

Development an Automation Transport System for DIU With IoT Based Tracking

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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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DAFFODIL INTERNATIONAL UNIVERSITY

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APPROVAL

This Project titled “**Developing an automated transportation system for DIU with IoT Based Tracking**”, submitted by **Dipok Biswas, Md. Mizanur Rahaman, Md. Mustafizur Rahman and Apurbo Kumar Anup** to the Department of Computer Science and Engineering at 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 05.12.2020

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DECLARATION

We hereby declare that, this project has been done by us under the supervision of **Tajim Md. Niamat Ullah Akhund, Lecturer, 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

To utilize the power of automation system with built in a project. You must be a student at Daffodil International University (DIU) to use this facility. The transportation system is a system we use every day. We made it an automation transportation system to make our journey easier. This automated transportation is for only Daffodil International University (DIU) students. Using this automated transportation system APP student will be acknowledgement of this feature. Bus arrival time schedule, Buy ticket, Current location of the bus and Notification or Alert. These facilities are being provided to the DIU students so that they do not miss the bus. Leaving the bus is a hassle for students many to get to their destination, wasting time and money.

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CHAPTER 1

Introduction

1.1 Introduction

There is a purpose behind all the work in the world. We know that everything around us is changeable. We get acquainted or get used to something new every day. So, to keep pace with this changing world, for the DIU student's transportation system is a little more organized and try to automated. We have arranged automated transportation system. We are believed every problem has a good solution. There is a reason behind everything that has been created in this world, because people have faced problems and find a good solution. Also, as Daffodil varsity students we have faced some problems of transportation system and Try to do minimize current disadvantage and we've got this automation transportation system in place to figure out how to work it out. This is the main purpose of this project. Automation Transportation system give DIU students for safety, efficiency, time saving, minimal cost, time schedule, buy tickets, current location and notification. To use this APP students will be benefited.

We have some object to invention of the project from here students will be able to know the name of the bus Destination and the schedule of the bus. Now you don't have to go manually and ask anyone. All kinds of information can be found in this app. The object of invention provide you can buy tickets online. You can select the seat of your choice from here anywhere and anytime. The object of invention provides location of the bus. Through which students will know where the bus is at the moment. Students do not have to wait at the bus station and their time will not be wasted if they know the location of the bus. The object of invention provides alert or notification for students. It will help him to remember that sometimes it is time to talk to their busy or someone. If it is used, no one will miss the bus. In the communities and economies of all developed countries, vehicle

modes of road transportation such as private cars, busses, trucks and the like play an important role. The ease of mobility provided by private cars has made it an important tool for modern society. Massive amounts were spent on turning early dirt roads into smooth concrete streets and large super-highways. Mechanical changes to the motor vehicle often have a substantial amount of money invested. Although there have been major changes. The key explanation for the above scenario is boost automated lanes capability by further packaging high velocity vehicles. It also provides other benefits perhaps not clear. Many of these benefits are the following is defined. If the automatic lanes are appropriate more motor buses, more light traffic manual lanes they will increase their production. The important feature of this innovation. It will be able to guide our students. It's provided us safety travel reliable efficiency and minimal cost support.

1.2 Motivation

- i. Gathering the solution of problems in on platform which we are facing more getting transportation Services within the utilization of web facilities.
- ii. Providing transport service by more time saving, easy and efficient way.
- iii. To improve student service

1.3 Objectives

- i. Provide new bus information, everywhere and anytime. Such as route information, bus schedules, and maps .
- ii. To notify the passengers about departure time.
- iii. To reduce manual hassle free.

1.4 Features

There are some features of application:

1. Location track
2. Notification
3. Ticket buys.
4. Safety and reliable
5. Time saving
6. And minimal cost
7. Ambulance
8. Bus Schedule

1.5 Social Impact

We think it will create more awareness among people. If a car is involved in an accident, it will be able to track its location within a minute. And aid agencies will receive a warning message and will be able to get there very quickly. Because the location in the area of the accident informs them that they will be able to rescue them once they reach there. In addition, if there is a problem with the vehicle, an emergency alarm will be sounded at the law enforcement office. This will help into protest vehicle robbery and snatching. The difficulty of how vehicles with automated and non-automated driving habits, such as various driving speeds and reaction times, co-exist can also result. Interactions between automated vehicles and vulnerable road users (mostly pedestrians and cyclists) pose potential risks in terms of detecting or precisely predicting the activity of vulnerable road users for automated vehicles. By doing these, even a little bit of panic in people can be reduced.

1.6 Report Layout

Report layout: In a clear way pictorial presentation of the project with a figure illustrating the whole project. The content and more the content and more. There are 5 chapters in the project report. A demographic representation explains all chapters with a short summary:

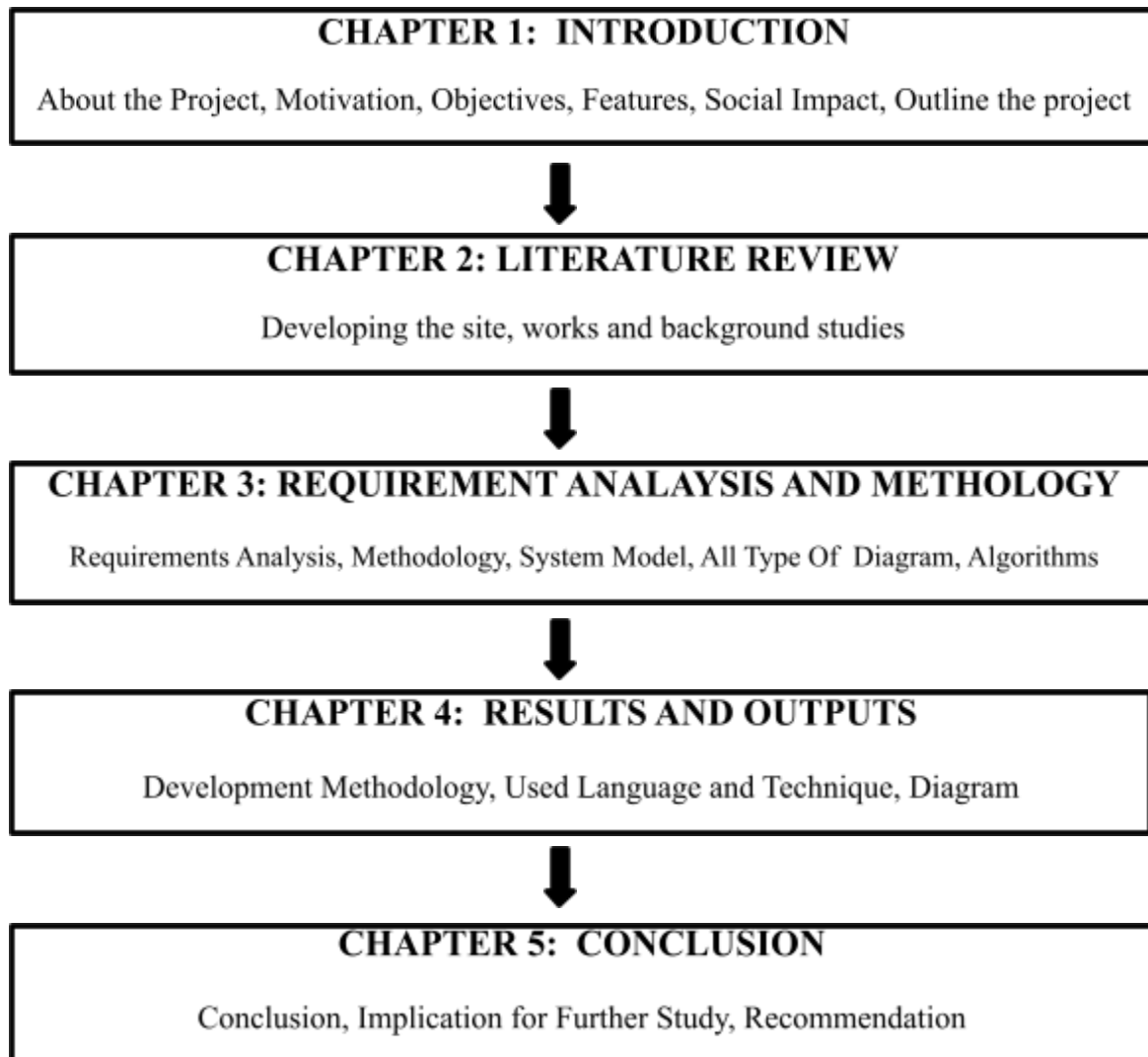


Fig: 1.6.1 Outline of the project

CHAPTER 2

Literature Review

2.1 Background Study

It innovation has been created in order to address the limitations of DIU transport systems and create a functional system for the general use of people. The cost of setting up, sustaining and running traditional transport networks has increased ever more and their use has been largely supplanted by the use of trucks and cars for the transport of cargo and interurban passenger travel. RF Street cars that were substituted for Arcos leading were used when they were replaced by buses less suitable because vehicles were in intensive service to the municipal authority for public transportation in town. The resulting car and truck traffic on roads and highways is a growing issue. The students and the faculty use the university bus to get to and from classes. The issue that occurs is that the student does not know the exact location of the university bus, or the faculty. And that's where this application comes to imagine. This system makes use of both GSM and GPS modules to provide an exact and actual bus location, and uses a GSM and GPS module micro-controller. For connectivity purposes, the GSM module will have a SIM card. With the support of the Global Mobility Services (GSM module), GPS offers longitude and latitude values, which are transferred to the server. Once the server has been uploaded the longitude and latitude values, the user can import them from his server with the help of android, and get the university bus location in real time which is visible via the integrated Google maps.

2.2 Invention's Field

This innovation concerns a transport system and more precisely, a system suitable for transporting people as well as vehicles and other freight conveyances with extremely high safety standards, performance, speed and comfort, capital costs and minimal adverse effects on the environment, a bus schedule, a track positioning, ticket buying and emergency ambulance service. The system is compatible and readily incorporated with existing systems.

2.3 Technical Challenges

At all networking, linkage, collaboration and regulatory levels communication is important. In particular, on the connection layer, communication is necessary between the road side and the car side. The coordinating layer includes coordination between panels. Place monitor requires network layer. Because of it, audio call and notification are given to us. Booking tickets cancellation if you provide customers with the option of canceling their reservations, customers that are too complex to handle also have to accept lots of cancelation requests from you. The technological problems were briefly and admittedly not thoroughly checked. One point that is evident from the analysis is that connectivity, sensors, controls and other technologies that are important cannot be dealt with alone. They are all bound up and should be formed for each other.

CHAPTER 3

Requirements Analysis & Methodology

3.1.1 Software & Hardware

Software:

1. XAMPP
2. Visual Studio code
3. PhpStrome
4. Sublime Text

Hardware:

1. Laptop
2. Keyboard
3. Mouse

3.2.1 Methodology

Evaluate the accuracy of GPS-based traffic data. This assessment is based on the results of a test on three modes of road transport (cars, bicycles and vehicles).

Find common GPS tuning methods and check related issues after the information below. This method is used in real GPS, tracking 62 car information. Investigate the impact of road network thickness on finding the most suitable location.

Access and access to GPS devices in geographic locations and multidimensional projects has grown exponentially in recent years. Learn how to use a variety of information such as GPS, time, coordinates, dashboard, and more, climate forecasting, and suggest that it will change the way organizations and communities function.

Improved GPS performance has been applied to a wide range of traffic, especially when GPS mechanics provide unreliable data to explain additional GPS travel, transportation, and budget information. Fir. It can be used to check the weather. For example, note the CO2 emissions due to increased GPS use in cars following vehicle information.

The use of GPS devices and the organization of GPS devices is a major challenge in future testing. In addition, the widespread use of GPS has led to significant improvements in device performance. Today, due to accuracy and increased accuracy, low-cost GPS tracking is designed in a complex way.

GPS device settings are disabled when tracking area. Information on the reliability of GPS-based traffic information for a multifaceted, sophisticated GPS device, how much space it has, and how fast it can be at the moment, can be used with real reliability. However, direct access is limited to the risk of deleting important information and the occurrence of errors. Weaknesses in GPS data should be taken into account along with additional data to ensure that applications are accurate, complete and simple.

Area of research	Research topics	Typical method	Main findings
Web Developing	Transportation System		
	How does the arrangement of the equipment influence the accuracy?	<ul style="list-style-type: none"> • Deductive of reasoning. • For Laboratory studies. • Observation data for one device. 	The GPS device with advanced innovative settings and ideal conditions (open area, numerous available satellites and magnification frames) creates higher accuracy.

Table 1: Appropriate experimental studies on the reliability of GPS-based data for transportation

3.2.2 Working Flow



Fig: 3.2.2.1 Mini A8 GPS Tracker

This item applies the freshest innovation in Bangladesh and has following points of interest: little size, long reserve life, basic the activity, stable capacities, and advantageous establishment. It is widely used to check family units, children, the elderly and pets, lost vehicles or other items.

Function	Commend
For Register	RG + Cell Number
To Check Location	DW
Open Voice callback	1111
Close Voice callback	0000
For Emergency Alarm	SOS
For Authorization	SQ + Cell Number
For Cancel Authorization	SQ

Table 2: GPS Tracking Function

Register

Users in Bangladesh and other countries must first add a mobile phone number to their device. A portable number can be used for registration, and a large number of "RG + portable device numbers" can be sent. For example, if the registration is correct, you will get the answer "Register effectively" and you can use other options for the device number "6200 trillion". If an error occurs you will receive a message saying "Registration failed, device number is empty, for example: RG13866668888". This means that the sent message does not have a mobile phone number, you just need to add a larger number. Do not enter the country code before the mobile number. For example, country "1" for the United States. You do not need to enter "RG16200000000" or "RG001620000000".

URL/Listening

After unlocking the icon using a SIM card, waiting for 10 seconds after completing the phone number, you can place the object within 10 meters. In this case, you can get a URL that tells you the current location of the device when you move away before or after 10s. It is recommended to wait longer than the device should turn on and then call.

Location Inquiry

Write the capital letter "DW" to send the device's mobile number, and you will get the answer via the address or then the URL. You can check the registration area with your mobile phone or computer.

Platform Inquiry

(Optional, newly approved users can enter the stage with a password.) Approved mobile phones can enter the stage using the device ID and password in the confirmation message. Parking, power requirements, route inquiries, missing information, electronic grids, gear wheels, etc. can be inquired, and when no one is approved, any phone can send a "DW" to check the device area, but once approved, only the approved area will be "DW approved" and a get information.

Voice Callback

How to set up a voice call : Call the SIM card number (via mobile or landline) on your device, skip and listen and hang between about 3s and this mobile / repair number is effectively set up. You can disable this feature by sending "1111" to the device to activate the power and sending "0000".

Emergency Alarm:

Send to capital letter "SOS" to the device, and when it is configured effectively, the user will call the designated number directly when the user presses the "SOS" button for more than 3 seconds.

3.2.3 Service Classes

Administration classes are liable for the non-visual piece of the web application. They incorporate the Message Processing Service, SMS Message Sender, and SMS Message Receiver class. The SMS Message Receiver class is all the more precisely depicted as a Broadcast Receiver. It is a help that is begun by the framework when another SMS shows up on the phone. It decides whether the message is intended for the application.

On the off chance that it will be, it begins the Message Processing Service and passes the SMS to it for additional preparation. It passes the SMS to the Message Processing Service class since the collector is just a brief time before it is killed by the framework. The cycle that begins when another SMS shows up on the cell phone for the application.

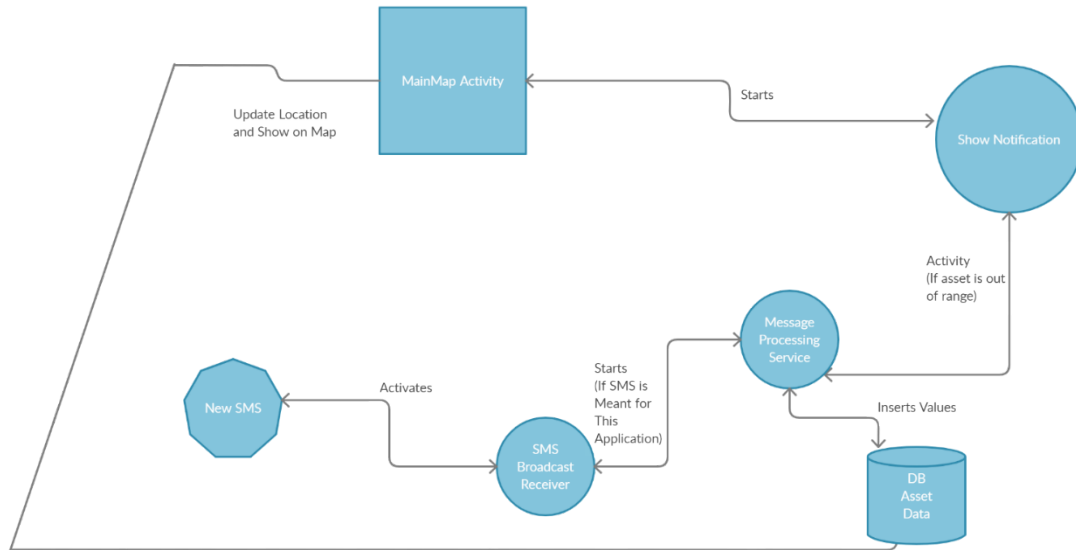


Fig: 3.2.3.1 SMS Tracking

Message Processing Service class is help that measures the SMS messages it gets from the SMS Message Receiver class and addition the applicable fields to the information base. It additionally handles the terminating of notifications to signal another SMS for the application has been gotten or show that the concerned resource is out of its geofence. SMS Message Sender class is begun at whatever point the application should send an SMS to the tracker. Not with standing sending the SMS, it likewise progressively registers for a Broadcast Receiver for the Sent SMS to get approval that it was really sent and afterward logs the SMS.

3.3 System Model

The Agile SDLC model is a mixture of repetitive programming and fixed-cycle models, focusing on standard flexibility and consumer loyalty by speeding up work programming projects. The Nimble strategy is slowly shaping the project. These gatherings are given in cycles. Each cycle usually lasts from one to three weeks. Each cycle includes leap groups that work in different regions.

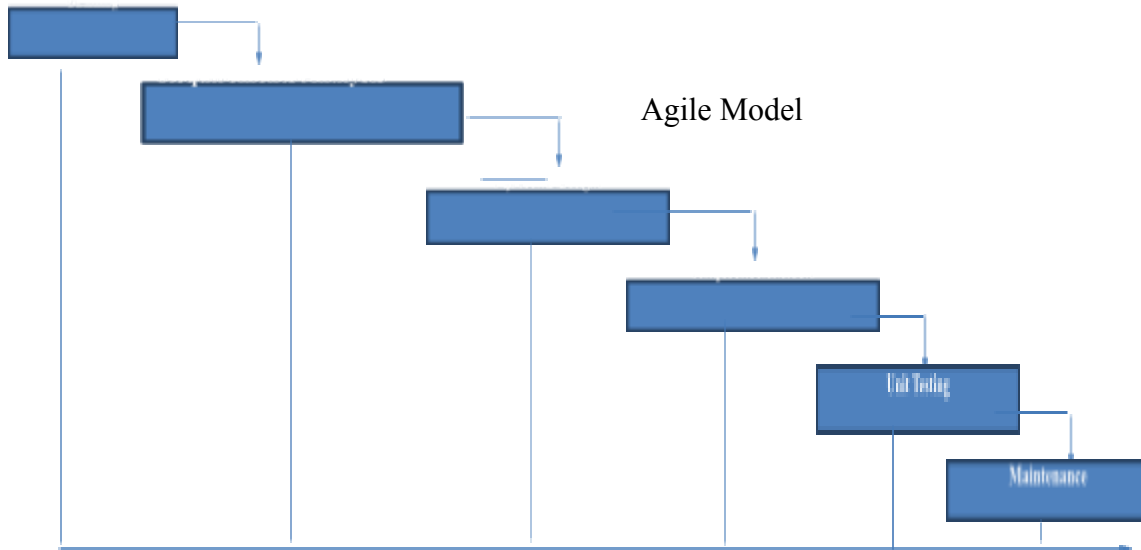


Fig: 3.3.1 System Model

Reason for choose model

1. Rapid continuous delivery of useful applications to please customers.
2. Instead of systems and tools individuals and relationships are emphasized. Constant contact between consumers, developers & testers.
3. Software is regularly supplied.
4. Cooperation between companies and developers is near and frequent.
5. Ongoing emphasis on technological quality and good design.
6. Daily adaptation of conditions to alter.
7. We welcome even late amendments to the specifications
8. When new modifications are needed. Agile independence is really important for progress. Owing to the pace of new rises, new improvements may be introduced at very low expense.
9. The developers need only lose the work for a few days, or even only few hours, to add a new feature.

3.4 All Type Of Diagram

3.4.1 Use Case Diagram

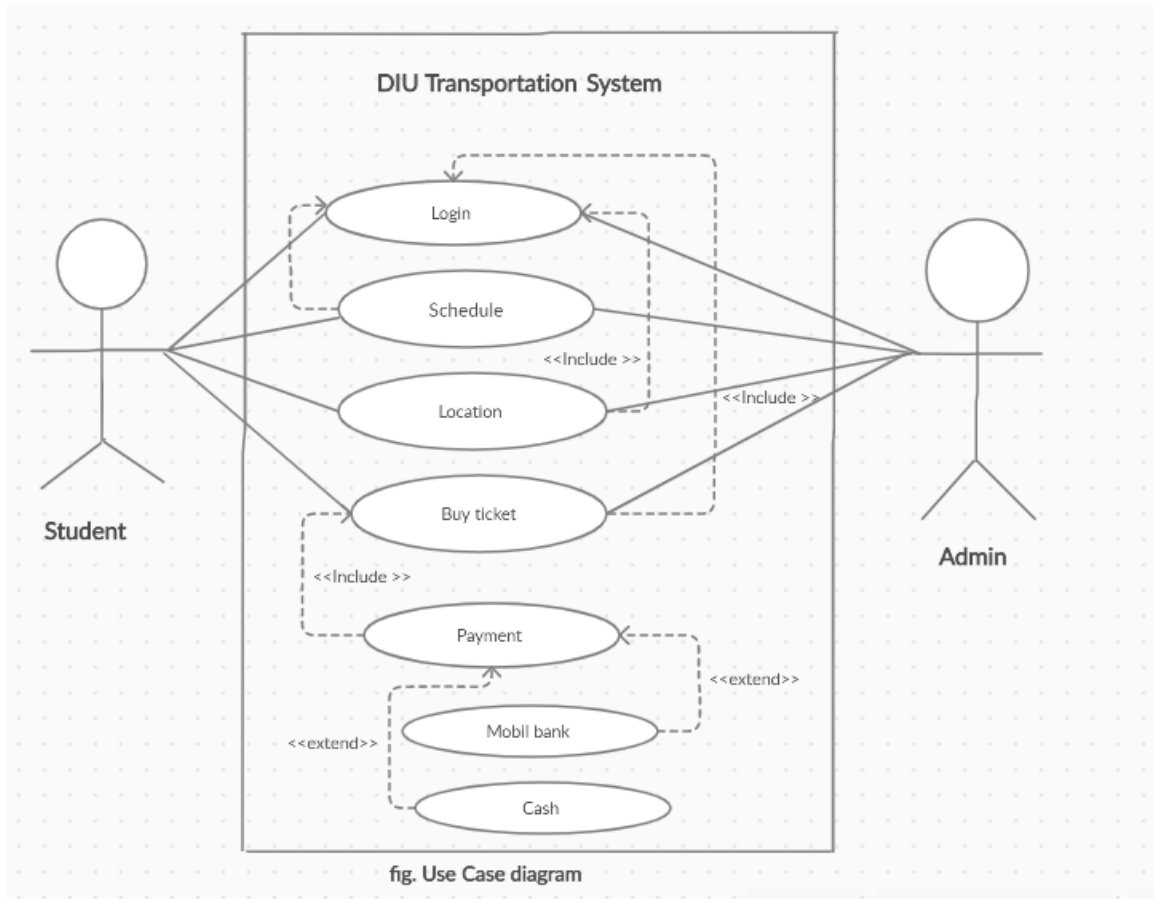


Fig: 3.4.1.1 Use Case Diagram

This figure illustrates the characteristics that can be used by administrators and students and the advantages of using this app. If we have to depend on a table or a value to do something, or whether we have to do something before and after and whether we have to do anything afterwards, we can find out to this fig.

Use Case

Explaining a range of behavioral procedures, including variants, this system gives the actor an observable value.

Student

Students or administrators who provide or receive information from a system are the beneficiaries of a system.

Include

Specifies that the source use case explicitly includes the behavior of the other use case in the specified location.

Extend

The target use case expands the action of the source.

3.4.2 Flow Chart Diagram

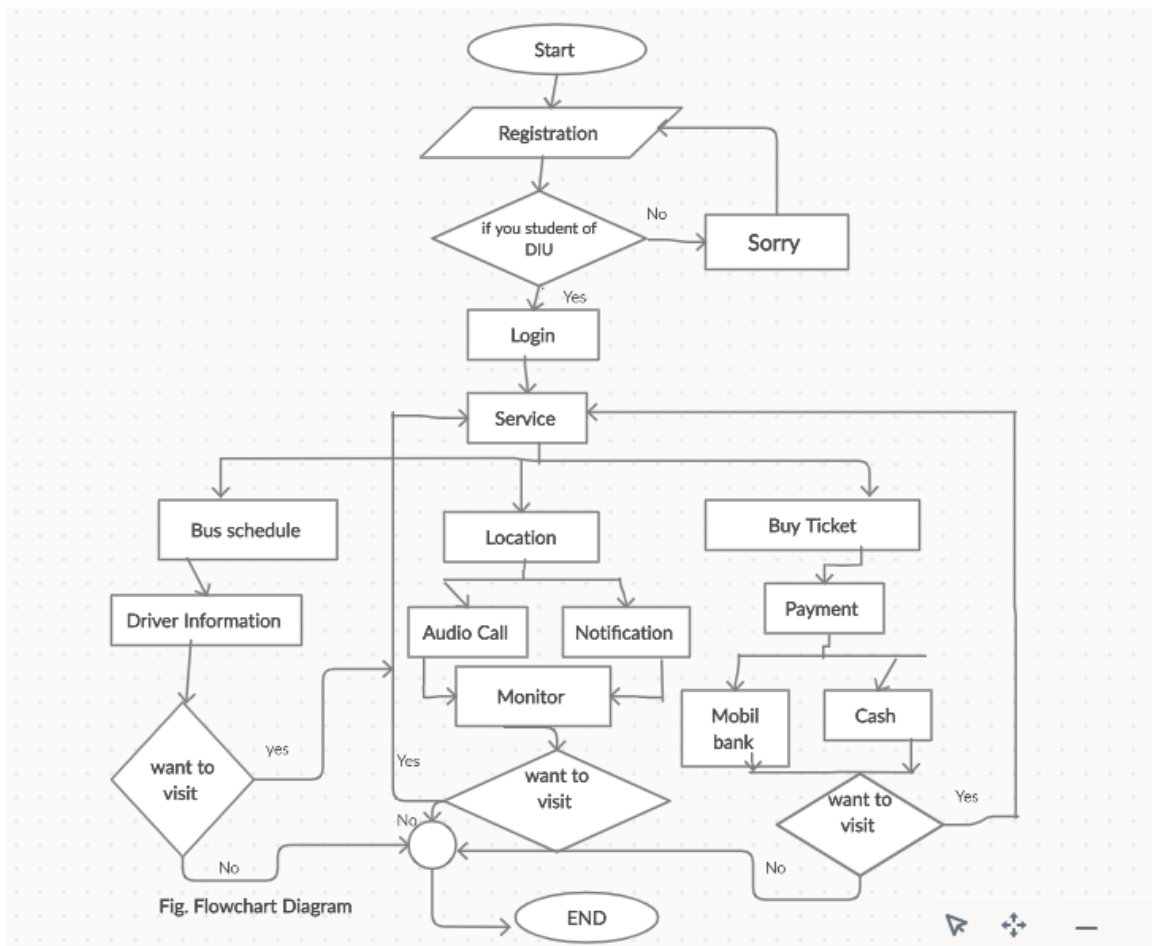


Fig: 3.4.2.1 Flowchart Diagram

This figure illustrates how, without any bugs, the device works and how to construct it. You will go to the menu and see the system's resources. There are several kinds of features and here is an overview of what kind of feature will work, and if you go anywhere, what design will work.

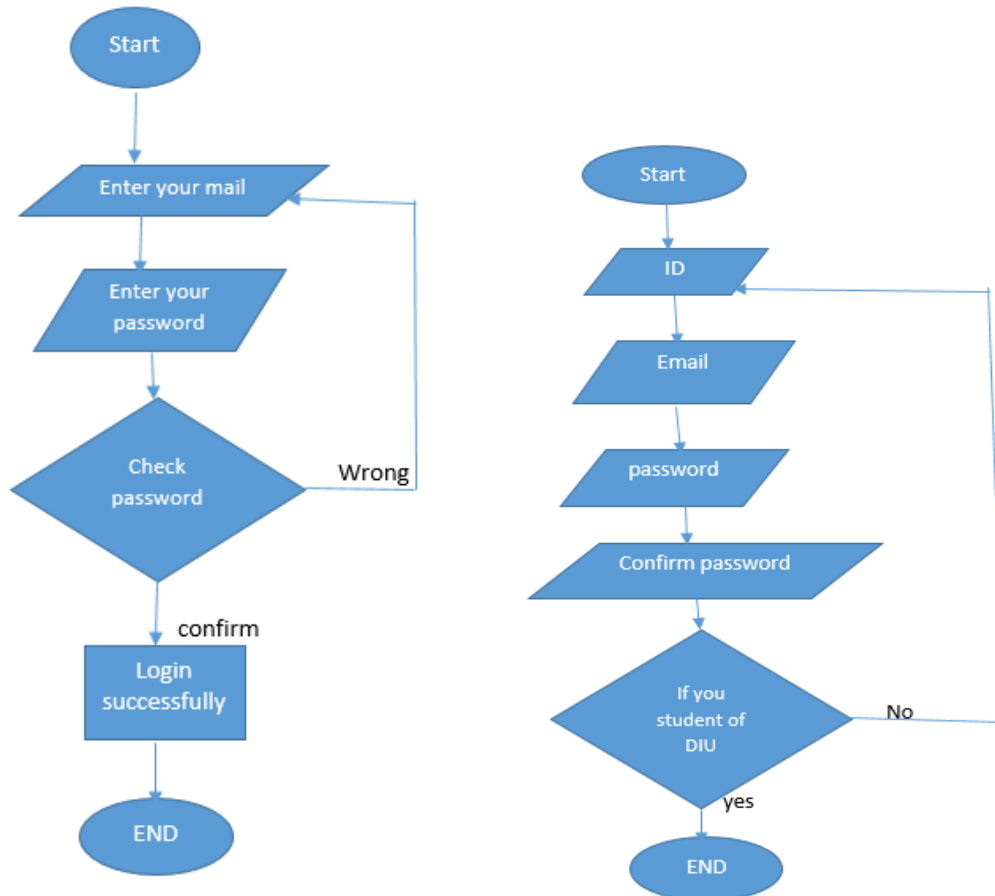


Fig: 3.4.1.2 Log in & Sign up

This figure illustrates the username and registration functionality for logging in. Users are asked to use this software to log in. What type of information is required to log in to this app from users and what results will be displayed.

3.4.3 Class Diagram

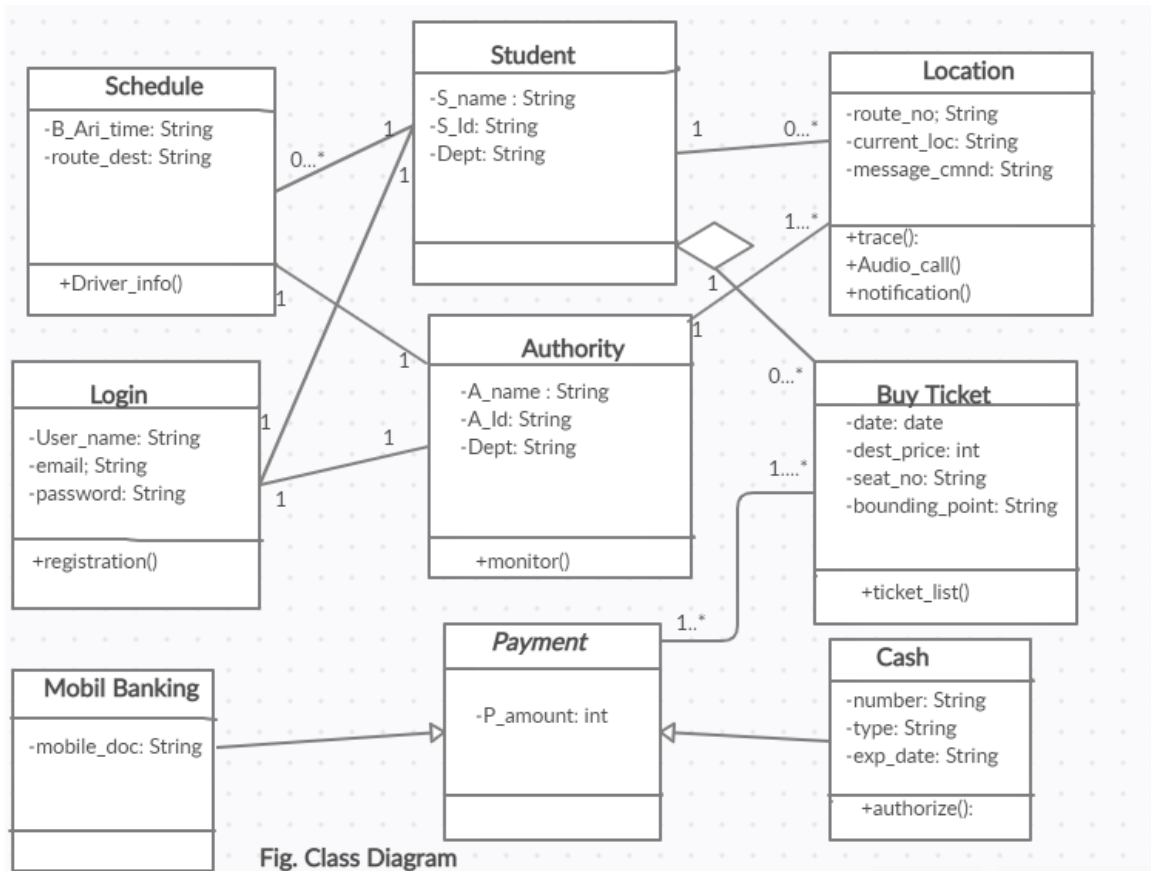


Fig: 3.4.3.1 Class Diagram

In Relation between Groups, this figure design is shown. It demonstrates the inter dependency between groups. Here is how to use one class's knowledge in another class and how to do it as well. For starters, we can see all of the features in our apps once we log in.

3.5 Algorithms

3.5.1 Algorithm for services

Step1: Start

Step2: please registration for visit our side

Step3: if you student of daffodil international university then, you can login

Otherwise we are sorry.

Step4: view all services

Step5: Bus schedule, location track, ticket buy and many more services you can select any of them.

1. If you select bus schedule you will show
2. Route information
3. Driver information and contract list
4. Emergency ambulance contract number
5. Current location of running bus

Else if you select location track.

Here, all work completes via message command.

- i. Type DW system give you a URL link here you see location of the bus
- ii. Type 1111 system provide an audio call here you known what happen inside the bus. Call coming constantly until you did not pressed cancel command.
- iii. Type 0000 audio call cancel never come up again

Else if select buy ticket

1. Date of ticket buy
2. Departure time
3. Seat no
4. Seat plan
5. Bounding point
6. Number of tickets buy
7. Details of ticket list

8. Payment
9. Mobile banking or hand cash

Step6: if you want to visit our side again please click mane bar

Repeat: Step4-Step5

Otherwise you can leave our side

Step7: END

3.5.2 Location Tracking Algorithm

Algorithms Step by Step: The algorithm utilizes the accompanying strides to allow the vehicle on the right connection and to the transport application. This application is utilized to refresh the decide its situation on that connection.

1. Locate the nearest point from the primary GPS point (i.e., introductory point).
2. Check whether the following point is an anomaly. In the event that not, at that point select all the street sections that go through the nearest point, in any case accept this point as the underlying point and go to step-1.
3. Utilizing the weighting formula, pick the right connection. These two focuses (i.e., beginning point and its next point) should be coordinated to this connection.
4. Decide the vehicle position on the right connection for every one of the two focuses.
5. Check whether the following point is an anomaly. On the off chance that truly, at that point go to step-1 and accept it as the underlying point. If not, map this point on a similar connection and decide its position and proceed with this cycle until the above mentioned conditions are valid, something else, go to step-1.
6. Repeat step-5 until the sum total of what focuses have been coordinated.

CHAPTER 4

Results And Outputs

4.1.1 Project Results

- ✓ Students first create account and then log in .
- ✓ They can see many information from here.
- ✓ Select the bus and track with send sms and call.
- ✓ Show available route bus and view seats.
- ✓ Contact with admin.
- ✓ Buy online ticket and payment with bKash.
- ✓ Available blog post here.
- ✓ Latest news
- ✓ Video
- ✓ View with Computers and Mobiles
- ✓ Bus Schedule
- ✓ Important Links
- ✓ Update user profile
- ✓ Admin panel

4.1.2 Results Discussion

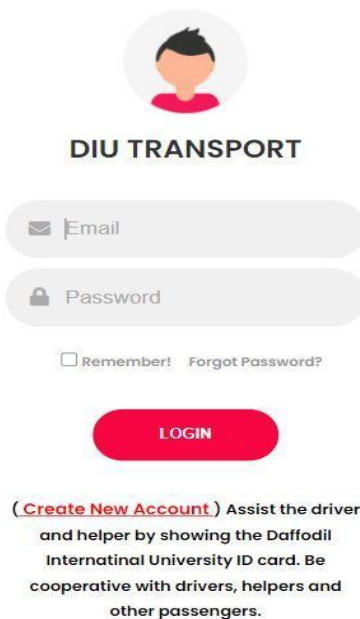
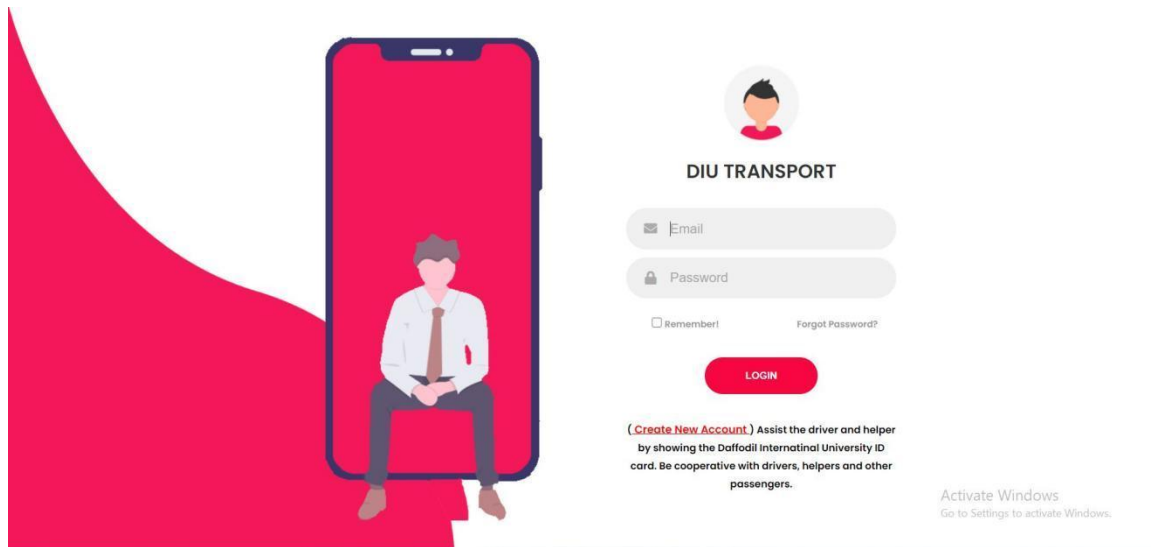


Fig 4.1.2.1: Login page

Login with email and password. Only current students and faculty member can login here. Permission for login is given by filtering current student and faculty.

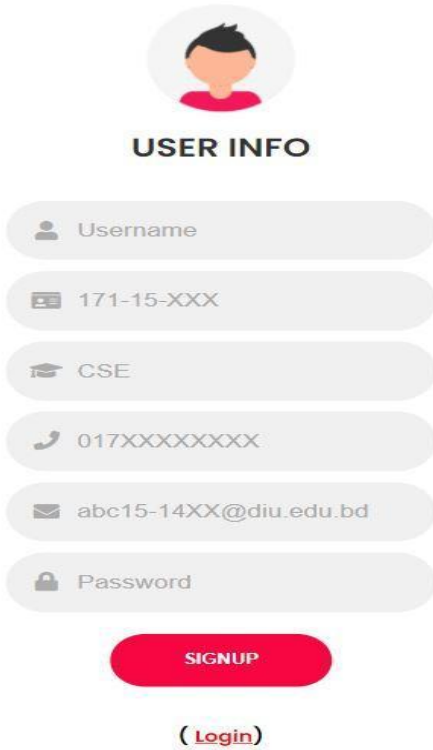
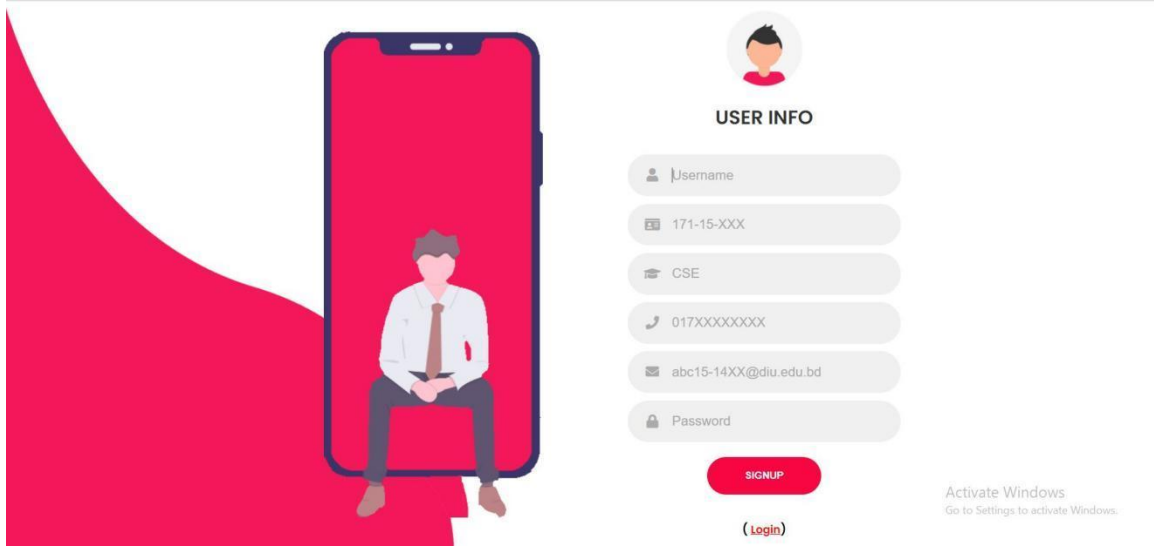


Fig 4.1.2.2: Registration page

Before entering our site, you must register. You must use the Daffodil International University ID and e-mail to register and also provide us with your contact number and department.

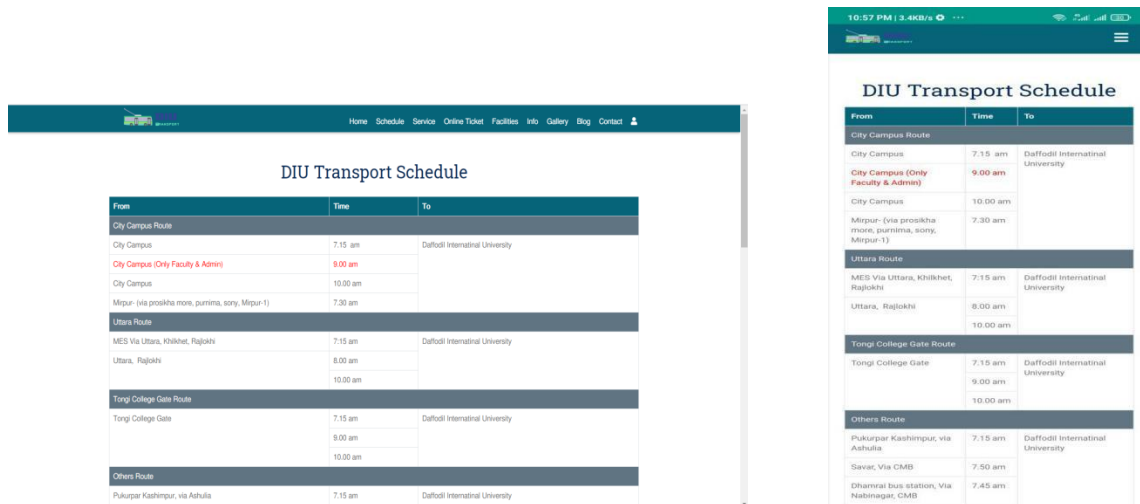
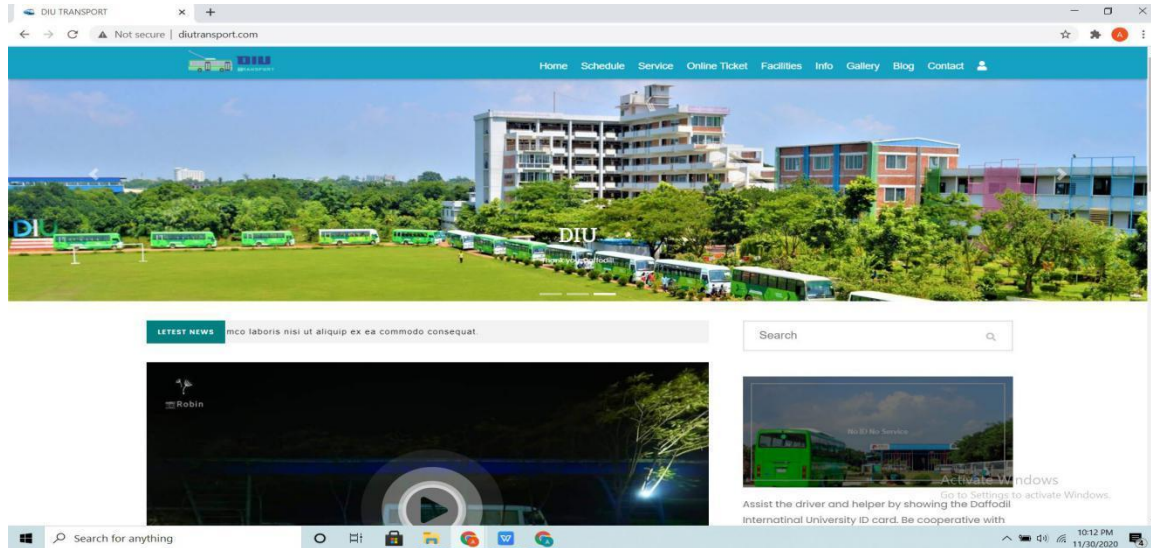


Fig 4.1.2.3: Home page & Bus schedule

On the schedule tab, the home page and schedule list of varsity buses are shown. Users would be able to know which bus runs on which route. And departure time for buses.

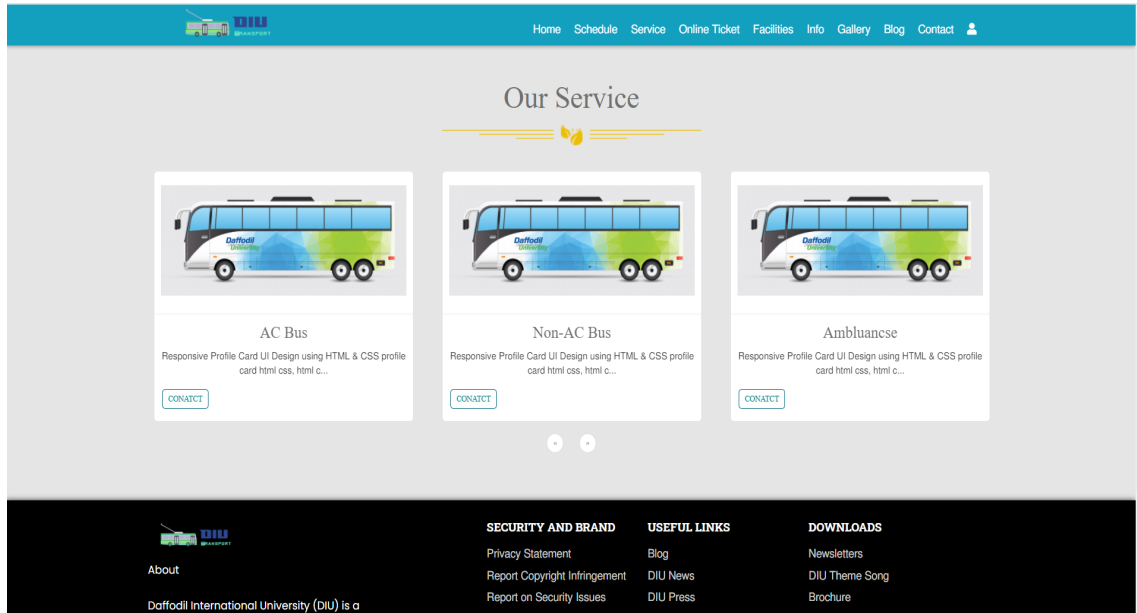


Fig 4.1.2.5: Service

We have AC, non-AC, ambulance and car etc. for the student bus service for us. Services for students and faculty are available.

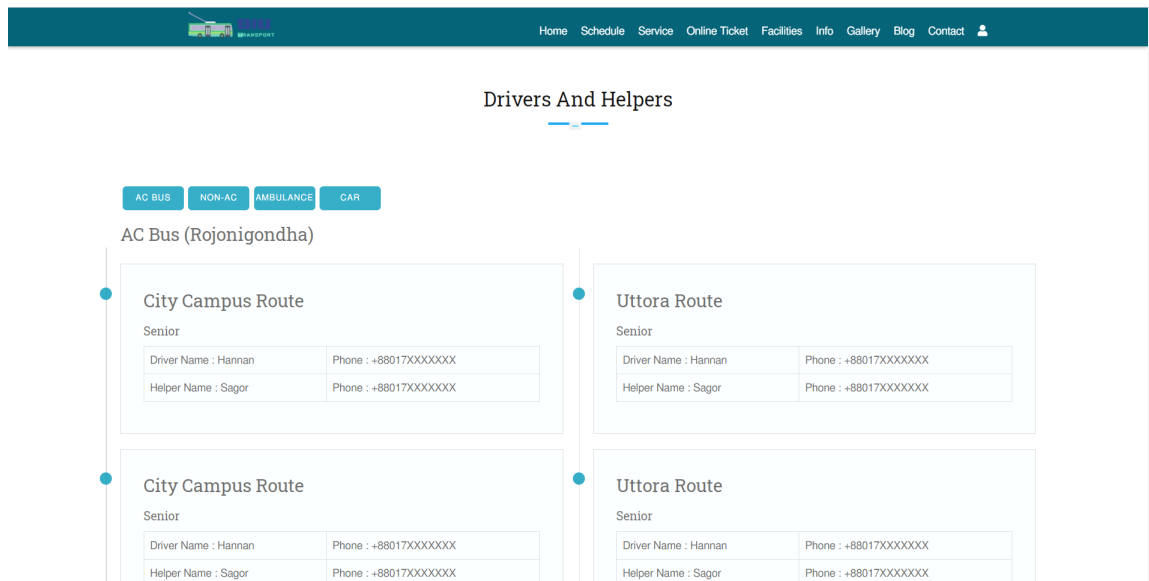


Fig 4.1.2.5: Driver and staff info

You will be able to know the contact list of the drivers from here and you will be able to directly staff the contact list as well.

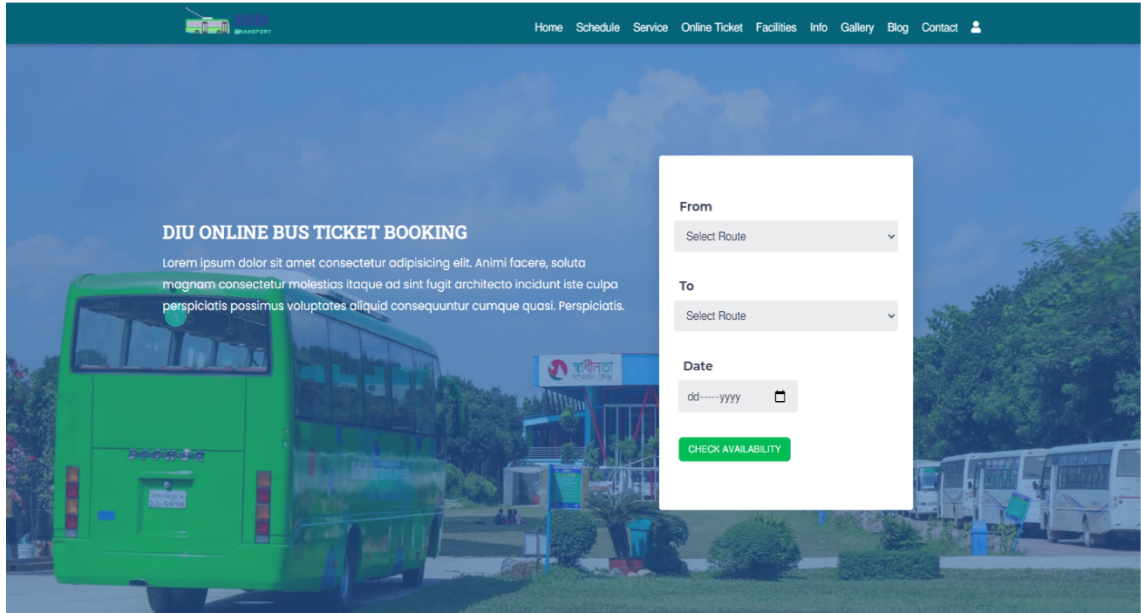


Fig 4.1.2.6: Online tickets

From here, if they wish, students and faculty can buy tickets from our application online. The money will be created automatically from the system when they go on a road and say their destination, and payment is bKash and payment can be made via cash. And the number of seats they choose to purchase. You can order as many as you want.

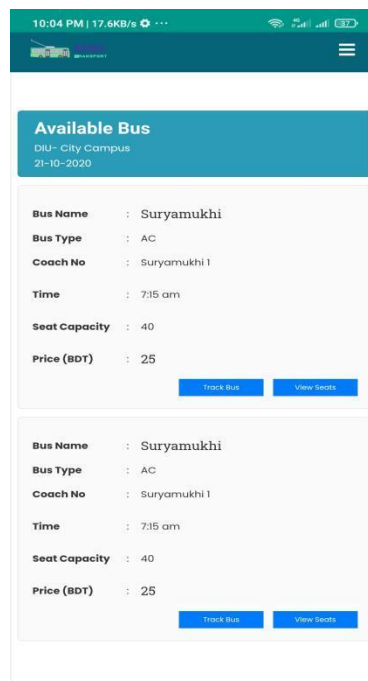
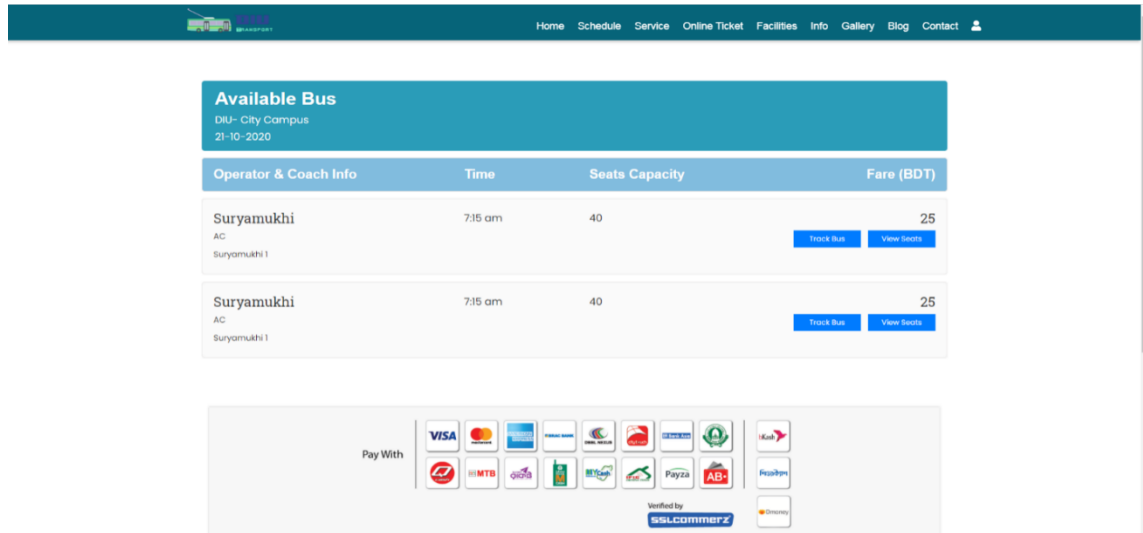


Fig 4.1.2.7: Available bus page

Fig 4.1.2.7 Everybody will know which bus is free from here. What route will the bus go on? You can change the direction of the bus if necessary and take it to a different route. You can see from the bus category that the bus is Non-AC or AC free.

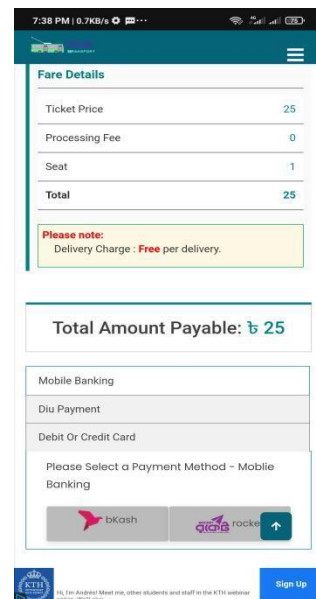
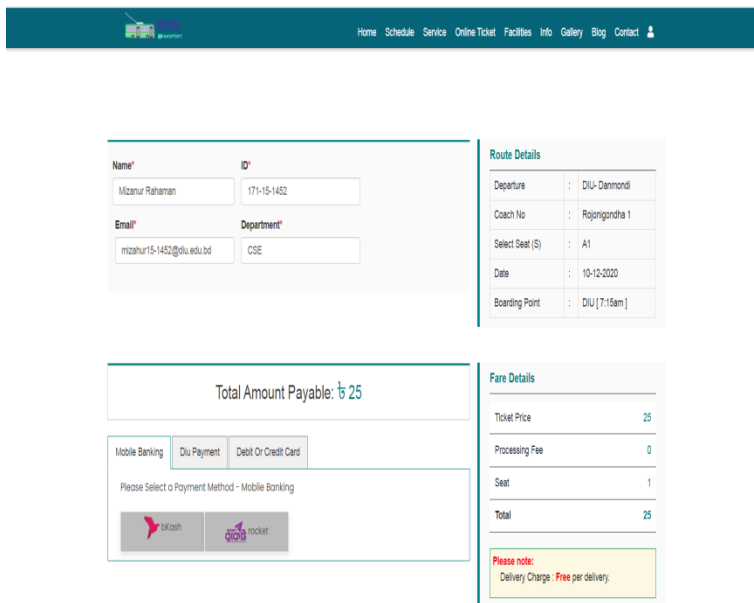
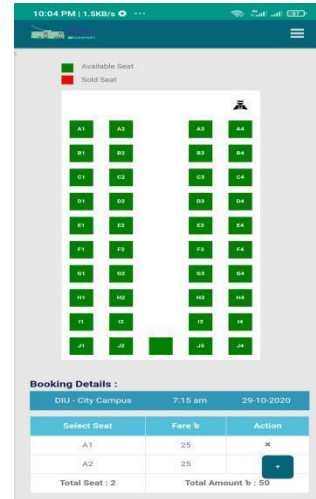
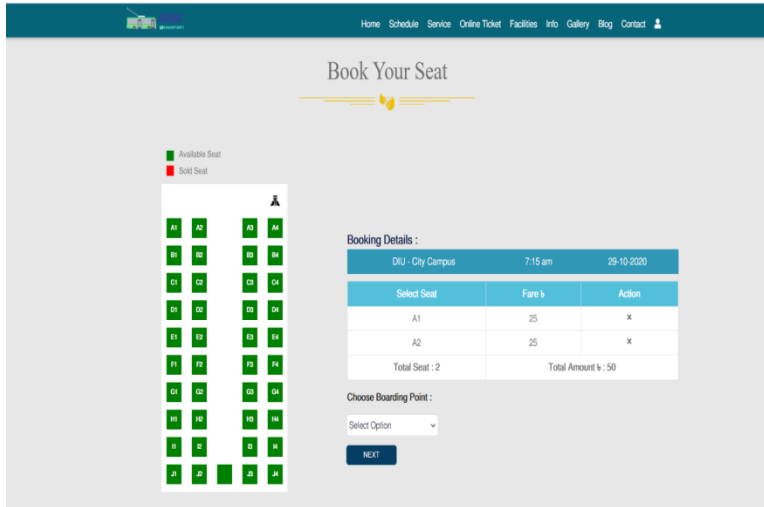


Fig 4.1.2.8: Seat booking page & Payment method

When purchasing tickets, students will be able to select their seats and use them as they wish. And they can see the plans for bus seats from here. And the device automatically produces the ticket price.

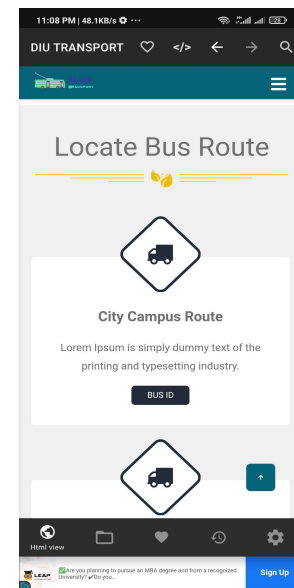
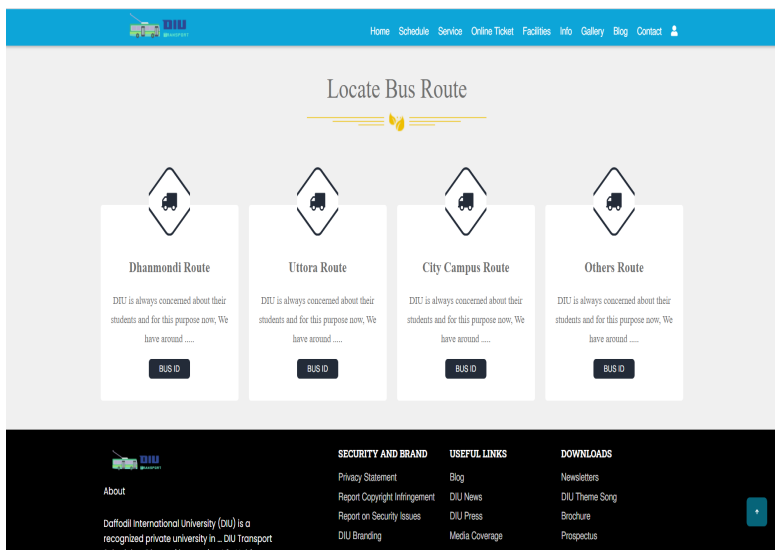
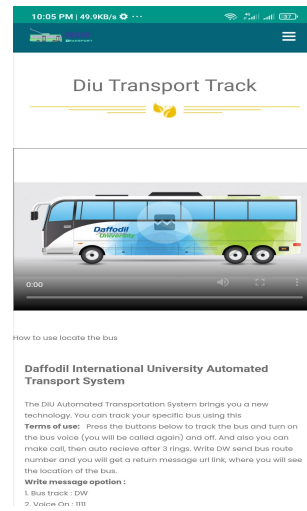
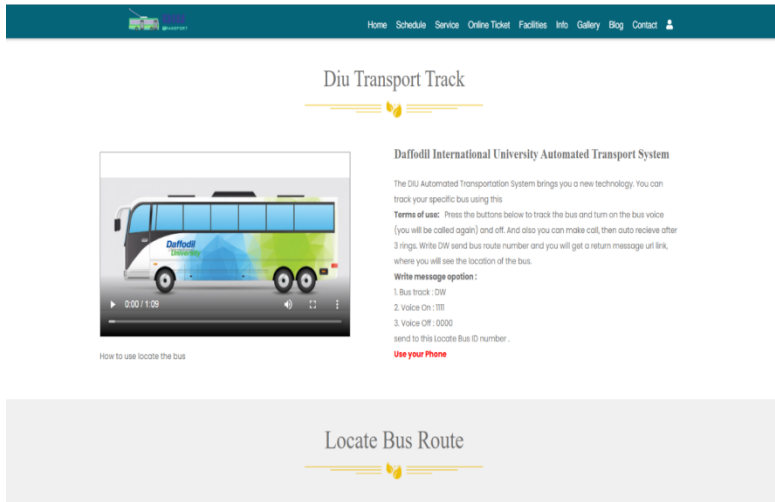


Fig 4.1.2.9: Locate bus

The buses here are grouped by road. On a road, one or more buses can exist. We've sorted by ID for them. The bus IDs have a button that can be pressed to understand the location of the bus.

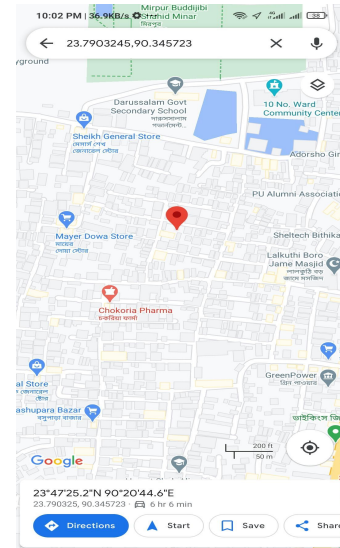
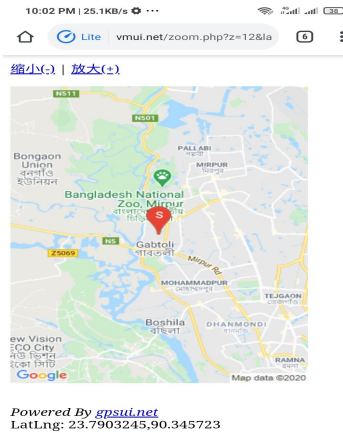
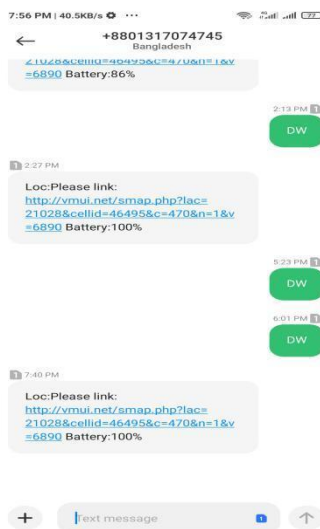
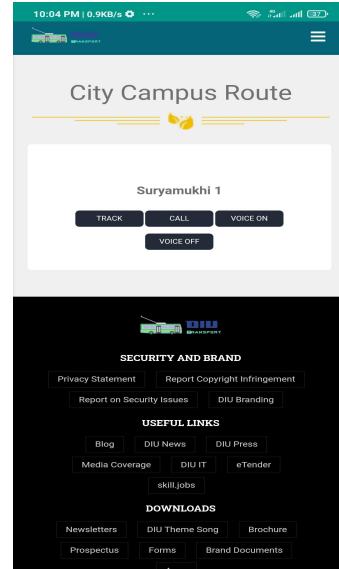
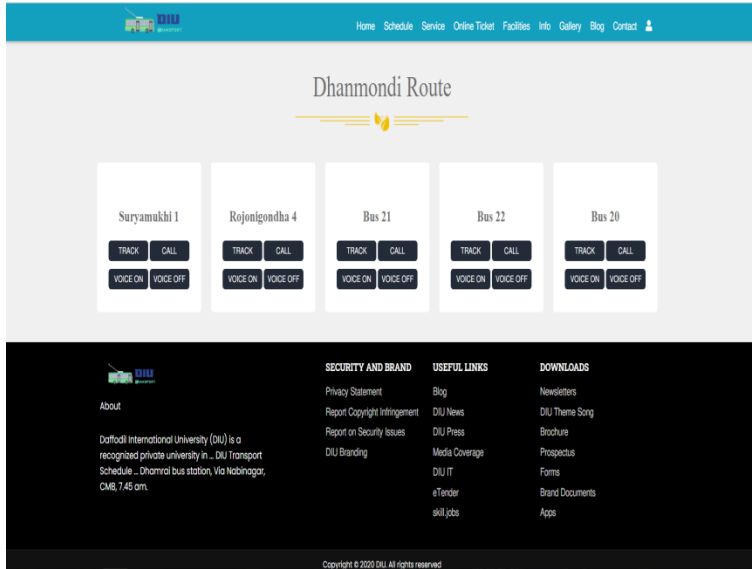


Fig 4.1.2.10: Location track

The DW style system gives you a URL connection that shows where the bus is located. The Type 1111 device offers an audio call where you know what's going on inside the bus. The call is continuously coming before you press the cancel command. Audio call cancel form 0000 never comes up again.

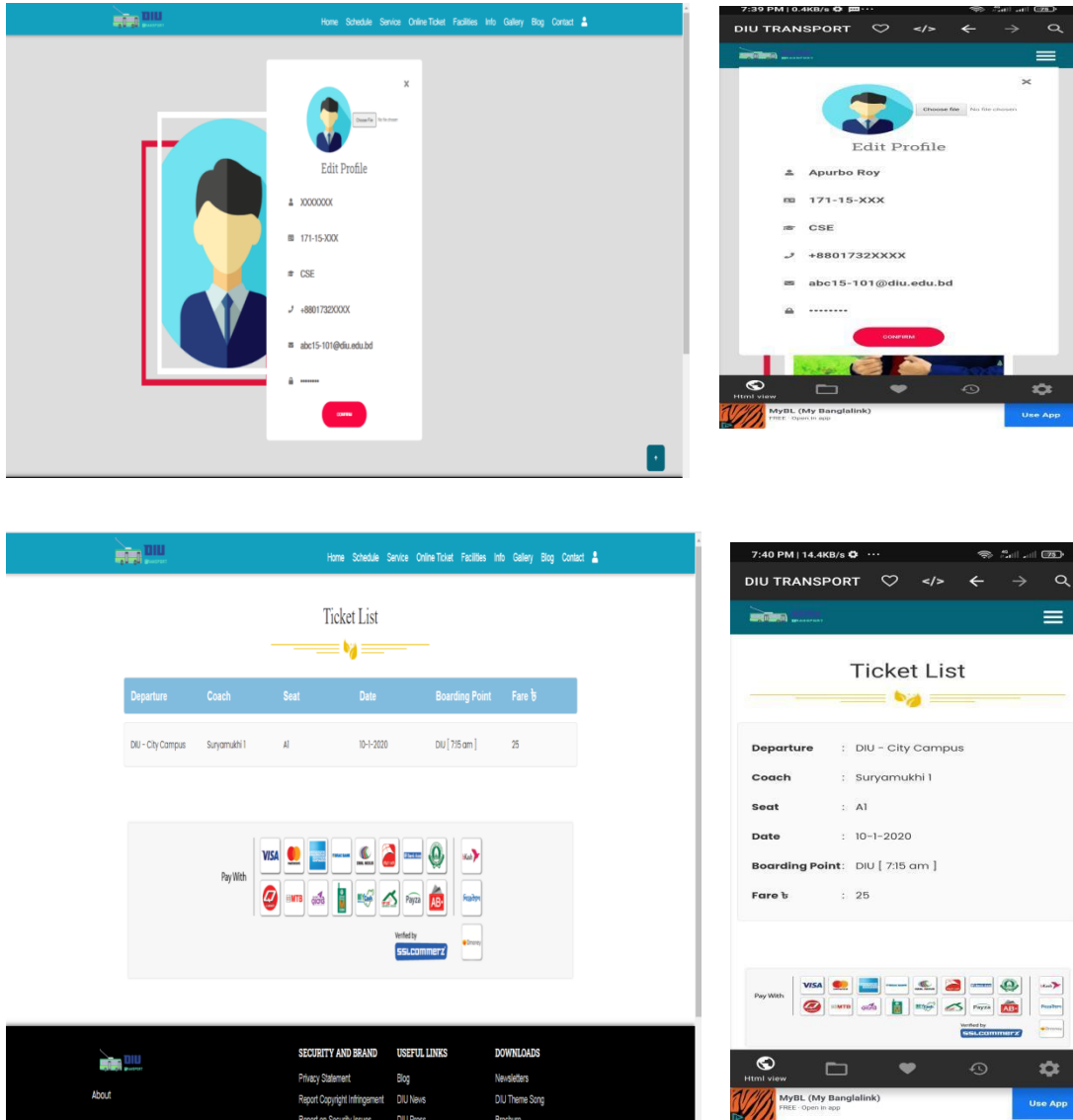



Fig 4.1.2.11: Profile & Passenger Details

From here, only administrators can see the custom in the formation, ticket list and total cost. And you'll know how many tickets for that bus have been sold so far.

4.2 Output



DIU TRANSPORT

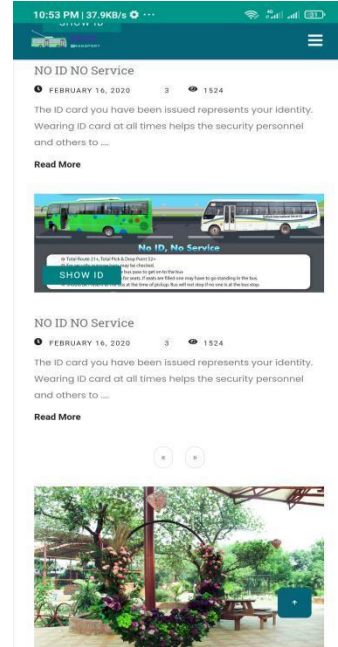
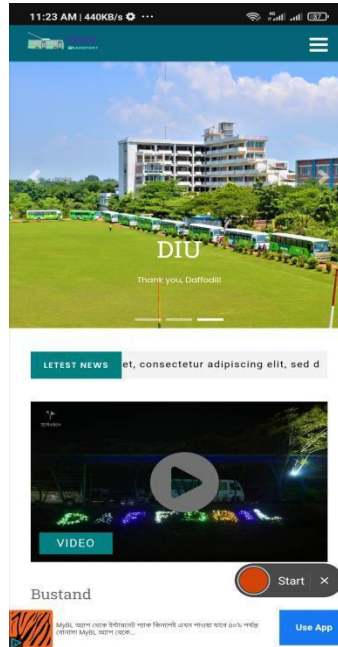
Email

Password

Remember! [Forgot Password?](#)

LOGIN

(Create New Account) Assist the driver and helper by showing the Daffodil International University ID card. Be cooperative with drivers, helpers and other passengers.

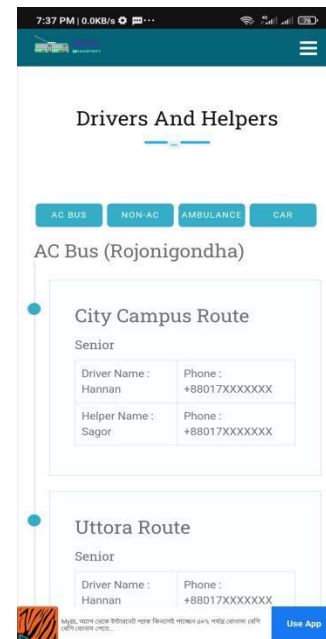
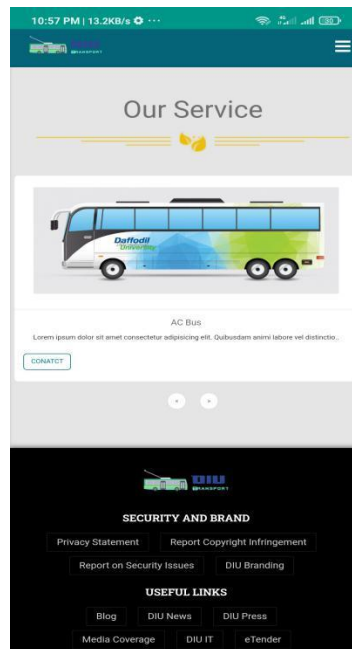


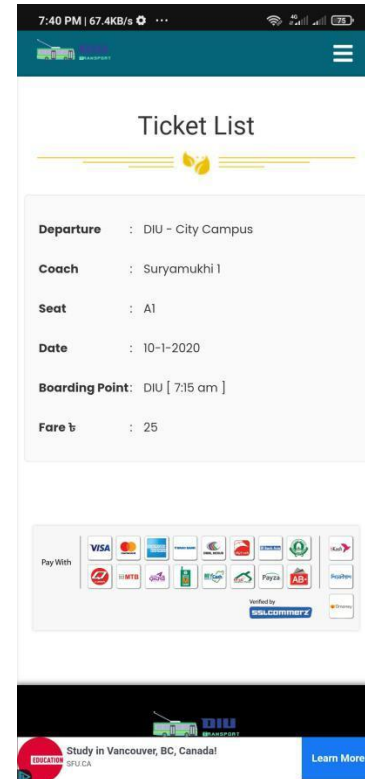
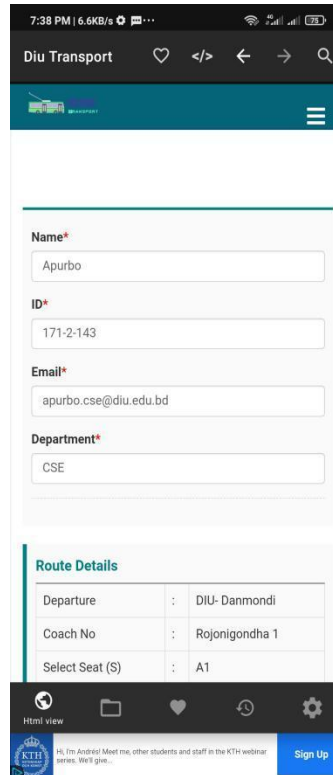
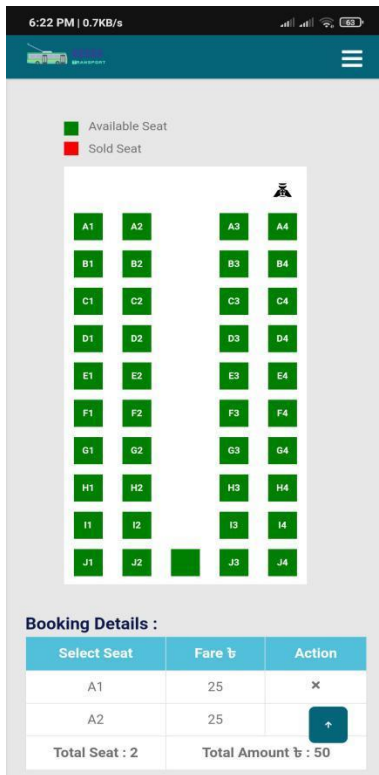
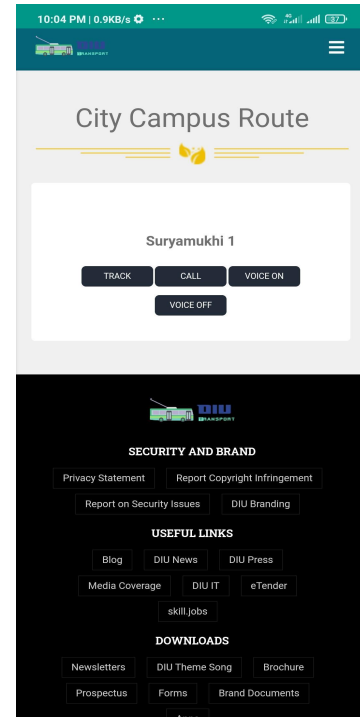
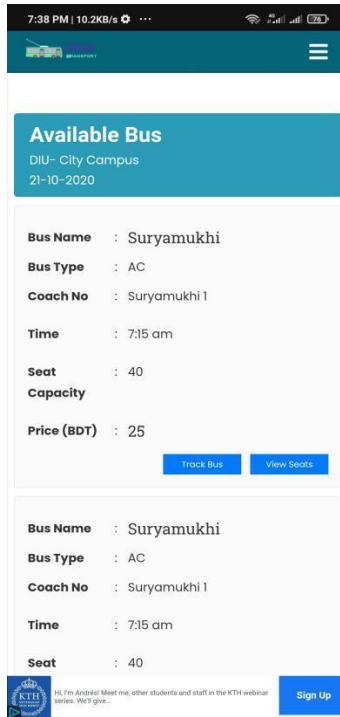
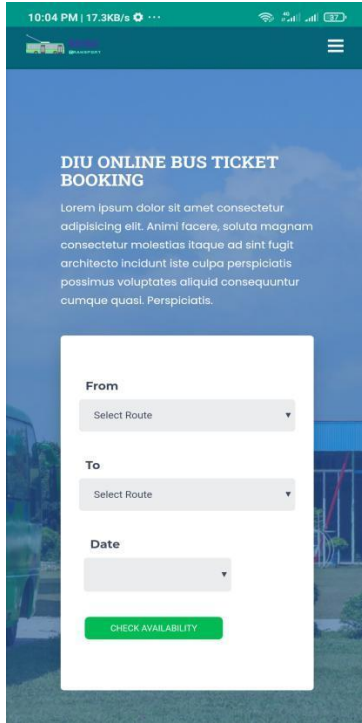
7:37 PM | 16.5KB/s

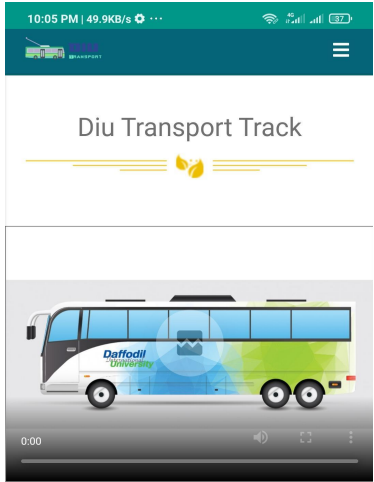
DIU Transport Schedule

From	Time	To
City Campus Route		
City Campus	7.15 am	Daffodil International University
City Campus (Only Faculty & Admin)	9.00 am	
City Campus	10.00 am	
Mirpur- (via prosikha more, purnima, sony, Mirpur-1)	7.30 am	
Uttara Route		
MES Via Uttara, Khilkhet, Rajlokhi	7:15 am	Daffodil International University
Uttara, Rajlokhi	8.00 am	
	10.00 am	
Tongi College Gate Route		
Tongi College Gate	7.15 am	Daffodil International University
	9.00 am	
	10.00 am	

Use App







How to use locate the bus

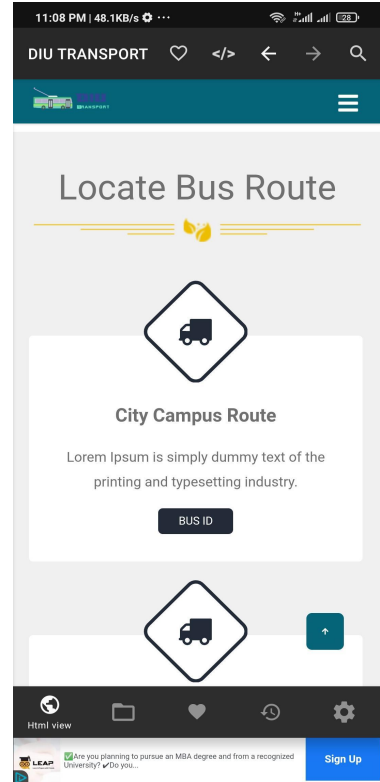
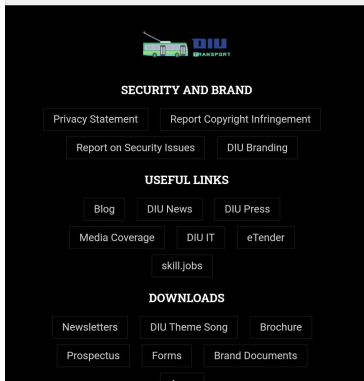
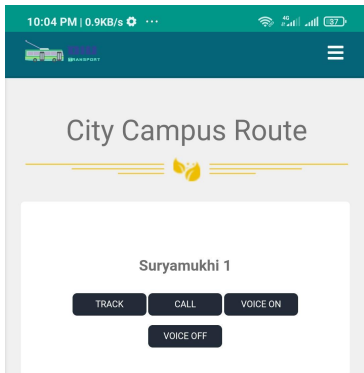
Daffodil International University Automated Transport System

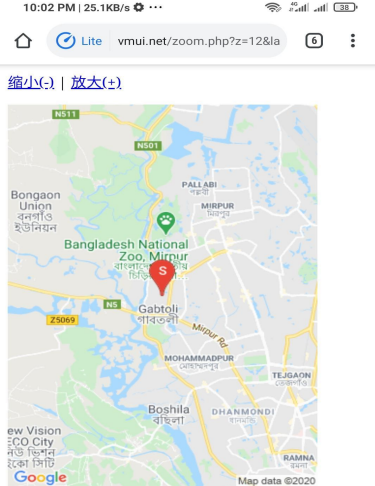
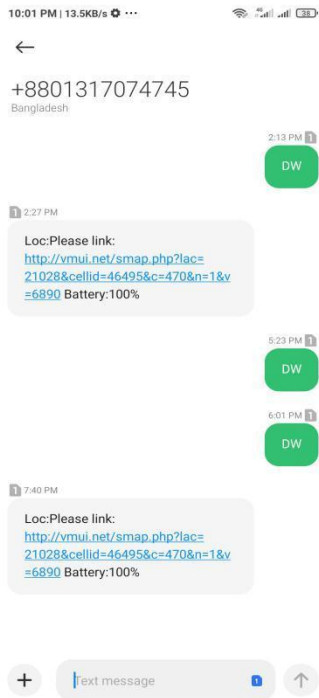
The DIU Automated Transportation System brings you a new technology. You can track your specific bus using this

Terms of use: Press the buttons below to track the bus and turn on the bus voice (you will be called again) and off. And also you can make call, then auto receive after 3 rings. Write DW send bus route number and you will get a return message url link, where you will see the location of the bus.

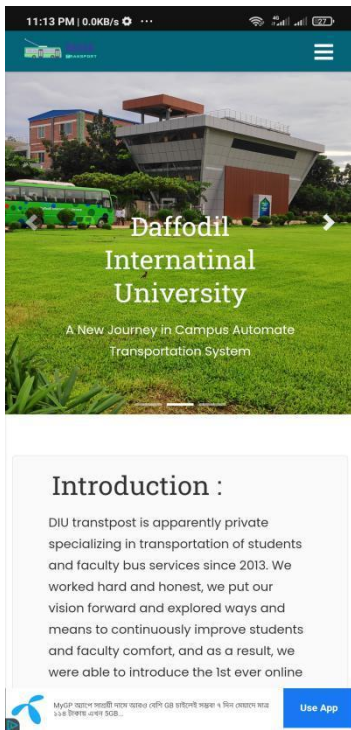
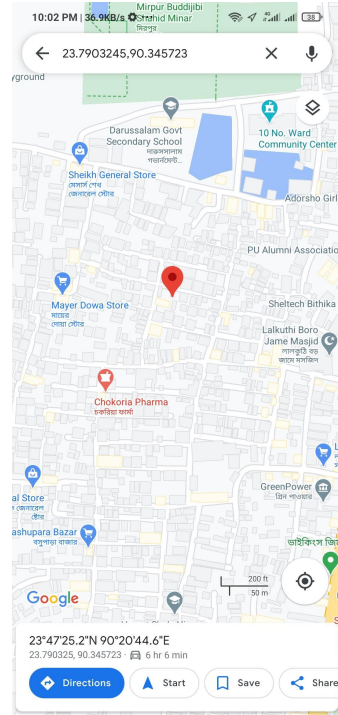
Write message option:

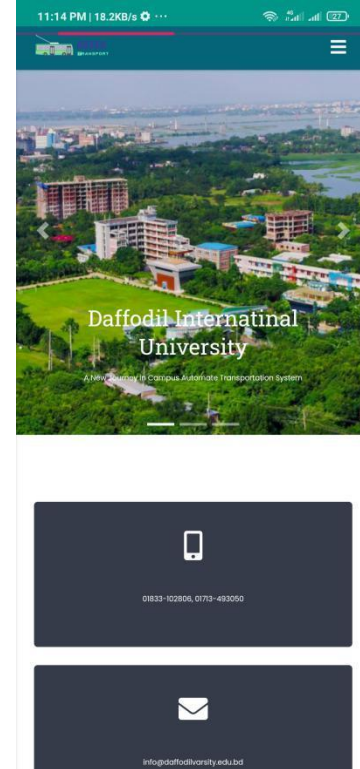
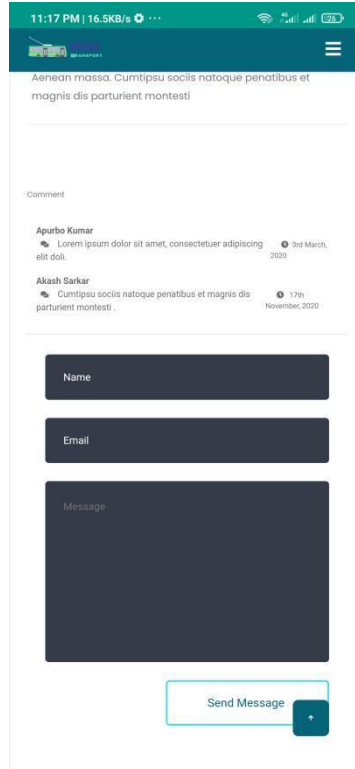
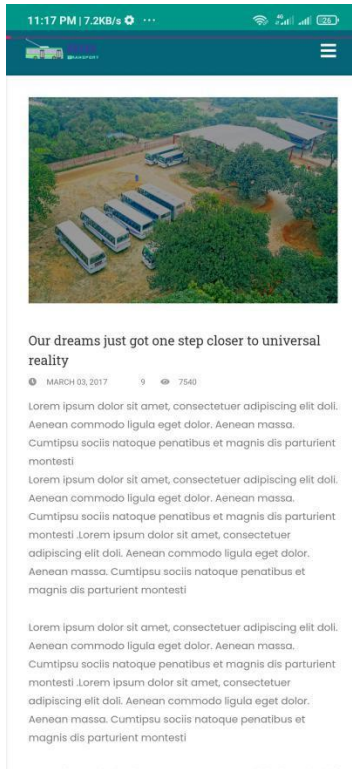
- 1. Bus track : DW
- 2. Voice On : !!!!!





Powered By [gpsui.net](#)
 LatLng: 23.7903245,90.345723





4.3 Limitations

- ✓ It should be operated in an open area in order to detect the latitude and longitude location faster.
- ✓ If the kit is moved a little bit, the GPS modern again takes time to detect the location.
- ✓ We have to connect the web server with a network. Otherwise, we won't able to enter the website.
- ✓ Mini A8 Device of the battery should be Dependable or Topped off when release.

CHAPTER 5

CONCLUSION

5.1 Project Future Outcome

We have some future plans for this invention. These facilities will be open not only to varsity students but to all.

1. Now what we do with audio calls and notifications we will do with face detection and picture capture.

2. With Latitude and Longitude, we will be able to track location later using Google Maps through web development.
3. Through Face Detect we can collect to rent from students.
4. We will be able to pay the rent with one card and DIU's ID card.
5. Contact the varsity authority and add permission to our project with permission from the mail and ID card database, no one can sign up or log in in the future except varsity students.
6. Mobile app

This automated transportation system will provide comfortable tension for the students. This automated transportation system will provide comfortable and tension free travel for the students.

5.2 Conclusion

We are very happy that our invention has succeeded in the purpose behind it. Our main purpose was to give the students a little bit of a journey Safety, time saving, reliable, minimal cost, Location track, notification, ticket buy. Any problems with the vehicle will be automatically communicated to the University's Transportation Management through audio calls and notifications. We have some future plans for this invention. These facilities will be open not only to varsity students but to all. Now what we do with audio calls and notifications we will do with face detection and picture capture. This automated transportation system will provide comfortable tension for the students. This automated transportation system will provide comfortable and tension free travel for the students.

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