

Survey on Cab Services for the Visually Impaired

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ABSTRACT

In today's growing world where technology advancing into every aspect of our lives, it has changed the way we go about our life. With all this technology in hand, improvements can be made in various ways to help the society. Focusing on the transportation industry, it has seen an exponential technological growth with the introduction of Applications and services which provide the people with an easy option of travel by booking Cabs which will arrive at their doorstep. Some of the leading apps in this category are Ola, Uber and so many more. However, these apps cater only to the common demographic of people/users. India is a country with over 13 million visually impaired individuals out of which the state of Karnataka has 264,170 people according to the Karnataka Census of 2011. With all these apps and technologies being available to us, we can provide a means of easy and safe transport to these impaired individuals. E-Car Savegalu is an attempt at providing these transportation services to the visually impaired in the form of an application which is intuitive and easy use to book cabs. This concept has a significant role to play in the society by helping a good number of visually impaired people in terms of travel.

Keywords : Visually Impaired, Cab Booking, Transportation Services.

I. INTRODUCTION

With the available improvements in technology it is imperative to provide a solution which will work towards the betterment of the society and make a change in our community. Organized rental cabs were introduced in the Indian market in 2004 with Meru cab service, this concept soon became popular among consumers in metropolitan cities. But the actual revolution came in 2010 when app-based services started its operation, followed by Uber in 2013.

For a particular number of visually impaired persons especially in the developing world, public transport is often, not a matter of choice but an absolute necessity. It is their only medium of access to employment, community resources, medical care and

recreational opportunities. As per India's 2011 census, 15 million of the world's 37 million blind people are Indians and the impairment increases with age. Of these impaired, only 32.8 percent are employed. The lack of means of consistent and safe transportation is clearly mentioned as one of the contributing factors.

An non friendly public transport system that is not adapted for their special needs reduces their options forcing them to settle for less-productive local employment opportunities. Using public transportation may also be problematic because environmental cues designed for sighted persons may not be accessible or because transportation information is not available in accessible formats (Marston & Golledge, 2003; Golledge & Marston, 1997). As a result, persons with visual

disabilities are more limited in their transportation options and may have difficulty in accessing transportation systems. Despite these barriers there is a lack of data concerning transportation issues among persons who are visually impaired.

Therefore, in this paper, we focus on how a cab service can be provided for the set of people who are visually impaired by focusing on building an application which is intuitive to use and is optimized to be used by them particularly. This application aims at providing an easy way for the visually impaired to travel as compared to the traditional ways which provide various barriers.

The organization of this document is as follows. In Section 2 (**Literature Survey**) we discuss the methods in which we can provide a better service. In Section 3 (**Barriers**), various issues and barriers that people with disabilities face when travelling in public transport. In Section 4 (**Conclusion**), the conclusion is discussed.

II. LITERATURE SURVEY

The paper[1] identifies the personal, environmental, and transportation factors that have an effect on visually impaired people's mobility and independence. The analysis has demonstrated that there are different subgroups of patients with different patterns of travel behaviour. While aspects of the built environment and transport system such as controlled road crossings and location of bus stops play an important role in determining the travel behaviour of visually impaired people, there is a personal aspect involving a combination of age and vision in the better eye that best explains the travel behaviour patterns of visually impaired people.

The paper[2] presents an assistive system for the visually impaired and blind people which helps them using public transport means. The proposed system uses mobile phones as a way for passenger

information system and GPS (Global Positioning System), GSM (Global System for Mobile Communications) and Bluetooth technologies for location detection and communication purposes. In the proposed system voice messages are given to the visually impaired people via mobile phones which have dedicated software installed. This system has been implemented and tested in public transport in two separate cities. Keywords Visually impaired-blind people-public transport-mobile phones.

This study[3] proposes audio-based software for mobile devices Audio Transantiago was designed in order to provide information regarding authorized bus stops for the entire bus service in the city of Santiago de Chile (known as Transantiago), allows the visually impaired users to build up a mental map that is adjusted to their surroundings while traveling on the bus system. It was found that the use of the software improved data processing skills, tempo-spatial orientation and orientation and mobility skills (O&M), as users were able to navigate from one place to another without having to obtain data prior to their trip.

The paper[4] describes an overall architecture of the system for guidance and public transport assistance of the visually impaired. The details of the applications are then developed for Android based smartphones are presented. The applications are mainly concentrated on aiding in urban navigation and provide various ways of accessing data from public transport passenger information system.

This study[5] is focused on identify the difference between Ola and Uber customers and for this data has been collected with the help of structured questionnaire. Data was collected from Mumbai and specifically from working professionals. After data collection, statistical analysis showed that female prefer Uber service over Ola but while it comes to safety consumer feel more safe with Ola than Uber.

Result of this study may help the taxi service industry to design their future marketing strategies.

The paper[6] is descriptive in nature and finds the various reasons for travellers' preferences regarding the app based taxi services. Data has been collected from 150 app based taxi users with the help of a structured questionnaire. Only those respondents have been chosen in the study who have at-least used the app based taxi 3 times and also have mobile app of taxi service in their phone. Statistical tools applied for the study are mean, standard deviation and one sample t-test.

A. Android Applications for Visually impaired

These are some of the applications that have been developed to aid the visually impaired in various ways.

1. ScanLife Barcode and QR Reader: The app runs on any Android phone, and it is cheaper than the expensive item readers that are there on the market. The app is simple and easy to use and all it needs is for the user to take a picture and let the app do its magic. ScanLife Barcode and QR Reader can read UPC and QR codes. Once a code is scanned, the app reads the embedded characters as a QR code. This is undeniably useful for people who have a hard time shopping for items or buying stuff due to their impairment.
2. TalkBack: TalkBack is an application that is part of Google's Android Accessibility Service, designed to help the visually impaired users with using their mobile devices. In a nutshell, TalkBack will greatly help the visually impaired people hear what they are trying to do with their mobile phone as the app will tell them the item that they have just selected or picked. The app can also read texts aloud and every movement the user makes on her or his phone is carefully being monitored and spoken by the app.
3. Magnify: Magnify by Appd Lab, is an innovative application that helps users see better by using their smartphone. This app is great for reading tiny print, visual impairment, or people who are just too lazy to put their glasses on. This app is handy and can serve a wide array of functions.
4. IDEAL Accessibility Installer: The IDEAL Accessibility Installer, also known as the Platform Access Installer, was designed by Google to be a complete package of Google's Android Accessibility programs. This app contains packages for the visually impaired people that will help them get through with operating their mobile phones. The app features an all-in-one installer that contains TalkBack, KickBack, and SoundBack (TKS) applications.
5. MessagEase Keyboard: MessagEase Keyboard is a smart and fast way to type full text on your Android device. Users of the application can type in fast messages by using only one hand or just one finger. The app is straightforward so that users don't need to challenge AutoCorrect. With MessagEase, users can accurately type words as the keyboard has large letters that can easily be seen. The leading factor of MessagEase Keyboard is how customizable it is. Users have the power to change the colors, type using a Swype gesture, change the keyboard layout, and even lookup dictionaries to find the right spelling. Users can also change the size, shape, haptic feedback, and many other features of the application. It is highly recommended for these demographic of users who have a hard time typing or seeing some parts of their phone's screen due to visual impairment.

III. BARRIERS

With the existing methods to travel like public transport, Auto services, cab services have made a considerable impact making it easier for users to order a cab which will arrive at their doorstep, and

the introduction of phone wallets has removed the hassle of money and change. Despite these efforts to improve the accessibility and affordability of public transportation, people with disabilities still face several issues while traveling by public transport. These issues were raised by members via the online survey and feedback session or were highlighted in newspaper articles. Below are the various set of barriers and problems faced by a visually disabled individual when it comes to daily commuting: -

A. Attitudinal Barriers

1. Bus Captains: Some bus captains lack sensitivity towards people with disabilities like being Visually impaired. Some also drive recklessly and make abrupt stops, causing safety issues for people who are blind and standing close to bus stops.
2. Fellow Commuters: Some commuters do not give way to commuters with a visual disability trying to board the bus. They also do not give up seats which are specifically reserved for the Disabled. Some commuters also stand on the tactile ground surface indicators, obstructing the path of people with a visual disability who rely on the tactile indicators to navigate around.
3. Taxi Drivers: Some taxi drivers refuse service to guide dog owners, people with a visual disability. Some drivers also do not aid these individuals.

B. Information and Communication Barriers

1. Language of Communication: Some bus captains only speak and understand Kannada, causing a communication barrier between the bus captains and people who are not locals, because the latter may only communicate in other languages such as English.
2. No access to information on Bus route: People with a visual disability have no access to information on bus route diversions and affected

bus service numbers.

3. Lack of info on type of taxi: Persons with a visual disability experience difficulty differentiating between premium and non-premium cabs.

C. Technological Barriers

1. Taxi Booking Apps: The available taxi booking apps cannot be used by a person who is visually impaired and needs to be optimized with voice inputs.

D. Other Barriers

1. Poor Customer Care Procedure: Customer Care members have given feedback that complaints given to transport operators only received generic responses, and no action was taken to resolve the issue.
2. MT Wardens: Some medically trained wardens do not know how to provide assistance to people with a visual disability. There is a lack in number of wardens stationed at these places of transport..
3. Tactile Ground Surface Indicators: These are tactile indicators which are placed on the surface of train Stations or Bus stops which act as navigational markers for the visually impaired but at places like train stations newspaper vendors station themselves over these and obscure the path for the visually disabled individuals.

IV. CONCLUSION

The paper introduces and explains the need for transportation facilities for the visually impaired. A voice over and a talk back feature can help these individuals to book cabs and also make their transportation easier. This paper explains various barriers faced by them and the methods that can

be used to implement these features into a single application. It also raises awareness for these big public transportation companies like Ola and Uber to consider the difficulties faced by these individuals.

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