A SURVEY OF SMART CARD APPLICATION: A USER PERSPECTIVES

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ABSTRACT

The study is on people behaviour on smart card, which is focus on awareness, perception, usage, and intention. The study is also continue to know about the relationship between two variable in each hypothesises which are generated in this study. The variables have been study are number of semester study and level of smart card awareness; level of smart card awareness and level of convenience in used smart card; level of smart card awareness and level of reliability on smart card; level of smart card awareness and level of willingness to use smart card in the future; level of reliability on smart card and number of smart card owned; level of reliability on smart card and level of willingness to use smart card in the future; level of reliability on smart card and level of willingness that smart card will be implemented in Malaysia in the future.

INTRODUCTION

Smart card technology is continuously improved in term of multifunction and applications. Smart card has various applications and this technology could be applied to vending machine, turnstile, transaction, retail and payphone.

People were reliant that there are lots of smart card advantages for their life. From that reason, they were anticipating that smart card could fulfil their interest and requirement. This new technology was changing their life. The rationale of the study is to determine what and how people react on changing of technology, which is focus on smart card. To ensure that smart card technology can be implemented successfully in Malaysia, this research must be done.

METHOD

This study was focus on master students in faculty of computer science and information technology at University of Putra Malaysia. The research method for sampling is involved 150 people that can call it as size of population (size of universe) for Master of Science (Information Technology), from that the minimum size required for sampling are 108 sample at 95% of confident level and 5 for maximum acceptable margin-of-error. Random sampling method was used to take the sample. Questionnaire is used for primary data. Secondary data also used, which is, refer to journals books and web sites.

RESULTS AND DISCUSSIONS

1.1 The influence of socio-demographic factors on the awareness of smart card

1.1.1 The influence of socio-demographic factors on level of smart card awareness

Table 1: Summarised of findings on socio-demographic factors on level of smart card awareness

Socio-demographic factors	Mean	N
A- Gender		
Male	3.2807	57
Female	3.0192	52
B- Number of Semester Study		
Junior	3.0000	54
Senior	3.3091	55
C- Race		
Malay	3.1800	50
Non-Malay	3.1356	59

Awareness levels:

      5= Very strongly aware   4 = Very aware   3 = Aware
      2 = Less aware   1 = Not aware

One of the survey objectives is to know the influence of socio-demographic factors such as gender, number of semester study and race on level of smart card awareness. Subsequently, the researcher would like to determine the difference between components in each of socio-demographic factors on level of smart card awareness.

The researcher used means for statistic method to make comparison between components for each of socio-demographic factors. The means technique, which is, used to show the average of awareness level on smart card for each component in certain socio-demographic factor. The rank of the awareness level was shown in table3.

The result of the survey is summarized in table 1. For the genders factor the value of mean for male is more than female; it is 3.2807 for male and 3.0192 for female. The difference value of means among the genders is significant different 0.2615. From the result, we can conclude that the male students were more aware compared to the female students.

For the numbers of semester study factor the value of mean for senior is more than junior; it is 3.3091 for senior and 3.0000 for junior. The senior category is represented from respondents from third, fourth and more than fourth semester study. Meanwhile for the junior category is represented from respondents from first and second semester study. The interpretation that generated from the difference of the means between

these two categories is the senior category is more aware on smart card compared with junior category. The difference value of means among these categories is significant different 0.3091.

The last finding on the influence of socio-demographic factors on level of smart card awareness is about race. The researcher found that there is no significant different between means among Malay and non-Malay. This because the difference of means is very small, from that the researcher found, there are no difference between races on level of smart card awareness. The difference value of means among race is 0.0444, which is mean value for Malay is 3.1800; meanwhile for the non-Malay mean value is 3.1356.

1.1.2 Smart card knowledge

Table 2: Summarized of findings on smart card knowledge

Smart card items	Level of smart card knowledge**					Mean
	5	4	3	2	1	
Types of smart card	1.0%	60.0%	24.8%	11.4%	2.9%	3.4476
Operation of smart card	1.0%	20.0%	25.7%	31.4%	2.9%	2.4667
Technology of smart card	1.0%	8.6%	24.8%	42.9%	22.9%	2.2190
Organization involves in smart card standardization	1.0%	12.4%	21.9%	45.7%	19.0%	2.3048

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**      5 = Clearly know          4 = Know            3 = Slightly know
        2 = Neutral/ not sure     1 = Don't know at all
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The knowledge on smart card is one aspect of awareness, the findings on its was summarised in table 2. These findings have shown the average level of smart card knowledge on certain smart card item.

The statistic method was used to make interpretation on the respondents' data; therefore the mean analysis was used to show the average level of smart card knowledge on certain smart card item. The interpretation is to show whether respondent has the knowledge at the level clearly know, slightly know, neutral or don't know at all on smart card.

In the survey, the researcher was found the respondents have little knowledge on types of smart card. The value of the mean is 3.4476. This value is not exceed to 4 point, which indicate the respondents have a good knowledge on types of smart card. So, the interpretation that could be made is respondents have little knowledge on types of smart card.

From the survey on smart card knowledge on operation of smart card, the researcher found that the respondents have no knowledge on it. The respondents were found they self are not sure whether they have the knowledge on it. The respondents also confused about the knowledge they have, from that, the researcher can conclude that the respondents are totally have no knowledge on the operation of smart card. The value of mean on level of smart card knowledge is about 2.4667. This value is not enough to indicate that respondents have the knowledge on operation of smart card.

The same situation occurred to other smart card knowledge such technology of smart card and organization involves in smart card standardization. The mean for smart card knowledge on technology of smart card is about 2.2190 and the knowledge on organization involves in smart card standardisation is 2.3048. From that the researcher can conclude that respondents are totally have no knowledge on these two subjects.

1.2 Perception of respondents on their reliability and convenience to use smart card that is implemented in Malaysia

1.2.1 Perception of respondents on their convenience to use smart card that is implemented in Malaysia

Table 3: Summarized of findings on perception of convenience to use smart card

Convenience	Frequency	Percentage
5 = Strongly agree	22	21.0%
4 = Agree	68	64.8%
3 = Neutral / not sure	15	14.3%
2 = Disagree	0	0%
1 = Strongly disagree	0	0%
Mean: 4.0667		

In the survey, there was positive perception on the convenience to use smart card among respondents. The value of means is 4.0667 and the percentage of respondents that agreed on the convenience to use smart card is 85%. The interpretation from that is, the respondents have the positive perceptive on the convenience to use smart card, which is implemented in Malaysia. There is no negative perception on it.

The convenience to use smart card is one of the advantages of smart card. In King Metro Transit research they have their finding on it. The result was indicated that 95% of respondents found smart card is easier and convenient to conduct the transaction compare with traditional method (cash). This is because smart card used contactless method compare with magnetic swipe system that used swipe pass method. The others reason that respondents have convenience of perception on smart card are because they found that the card was very durable and they could keep it in their badge holder, and they also felt the smart card was about as convenient as a flash pass.

1.2.2 Perception of respondents on their reliability on smart card that is implemented in Malaysia

Table 4: Summarised of findings on perception of reliability on smart card

Reliability	Frequency	Percentage
5 = Very reliable	3	2.9%
4 = Reliable	56	53.3%
3 = Neutral / not sure	31	29.5%
2 = Not reliable	15	14.3%
1 = Very not reliable	0	0%
Mean: 3.4476		

The reliability aspect is the important thing to ensure certain product such smart card successfully implemented. In King Metro Transit research they have their finding on it. The finding that they were found is the overall reaction to the smart card was very positive. The discussion was animated and upbeat with little evidence of any serious anxieties about the use of this new technology. From that point, they found that 60% of respondents were have positive perception on reliability on smart card.

In this survey, the result was a little bit different from the King Metro Transit research; there is positive perception on reliability on smart card among respondents. The percentage of respondents that have positive perception on reliability on smart card is only 56.2%. The interpretation from that is, the respondents have the positive perceptive on the reliability of smart card, which is implemented in Malaysia. But there is also has negative perception on it. The percentage of respondents that have negative perception on reliability on smart card is 14.3%.

Even though they have positive perception on reliability of smart card, but there are not strong because the value of mean is 3.4476, this is indicate that the respondents not really achieved the positive perception on reliability of smart card. The high amount of respondents that have positive perception on reliability of smart card but the level of reliability is still not enough to achieved ideal level on reliability of smart card.

1.3 Smart card application types that respondents frequently used

1.3.1 Smart card consumer

Table 5: Number of smart card consumers

Smart card consumer	Frequency	Percentage
Yes	87	82.9%
No	18	17.1%

In this survey, the respondents that already been a smart card consumer are about 82.9%. This amount is high compared to those who are not the smart card consumer, which is, only 17.1%

1.3.2 Smart card application types

Table 6: Summarised of findings on smart card application types that respondents frequently used

Smart card application type	Frequency	Percentage
Telephone card	77	73.3%
Access card	26	24.8%
Transit card	50	47.6%
Master card	39	37.1%

The result of the survey shows that the telephone card is the highest type of smart card application used. The percentage of the telephone card usage is 73.3%. The second highest is transit card which 47.6%. The third rank of smart card application types is master card usage; the percentage of it is 37.1%. Finally, the access card, which 24.8% of respondents

1.4 Intention of respondents to use smart card in the future

Table 7: Summarised of findings on intention of respondents to use smart card in the future

Willingness to use in the future	Frequency	Percentage
5 = strongly agree	13	17.1%
4 = Agree	74	70.5%
3 = Neutral / not sure	13	12.4%
2 = Disagree	0	0%
1 = Strongly disagree	0	0%
Mean: 4.0476		

Finding at the above (table 7) shown how many of respondents those agree or willing to use the smart card in the future. The result of the survey shown 87.6% of respondents was intended to use smart card in the future. The value of the mean is 4.0476. This indicates that the respondents have the strong intention to used smart card in the future. There is no negative intention to use smart card in the future, but there are have the minority of respondents, which is not sure or in doubt to use smart card in the future. The percentage of this minority of respondents is 12.4%.

In King Metro Transit research they were found that intention of respondent to use smart card in the future is very positive which is 86% intend to use smart card after their know the advantages of smart card.

1.5 Research Hypotheses

Hypothesis 1

	Level of smart card awareness (y)
Number of semester study (x)	$P = +0.191$

Correlation is significant at the 0.05 level (2 tailed)

There is a positive relationship between number of semester study and level of smart card awareness. The value of p is 0.191, this value is very small and its indicates that there is a weak relationship between these two variables.

The interpretation that can be made is the increasing on number of semester study is not significant influence to increasing the level of smart card awareness.

Hypothesis 2

	Level of convenience (y)
Level of smart card awareness (x)	$P = +0.587$

Correlation is significant at the 0.01 level (2 tailed)

There is a positive relationship between level of smart card awareness and level of convenience in used smart card. The value of p is 0.587, which is almost near to value of one. This value gives the strong relationship between these two variables.

The interpretation that can be make is the increasing or decreasing on level of smart card awareness is significant influence to increasing or decreasing on level of convenience in used smart card.

Hypothesis 3

	Level of reliability (y)
Level of smart card awareness (x)	$P = +0.263$

Correlation is significant at the 0.01 level (2 tailed)

There is positive relationship between level of smart card awareness and level of reliability on smart card. The relationship between these two variables is not strong with value of p equal to 0.263. Therefore, the increasing or decreasing on level of smart card awareness is not significant influence to increasing or decreasing on level of reliability on smart card.

Hypothesis 4

	Level of willingness to use smart card (y)
Level of smart card awareness (x)	$P = +0.298$

Correlation is significant at the 0.01 level (2 tailed)

There is positive relationship between level of smart card awareness and level of willingness to use smart card in the future. The value of p is 0.298. This value gives the weak relationship between these two variables. Therefore, the increasing or decreasing on level of smart card awareness is not significant influence to increasing or decreasing on level of willingness to use smart card in the future.

Hypothesis 5

	Number of smart card (y)
Level of reliability (x)	$P = +0.304$

Correlation is significant at the 0.01 level (2 tailed)

There is a positive relationship between level of reliability on smart card and number of smart card that respondent owned it. The relationship between these two variables is not too strong which is value of $p = 0.304$. In this situation, we can say, the increasing on level of reliability on smart card is influence to increasing on number of smart card that respondent owned. The same situation will occur when the decreasing happen.

Hypothesis 6

	Level of willingness to use (y)
Level of reliability (x)	$P = +0.384$

Correlation is significant at the 0.01 level (2 tailed)

There is has positive relationship between level of reliability on smart card and level of willingness to use smart card in the future. The relationship between these two variables is not strong which is value of $p = 0.384$. In this situation, we can say, the increasing on level of reliability on smart card is influence to increasing on level of willingness to use smart card in the future. The same situation will occur when the decreasing happen.

Hypothesis 7

	Level of willingness –implemented widely in the future (y)
Level of reliability (x)	$P = +0.351$

Correlation is significant at the 0.01 level (2 tailed)

There is has positive relationship between level of reliability on smart card and level of willingness that smart card will be implemented in Malaysia in the future. The relationship between these two variables is not strong which is value of $p = 0.351$. In this situation, we can say, the increasing on level of reliability on smart card is influence to increasing on level of willingness that smart card will be implemented in Malaysia in the future. The same situation will occur when the decreasing happen

CONCLUSION

Here, there are three socio-demographic factors that can influence the level of smart card awareness. Those factors are gender, number of semester study and races among students. Some of the distinctive factors of socio-demographic suggest that a different result. Gender, for instance, show that male are more aware than female. In here, it indicates that genders factors can influence the level of awareness. The same situation occurs on number of semester study. This factor also can influence to level of smart card awareness. This can show when senior category is more aware on smart card compared with junior category. There is different result on race factor. This factor is not influence to level of smart card awareness. That because no significant different between Malay and non-Malay on level of smart card awareness. The conclusion is races among respondents are not influence the level of smart card awareness

The knowledge on smart card is a part of awareness aspect. The conclusion is respondents have no knowledge on operation of smart card. The respondents were found they self are not sure whether they have the knowledge on it. The respondents also confused about the knowledge they have. The same situation occurs to other smart card knowledge such technology of smart card and organisation involves in smart card standardisation. The respondent is only having a little knowledge on types of smart card.

The respondents have positive perception on the convenience to use the smart card, which is implemented in Malaysia. There is no negative perception on it. For the reliability, even though respondents have positive perception on reliability of smart card, but there is not strong. The respondents have not really achieved the positive perception on reliability of smart card. The conclusion is high amount of respondents that have positive perception on reliability on smart card but the level of reliability is still not enough to achieved ideal level on reliability of smart card.

The respondents, which are smart card consumers, are highly compare with non smart card consumers. From that, telephone card is the highest smart card application types that respondent used. The second highest is transit card. The third ranking of smart card application types is master card usage and the last one was access card.

Respondents have the strong intention to used smart card and no negative intention to use it in the future, but there is have the minority of respondents, which is not sure or in doubt to use smart card in the future.

Conclusion on Research hypotheses

The conclusion for each research hypotheses were concluded as the below:

1. There is a positive relationship between the number of semester study and level of smart card awareness. The increasing of number of semester study is not significant influence to increasing on level of smart card awareness.

2. There is a positive relationship between the level of smart card awareness and the level of convenience in used smart card. The increasing or decreasing on level of

smart card awareness is significant influence to increasing or decreasing on level of convenience in used smart card.

3. There is a positive relationship between the level of smart card awareness and the level of reliability on smart card. The increasing or decreasing on level of smart card awareness is not significant influence to increasing or decreasing on level of reliability on smart card.

4. There is a positive relationship between the level of smart card awareness and the level of willingness to use smart card in the future. The increasing or decreasing on level of smart card awareness is not significant influence to increasing or decreasing on level of willingness to use smart card in the future.

5. There is a positive relationship between the level of reliability on smart card and the number of smart card owned. The increasing on level of reliability on smart card is influence to increasing on number of smart card that respondent owned. The same situation will occur when the decreasing happen.

6. There is a positive relationship between the level of reliability on smart card and the level of willingness to use smart card in the future. The increasing on level of reliability on smart card is influence to increasing on level of willingness to use smart card in the future. The same situation will occur when the decreasing happen.

7. There is a positive relationship between the level of reliability on smart card and the level of willingness that smart card will be implemented in Malaysia in the future. The increasing on level of reliability on smart card is influence to increasing on level of willingness that smart card will be implemented in Malaysia in the future. The same situation will occur when the decreasing happen

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