

A BILLING AND LOCATION MONITORING SYSTEM FOR PUBLIC TRANSPORT VEHICLES BASED ON VEHICULAR ADHOC NETWORK

A.S. Usman*, J.G. Kolo, A. James, Nuhu B. K., L.A. Ajao, Umar B. U.

Computer Engineering Department, Federal University of Technology, Minna Niger state, Nigeria.

Abstract

The objective of this paper is to resolve the challenges faced by transport owners in billing passengers that covered different distances with a particular focus on buses. The existing Automatic Vehicle System (AVS) approaches focus on taxis which are boarded by individuals. However, the passenger individual mileage covered in a public transport vehicle like bus has been an issue for long. Each passenger needs to know the distance he/she covered so as to be charged according to the miles travelled. Also, misunderstandings sometimes occur between the transport owners and the drivers due to low or lack of remittance of the fares charged. This research work brings about proper management of public transportation business in the country. This paper proposes four modules; the Capturing Module takes the biometric data of passengers for individual identification while Data Processing Module processes the information and the GPS locations to get the individual distances covered. In Transmission Module, the computed distance and bills are transmitted to the transport owner while the Display Module displays the distance and bills in the vehicle for everybody's view. At the end of the field experiment using the system, our computed distance was compared with the known or measured distance travelled and the difference was insignificant.

Keywords: Billing system, Vehicular Adhoc Network, Wireless Sensor Network, Global Positioning System, Automatic Vehicle System Location Monitoring System.

1.0 INTRODUCTION

Transport is one of the important infrastructures that play a key role in the financial sector of any country. Transport can be categorized into private and public. While the private is owned, used and monitored by individual owners, the public transport is for the public to pay and use.

However, in most developing countries public transport system is not effective because of mileage and monitoring challenges [1]. For years, public transport owners have attempted to monitor the location and miles covered by the operator (driver) of a vehicle to know the total passenger fares in a day or week. Also, the passengers sometimes are charged the same amount for covering different distances. This brings the need for a more efficient transport system and led transport authorities in urban centers to implement Automatic Vehicle Systems (AVS). AVS has enabled transport authorities to observe, collect, calculate and analyze the mileage and location information about a vehicle. However, the individual mileage covered in a public transport vehicle like bus has been an issue for long. Each passenger needs to know the distance he/she covered so as to be charged according to the miles travelled. Also misunderstanding sometimes occurs between the transport owners and the drivers due to low or lack of remittance of the fares charged.

This research therefore seeks to address the mileage and passenger fares charged by developing a billing and location monitoring system for public transport vehicles based on vehicular Adhoc network.

2.0 LITERATURE REVIEW

Public Transport System

Transportation system provides a very efficient means of moving large number of people with considerable flexibility in order to meet demand throughout the city. It plays a key role in shaping urban and rural landscape through its influences on the form and size of settlements, the style and pace of life by facilitating trade, permitting access to people and resources, and enabling greater economies of scale [2]. Transportation system is a requirement for every nation regardless of its industrial capacity, population size or technological development. Transportation system could either be private or public transport system.

Corresponding Author: Usman A.S., Email: adamusmanshaba@yahoo.com, Tel: +2347067786071