[LOG 14] THE MEASUREMENT OF THE SAFETY PERFORMANCE TOWARDS PASSENGER SATISFACTION IN RAIL TRANSPORT

Mohd Azril Ismail[1,] Lizawati Latip[2], Nur Shamela Kahsan[3] & Wan Nurul Aini Wan Jusoh[4]

[1-4]*School of Technology Management and Logistics, College of Business, Universiti Utara Malaysia, 06010 UUM Sintok, Kedah*
azril@uum.edu.my[1], lizawatilatip@gmail.com[2], nurshamela@yahoo.com[3], wanurulaini@hotmail.com[4]

ABSTRACT

The purpose of this study to knows passenger satisfaction level from the safety performance of the rail transport in Northern Peninsular Malaysia. The objectives of this study to examine the relationship between safety performance and passenger satisfaction in railway transport. Passenger satisfaction is an important aspect that is often given attention by the service provider. Safety performance becomes a major variable that influence passenger satisfaction. The underpinning theory in this study is American Customer Satisfaction Index (ACSI) to measure the level of passenger satisfaction. The main instrument that used in this study is questionnaire. The research was conducted based on questionnaire that involved 400 respondents by finalized the 390 respondent as our main data in measuring the result finding. The sample size of this study is the passenger of rail transport in Northern area where from KTM Arau, Perlis, KTM Alor Setar, Kedah, Butterworth, Pulau Pinang and end at KTM Ipoh, Perak. The researcher use Reliability Analysis and Pearson Correlation to analyse the data from questionnaire distributed to respondents by using statistical package for Social Science (SPSS) version 20.0. The result indicates positive and significant relationship between safety performance and passenger satisfaction in rail transport. Thus, passenger will satisfy towards the higher of safety performance.

Keywords: *safety performance, reliability, maintenance, facility, passenger satisfaction*

INTRODUCTION

Malaysia is urbanizing. According to the Department of Statistics Malaysia, the report issued on 22 of July 2016, total population of Malaysia is estimate at 31.7 million on 2016 compared with 31.2 million on 2015. This shows the increasing number of 0.5 million people within a year. This rising population will increase the demand towards public transport, especially for those populations that from inter-mediate and low-income level. They more preferred to use public transport rather than private vehicles due to several reasons such as the disability to own car, low wages, high living standards in urban area like Kuala Lumpur and Penang and most of people use public transport to avoid congestion that more safer and faster. Each of modes of transport has different advantages for example in terms of their management of the delivery and movement of goods and passenger. The effectiveness of each modes of transport depends on their service quality. The major factors from the services quality included such as the

reliability, punctuality, availability, cleanliness and maintenance (Sekaran, 2009). According to the Keretapi Tanah Melayu Berhad (KTMB, 2016), KTMB was changed from its formerly name of Malayan Railway Administration after corporatization by the government in 1992. KTMB is the only rail transport in Malaysia, thus is fully-owned by the federal government. There are four services that are operating under KTMB, which are commuter, ETS, intercity passenger and cargo train. Safety performance is very important to be continuous maintain and improve, so that the passenger satisfaction can be increase as well increase the performance of the company, such as the KTMB, for them to give excellent services to all passengers in future. It is as well to find either these two variables show the significant result and support the previous research that have been conducted by the previous researchers.

PROBLEM STATEMENT

According to the European Commission (2016), safety issue is the main concern for any modes of transport system. People's expectation believes that transportation is only the safer system that can use for mobility purposes. Safety is primarily factor towards the successful of the railway sector and urban transport system in the worldwide (Szymkowiak, 2015). The rail safety include the overall condition of the railway operation such the track, locomotive, operators, facility and equipment and the number of incident and accidents happened as well. This will show how effective and safer the rail transport performance towards the users. Definitely will influence the users or passengers feeling and satisfaction on what they benefit from the service (Prakash, 2003).

According to the Kereta Api Malaysia news website on May 8, 2016, it stated that two trains collided in Kuala Kubu Baharu. The Assistant Director of Operations Fire and Rescue Department of Selangor stated that the accidents involving the intercity train of 13 carriages departed from Butterworth to Kuala Lumpur and an Electric Train Service (ETS) of six carriages of destination to Ipoh, Perak (Mohd Sani Harul, 2016). These two trains were collided in Kuala Kubu Baharu after pass thee Batang Kali station and caused 10 passengers injured. Although there is no deaths reported, but KTM commuter of Rawang-Tanjung Malim had to be cancelled, while all ETS end at Rawang station and all passengers need using bus to continue the journeys.

Another case that happened in Malaysia which involved the KTM intercity the Ekspres Sinaran Utara, slipping in Kampung Baru from Butterworth to Kuala Lumpur in February 2013. The locomotive train of 10 wagons and carry more than 150 passenger suffered minor fire believed caused by the leakage of diesel in engine. This has disrupted the rail routes to other trains, but some wagon or carriages were move and some were takes to the Bukit Mertajam train station (Bernama, 2013).

According to Sinar Harian Online, there also derailment incident happened in Ekspress Wau train depart from Kuala Lumpur to Tumpat. The train derail from its railway track due to the landslide in Kampung Sungai Yu Merapoh, Kuala Lipis Pahang. The incident happened at 6.30 am on 18 August 2012, involving 14 carriages, causing three passengers facing serious injuries and eight passengers facing injured. The train station become congested with the passenger that facing delay on their journey. All of them was transferred to Gua Musang Hospital and getting recover (Bernama, 2012).

We can identify that this problem absolutely can increase the dissatisfaction to all passengers. Each people have different value of satisfaction. The satisfaction can be measure between the gap of the real service offer and the expectation of the people. If the service offering by the train for instances more and meet the person expectation, then they will be more satisfy and feel safer to use that services (Minami Wakata, Kumiko Takahashi & Yusaku Okada, 2015).

The safety performance and consumer satisfaction are interrelated. Safety performance will determine the passenger satisfaction provided by rail transport in Malaysia. This issue led us to focusing on customer satisfaction that came from the safety performance of rail transport in northern area of Malaysia. The research purpose is to measure the passenger satisfaction using the three indicators of safety performance, which reliability, maintenance and facility and equipment.

LITERATURE REVIEW

In this research, the independent and dependent variable are the safety performance and passenger satisfaction respectively. Safety performance have three main elements which the reliability, maintenance, facility and equipment. Safety can be defined as the risks associated with the activities of the transport, related to, or indirect support of the operation of transport, are effective controlled and reduced to an acceptable level. The effective of the safety in transport services, the accident can be minimize to save the passenger life (International Collaboration Group., 2013). Safety performance can be defined as service provider's safety achievement where its safety performance targets and safety performance indicators (International Collaboration Group., 2013).

Reliability can be defined as the ability of a systems or operations to perform its functions that required under stated conditions for a specific period of time given (Michiel Vromans, 2005). Other than that, the concept of reliability is a sense of dependence or trust and perhaps has a notion to fall back on (P.D.F. Concradie & C.J. Fourie, 2015).

Maintenance is the work of keeping the asset in good or proper operating condition. The maintenance of department will be target the successful missions of the train to operate in good condition and can avoid the failure of the operating (Gulati. R, 2013). Regular inspections should be done to ensure the ability and the condition of the locomotive, wheel, railway track, wagon, braking system, ballast and coach will function well, thus to avoid and lessen any risks happened (Railway Technical Web Pages 1998 – 2016).

The facility in rail transport is the property or assets that mainly function to make the rail transport operated in convenient and efficient way (Jean-Paul Rodrigue & Brian Slack, 2016). Basically, an equipment provided is to improve the safety and the effectiveness of the rail terminal operations. Again, it aim to protect and preserve the passenger, and to make sure the passenger received better quality service and boost their satisfaction (Parasuraman, Zeithaml & Berry, 1985).

Customer satisfaction is the user or consumer feeling or attitude toward a service or product recently used (Jamal & Naser, 2002). . Kotler and Keller had explain the most complete definition of satisfaction which is the person's feeling happiness or sadness which resulted from comparing goods or services perceived performance against his or her expectations (Kotler & Keller, 2006).

According to the Abadi Dwi Saputra (2010), the facilities and equipment are influence the passenger satisfaction in rail transport such as warning light. It is useful to warn passengers when in danger condition in their journey where the warning light as the best prevention to save passenger life in case danger condition happened such as fire, machine accident and so on.

Based on the previous research by Marin Marinov, Ovuezirie Darlton Agajere, Mariana Bigotte, Dario Proietti & Iliana Gerenska on their research topic of Customer Satisfaction Factors for Light Rail in London, they identified that the most factors that influence customer satisfaction are reliability and punctuality. The passengers tend to be more satisfied and happy if the train arrive and depart on the right time based on the scheduled given in train's station.

According to Saravanan and Gandhimathi (2014), the service quality of punctuality are influence the passenger satisfaction in rail transport where the results shows that the higher of the service quality influences the passenger satisfaction in rail transport is punctuality which an average of mean 3.95 passengers was satisfied for rail services. The passenger have stated that the trains are very punctual as the properly arrive and depart from the junction, it is ranked in first position compared to other service quality in rail transport.

Thus, the researcher in this research wants to measure the element in safety performance that will affect the passenger satisfaction of rail transport in Malaysia. The questionnaire will be distribute to the people who have the experience using the rail transport such the train intercity, ETS and commuter train in Northern of Malaysia. The three elements of safety performance; reliability, maintenance and facility and equipment will be ask to measure the level of passenger satisfaction of rail transport in Malaysia.

METHODOLOGY

Based on this research, types of research of this study is correlational. This research is to identify the three variables of safety performance that will affect passenger satisfaction in Northern area of Malaysia. Correlational study conducted in a natural environment with minimal interference.

Customer satisfaction index (CSI) is data and information about the level of customer satisfaction obtained from the measurement results quantitative and qualitative obtain the opinion of customer public service to compare between expectations and reality (Yulis Anggraini, 2010). CSI is use to determine the level of customer satisfaction comprehensive view of the level of importance of the attributes of a product or service. CSI is an index to determine the level of overall customer satisfaction with an approach that considers the importance of the attributes measured (Siti Husna Ainu Syukri,

2014). Based on this study, we use the customer satisfaction index as the theory for the measurement the passenger satisfaction of the rail transport services due to the safety performance. Using customer satisfaction index gives a favorable aspect because the information provided is clear and measurable.

American Customer Satisfaction Index (ACSI) was introduced in 1994 to measure the 200 companies in 34 industries. This index is considered one of the indicators of the national economy associated with the level of customer satisfaction of products and services used or consumed by households in the United States. Although it is not clear how the ACSI can achieve this goal, but the publication shows that relations between the index of satisfaction with profitability and industrial are look real. Likewise, the appeal of the industry will be weak due to a decrease in customer satisfaction. The decline in customer satisfaction will result in greater pressure on companies to lower prices.
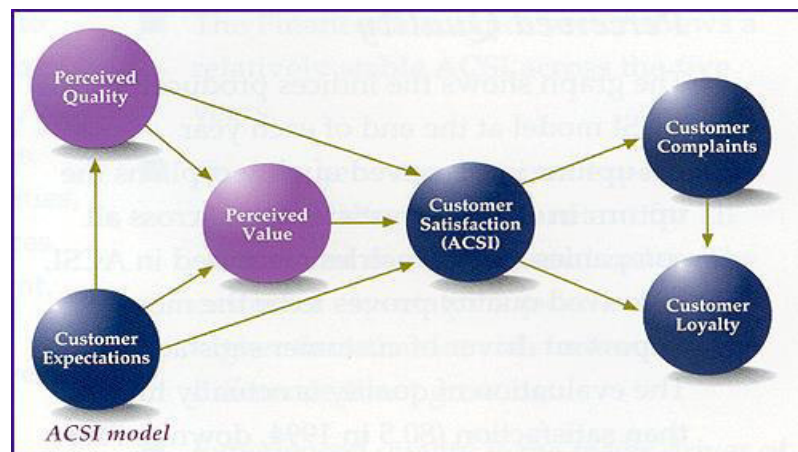

Figure 1
American customer satisfaction index (Fornell, 1996)

In this research, the ACSI Theory was used because the major element of this theory closely related with the research variables, whereas primarily to measure the customer satisfaction that describe three antecedents of customer satisfaction (perceived value, perceived quality, and customer expectations), and two consequent (customer complaints and customer loyalty). Perceived quality defined as a story of how a product or service to meet the customers' needs (customization) and how to sustain the needs up to the hands of customers (reliability). Although the antecedents of ACSI Theory looks differ from the independent variables of the research, but still interrelated and the researcher make it as the benchmark that will affected the customer satisfaction which is the passenger of the rail transport of this research. Below show the two main variables of this research which dependent and independent variables. These variables are safety performance and passenger satisfaction respectively. Below show the schematic diagram of the research.
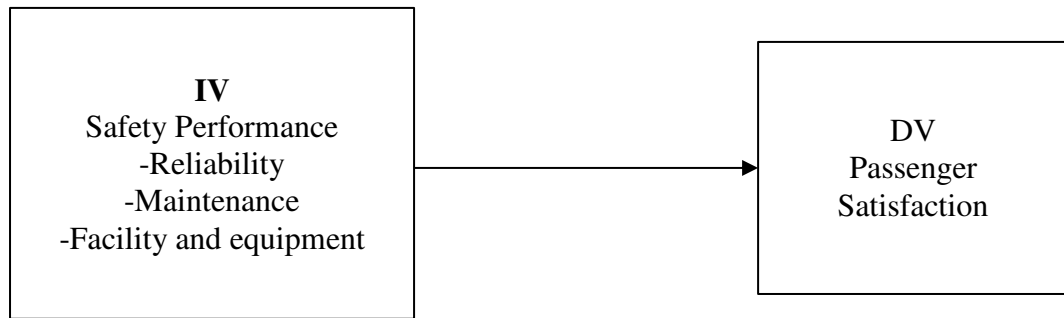
Figure 2
Schematic diagram

RESEARCH OBJECTIVE

To examine the relationship between safety performance and passenger satisfaction in railway transport.

RESEARCH HYPOTHESIS

H_1:   There is a relationship between safety performance and passenger satisfaction in railway transport.

RESEARCH DESIGN

Approach used on this research is quantitative method research. The researcher uses the quantitative method to support the theory of the customer satisfaction index which is use American Customer Satisfaction Index (ACSI). ACSI determine a significantly stated that measure the customer satisfaction through the quality of products or services (American Customer Satisfaction Index). The study setting is field study where the researcher focused directly to the research location and respondents. The research takes place from KTM Arau Perlis, to KTM Ipoh, Perak. Unit of analysis is the population to be study with the total population of passenger use in Northern area of Malaysia. The unit of analysis is an individual, which is the passenger that using the train itself, with the sample size of 400 respondents. The sample size of 400 taken based on the Krejcie and Morgan Table from the total population. However, the exact respondent was 397 passengers that included in the data finding, due the deletion of the outliers. The research focus on the passenger satisfaction of rail transport in Northern state of Malaysia, thus the target population of this research is individual, which is focusing on the passenger of rail transport/train. Type of time horizon applied in this research is cross-sectional. The period of this research started from September until December 2016 hence the time is limited within this timeframe. In this study, the source of data is primary data. For the data collection method in this study, researcher used the questionnaire by distribute directly to the passenger and facing the time and passenger constraints. The questionnaire is adopted by previous research (Abadi Dwi Saputra, 2010) by changing the indicator of variables.

DATA ANALYSIS AND FINDING

Table 1
Reliability statistics

Cronbach's Alpha	Cronbach's Alpha based on Standardized Items	N of Items
.936	.925	19

Table 2
Reliability statistics

Cronbach's Alpha	Cronbach's Alpha based on Standardized Items	N of Items
.949	.950	8

Reliability analysis is to measure the consistency of the scale across time horizon and context of study. Table 1 above shows the Cronbach's Alpha for the values of independent variable is 0.936 and Table 2 shows the Cronbach's Alpha for the values of dependent variable is 0.949. Based on level of acceptance that suggested by Sekaran & Bougie (2010), the value has a good reliability condition.

Table 3
Correlations

		SPC	PSC
SPC	Pearson Correlation	1	.879[**]
	Sig. (1-tailed)		.000
	N	397	397
PSC	Pearson Correlation	.879[**]	1
	Sig. (1-tailed)	.000	
	N	397	397

**. Correlation is significant at the 0.01 level (1-tailed).

Correlation analysis is the test done to examine linear association or relationship between two metric variables. The independent variables is the safety performance (SP) with the three main elements; reliability (R), maintenance (M), facility and equipment (FE), with the dependant variables of the passenger satisfaction (PS). Based on the Table 3.0 above, correlation has performed to determine between safety performance and passenger satisfaction. The correlations value for the SP (0.879). Based on the table 3.0 above, the result shows a significant and positive relationship between the three elements of safety performance with the passenger satisfaction (p=0.001<α). The result shows that the safety performance contributed 87.9% to passenger satisfaction while the rest of 12.1% are contribute by other factors that not use or test in this research. This became the limitation of this research study. These elements support the objective of the research. Therefore, the result indicates that the higher of safety performance, the higher the passenger satisfaction in rail transport of Northern area.

CONCLUSION AND RECOMMENDATION

Safety performance is the vital element that contributed to the passenger satisfaction. It became the major priority by the passenger nowadays to take the public transport especially rail transport, due to the effective of the safety. The higher the safety performance will influence the high level of passenger satisfaction. This research "The

Measurement of Safety Performance towards Passenger Satisfaction in Rail Transport"
is being studied by the researcher to identified the passenger satisfaction through the
safety performance that served by the train services of KTMB Malaysia in Northern
area. Continuous improvement of the rail safety should be improve especially in term
of maintenance by KTMB to attract more people use rail transport as their main
convenient public transport that will increase their satisfaction towards this services.
Besides that, future research can be conducted to other modes of transportation such
road, air and sea transportation, due to the rapid changing of passenger needs, wants
and satisfaction.

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