
Application for Freelance Truck Drivers in India

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Abstract

Efficient road transport is a key factor in promoting a healthy economy and sustainable physical development. Freelance truck drivers often do not have a scale to run their operation more efficiently or to brand and market themselves. Finding a customer for such truck owners becomes a crucial task. In this paper we propose a mobile phone application that enables a freelance truck driver operating on long distances to find

customers and for customers to find a suitable truck driver. Our application was developed after initial user studies. Prototypes of the application were iteratively improved through feedback from the users.

Keywords

Digital divide, mobile commerce.

ACM Classification Keywords

H.1.2 Human Factors.

Introduction

The last few years have marked emergence of several mobile applications in the developed world (maps, email, instant messengers, calendar etc.). Many of these applications are meant to be used in conjunction with a corresponding desktop or web based applications. Other applications are adaptations of their counterparts on the other devices such as cameras, GPS or MP3 players. As a result, applications on mobile phones try to closely resemble their counterparts on other platforms.

In developing countries, on the other hand, mobile phones have been the primary and often the only digital device for many people. In the last five years, mobile phones have penetrated beyond the educated,

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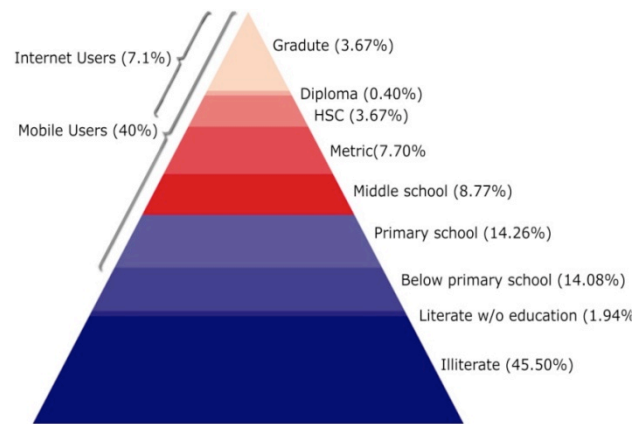


Figure 1. The education in India [1] compared to mobile phone penetration [4] and internet penetration from [2]

office-going population in these markets. In year 2009, the number of mobile phones crossed 400 million in India [4]. A majority of these new mobile phone users are people with limited education and exposure to technology (figure 1). Not surprisingly, use of mobile telephony has largely remained restricted to voice calls [3]. However, voice connectivity realizes only a small part of the larger promise of the digital world and the advantages it can bring to development. With features like data storage, GPS and 3G connectivity spreading rapidly, internet based applications for low-tech, low educated users shows good promise.

Road transport in India has more than 70% share of the goods and freight traffic involving about 5 million truck drivers [5]. Most of these belong to low-income group; have low levels of education and low exposure to technology. There are two types of truck drivers in India: employees of large transport companies owning

10s to 100s of trucks and freelance truck drivers who own 1-4 trucks (usually driven by members of the same family). The drivers in the latter case need to find customers on their own.

In this paper we present ideas for a mobile application that helps long-distance freelance truck drivers find and manage customers. The second section details the findings from our initial contextual inquiries. An application was designed on the basis of the findings and was iteratively improved through feedback from truck drivers. The third section details the features of the application and its improvements. The fourth section describes the findings from a usability test.

User studies

We conducted contextual inquiries in the states of Maharashtra, Gujarat and Karnataka. Users included 13 freelance truck drivers and 7 people who rented trucks on a regular basis. All truck drivers had at least one mobile phone in their family and have been using it for more than a year. Their exposure to technology was limited to TVs, radios and mobile phones.

We found that there are three main ways for a freelance truck driver to get business: waiting at a truck stand, getting customers through brokers and getting repeat business from customers with whom they have dealt with earlier.

In every geographical area, there is a truck stand (usually near an industrial area). Large cities will have several truck stands, while smaller towns will usually have only one. It is a common practise for truck owners to wait on a truck stand for customers. Some truck drivers don't mind waiting for a day or two before they

find a customer. At most truck stands, there is a truck union, which allows only local truck drivers to do business there. This makes it relatively easy for the local truck drivers to find customers in the onward direction, but makes it harder for them to find customers on the return journey. Moreover truck drivers prefer not to spend time away from their home town. As a result, many trucks return empty. At times, a truck driver may have a preferred destination. This might be on the longer term (for example, if they have their family in that town) or if they need to be in that town on an occasion. In this case, the truck driver makes it known on the truck stand and any customer for that destination is diverted to him.

Transport companies provide a factor or assurance to the customers. Customers are concerned about time their shipment would take and the safety of their goods, and therefore prefer companies over individual truck drivers. Several freelance truck drivers associate themselves with transport companies that work like brokers to find them customers. However truck drivers lose a margin in such transactions.

Some truck drivers rely on business from earlier customers. Several freelance truck drivers use mobile phones for business. Prospective customers often contact truck drivers over the phone directly. The contact details of truck drivers spread organically amongst customers. While truck drivers make more money in these transactions, it is harder for them to find new customers.

Truck drivers rarely write down their schedules. When the driver is talking to a customer on the phone, he may not be entirely sure about his schedule. At times,

truck drivers miss important events (such as weddings) or may be late or may not show up at the appointed time at the customer's location.

Many truck drivers currently ply on fixed routes (because of the way they get customers), so they don't need static information (such as maps, restaurants, fuel stations etc.). However, they need dynamic information (such as weather, traffic, accidents). Currently they gather this information from other truck drivers, the transport company and customers. On several occasions, they don't get such information in time.

The truck drivers charge a flat rate between a pair of cities and not on the basis of kilometres travelled. These charges are usually negotiated.

Battery life of mobile phones seems to be a critical factor for long-distance truck drivers. It is not common to have a phone charger in the truck. (Of the 13 trucks we saw, only one had a phone charger.)

Our contextual inquiry gave us lot of understanding about the transport scenario in India. It pointed to the need for having a phone-based customer-finding application for truck drivers, but it did not generate enough details to design a suitable application. Hence we adopted an iterative approach, wherein we prototyped some of our ideas and took the prototypes to the users. The prototypes were improved upon iteratively based on the users' feedback.

Design

The design of the proposed application has two parts: the truck driver application and the customer application. The truck drivers need to have a

customised phone with a 'truck driver application' to be a part of the system. The customers may download a 'customer application' on their phones (below, we describe this scenario). In case a customer does not download it, similar functionality could also be accessed through an interactive voice response system (IVRS), which we have skipped here for brevity.

Customer Application

The customer who wishes to rent a truck launches the customer application. On the first screen he chooses the destination, type of goods (furniture, vegetables etc.), weight of goods (100 kilograms, 500 kilograms, half truck, full truck, 2 trucks etc.), date, time and whether the customer will require any labour for loading and unloading (figure 2a). The fields are pre-filled with expected default values based on past transactions.



Figure 2. (a) Input fields on customer's phone (b) Search results showing a list of truck drivers

When the user submits the information, a list of truck drivers who are free to travel on this route on the selected day appears as the search result (figure 2b). If the customer had a partial truckload to carry, trucks scheduled to travel on the route on that day with complimentary partial load are displayed at the top. The list shows the name of the truck driver, a rating by previous customers and a photo of the truck, showing size and type of truck. If the truck is scheduled to leave at a particular time on the route, this is indicated as well. The customer can call a truck driver of his choice by selecting his name from the search results list.

The sequence of truck drivers in the search results list is determined by parameters such as rating by other customers, whether the truck driver is located near the customer, whether the customer has worked with a truck driver in the past, the duration for which the truck driver has been waiting for a customer etc. If a truck driver is already scheduled to run his truck on the route (either partially filled, or empty) he too gets a priority in the search results.

Truck Driver Application

At all times, the desktop screen of the truck driver's phone shows his schedule for 4-5 days (figure 3a). When the truck driver gets a call from a customer through the system, the desktop screen displays the name of the calling customer (if available), his rating, the destination, the distance, the type and weight of the load and the date on which he desires a truck, and whether he needs labour to load and unload the truck (figure 3b). The truck driver gets this call only if, as per his schedule, he is free on this day and waiting for a customer or if he is carrying a complementary partial load to the same destination on the same day. The

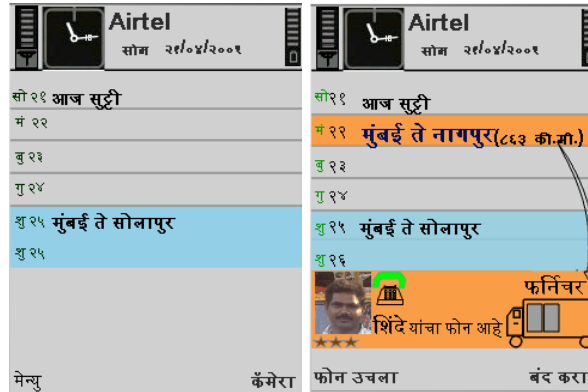


Figure 3. a) Mobile phone of truck driver before getting a call
b) Mobile phone of truck driver while incoming call

truck driver can also see his other commitments around this date. Thus, even before the truck driver has answered the phone, he already knows the details of the trip, that he is free in his schedule to make the trip and that the customer is reliable.

The truck driver then talks to the customer and negotiates a price for the trip. They also discuss other details, such as address, need for labour etc. After the call, if the deal is finalized, the truck driver inputs the departure time into the system in two clicks (figure 4). The system then blocks him out of this date and starts looking for a return journey.

The customer contact details are stored in the truck driver's schedule automatically. If he needs to, the truck driver can call a customer directly from the schedule on his phone desktop. Similarly, if the truck driver misses a business call originating from the

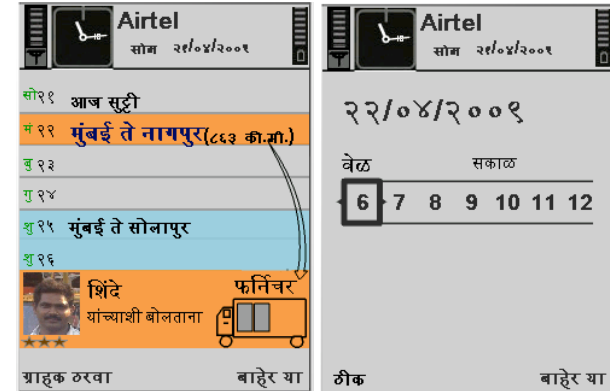


Figure 4. After the call, the truck driver confirms the trip and inputs the departure time

system, he can view the itinerary details in the schedule before calling back.

If the truck driver wishes to take a holiday on a particular day, he can mark it on the schedule for that day. The system automatically stops including his name for search results for that day. The system also gives him a higher priority in search results for the day after a marked holiday. This incentive is meant to encourage truck drivers to mark off days and minimize the number of false calls that customers need to make from the search results page.

The application also allows the truck driver to select a preferred destination for a particular date. This might happen if the truck driver would like to travel to that destination for personal reasons. If the truck driver does this, the system gives him a priority in search results listing for that route (and removes his entries for other routes, thus giving priorities to other truck

drivers on those routes). This mimics the current behaviour, where truck drivers often ask for a specific route to transport companies or truck stands.

the application detects that a scheduled journey is underway, it automatically provides information such as traffic and weather updates for the next 200 km in the direction of the destination. If the driver is travelling on a route that is unfamiliar to him, he can use the schedule to drill down to more static information such as the route map, fuel stations, restaurants, service stations etc. (figure 5).

On completing the delivery, the truck driver and the customer can rate each other (figure 6). This rating is averaged across drivers and customers and displayed in search results and customer calling screens respectively.

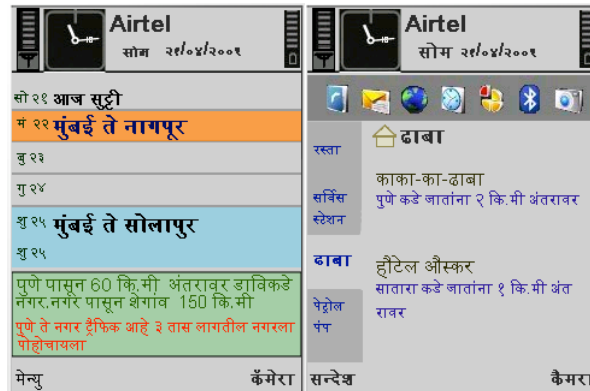


Figure 5. Dynamic information (traffic / weather) is provided on the desktop. The driver can drill down to view static information on unfamiliar routes.



Figure 6. Truck driver and customer rate each other after each transaction.

Evaluation

The application was prototyped on Nokia N95 phones and shown to 6 truck drivers and 3 potential customers in Maharashtra. Each user was given typical tasks and asked to think aloud while performing these tasks. Truck drivers were asked to do tasks of picking up a call, confirming the customer, setting up a destination for a specific date, taking an off etc. The customers were given a scenario where they have to shift furniture from Mumbai to Pune and have to search for a truck driver using this application.

A truck driver raised an issue of labour – truck drivers often provide labour to customers to load and unload trucks. On the other hand, some customers have their own people to do this work. Truck drivers thought that the system might take them to new destinations that they may not have heard of, and it might be difficult for them to estimate the time. So they wanted to know the distance to the new destination. The truck drivers

reported that the route related information was of great use to them while on move.

The customers were generally comfortable using the prototype, but some were confused with the default values presented. The customers suggested default values for the fields in figure 2a. One issue potential customers raised was the variety in trucks. A goods carrier truck in India could range from a small, 3-wheeled tempo with the capacity of about 1 ton, to medium sized trucks with a capacity of 10 tons, and to large, multi-axel truck that can carry up to 25 tons. To take care of this issue, we introduced a photograph of the truck in the search results page (figure 2 b). The application still has an unsolved problem – selecting an unlisted destination by the customers. Currently, only a small list of cities is listed in the drop-down in figure 2a. All small towns and many cities have been skipped. Identifying these, their location and distance from the source is still an unsolved problem in our solution, given the ambiguity in spellings and difficulty in text input in Indian languages.

Conclusion

The application helps customers find long-distance freelance truck drivers on a specific route on a specified date. The system widens the truck drivers' choice for customers. The system proposes intelligent search to help truck drivers optimise their business and yet tries to be fair to all drivers. Drivers who have been waiting for long, drivers returning from an off day, drivers who are carrying partial loads, and drivers on a return journey to their home towns get priorities in the search list.

The advantages of the system are both ways. It enables truck drivers find new customers and optimises their business. Optimised trucking business and transparency in turn will help reduce costs for customers.

For a market of 5 million truck drivers, it may not be feasible to launch a special hardware product, but an existing hardware with special software supported by a back-end search system may be more feasible.

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