

SMS BASED VEHICLE SHARING SYSTEM

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Introduction

One of the biggest challenges people face nowadays is transportation. It is even worse with frequently fluctuating world oil prices. Governments are emphasizing on the use of public transportation because of the cost increase and growing traffic congestion. However, most of the passengers consider public transport as an inconvenient and uncomfortable source of transportation.

Vehicles are often shared in the rural communities, but the arrangement is ad-hoc and chaotic. It is virtually impossible for the vehicle owners and passengers to organize such trips due to the communication gap which prevails in the society. In this project we addressed this communication gap using a distributed mobile phone system to share transport.

By the end of this year, half the world population will use mobile phones (Partio, 2009). Mobile phones have become a common commodity even in developing countries like ours. Often rural masses in developing countries are devoid of basic necessities, infrastructure and information. Given that more than 20% of those who will be using mobile phones are illiterate but intelligent and numerate, the aim of this project is mainly to empower the people in rural communities who are suffering a lot with the transportation problem and, to research methods to communicate effectively with minimal use of text and maximal use of numbers.

Study of existing Systems

There are several existing vehicle sharing systems. However, none of them are

Short Message Service (SMS) based systems - the cheapest corner of mobile communication. One of the main purposes of currently available software systems is to find the best match - the persons who have the similar likings- for your journey, but the vehicle arrangements have to be done by yourselves. Few of such software systems are discussed here.

Carpoolworld.com (Carpool, 2009) looks at exactly where everyone lives and works to find perfect carpool matches for everyone. *eRideShare.com* ([eRideShare](#), 2009) is free service for connecting commuters, or travellers going the same way. It's a good way to commute or travel inexpensively, and maybe even make a few friends, while reducing pollution, traffic, and dependence on oil. *Seattle Smart Traveler* (SST, 2009) is a dynamic ride sharing with the concept whereby commuters are linked with one another for the purpose of sharing a single trip together. *Carpool Application on Facebook* (Zimride, 2009) is a simple way to find friends and classmates going the same way you are. All these systems are web-based and require users to access the Internet for communication.

However, the main difference and therefore the advantage of our system compared to the existing ones is that, it provides SMS base control system in addition to the web-base system. Therefore, with the aid of our system, passengers can easily arrange their journeys and vehicle owners can easily share their vehicles with passengers who are having similar needs using a cheap medium, namely SMS, available via their mobile phones.

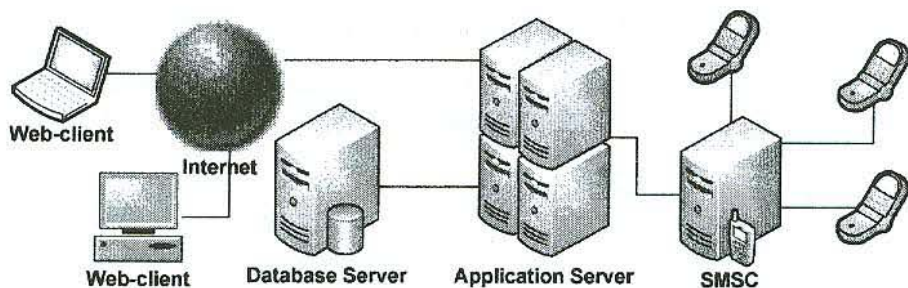


Figure 1. Main Model of the System

Architecture and Environment

Figure 01 depicts the overall architecture of the system. Mobile phones have enabled widespread communication beyond voice. Since most developing countries including Sri Lanka have excellent mobile phone coverage, it is this medium we chose to address the lack of communication. Given that SMS are seen as the cheapest way of electronic communication, we decided to use this service with the aid of the numeracy (that even the illiterate persons often possess).

The whole system is deployed on an application server and it runs continuously to process the user requests. An SMSC (SMS Centre) which is connected to the application server receives and sends text messages in and out of the system. All the information is stored in the database and whenever a request comes, application server will process the request with the aid of the database. Whole System can be divided mainly into two sections: (1) SMS Module and (2) Web Module.

Research on the SMS format

First phase of the project mainly focused on finding an efficient and easy text message format such that every person could use that without much difficulty irrespective of their literacy level. The research was mainly focused on finding the SMS formats such that it should use less amount of text and should mainly rely on numerals. In Figure 2 are the SMS formats used in the system and Figure 3 is

a typical SMS flow for a journey. Both the vehicle owners and passengers must be aware of the correct format in order to use the system. All the literals used in text messages are made case insensitive to improve flexibility.

Vehicle owner registering a new journey:

**A: vo start destination seats price date
time vehicle_no**

vo Kandy Colombo 3 50 2008-05-25 09.30 GH-2345

Confirmation message to the vehicle owner from the system:

**B: journey_id start destination date
time vehicle_no**

123 Kandy Colombo 2008-05-25 09.30 GH-2345

System's message to the vehicle owner one hour before the journey starts (an alert):

C: journey_id vehicle_no booked_seats
123 GH-2345 3

Passenger to search a vehicle for journey:

D: pas start destination seats_needed date
pas Kandy Colombo 2 2008-08-25

Passenger to book a journey from a list:

E: pas message_id journey_id
pas 321 123

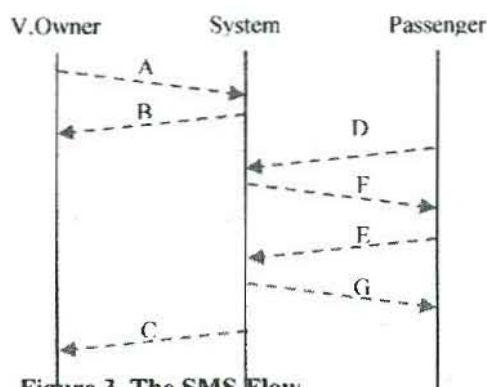
System's message to passenger based upon D:

**F: message_id journey_id vehicle_type
vehicle_model a/c fuel_type price time**
321 123 car mazda yes petrol 500 09.30

System's message to the passenger when a journey is booked:

**G: vehicle_no vehicle_owners_mobile_no
journey_id**
GH-2345 +94714323457 123

Figure 2: SMS Formats



**Figure 3. The SMS Flow
The SMS Module**

Vehicle owners could schedule a journey in the system by sending a text message to the system. Passengers could request details of desired journeys by sending a text message to the system. System should search the journeys registered by vehicle owners according to the passenger requirements and send a text message with the list of journey details to the passenger. Passenger could select the most preferable journey from the list and could send a text message to the system confirming the selected journey. System should send a confirmation text message to the passenger according to the correct format upon receiving a journey confirmation message from a passenger. Whenever all the seats of a particular journey are booked, or when all the seats are not booked when the current time is one hour before the journey scheduled time, then the system send a text message to the vehicle owner.

The Web Module

Basically the web module consist of three main categories of users namely vehicle owner, passenger and administrator. Vehicle owners are able to use it for registering, searching journey and for adding vehicle details, edit profile details, etc. Vehicle owners can schedule journeys through the web using journey schedule module (apart from using an SMS). Every vehicle owner also has all the features

provided in the passenger module like search journeys and booking journeys. There is a web page for the purpose of registering, searching for scheduled journeys and for booking preferred journey for passengers.

Administrator decides the supported cities in the system where a particular journey starts or finishes. After logging in, admin can insert or delete cities into the system. Whenever a vehicle owner scheduling a journey in journey schedule module it will auto suggests names of the possible cities using administrator specified cities.

Conclusion

This software system provides a solution to the transportation problem which is one of the major problems people in the rural areas are suffering nowadays by providing mobile phones based distributed system for vehicle owners and passengers to share vehicles. Vehicle owners can reduce the cost of their journey by sharing the other seats with the people who are going to the same destination. Everyone could use this system without difficulty because of the text message format used in this system, which uses lesser amount of literals and more numerals.

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