

PRODUCT SERVICE SYSTEM (PSS) ACCEPTANCE AMONG CONSUMER IN
MALACCA

NASIHAH SOLEHAH BINTI MOHAMMAD YUNUS

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

Pengesahan Penyelia

‘Saya/Kami* akui bahawa telah membaca
karya ini dan pada pandangan saya/kami* karya ini
adalah memadai dari segi skop dan kualiti untuk tujuan penganugerahan
Ijazah Sarjana Muda Pengurusan Teknologi (Inovasi Teknologi)’

Tandatangan :

Nama Penyelia : DR YUSRI BIN ARSHAD

Tarikh :

Tandatangan :

Nama Penilai : PN. NOR AZAH BINTI ABDUL AZIZ

Tarikh :

** Potong yang tidak berkenaan*

PRODUCT SERVICE SYSTEM (PSS) ACCEPTANCE AMONG CONSUMER IN
MALACCA

NASIHAH SOLEHAH BINTI MOHAMMAD YUNUS

Report submitted in fulfillment of the
requirements for the Bachelor Degree of Technopreneurship with Honour

Faculty of Technology Management and Technopreneurship

Universiti Teknikal Malaysia Melaka

2017

“Saya akui laporan ini adalah hasil kerja saya sendiri kecuali ringkasan dan petikan yang tiap-tiap satunya saya telah jelaskan sumbernya”

Tandatangan :

Nama :

Tarikh :

DEDICATION

My parents, my adviser and my friends

AKNOWLEDGEMENT

Assalamualaikumwarahmatullah. I am very grateful to finally complete my proposal making on the study of social acceptance of product-service system (PSS) in Malacca. I would like to thank everyone who has contributed in the progression of report, especially to my parents whom providing physically and mental support. The biggest gratitude to my adviser of project Dr Yusri bin Arshad for the knowledge and skills. Not forget to my teammate Nor Aqliema binti Mhd Anuar which have been striving besides me through thick and thin. Thank you so much to the University Teknikal Malaysia Melaka (UTeM) for the opportunity and experience to prepared a theoretical research.

ABSTRACT

Today production, sales and marketing focus to satisfy the customer demand. Product–Service System is an innovation strategy, shifting the trade centre from the physical products of design and sales to a system of the design and sales adding the objective to fulfilling client demands. The area of product design concentrate on the increase of consumer acceptance by configuring the product based on the product and the customer. As PSS has becoming the trend in industry, the researcher expects to plant the idea of PSS nationally in Malaysia. The acceptance will be measured from the variables; the perceived by customer, end-user involvement, perceived relative advantage, reciprocal trust factor, managing expertise and perceived behaviour control. The researcher fills the gap study of PSS acceptance by the consumer. To construct the theoretical framework researcher build in based on UTAUT, Roger’s Theory, TAM, and TPB. Descriptive research is used. The sample uses 200 respondents to gain sufficient size to warrant statistical analysis. The data is gain from the result of questionnaire that has been distributed at the area of Malacca town. So it is consider the researcher used primary data from the questionnaire analysis result. The study generates data analysis by using SPSS for both pilot testing and actual survey. In order to identify the correlation of the objective and variable, researcher analysed based on t-distribution table and compared the value from the table and the value from the analysis result. To conclude the study, researcher includes the discussion, limitation, implication, and recommendation in the final chapter.

ABSTRAK

Pengeluaran hari ini, jualan dan pemasaran tumpuan untuk memenuhi permintaan pelanggan. Sistem produk-Service adalah satu strategi inovasi, beralih pusat dagangan itu dari produk fizikal reka bentuk dan jualan kepada sistem reka bentuk dan jualan menambah objektif untuk memenuhi permintaan pelanggan. Bidang reka bentuk produk menumpukan perhatian kepada peningkatan penerimaan pengguna dengan mengkonfigurasi produk berdasarkan produk dan pelanggan. Sebagai PSS telah menjadi trend dalam industri, penyelidik menjangka untuk menanam idea PSS nasional di Malaysia. penerimaan ini akan diukur daripada pembolehubah; yang dilihat oleh penglibatan pelanggan, pengguna akhir, kelebihan relatif dilihat, faktor kepercayaan timbal-balik, kepakaran pengurusan dan kawalan tingkah laku dilihat. penyelidik mengisi kajian jurang penerimaan PSS oleh pengguna. Untuk membina teori membina rangka kerja penyelidik di berdasarkan UTAUT, Teori Roger, TAM dan TPB. penyelidikan deskriptif digunakan. sampel menggunakan 200 responden untuk mendapatkan saiz yang mencukupi untuk mewajarkan analisis statistik. data adalah keuntungan dari hasil soal selidik yang telah diedarkan di kawasan bandar Melaka. Jadi ia adalah dianggap pengkaji menggunakan data utama dari hasil analisis soal selidik. Kajian ini menjana analisis data dengan menggunakan SPSS untuk kedua-dua ujian rintis dan kajian sebenar. Untuk mengenal pasti korelasi objektif dan berubah-ubah, penyelidik dianalisis berdasarkan jadual taburan t dan dibandingkan nilai dari meja dan nilai dari hasil analisis. Untuk membuat kesimpulan kajian itu, penyelidik termasuk perbincangan, had, implikasi dan cadangan dalam bab akhir.

TABLE OF CONTENT

CHAPTER	TOPIC	PAGE
CHAPTER 1		1
INTRODUCTION		1
	1.1 Background	2
	1.2 Problem statement	2
	1.3 Research objectives	3
	1.4 Research questions	3
	1.5 Significant of the research	4
	1.6 Contributions of the study	4
	1.7 Scope of study	5
	1.8 Limitation of study	5
	1.9 Structure of the thesis	6
	1.10 Summary	6
CHAPTER 2		8
LITERATURE REVIEW		8
	2.1 Introduction	8
	2.2 Definition of terms	9
	2.2.1 PSS acceptance	9
	2.2.2 Product-Service System (PSS)	11
	2.3 Past studies on the study PSS (issue, method, result)	12
	2.4 Variables	19
	2.4.1 Perceived by customer	19
	2.4.2 End-user involvement	21

2.4.3	Perceived relative advantage	22
2.4.4	Reciprocal trust factor	25
2.4.5	Managing expertise.....	26
2.4.6	Perceived behavioral control	28
2.5	Theories	30
2.6	Summary	34
CHAPTER 3	35
RESEARCH METHODOLOGY	35
3.1	Introduction	35
3.2	Theoretical framework	36
3.2.1	Research model.....	36
3.3	Hypothesis development	37
3.3.1	Perceived by customer.....	37
3.3.2	End-user involvement.....	37
3.3.3	Perceived relative advantage	38
3.3.4	Reciprocal trust factor	38
3.3.5	Managing expertise.....	39
3.3.6	Perceived behavior control	40
3.4	Research method	40
3.5	Research design.....	41
3.5.1	Population and sampling	42
3.5.2	Data collection method.....	44
3.5.3	Primary data.....	44
3.6	Analysis technique	45
3.6.1	Statistical Package for Consumer Science (SPSS).....	45
3.6.2	Correlation analysis	46
3.6.3	Regression analysis.....	46
3.7	Scientific canon	47
3.7.1	Reliability	48
3.7.2	Internal validity.....	48
3.7.3	External validity	49

3.7.4 Construct validity	49
3.8 Summary	50
CHAPTER 4	51
DATA ANALYSIS	51
4.1 Introduction	51
4.2 Pilot testing analysis	51
4.3 Frequency analysis of respondent profile	55
4.3.1 Gender	54
4.3.2 Race	55
4.3.3 Age	56
4.3.4 Occupation	58
4.4 Descriptive statistic for variables	59
4.4.1 Perceived by customers	60
4.4.2 End-user involvement	62
4.4.3 Perceived relative advantage	64
4.4.4 Reciprocal trust factor	66
4.4.5 Managing expertise	68
4.4.6 Perceived behavior control	70
4.4.7 PSS acceptance	72
4.5 Correlation analysis	74
4.6 Multiple linear regression	77
4.6.1 Anova	78
4.6.2 Coefficient	79
4.7 Hypothesis testing result	80
4.8 Summary	82
CHAPTER 5	83
DISCUSSION AND CONCLUSION	83
5.1 Introduction	83
5.2 Summary of frequency analysis	83
5.3 Discussion of research objective	84

5.3.1 Objective 1: To know the consumer characteristics in Malacca.	84
5.3.2 Objective 2: To create awareness of PSS among the Malacca consumer population.	85
5.3.3 Objective 3: To understand the relationship between the consumer behavior and the acceptance of PSS among consumer.	85
5.3.4 Objective 4: To recognize the PSS acceptance of PSS in Malacca.	86
5.4 Limitation	87
5.5 Implication.....	88
5.6 Recommendation.....	88
5.7 Summary	89
REFERENCE.....	90
APPENDIX A	98
APPENDIX B	99
APPENDIX C	104
APPENDIX D.....	111
APPENDIX E	113

LIST OF TABLES

TABLE	TITLE	PAGE
Table 1	Thesis Structure	6
Table 2	Summarize from the past studies	15
Table 3	Advantages implementing LCS (PSS) by Garetti et al, (2012)	24
Table 4	The examples of success product-service systems adaptation on established company collected by Beuren et al, (2013)	25
Table 5	Labor Force Participation in Malacca for the past 10 years	43
Table 6	Pearson's Correlation Coefficient Range	46
Table 7	Cronbach's Alpha Coefficient	52
Table 8	Reliability Statistics	52
Table 9	Reliability Statistic for Pilot testing	52
Table 10	Respondent's sex	54
Table 11	Respondent types	56
Table 12	Respondent's age	57
Table 13	Respondent job	58
Table 14	Statistic analysis of customer influences' items	61
Table 15	Statistic analysis of end-user involvement's item	63
Table 16	Statistic analysis of perceived relative advantages' item	65
Table 17	Statistic analysis of reciprocal trusts factor's items	67

Table 18	Statistic analysis of managing expertise's item	69
Table 19	Statistic analysis of perceived behavior control's items	71
Table 20	Statistic analysis of social acceptance's items	73
Table 21	Customers' Influences Correlation	74
Table 22	End-user Involvement Correlation	75
Table 23	Perceived Relative Advantages Correlation	75
Table 24	Reciprocal Trust Factor Correlation	76
Table 25	Managing Expertise Correlation	76
Table 26	Perceived Behavior Control Correlation	77
Table 27	Model summary	78
Table 28	ANOVA ^a	78
Table 29	Coefficients ^a	80
Table 30	Hypothesis testing for all variable	81

LIST OF FIGURES

FIGURE	TITLE	PAGE
Figure 1	Evolution of PSS in concept by Baines et al 2007	12
Figure 2	PSS-categorized by Tukker & Tischner, 2006	14
Figure 3	The Unified Theory of Acceptance and Use of Technology (UTAUT) based of Müggenburg et al, (2012) study	31
Figure 4	Five stages in the decision innovation process, Diffusion of Innovation Theory	31
Figure 5	The Technology Acceptance Model (TAM)	32
Figure 6	Proposed model based on TAM	33
Figure 7	The Theory Planned Behavior (TPB) framework	34
Figure 8	Theoretical Framework	36
Figure 9	Table of sampling population	43
Figure 10	Percentage of respondent's sex	55
Figure 11	Percentage of Respondent types	56
Figure 12	Percentage of respondent age	57
Figure 13	Percentage of respondent job	59
Figure 14	Percentage of customer influences' item	61
Figure 15	Percentage of end-user involvement's item	63
Figure 16	Percentage of perceived relative advantages' item	65

Figure 17	Percentage of reciprocal trusts factor's items	67
Figure 18	Percentage of managing expertise's item	69
Figure 19	Percentage of perceived behavior control's items	71
Figure 20	Percentage of social acceptance's items	73

CHAPTER 1

INTRODUCTION

There is evidence that Product-Service System (PSS) plays a crucial role in regulating the improvement in the industrial sector. In recent years, there has been an increasing interest to identify the acceptance of Product-Service System (PSS) on the customer whom is the manufacturing sector and then this study proposes to analyze the Product Service System (PSS) acceptance among consumer in Malacca, Malaysia. In this chapter the main aim is to briefly understand the concept of the Product-Service System and recognize its application in the real world. The initial part of this thesis discusses the research background followed by the statement of problem. The research objectives are set and the research significations, as well as the contributions have been concisely mentioned. This stage is continued about the scope of study and finalize with the organization of the thesis.

1.1 Background

In the new global economy, Product-Service System (PSS) has become a central issue in the area of Information Systems. According to Wikipedia, PSS happen when the company deals a combination of both products and services, also mentioned (van Halen, te Riele, Goedkoop) quote "a marketable set of products and services competent of jointly fulfilling a user's desires". Cavalieri & Pezzotta, (2012) cite several lines of evidence from (Mont, 2004; Mont & Plepys, 2004; Mont, 2002) suggest that the concept of Product–Service System is an innovation strategy, shifting the trade center from the physical products of design and sales to a system of the design and sales adding the objective to fulfilling client demands. The idea of sustainability in business force main stakeholders to employ PSS to stay competitive in the industry. Armstrong & Lang, (2013), discuss Mont, (2002) said that consequently, the conventional large scale manufacturing model is now evolving to flexible production with PSS. The Small and Medium Enterprises (SMEs) is also needed to deliver (Pardo et al, 2012).

1.2 Problem statement

Today production, sales and marketing focus to satisfy the customer demand. The area of product design concentrate on the increase of consumer acceptance by configuring the product based on the product and the customer (Schmidt et al, 2015). Schmidt et al, (2015) also inform that customer issues the trust to the provider, as they create high perception of lifecycle costs to get PSS material and requirement. Qu et al, (2016) claimed Rexfelt, & af Ornäs (2009) have published the journal discussion in which dealing with customer acceptance of PSS is very imperative from the perspective of the sustainability of the worldwide economy. One study by Schmidt (2014) examined

the trend in market success is contributed to reach the customer acceptance as the invention's benefits and novelty do not have to be greater (Hansen & Wakonen, 1997).

1.3 Research objectives

As PSS has becoming the trend in industry, the researcher expects to plant the idea of PSS nationally in Malaysia. The following are point out the main objectives for the research towards PSS acceptance of PSS;

1. To know the consumer characteristics in Malacca.
2. To create awareness of PSS among the Malacca consumer population.
3. To understand the relationship between the consumer behavior and the acceptance of PSS among consumer.
4. To recognize the PSS acceptance of PSS in Malacca.

1.4 Research questions

The adoption of PSS in the industry aim is to producing the specific customers required product and service. To prove the needed of PSS in the industry is vital, the research states the questions topic for evaluation;

1. What is the consumer characteristic in Malacca?

2. What is the information of PSS among Malacca consumer population?
3. What does the relationship of the interest and the acceptance of PSS among consumer?
4. What is the consumer response towards PSS?

1.5 Significant of the research

The significance of the study is to bring the PSS close with the society as it will become familiar so that the industry may implement the PSS without worries of PSS acceptance on the system. Cavalieri & Pezzotta, (2012) mention Baines et al, (2007) state PSS in industry will get to release customers from the ownership responsibility, reduced the expenses by offering requested services, and designing the sustainable business approach. The research's result can act as information to the industry regarding the consumer behavior.

1.6 Contributions of the study

Previous research has find out that relative advantage, trial ability, compatibility, complexity and perceived risk are the influential factors for customer acceptance of innovation (Schmidt et al, 2016). The present work is designed to understand excites of interest toward PSS by the consumer's response. This research reviews perceived by

customer to recognize the end-user involvement, and the relationship of perceived relative advantage and reciprocal trust factor as the expertise management and perceived behavior control will be identified.

1.7 Scope of study

The study of acceptance towards PSS is based on the outside literature from other country. The PSS acceptance of PSS focuses on Malacca range only, which will be determined by factors that excite the interest. The study and questionnaire distributions will be around the town region because the high number of labor force rate than rural area. The researcher attempts the gain data randomly from various backgrounds of people.

1.8 Limitation of study

The reader should bear in mind that the study is based on the outside literature. As Malaysia is the developing country there is not yet proves the implementation of PSS in the country. The resources are collected by other country such as Germany and United State whom consider as developed country. To start fitting the idea of PSS locally will be challenging as the society, knowledge and culture are obviously different. There is still lack of PSS-knowledge among the consumer.

1.9 Structure of the thesis

<i>Chapter</i>	<i>Brief Description</i>
Chapter 1	This chapter is generally discussed about the basic concept of the study, background of the study, problem statement, the research objectives and research questions.
Chapter 2	This chapter is describing about the definition of the topic and reviewing the related theories along with the past studies about the topic.
Chapter 3	In this chapter, the researcher will build the theoretical framework and explain about the research methods which will be used in conducting the research.
Chapter 4	This chapter testing all the hypotheses that have been developed by using Statistical Package for the Consumer Sciences (SPSS). It is mainly to test the reliability and validity of the data collected and the relationship between dependent variable, independent variables and moderating variable.
Chapter 5	This is the last chapter that summarizes the overall analysis and results and conclusion for this study. The researcher will explain the results and findings to validate the research objectives and questions, limitation of study, also discussing recommendation for future research and finally the conclusion.

Table 1 : Thesis Structure

1.10 Summary

In summaries, this section has described the practice and benefits of PSS to industry. The chapter then moves on to the study of PSS acceptance of PSS which evaluated by perceived by customer, end-user involvement, perceived relative advantage, reciprocal trust factor, managing expertise and perceived behavior control.

Research applies UTAUT, Roger's Theory, TAM, and TPB theories and scope in the area of Malacca.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

As described on the previous page the research is to identify the PSS acceptance of Product-Service System in the area of Malacca. Moving on now to consider the definitions of the term uses and the past studies focus on the acceptance of PSS and the explanation on how and why it is PSS-related of each factors that excite the interest; perceived by customer, end-user involvement, perceived relative advantage, reciprocal trust factor, managing expertise and perceived behavior control. And then as the research applies UTAUT, Roger's Theory, TAM, and TPB to construct the theoretical framework, these theories will be clarified further. This study used numerous reference sources such as journal, thesis, books, websites and other published standard as a parameter.