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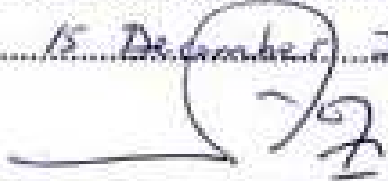
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A SURVEY ON FACTORS AFFECTING FUEL SMART CARD USER
ACCEPTANCE AND SECURITY

SEYED GHOLAMREZA ESLAMI

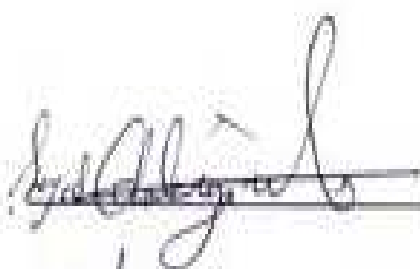
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To my beloved father and mother

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ABSTRACT

Smart card technology is one of the strong computer revolutions among the fast growing usage of new technologies. Due to widespread distribution of smart card, a special type of smart card has been applied for the fuel system that is used nowadays by most vehicles' owners in Iran. Due to the advantages of the fuel smart card such as managing fuel quota by optimizing using fuel quota and preventing from smuggling is becoming popular among vehicles' owners in Iran. In this master project report the user acceptance and security factors of fuel smart card have been evaluated. Acceptance factor based on adoption model involved many factors such as: satisfaction, security, external variables, attitude toward using, and adoption. In this report have been evaluated acceptance and security factors of the fuel smart card technology by distributing questionnaire among UTM (University Technology Malaysia) Iranian students and MMU (Multimedia University) Iranian students, either asking by e-mail from people who are not available. Based on preliminary results security is most important factor for the fuel smart card users.

ABSTRAK

Teknologi kad pintar merupakan salah satu revolusi terkini dan terbesar dalam dunia pengkomputeran yang semakin pesat dan meluas penggunaannya. Disebabkan penggunaannya yang meluas, sejenis kad pintar khas untuk tujuan sistem pembelian bahanapi telah digunakan oleh sebahagian besar pemilik kenderaan di Iran. Penggunaannya yang dapat menguatkuasakan pembelian bahanapi secara berkuota dan mengelakkan daripada penyeludupan bahanapi keluar daripada Iran telah menyebabkan ianya popular dikalangan pemilik kenderaan di Iran. Tesis ini membincangkan penerimaan pengguna dan faktor-faktor keselamatan kad bahanapi pintar tersebut. Penerimaan sistem ini berasaskan '*adoption model (conceptual frame work)*' oleh Hamed Taherdoust yang merangkumi faktor-faktor seperti: kepuasan, keselamatan, pemboleh ubah dalaman, sikap untuk mengguna dan adaptasi. Di dalam tesis ini saya menilaikan faktor-faktor penerimaan dan keselamatan yang berkaitan dengan teknologi kad bahanapi pintar melalui borang soal selidik yang diedarkan dan juga melalui emel kepada pelajar-pelajar Iran UTM.

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LIST OF ABBREVIATIONS

ANOVA	-	Analysis Of Variance
CPU	-	Central Processing Unit
IDT	-	Innovation Diffusion Theory
PC	-	Personal Computer
PEOU	-	Perceived Ease of Use
PIN	-	Personal Identification Number
PTT	-	Postal and Telecommunication service agency
PU	-	Perceived Usefulness
PVC	-	Poly Vinyl Chloride
SCT	-	Social Cognitive Theory
TAM	-	Technology Acceptance Model
TAM2	-	Extension of Technology Acceptance Model
TPB	-	Theory of Planned Behavior
TRA	-	Technology of Reasoned Action
USA	-	United State of America
UTAUT	-	Unified Theory of Acceptance Use of Technology
UTM	-	University Technology of Malaysia
MMU	-	Multi Media University
NIOPDC	-	National Iranian Oil products Distribution Company

Chapter 1

INTRODUCTION

In introduction chapter, brief description and information about fuel quota system in Iran is given. This section composed of five sections: introduction, background of the problem, statement of the problem, objectives of the study, scope of the study, significance of the study.

1.1 Introduction

Smart card is a plastic card, its size is the same as a credit card (smart card dimension is 85.6 mm by 54 mm) also has a memory chip embedded inside a smart card for reading and writing. We need to write in smart card and also need to read from smart card. Smart cards have capabilities like storing and saving data, making calculations, processing data, managing files, and executing encryption algorithms.

With the improvement in the smart card technology, the smart cards will be replacing cash, identifying cards, passports, airline tickets, and Medical records for patients (Al-Alawi and Al-Amer, 2006). We can use smart cards for fuel system, in other words we can use fuel smart card for defining quota in fuel system for each person. We can have inspection and control on fuel system since all transaction with fuel station will be saved in fuel smart card memory. By using fuel smart card, we can check the amount of fuel that driver has filled to the tank since when driver has filled fuel to the tank the amount of liter will be saved in memory of smart card. When driver insert the fuel smart card in to the smart card reader of petrol pump the balanced of fuel quota will be shown therefore we can cease fuel stealing for private and public departments.

Departments can follow the fuel transaction based on fuel system, they can find out that has driver filled fuel to the tank based on the receipt that has submitted or not.

Since the memory of smart card has a capability of saving the last transactions of fuel filling to vehicle's tank on itself. By inserting fuel smart card in to the smart card reader of petrol pump the amount of liter that driver has just filled to the tank can be shown by monitor that has been contrives to the petrol pump.

1.2 Background of the problem

Nowadays there are many departments using many vehicles, therefore they need to employ drivers for their purposes; they need to fill fuel to their vehicle's tank. In some departments the drivers after filling fuel to departments' vehicle tanks, have to submit the receipt that shown the amount of fuel that driver has filled into the tank to receive their money based on the receipt. So conforming the receipt that shown the amount of liter that driver has filled to the tank and the amount of fuel that driver has filled to the tank is necessary.

By using fuel smart cards the companies have ability to do fuel injection tracking since all fuel transactions have been saved in fuel smart card memory. In addition using fuel smart cards will cease smuggling since the vehicle's owners have limited fuel quota and for buying each liter of fuel they have to use their quota and without using their fuel quota price of each liter of fuel is expensive 5 times more than price of each liter form their quota. Using fuel smart card let drivers to optimize their fuel quota. Since they have quota for their fuel they prefer not to use their quota for any purposes.

1.3 Statement of the problem

By managing and controlling fuel quota we can cease fuel smuggling since fuel smart card let to check the correctness of amount of fuel that driver has filled to the tank since last few transactions of fuel system will be saved in fuel smart card memory. By conforming the receipt to amount of fuel that they have filled to the tank that will be shown upon inserting fuel smart card to the smart card reader of petrol pump we can cease fuel smuggling. Our main problem here is analyzing factors that affect fuel smart card security and user acceptance of fuel smart card technology in Iran.

1.4 Objectives of the study

The goal of this project is to analyze factors that affect fuel smart card security and user acceptance of fuel smart card technology in Iran. The research objectives would be as follows:

1. To analyze respondents' reaction on factors that affect security of fuel smart card.
2. To analyze respondents' reaction on factors that affect user acceptance of fuel smart card.

Security factor is part of user acceptance factor, in this report we have decided to analyzed factor that affect in security of fuel smart card separately since users' concern about security, has increased and it has been known as one of the most significant factor for technology acceptance (Vijayasathy LR., 2004).

1.5 Scope of the study

This study help to analyze fuel smart card technology in Iran based on respondents' reaction on factors that affect fuel smart card user acceptance and security.

Two universities in Malaysia, two Companies in Iran and a few residents in Mashhad have been selected to participate in the case study. They are:

1. NIOPDC, Iranian fuel company
2. ASHNA company, Fuel smart card developer
3. Iranian fuel smart card users at UTM,MMU and users in Mashhad(Iran)

1.6 Significance of the study

By analyzing factors that affect fuel smart card security and user acceptance and applying results in fuel smart card technology, we persuade people to use fuel smart card. In addition by giving information to people regarding to fuel smart card technology, let fuel smart card users to know how they can use fuel smart card and what the advantages of using fuel smart card are.

1.7 Project deliverables

Project deliverables are:

- I. Questionnaire in appendix A
- II. Row data in Excel that is respondents' answers to questionnaire in appendix B

- III. Cronbach's alpha for all questions of individual factor of adoption model (satisfaction, security, external variables, attitude toward use, and adoption) in appendix C.

1.8 Project plan

During this report we have used SPSS for analyzing data which are respondents' answer to questionnaire and to check the reliability of questionnaire. We have used Excel 2007 for drawing figures for better understanding the analysis. We have used word 2007 for typing the report and Sony VGN-SZ 75GN laptop for doing this master report project. In addition the period of each chapter is in Figure 3.1 research project schedule in research methodology.

1.9 Report outline

This report composed of five chapters. The first chapter is introduction that talks about what is the problem and how does this report relate to problem, also talks about objectives of this study and significance of this study. In addition talks about case studies that have chosen for answering the questionnaire.

The second chapter is literature review that talks about history of smart card and fuel smart card. In addition talks about security of fuel smart card and factors that influenced in security. In addition talks about fuel smart card user acceptance. During this chapter some acceptance model were described.

Chapter three is research methodology that talks about the sampling and why did we have used this sampling also about the method and strategy that we have used to achieve to objectives in scope of study. In addition schedule of this report is in this chapter.

Chapter four is implementation and discussion that talks about adoption model that we have used for this report also why we have chosen this adoption model. In addition talks about the questionnaire and how did we design it, also talks about the survey reliability and validity of survey. Finally describes the statistical analysis of individual factor of adoption model and statistical analysis of respondents' reaction on factors that affect fuel smart card security and user acceptance.

Chapter five is conclusion that talks about the contributions of this report and finally shows the results of statistical analysis part.

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