# Campus Ride: An Environment-friendly Ride Sharing Platform for Academic Institutions

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*Abstract*—Road traffic is putting footprint on the environment and lower utilization of space in the private vehicles worsen the problem. In developing countries, the problem has become crucial as they do not have sufficient infrastructure for transportation. This paper presents the design and implementation of a ride sharing network designed to connect students in same institution who commute on the same route. Security of the students is considered to be the first priority in the design that is why the service will be provided within students of same institutes only. Someone can offer a ride to/from their institutes if they have seats available in their transport, or students can travel together on a public transport and split the fare. This way they can help reduce the number of transport traveling to/from each institute every day. In a survey among the students of an institution it is found that almost two third of the seats/space of the transports those people use are not used or empty. This ride sharing platform is a way to better utilize the empty seats in most passenger cars, thus lowering fuel usage and transport costs. It can serve areas not covered by public transport systems. Not only does it reduce our carbon footprint and reduce traffic on our roads, but it is an easy and effective way of reducing your travel costs and saving money. Ride sharing is a necessary mean that should have been introduced in our modern society for the betterment of our citizens and mainly students on their daily transport system in urban areas.

*Keywords*—*Road Traffic; Social Computing and Social Network; Environment; Transportation; Security.*

## I. INTRODUCTION

Like many capitals of the developing country, the infrastructure of Dhaka doesnt match the scale of its population. Just 7% of the city is covered by roads, compared with around 25% of Paris and Vienna and 40% of Washington and Chicago [2]. Dhaka also suffers from the absence of a deliberate road network, feeder streets leading to arterial leading to highways [1]. Students in Dhaka city face a major problem in transportation - especially for someone who does not have their own transport. Regular commuters - in particular, have a difficult time for the severe shortage of quality public transport facilities. Buses are always overcrowded, and may not be feasible modes of transport, particularly for female students. Auto rickshaw or taxi are ridiculously expensive. The brunt of rush hour traffic is largely felt by students who have to be at their designated places within a specific time.

Heavy rush hour traffic coupled with a serious lack of transport options means commuting from home to school/ college/university and vice versa can be quite afflicting indeed. Students who manage to get a ride also face a major problem which is security. Students especially the females always face a security threat if they travel alone. The reasons we need car-pooling ride-sharing platform in Bangladesh especially in Dhaka are given below [3].

- Lack of Intra-city public transportation in comparison to the number of people.

- Traffic jam caused by extra transport vehicles on the streets.

- Disorganized traffic system.

- Students suffer most in this case because only few of them can afford their own private transport and they may need to travel to a long distance from their home to Campus.

- Students traveling alone will feel secured if they travel with other students.

The share of private cars in Dhaka's daily commutes is a negligible $5-10\%$ but private cars occupy a staggeringly asymmetrical $70-80\%$ of the road space. Achieving that goal sooner would depend on how quickly we can revise an urban problem like street congestion in human terms. Technology is easy to fix, human conditions aren't. The sooner we realize that Dhaka's traffic congestion is not a problem of transportation engineering alone the better.

By conducting a survey among 300 students of North South University, and we found out that approximately $62.5\%$ seats of their regular transports remain empty or unused on a regular basis. The survey also shows that 92% of the students are really optimistic to share ride in a regular basis with other students from the same institution with proper security and proper verification of those people whom they are going to share ride with.

Our aim is to solve the transportation problem by connecting the students who are planning to travel on the same route and approximately at the same time. Initially, these connections will be between university students only. So, for a cab ride, it may help them to reduce their expenses. Security of the students will be ensured, as the registration process would only accept university email address. And also another verification level will be added as the students will need to show their current semester advising documents. And, if possible the user can be verified by the institutions authority as a valid student.This way the system can provide more roads to accommodate more private cars, while the utility of mass transit remains an idealistic talking point. Ride sharing can be geared more toward commuters interested in sharing the

expenses of ride-sharing. Ride-sharing is one of the common means of transport for many passengers, especially those who study in same institutes and live nearby places. It is a good option to consider if you do not have your own vehicle and also if you do not want to experience the trouble related to traveling in public transport.

The paper is organized as follows, relevant existing solutions are discussed in Section II, the proposed solution is presented in Section III, the design and implementation of the proposed Solution IV, sustainability of the solution and impacts on different sectors are explained in Section VI. Finally, this paper is concluded in Section VII.

## II. EXISTING SOLUTIONS

There can be a solution that if each institutes provides the students with their own transports to/from various destination. That will be really helpful to the students who are finding difficult to reach their home or to come to the campus on time. But institutes already have a huge number of students. So providing transportation for all students will require a large number of transports and huge investment. It is not possible to establish such a transport system within a short period of time and moreover these transports can make the traffic situation of Dhaka even worse. Only public universities of Bangladesh and a handful of other institutes provide transportation for their students but these are not enough for the number of students.

Uber Technologies Inc. is an American multinational online transportation network company headquartered in San Francisco, California. It develops markets and operates the Uber mobile app, which allows consumers with smartphones to submit a trip request which is then routed to Uber drivers who use their own cars. As of May 2016, the service was available in over 66 countries and 449 cities worldwide. Since Uber's launch, several other companies have replicated its business model, a trend that has come to be referred to as Uberification [9]. These types of services are not preferable for the students as it operates for a single user for every ride. Moreover, the expenses of each ride are too high for the students.

Lyft is a privately held American transportation network company (TNC) based in San Francisco, CA. Launched in June 2012, the company's mobile-phone application facilitates peer-to-peer ridesharing by connecting passengers who need a ride with drivers who have a car. Lyft was launched by Logan Green and John Zimmer as a service of Zimride, a ridesharing company the two founded in 2007. Zimride focused on ridesharing for longer trips, often between cities, and linked drivers and passengers through the Facebook Connect application.

ANI Technologies Pvt. Ltd., operating under the trade name Ola, is an Indian online transportation network company. Ola was founded as an online cab aggregator in Mumbai, but is now based out of Bangalore. Ola provides different types of cab service ranging from economic to luxury travel. The cabs are reserved through a mobile app. This cab service supports both cash and cashless payment options with Ola money. It claims to clock an average of more than 150,000 bookings per day and commands 60 percent of the market share in India. November 2014 Ola also started on-demand auto rickshaw service on its mobile app in Bangalore, Pune and few other
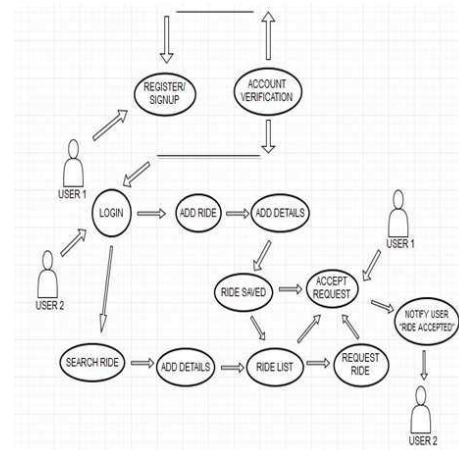


Fig. 1. User case diagram of the system

cities. This type of cheap taxi service can also be a solution of the students if they get to share it.

There is another system will be opening soon in Bangladesh called www.amarbike.com. It is a similar ride sharing website where a user can provide his/her destination and starting location and a bike will come to their doorstep to pick the user. This kind of system cannot be helpful for the students as only one student can ride a bike except for the driver. And also students have to carry addition helmets for their journeys. Security is also a big question for this system as fake drivers can pick the students and use this system for unethical means.

## III. PROPOSED SOLUTION

As shown in the Fig. 1, a user first need to sign-up/register. After registration is complete the user needs to go through a process for his/her account verification. Account verification is needed so that only University students can register and use this service. After account verification a user can *login* and start using the services. After *login* is completed using the University E-mail address or University ID and the password provided during the time of registration. Once a user is logged in he/she can add ride, if they are searching for other students to share their ride with. Students who are using their own transport or searching other students to share a public transport and split the fare can add their rides.

- New Post: there a button for the user after log-in. After clicking it the user will be asked if they are searching ride to the campus or from the campus.

- Starting Point: it is a panel that if a student is traveling to the campus then it will take the starting point of the journey from the student as an input.

- Destination: it is option that if a student is traveling from the campus then this button will take the destination of the journey from the student as an input.

- Male/Female/Both: Students will be able to choose the gender of the fellow traveler. They can choose whether they can to travel with anyone or they want to travel with same gender only.
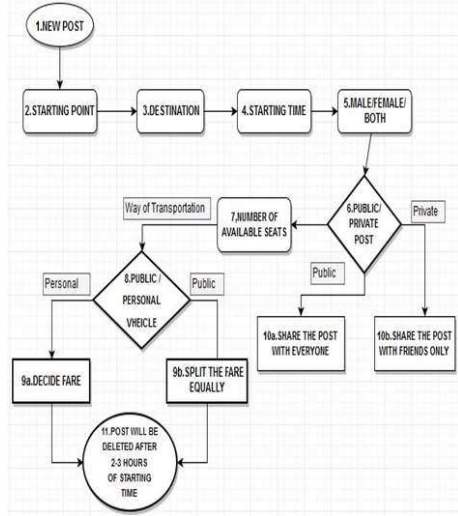
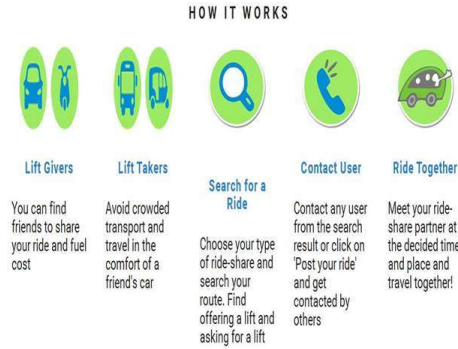Fig. 2. Complete flow chart of the system



Fig. 3. How the complete system works

- Public/Private Post: Students who will be posting their rides also can decide whether they want to share the post in public or private with their friend only.

- Public/Private Vehicle: Students will also have to provide whether the ride type is private transportation or public transportation.

- Decide a Fair: They will be able to decide a fair if the ride is a private transportation.

- Split the Fair Equally: It is an option for users. If the ride is a public transportation, then they will equally split the fare.

## IV. DESIGN AND IMPLEMENTATION

As shown in the Fig. 3, that is how the full system will work. There are lift givers who usually adds the rides. Another type of users is the lift takers. Lift takers are the users who search for a ride in the specific time to a specific direction from a fixed starting point. Search for a ride is the option when the user can search for the rides added already by other users. Here the user can send a request to the user who has added the ride to join the ride. Contact user is an option if both the lift takers and lift givers agreed upon sharing the ride then
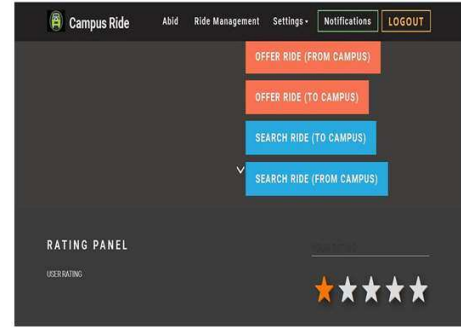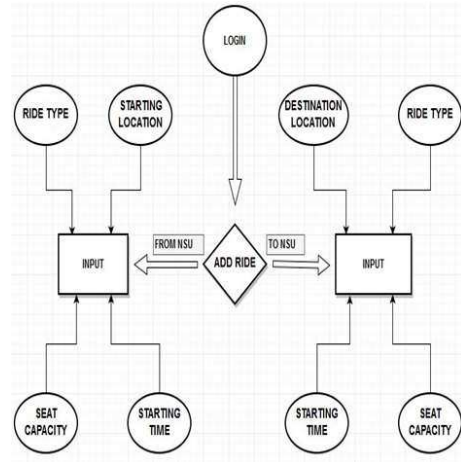


Fig. 4. Home Page of the system



Fig. 5. Ride adding process

they can contact each other using the system to be confirmed about every detail about the ride.

As shown in the Fig. 4, after successfully logged in, the user will be directed to the index page. From the index page the users will be able to do some user activity that includes the following functions.

- User Profile: Here users can see owns profile and can edit or update information.

- Offer Ride (From Campus): Add a ride from Campus so that other users can share.

- Offer Ride (To Campus): Add a ride to Campus from a similar starting point to share with other users.

- Search Ride (To Campus): Search added rides by other users to share the journey to campus.

- Search Ride (From Campus): Search added ride from campus to somewhere preferable.

- Manage Rides: Here the users will be able to see the current status of their added rides, requested rides, and previously shared rides.

As shown in the Fig. 5, a user after *login* can select to add ride. When they do so they will be asked whether they want a ride to campus or from campus. They will require providing
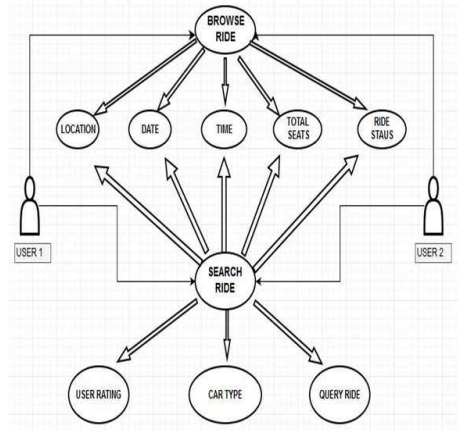
Fig. 6.   Ride searching and matching process

some fixed inputs like ride capacity, seat available and ride type whether it is public or private.

As shown in the Fig. 6, a user first need to *login*. After logging in the user also will be able to search ride. If they choose to search ride, they will be asked the ride is from campus or to campus.

There are various options used in this system to make it more users friendly. They are given below.

- Proximity Search panel which the system contains of a proximity search. It works in a way that if a user enter a starting point or destination location while searching for a ride they will also be shown other rides which are offered in the area near to the area which they are searching for. In this way if they can't manage to search a ride to/from the exact location, they can go to any other place nearer to their starting point / destination.

- Ride List (Circle Priority) panel where a user adds a private ride it will only be visible to the users who are in his/her circle list. In case of searching a user can also search the rides added by their circle list only. In this way they will see the private post or public post of other user who are in the circle list. And any other users who are not the user's circle list won't be seeing the private posts.

- Rating Option panel (Fig. 4) that allows other user to rate a ride shared and the rating will be saved in the involved users' profile. And the rating will be visible to other users so that the rating will help other users to decide whether to share the ride or not. Good rating can be a way of showing the users social capacity of the user. However a bad rating will show other users that the user is not a good choice to share a ride with.

Notification Panel is first introduced to the users when they click the Notification button then they will be redirected to the notification chart. There they can see whether others accept or reject their rides. Suggestion list panel where the users can see many suggestions of people who has same main/home location as the user given on the sign up. In this way, it will be easier

for user to find other users who are using this service and add them in their circle and share their ride to home and university.

## V.   SUSTAINABILITY

To maintain our site and server, we need to maintain our domain and hosting with some specific cost and on the large scale; if the number of user increases we also need to enlarge our hosting size and bandwidth with some extra money. Certain points to be considered for maintaining the system:

1) Monetary aspect: User has to decide what fare is to be given based on fuel, maintenance and parking. Also one important thing is to be kept in mind is that when should the fare be collected daily, weekly, or monthly and should be informed in advance [14].
2) Late comers: Ride-Sharing management solely depends upon time management. Late comers disrupt the whole process. Strict rules should be established for latecomers. The maximum time for waiting should be fixed up to five minutes. To avoid it fix well in advance the meeting point (pick & drop place).
3) Avoiding frequent stopping: Frequent stopping in between your office and home or any destination should be avoided. This saves time and late arrival at both the office and back home journey [14].
4) Substitute: Unforeseen can happen anytime. So to be on the safer side other substitute should be kept in mind. Example: mechanical breakdown or illness of the other user.
5) Maintaining your vehicle: A well maintained vehicle will consume less fuel in comparison to a poorly maintained vehicle. Ensure that the vehicle is well maintained. This will guarantee a secure, steadfast and comfortable journey.
6) Mutual co-operation among the riders: Mutual cooperation among the riders is a must. In between the journey, smoking should be prohibited. Seating arrangements should be proper- small person in the back row as there is less legroom / leg space in some vehicles and big person in the front row. Caring for the fellow passenger would make the journey more comfortable. If you are rider make sure that you should not heart the feeling of car / van / bike owner by unnecessary fingering to his vehicle. If you want to use anything, ask for it before using.
7) Check all details: Before going into any pool check all details of the person(s) details with whom you are planning to share your ride.
8) Provide all details: Provide all necessary details (relevant & genuine) to the service provider as well as inform your friends/family members about the Campus-Ride.com so that they were well informed about it - in case of any incidence/mishap.

For our sites there will be add slots where other companies can place their ads. And we will charge them money for their advertisement in our site that will generate the revenue of the site. Ensure that a proper system is maintained in the website. Discipline and manner are the two strong weapons of good ride sharing.

Once the system starts to attract a large number of users from North South University then we will request other universities for start implementing the system in their institute

as well. In this way if a large number of people use the system regularly then it can effect largely to reduce the traffic congestion of Dhaka and also the carbon footprint of the city in will reduced.

## VI.  IMPACT ON DIFFERENT SECTORS

Current socio-economic circumstances in large cities impose an increased need for mobility. Some of the transportation energy consumed during peak commuter periods is wasted through slow running in congested traffic. Most large cities are overcrowded with vehicles, facing a continuously growing volume of traffic. Traffic congestion, an everyday phenomenon, are basically caused by the large number of vehicles, moving or searching for a parking place [11].

### A.  Environmental Impact

Ridesharing reduces the number of cars on the road, thus directly lessening the quantity of harmful gasses emitted into the atmosphere [10]. The reduction of driving is the key to improving air quality, reducing pollution and combating global climate change. Ridesharing results in less carbon and foot print that's a great and eco-friendly thing in the context of global warming and climate change issues.

### B.  Economic Impact

Cutting down on transportation costs is one of the great individual benefits of ridesharing. The driver's costs for fuel, vehicle maintenance and tolls are offset by the money contributed by the riders [12]. Ride sharing conserves or saves non-renewable energy resources.Ridesharing savings will increase as the number of participants in a particular rideshare increases.Factors influencing rideshare savings include the fuel efficiency of the vehicle, the price of gas and the cost of tolls and parking.

### C.  Social Impact

Ride sharing will work as an social connection cause people will ride with each other whether are known to each other or not. It can give people the joy of others company while riding that may create social bonding. User who lives near each other will travel often to the same place and will eventually create a community with some common interest [13]. Al last, we can say 'sharing is caring'. Ridesharing reflects this motto.

## VII.  CONCLUSION

In developed countries, the large cities are overcrowded with vehicles, facing a continuously growing volume of traffic. Traffic congestion is also becoming a great problem for the developing countries especially for the urban population of the developed or developing countries. In theory, this ride sharing platform could lead to great reductions in the use of private vehicles; however, in practice they have obtained limited success for two main reasons the psychological barriers associated with riding with strangers and poor schedule flexibility. To overcome some of the limitations of the traditional schemes, we proposed a ride-sharing platform with two main new features establishing a base trust level for rideshares to find compatible matches on regular journeys and at the same time

allowing to search for a ride in an alternative location when one student has a trip schedule different from the usual one. It will have a great positive impact on social, economic and environmental sector. Because the system connects students traveling to same place on an approximate same time, so they can share all or part of their commute, cutting transportation costs for the students while reducing traffic congestion and pollution of the entire city. This ride sharing concept will not only give the campus going students some economic and social benefits but also it will also have some environmental positive impact by reducing carbon foot print and reducing pollution.

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