

The Impact of Service Automation on Customer Satisfaction and Customer Retention: An Empirical Study of Malaysian Rail Transportation

Victor Ong, Ng Mei Yee, Giam Jing Hui, Nurdina Kasim and Izya Hizza

Purpose *To examine how the impact of automated service attributes on the service encounter satisfaction and customer retention and to provide fundamental insights for rail transportation in future service planning decisions.*

Methodology *Quantitative method was performed. The primary data was collected by distributing the self-administrated questionnaires and was coded, captured and analyzed in SPSS18.0 software. Descriptive analysis and inferential analysis were used to assess the structural model.*

Findings *The results show that the attributes of convenience and customization contribute towards the service encounter satisfaction with automated services, which then lead to customer retention. The findings reinforced that the convenience of automated service as a major determinant of technological acceptance as well as customer adoption.*

Practical implication *The Malaysia government can develop better automated service system in rail transportations to attain high efficiency and excellent customer experience in service delivery based on the analysis result.*

Originality/value *This study fulfills an identified information need in rail transportation industry in Malaysia and provide the government a practical insight in developing automated service system in the future especially towards the MRT project.*

Keywords: Service encounter satisfaction, Customer retention, Automated service, Reliability, Convenience, Customization.

Introduction

With the rapid evolution of society and the advent of technology, the demands for public transportation is an important and challenging issue in a country that is fast progressing (Bardi et al., 2011). Public transportation provides people with mobility and access to employment, institutional resources, medical care, and recreational opportunities in societies across a country. The integration of public transportation channels into wider economic and land use planning can always help a community enhance business opportunities, and more importantly, from a citizenry point of view, it creates a sense of community through transit-oriented development (Aziz and Amin, 2012).

However, the Malaysian economy is developing so fast that most of the people can afford to own means of transport and hence the vehicle population has also boomed. This is further worsened by the lack of a comprehensive public transport infrastructure, not to mention inadequate parking spaces. Air pollution and other environmental hazards are also yet another cause for

concern. Yet, many people are avoiding public transport such as buses or trains due to long queues and long waiting periods. Of course, this adds to the crowding at such places and serves to encourage transport ownership as a result.

As part of any orderly development in a city that is constantly growing, the authorities must confront the issues relating to public transport and address the problems that accompany their use. The transport networks must also prepare for the future in order that they can cater to a growing urban population as well as increasing expectations of an urbanized society.

In recognition of this, the government in the mid-1990s embarked on a programme of massive investments in public transport – and in railway infrastructure, it has completed three major intra-city rail systems in the Klang Valley (i.e. the metropolitan areas of Kuala Lumpur and the surrounding satellite towns). These are the Keretapi Tanah Melayu (KTM), Light Rail Transit (LRT) and Monorail.

In recent years, the Malaysian government has proposed to spend US\$50 billion to further develop the rail networks over the next seven years – the development of the Mass Rapid Transit (MRT) – launched in 2011 – as well as to extend the current rail connectivity to embrace a bigger geographical area and in the process, integrate the existing rail networks.

Research Problem Definition

For developing countries looking at sustainable development, urbanization is one of those challenges planners have to deal with. Particularly in the area of labor mobility and the movement of people from one place to another without suffocating our busy roads, thereby contributing to a worsening environment and health-related issues.

The level of urbanization in Malaysia is 38% and growing – therefore, this issue induces constant developments in the fast-changing transportation industry. In this era of technology advances, there are evolving transportation systems that are capable of satisfying the demanding individual's travel challenges at both intra-city and inter-city levels. Since many researches have shown that the traditional service encounters which involve high levels of manpower have led to customer dissatisfaction and complaints – the authorities have implemented the automated service system in rail transportation to enhance service encounters thereby allowing customers to perform the necessary services with less or even without human interaction.

Automated service system is the technique use in industrial control that could execute automatically through electronic control system. The examples of automated services in rail transportation are the automated fare collection systems, platforms arrival systems, ticket vending machines, security cameras and other specific automated systems. The implementation of automated system in rail service encounters could lead to the improvements in service efficiencies and quality of management information (Baragwanath, 1998). Hence, this proposed study is to gain valuable information to assist the authorities in enhancing rail transportation in Malaysia by using the automated

service system to achieve high efficiency and deliver superior services to the travelling public.

Moreover, this study examines how customers respond to the attributes of reliability, convenience and customization towards the adoption of automated service systems. When we ascertain the results, the authorities can evaluate the effectiveness of the system and predict the response of customers towards this self-service technology, i.e. SST (Mokhtarian, n.d).

Research Objectives

This study is to examine how the attributes of automation service (reliability, convenience and customization) impact on service encounters resulting in customer satisfaction and customer retention. The reason to conduct this study is to provide further insights in the provision of rail transportation in respect to future planning decisions in Malaysia. The development of the Mass Railway Transit (MRT) project through service automation which is currently ongoing is a case in point. Our investigation via this proposed study allows us to uncover helpful information that can allow the government and related parties to appreciate the main indicators of customer satisfaction with regard to service automation. And this study helps to determine to what extent customers' satisfaction with automated service encounters in the country does affect customer retention as an additional outcome.

Literature Review

The Attributes of Service Automation

The importance of service attributes was determined in the previous researches, which particularly stressed on the relationship between overall satisfaction and attributes (Mittal et al., 1998). Cronin and Taylor (1992) suggested that particular attributes are varied among different industries depending on its importance to that industry. The service attributes may vary across the form of service delivery either self-service technology or personal service (Beatson, Lee and Coote, 2007). The advancement of technology has brought prominent influences to the development of service delivery alternatives and impactful outcome on service marketing (Dabholkar and Bagozzi, 2002). Today, the service automation within service industries is having a substantial impact on traditional methods of business and the strategies undertaken by organizations. The automated service attributes have been identified in previous research which includes reliability of the technology, convenience of the technology and customisation of the technology (Beatson et al., 2007; Meuter et al., 2005; Walker et al., 2002.)

Service Automation

Automated service presents the organisations various potential opportunities in developing service design strategies and new service development (Henderson et al, 2003). Automated service originally defined as 'interactive, content-focused and web-based customer service which demonstrated by the customers and synthesized with related organizational customer support process and technologies with the objective of enhancing the customer and

service provider relationship' (Ruyter et al., 2001). Surjadja et al. (2003) explained automated service is any online-based service served via the internet whereby the interaction between customer and the organisation is limited to the information and communication technology (ICT) itself. However, the consideration of other essential automated service dimensions such as telephone services and automated service delivery outlets have not been mentioned in these explanations. Buckley (2003) has further extended the definitions of automated service as the electronic stipulation of a service to customers. This definition is demonstrated in a holistically manner since it involves the consideration and assessment of other service delivery methods beyond services through the internet.

Reliability

Reliability is a key attribute of excellent customer service since it determines the repeated use of certain services (State Library of Victoria, 2009). Reliability defines as the ability of a system to keep operating over time (Clements et al., 2002). Parasuraman et al. (1988) also explained that reliability is the capability to achieve the promised service consistently and accurately. Customers will refuse to exercise automated service options on their next visit if a poor first experience is encountered with the technologies. A consistent and dependable service will always increase a customer's satisfaction and confidence with the rail transportation service. Therefore, the dissatisfaction on the services offered owing to poor quality in term of performance efficiency and information accurateness always cause to loss of customer. Reliability encourages customer trust toward certain services which can be verified through the functionality and speed of technology, streamlining and maintaining procedures and maintaining standards of service delivery (State Library of Victoria, 2009).

Convenience

The practice of convenience is another key factor that forms customer perceptions of service quality (Amorim et al., 2012a). The improvements in process convenience demonstrate a powerful impact on customer return intentions to service alternative, especially the automated service driven by technology, which also known as self-service technology option (Amorim et al., 2012b). This emphasizes the implication of perceived convenience in developing customers' motivation to choose service alternatives must involve high degree of customer participation such as waiting less time in line. In order to attain outstanding service quality, service differentiation can be carried out based on the operational characteristics of each delivery alternative.

Customization

Service customization has become increasingly popular in the service industry, which means to assure as many needs as possible for each individual customer (Kara and Kaynak, 1997). Anderson et al. (1997) defines customization as the degree to which the service provider's offering is tailored to meet heterogeneous customers' needs. Kotler (1989) and Pine (1993) explained customization as the response to the irregular nature of customer

demand for greater selection, extra attributes, and better value in services. Driven by the expected benefits, customization is always the foundation of comprehensive customer relationship management (Freeland, 2003; Lemon et al., 2002). Undoubtedly, the revolutions in computer system and the widespread of the Internet have offered potential opportunities to marketers to customize offerings to fit the demand of diverse populations. Many researchers predicted that corporate investment in customized technologies will expand remarkably in the future due to the increase of market demand (Gardyn, 2001; Kim et al., 2001; Rust and Lemon, 2001). This trend stays on track with companies' strong desires for latest nature information and extent of demand for service customization (Liechty et al., 2001).

Service Encounter Satisfaction

The customer is considered the critical aspect for service providers to achieve service innovation and to ensure sustainable business value and profits in the process of conveying service experience (Hsieh and Yuan, 2010). Researchers agreed that consumer satisfaction resulted from a subjective relationship between expected and perceived attribute levels. The term customer satisfaction at the point of delivery as used herein is consistent with the definition of service encounter satisfaction, i.e. customer satisfaction with a distinct service encounter normally reflects the feelings of customer about a specific interaction or moment of truth. The expectancy disconfirmation model proposed by Oliver (1989) has presented a conceptual and empirical support in signifying the customer satisfaction which represents how reasonably the services provided match customer expectations. A positive disconfirmation occurs when customer perception exceeds customer expectation, and thus the customer is satisfied with the service. In contrast, dissatisfaction responds to negative disconfirmation which indicates the service provider failed to identify the customer's expected quality on certain service.

However, Woodruff et al.(1983a) identified that consumers have a "zone of indifference" in evaluations which demonstrating performance may not fall under the expectation models with certain aspects of the encounter. Zone of indifference therefore referred to the range of disconfirmation which presumably leads to a neutral state. Consequently, customer satisfaction is "a psychological form ensuing when the emotion surrounding disconfirmed expectations is accompanied with the consumer's preceding opinions about the consumption experience" (Oliver, 1981). The disconfirmation model described in Figure 1 is based on this Woodruff et al. (1983b) notion as demonstrated by Hill (1986).

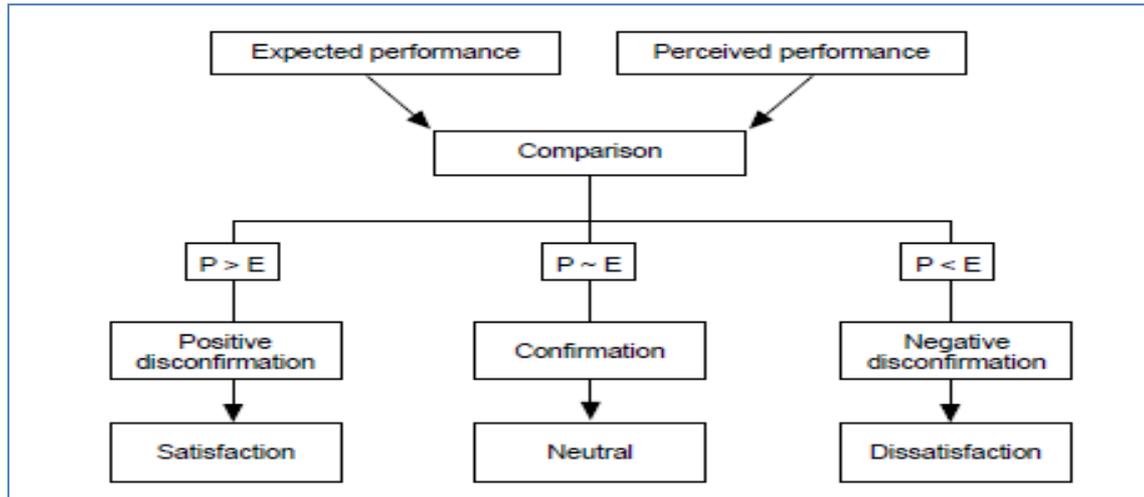


Figure 1: The Disconfirmation Model

Expectations principally identified as the predictions about certain events that likely to occur during the impending exchange, which also apply as a reference against which performance can be compared and assessed disconfirmation. It often conceptualized as combination of customer wants and customer beliefs about what the service provider is capable of providing (Zeithamlet al., 1993a). Parasuraman et al. (1991) proposed that customer expectations comprise two levels: desired and adequate. Desired expectation implies the level of service a customer desires to receive, in short, it is the level of service performance that the customer expects. Adequate expectation explains a lower level of expectation which considers as the customer's acceptable level of performance (Zeithaml et al., 1993b).

Customer Retention

Retention can be generally defined as “to continue to do business or exchange with the particular firm continuous basis” (Zineldin, 2000). Potter-Brotman (1994) stated that services does effect customer retention positively and influence service providers to enhance relationship with customer by creating satisfaction. Some researchers argued trust has a stronger emotion that provide a better prediction on retention instead of customer satisfaction (Hart and Johnson, 1999). Dawkins and Riechheld, 1990) cited by Ahmad and Butte (2001) had claimed that there are a 5% increase of retention will lead an increase of the value of customers, which is between 25% and 85% increase in many industries. Ahmad and Butte (2001) also stated that customer retention deserve better attention in a part of strategic marketing goals, rather than being seen as a result of “good” marketing management.

Gustafsson et al. (2005) has identified three important drivers of customer retention in their previous literature. Those attributes consist of the customer satisfaction, affective commitment and calculative commitment. Affective commitment is seen to be more emotional due to the high level of trust which established through personal involvement between the customer and the service providers (Gabarino and Johnson 1999; Morgan and Hunt 1994). Cumulative commitment is seen to be economic oriented because the customer only depends on the product or service benefits owing to the lack of alternative or price related factor (Anderson and Weitz, 1992; Dwyer et al.,

1978; Heide and John, 1992). Importantly, customer satisfaction demonstrates the direct effects to the service provider’s market share and customer retention (Rust and Subramanian, 1992). However, Hansemark and Albinson (2004) critiqued that sometimes the customer not return to the firm may not necessarily because of the satisfaction. Customers retain in the company not because they are satisfied, but because they are lack of product alternatives (Erikson and Lofmarck Vaghult, 2000).

Moreover, Venetis and Ghauri (2004) found out that there service quality directly an addition to customer retention, regardless for their desire to need to stay in the relationship. Hansemark and Albinson (2004) has found out that retention can be recognized by the satisfaction of customer towards the service, by developing good relationship with customers which create mutual confidence. The higher the level of satisfaction, the greater the retention of customers (Ranaweera and Prabhu, 2003; Anderson and Sullivan, 1993; Fornell, 1992).

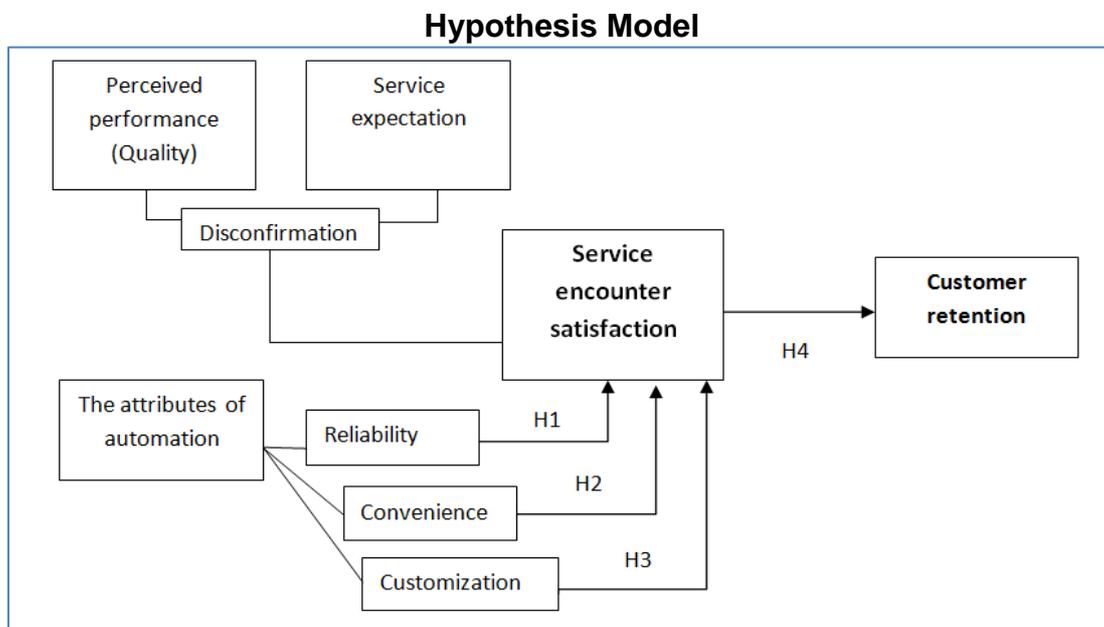


Figure 2 Hypothesis Model

A proposed hypothesis model of this research is developed by combining the theoretical framework of service encounter evaluation model (Oliver and Swan, 1989) and customer satisfaction evaluation model based on self-service technology (Beatson et al., 2007). This framework proposed the direct relationships exist from the attributes of automation in rail transportation to service encounter satisfaction. For example, it can be presumed that if consumers rate the performance of the various components of the service positively they are more likely to be satisfied overall with the complete service experience.

The automated service attributes had been identified in previous researches (Dabholkar, 1996; Meuter et al., 2000; Walker et al., 2002) which includes the reliability of technology, the convenience of technology and the customisation of technology. Based on these major attributes, 3 hypotheses have been proposed to determine the customer satisfaction towards the automated service encounter in rail transportation:

H1: Reliability of the technology in rail transportation has significant influences on service encounter satisfaction.

H2: Convenience of the technology in rail transportation has significant influences on service encounter satisfaction.

H3: Customization of the technology in rail transportation has significant influences on service encounter satisfaction.

Furthermore, a comprehensive investigation of consumer retention is developed in this framework based on the domain of automated service encounter. The importance of understanding automation impact on customer retention since the industry cannot survive without repeat usage (Beatson. A. et al., 2007b). By having automated technology services, organisations are reducing personal contact which is believed to have a positive influence on consumer retention (Buell et al., 2010). A previous study showed that high extend of customer satisfaction translated into customer retention is radically reduced by approximately 60% in cases where the customers were not as strongly satisfied (Chandrashekar et al., 2007). Based on the overall empirical evidence, this study thus hypothesized:

H4: The service encounters satisfaction lead to customer retention in rail transportation.

Methodology

Quantitative methods will be using for this study which usually employs to measure social reality as it produces a high accuracy level with the statistical data. The primary data was collected by distributing the survey questionnaires. Quantitative method on the other hand will be used to analyse customer satisfaction towards the automated services in rail transportation. The design of practical task involved in this research has been summarized in Table 1. The self-administered questionnaires were distributed through on-site distribution and Internet. In term of on-site survey, data was collected mainly from Sunway area, Mid Valley-The Gardens, KL Sentral, and Puchong Area, while the Internet survey data was collected through Facebook and e-mail. The respondents represented a good mix of university students as well as the workforce members from all age group.

RESEARCH SCOPE	Automation in rail transportations
GEOGRAPHIC LOCATION	Klang Valley
SURVEY METHODOLOGY	Self- administered questionnaire
TYPE OF SAMPLING	Convenience sampling
SAMPLE SIZE	N=120

As mentioned in the hypothesis model, the major framework components that found in the research comprised the *service encounter evaluation model* (Oliver, 1980 and Swan, 1983) and customer satisfaction evaluation model based on self-service technology (Beatson et al 2007). The questionnaire is divided into 5 sections. Based on the respondents' experience, section A and section B gathers the information about the 3 major attributes of automated services in rail transportation as demonstrated in H1, H2 and H3. To carry out the proposed objectives of this study, Beatson's et al. (2011) study is adapted to measure the influence of each automated service attributes. Section C covered the information on the general opinion about the service encounter satisfaction with service automation in rail transportation, while section D covered the intention of customer to stay with the automated services. Lastly, the respondent's demographic profiles were asked in Section E to compare the result differences based on different characteristics.

To analyze the collected data, method of descriptive analysis and inferential analysis were employed by using the SPSS 18.0 software. Descriptive analysis was used to describe the personal details. The general measures of percentage are used to analyze the data collected throughout the questionnaires. Inferential analysis is used to make prediction and inferences about a population from the sample analysis. The result of the analysis can generalize the using sample to the larger population that the samples represent. In order to test the issues of generalization, the test of significance is necessary to perform in order to show how likely the result is due to the chance (Creative Research System, 2012). The example of this methods included reliability test and multiple linear regression. Rail transportation was measured by quantitative data which is Likert scales to measure the factors. The Likert scale is a uni-dimensional and able to design into 5-7 choices. This study only designs into 5-point Likert scale as being categorized as "Strongly Agree, Agree, Neutral, Disagree and Strongly Disagree".

Data Analysis

Descriptive Results

Demographic Variable	Details	Frequency	Percentage (%)
Gender	Male	60	50
	Female	59	49.2
Age Range	<17	17	14.2
	18-24	64	53.3
	25-34	34	28.3
	>45	4	3.3
Marital Status	Single	40	33.3
	Married	79	65.8
	Others	1	0.8
Employment Level	Employed	76	63.3
	Student	40	33.3
	Housewife	3	2.5
	Others	1	0.8
Education	Secondary	16	13.3
	Diploma	26	21.7
	Degree	47	39.2
	Postgraduate	24	20.0
	Others	7	5.8

Table 1 Demographic Profile of Respondents

The respondents, who are eligible to receive the questionnaire, were students and office workers in Malaysia, thus the sampling frame for the sample is completed through convenience sampling from which the population is drawn. According to 120 total respondents from the satisfaction of using automated services in railway transportation in Malaysia were obtained, there are 60 female respondents and the rest are males. The respondents have a dominant average age of 18 -24 years old (53.3%), followed by 25-34 years old (28.3%) and least is 45 years old and above (0.3%). Based from the respondents, they have a dominance of (65.8%) of them are married followed by single (33.3%) and others (0.8%). The highest education level of the entire sample contributes to degree students (39.2%) and the least majority of respondents are professional terms of profession (5.8%). In addition, 63 % of the respondents are employed followed by 33 % are students. The minority of the

respondents under employment status are Housewives (2.5%) and others (0.8%).

Cronbach's Alpha for Each Variable

Reliability

Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.913	.914	5

Convenience

Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.880	.880	5

Customization

Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.680	.680	2

Customer Satisfaction

Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.815	.816	6

Customer Retention

Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.825	.828	3

Based on the table above, Cronbach's alpha also indicated in this study. Cronbach's alpha is the measurement of the uni-dimensional of each construct should consider higher than 0.5 for acceptance level of reliability. There are five variables included in this study which consists of reliability, convenience, customization, customer satisfaction and customer retention.

The Cronbach's alpha value for reliability is 0.913, convenience is 0.880, customization is 0.680, customer satisfaction is 0.815, and customer retention is 0.825. Each variable reached the acceptance level which means all the variables are reliable to adapt in this study.

The means for each variable were calculated to conduct correlation and linear regression analysis. The table below shows the Pearson's correlation coefficients for customer satisfaction with the other three variables, which are reliability, convenience and customization.

Correlations

		Customer Satisfaction	Reliability	Convenience	Customization
Pearson Correlation	Customer Satisfaction	1.000**			
	Reliability	.484**	1.000		
	Convenience	.580**	.814**	1.000	
	Customization	.618**	.614**	.692**	1.000
Sig. (1-tailed)	Customer Satisfaction	.	.000	.000	.000
	Reliability	.000	.	.000	.000
	Convenience	.000	.000	.	.000
	Customization	.000	.000	.000	.
N	Customer Satisfaction	120	120	120	120
	Reliability	120	120	120	120
	Convenience	120	120	120	120
	Customization	120	120	120	120

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

Table 2 Result of correlation

The relationship between the independent variable, reliability and the dependent variable, customer satisfaction has a slightly weak positive correlation of 0.484. Convenience and customer satisfaction has a partially positive relationship of 0.580. The correlation between customization and customer satisfaction however resulted in a slightly strong positive correlation, which is 0.618. R-square value was found to be 0.427, which means 42.7% of the variation of customer satisfaction, can be explained by reliability, convenience and customization.

After determining the correlations, a standard regression analysis is done and the table below shows the unstandardized coefficients extracted from multiple linear regression analysis.

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	1.170	.186		6.283	.000					
	Reliability	-.023	.097	-.029	-.235	.815	.484	-.022	.017	.332	3.013
	Convenience	.253	.107	.315	2.358	.020	.580	.214	.166	.278	3.603
	Customization	.347	.081	.418	4.259	.000	.618	.368	.299	.514	1.947

a. Dependent Variable: Customer Satisfaction

Table 3 Result of Coefficients

Table 3 demonstrated the result of coefficient from SPSS data. In linear regression, the model specification is that the dependent variable y_i is a linear combination of the *parameters*. B represents Beta value in the Table of Correlation. The following equation is added the coefficient for the following multiple linear regression model:

$$y = b_0 + b_1x_1 + b_2x_2 + \dots + b_px_p$$
$$=-0.023 + 0.253^{x_1} + 0.347^{x_2}$$

The equation signifies that each unit increase in convenience or customization will leads to an increase in customer satisfaction given that all variables remain constant. However an increase in reliability will cause customer satisfaction to decrease if all variables remain constant.

Based on the Coefficient Summary table, this study signified the result of hypothesis as below:

H₁: Reliability of the technology in rail transportation has significant influences on service encounter satisfaction.

Decision rule

As explained in the Table 3, the t-statistic for the reliability of automation services and customer satisfaction is -0.235 (p-value <0.05) and Beta is -0.029. Since the p-value is larger than -0.235 and Beta is negative, there is no sufficient evidence to indicate that the reliability does influence customer satisfaction. Hence, H₁ is rejected.

The linear regression equation for the reliability of automation services and CUSTOMER SATISFACTION = 1.170 + (-.023) (REALIBILITY). This means that for every unit increase in attitude, the purchase intention will be affected and increase by 0.023.

H₂: Convenience of the technology in rail transportation has significant influences on service encounter satisfaction.

Decision Rule

As explained in the Table 3, the t-statistic for the convenience of automation services and customer satisfaction is 2.358 (p-value > 0.05) and Beta is -0.029. Thus, there is sufficient proved that the respondents state convenience in using automation service in railway transportation is significance influence customer satisfaction. Since p-value is 2.358 > 0.05, therefore H₂ is accepted. It showed that it is a positive relationship between convenience and customer satisfaction.

The linear regression equation for the convenience of automation services and CUSTOMER SATISFACTION = 1.170 + 0.253 (CONVIENIENCE). This means that for every unit increase in attitude, the purchase intention will be affected and increase by 0.253.

H₃: Customization of the technology in rail transportation has significant influences on service encounter satisfaction.

Decision Rule

As explained in the Table 3, the t-statistic for the customization of automation services and customer satisfaction is 4.259 (p-value > 0.05) and Beta is 0.418. Thus, there is sufficient proved that the respondents state there is a convenience in using automation service in railway transportation is significance influence customer satisfaction. Since p-value is 4.259 > 0.05, therefore H₃ is accepted. It showed that it is a positive relationship between customization and customer satisfaction.

The linear regression equation for the convenience of automation services and CUSTOMER SATISFACTION = 1.170 + 0.347 (CUSTOMIZATION). This means that for every unit increase in attitude, the purchase intention will be affected and increase by 0.347.

Result Conclusion

On the whole, customization (4.259) has the highest explanatory power as compared to the other predictor variables: reliability (-0.235) convenience (2.358). Furthermore, the coefficient summary table has also indicated that customization and convenience have positive relationship to customer satisfaction since the p-value of both factors is less than 0.05

Regression for Customer Satisfaction and Retention

Model Summary^b				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.675 ^a	.456	.452	.61059
a. Predictors: (Constant), Customer Satisfaction				
b. Dependent Variable: Customer Retention				

Table 4 Model Summary

Multiple regression is an equation that is represented the best prediction of a dependent variable from several independent variables. This analysis is used when the independent variable are correlated with one another with the dependent variable (Coakes & Ong, 2011). As the second correlation after examining the three attributes, the relationship of customer satisfaction and retention will be tested. In this context the aim of using the multiple regressions is to test if the levels of consumer’s satisfaction (independent variable) correlate with customer retention (dependent variable) in automated services in Malaysia railway transportation. This is because individuals have variability in their behavior and an action which is a challenge for researchers to concretely predict.

Based from the results in Table 3 the correlation between independent and dependent variable explains 45 per cent of the variance (R Square) in customer satisfaction on automation service, which is somewhat highly significant.

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	36.897	1	36.897	98.967	.000 ^b
	Residual	43.992	118	.373		
	Total	80.889	119			

a. Dependent Variable: Customer Retention
b. Predictors: (Constant), Customer Satisfaction

Table 5 ANOVA

The ANOVA table (Table 4) has illustrated that the F-value is 98.967 and the p-value is less than 0.05, which indicated that the variable of the study is significant.

Coefficients

Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations			Collinearity Statistics		
	B	Std. Error	Beta			Zero-order	Partial	Part	Tolerance	VIF	
1	(Constant)	.449	.230		1.952	.053					
	Customer Satisfaction	.797	.080	.675	9.948	.000	.675	.675	.675	1.000	1.000

a. Dependent Variable: Customer Retention

Table 6 Coefficient

Table 5 show the coefficient results produced from the test. Based on the table, the following equation can be constructed:

$$y = 0.449 + 0.797 x_1$$

Table 5 also stated that the t-value for customer satisfaction is 9.948 which is ($p < 0.05$) whereas the Beta is 0.675. From these values it is proved that there is a significance relationship in customer satisfaction in influencing customer retention towards automated services in railway transportation in Malaysia. Thus, H4 is accepted as p-values is less than 0.05 ($p \text{ value} = 0.000$).

H₄: There is a significant relationship in customer satisfaction in influencing customer retention towards automated services in railway transportation in Malaysia.

Discussion and Findings

Reliability in the automated services can be separated into two parts which are functional and technical (Narteh, 2013). Functional aspects of reliability describe the ability of automated service to deliver as expected with no errors whereas on the other hand technical reliability is more towards the quality and the design of the service (Narteh, 2013). Automated service is more consistent and has low possibility of distortion in delivering service. Therefore railway transportation users prefer automated service, as it is less prone to make errors and mistakes in comparison to normal human interactions. The result of 'reliability' in this study is consistent and similar to other previous studies, which indicates that there is relationship between reliability and customer satisfaction. Narteh (2013) stated in his study that reliability is a fundamental factor to determine the quality of automated services and it also serves as the strongest predictor to customer satisfaction.

The results obtained for this research shows there is no relationship between convenience and customer satisfaction. However, convenience should not be neglected as it still plays a role to increase customer satisfaction. In the literature review, it is stated that customers are more willing to take part in activities that requires less involvement and effort such as queuing in line. This behaviour can be explained by using a study by Narteh (2013) where he describes convenience to be a major determinant of technological acceptance as well as customer adoption. The automated services should be user friendly in order to attract customer because it will provide ease of use while using the automated service. Location and the number of the service provided should also be taken into consideration as it must be located that right place to avoid congestion.

The other variable that is included in this study is customization. Although the relationship between customization and customer satisfaction is insignificant, there is still some evidence that can support H₁. Ahmad A (2011) uses a different term, i.e. 'Personalization as it refers to the possibilities of personalized service through automated service channels. Railway transportation needs to customize automated services in order to be able to target certain user groups and hence gain competitive advantage (Ahmad, 2011). Based on our literature review, due to the criteria of customization that meet specific demands, this acts as an important factor in customer relationship management and consequently will then increase the customer satisfaction (Freeland, 2003; Lemon et al., 2002). However using fully automated service, it can be hard to provide value to users without any human interaction (Ahmad Al-Hawari, Ward and Newby, 2009).

From the proposed framework, the researchers had assumed that there are direct relationships that occur in customer satisfaction of automated services in railway transportation for the second stage of the framework. The first stage includes how attributes of service automation influence customer satisfaction. The customer relationship can benefit from in-depth factors that influence

retention towards the automation service. The customer satisfaction and the relationship based from the marketing literature stated that there are generally a significant relationship of both retention and satisfaction. A research by Potter-Brotman (1994) clarified that service providers create customer retention by enhancing the relationship with consumers to create satisfaction. Based on the results, the attributes for retention are highly significant which relates to the previous literature that suggest three basic predictions of retention (overall customer satisfaction, affective commitment and calculative commitment) (Gustafsson,2005).

In this research, customer satisfaction is the dependent variable for customer retention. Moreover, a thorough understanding on the automated service attributes – customization, convenience and reliability) can help in developing customer satisfaction and retention. Basing on past literature reviews, customer satisfaction can be considered as the key performance for retention as compared to other customer retention predictions.

From previous evidences of the literature review, researchers had evaluated a broader view of customer retention towards public railway transportation. Two stages of the framework have guided the researchers to study an extensive research on service automation. Generally, the first stage mainly focuses on automation attributes and the second part is on how the automation services also lead to customer retention. These two stages of framework signify that the study is done to evaluate two different theories (customer satisfaction and customer retention).

Research Implications

The results gathered provide valuable input for marketing managers of transportation companies specifically and service organizations in general to improve service levels. Berry et al (1990) stated that managers could work toward improving problem-resolution as a way to challenge customer perceptions, particularly those that the company is not aware of.

Additionally, there are opportunities to build strong loyalty among consumers, particularly working adults and young professionals, by examining and evaluating their levels of satisfaction and retention relating to their preference towards automation in terms of scale and scope that can be made available in the railway transportation service.

Furthermore, this study might help marketers to design promotions that not only specifically target this group of rail commuters but also target car owners who have not considered rail transportation as a genuine alternative to intra-city and inter-city commuting. This can potentially open up a bigger market that has a corollary effect of reducing traffic congestion and more importantly, from the point of view of the travelling public – not just to help reduce the worsening traffic congestion in the cities, but also to significantly reduce the amount of travelling time.

From the results, it can be seen that a majority of the respondents respond positively toward using rail transport – particularly because of the automation services provided in railway transportation in Malaysia. Based on this,

marketers can use this insight by coming up with strategic and tactical communication plans to attract and influence more Malaysians to use rail transport.

Conclusion

In conclusion, the factor of reliability presents an insignificant relationship in influencing customer satisfaction on service encounters. However this does not mean the authorities should neglect the reliability in the use of technology because it is likely that consumers *expect* it rather than demanding it. [Note: This is an area of further research].

After all, technology is here to stay. It is the goal of service organizations everywhere to continually work toward facilitating service encounters which will enhance the service delivery process and increase users' satisfaction through the adoption of technology in this specific industry. Lastly, this study concludes that customer satisfaction in service encounters is a prerequisite to customer retention – especially when automation is progressively being introduced to make it easy and seamless for commuters at large. Furthermore, it debunks the old stereotype notion that railway transport is inefficient and outdated – instead it has made the quantum leap into the 21st century.

Limitations of Study

Due to the lack of secondary sources on service automation in rail transportation in Malaysia, there were insufficient evidences to support the direct relationships of the attributes of automated services and customer satisfaction. Hence, the proposed framework was employed in this research because only a very limited study had been done in examining the role of customer satisfaction in service encounters with regard to the process of automation in rail transportation.

One specific area which we could have focused more is the relationship between convenience and customer satisfaction. We didn't attach much importance to it as much as the other factors – e.g. in the way we designed our questionnaire – that we take 'convenience' very much for granted.

This research only examines the attitudes of 120 respondents – and this limits our ability to accurately generalise our findings in a manner that can represent the Malaysian population. The sample was just too small.

Recommendations on Future Research

Since quantitative method was used in the current research by addressing the proposed objectives in two stages. Firstly, it is to evaluate the relationship between the automation service attribution leads to customer satisfaction, whereas the second stage is evaluating the customer satisfaction and customer retention. The researchers suggest that future research adopt both qualitative and quantitative method in conducting similar research topics in order to gain a deeper understanding as well as further reinforcing our results.

Moreover, as this research has its own limitations investigating the service automation that influences customer satisfaction and retention – future research could expand this study to include a bigger sample from different urban epicenters within the metropolitan Klang Valley.

Since the current study is targeted towards customer satisfaction and retention, further research can be done by studying other approaches involving customer expectations, customer intentions and customer preferences in this area of service encounters to enrich our understanding of the issues facing the public transportation industry in Malaysia.

References

- Ahmad, R. and Buttle, F., 2004. Customer retention management: a reflection of theory and practice. *Marketing Intelligence & Planning*, 20(3), pp.149-161.
- Ahmad, A., 2011. Automated service quality as a predictor of customers' commitment. *Asia Pacific Journal of Marketing and Logistics*, 23(3), pp. 346-366.
- Ahmad, A. et al., 2009. The relationship between service quality and retention within the automated and traditional contexts of retail banking. *Journal of Service Management*. 20(4), pp. 455-472.
- Almselati, A.S. et al., 2011. An Overview of Urban Transport in Malaysia. *Medwell Journals*. 6 (1), pp. 24-33.
- Amorim, M. et al. 2012. *Self-Service Processes Still Need a Helping Hand*. [online] Available at: <<http://www.ieseinsight.com/doc.aspx?id=1410&ar=14>> [Accessed 9 November 2013].
- Anderson, E.W. and Weitz, B., 1992. The Use of Pledges to Built and Sustain Commitment in Distribution Channels. *Journal of Marketing Research*, 29(2), pp.18-34.
- Anderson, E.W. and Sullivan, M.W., 1993. The antecedents and consequences of customer satisfaction for firms. *Marketing Science*, 12 (2), pp. 125-43.
- Anderson, E.W. et al. 1997. Customer satisfaction, productivity, and profitability: differences between goods and services. *Marketing Science*, 16 (2), pp. 129-45.
- Asean Japan Transportation Partnership, 2010. *Rail Transport Malaysia*. [online] Available at: <<http://www.ajtpweb.org/statistics/Malaysia/rail-transport-malaysia>>. [Accessed 1 October 2013].
- Aziz, A.A and Amin, N.M., 2012. *Transforming the Land Public Transport System in Malaysia*. [online] Available at: <http://itaacademy.gov.sg/doc/J12%20May-p30Azmi%20Bin%20ABDUL%20AZIZ_Transforming%20the%20Land%20Public%20Transport%20System%20in%20Malaysia.pdf>. [Accessed 28 September 2013].
- Bardi, E.J. et al., 2011. Critical Link in the Supply Chain. In: Jack W. Calhoun, Sabatino, J and Heink.Net. *Transportation: A Supply Chain Perspective*. 7th ed. United States: South-Western Cengage Learning. p24.
- Beatson, A. et al. 2007. Self-Service Technology and the Service Encounter. *The Service Industries Journal*, 27 (1), January, pp.75–89.
- Berry, L. L. et al., 1990. Five Imperatives for Improving Service Quality. *Sloan Management Review*, 31(7), pp. 29-38.
- Buckley, J. 2003. E-service and the public sector. *Managing Service Quality*, 13(6), pp.453- 462.
- Buell, R. W. et al. 2010. Are Self-Service Customers Satisfied or Stuck?. *Production and Operations Management*, 19(6), pp. 679-697.
- Chandrashekar et al. 2007. Satisfaction Strength and Customer Loyalty. *Journal of Marketing Research*, 43, February, pp.153-163.

- Clements, P. et al. 2002. Evaluating Software Architecture. *SEI Series in Software Engineering*. Addison-Wesley.
- Coakes, S.J. and Ong, C., 2011. *SPSS: analysis without anguish: version 18 for Windows. 18th ed.* Australia: John Wiley & Sons Australia, Ltd.
- Creative Research System, 2012. *Significance in Statistics & Surveys*. [online] Available at: <<http://www.surveysystem.com/signif.htm>>. [Accessed 10 November 2013].
- Cronin, J.J. and Taylor, S.A. 1992. Measuring service quality; a re-examination and extension. *Journal of Marketing*, 56(3), pp.55–68.
- Dabholka, P. and Bagozzi, R. 2002. An attitudinal Model of Technology-based Self-Service: Moderating effects of Consumers Traits and Situational Factors. *Journal of Academy of Marketing Science*, 30(3), pp.184-201.
- Dabholkar, P.A. et al. 2003. Understanding consumer motivation and behaviour related to self-scanning in retailing implications for strategy and research on technology-based self-service. *International Journal of Service Industry Management*, 14(1), pp.59–95.
- Dawkins, P. and Reichheld, F., 1990. Consumer as a Competitive Weapon. *Directors and Boards*, 14 (2), pp. 42-47.
- Dijke, J.V. et al., 2012. Certification of automated transport system. *Social and Behavioral Sciences*, 48, pp. 3461 – 3470.
- Eriksson, K. and Vaghult, A.L., 1999. Customer Retention, Purchasing Behaviour and Relationship Substance in Professional Services. In: 15th Annual IMP Conference, D Mc Loughlin and C Horan. University College, Dublin.
- Freeland, J.G., 2003. *The Ultimate CRM Handbook*, McGraw-Hill, New York, NY.
- Garbarino, E. and Johnson, M., 1999. The Different Roles of Satisfaction, Trust and Commitment in Customer Relationship. *Journal of Marketing*, 63(2), pp. 70-87.
- Goh, M., 2013. *Malaysia set to spend US\$50b to develop rail network*. [online] Available at: <<http://www.channelnewsasia.com/news/asiapacific/malaysia-set-to-spend-us/809918.html>>. [Accessed 30 September 2013].
- Gustafsson, A. et al., 2005. The Effects of Customer Satisfaction, Relationship Commitment Dimension, and Triggers on Customer Retention. *American Marketing Association*, 69, pp. 210-218.
- Hansenmark, O. and Albinson, M., 2004. Customer Satisfaction and Retention: The Experience of Individual Employee. *Managing Service Quality*. 14 (1), pp. 40-57.
- Hart, C and Johnson, M., 1999. Growing the trust relationship. *Journal of Marketing Management*, 8 (1), pp. 8-19.
- Heide, J.B. and John, G., 1990. Alliances in industrial purchasing: the determinants of joint action in buyer-supplier relationships. *Journal of Marketing Research*, 27(1), pp. 24-36.
- Henderson, J, et al., 2003. A critical review of e-service in Northern Ireland Electricity. *Managing Service Quality*, 13(6), pp.463-470.
- Hill, D.J., 1986. Satisfaction and Consumer Services. *Advances in Consumer Research*, 13, pp.311-315.
- Hsieh, Y. H. and Yuan, S. T., 2010. Design of the customer expectation measurement model in dynamic service experience delivery. *Pacific Asia Journal of the Association for Information Systems*, 2(3), pp.1–19.
- Kara, A. and Kaynak, E., 1997. Markets of a single customer: exploiting conceptual developments in market segmentation. *Journal of Marketing*, 31(11/12), pp. 873-95.
- Kotler, P., 1989. From mass marketing to mass customization. *Planning Review*, 17(5), pp.313-325.
- Lemon, K.N. et al., 2002. Dynamic customer relationship management: incorporating future considerations into the service retention decision. *Journal of Marketing*, 66 (1), pp. 1-14.

- Liechty, J. et al., 2001. Choice menus for mass customization: an experimental approach for analyzing customer demand with an application to a web-based information service. *Journal of Marketing Research*, 38 (2), pp. 183-96.
- Mazwin, N.A., 2013. *PM: MRT to transform Malaysia*. [online] Available at :<<http://www.thestar.com.my/News/Nation/2013/05/31/PM-MRT-to-transform-Msia-Project-will-show-we-are-a-developed-nation-says-Najib.aspx>>. [Accessed 3 October 2013].
- Meuter, M.L. et al., 2000. Self-service technologies: understanding customer satisfaction with technology based service encounters. *Journal of Marketing*, 64(3), pp. 50–64.
- Meuter, M.L. et al., 2005. Choosing among alternative service delivery modes: an investigation of customer trial of self-service technologies. *Journal of Marketing*, 69(April), pp.61–83
- Mittal, V. et al., 1998. The asymmetric impact of negative and positive attribute-level performance on overall satisfaction and repurchase intentions, *Journal of Marketing*, 62(January), pp.33–47.
- Moaz, Y.A., 2010. *Good public transport system needs reliability, availability*. [online] Available at :<<http://www.malaysiakini.com/letters/136889>>. [Accessed 30 September 2013].
- Morgan, R.M. and Hunt, S.D., 1994. The commitment-trust theory of relationship marketing. *Journal of Marketing*, 58 (7).
- Narteh, B., 2013. Service quality in automated teller machines: an empirical investigation. *Managing Service Quality*. 23(1), pp. 62-89.
- Oliver, R. L., 1981. Measurement and Evaluation of Satisfaction Process in Retailer Selling. *Journal of Retailing*, 57, pp. 25-48.
- Oliver, R.L. and Swan, J.E., 1989. Consumer Perceptions of Interpersonal Equity and Satisfaction in Transactions: A Field Survey Approach. *Journal of Marketing*, 53, pp. 21-35.
- Parasuraman, A. et al., 1991. Refinement and reassessment of the SERVQUAL scale. *Journal of Retailing*, 67(4), pp. 420-450.
- Parasuraman, A. et al., 1988. SERVQUAL: a multiple-item scale for measuring consumer perceptions of service quality. *Journal of Retailing*, 64(1), Spring.
- Pine, B.J. II., 1993. *Mass Customization: The New Frontier in Business Competition*. Harvard, pp. 10-13.
- Potter-Brotman, J., 1994. The New Role of Service in Customer Retention. *Managing Service Quality*, 4(4), pp. 53-56.
- Ranaweera, C. and Prabhu, J., 2003. The Influence of Satisfaction, Trust and Switching Barriers on Customer Retention in a Continuous Purchasing Setting. *International Journal of Service Industry Management*, 14(4), pp. 374-395.
- Rust, R.T and Subramanian, B., 1992. Making Complaints a Management Tool. *Marketing Management*, 1(3), pp.41-45.
- Ruyter, K. et al., 2001. Customer adoption of e-service: an experimental study. *International Journal of Service Industry Management*, 12(2), pp. 184-207.
- State Library of Victoria, 2010. Customer service excellence in the self-service public library. State Library of Victoria: Shared Leadership Program. [online]. Available at: <http://conferences.alia.org.au/online2011/papers/paper_2011_B11.pdf> [Accessed 9 November 2013].
- Surjadjaja, H et al., 2003. Determining and assessing the determinants of e-service operations. *Managing Service Quality*, 13(1), pp. 39-53.
- Venetis, K. and Ghauri, P., 2004. Service Quality and Customer Retention: Building Long-Term Relationships. *European Journal of Marketing*, 38(11/12), pp. 1577-1598.
- Walker, R.H. et al., 2002. Technology-enabled service delivery: an investigation of reasons affecting customer adoption and rejection. *International Journal of Service Industry Management*, 13(1), pp.91–106.

*Proceedings of 4th Global Business and Finance Research Conference
25 - 27 May 2015, Marriott Hotel, Melbourne, Australia, ISBN: 978-1-922069-76-4*

- Woodruff et al. , 1983. Modelling Consumer Satisfaction Processes Using Experience-Based Norms. *Journal of Marketing Research*, pp. 296-304.
- Zeithaml, V. et al., 1993. The Nature and Determinants of Customer Expectations of Service. *Journal of the Academy of Marketing Science*, Vol. 21, No. 1, pp. 1-12.
- Zineldin, M., 2006. The royalty of loyalty: quality and retention. *Journal of Consumer Marketing*. 23(7), pp. 430-437
- Zineldin, M., 2000. *TRM Total Relationship Management*. Student Literature, Lund.

Appendix

Questionnaire

Dear Respondents,

We are students from SUNWAY UNIVERSITY who currently enroll in Degree in Business Studies. We are conducting a survey on “The impact of service automation on service encounters satisfaction and customer retention in rail transportation”. The service encounter satisfaction and customer retention questionnaires are distributed to determine the customer satisfaction level and their willingness to stay with the automated services. With advancement of technology, the introduction of automated system is critical for the service provider to enhance the service encounter process and to satisfy individual’s travel demands. The examples of automated service are electronic arrival system, fare collection machine, ticketing machine, CCTV security system and etc. We would like to include your valuable opinions in this research to provide us important information. Please help us by taking a few minutes to complete this questionnaire. Thank You.

Section A

1. How frequent you take rail transportation?
 Less than 1 time per week 1-3 times per week More than 3 times per week
2. Are you aware of the automated services provided at the station?
 Yes No
3. Have you been using automated services when travelling with rail transportation?
 Yes No

Section B

Please rate the following statement. (1-strongly agree, 2-agree, 3-neutral, 4-disagree, 5-strongly disagree)

****Note: Automated service refers to electronic arrival system, fare collection machine, electronic ticketing machine, Touch & Go system and CCTV security system.**

Automated Service Attributes	1	2	3	4	5
1. The automated service delivery is consistent.					
2. The automated service is accessible.					
3. The automated service functions.					
4. The automated service is dependable.					
5. The automated service is accurate.					
6. The automated service provides me different range of services.					

7. The automated service is conveniently located.					
8. The automated service is compatible in other railway platforms (e.g. Touch & Go card).					
9. The automated service is a convenient way to conduct service transactions.					
10. The automated service is less time consuming.					
11. The automated service offers me variety of services that satisfy me specific needs.					
12. The automated service offers me better accessibility in travelling.					

Section C

Please rate the following statement.

(1-strongly agree, 2-agree, 3-neutral, 4-disagree, 5-strongly disagree)

Service Encounter Satisfaction	1	2	3	4	5
13. I am satisfied with the overall performance of existing automated service in rail transportation.					
14. I am satisfied with the speed of automated service delivery.					
15. The existing automated service exceeds my expectations.					
16. I have truly enjoyed the process of using automated services in transportation.					
17. The automated service in railway transportation made the customer experience more satisfying.					
18. I prefer automated services compared with face-to-face customer service.					

Section D

Please rate the following statement.

Customer Retention	1	2	3	4	5
19. I will choose automated services again when travelling with railway transportation.					
20. I will recommend my friends and family to use automated services in railway transportation.					
21. I will always consider automated service as					

my first choice.					
------------------	--	--	--	--	--

(1-strongly agree, 2-agree, 3-neutral, 4-disagree, 5-strongly disagree)

Section E: Socio-Demographics

1. Gender: Female Male

2. Age: >17 18 - 24 25 - 34 35 – 44 > 45

3. Marital Status: Single Married Others

4. Employment Status: Employed Students Housewife
 Retired Other

5. Educational Level: Secondary education Degree Master
 Professional