

FINDING ACCIDENT PRONE AREAS OF BANGLADESH

BY

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This Report Presented in Partial Fulfillment of the Requirements for the
Degree of Bachelor of Science in Computer Science and Engineering

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APPROVAL

This Project titled “**Finding Accident Prone Areas of Bangladesh**”, submitted by Niloy Sarker, ID No: 161-15-7372 to the Department of Computer Science and Engineering, Daffodil International University has been accepted as satisfactory for the partial fulfillment of the requirements for the degree of B.Sc. in Computer Science and Engineering and approved as to its style and contents. The presentation has been held on 7th December, 2019.

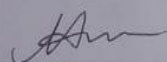
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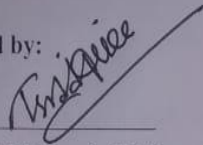
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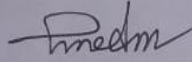
I hereby declare that this project has been done by us under the supervision of **Mr. Shah Md Tanvir Siddiquee**, Assistant Professor, Department of CSE Daffodil International University. We also declare that neither this project nor any part of this project has been submitted elsewhere for award of any degree or diploma.

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ABSTRACT

This report is intended for the people of Bangladesh, to know about the accident-prone areas of Bangladesh when they travel from one place to another place. There has been a fearful increment in road accidents, mostly highway accidents, in Bangladesh over the past few years. According to a study guided by the Accident Research Centre (ARC) of BUET, road accidents assertion on average 12,000 lives annually and lead to about 35,000 injuries. Here, people will see the accidental areas as a pointer marker in the google map. Those areas will be shown in the google map when they give the input of the source as, from where they are starting their journey and destination as, where they are ending their journey. They can search for those accidental areas from the website, as well as find those areas using an android app. People will get to know the details of the accident statistics for those areas. The name of the region will be shown as yellow, red or black color in-order to provide information on the severity of the accident in that area. Yellow color will be shown for slight severity, the red color will be for serious severity and black color will be for fatal severity.

TABLE OF CONTENTS

CONTENTS	PAGE
Board of examiners	i
Declaration	ii
Acknowledgment	iii
Abstract	iv
List of Tables	viii
List of Figures	ix
CHAPTER	
CHAPTER 1: INTRODUCTION	1-4
1.1 Introduction	1
1.2 Motivation	1-2
1.3 Rationale of the study	2
1.4 Research Questions	2-3
1.5 Expected Outcome	3
1.6 Report Layout	3-4
CHAPTER 2: BACKGROUND	5-9
2.1 Introduction	5
2.2 Different kinds of accidents in Bangladesh	5-7
2.3 Related Works	7-8
2.4 Research Summary	8
2.5 Scope of Problem	8-9
2.6 Challenges	9

CHAPTER 3: RESEARCH METHODOLOGY	10-18
3.1 Introduction	10
3.2 Research Subject and Instrumentation	11-17
3.2.1 Source and Destination	11-12
3.2.2 Matching the source and destination with database	13
3.2.3 System taking latitude, longitude, area name, accidental statistics, distance from the source and incident severity	13-14
3.2.4 Admin login	14-15
3.2.5 Admin home page	15-16
3.2.6 Admin add routes	16
3.2.7 Admin add points	17
3.3 Data Collection Procedure	17
3.4 Statistical Analysis	17
3.5 Implementation Requirements	18
CHAPTER 4: EXPERIMENTAL RESULTS AND DISCUSSION	19-22
4.1 Introduction	19
4.2 Experimental Results	19
4.3 Descriptive Analysis	19-22
4.3.1 Web-based experimental result	19-20
4.3.2 Android mobile application experimental result	20-22
4.4 Summary	22
CHAPTER 5: SUMMARY, CONCLUSION, RECOMMENDATION, AND IMPLICATION FOR FUTURE RESEARCH	23-24
5.1 Summary of the Study	23
5.2 Conclusions	23-24

5.3 Recommendations	24
5.4 Implications for further research	24
REFERENCES	25
APPENDICES	26
APPENDIX A: RESEARCH REFLECTION	26
APPENDIX B: RELATED ISSUES	26
PLAGIARISM	

LIST OF FIGURES

FIGURES	PAGE NO
Fig 2.2.1: Real scenario of Truck vs Car road accident on the spot	6
Fig 2.2.2: Real scenario of Bus vs Truck road accident on the spot	6
Fig 2.2.3: Real scenario of road accident a car fell down in beside the road	7
Fig 3.1: Proposed working procedure	10
Fig 3.2.1.1 Web application GUI	11
Fig 3.2.1.2 Web application Search in Map	12
Fig 3.2.1.3 Android Search GUI	12
Fig 3.2.2 Matching with database	13
Fig 3.2.3 Taking different data from database	14
Fig 3.2.4.1 Admin login	14
Fig 3.2.4.2 Admin login data checking from database	15
Fig 3.2.5.1 Admin Home Page	15
Fig 3.2.5.2 Admin Home Page with logout	16
Fig 3.2.6 Add new route	16
Fig 3.2.7 Add new points	17
Fig 4.3.1.1 In Web Google Map showing the latitude and longitude of different areas	20
Fig 4.3.1.2 Web view of accidental statistics of different areas	20
Fig 4.3.2.1 In Android Google Map showing the latitude and longitude of different areas	21
Fig 4.3.2.2 Accidental statistics of different areas in the Android App	22

LIST OF TABLES

TABLES

PAGE NO

Table 2.4.1 Comparisons among these web accidental areas find out application

8

CHAPTER 1

INTRODUCTION

1.1 Introduction

This project-based thesis presents a new way of finding road accident-prone areas of Bangladesh from a qualitative research study. Nearly 1.3 million people die on the world's roads each year [1]. In Bangladesh, road accidents are a major mass concern resulting in over 21000 fatalities each year. These road accidents took place on various highways, national, inter-district and regional roads across the country [2]. According to World Bank statistics, the annual fatality rate from road accidents is formed to be 85.6 fatalities per 10,000 vehicles [3]. According to a WB report, only 40% of the main roads (National Highways and the Zila Roads) are in good state [3]. Hence, the roads in Bangladesh have become deadly [3].

1.2 Motivation

In Bangladesh, daily 20 people being killed on average due to road accidents based on 2018 road accident statistics. It is increasing day by day. There are many causes of accidents. Some of them are:

1. Mental, physical and financial pressures on drivers.
2. General lack of road safety awareness.
3. Reckless driving.
4. Unfit vehicles.
5. Untrained drivers.
6. Faulty road design.
7. Poor traffic management.

The main reason for these road accidents besides all other major reasons is that, the lack of knowledge for general people and as well as drivers of different vehicles, that they do not know which are the most accidental areas and where they have to drive very carefully. If the general people can know the accidental areas between their starting area of journey and their destination, they will be able to be more careful. Besides that, they can also inform the drivers to drive carefully while passing those accidental areas. That idea came to my mind to help common people like us to know about those accidental areas before they start their journey. It motivates me to do this

research about this topic and come to end up with a project that will help all people of Bangladesh.

1.3 Rationale of the Study

Road accident is a serious issue that is gradually increasing as the government knows that they have to take steps to decrease these accidents. Many researchers have tried to find the most efficient way to trace the accidental areas of all over Bangladesh, statistics of those accidents and the reasons for those accidents. There are some research paper, journal, and article that gives the details of those accidents happened all over Bangladesh. Besides that, Passenger Welfare Association, Bangladesh also keeps the data for every year's accident. But there is no web application and android application for general people of Bangladesh to know about accidental areas of different routes, accidental statistics of those accidental areas and the distance of those areas from the user's current location. The problem is that most of the people in our country do not follow the research papers, journal or any kind of article. That's why though there are data of accidents the common people can not know which are accidental areas, statistics of those accidents. The researchers working on different projects and research based on road accident topic but no one still now make a web and android application for this most important topic.

1.4 Research Questions

- RQ 1. Where accidents occur?
- RQ 2. When accidents occur?
- RQ 3. What was the result of the collision?
- RQ 4. Who-was involved?

Descriptions:

RQ 1. Where (Location) – describes the detailed location of the accident preferably happened. Other locational information such as the area's name.

RQ 2. When (Time) – relates to:

- The time of the day.
- Day of the month.
- Year.

RQ 3. What (Kind of accidents): Outcome of accidents: Deaths, injuries.

RQ 4. Who (Vehicle, Passenger):

- Vehicle: Car, Bus, Truck, Motorcycle, etc.
- Passenger: Age, Sex.

1.5 Expected Outcome

In this research, I tried to find a greater way to help the users to find out the accident-prone areas of Bangladesh and provide them the accidental statistics of that area that they searched. I implemented an ingenious web and android application to find out the projected proposition. The fundamental objective of these applications is to find the accident-prone areas of Bangladesh for the route provided by the users. These applications also have some additional options for the users. That is:

- The accidental statistics of the areas for different routes.
- The user can also know the incident severity of that area.

1.6 Report Layout

Chapter 1: Introduction

I have introduced my research topic, the motivation of this research, the rationale of the study, the questions raised before starting the research and the expected output of the research. This chapter also has the report layout.

Chapter 2: Background

This chapter contains an introduction, the works related to this research and a summary of the analysis of those related works. It also contains the scope and challenges we could face to implement this research.

Chapter 3: Research Methodology

In this chapter, I have an introduction to our research subject and instruments. Here I showed how I collected the data and also the statistical analysis of the collected data. These things I needed to complete the research and described here.

Chapter 4: Experimental results and discussion

Here, I have the results of testing my web and android application and the descriptive analysis of the results.

Chapter 5: Summary, conclusion, recommendation, and implication for future research.

In this chapter, I have the summary and conclusion of the research study. I have also some recommendations and suggestions for further study of this research.

CHAPTER 2

BACKGROUND

2.1 Introduction

Road accident is the most alarming issue in Bangladesh. Roads and Highways are more submissive to road accidents in Bangladesh. The number of road accidents increases on the eve of festivals. Different researchers used different ways to detect accidental areas, accidental statistics and accidental occurrence reasons for Bangladesh. To make an efficient way to trace the accidental areas, accidental statistics, reasons behind the accident and provide details of the accident in time, the researchers are working uninterruptedly. Many of the research are already published and did quite well to provide accidental statistics, reasons for accidents to the people of Bangladesh.

The government has also taken some innovative steps to decrease the accident in our country. Besides that, The Honorable Prime Minister of the People's Republic of Bangladesh in her first address to the nation declared to establish an Accident Research Centre in mitigating the accident problem in the country [4]. Proposed Accident research started its activities in January 2002. At its inception activities were managed at the Traffic Engineering and Safety Research Centre of transportation and Traffic Engineering Division of the Civil Engineering Department, BUET [4].

2.2 Different kind of accidents in Bangladesh

On roads, 41.53 percent of the incidents involved vehicles running over people, 16.18 percent of vehicles falling into ditches and 29.72 percent of collisions. There are many kinds of accidents happened in every day. Some of them are:

1. Bus vs Bus.
2. Bus vs Trucks.
3. Bus vs Motorcycle
4. Bus vs Small vehicle.
5. Truck vs Truck.
6. Truck vs Motorcycle.
7. Truck vs Small vehicle.
8. Bus vs Car.

9. Truck vs Car.

10. Car vs Motorcycle, etc.



Fig 2.2.1: Real scenario of Truck vs Car road accident on the spot



Fig 2.2.2: Real scenario of Bus vs Truck road accident on the spot



Fig 2.2.3: Real scenario of road accident a car fell down in beside the road

2.3 Related Works

Many researchers have already given different and efficient approaches to collect data on accidental areas. There is a web-based application already available but that is not for our country. That web application is for people of the United Kingdom. Those developers have applied different formulas to find the accidental areas, the incident severity, and the accidental statistics of those areas.

The Crash Map UK takes an input of area name from users and matches them with the area name from the database. This application finds out the incident severity of that area as well as which are the accidental areas nearby of that given area name and also shows the statistics of those accidental areas accidental statistics. Besides that, they also show the casualty types of those areas, as like Pedal cycle casualty, Child casualty, Motorcycle casualty, and Pedestrian casualty [5]. They also show the results for different types of vehicles like Pedal Cycle, Motorcycle, Car, Goods vehicle, Bus, and Young driver [5].

The Collision Map UK is the UK's foremost supplier of computer mapping (GIS) software for traffic and highway applications. Their software and services are used by almost every highway authority in the UK and by the central government [6]. This map includes injury-related collisions reported to/recorded by the police. This data, known as STATS19, is collected by police at the scene of an accident or maybe reported by a member of the public [6]. While not every injury collision is

reported to the police, this dataset together with that of other police forces is the most reliable source of information on road casualties [6].

2.4 Research Summary

After using the different web applications, there are some recognized web applications that can successfully locate the accidental areas, the accidental statistics, and the incident severity. But these applications do not work for our country. So, this is the reason, I wanted to do this project for my country people.

Table 2.4.1 Comparisons among these web accidental areas find out application

Application	Area distance from Source	Incident Severity	Accidental Statistics	Android Application	Available in Bangladesh	Use of Google Map
Crash Map UK[7]	N	Y	Y	N	N	N
Collision Map UK[8]	N	Y	Y	N	N	N
Crash Alert BD (My Method)	Y	Y	Y	Y	Y	Y

2.5 Scope of the Problem

My proposed system mostly relies on the input of the area name provided by the users. The provided area name will be evaluated. A result will be created by the system. If the given area names exist in the database, the system will look for the name of the area then it will find the accidental statistics, incident severity, and distance from the source in the database. So, the whole system depends on the data that is the area name. Data mining has some great opportunities in the research area. Finding an accidental area from the data is just the primary research area of data mining. This process can be used in different fields. To find out the accidental areas, the system needs the data of that given area and the details of those areas like distance

from the source, incident severity, and the accidental statistics of those areas in the system database. If this system works for the accidental area of Different divisions, the system can be used for different districts, sub-district and so on.

2.6 Challenges

Accidental area identifications by data mining has been relatively widely held throughout the world because it is comparatively easier process. It can reduce accidents all over Bangladesh significantly. But due to its dependency on the data that is area name provided by the users, it has some difficulties perform correctly. The most concerning matter about this application is that the user has to turn on the internet while using it which means the user can not take the advantages of these applications without the internet. For using mobile android application users have to give permission of the GPS to the app for the very first time but they do not need to turn on the GPS for further use of this application in the mobile. Besides that, if the area name provided by the user does not exist in the database the user can not find the details of accidental area name, accidental statistics, incident severity and the distance of those areas from the source of that given route. So, the system cannot give any details of that route if it cannot found the area name in the database.

CHAPTER 3

RESEARCH METHODOLOGY

3.1 Introduction

To find the details of the accidental area of the route given by the user, the database has to contain the area name as their source or as their destination in the route table list. Fig 3.1 shows the details work of the system. Here in this thesis to overcome my problem HTML, CSS, PHP, JAVASCRIPT, MySQL, and JAVA is used as communication language among all operations, software, and platform. Fig 3.1 shows the path of the journey regarding this research.

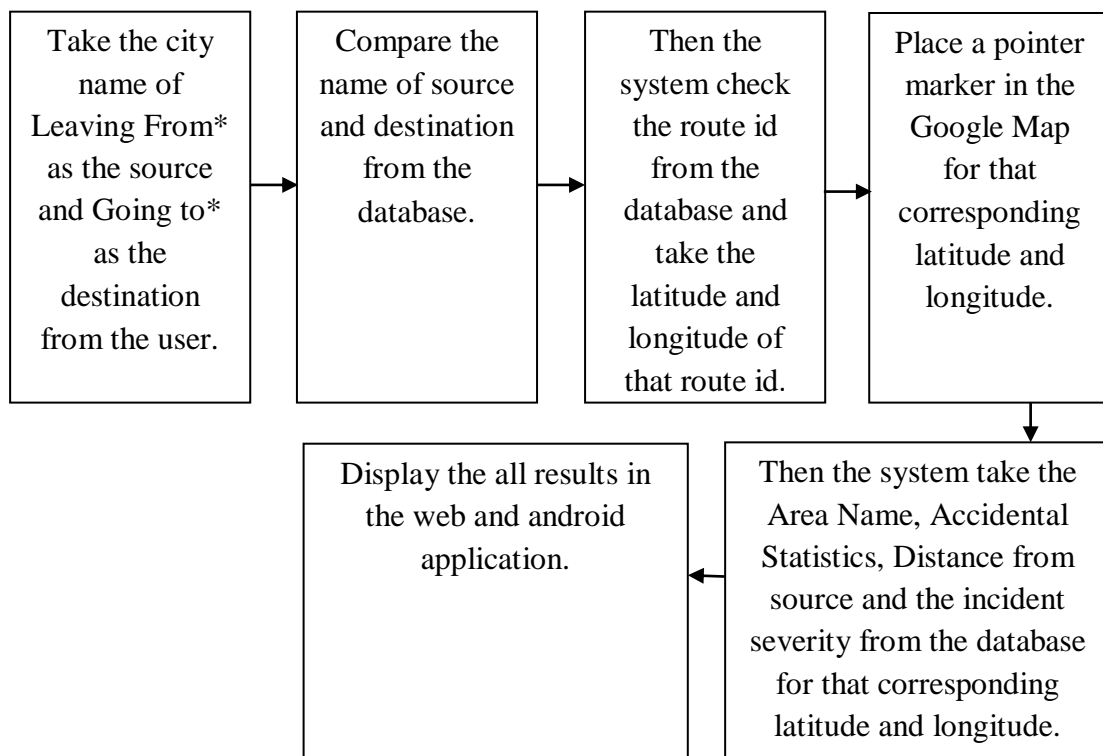


Fig 3.1: Proposed working procedure

3.2 Research Subject and Instrumentation

Processing the provided city name correctly the city name should be correctly spelled. I have collected my desired dataset from different papers, e-paper, conference papers, journals, online news portals, different facebook groups, google form and as well as from Bangladesh Road Transport Authority. The process, I followed to find the accidental area data from the database are discussed below.

3.2.1 Source and Destination

In this part, the system takes the input of the city name for Leaving From* as the source and the city name for Going To* as the destination from the user. That means the user giving the route of his journey to the system.

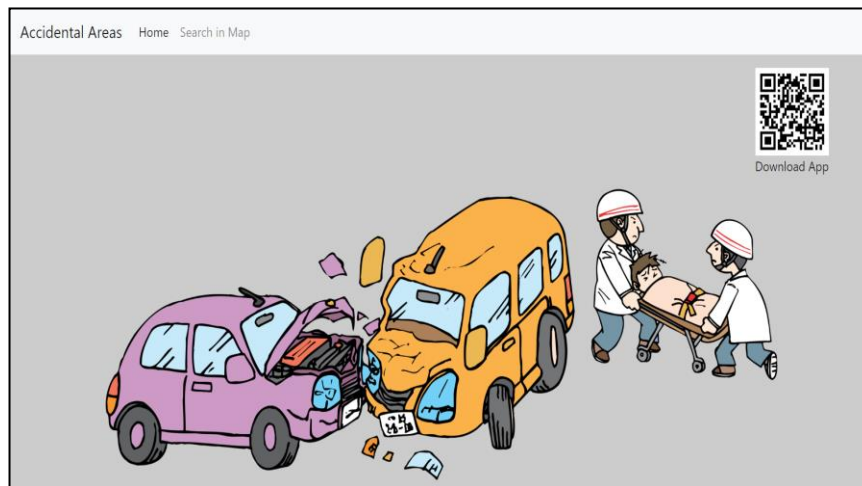


Fig 3.2.1.1 Web application GUI

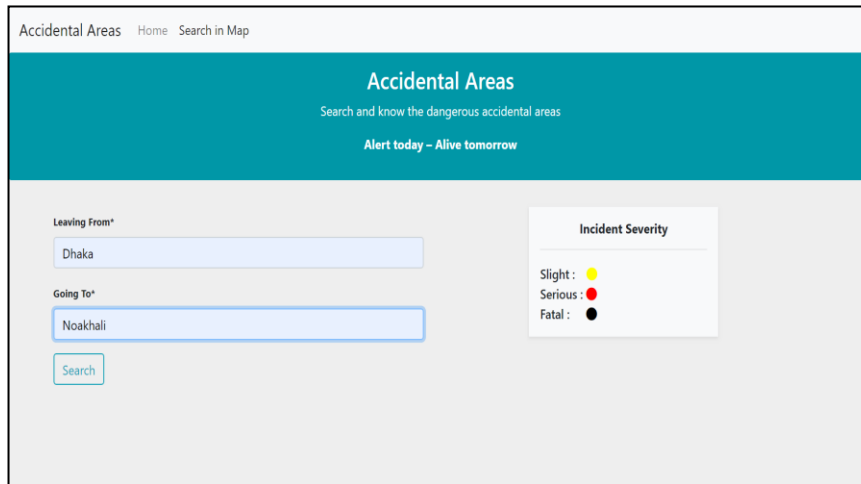


Fig 3.2.1.2 Web application Search in Map

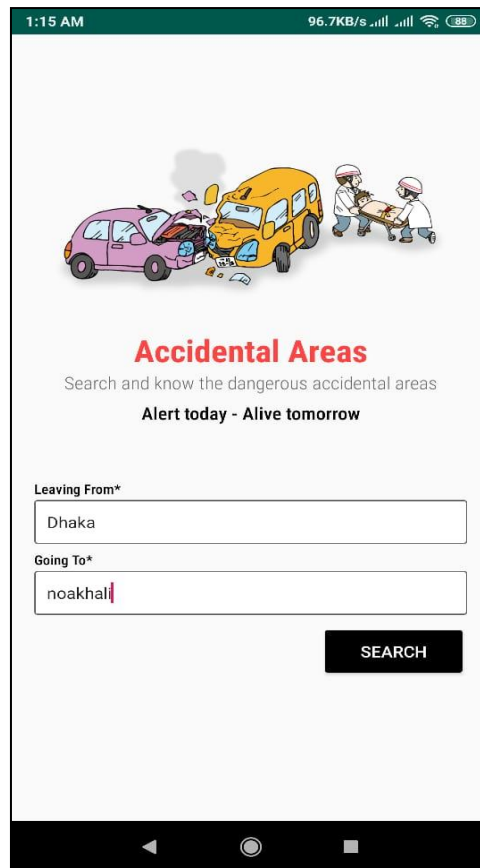


Fig 3.2.1.3 Android Search GUI

3.2.2 Matching the source and destination with database

After taking the name of the source and destination, here system checking the name of the city from the database.

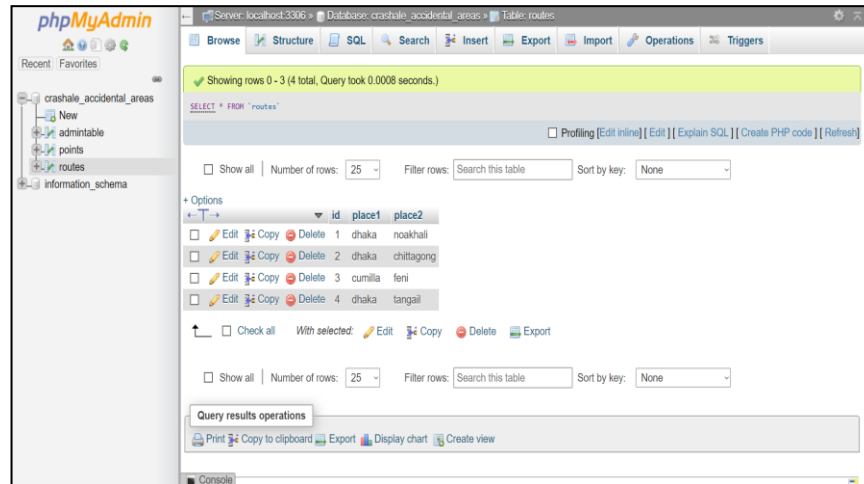


Fig 3.2.2 Matching with database

3.2.3 System taking latitude, longitude, area name, accidental statistics, distance from source and incident severity from database

After getting the source and destination as place1 and place2 the system takes the route id of that route then it takes the different latitude and longitude of those accidental areas that are included in that route id for that particular route. After that, the system will take the area name, accidental statistics, distance from the source and incident severity sequentially.

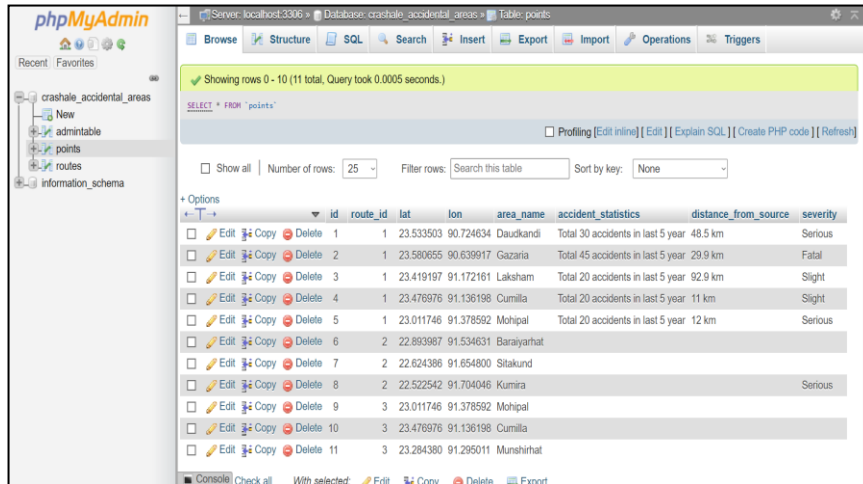


Fig 3.2.3 Taking different data from database

3.2.4 Admin Login

Here, is the web view of the admin login page for the admin control panel. The system will match the user name and the password from the database.

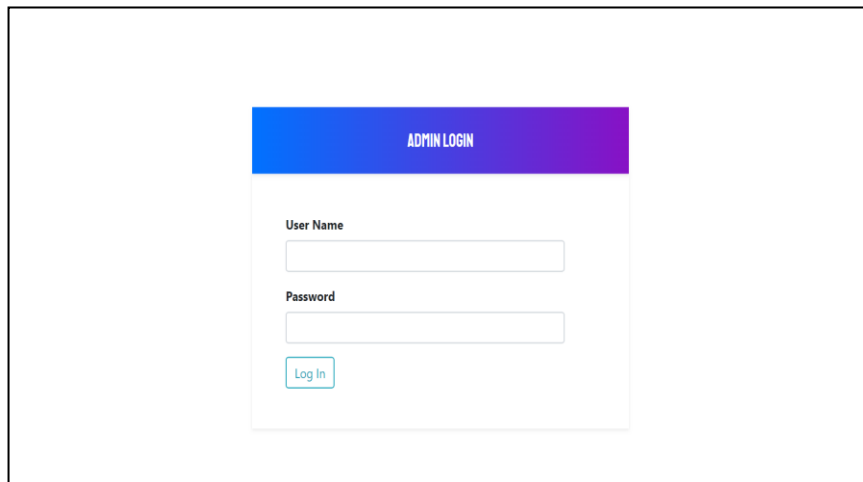


Fig 3.2.4.1 Admin login

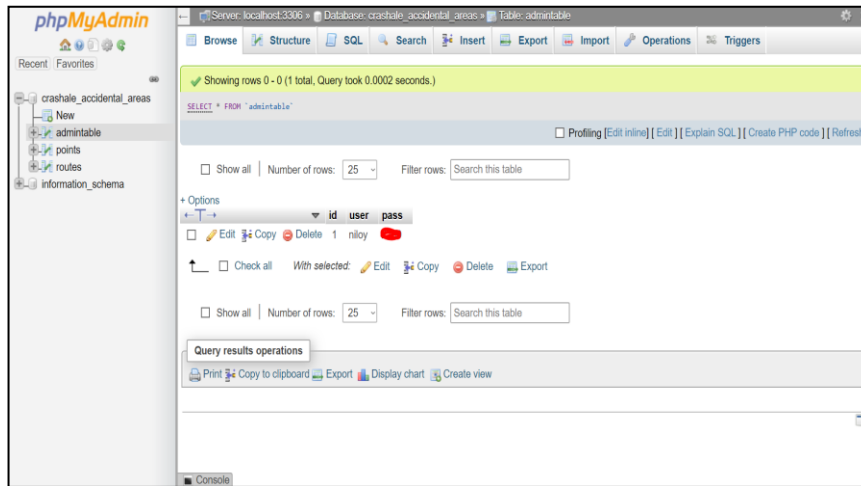


Fig 3.2.4.2 Admin login data checking from database

3.2.5 Admin Home Page

Here, is the web view of the admin control page. Where admin can add the new data And can also see the previous data that he entered. Here admin can also get log out from the admin page after inserting the new data.

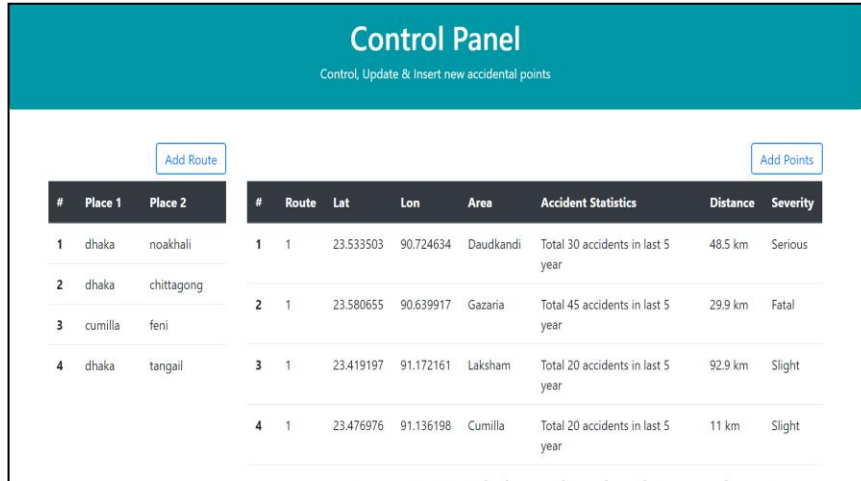


Fig 3.2.5.1 Admin Home Page

4	dhaka	tangail	3	1	23.419197	91.172161	Laksham	Total 20 accidents in last 5 year	92.9 km	Slight
4			4	1	23.476976	91.136198	Cumilla	Total 20 accidents in last 5 year	11 km	Slight
5			5	1	23.011746	91.378592	Mohipal	Total 20 accidents in last 5 year	12 km	Serious
6			6	2	22.893987	91.534631	Baraiyarhat			
7			7	2	22.624386	91.654800	Sitakund			
8			8	2	22.522542	91.704046	Kumira			Serious
9			9	3	23.011746	91.378592	Mohipal			
10			10	3	23.476976	91.136198	Cumilla			
11			11	3	23.284380	91.295011	Munshirhat			

[Logout](#)

Fig 3.2.5.2 Admin Home Page with logout

3.2.6 Admin Add Routes

The web view of the admin control panel. Here the admin can add new routes to the database.

The screenshot shows a modal window titled "Add New Route" with a close button (X). Inside the modal, there are two required text input fields labeled "Place 1 *" and "Place 2 *". Below the inputs are two buttons: "Close" and "Add". The background is a blurred view of the admin dashboard, showing a table with columns: #, Place 1, Place 2, #, Statistics, Distance, and Severity. The table contains several rows of route data, including entries for dhaka, tangail, Laksham, Cumilla, Mohipal, Baraiyarhat, Sitakund, Kumira, and Munshirhat.

Fig 3.2.6 Add new route

3.2.7 Admin Add Points

The web view of the admin control panel. Here the admin can add new points for different routes to the database.

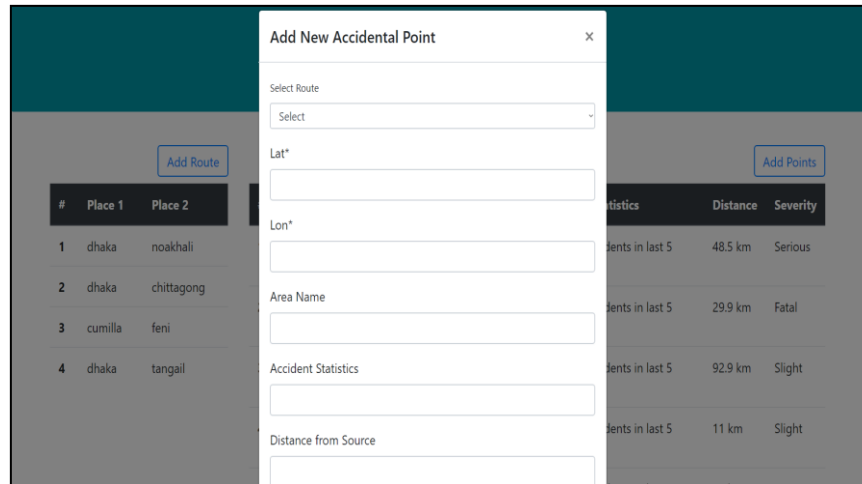


Fig 3.2.7 Add new points

3.3 Data Collection Procedure

Required data for my dataset is collected from different papers, e-paper, conference papers, journals, online news portals, different facebook groups, google form and as well as from Bangladesh Road Transport Authority[8]. After collecting all the data, I insert the data into the database.

3.4 Statistical Analysis

Through my data analysis, I have come to realize that my system is obtained 100% validation accuracy in every step for giving results to the users for their given route. To calculate the accuracy of giving results of different data for a particular route, I give the wrong spelled city name in the input but the system showing it correctly that the input city name is wrong either the details of that city not included yet in the system database.

3.5 Implementation Requirements

For implementation of this system, the sublime text, PHP storm, notepad++ for doing the Html, CSS, Php, Javascript, Bootstrap. Besides that, for using the MySQL database, the xampp open-source database should be available on the computer. As well as android studio have to be installed in the computer for doing java code for android application.

CHAPTER 4

EXPERIMENTAL RESULTS AND DISCUSSION

4.1 Introduction

There are many sample data used in the database. There are both web-based and mobile android application based experimental results show here. The system is capable of finding 20 district's accidental areas and details of those area's accidental statistics right now. Both of the systems are internet dependable and can be used with a better internet connection. In this chapter, we will describe the experimental results for both web-based and mobile android application.

4.2 Experimental Results

Experimental results for both web-based and android mobile applications capable of finding 20 district's accidental areas and details of those area's accidental statistics. The data provided in this experimentation are collected from different sources.

4.3.1 Web-based Experimental Result

This paper demonstrates the finding of the accidental areas of different routes. Twenty different district's route's accidental areas and statistics were identified by my system. The route I work on, that is the route that goes noakhali from Dhaka. There are 5 different accidental areas in this route. The system showing the users those accidental areas in the google map and also giving the accidental statistics of these accidental areas.

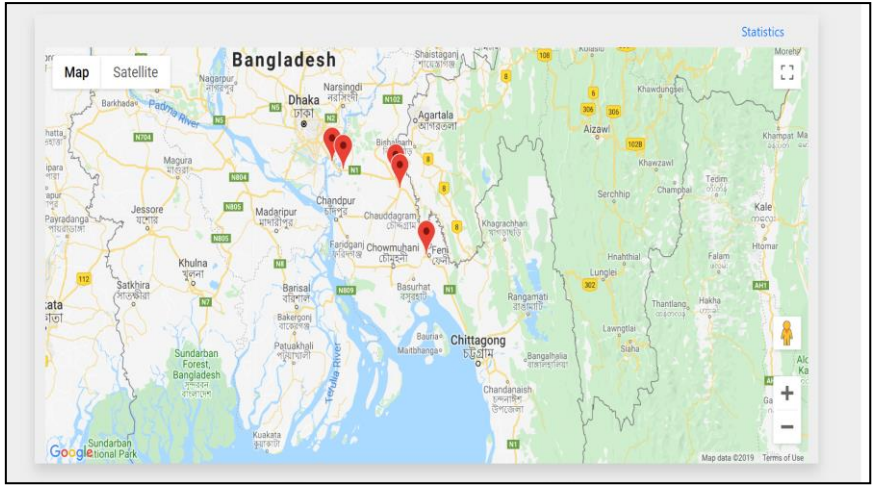


Fig 4.3.1.1 In Web Google Map showing the latitude and longitude of different areas

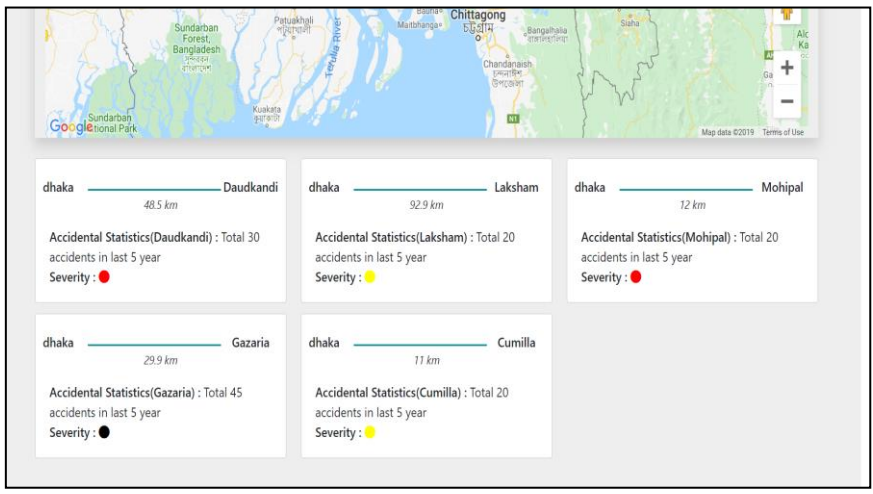


Fig 4.3.1.2 Web view of accidental statistics of different areas

4.3.2 Android mobile application Experimental Result

In this session, I deploy my android system on the Android platform to bring this system to everyone’s hand. In that case, I take my system model and integrate it into the android system by using the language communication system java on Android Studio. Figure 4.3.2 shows the GUI of my Android App.

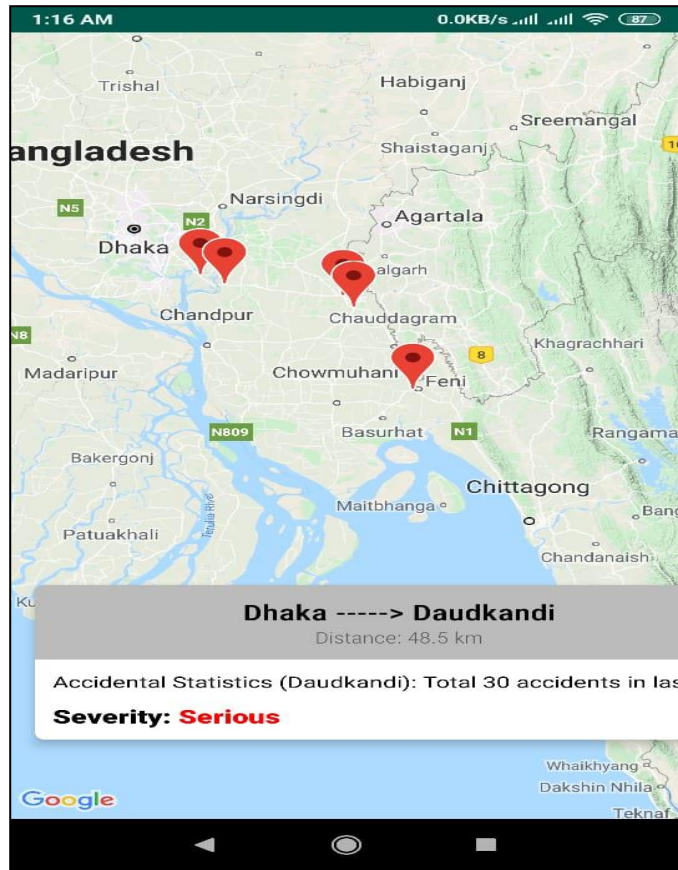


Fig 4.3.2.1 In Android Google Map showing the latitude and longitude of different areas

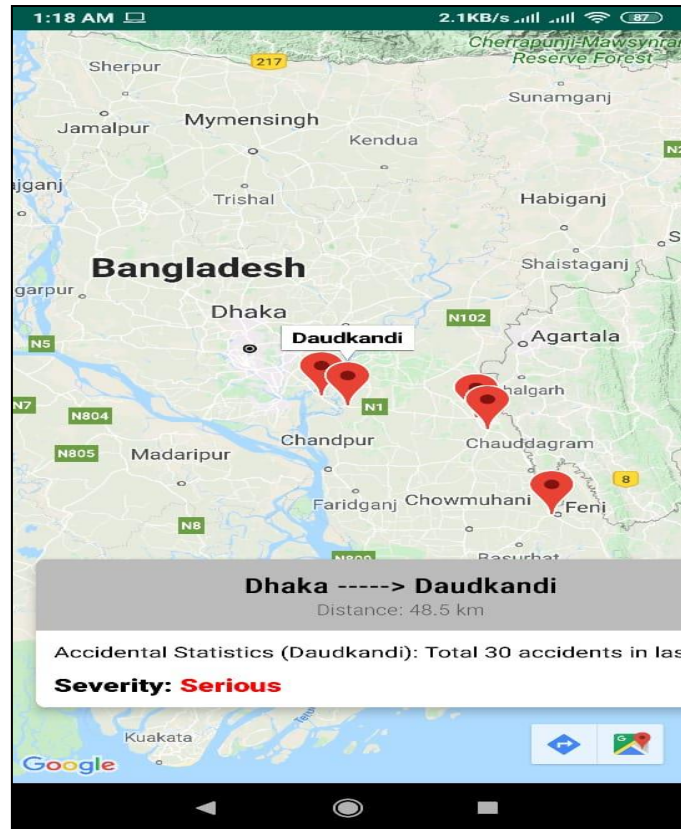


Fig 4.3.2.2 Accidental statistics of different areas in the Android App

4.4 Performance Analysis

The evaluation speed performance can vary for the speed of the internet connection. If the internet connection is good it will be a matter of time to get the data from the database.

CHAPTER 5

SUMMARY, CONCLUSION, RECOMMENDATION, AND IMPLICATION FOR FUTURE RESEARCH

5.1 Summary of the Study

Though the various kind of accidents happen daily in our country, this sector is no as improved as it should have been to decrease the accidents. The people of our country can know about the accidents from electronic media, newspapers and online news portals. This is causing accidents increasing day by day. Because of the lack of knowledge which are the accidental areas of different routes. This is why I tend to make a system that will help people of Bangladesh to find out the accidental areas of different routes before they are starting their journey. The user will provide the source and the destination of their journey and the system will give them the result that which are the accidental areas of their journey route. Besides that, they will get to know about those area name, accidental statistics of those different areas of that particular route, incident severity of the areas, distance of those accidental areas from their source where they are starting their journey. So, my main objectives were to make a better system for people in web-based applications as well as android mobile applications. Besides that, I tried to make a user-friendly environment for any age of user. So, it is a complete information for every user to know about the accidental areas before starting their journey.

5.2 Conclusions

Data mining unbolted up a vast amount of research scope. Accidental areas & accidental statistics finding can be a gigantic feat for every people of Bangladesh if it reaches the maximum range of users. Particularly, for the drivers of all vehicles who do not have any idea of the accidental areas where they going to drive. With these applications, any user can find out & know about their accidental areas, accident statistics, respective areas of accidents that could happen in their journey. The details about accident statistics and knowing about those accidental area names that will help them to take necessary steps.

5.3 Recommendations

Accidental areas and accidental statistics finding system has massive opportunities to contribute to accident decreasing sector. It can be used for every people of Bangladesh as well as in other countries if the accident data & statistics inserted into the database.

5.4 Implication for Further Study

We are increasingly dependent on modern technology to ameliorate the general people about knowing the accidental areas and it's previous statistics of accidents to enhance the decreasing amount of accidents. In my proposed system, I build up a new way in which accidental area and accidental statistics can be found easily and they can take necessary steps before starting their journey. The users will get the results of the given route within a blink of eyes without wrecking valuable time and effort. In this session, I have already deployed the system in the Public Website as well as on the Android platform. It is planned to integrate this system into the IoT devices so that any vehicle drivers can get alert before a major accident that could be happened while passing those accidental areas. In the future, by using some physical device like alert sensors, GPS locator, modem receiver and led sensors, I will be able to provide information about the accidental areas of all routes to any kind of vehicle that will help the drivers to get informed about those accidental areas before they pass through those areas and they could be able to more careful while driving when they pass through those areas. Above all, I am aimed to ennoble our country by bringing revolution by decreasing the accidents that happened daily in our country.

REFERENCE:

- [1]"Road Safety", *South-East Asia Regional Office*, 2019. [Online]. Available: <http://www.searo.who.int/bangladesh/road-safety/en/>. [Accessed: 28- Oct- 2019].
- [2]"Report: 2,329 killed in 2,159 road accidents from Jan-June 2019", *Dhaka Tribune*, 2019. [Online]. Available: <https://www.dhakatribune.com/bangladesh/2019/07/05/report-2-329-killed-in-2-159-road-accidents-from-jan-june-2019>. [Accessed: 28- Oct- 2019].
- [3]"Road Accidents in Bangladesh: An Alarming Issue", *World Bank Blogs*, 2019. [Online]. Available: <https://blogs.worldbank.org/endpovertyinsouthasia/road-accidents-bangladesh-alarming-issue>. [Accessed: 28- Oct- 2019].
- [4]"Accident Research Institute", *Ari.buet.ac.bd*, 2019. [Online]. Available: <http://ari.buet.ac.bd/About%20Us.php>. [Accessed: 03- Nov- 2019].
- [5]"CrashMap", *Crashmap.co.uk*, 2019. [Online]. Available: <https://www.crashmap.co.uk/Search>. [Accessed: 29- Oct- 2019].
- [6]"Buchanan Computing collisionmap", *Buchanan Computing collisionmap*, 2019. [Online]. Available: <https://www.collisionmap.uk>. [Accessed: 03- Nov- 2019].

APPENDICES

Appendix A: Research Reflection

Finding out accident-prone areas of Bangladesh, get details about each accidental area's statistics using data mining has always been in our matter of concern since the starting of the final year. As I had no experience with data mining, I had to start from scratch. But by the grace of almighty and with the help of my respected supervisor, I have accomplished my goal. This research was harder than I thought as there are already several publications in the market. So, not only I had to do our research, but I also had to make sure that it is better. In both applications, I tried to make a user-friendly environment for the users. But, I found after analyzing all the existing web-based applications in the market there is no web-based or mobile android applications, that are available in our Bangladesh. So, the first priority of my project was to build a platform where the finding process can be done for our country. Secondly, I wanted to build a database of all accidental areas of our country for the users where they can find all the accident-prone areas of Bangladesh.

Appendix B: Related Issues

Though it was challenging to make a project about this particularly well-researched subject, it was an important lesson in my life. I had to do a survey to collect the necessary data for the system database. I am grateful to all, who helped me unconditionally whenever I needed it. I also had help from my beloved classmates and teachers.

Finally, I want to develop and improve this project as this has a vast possibility to be the necessary application for all the people who can know about accident-prone areas of Bangladesh of their own. I hope I will reach my desired destination very soon.