

# Evaluation of *Tenaga Nasional Berhad* Payment Kiosk

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*Abstract* - Self-service payment kiosks are now widely used in Malaysia including at *Tenaga Nasional Berhad* (TNB). This payment kiosks become required for TNB to shorten the time of counter services. Hence *Tenaga Nasional Berhad* is applying this payment kiosk in order to improve customer experience and to gain trust. However, TNB Payment Kiosk has provided difficulty to the user with several issue such unable to display updated bill amount, no sound and alert when performing a transaction. Users are from various age groups and background which involve a lot in customer relationship. This study is related to usability and this issues is to provide the evaluation of the kiosks. This study also has developed the usability model for evaluation that contains seven factors. With the evaluation has been conducted, recommendations are provided after the issues have been identified so that developers can make enhancement to the system. This will help to improve the payment kiosks are implemented at TNB and enhance the *Tenaga Nasional Berhad* productivity in the customer service area.

**Keywords :** *Tenaga Nasional Berhad (TNB)*

## I. INTRODUCTION

Technology now becomes a major role to increase the company efficiency and services. This evolution is dynamic for companies to satisfy their customer with their offering in less time and lower cost. In the recent trend, the technology-based-self services is more suitable and efficient to overcome the busy lifestyle experienced by Malaysians especially in big cities like Kuala Lumpur. Technology-based self-service such as auto teller machine,

food and beverages vending machine, ticket vending machine and much more in future will be crucial for the company and even to the customer to have the services very easily and efficiently.

TNB has introduced the payment of electricity bills, through TNB Payment Kiosk by using checks, credit cards and cash that are located in the Klang Valley as a starting location and will be expanded throughout the TNB branches across the country soon. According to TNB Customer Service Senior General Manager, Kamaliah Abdul Kadir, installations of more automated TNB Payment Kiosk will make customers easier to paying electricity bills at the same time to cater the increasing number of customers. TNB customers can now pay their TNB bills at 45 locations of TNB Payment Kiosk at Selected Kedai Tenaga. This research will evaluate the feedback of Malaysian about the self-service technology with focus on TNB Payment Kiosk.

After TNB Payment Kiosk has been established, there are a lot of complaints from user that need to be improved to satisfy their needs especially when performing the payment kiosk. Based on preliminary research with TNB payment kiosk user N. Z. Harun (personal communication, 30 Nov 2015), even though the kiosk is easy to use but somehow is takes long queue for unsuccessful transactions. It is because of the scanner is not easy to detect the barcode at the bills which cause the user to repeat the transaction for few times.

With no sound and alert from the machine, users are not mentioned whether the barcode is detected or not. They will get notify that the time is over and need to repeat again the transaction.

The objectives of this study are:

- i) To evaluate the usability of TNB Payment Kiosk.
- ii) To provide recommendation for future enhancement of the system.

The thesis was expected to help TNB Payment Kiosks in improving the quality of service that been provided for TNB users. The payment kiosks also was expected able to minimize long waiting time in doing transaction for electricity bill payment. Result of this study will be able to help in citizen to feel convenience to pay bills.

## II. METHODOLOGY

Referring to the aims of the study, thus it can be said that this study uses qualitative research methodology. This is because the approaches include a process of understanding some aspects of customer experience. This study implements is focusing on interview. It aims to describe what materials were used, how it was prepared and carried out to obtain the data for this research. Then, it explains how the data was analyzed and the rationale for why specific analyses were chosen in order to fulfill the research objectives. This study's objective is to define and evaluate the usability of TNB Payment Kiosk.

This research is highly influenced by usability consolidated research model previous research on Website Experience Satisfaction Model conducted by Coker. B., 2013. He has come out with hypothesis which can be used to identify list of usability issues in a system or website.

According to (Coker. B., 2013) "Although several attempts have been made to develop models to measure quality of website experience, no-one has sought to develop an

instrument short enough to be of practical use as a quick customer satisfaction feedback form". This research also used a deductive approach since the study has developed Usability model of TNB Payment Kiosk.

A deductive approach is based on a theory or model where the analysis moves from the general to the specific (Coker. B., 2013). Base on the model, all analysis has been categorized according to factors in model as refer to Figure 1.1 below.

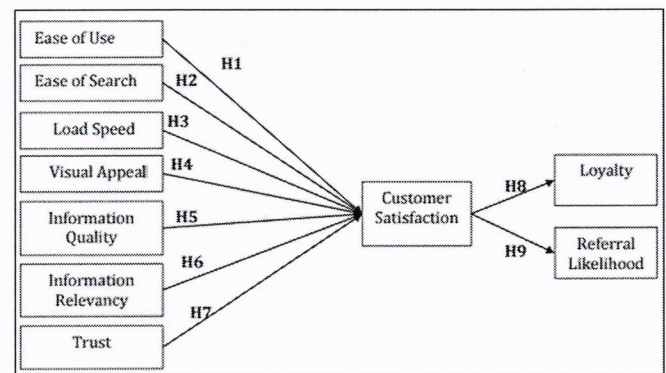


Figure 1.1: Usability Evaluation Model  
(adapted from Website Experience Satisfaction Model by Coker. B. 2013)

From this model, measurable criteria for usability evaluation has been defined. From the usability criterias, this study able to developed interview questions. In overall, the interview question will concentrate on several issues as following:

- a. Load Speed

As from (Hwang, 2006), load speed is a process of delivering requested task in the most short time. Minimum load speed in any system is a sign of the successfulness of the product. This criterion has been asked in the interview session to know user's perception towards the kiosk.

b. Visual Appeal

This factor must contain the navigability criteria and minimal action criteria, which suppose TNB Payment Kiosk system help to drive user in complete their task. The step to complete the task must be less than the previous system in order to improve the productivity of the user.

Visual appeal is a common issue discussed in any topics relevant to the human computer interaction (HCI). It is a basic thing need to be given priority in designing any information technology product especially application system. Visual appeals discuss how the color of font, background of the page and size of the button really impact users perception. For example, kiosk with low quality in fulfilling visual appeal criteria may be left behind compared to kiosk with clear button design and using attractive screen background. These agreed by (Farooq U., 2010) as well as (Capel J.J., 2007).

c. Information Quality

Reflects the knowledge and skill level of the users while performing some task that it allows user to access the system anywhere when they required doing so. The system also must provide the fault tolerance which allow user to understand the error message that been generated by the system.

Beside, information quality also explains about the quality of information displayed. Wrong information may create stress among users. (Paternò, 2000) look really serious on the important of displaying correct data in any application especially kiosk because human easily feel down with any problem even in first attempt. They might be will not use the application with bad information quality again.

d. Information Relevancy

Information relevancy is about the friendliness of the application in helping user to complete the task. It is refer to the assistant given when using the application. For example, step-by-step guidance was given along the process of printing telephone 's bill. Other than that, there is a voice supporting users in completing the task. (Granollers, 2003) do mention about an important of system assistance especially for elderly.

The relevancy of information in the application also can be decided from the effectiveness factor. The application must contain consistency and feedback criteria which TNB Payment Kiosk system should allow the user to know the status of their task. This feedback must be consistent which the user should know what kind of data that available for them.

e. Trust

In the context of payment kiosk experience, this study recommends consumer perceptions of trustworthiness to be an important factor which must be addressed, and in the case of payment kiosk, the focus should be on perceptions of privacy and security.

In today's world of touch screen payment kiosk, security whilst making deposit to machine is a major concern for payment kiosk. Consumers are concerned that their payment are actually being paid by them and the information would be updated.

f. Ease of Use

With the identification of attributes that comprise customer experience of Internet payment kiosk, this research shall explore the impact of said variables on the behavioral

consequences of customers, and examine if a satisfying payment kiosk experience can explain and predict consumer behavior towards payment kiosk in future.

It is important to note that in its emphasis on perceptions of payment kiosk experience, this research is focusing on attitudes towards the kiosk itself. Consequently, in conceptualizing behavioral outcomes of a satisfying payment kiosk experience, this study focuses on future behavior towards the kiosk itself.

Thus, it has been found that measures such as privacy statements have found to put consumers “at ease” and helped to foster feelings of trust and credibility with payment kiosk.

As such, for the purposes of this study, the outcomes of a satisfying payment kiosk experience are proposed to be 1) intention of re-visit, and 2) likelihood of customer referral, which are indicators of attitudinal and behavioral loyalty.

g. Satisfaction

The attractiveness and operability criteria must be a factor for satisfaction evaluation. These criteria are to determine whether TNB Payment Kiosk can easily being handle and have a good user interface, the user is more on the comfortable to use the TNB Payment Kiosk. This factor also is the most important factor in order to derive the productivity of the machine.

Since interview is the instrument for this study, there are two techniques has been use in this instrument which is standardized (open-ended interview) and closed (fixed-response interview) (Valenzuela D, 2008). Standardized (open-ended interview) is conducted by having the same open-ended questions are asked to all

interviewees. This approach facilitates faster interviews that can be more easily analyzed and compared. Closed (fixed-response interview) is where all interviewees are asked the same questions and asked to choose answers from among the same set of alternatives. This format is useful for those not practiced in interviewing.

All interview sessions has been recorded with digital audio as for reference in analysis. This also helps to have more accurate response from correspondents in order to provide results for this study.

3.4 Data Analysis Model

The data analysis method for this project is the qualitative content analysis. According to (Toni et al., 2013) “Content analysis is a method of analyzing written, verbal or visual communication messages”. This research also used a deductive approach since the study has developed Usability model of TNB Payment Kiosk.

A deductive approach is based on a theory or model where the analysis moves from the general to the specific (Valenzuela D, 2008). Base on the model, all analysis has been categorized according to factors in model as refer to Table 1.1 below.

Table 1.1: TNB Payment Kiosk Usability Analysis Matrix

Factors	Load Speed	Visual Appeal	Information Quality	Information Relevancy	Trust	Ease of Use	Satisfaction
Respond							

### III. RESULT AND FINDING

The data analysis will be divided into two main sections which are analysis of expert review and TNB Payment Kiosk guidelines. Each section will describe on the data that been gathered and discussed regarding the recommendation that can be implement to the related issue.

This section discussed on the analysis for the interview data that gathered in order to identify the usability issue for each factors which are effectiveness, efficiency, learnability, usefulness and satisfaction as been describe in TNB Payment Kiosk usability model (Table 1.1). The respondents are seven random users which are being user at TNB Payment Kiosk at PJH Building Putrajaya.

#### a. Demographic Analysis

Table 1.2 show the summary on the demographic analysis on TNB Payment Kiosk respondents which the average age of respondents that using TNB Payment Kiosk is 32 years old. The highest level education from the correspondent is Degree and the lowest is SPM certificate holder. Half of the correspondents are familiar and regular user of TNB Payment Kiosk.

Table 4.1: Demographic Analysis Table

Respondent	Age	Gender	Education level	Active user
A	28	M	Diploma	Y
B	34	F	Degree	N
C	29	M	SPM	Y
D	42	F	SPM	Y
E	35	F	Degree	N
F	17	F	SPM	Y
G	38	M	SPM	N

According to Arientawati (2003), the background of respondent does not influence the usability study since she mentions that to a system achieve usability, all the

users must be able to understand and use the system effectively. Hence users educational level and background does not contribute the to the usability influences.

From the interview, the results can be divided into two categories such issues encountered and positive feedback from the respondent. Below list are evaluation categories that manage the positive feedback regarding TNB Payment Kiosk:

- i. Ease of Use Evaluation
- ii. Trust Evaluation
- iii. Satisfaction Evaluation

Overall respondent agreed that the payment kiosk is easy to use, saves time and reduce stress of counter payment and not complicated. For first timer, they also satisfy with the instruction and guide from the machine. It is approved that the evaluation of ease of use for TNB Payment Kiosk was smoothly carried out.

For trust evaluation, respondents believe that the machine is save to be performed and they confident doing the payment through the machine. The payment kiosk is trusted and has integrity. Another positive evaluation is about customer satisfaction category which justify the satisfaction of TNB Payment Kiosk. Most of respondent satisfy with TNB Payment Kiosk services and planning to re-visit in the future. However, there are always a room for improvement to enhance the services provided by the kiosk. Issues Encountered During Interview Session:

- i. Load Speed Evaluation

Base on the analysis that been made there is one issue that has been taken out from load speed factor that has been describe as below:

- a. Does TNB Payment Kiosk easily to detect barcode to scan bill?

All correspondents that using the barcode scanner agreed that TNB Payment Kiosk did not notify user whether the barcode was detected or not. The respondent need to read from the screen either to scan again or successfully scan. They need to wait until the barcode detected by the machine. This issue has not fulfilled the feedback criteria which required in the load speed factor.

Hence this show that the load speed factor in TNB Payment Kiosk has not been achieves and required enhancement.

#### ii. Visual Appeal Evaluation

Base on the analysis that been made there is one issue that has been taken out from visual appeal factor that has been described as below:

- a. Do you like the color scheme used throughout the interfaces?

3 from 7 correspondents are not satisfied with certain screen font color display. The background and font was dark and the word turn out to be not clearly to see by the respondents.

#### iii. Information Quality Evaluation

Base on the analysis that been made there is one issue that has been taken out from information quality factor

- a. Was TNB Payment Kiosk provides updated bills?

Two of participants were dedicated to make a payment by scan their bill and the other five respondents

are focusing on key-in the account number. Below are the results:

- 1) Barcode scanner

The amount shown at the screen is exactly as stated in the bill. The system is not up to the latest date. For example, even though the user had made the payment before, the system still shows the exact amount of the bill of that month not the latest/current month. Normally after the payment has been made, the next bill will generate the latest amount. If they want to pay for certain amount, the system will reject and only accept the exact amount shown at the screen. If the user still continue to perform this task, the user need to re-do the process by using the key-in function.

- 2). Key-in

For respondents who key-in the account number, the screen only shows the box to key-in the amount to be pay. The system is not updated. User will not know the outstanding or latest amount of their bill.

#### iv. Information Relevancy Evaluation

Base on the analysis that been made there is one issue that has been taken out from information relevancy factor that has been described as below:

- a. Was there alert notification or sound when scanning the barcode?

All respondents that using barcode scanner are not satisfy because the barcode scanner does not produce any sound when the respondent performs this task. The payment screen will appear if the barcode successfully scan or notification to repeat the task will appear at the kiosk screen. There is no alert sound from the machine for this transaction.

#### IV. CONCLUSION

Although this research finding is based on the seven respondent of the TNB Payment Kiosk user, the contribution is huge. According to Zakariah (2008), a confirmation of issues and challenge can be discovered from a single case. From the data that been gathered among the five factors in the TNB Payment Kiosk usability model which are load speed, visual appeal, information quality and information relevancy there are issues which need enhancement from TNB Payment Kiosk's developer in order to help this users on the daily basis operation.

The factors that listed in the TNB Payment Kiosk usability model are factors that influence the TNB users. This study has identified several issues from TNB Payment Kiosk that related to the factors.

Through the interview there user of the TNB Payment Kiosk is satisfy with the system since it help the user to make a payment in a quick time. Despite all the issue that been raise by user, there are also recommendation that they provide to improve TNB Payment Kiosk.

Form the literature study and the interview session, this research has provide the recommendations for each issue that been discovered during the evaluation. The recommendations are provide to the TNB Payment Kiosk developer for future enhancement for the system. Thus the objectives of this study have been fulfilled.

This study has opened up the current situation on TNB Payment Kiosk from user perspective and allows developer to understand the user behavior and involve user in the next development so that they can cooperate each other in drive the company service and product. The usability of TNB Payment Kiosk will help to improve the customer service that provide by Tenaga Nasional Berhad.

The data analysis chapter has discussed two major sections which are the TNB Payment Kiosk usability evaluation and its recommendation. This section will summarize the findings of this study.

Results and findings have showed that TNB Payment Kiosk has facing issue in usability according to TNB Payment Kiosk usability model. All the respondents have responded that TNB Payment Kiosk has missing one factor of usability which is information quality. Furthermore 43% user has agreed load speed, visual appeal and information relevancy factors also having issue in the system.

The top two issues that been facing by TNB Payment Kiosk has been stated below:

- i. User face difficulty since TNB Payment Kiosk data is not up-to-date.
- ii. The major issue that affects TNB Payment Kiosk is barcode scanner slowness and no sound and alert notification.

Based in the issue above there are 5 recommendations that been provide in order to fix and avoid issue that related to usability in the future. Hence the recommendation area has been listed below.

- i. Efficient device that just touch the bill to the scanner
- ii. Use appropriate color for font and background
- iii. Integrated and centralized database
- iv. Availability of sound and alert
- v. Optimizing the user experience

As per discussed in this chapter the findings and recommendation can be used to enhance and improve TNB Payment Kiosk for the company in delivery better service to the customer and build the trust from it.

## V. RECOMMENDATION

Due to the limitation of this study, it was suggested for future study to cover following potential scope to be explored:

- a) To study readiness of systems in University Teknology MARA towards achieving integrated system environment.
- b) To study sections that extracting data from other system such as STARS, SIMS, IPSIS, FAIS and so many others.
- c) To study sections that using data from manual file such as departments or faculties without any single storage to store their data

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