

SUPERVISOR'S APPROVAL

“I acknowledge that I have read this thesis and this thesis is sufficient in terms of scope and quality for the award of Bachelor of Technology Management (Innovation of Technology)

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Date : 20 JUNE 2014

PASSENGER SATISFACTION
ON INFORMATION TOWARDS THE ITS COMPONENTS OF RAPID KUANTAN
BUS SERVICE.

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DECLARATION

“I declare that all parts of this report are the results of my own work except for the quotations and references, the sources of which I have been acknowledge in the bibliography”

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DEDICATION

To my mom and my family and also my future family

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All praise is due to Allah, most Gracious, and most Merciful. Without whose help and mercy, I would not have reached this far.

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ABSTRACT

The purpose of this study is to investigate the passenger satisfaction on information provided using Intelligent Transportation System (ITS) components by Rapid Kuantan service. Another aim is to identify the dominant variable of ITS components with the passenger satisfaction on information of the Rapid Kuantan service. The method used in this research is quantitative method where the researcher had conducted a questionnaire survey to the passenger of Rapid Kuantan service. The sample for the research is 100 respondents. The questionnaire collected from the passenger had been analysed and developed as findings. The result had showed that there are significant correlations between ITS components which are Bus LED Destination, Bus Next-Stop Sign, Audio Voice Announcement System, Multimedia Passenger Information and also Bus Station Display System with the passenger satisfaction in partially and also in simultaneously. As the conclusion, the research will help Rapid Kuantan service to identify the performance of implementation of ITS components in the bus towards the passenger satisfaction and can be used as reference to other bus company which wish to implement the same system that can manage its management of passenger information system.

(Keywords: Intelligent Transportation System, passenger satisfaction, correlation coefficient)

Abstrak

Tujuan kajian ini adalah untuk menyiasat tentang kepuasan penumpang bas kepada maklumat yang disediakan menggunakan komponen-komponen Intelligent Transportation System(ITS) oleh perkhidmatan Rapid Kuantan. Matlamat lain adalah untuk mengenal pasti pembolehubah dominan komponen ITS dengan kepuasan penumpang pada maklumat perkhidmatan Rapid Kuantan. Kaedah yang digunakan dalam kajian ini adalah kajian kuantitatif di mana pengkaji telah menjalankan kajian soal selidik kepada penumpang perkhidmatan Rapid Kuantan. Jumlah responden untuk kajian ini adalah 100 orang. Soal selidik yang dikumpul daripada penumpang itu telah dianalisis dan dijadikan sebagai dapatan kajian. Dapatan kajian telah menunjukkan bahawa terdapat korelasi yang signifikan antara komponen ITS iaitu LED Destinasi Bas, Tanda Bas Berhenti , Sistem Pemberitahuan Suara Audio, Sistem Maklumat Penumpang dan juga Sistem Paparan Stesen Bas dengan kepuasan penumpang secara sebahagiannya dan juga dalam masa yang sama . Sebagai kesimpulan , kajian ini akan membantu perkhidmatan Rapid Kuantan untuk mengenalpasti prestasi pelaksanaan komponen ITS dalam bas ke arah kepuasan penumpang dan boleh digunakan sebagai rujukan kepada syarikat bas yang lain yang ingin melaksanakan sistem yang sama yang boleh menguruskan pengurusannya daripada sistem maklumat penumpang.

(Kata kunci: Intelligent Transportation System , kepuasan penumpang, pekali korelasi)

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NOMENCLATURE

UTeM	Universiti Teknikal Malaysia Melaka
PSM	Projek Sarjana Muda
FPTT	Fakulti Pengurusan Teknologi dan Teknousahawan
ITS	Intelligent Transportation System
BRT	Bus Rapid Transit
LED	Light Emitting Diode

CHAPTER 1

INTRODUCTION

1.1 Background of Study

Transportation and urban development have closed relation. In a developed urban area, good traffic circulation system service has a key role for the ordered flows of people and information with high efficiency. In a developing country like Malaysia, the migration of people from the rural areas to the urban areas has progressed differently. For example, a city like Kuala Lumpur, high population density is supported by a multimodal system of cars, motorcycles, buses and trains. A mode of transport is a technological solution that used a fundamentally different vehicle, infrastructure and operations.

Passenger information is information provided to public transport users about the nature and state of a public transport service, though visual, voice or touchable media. A distinction can be drawn between:

- Static or Planned information, which changes only slowly and is typically used for journey planning prior to departure (stations and stops, routes, service numbers, times, trip durations, fares, etc.)

- Real time information, which changes continuously as a result of real-world events and is typically used during the course of a journey (primarily how close the service is running to time and when it is due at a stop, but also incidents that affect service operations, platform changes etc.).

Static information is made available traditionally in printed form through route network maps, timetable booklets, name signs and/or pictograms at stations and stops, etc. This information is also available through dedicated national and local telephone services. In many areas, static information is now being made available electronically through websites or over mobile phone services (typically via SMS).

Information is increasingly provided in audio form as well, both on vehicles and at stops. Public address systems, usually but not always automated, will typically give next service announcements at stations and next stop announcement onboard vehicles.

Real time information is an advance on this, which recognizes the fact that public transport services do not always operate exactly according to the published timetable. By providing real time information to travellers, they are better able to conduct their journey confidently, including taking any necessary steps in the event of delays. This helps to encourage greater use of public transport, which for many countries is a political goal. Real time information is provided over specialist passenger information systems.

On the bus network in Paris, monochrome LCD displays have been used since 1996 to indicate the time needed for a bus on a bus route to arrive at a bus stop, after a two-year trial period on a few bus routes.

In the public transit sector, Intelligent Transportation System(ITS) represent a range of technologies including, but not limited to computer aided dispatch/automatic vehicle location (CAD/AVL), traveler information, electronic fare payment, transit security systems, automated passenger counters (APC), vehicle fleet monitoring

devices, signal priority, and digital and mapping software applications. For several years, the bus operator has implemented a number of newer technologies which are being utilized to support the bus system, including those which improve on-time performance and reliability.

Most transportation professionals agree that society cannot simply build its way out of urban traffic congestion problems. As one of several alternatives to costly build solutions, ITS provides the technology to enable people to make smart travel choices, and continued deployment of ITS strategies is an important component of bus service long-range and short-range transit plans.

ITS has created opportunities to respond proactively to increasing demand for efficient operation of public transit services, and to convey information in a more timely manner to our customers. This includes global positioning system (GPS) technology that provides real-time schedule information to riders, electronic fare payment for greater customer convenience and faster boarding times, and devices that integrate with traffic signal systems allowing transit vehicles priority over other vehicles.

1.2 Problem Statement

Passenger satisfaction service arises when a company can provide passengers with benefits that exceed passenger's expectation and this is considered value-added. If customers are satisfied with the product or service, they will buy more, and do so more often. Passenger gratification is an essential goal for each bus services providing passenger services. The on board experience is still something special for the customer. The customer has a wide choice to select the suitable bus operator according to their requirements. Therefore, bus services are continuously working on the on-board product development and innovation to differentiate themselves from competitors. During the last few years a variety of on-board product innovations have entered into

the market. If the passenger is not satisfied, due to the negative experience, the client will reconsider the buying decision for further services and will probably switch to another option in travelling. This kind of situation belongs to the daily business in the passenger bus industry.

Nowadays, bus services already implemented the passenger information system in their system for the passenger uses in order to gain the information regarding their travelling time and journey and all the information regarding their travelling. It helps them to improve in arranging the time more efficient. But some of the passenger just into the modern bus services and still does not get used to the information provided by the operator regarding the bus services. With this study it will help the bus operator to determine either the passenger information provided by them is reliable enough and giving the passenger good impact and help them to travel much more by using public transport.

Excellent passenger satisfaction is one of the greatest assets for bus business in today's competitive environment. There are many factors that can help bus operator to build its customer base and passenger service and satisfaction can be a determining factor in the success of an entire operation. The research related to customer satisfaction in the bus industry regarding the information gain by the passenger in the bus and at terminal. A number of studies have conducted in service quality related theories and methods in the bus industry. Conversely, most previous bus service studies have relied mainly on passenger satisfaction and service quality to describe passenger evaluations of services and have focused on the effect of bus service quality at the aggregate construct level.

Although examining the effect of individual dimensions of service attributes has potentially great utility for bus operators, the effects of individual dimensions of bus service quality has not been fully investigated in previous bus service studies. In addition, the findings would enhance the bus operator to improve their passenger information system and customer relations management as well as their brand loyalty.

1.3 Research Questions

1. Is there any significant correlation between the Bus LED Destination with passenger satisfaction on information of the Rapid Kuantan service?
2. Is there any significant correlation between the Bus Next-Stop Sign with passenger satisfaction on information of the Rapid Kuantan service?
3. Is there any significant correlation between the Audio Voice Announcement System with passenger satisfaction on information of the Rapid Kuantan service?
4. Is there any significant correlation between the Multimedia Passenger Information with passenger satisfaction on information of the Rapid Kuantan service?
5. Is there any significant correlation between the Bus Station Display System with passenger satisfaction on information of the Rapid Kuantan service?
6. What is the significant correlation between overall Intelligent Transportation System (ITS) components with passenger satisfactions on information of the Rapid Kuantan service?
7. What is the dominant variable of Intelligent Transportation System (ITS) with passenger satisfactions on information of the Rapid Kuantan service?

1.4 Research Objectives

- 1 To determine the significant correlation between the Bus LED Destination with passenger satisfaction on information of the Rapid Kuantan service.

The level of passenger satisfaction towards the Bus LED Destination will be determined from the passenger perception on the efficiency and acceptance towards the Bus LED Destination which is located on the bus.

- 2 To determine the significant correlation between the Bus Next-Stop Sign with passenger satisfaction on information of the Rapid Kuantan service.

The level of passenger satisfaction towards the Bus Next-Stop Sign will be determined from the passenger perception on the efficiency and acceptance towards the Bus Next-Stop Sign which is located on the bus.

- 3 To determine the significant correlation between the Audio Voice Announcement System with passenger satisfaction on information of the Rapid Kuantan service.

The level of passenger satisfaction towards the Audio Voice Announcement System will be determined from the passenger perception on the efficiency and acceptance towards the Audio Voice Announcement System which is provided at the terminal.

- 4 To determine the significant correlation between the Multimedia Passenger Information with passenger satisfaction on information of the Rapid Kuantan service.

The level of passenger satisfaction towards the Multimedia Passenger Information will be determined from the passenger perception on the efficiency and acceptance towards the Multimedia Passenger Information which is located on the bus.

- 5 To determine the significant correlation between the Bus Station Display System with passenger satisfaction on information of the Rapid Kuantan service?

The level of passenger satisfaction towards the Bus Station Display System will be determined from the passenger perception on the efficiency and acceptance towards the Bus Station Display System which is located at the terminal.

- 6 To determine the significant correlation between overall Intelligent Transportation System (ITS) components simultaneously with passenger satisfactions on information of the Rapid Kuantan service?

The level of passenger satisfaction towards the overall ITS components function for providing passenger information will be determined simultaneously from the passenger perception on the efficiency and acceptance.

- 7 To determine the dominant variable of Intelligent Transportation System (ITS) with passenger satisfactions on information of the Rapid Kuantan service?

The most relevance ITS components that had been implemented at the bus services will be identified and can improve the less relevance ITS components in order to provide more efficient information to the Rapid Kuantan passenger.

1.5 Scope and Limitations

The scope of study in this research involves level of satisfaction of bus user at Kuantan as well as the most relevance ITS components that had been implemented in the Rapid Kuantan services. The study emphasized on how the information channeled through out the media (Passenger Information System) such as LED board in bus, Variable Message Signs and Audio Announcement can influence and assist the bus user in making decision and facilitate them to travel efficiently.

However, there are several limitations of the study that have been identified. Primarily, the limitation of the study is regarding the location of the study area, which

is only limited to Kuantan, Pahang. Therefore, the researcher has to be aware of the boundary of the study area in order to assure the sample selected is within the right area of study. In addition, the respondents may not be able to answer the questions consistently due to some unfamiliar technical terminologies in the questionnaires such as Platform Display and so on.

The study also received lack of cooperation by respondents during the questionnaire survey was conducted. In addition, the limited time duration given to complete this study which starts at September 2013 until June 2014, might be short in providing accurate data collection. Therefore, the time frame which is about twelve months period caused constraint in the process of collecting the data and sources in completing this research paper.

1.6 Significance of Study

Nowadays, public bus usage has been encouraging and increasingly becoming a factor in travelling. However, there are still many factors influencing public not to use public bus service to travel due to various reasons. This research identified and explained how the bus users satisfaction level towards the information provided by the bus services.

The bus operators will gained information regarding the Intelligent Transportation System (ITS) applications that had be applied in the bus services can determined the level of satisfaction passenger of travelling by public bus. This study also measure how much passenger value the technology implemented in the bus service nowadays to make their lives become easier than ever and lead them to use the public transport rather that their own vehicle in order for Malaysia government to encourage the people to use the public transport to reduce the carbon emission and global warming.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

This chapter provides an overview of the concepts of Intelligent Transportation Systems (ITS) and its component such as Passenger Information System, Traveler Information Systems and Public Transport Information System. The passenger satisfaction topic also will be included in this chapter and also the relationship for the ITS components to the passenger satisfaction will be included in this chapter. The hypothesis regarding the ITS components to the passenger satisfaction will be described and also the theoretical framework will be constructed at the end of this chapter. These inputs would aid to the better understanding of the topic. However the scope of the topic discussed in this chapter is very broad. This is to acquire detail and full understanding of the study.

2.2 Intelligent Transportation System

As explained by Chowdhury and Sadek (2003), ITS refers to a variety of tools, such as traffic engineering concepts, software, hardware, and communications technologies, that can be applied in an integrated fashion to the transportation system to improve its efficiency and safety.

Central Concept of ITS

There are several concepts that are central to the ITS discipline. According to Francois(2000), the first concept is that there are items of information that if gathered and distributed in a timely way, can positively affect how the transportation system functions and its safety. The second concept is that information collected and used in ITS can be of benefit to one or all of the following: the driver of a vehicle, the entity for whom a driver may work, pedestrians, transit riders, other member of the public and the public sector officials responsible for management of the transportation system.

Based on the third, ITS can only be truly effective nationally when a unified framework for integrating the many components of an ITS systems, called a systems architecture, has been developed and put in place. As this is being written, much is being accomplished towards producing such systems architecture for use by public agencies and private organizations alike.

According to Francois (2000), the fourth concept is that ITS development and deployment requires expertise in a number of areas, including electronics, civil engineering, human factors, information management, satellite technology, public and private sector policy deployment and management practice and finance. It is not expected that each practitioner will have professional knowledge on all of these areas and thus the assembly of a team is the usual approach to developing and implementing ITS system. But it is important that those with electronic and computer skills be aware of the concern of the civil and mechanical engineers who develop and build roads and vehicles for example and that all engineers be aware of and understand the human limitations that may be involved in use of a particular technology.

Public Transit and ITS

According to Kushner (2000), it is estimated that approximately six million people per day use public transportation in U.S.A. However, more than three quarter of