Chapter 5
Design of a Voice-Based Automated Enquiry System for Public Transport

Oluwatoyin Catherine Agbonifo
https://orcid.org/0000-0001-8888-1137
Federal University of Technology, Akure, Nigeria

Samuel Ibukun Olotu
https://orcid.org/0000-0001-6864-7140
Federal University of Technology, Akure, Nigeria

Toyosi Ayo Oluwatusin
Redeemer's University, Nigeria

ABSTRACT

Public transportation provides opportunities for mobility, access to basic services, work, and studying. It is of great benefit to those who choose to ride as well as those who have no other choice. Generally, commuters often experience waiting at a transport terminal to get information from transport controllers about transport facilities. The transport enquiry system is useful to provide bus details necessary to plan travel and save the waiting time for the user at the bus station. This chapter aims to develop a voice-based automated transport enquiry system. The need for the voice application is borne out of the desire to assist people, especially those with visual impairments, to have access to the functionality of the transport enquiry system. A test case of the Federal University of Technology Akure (FUTA) shuttle system is used. A survey is carried out to evaluate the performance of the system among users of the proposed system and the obtained response time, efficiency, and functionality metrics is presented.

DOI: 10.4018/978-1-6684-5347-6.ch005

INTRODUCTION

Transportation is the movement of people, goods and services from one place to another (Bukohwo and Ature, 2014). Without adequate transportation, it would be impossible for people to shop, socialize, worship, or participate in many other life-enriching activities. Public transport provides a fast and cheap mobility option that facilitates social inclusion for low-income earners, the elderly, people with a disability and the unemployed (Choubey and Kr Gupta, 2013). Some other benefits of public transport include access to jobs, education and medical services for those who cannot or prefer not to drive. Traditionally, every potential commuter awaits the bus at the bus stop in order to take the public transport. This usually involves some waiting time before the arrival of the bus and, in some cases, may eventually be cancelled due to some reasons. This has necessitated the automation of enquiry about the arrival of buses at various bus stops with a smartphone.

An enquiry system is useful in not only providing bus details but also helps in travel planning and saving of enormous timing of the user, which would have been spent waiting at the bus station. The public transport enquiry system possesses the characteristics of providing information about different forms of public transport and their transfer details for any origin–destination pair, advising users on routes, transfer details, and alternatives, if any, according to their preferred criteria (Pun-cheng, 2012). With the tremendous growth in natural language processing techniques, it has become a reality to implement speech recognition and synthesis, programmatically (Khanna et al., 2014).

Public transport is a system that reflects a city's civilization and modernization. New visitors to any place will enjoy their travel more if they can easily and quickly find the bus route to their destination. Citizens and regular visitors may still lose track of bus routes that keep changing due to city expansion. Some people that rely on internet maps for direcions to locations of their destination may sometimes be faced with the challenge of delay in updates. In today's rapidly developing cities and their public transport system, it is necessary to develop an inquiry system to make available information on the city's public transportation systems to potential passengers.

This research paper aims to develop a voice-based automated transport enquiry system. The voice-based automated transport enquiry system operates based on the voice input given by the user. The voice application is aimed at assisting the visual impaired or blind or to have unrestricted access to the functionality of the transport enquiry system. A test case of the FUTA shuttle system is used for the implementation. Subsequently, an online survey was carried out to evaluate the system's performance based on three metrics such as response time, efficiency and functionality.

ICT Policy for Agriculture Based on a Transaction Cost Approach: Some Lessons from Sri Lanka

Harsha de Silvaand Dimuthu Ratnadiwakara (2010). *International Journal of ICT Research and Development in Africa (pp. 51-64).*
www.irma-international.org/article/ict-policy-agriculture-based-transaction/41936