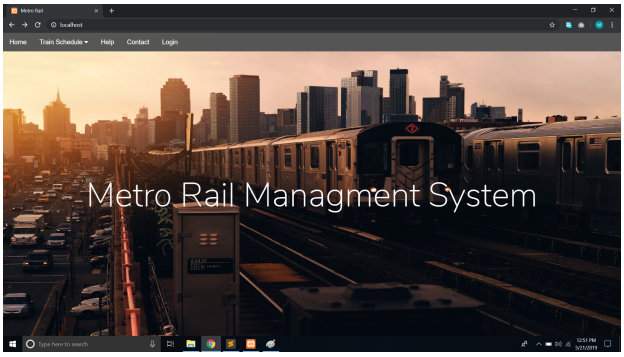

Fig. 4: Homepage

REGISTER COMPLAINT

Description of Feature: This feature allows users to file complaints through the site. The user does not require a registration. He can give his name, email-id, phone number, address and other details along with the complaints. The admin will reply to the complaints sent by user.

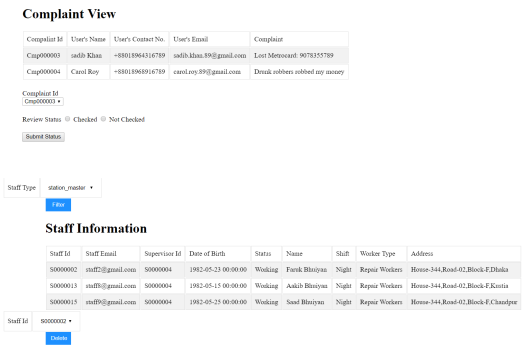

Fig. 5: Complaint Management

Functional Requirements:

- System must be able to verify information.
- System must be able to store the information in database.
- System must be able to retrieve information when required by admin.

METRO CARD

Description of Feature: 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 password and can recharge their tickets online. It also allows them to view their balance and journey history.

Functional Requirements:

- User id is provided when they register.
- The system must be able to show the users balance and journey history.
- The user must be able to logout after they had finished recharging or after viewing the balance or journey history.

FAIR AND ROUTEMAP

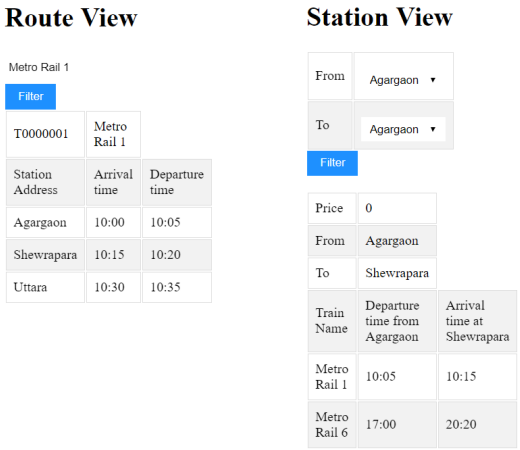

Fig. 6: Train Schedule

Description of Feature: This feature allows the 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.

Functional Requirements:

- System must allow the users to enter the source and destination stations.
- System must be able to retrieve information from the database.

ADMIN

Description of Feature: This feature allows the admin to view and reply to complaints. Admin can add stations, routes ,train, trip.[2] Admin can also add and update fair details, and even add a new admin. Actually, the admin is a panel consisting of a group of authorized persons.

Functional Requirements:

- The system must allow admin to add train, stations, routes, fair, metro timetable and even add a new admin.
- The system must also allow admin to reply to the complaints send by the user.
- The system should be designed in such a way that only authorized people should be allowed to access some particular modules.
- The records should be modified by only administrators and no one else.

MESSAGE AMONG STAFFS

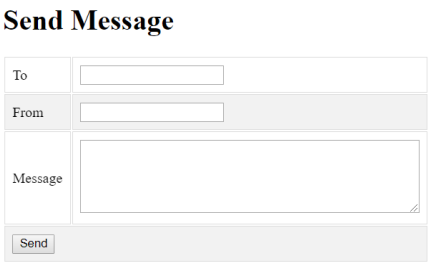

Fig. 7: Message passing among staffs

Description of Feature: This feature allows the staffs to send messages to other staffs. Their chat messages will be stored in database.

BUY TICKETS

Description of Feature: This feature allows only the registered users to buy tickets from the website. Users can buy maximum 6 tickets at a time.

Functional Requirements:

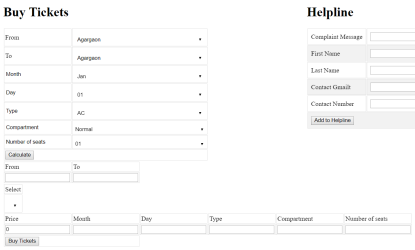

Fig. 8: Ticket purchasing system

- The system must also allow only the registered users to buy tickets online.
- The system must show the description of the ticket buy details of a user.
- Ticket purchasing details must be stored in the system database.

C. System Requirement

OS Version : Windows 7/10, Ubuntu 16.04/18.04

Front End : HTML, CSS , Laravel.

HTML (Hyper Text Markup Language): HTML is a syntax used to format a text document on the web.

CSS (Cascading Style Sheets): CSS is a style sheet language used for describing the look and formatting of a document written in a markup language.

Laravel: Laravel is a free, open-source PHP web framework, created by Taylor Otwell and intended for the development of web applications following the modelviewcontroller (MVC) architectural pattern and based on Symfony.

TABLE I: Trains Table

	Name	Type
1	Train id	VARCHAR2(12)
2	Train name	VARCHAR2(20)
3	Capacity	NUMERIC
4	Status	VARCHAR2(12)
5	Driver	VARCHAR2(50)
6	Length	NUMERIC
7	Start station	VARCHAR2(12)
8	Stop station	VARCHAR2(12)
9	Type	VARCHAR2(12)

TABLE II: Route Table

	Name	Type
1	Train id	VARCHAR2(12)
2	Station id	VARCHAR2(20)
3	Arrival time	VARCHAR2(20)
4	Departure time	VARCHAR2(20)

TABLE III: Users Table

	Name	Type
1	User id	VARCHAR2(12)
2	First name	VARCHAR2(20)
3	Last name	VARCHAR2(20)
4	User pwd	VARCHAR2(12)
5	Contact num	VARCHAR2(11)
6	Email	VARCHAR2(50)
7	Occupation	VARCHAR2(20)
8	Address	VARCHAR2(100)

TABLE IV: Helpline Table

	Name	Type
1	Complaint id	VARCHAR2(12)
2	Shift	VARCHAR2(20)
3	Complaint msg	VARCHAR2(200)
4	First name	VARCHAR2(20)
5	Last name	VARCHAR2(20)
6	Email	VARCHAR2(50)
7	Contact number	VARCHAR2(11)
8	Complaint time	TIMESTAMP(0)

TABLE V: Users Table

	Name	Type
1	User id	VARCHAR2(12)
2	First name	VARCHAR2(20)
3	Last name	VARCHAR2(20)
4	User pwd	VARCHAR2(12)
5	Contact num	VARCHAR2(11)
6	Email	VARCHAR2(50)
7	Occupation	VARCHAR2(20)
8	Address	VARCHAR2(100)

TABLE VI: Staff Table

	Name	Type
1	Staff id	VARCHAR2(12)
2	Supervisor id	VARCHAR2(20)
3	DOB	DATE
4	First name	VARCHAR2(20)
5	Last name	VARCHAR2(20)
6	Status	VARCHAR2(50)
7	Type	VARCHAR2(11)
8	Address	VARCHAR2(50)
9	Balance	NUMERIC

Back End : Oracle 11g.
Orcale : Oracle Database (commonly referred to as Oracle RDBMS or simply as Oracle) is a proprietary multi-model database management system produced and marketed by Oracle Corporation.

V. Discussion

We have tried to develop a user friendly website for common users. Beside this managements like staff managing,users login,complaint handling,routing,train managements etc have been implemented.We will be looking forward to future developments.

VI. Limitations and Future Expansion

All the tables are not implemented in the front end. Update function for every table has not added yet. We worked on just 2 tables for update operation. As it is a govt website, other govt websites have not integrated yet for user verification part. Only some data are collected for demo test. Deletion of table data is not implemented in front end.
In future, log in system for all the staffs will be added, whole metro rail management system will be controlled online, message passing among staffs will be improved, update deletion on each table will be added etc.

VII. Conclusion

The project entitled Metro Rail Management Online 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 laravel 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. 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 admin having separate permissions.

References

[1] M. Siemiatycki, "Message in a metro: building urban rail infrastructure and image in delhi, india," *International journal of urban and regional research*, vol. 30, no. 2, pp. 277–292, 2006.