

# A Study on the Acceptance of E-Ticketing In Universiti Utara Malaysia Bus Service

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## ABSTRACT

*The purpose of this study is to examine the level of acceptance by Multimedia Seminar TIV3073 students on the implementation of e-ticketing for Universiti Utara Malaysia (UUM) bus service. E-ticketing is new in UUM as it only started in the second semester of 2006/07 session by the bus service provider, Unic Symbol Business Sdn Bhd. The method used is survey and the instrument is a set of questionnaire. The questionnaire addresses the overall users' satisfaction towards this system, users perception in terms of acceptance and also suggestions to further enhance the system. In measuring the acceptance level, four constructs were used which include User Satisfaction (US), Perceived Usefulness (PU), Perceived Ease of Use (PEU), and Perceived System Performance (PSP). This study indicates that the overall acceptance level is low which is between the range of 2.00 to 2.50 from a scale of 5.00.*

## Keywords

*Acceptance, e-ticketing, bus service*

## 1.0 INTRODUCTION

E-ticketing is defined as a contractual and monetary relationship between the transport operators and the users of public transport services for the provision of a service linked to the monetary value of the ticket. The provision of a ticketing system requires a set of complex procedures that involves the issuance and validation of the ticketing medium (Markantonis & Mayes, 1999). E-ticketing is also a method for documenting the sale, tracking, usage and accounting for a passenger's transportation without requiring the issue of paper "value documents" (Ng-Kruelle & Swatman, 2006).

UUM with a students population of 22,000 has implemented e-ticketing for UUM bus service commencing on the second semester of 2006/07 session. This service is implemented via the usage of smart cards which are slotted into the points used as e-tickets every time one uses the internal bus service. Smart cards are seen as the "smart" tool to execute this concept since it is an essential part of UUM's student. The smart cards are designed to be used for e-cash, bank card, student ID and also for library transactions.

Prior to e-ticketing, all students were required to pay RM42.00 per semester for an unlimited use of the bus service. The set back resulted from was that all students, regardless of using the bus service or not, would have to pay the amount every semester. Therefore, the university has chosen to privatize the bus service to ensure a better service quality and most importantly to be fair to the students. Therefore, this study was conducted in the spirit of examining what is the level of student's acceptance towards this system.

## 2.0 LITERATURE REVIEW

The degree of willingness to utilize or accept information technology has been a topic of high importance in information systems (IS) research (Kerr & Hiltz, 1982). For users to accept a new technology, they must be prepared to replace old habits, pervasive in their daily activities, with new habits (Blair, 1974). Acceptance refers to the usage and satisfaction of the (potential) customers of the electronic intermediary with the services provided by the intermediary (Fiel, Janssen, Faber & Wagenaar, 2004). In the IS research, acceptance is often associated with the well-known Technology Acceptance Model (TAM) aimed at predicting and explaining the use. TAM presents two variables, perceived usefulness and perceived ease of use, as determinants of user acceptance (Davis, 1989).

TAM was proposed to address why users accept or reject information technology. The model is based on an adaptation of the theory of reasoned action which explains and predicts the behaviours of people in specific situation (Legris, Ingham & Collette, 2001). The key purpose of

TAM is to provide a basis for tracing the impact of external variables on internal beliefs, attitudes, and intentions. Figure 1 presents the original version of TAM.

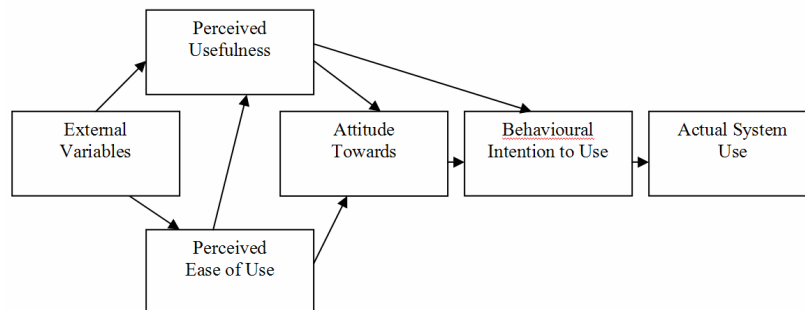


Figure 1: Original Technology Acceptance Model

Acceptance includes the main criteria of Satisfaction, Perceived Usefulness (PU), Perceived Ease of Use (PEU) and Perceived System Performance (PSP). According to Davis (1989), PEU is the degree to which a person believes that using a particular system would enhance his/her job performance. Thus, PEU is a cognitive appraisal of reduced personal investments and frustrations involved with a system whereas PU is that of increased job performance due to using the system. Therefore, PEU and PU conceptually overlap with the user's satisfaction.

In the effort to explain system use, researchers developed tools for measuring and analyzing computer user satisfaction. As indicated by Bailey & Pearson (1983), it was natural to turn the efforts of psychologists, who study satisfaction in a larger sense. In general terms, satisfaction is considered as the sum of one's feelings or attitudes toward a variety of factors affecting the situation.

PSP refers to the degree to which a person believes that a system is reliable and responsive during a normal course of operations. In the e-service provision industry, the concept is closely related to that of service level, which represents the performance benchmark provided contractually in the form of a service level agreement (Andress, 2001). The concept of PSP also relates to that of service quality, which subsumes dimensions such as system accessibility, flexibility, reliability, and response time (Bailey & Pearson, 1983).

### 3.0 STUDY OBJECTIVES

Since the implementation of e-ticketing arises from students' dissatisfaction with the previous bus service, it would therefore be appropriate that the study is done to fathom the acceptance and usability of the current service

which is being provided. The objectives of this study are as follows:

- i) To determine the overall users' satisfaction level towards e-ticketing,
- ii) To determine users' acceptance users' perception towards e-ticketing and
- iii) To get suggestions to further enhanced the e-ticketing system.

## 4.0 METHODOLOGY

### 4.1 Measures of the Constructs

The questionnaire consists of General Information, User Satisfaction (US), Perceived Usefulness (PU), Perceived Ease of Use (PEU), Perceived System Performance (PSP) and Open-Ended Questions. Items selected for the constructs were adapted from prior studies to ensure content validity. User satisfaction was measured using the five-item measures adapted from Magal's service quality instrument by Landrum, Prybutok, & Zhang (2006). The five items for the PU and PEU constructs were adapted from Liu & Ma (2006) and Koohang & Ondracek (2005). The PSP was measured by five items adapted from Liu & Ma (2006). A 5-point Likert scale anchored by "Strongly Disagree" (1) and strongly agree (5) was used.

### 4.2 Data Collection

Since UUM students population is 22,000, it is a challenge to be able to select enough samples for this study. Due to time constraint, this study was conducted amongst he Multimedia Seminar TIV3073 students of the second semester 2006/07 session. Questionnaires were distributed during the Multimedia Seminar class and altogether 161 respondents completed the questionnaire and returned usable responses. Since the total number of students is 161, thus the response rate is 100%.

## 5.0 DATA ANALYSIS

Since this study was targeted to TIV3073 students who were the users of the UUM's bus service, only 133 respondents used the provided bus service. This figure of 133 was well above the sample size of 113 required by [Sekaran \(2003\)](#) from a population of 161. SPSS version 12 was used to analyze the data.

Majority of the respondents are in the 6<sup>th</sup> semester and 80.1% of them were female.. The age group for the

respondents was divided into three i.e. i) 20-22, ii) 23-25, and iii) 26 and above where the distributions were 57.1%, 41.4% and 1.2% respectively. Since the study caters for students who were using the UUM's bus service, the distribution of the users according to Residential Colleges and Ethnicity is important because the location of the colleges determine how the students commute within the campus. Table 1 shows the distribution of the respondents based on Residential Colleges.

*Table 1: Distribution of respondents in the class and according to those using the bus service based on residential colleges*

| Residential College | Overall respondents In the class | Respondents according To those who Use the bus service | Respondents that Do not use The bus service |
|---------------------|----------------------------------|--|---|
| MAS                 | 11                               | 7  | 4   |
| Proton              | 8                                | 7  | 1   |
| Petronas            | 10                               | 8  | 2   |
| TM                  | 4                                | 4  | 0   |
| Kachi 1             | 11                               | 9  | 2   |
| TNB                 | 15                               | 12   | 3   |
| EON                 | 8                                | 6  | 2   |
| Guthrie             | 12                               | 10   | 2   |
| Kachi 2             | 15                               | 14   | 1   |
| Tradewinds          | 7                                | 5  | 2   |
| YAB                 | 15                               | 14   | 1   |
| Perwaja             | 8                                | 4  | 4   |
| MISC                | 20                               | 19   | 1   |
| Bank Muamalat       | 17                               | 14   | 3   |
| <b>Total</b>        | <b>161</b>                       | <b>133</b>   | <b>28</b>                                   |

There are altogether 15 residential colleges and they are within the campus with the exception of Kachi 1 and Kachi 2 which are out of the campus zone. From the population of 161, 20 respondents or 12.4% are from MISC College

while, only 4 students are from TM College. There are no records of students who are from Maybank College, which is the fifteenth residential college.

*Table 2: Distribution of respondents according to ethnicity*

| Ethnic/Race  | Overall respondents In the class | Respondents according To those who Use the bus service | Respondents that Do not use The bus service |
|--------------|----------------------------------|--|---|
| Malay        | 137                              | 114  | 23  |
| Chinese      | 11                               | 9  | 2   |
| Indian       | 8                                | 7  | 1   |
| Others       | 5                                | 3  | 2   |
| <b>Total</b> | <b>161</b>                       | <b>133</b>   | <b>28</b>                                   |

From Table 2, it is known that 28 students who did not use the bus service were from the following ethnic: Malay (23), Chinese (2), Indian (1), and from others (2). Items from Section 2 to Section 5 were analyzed for its reliability. The cronbach alpha values were calculated to determine the inter-item reliability which assesses the degree of internal consistency between multiple measurements of a

dimension. The overall cronbach alpha for all dimensions are shown in Table 3. Since all the dimensions have cronbach alpha values of greater than 0.7, thus, all of them satisfy the internal reliability criterion as recommended by [\(Nunnally, 1978\)](#).

Table 3: Cronbach alpha for all the dimensions

| Dimensions                         | Cronbach Alpha |
|------------------------------------|----------------|
| User Satisfaction (US)             | 0.938          |
| Perceived Usefulness (PU)          | 0.939          |
| Perceived Ease of Use (PEU)        | 0.922          |
| Perceived System Performance (PSP) | 0.899          |

Descriptive analysis is used to investigate the users' acceptance of e-ticketing for UUM's bus service. It

includes the overall mean score, standard deviation (SD), minimum and maximum mean score.

Table 4: Descriptive statistics for users' acceptance of e-ticketing

| Dimensions                         | N   | Min  | Max  | Mean   | SD     |
|------------------------------------|-----|------|------|--------|--------|
| User Satisfaction (US)             | 133 | 1.00 | 4.20 | 2.3263 | .89357 |
| Perceived Usefulness (PU)          | 133 | 1.00 | 4.40 | 2.1323 | .83843 |
| Perceived Ease of Use (PEU)        | 133 | 1.00 | 4.20 | 2.3248 | .87511 |
| Perceived System Performance (PSP) | 133 | 1.00 | 4.40 | 2.3008 | .82191 |

The mean scores for all the constructs fall in the range of 2.00 to 2.50 which is towards the anchor disagreed. The low mean score indicates that the users' are not accepting the system well. Of all the four constructs, the overall mean for Perceived Usefulness (PU) is the lowest which is at 2.13. The overall mean scores for user satisfaction (US),

Perceived Ease of Use (PEU) and Perceived System Performance (PSP) are almost the same.

The mean of the minimum scores for all the constructs are 1.00 and the mean of the maximum scores for US and PEU are 4.20 while for PU and PSP are 4.40

Table 5: Descriptive statistics for user satisfaction of e-ticketing for UUM's bus service.

| User Satisfaction                                    | Mean   | Standard Deviation |
|--|--------|--------------------|
| I am satisfied with e-ticketing for bus service      | 2.2556 | 1.05640            |
| E-ticketing for bus service is successful            | 2.3985 | 0.99194            |
| E-ticketing for bus service is effective             | 2.3383 | 0.99915            |
| E-ticketing for bus service is efficient             | 2.3985 | 0.97654            |
| E-ticketing for bus service has met my expectations. | 2.2406 | 0.96256            |

As shown in Table 5, the mean indicates that respondents disagreed that they were satisfied with the e-ticketing. They also disagreed with the perception that e-ticketing is

successful, effective and efficient. E-Ticketing has not met their expectations.

Table 6: Descriptive statistics for perceived usefulness of e-ticketing for UUM's bus service.

| Perceived Usefulness   | Mean   | Standard Deviation |
|--|--------|--------------------|
| Using e-ticketing for bus service enables me to get on the bus quickly     | 2.1126 | 0.96652            |
| Using e-ticketing for bus service allows me to reach my destination faster | 2.0602 | 0.91915            |
| I find e-ticketing for bus service is useful                               | 2.2632 | 0.87814            |
| I find e-ticketing for bus service saves my time                           | 2.0376 | 0.95668            |
| Overall, I find using e-ticketing for bus service to be advantageous       | 2.1880 | 0.95466            |

As shown in Table 6, the respondents did not agree that e-ticketing allows them to get on the bus quickly, reach the destination faster and saves their time. They disagreed with

the notion that the e-ticketing for bus service is useful and to be advantageous.

*Table 7: Descriptive statistics for perceived ease of use of e-ticketing  
For UUM's bus service.*

| Perceived Ease of Use  | Mean   | Standard Deviation |
|--|--------|--------------------|
| Using e-ticketing for bus service is easy for me                     | 2.2256 | 0.98178            |
| I found it easy to do whatever I want                                | 2.1353 | 0.90271            |
| I find using e-ticketing for bus service is clear and understandable | 2.3308 | 0.99027            |
| Learning to operate this system is easy for me                       | 2.6090 | 1.09292            |
| Overall, I find the use of e-ticketing for bus service is easy       | 2.3233 | 1.03389            |

As shown in Table 7, the respondents also felt that e-ticketing is not easy for them, it was not easy to do whatever they wanted and the concept of using e-ticketing

is not clear and understandable. However, they felt neutral for the part ease of learning to operate this system. They did not find that the e-ticketing is easy overall.

*Table 8: Descriptive statistics for perceived system performance of e-ticketing  
for UUM's bus service.*

| Perceived System Performance   | Mean   | Standard Deviation |
|--|--------|--------------------|
| It is fast to use this system to validate the metric card                                    | 2.3308 | 1.02781            |
| This system recovers from error quickly  | 2.2180 | 0.91567            |
| The system reliably handles all transactions   | 2.3609 | 0.94017            |
| It is fast to use this system  | 2.3910 | 1.02864            |
| Using e-ticketing for bus service would make it easier for me to reach my destination faster | 2.2030 | 0.95155            |

As shown in Table 8, the respondents disagreed that it was fast to use this system to validate the metric card. They also disagreed that the system recovers from errors quickly, reliably handles all transactions and makes it easier for them to reach their destination.

within campus is too expensive for the students. There were also suggestions to go back to the initial bus system which required the students to pay RM 42.00 per semester for unlimited rides. There were also complaints by respondents that the buses tended to carry more passengers than they are supposed to and insist that buses adhere to the passengers' limit to ensure the safety of all those in the bus.

From the 161 respondents, only 96 respondents answered the open-ended questions. The comments received were grouped into three main categories i.e. i) disagree with the current e-ticketing system and seek to abolish it (62.50%), ii) agree with the current e-ticketing system (15.62%) and iii) unhappy with current e-ticketing system but would like to have it improved in the future (21.88%).

## 6.0 CONCLUSION

The overall user satisfaction towards the e-ticketing system for bus service implemented in UUM is low which is 2.33 on a scale of 5.00. The users also rate the system as below average in terms of users' acceptance whereby all the mean scores are in the range of 2.00 to 2.50. The majority of the respondents (62.50%) in the survey disagree with the concept of e-ticketing and seek to abolish it. 21.88% agree with the current e-ticketing system but are not fully satisfied as they would like to have it improved in the future and 15.62% are happy with e-ticketing implementation in UUM. Most of the suggestions offered centered on the management of the bus service provider and only a few mentioned having a better system which would be error-free.

For those who disagreed with the system and intend to abolish it, their response ranged from reasons that e-ticketing is too expensive to annoying especially since the system is prone to errors when used. There were also complaints that the machine which was used could not detect the metric card and this caused hassle to many.

For the respondents who agreed with the current system, they felt that e-ticketing is helping the students by making it more convenient for students to travel. They also noted that the system is much better now when compared to the time when it was first introduced.

Among the suggestions received are that Unic Symbol Business Sdn Bhd should increase the number of buses and buses should be more punctual. Many suggestions called for a price reduction as they felt that RM 0.40 per ride

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