UNDERSTANDING CUSTOMERS' ACCEPTANCE OF TELEMATICS: THE LINKAGE OF ATTITUDINAL, NORMATIVE, AND CONTROL BELIEF STRUCTURE WITH TECHNOLOGY ACCEPTANCE MODEL (TAM)

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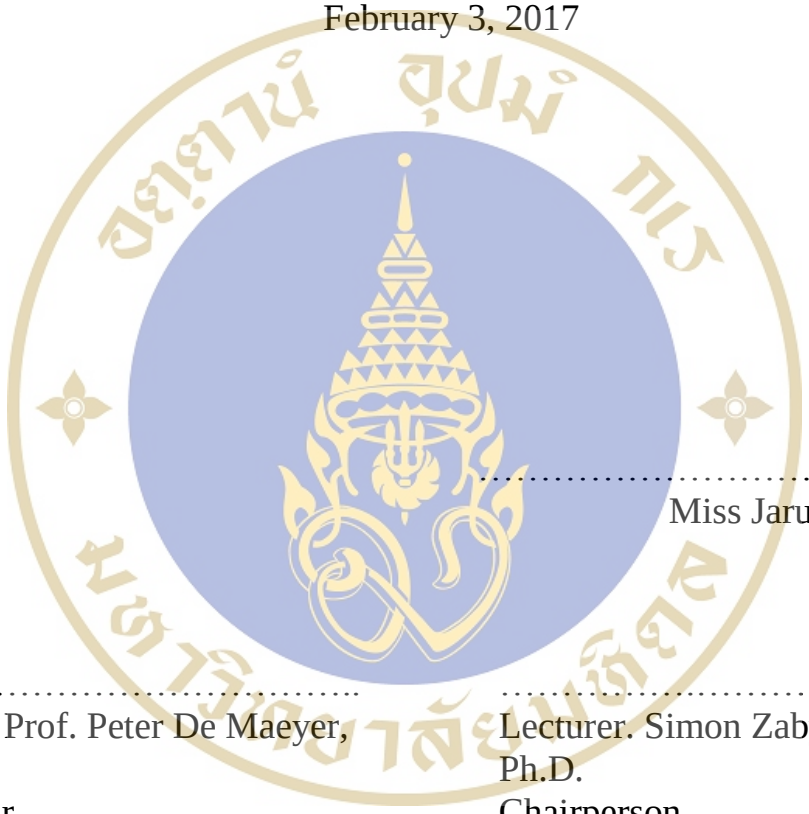

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ABSTRACT

Widely known that Thai Government is trying to boost up Thai economy, which called "Thailand 4.0" focuses in value-based economy. From this concept, the Digital Internet of Things (OIT) is coming up to support in many marketing activities. Intentionally, researcher found that the technology acceptance could enhance the Aftersales Business, Recent studies showed the benefits of telematics many years. However, in Thailand there are some senses that consumers are not interested in this technology. Intentionally, this project has the objectives to study the viable case of the developing stage of installed telematics through the Technology Acceptance Model; both experienced and non-experienced users. Furthermore, this project research would like to examine the influential factors overall liking and intention to use the installed telematics in car.

This project research's design and methodology was the convenient sampling with no quota because the limited time of the research and got the sample size around 150 respondents as well as limited study for the Bangkok area users. The target of the research is both male and female at aged between 20-60 years old because in Thailand, many people started their income at aged 20, and at aged 60 is the retired period. The survey was conducted from May to June in 2016, with quantitative for customers' perspective and qualitative for the telematics project developer's perspective.

KEY WORDS: Telematics/ Technology Acceptance Model/ Attitudinal belief structure/ Normative belief structure/ Control belief structure

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CHAPTER I
INTRODUCTION

What is Telematics? Telematics encompasses owner and vehicle by cellular network to receive vehicle information via data center.

In academic terms of telematics, it is a convergence of 'Telecommunication and Information Technology' science; the word telematics comes from "Telecommunications" and "Informatique" in French, related to wireless technologies and computational systems. By allowing mobile communications using an information processing transmitted from a big data to users. Recently, telematics is widely practical applications in automotive industry such as vehicle tracking, trailer tracking, container tracking, satellite navigation, wireless vehicle safety communication.

Thailand's Economics Catalyst, the government policy launches for reform Thai economy structure naming of Thailand 4.0, which has a focus area in Valued-Based Economy for surviving in the prospered 21st century through security, and sustainability under the concept of moving the economy with an innovation. For bringing up the kingdom to status of 'upper-middle income economy; Thailand 1.0 focuses on agriculture, 2.0 focuses on light industries, 3.0 focuses on heavy industries. Thus, the implementation of Thailand 4.0 will shift the existing four elements (changed from traditional farm to be a smart farming, from traditional SME to be a smart enterprise or called as startup, from traditional services to high value services) and five focused industries. Likewise, this policy would be "New engines of growth" coming up from comparative advantage to competitive advantage there are five clusters of targeted technology and industries as follows; Food-Agriculture-Bio Technology, Health-Wellness-Bio Medical, Smart Devices-Robotics-Mechatronics, Digital-Internet of Things-Artificial Intelligence and Embedded Technology, and Creative Culture and High Value Services. Noticeably, the trend of Internet of Things

(IoT) is coming up into economic waves; government policy support, in automotive industry has a movement in this terms as well; telematics mentioned earlier.

Recent studies showed the benefits of telematics in terms of proactive marketing activity as mentioned above. Currently in the global trend; telematics is developing and accordingly there are many car manufacturers; such as Nissan, Volvo, BMW are already installed it in their products. As well as in Thailand; one of the car manufacturing; MG already installed and launched which called “INKANET”. This application could check the basic car engine, traffic service center, notify an emergency case, calculate an estimate travel time. Thus, it shows that the trend of technology development in this term has the vision. The business motivation behind this study is that the Thai division of a large car manufacturer has launched, yet there are some senses that consumers are not that interested which is unclear points whether the automotive industry clearly understand consumers’ motivation of using telematics or not.

In this context, the goal of this study is to better understand customers’ motivations to use telematics. Related goals are how to best communicate the benefits and stimulate its adoption are the interesting areas to have an apprehension by having knowledge based proactive selling that could gain more loyal customers. Once, loyal customers repurchase cars by well-understanding of service planning, so that this shall call back customers. Moreover, the relationship between car manufacturer and dealers could maintain its revenue at the same time. As well as this could be linked to customers’ relationship management (CRM). Thus, by proactive understanding, it could reduce costs; prevent expensive recall processes and protect the branding as a final outcome.

1.1 Objectives

This project would like to study the viable case to develop the telematics by utilizing and extending the Technology Acceptance Model. This project is mainly study in terms of Aftersales Business to examine the determinants of telematics adoption and usage by individual users; both experienced and non-experienced using

telematics, through exploring the linkage of Attitudinal, normative, and control belief structure with Technology Acceptance Model (TAM).

1.2 Background

This project analyzes one of the top five automotive companies in Thailand as an empirical study. Currently, the company separates Marketing Division from Aftersales Business Division. So, that the main objective of enhancing customers to buy cars; on the other hand, Aftersales Business Division will handle for customer relationship management and sustain the relationship to endorse the repurchasing intention. To focus on the part of Aftersales Business; customer relationship building through technology, the company assigns directly Aftersales Business Department to manage and develop the possibility of applying telematics into the Aftersales Business and other information technology marketing to prolong the relationship between company and its customers in long-terms.

Intentionally, this research aims to understand and study the feasible case of installing telematics into Aftersales Business marketing in this fluctuated economy of Thailand, which focusing on Bangkok customers as a surrogate measure for telematics usage due to the limited time of study.

1.3 Expected benefits

1.To understand how customers' acceptance regarding experienced, and non-experienced using car telematics through Technology Acceptance Model (TAM).

2. To examine the determinants that influence overall liking and intention to use telematics system.

1.4 Scope of the study

This research project which is divided into two stages; starting with the first stage of conceptual development based on the literature reviews and qualitative

interviews with telematics development project of the company consists of managerial level and technical engineers to have marketer together with engineering improvement perspectives the second stage involving data collection about 150 respondents by means of questionnaires. Target of individual users of experience and non-experience using car telematics in Bangkok, Thailand. Online survey conducted with questionnaire length 10 minutes.

1.5 Research framework and hypothesis development

1.5.1 Research model

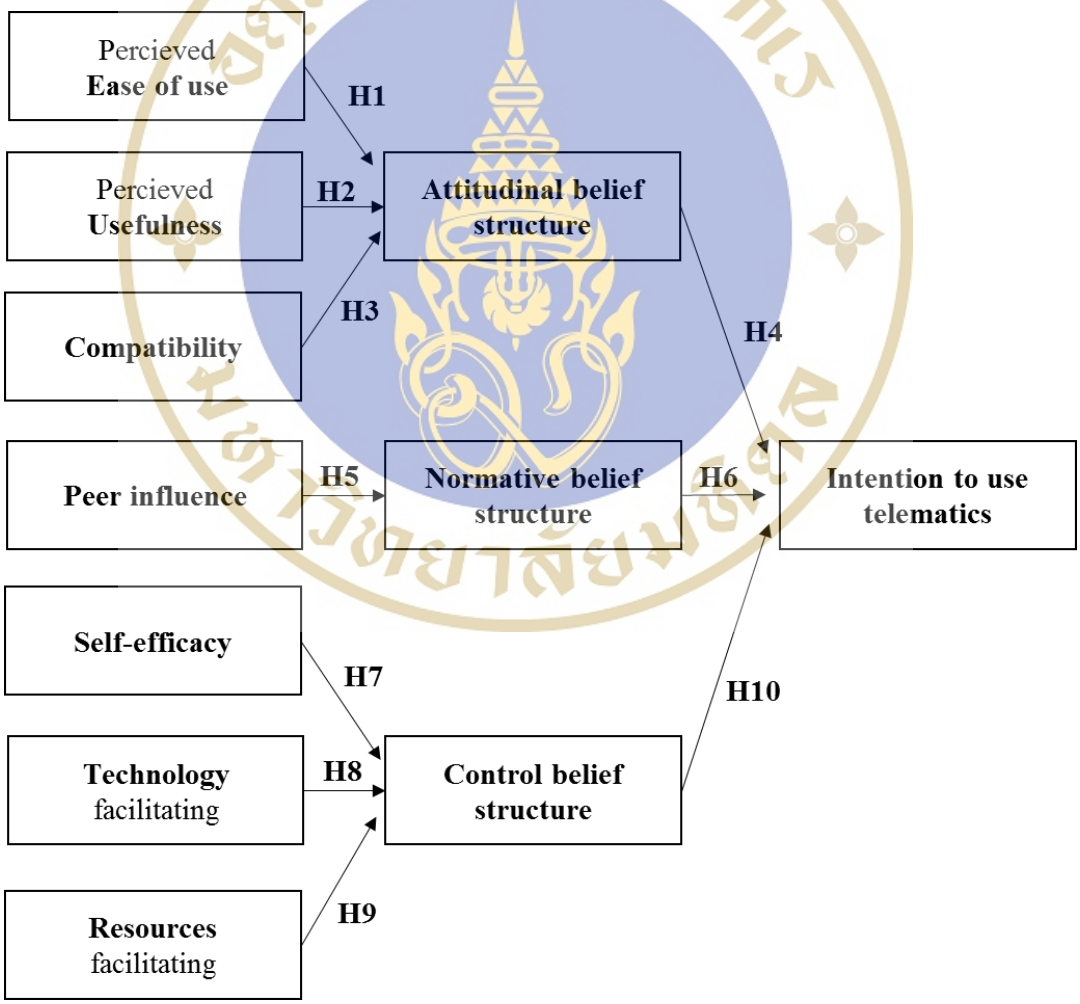

Figure1: The proposed research adapted by Technology Acceptance Model (TAM) and Decomposed Theory of Planned Behavior (DTPB)

1.5.2 Hypotheses

H1	Perceived ease of use has positive influences attitudinal belief structure
H2	Perceived usefulness has positive influences attitudinal belief structure
H3	Compatibility of users (Passed experience) has positive influences attitudinal belief structure
H4	Attitudinal belief structure has positive influences intention to use telematics
H5	Peer influence directly influences normative belief structure
H6	Normative belief structure has positive influences intention to use telematics
H7	Self-efficacy has positive influences control belief structure
H8	Technology facilitating conditions has positive influences control belief structure
H9	Resources facilitating conditions has positive influences control belief structure
H10	Control belief structure has positive influences intention to use telematics

CHAPTER II

LITERATURE REVIEW

2.1 Definition of Telematics

Below table is the definition of Telematics that many research papers quoted from year 1992-2015.

Table 1: The definition of telematics

Item	Definition	Source
Telematics	A combination of information technology and telecommunications, which provided information in all time and places.	T. R. Wander, 1996;
	There are four main characteristics of telematics; timeliness (giving information system to users at any time), mobility (users could be served by anywhere). Individuality (all demand depends on each of user geographical location and needs), lastly, convenience (information and services are provided through vehicle)	Young-Wook Song and Ji Dae Kim and Lianggri Yu, 2012
	The wireless software technology that will be installed in vehicles and it will enhance to change the value chain impact. Telematics is another key of collaborative community to be an innovative ecosystem built around shared goals of companies and as well as in the community.	Daniels Blake and Tom Cucuzza and Sanjay Rishi, 2003

2.2 Definition of Technology Acceptance Model (TAM)

There are many studies are relevant to Technology Acceptance Model (TAM), however the first study in this terms was firstly developed in 1986 by Davis F. D., which was trying to explain how users accept to new information technology and adopt to use it. However, TAM was adapted from Theory of Reasoned Action, which described the behavior of people was driven by behavioral intentions, so that it will drive the attitude towards behavior together with subjective norms (meaning that such norms represent the expectations of other people by performing behavior, thus they show how a person is influenced by the perception of his/ her behavior by their referenced people such as family and friends or their supervisor). The tables below consist of development of Technology Acceptance Model and the determinants affect to users' intention to accept and use the information system.

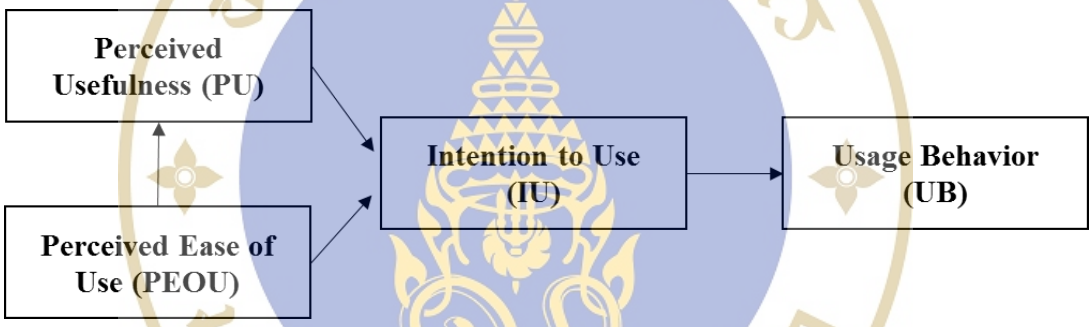

Figure2: Original Technology Acceptance Model (TAM) developed by Fred D. Davis, 1986

Table 2: The development of Technology Acceptance Model for the research

Theory	Definition	Source
Theory of Reasoned Action (TRA)	Theory suggests that a person's behavioral intention depends on the person's attitude about the behavior (Would I do this sort of thing normally?) and subjective norms (Would other people in the group do this?)	Taylor and Todd, 1995
Technology Acceptance Model (TAM)	An information systems theory that models how users come to accept a technology and how they use that	Fred D. Davis, 1989, Taylor and Todd, 1995

Table 2: The development of Technology Acceptance Model for the research (cont.)

Theory	Definition	Source
	Technology to predict the Information Technology Usage Behavior, developed by Theory of Reasoned Action (TRA)	
Decomposed Theory Planned Behavior (DTBP)	This theory adds up the determinant of Control belief structure (PBC), which refers to a person's perceptions of their ability to use the information technology, to understand the behavioral intention to use the technology of users	Taylor and Todd, 1995

Table 3: The definition of determinants from Technology Acceptance Model (TAM)

Determinant	Definition	Source
Perceived usefulness (PU)	1) The degree that a person believes that by using a system will enhance his or her job performance	Taylor and Todd, 1995; Karahanna and Straub, 1999, Lee Young and Kenneth A Kozar and Kai R T Larsen, 2003
	2) The degree that a person believes the overall job performance is increased or got by a system or technology	Eunil Park; Ki Joon Kim, 2012; Abdul R Afshraf and Narongsak Thongpapanl and Seigyoung Auh, 2014
	3) A belief that the technology would help job performance of the users	Steve Baron Anthony, 2006

Table 3: The definition of determinants from Technology Acceptance Model (TAM) (Cont.)

Determinant	Definition	Source
Perceived usefulness	4) The degree that a person accepts the system will boost up his/ her job performance	John P Wentzel; Krishna Sundar Diatha; VSS Yadavalli, 2013
	5) A remarkable belief of a person that by using the technology will enhance his of her job performance, once he or she adopts to use the technology system.	Davis, 1989; Taylor and Todd, 1995; Shih-chih Chen, 2008; Huei-Huang Chen and Shih-Chih Chen 2009
Perceived ease of use (PEOU)	1) The degree that a person believes by using a system or technology would be free from any of his or her effort.	Eunil Park; Ki Joon Kim, 2012; Abdul R Afshraf and Narongsak Thongpapanl and Seigyoung Auh, 2014
	2) The degree that a person believes that his or her task and work performance are got better by adopted technology with effortless.	
	3) A belief about the users would be free from mental effort when using technology.	Steve Baron Anthony; Patterson Kim Harris, 2006
	4) The degree that a person believes that if he or she uses the system would be free from any effort.	John P Wentzel; Krishna Sundar Diatha; VSS Yadavalli, 2013
	5) A remarkable belief of a person that by using the system will be free of effort.	Davis, 1989; Taylor and Todd, 1995; Shih-Chih Chen, 2008

Table 3: The definition of determinants from Technology Acceptance Model (TAM) (Cont.)

Determinant	Definition	Source
Attitudes (A)	1) The preference of people when they utilize a system of technology	Eunil Park, Ki Joon Kim, 2012
	2) A person's general feeling that performing the behavior is a favorable or unfavorable action.	Huei-Huang Chen and Shih-Chih Chen, 2009
Behavioral Intention (BI)	1) The actual use of a given information system	Taylor and Todd, 1995; Karahanna and Straub, 1999; Young Lee and Kenneth A Kozar and Kai R T Larsen, 2013
	2) The degree of the notion and mental state of the people in general to deliver a system of technology	Eunil Park; Ki Joon Kim, 2012; Abdul R Afshraf and Narongsak Thongpapanl and Seigyoung Auh, 2014
	3) An individual's subjective probability that he or she will engage in that behavior.	Huei-Huang Chen and Shih-Chih Chen, 2009

2.3 Definition of Decomposed Theory of Planned Behavior (DTPB)

The Decomposed Theory of Planned Behavior (DTPB) is the development of the Theory of Planned Behavior (TPB), which consists of three independent

determinants added up Subjective Norms (SN) or Normative belief structure and Control belief structure (PBC) from the previous model of Technology Acceptance Model (TAM) that have any the Attitudes.

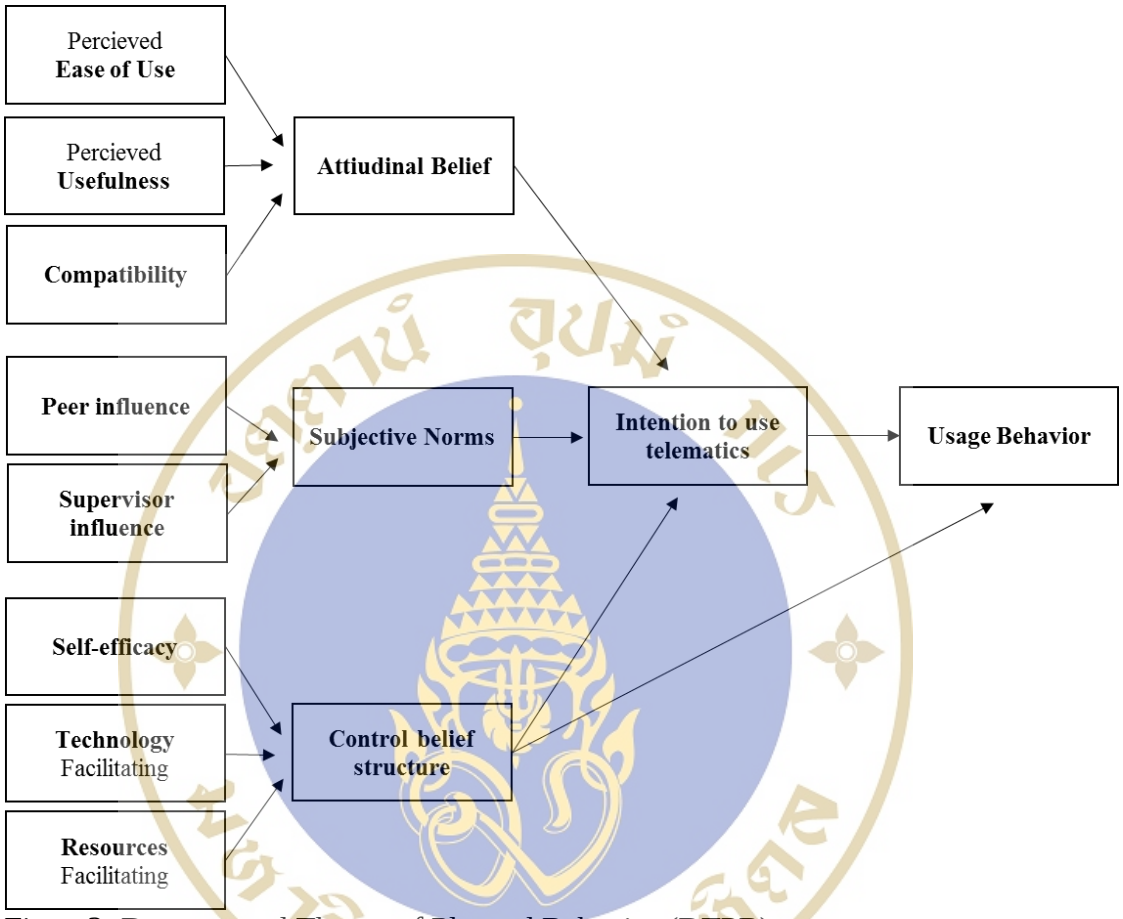

Figure3: Decomposed Theory of Planned Behavior (DTPB)

Table 4: The definition of determinants from Decomposed Theory of Planned Behavior (DTPB)

Determinant	Definition	Source
Compatibility	The degree that a person believes that he or she has the potential to adopt the information technology by his or her existing values, needs, and past experiences of the technology.	Taylor and Todd, 1995

Table 4: The definition of determinants from Decomposed Theory of Planned Behavior (DTPB) (Cont.)

Determinant	Definition	Source
Subjective norms (Normative belief structure)	It represents the expectations of other people to his or her behavior. So that a person will influenced by the perception of such referenced people, such as family and friends or supervisor.	Taylor and Todd, 1995
Behavioral control	1) A resource of a person that can perform a certain behavior. The degree that users would like to get involve to the information system, which this determinant will enhance the users to have the intention to use.	Ajzen, 1991; Taylor and Todd, 1995
	2) An interest of a person by his or her perception to the information technology that ease or difficult.	Shih-Chih Chenn, 2008
Self-efficacy	A perception of the users to the information technology that judged by his or her potency to perform a behavior. It is linked to his or her controllability of the technology.	Taylor and Todd, 1995
Facilitating conditions	The control beliefs which linked to resources and technology determinants such as time and money and information technology's compatibility that may obstruct the usage of the users.	Karahanna and Straub, 1999; Young Lee and Kenneth A Kozar and Kai R T Larsen, 2003

Many studies analyze models stated above that TAM is the model derives from Theory of Reasoned Action (TRA), and Taylor and Todd, 1995 concluded that TAM has limited measurement which is suitable for evaluate the behavior of

individual usage when users had prior experience. The Behavior Intention (BI) shall not affected by the attitude as an important determinant of intention and usage, if the users had no experience. However, this model can be an effective measure for the Behavior Intention (BI), when attitude may not be a determinant of using Information Technology regarding the performance is the key.

It can be concluded that TAM is suitable for measure the Behavior Intention (BI) regards to key using is a performance, which does not require attitudinal factor. On the other hand, TAM is an effective measurement for Information Technology usage with whom had prior experience.

The Decomposed Theory of Planned Behavior (DTPB) is adapted from Theory of Planned Behavior (TPB) of three independent determinants, which add Subjective Norms (SN) or Normative Behavior, and Control belief structure from TAM which having only Attitudinal Belief Structure. The theory hypothesis is the extended in the detail of the determinants; Attitudinal belief structure, Normative belief structure, and Control belief structure (PBC). Accordingly, Mathieson's paper in year 1991 found that PBC also have a significant relates to the determinant of Behavioral Intention and usage as well as mentioned by Taylor and Todd's paper year 1995. Even prior studies showed Subjective Norms (SN) is an unclear determinant of Behavioral Intention, if the situations of referenced groups are not significant related together; in such paper quoted that "If the referent groups have cancel each other". However, for the Subjective Norms (SN) determinant, many research papers found that it can be used for evaluate at the early stage of implementation and design features, when individual has limited direct experience of using Information Technology. Remarkably noted by Taylor and Todd, 1995 that this model; DTPB, is not sufficient condition for the successful implementation. This model particularly provides the viable case of applying Technology Information in the future, which only suitable for giving the based information for the executive to make an easier decision before launching any new information technology.

CHAPTER III
RESEARCH METHODOLOGY

3.1 The telematics development project in automotive industry

Telematics development project is one of the functions in Aftersales Business Division, currently divided into several functions such as Call Center, Information Technology, Customer relationship and others related to enhance customers repurchasing intention. For telematics development project is a facility; liking an information technology center for customer services, which connecting with customers through activities and any other information technology; website, E-Commerce, Line or Facebook. The main missions are customer relationship enhancement both online and offline. Thus, telematics is on process of improving application for automated guided vehicle systems. Not only related to customer services, but it the customers also benefits for the safety issue.

The telematics development project is composed of Technical Engineering Officers, Manager of Aftersales Business, and together handling with General Manager of the Aftersales Business. These staffs will study from the current information of customers' usage their application, which automated guided vehicle; recommend the most suitable convenience route, restaurant guided, emergency call support their customers who have downloaded the paid application or limited selected customers.

3.2 Instrument Development

Participants in the study were all Bangkokian who living and working in Bangkok. The total number of participants were 150 respondents completed the survey (which measured intention to use the telematics and its determinants), of whom experienced and non-experienced using telematics in car. By conducting online

questionnaire length 10 minutes within two-month period of collecting data from target respondents due to the limited of study time.

The survey was conducted through website “survey monkey” due to the convenience of running statistics data, because the data can bring into SPSS program directly. Furthermore, the website supports researcher to design the suitable survey; for example; before launching survey into public, the research could test the survey by his or herself, the number of respondents could be monitored by the researcher which provided in mobile application. After studied many websites, researcher found that it is more convenient than others, so chose to use this website to conduct the survey. In addition, this project focuses on Bangkokians, so research found that it is suitable for the target group to do the research. At the same time, Bangkokians are not only using Thai language, so the survey was conducted in English version as well.

3.3 Data collection and Instrument

The scale development process began with a qualitative interview for having marketer perspective with the supportive of Technical Engineer Officer and Manager who handling the project. The interview was processing with open-ended question and in-depth scrutinizing discussion was conducted. The purpose of the interview was to initially understand telematics measure to enhance acceptance and reduce the resistance of the users as the following qualitative questions (as provided in the Appendix B),

(1) What kind of action can company take to increase telematics acceptance?

(2) Which telematics characteristics create and support telematics acceptance?

Based on the result of the interview qualitative research will be self-developed for measuring proactive Aftersales Business Marketing approach to be taken by Intention to use telematics as the further quantitative research respectively. For the quantitative survey, the questions were conducted for rating-scale from 1-5, due to the assumption of most of the respondents are non-experienced users. If the survey were conducted rating-scale from 1-7, it might not suitable for the non-experienced-users from not having enough experience for the evaluation. The questionnaire survey is provided in the Appendix A.

CHAPTER IV
RESEARCH FINDING

The project regarding determinants influencing consumer acceptance of Telematics in Bangkok, Thailand conducted qualitative research by interviewed the application developer, quantitative research conducted through an online survey. There were two perspectives of qualitative research; one managerial level of the project development, and another one of engineer technical developer. For quantitative research was conducted online survey; and there were 154 respondents who completed the survey between May and June 2016. Research finding is showed below.

4.1 Demographic profile of the respondents

This part reports the general profile of the respondents including gender, age, marital status, employment status, telematics' experience, and how people are aware of the telematics functions for the quantitative research.

From table 5, the total number of respondents who participated in this project were n=154. The majority were male (57.1%) of the respondents, and female (42.9%). Accordingly, the respondents aged between 20-29 years old (41.6%), following by the aged between 40-49, 50-59, and 30-39 years old with 19.5%, 18.8%, and 16.2% respectively. Almost 70% of the respondents were full-time employee, and the report shows that 1 out of 4 of the respondents get monthly income between 30,001 – 45,000 baht. Half of them are single. It shows that the focus of this project was males with the early working age who have income in the middle-range of the population.

Table 5: Demographic profile

Gender	Frequency	Percent	Valid Percent	Cumulative Percent
Male	88	57.1	57.1	57.1
Female	66	42.9	42.9	100.0
Total	154	100.0	100.0	
Age				
Less than 20	5	3.2	3.2	3.2
20-29	64	41.6	41.6	44.8
30-39	25	16.2	16.2	61.0
40-49	30	19.5	19.5	80.5
50-59	29	18.8	18.8	99.4
60 or higher	1	.6	.6	100.0
Total	154	100.0	100.0	
Marital status				
Single	84	54.5	54.5	54.5
Married	61	39.6	39.6	94.2
Divorced	9	5.8	5.8	100.0
Total	154	100.0	100.0	
Employment Status				
Employee full time	107	69.5	69.5	69.5
Employee part time	23	14.9	14.9	84.4
Unemployed	10	6.5	6.5	90.9
Retired	14	9.1	9.1	100.0
Total	154	100.0	100.0	
Income per month (baht)				
Less than 15,000	6	3.9	3.9	3.9
15,000 – 30,000	36	23.4	23.4	27.3
30,0001 – 45,000	40	26.0	26.0	53.2

Table 5: Demographic profile (Cont.)

Income	Frequency	Percent	Valid Percent	Cumulative Percent
45,0001 – 60,000	28	18.2	18.2	71.4
60,001 – 75,000	15	9.7	9.7	81.2
Higher than 75,000	29	18.8	18.8	100
Total	154	100.0	100.0	

Table 6 reports the number of experienced telematics users. The research found that most of the respondents have non-experience with telematics answering to the survey for 59.7%.

Table 6: Have you had experience with "Telematics"?

Experience using telematics	Frequency	Percent	Valid Percent	Cumulative Percent
Yes	62	40.3	40.3	40.3
No	92	59.7	59.7	100.0
Total	154	100.0	100.0	

However, in the table 7 shows the functions of telematics that car users are aware; the most popular telematics function was calculating an estimate travel time (66.9%), followed by notify an emergency case (29.9%), and the least popular function was book time for maintenance (10.4%) as presented.

Table 7: The functions of telematics do car users are aware?

	Frequency	Valid Percent
Notify an emergency case	46	29.9
Calculate an estimate travel time	103	66.9
Book time for maintenance	16	10.4
Basic engine condition checked	20	13.0
Find my car	33	21.4

4.2 Descriptive statistics

The below tables show the summary statistics (Mean and Standard deviation) of perceived usefulness, perceived ease of use, normative, control belief structure towards intention to use telematics in car.

In table 8 reports grand mean and standard deviation of perceived usefulness determinant as 3.31 and 0.73 respectively. By comparing sub-attributes, enhancing the users' effectiveness while driving is higher than the overshadowing the disadvantage of using telematics (mean = 3.53, S.D. = 0.81, and mean = 3.10, S.D. = 0.89 respectively).

Table 8: Mean and standard deviation – perceived usefulness

Perceived Usefulness	Mean	Std. Deviation
I would find automotive telematics will enhance my effectiveness while driving.	3.53	0.81
The advantages of using automotive telematics will overshadow the disadvantage	3.10	0.89
Perceived Usefulness	3.31	0.73

Table 9 reports grand mean and standard deviation of perceived ease of use determinant as 3.27 and 0.56 respectively. By considering sub-attributes, the perception of belief that it will be not difficult to learn how to use telematics in car is the highest mean responses (mean = 3.43, S.D. = 0.82).

Table 9: Mean and standard deviation – perceived ease of use

Perceived Ease of Use	Mean	Std. Deviation
It will be easy to operate automotive telematics while driving	3.30	0.83
It will be not difficult to learn how to use automotive telematics	3.43	0.82

Table 9: Mean and standard deviation – perceived ease of use (Cont.)

Perceived Ease of Use	Mean	Std Deviation
I find it easy to get the automotive telematics to do what I want to do	3.12	0.82
Interaction with the automotive telematics does not require a lot of my mental effort	2.94	0.88
Perceived ease of use	**3.27**	**0.56**

Table 10 reports grand mean and standard deviation of compatibility as 3.28 and 0.77 respectively. By considering sub-attributes, the installed telematics into my car will be compatible with my driving determinant is higher than the using telematics will fit well with the way my driving mean responses (mean = 3.29, S.D. =0.86, and mean = 3.26, S.D. = 0.80 respectively)

Table 10: Mean and standard deviation – compatibility

Compatibility	Mean	Std. Deviation
Using telematics will fit well with the way my driving	3.26	0.80
The installed telematics into my car will be compatible (match) with my driving	3.29	0.86
Compatibility	3.28	0.77

Table 11 reports grand mean and standard deviation of normative determinant as 3.10 and 0.98 respectively.

Table 11: Mean and standard deviation – normative

Normative	Mean	Std. Deviation
My friends would think that I should use	3.10	0.98
Normative	**3.10**	**0.98**

Table 12 reports grand mean and standard deviation of control belief structure determinant as 3.14 and 0.79 respectively. By considering sub-attributes, "I have resources, knowledge, and ability to use automotive telematics" received higher mean responses (mean = 3.27, S.D. = 0.90).

Table 12: Mean and standard deviation – Control belief structure

Control belief structure	Mean	Std. Deviation
I have the resources, knowledge, and ability to use automotive telematics	3.27	0.90
Using automotive telematics is entirely within my control	3.02	0.83
Control belief structure	3.14	0.79

Table 13 reports grand mean and standard deviation of intention to use towards the telematics installed in purchased car determinant as 3.64 and 0.60 respectively. By considering sub-attributes, "I intend to use automotive telematics while driving as often as needed" received highest mean responses (mean = 3.85, S.D. = 0.63).

Table 13: Mean and standard deviation – Intention to use towards the telematics installed in purchased car

Intention to use towards the telematics installed in purchased car	Mean	S.D.
I intend to use automotive telematics while driving as often as needed	3.85	0.63
I would extend possibly use automotive telematics while driving	3.59	0.86
I intend to use automotive telematics while driving rather than discontinue	3.49	0.88
Intention to use	**3.64**	**0.60**

Table 14 reports Cronbach's alpha test of reliability of each determinant asked in the survey. Almost all of determinants had alpha greater than the acceptable level (higher than 0.700) except perceived usefulness and intention to use determinant.

Table 14: Cronbach's alpha of the scale determinants

	Number of items	Alpha
Perceived usefulness	2	0.602
Perceived ease of use	2	0.847
Compatibility	5	0.708
Control belief structure	2	0.802
Intention to use	3	0.617

Amongst all determinants related to attitude, perceived behavioral control and normative structure towards using telematics installed in purchased car, intention to use had highest mean score (mean = 3.64, S.D. = 0.60), followed by perceived usefulness determinant (mean = 3.31, S.D. = 0.73), compatibility (mean = 3.28, S.D. =

0.77), perceived ease of use (mean = 3.27, S.D. =0.56), control belief structure (mean = 3.14, S.D. = 0.79), and normative (mean = 3.10, S.D. = 0.98) respectively.

4.3 Hypothesis testing

This part reports the test statistics including correlation and linear regression models. The hypotheses were tested at 10% significance level.

Correlation coefficients (r) are presented in table 15, Compatibility towards intention to use telematics was strongly positively correlated (r = .593, p-value = .000). Normative and Perceived Usefulness were also strongly associated to intention to use as well (r = .537, p-value = .000 and r = .500, p-value = .000 respectively), but weak correlation between Control belief structure and intention to use (r = .480, p-value = .000), and lastly the correlation between Perceived Ease of Use and intention to use were weak as well (r = .455, p-value = .000).

4.3.1 Result of quantitative research

Table 15: Pearson's correlation

	Perceived Usefulness	Perceived Ease of Use	Compatibility	Normative	Control belief structure	Intention to Use (DEP)
Perceived Usefulness	1	.553** .000	.607** .000	.501** .000	.456** .000	.500** .000
Perceived Ease of Use	.553** .000	1	.643** .000	.389** .000	.573** .000	.455** .000
Compatibility	.607** .000	.643** .000	1	.669** .000	.630** .000	.593** .000
Normative	.501** .000	.389** .000	.669** .000	1	.483** .000	.537** .000
Control belief structure	.456** .000	.573** .000	.630** .000	.483** .000	1	.480** .000

Table 15: Pearson's correlation (Cont.)

	Perceived Usefulness	Perceived Ease of Use	Compatibility	Normative	Control belief structure	Intention to Use (DEP)
Intention to Use (DEP)	.500** .000	.455** .000	.593** .000	.537** .000	.480** .000	1

Linear regression models that tested in this project were as follows.

Model I: Intention to use = f (perceived usefulness, perceived ease of use, compatibility, normative, Control belief structure)

From table 16 to table 18 reports the estimation results from the first model and the rest of the tables will reveal results of the second model. Regression coefficients were tested at 10% significance level.

Table 16 reports model summary of the first model where dependent determinant were perceived usefulness, perceived ease of use, compatibility, normative, and control belief structure, and independent determinants was intention to use. The R Square was .422 which means the model can be used to predict the attitude scores better than using the mean by 42.2 percent.

Table 16: Model I - Model summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.650[a]	.422	.401	.46443

Table 17 reports the F statistics which was used to test the overall significance of the regression model. The proposed model was statistically significant at 5 percent significance level (F = 20.007, p-value = .000). This means at least one of the explanatory determinants would be statistically significant in predicting the score of dependent determinant.

Table 17: Model I - ANOVA table

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	21.578	5	4.316	20.007	.000[b]
	Residual	29.551	137	.216		
	Total	51.128	142			

The following table 18 presents the regression coefficients of the first model. All explanatory determinants, except for perceived ease of use and control belief structure, were statistically significant at 10 percent significance level. By considering beta sizes, compatibility had highest impact (Beta = .185), followed by normative (Beta = .133), and perceived usefulness (Beta = .131) respectively. The 90% confidence interval of each predictor was also reported in the right columns. From this table, the model can be written as follows.

Intention to Use score = 1.689 + .131 * (perceived usefulness) + .066 * (perceived ease of use) + .185 * (compatibility) + .133 * (normative) + .089 * (control belief structure)

Table 18: Model I - Regression coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	1.689	.240		7.030	.000	1.214	2.165
	Perceived Usefulness	.131	.071	.159	1.843	.067	-.010	.273
	Perceived Ease of Use	.066	.099	.062	.671	.503	-.129	.262
	Compatibility	.185	.088	.237	2.102	.037	.011	.359
	Normative	.133	.055	.218	2.426	.017	.025	.242
	Control belief structure	.089	.067	.118	1.339	.183	-.043	.221

Model II: Intention to use = f (perceived usefulness, compatibility, normative)

Table 19 reports model summary of the second regression model selected only the determinants which sig. from the first model, so the dependent determinants was intention to use telematics, and independent determinants were perceived usefulness, compatibility, and normative. The R Square was .410 which means the

model can be used to predict the intention to use scores better than using the mean by 41.0 percent.

Table 19: Model II - Model summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
2	.640[c]	.410	.397	.46604

Table 20 reports the F statistics which was used to test the overall significance of the regression model. The proposed model was statistically significant at 5 percent significance level (F = 32.135, p-value = .000). This means the perceived usefulness, compatibility, and normative score, the only explanatory determinant in the model, would be statistically significant in predicting the intention to use telematics.

Table 20: Model II - ANOVA table

Model 2	Sum of Squares	df	Mean Square	F	Sig.
Regression	20.939	3	6.980	32.135	.000
Residual	30.190	139	.217		
Total	51.128	142			

The following table 21 presents the regression coefficients of the second model. All explanatory determinants were statistically significant at 5 percent significance level. By considering beta sizes, compatibility had highest impact (Beta = .258), followed by perceived usefulness (Beta = .156), and normative (Beta = .135) respectively. The 95% confidence interval of each predictor was also reported in the right columns. From this table, the model can be written as follows.

Intention to Use score = 1.861 + .258 * (compatibility) + .156 * (control belief structure) + .135 * (normative)

Table 21: Model II - Regression coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
2	(Constant)	1.861	.197		9.461	.000	1.472	2.250
	Compatibility	.258	.076	.331	3.417	.001	.109	.408
	Normative	.135	.054	.222	2.493	.014	.028	.242
	Perceived Usefulness	.156	.069	.188	2.268	.025	.020	.291

4.3.2 Result of qualitative research

Managerial level perspective for application development answered the question of "What kind of action does the company take into application development for increasing telematics acceptance in cars?" The manager of the project telematics developing answered "In my opinion, the drivers for introduction stage that could gain the customers' acceptance there were mainly seven parts; **1. Safety concerns**; from my experience of develop application I found that customers mainly concern about how the application could help them in the emergency case **2. Location detectable application**; this concerns come up from the base idea that most of Thai people are in the middle-class. It might not easy to get a car, it would be better if they could ensure that they could tackle where their car is in the place they always know. **3. Report diagnostics**; this application will help customer to analyze their car's engine by remoting to find the error (the application will show the error code). So, the customers might not need to bring their car to the dealer and could check their car by themselves first. Simultaneously, the customers could call to the service center to check up before they move their car to check whether the car could continue driving or not? **4. Insurance fee**; this function will be benefit to the customer car usage information such as we could calculate the insurance fee. **5. Control your car by mobile phone**; the information will be linked into the networking such as you can warm your car's engine through mobile control in advance before you start driving or turn on air-condition of the car before you will get into or you can check whether you already lock or unlock cars or not. **6. Wifi-hotspot**; customers could use their connection with the car wifi-hotspot. **7. Operator Service**; we launch this function due to support navigator application."

Secondly, the developers were asked that “What telematics characteristics create and support telematics acceptance?” The manager said that “I would assume that the internship of using telematics is the customer data for analyzing in the future. For example; in Japan telematics is all about the safety issue, when we have a big data of customers using telematics, we could use this information to forecast how serious does the emergency were. The more information users sharing together, the more useful of data to analyze by telematics data system. Obviously, it could be said that we use data of telematics to set further marketing strategies to support consumer insight more, due to the using transaction of the data we gain.” It is surely that the data of customers using telematics in their cars will be analyzed for setting marketing strategy to serve the most of frequency of application they use.

In terms of technical engineer, he said that “There are two kinds of telematics installed in cars currently, we called “PROPE”. Firstly, we most installed in taxi for the main purpose is “Traffic information or to evaluate how traffic heaviness in each location, area. Secondly, the information we gain from the location users turn on when they use their phone or the application like google. We could be evaluated by location detection from movement of the car which we called the application detection.” It could be said that the major purpose of telematics in cars nowadays were to support or assist customers like emergency case.

CHAPTER V
CONCLUSION AND RECOMMENDATIONS

The purpose of the research project was to understand how the customers' acceptance to telematics which installed in car through the Technology Acceptance Model (TAM), as well as study the linkage of attitudinal, normative, and control belief structure as the determinants. To provide the fully explanations of the study the researcher adapted the model of Decomposed Theory of Planned Behavior (DTPB) into this project research due to limited data of respondents; 154 Bangkokian, through online survey questionnaires for two-month period.

The adapted mentioned model enhances the comparable experienced and non-experienced users for the installed telematics in car through the Theory of Acceptance Model (TAM), many researches showed it is suitable to study the respondents who has experienced with the technology, or to measure the attitudinal usage of the customers. From the determinants of this theory; Theory of Acceptance Model, consists of Perceived Usefulness (PU) and Perceived Ease of Use (PEOU) to evaluate the attitudinal behavior of the users. Significantly, this model intents to understand purely the attitudinal belief of the user. Yet, Decomposed Theory of Planned Behavior (DTPB) was the theory that extended from the Theory of Planned Behavior (TPB), which adds up the determinants of Normative and Control Belief structure as the major of behavioral intention and IT usage behavior. It is coming the giving reason that the latter theory will help this research project to understand the acceptance of the limited experienced user through the Normative belief structure. Moreover, for the Control Belief Structure which consists of Self-efficacy increases the understanding of internal determinant and external factors; the Technology facilitation condition and Resources facilitation condition as the sub-attributes; to understand the target users and the developer could recognize the technical and design features which is in the stage of early implementation before launch the features.

5.1 Discussion of research finding

The customers' acceptance determinants to behavioral intention to use technology that led to the conclusion that there is the linkage between one another of each determinant; perceived ease of use, compatibility, and control belief structure were strong linkage. Yet, the determinants like intention to use, perceived usefulness were weaker. Moreover, there were three influential determinants; perceived usefulness, compatibility, and normative, help to understand customers' acceptance of telematics from the showed reasons below.

5.1.1 The linkage of attitudinal, normative and control belief structure to the intention to use.

The research proved from the Pearson's Chi-Square test that there is the linkage between Attitudinal, Normative and Control Belief Structure to the Intention to use. However, in each of the determinant has the variance level of the linkage as the detail shows below.

1. Attitudinal Belief Structure; Perceived Usefulness and Compatibility are strongly positively related to the intention to use (r = 0.500, p-value = 0.000, and r = 0.593, p-value = 0.000 respectively). However, for Perceived Ease of Use has a weaker correlation to the intention to use (r = 0.537, p-value = 0.000)

2. Normative Belief Structure is strongly positively related as well (r = 0.537, p-value = 0.000)

3. Control Belief Structure has weak relationship to the intention to use (r = 0.480, p-value = 0.000).

The research also proved that this project is reliable from the Alpha score is greater than 0.7000. But the Perceived Usefulness and the Intention to use shall need to collect more number of the sample size to be proved the reliability, coming from the Alpha score got around 0.6000.

5.1.2 The customers' acceptance to intention to use Telematics in car

This project chose to do the research for 2 models to prove that which model is better to understand the target users. So that, the model I used all the determinants of the proposed model (perceived usefulness, perceived ease of use,

compatibility, normative, and control belief structure). And for the Model II the project research selected for only the statistically significant determinants from the Model I, which are perceived usefulness, compatibility, and normative. And the research proved that both two models (Model I = 42.2%, and Model II = 42% result from the R square score) can be used for the prediction of the intention to use for the installed telematics.

Model I: Intention to use = f (perceived usefulness, perceived ease of use, compatibility, normative, control belief structure)

Model II: Intention to use = f (perceived ease of use, compatibility, normative)

Both models in this project show that the determinant of Compatibility has the greatest impact tot the customers' acceptance, due to most of the respondents are non-experienced users to the installed telematics in car. It proves that as Todd and Taylor found that the attitudinal structure, which consists of the determinants of Perceived Usefulness and Perceived Ease of Use are suitable to predict the experienced users. However, the Decomposed Theory of Planned Behavior (DTPB) extended the attitudinal determinant for compatibility (the determinant that let the users perceived whether they has the potency to adopt the new innovation through his or her existing values, previous or current needs or not) to ensure and could be asked for the non-experienced users in terms of his or her attitude to the intention to use the information technology.

5.2 Managerial Implication

There is the linkage of the attitudinal, normative, and control belief structure. Even in this research project drop the result of technology facilitating conditions due to the limited experienced customers to telematics. So, the non-experienced customers cannot evaluate their experience to the technology facilitating conditions good enough. However, for the internal determinants; self-efficacy, and resources facilitating condition, in the control belief structure can use for the prediction for the customers' acceptance. Accordingly, perceived ease of use in the attitudinal belief structure had the constraint to find the research result to predict the

intention to use telematics, coming from the same root cause of non-experienced customers.

The result of this research project shows that for the introduction stage: developing information technology; the determinants of Attitudinal, Normative, and Control Belief Structure has the linkage to the intention to use. However, in each determinant there is some dependent sub-attributes need to verify whether they are suitable to make the understanding with the users' acceptance or not.

For non-experienced users to installed telematics in car tend to be impacted from their passed experienced (Compatibility determinant), existing, value, previous and current need with the technology. If the target customers are the technology like this project found (Male aged between 20-29), they are tend to accept the installed telematics in car easier than the customers who had a bad experience with the technology.

Thus, if the company would like to understand the customers' acceptance, it is necessary to understand his or her passed experience of the target customers and solve his or her bad passed experience to the technology.

5.3 Limitations and Suggestions

5.3.1 Scope of the study

From the limitation of the research period, this project decided to scope the study only for the Bangkok area. However, to launch the installed telematics in car further study should do the research for other area side due to the target customers do not scope only in Bangkok. Moreover, this research does the survey for the installed telematics in car, this shows that the telematics can install in other purposes as well; such as logistics fleet or insurance terms.

Furthermore, this project was conducted limited scope for the installed telematics in car which related to the diary use of the customers only. And this project did a research for the Decomposed Theory of Planned Behavior (DTPB) for subjective norms limited only for friends only since Thai people are much more have the referent group of people by friends. However, in this Decomposed Theory of Planned Behavior

(DTPB) have more sub-attributes like the supervisor or family members that this project did not used for the research.

5.3.2 Population and demographic profile of the respondent

In this research project focuses on non-experienced customers in Bangkok, with small sample size (n=154) due to the limited time of the project research. So, the research cannot understand for the experienced users of installed telematics in car in terms of attitudinal determinant.

5.3.3 Implication for future research project

As the limited scope of the project mentioned above, for further research project could enhanced the quality of the research deeper for further area; not only Bangkok, Thailand. And the research could extend to understand for the viable case of global trend like logistics fleet or insurance terms.

In addition, in this research project shows that there were some functions that customers already aware; calculate estimate time, and notify an emergency functions. However, the project has not asked to understand their acceptance to the existing or the expectation of the users in using the telematics in the detail. Thus, if further research could enhance other functions to enhance customers' awareness, it could be the easier way to let non-experienced customers accept the newly launched telematics or other technology in these terms.

5.4 Conclusion

There were a lot of researches of Technology Acceptance Model (TAM), which adapted from Theory of Reasoned Action (TRA) to understand the acceptance of the users to the intention to use of the information system or technology. As mentioned in this project, this model is suitable for understand the experienced users with the determinants consist only for the attitudinal perspective. However, there are many models are trying to do a research for understanding the customers' acceptance like Theory of Planned Behavior (TBP) or Decomposed Theory of Planned Behavior (DTPB) that extended the model from the prior model (Technology Acceptance Model

-TAM), not only scoped with the experienced users but enhance to have the deeper understanding of the customers' insight of non-experienced users. Thus, it could be said that the Decomposed Theory of Planned Behavior (DTPB) are trying to solve the difficulty of non-experienced users by adding up the determinants like Normative or Perceived Behavioral Control to understand further internal or external determinants that help the technology developer or company to predict the intention to use the technology in the introduction stage before launched new technology.

From the research result found that it could be assumed that the acceptance of the Thai consumers is not interested in the installed telematics in cars, due to his or her limited experienced. However, the installed telematics in car is viable to launch in Thailand yet the understanding of the user' passed experienced is the most important determinant for the system developer to recognize.

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APPENDICES

Appendix A –Quantitative Questionnaire Items

Questionnaire of understanding Customers' acceptance of Telematics: the linkage of attitudinal, normative, and control belief structure with Technology Acceptance Model (TAM)

แบบสอบถามเพื่อความเข้าใจในการยอมรับการใช้เทมาติกส์ของลูกค้า: ความเกี่ยวโยงของทัศนคติ, บรรทัดฐานและปัจจัยการรับรู้ถึงการควบคุมพฤติกรรมของตน โดยทฤษฎีการยอมรับการใช้เทคโนโลยีสารสนเทศ

This questionnaire is conducted by a master individual study student from College of Management Mahidol University to better understand customers' motivations to use telematics. Related goals are how to best communicate the benefits and stimulate its adoption in Thailand. Filled-in information will be kept confidential and will be used for this research only. Please kindly answer all the questions; it will take you only 10 minutes. Thank you for your collaboration.

แบบสอบถามนี้จัดทำโดยนักศึกษาชั้นปริญญาโทจากวิทยาลัยการจัดการ มหาวิทยาลัยมหิดล เพื่อให้มีความเข้าใจว่าลูกค้ามีแรงจูงใจใดในการใช้เทเลมาติกส์ นอกจากนี้เพื่อให้ทราบว่าจะมีการสื่อสารเกี่ยวกับประโยชน์ของเทเลมาติกส์เพื่อกระตุ้นแรงจูงใจในการยอมรับการใช้งานเทเลมาติกส์ในประเทศไทย กรุณาเตอบคำถามซึ่งจะใช้เวลาประมาณ 10 นาที ขอบคุณสำหรับความร่วมมือ

Part I: General Information about demographic (ข้อมูลทั่วไป)

Introduction: Please mark a ☑ next to your choice and fill in the gap (กรุณาเลือกคำตอบดังนี้)

1. Please select your gender (กรุณาเลือกเพศของท่าน)

❒ Male (ชาย)) ❒ Female (หญิง)

2. Please select your age (กรุณาระบุอายุของท่าน)

❒ 20 – 29 ❒ 30 – 39 ❒ 40 – 49

❒ 50 – 59 ❒ 60 or higher (อายุ 60 หรือมากกว่านั้น)

3. Have you had experienced with “Telematics”? (Telematics is the system that helps car owner to connect with car through his or her mobile)

(ท่านเคยใช้ เทเลมาติกส์หรือไม่? เทเลมาติกส์คือ ระบบที่ช่วยให้เจ้าของรถยนต์สามารถเชื่อมต่อกับรถยนต์ของตนได้โดยผ่านเครือข่ายมือถือ)

❒ Yes (เคย) ❒ No (ไม่เคย)

4. Which of these functions are you aware of when talking about telematics?

(ฟังก์ชั่นใด ต่อไปนี้ที่ท่านเคยได้ยินมา?)

❒ Notify an emergency case (การแจ้งเตือนกรณีมีเหตุฉุกเฉิน)

❒ Calculate an estimate travel time (การคำนวณระยะเวลาเดินทาง)

❒ Book time for maintenance (การจองคิวเพื่อเข้ารับการตรวจสอบ)

Part II: Evaluate of related questions on Telematics (วัดผลจากคำถามที่เกี่ยวข้อง)

Instruction: Please identify to what extend you agree or disagree with each of the following statements. (กรุณาเลือกข้อที่ท่านเห็นด้วยมากที่สุด)

Determinants (X)

5. Please rate how you agree with the following attributes when you are using Telematics. (Single answer for each statement) (ท่านเห็นด้วยกับการใช้เทเลมาติกส์ในแต่ละข้ออย่างไร? เลือกข้อเดียว)

Items คำถาม	**Low** (ต่ำ)				**High** (สูง) (
	1	**2**	**3**	**4**	**5**
	Strongly disagree ไม่เห็นด้วยอย่างยิ่ง	**Disagree** ไม่เห็นด้วย	**Moderately agree** ค่อนข้างเห็นด้วย	**Agree** เห็นด้วย	**Extremely agree** เห็นด้วยอย่างยิ่ง
1. Attitudinal belief structure (ทัศนคติ)					
A. Perceived Usefulness รู้สึกเป็นประโยชน์					
I would find					

automotive telematics will enhance my effectiveness while driving (การใช้เทเลมาติกส์ทำให้ฉันขับขี่ได้ดีขึ้น)					
The advantages of using automotive telematics will overshadow the disadvantages (ข้อดีของเทเลมาติกส์ทำให้ฉันมองข้ามข้อเสียไป)					
B. Perceived Ease of Use รู้สึกใช้ง่าย					
My interaction with automotive telematics while driving is clear and understandable (ฉันรู้สึกว่าเทเลมาติกส์ตอบสนองการขับของฉันได้ชัดเจนและเข้าใจได้)					
It will be easy to operate automotive telematics while driving (เทเลมาติกส์ใช้ได้อย่างง่ายดายขณะขับขี่)					

It will be not difficult to learn how to use automotive telematics (การใช้เทเลมาติกส์ในรถยนต์นั้นไม่ยากสำหรับฉัน)					
I find it easy to get the automotive telematics to do what I want to do (ฉันรู้สึกว่าเทเลมาติกส์ทำสิ่งต่างๆ ที่ฉันต้องการได้อย่างง่ายดาย)					
Interaction with the automotive telematics does not require a lot of my mental effort (การตอบสนองของเทเลมาติกส์ในรถยนต์ไม่ได้สร้างความลำบากใจ)					
C. Compatibility การเข้ากันได้ดี					
Using telematics will fit well with the way my driving (การใช้เทเลมาติกส์เหมาะกับการขับขี่ของฉัน)					
The installed					

telematics into my vehicle will be compatible with my driving (เทเลมาติกส์ที่ติดตั้งมาในรถยนต์จะเข้ากับการขับขี่ของฉันได้)					
2. Normative belief structure (ความเชื่อจากบรรทัดฐาน) **D. Peer influence** อิทธิพลจากเพื่อน					
My friends would think that I should use the telematics (เพื่อนๆของฉันคิดว่าฉันควรที่จะใช้เทเลมาติกส์)					
3. Control belief structure (การควบคุม) **E. Perceived Behavioral control** รู้สึกถึงการควบคุมได้					
I have the resources, knowledge, and ability to use automotive telematics (ฉันมีทรัพยากรด้านความรู้และความสามารถที่จะใช้เทเลมาติกส์ในรถยนต์ได้)					
Using automotive telematics is entirely within my control (การใช้เทเลมาติกส์ในรถยนต์อยู่					

ภายใต้การควบคุมของฉันทั้งสิ้น)					

Dependent variable (Y)

Intention to Use แนวโน้มที่จะใช้

6. Now please think about your attractive of using telematics. Could you please rate the overall attractiveness of the telematics installed in cars that you purchased?
(กรุณาให้ความเห็นว่า ท่านมีความสนใจที่จะใช้เทเลมาติกส์ที่ติดตั้งมาในรถยนต์ที่ซื้อมาหรือไม่ ดังคำถามต่อไปนี้)

	Low (ต่ำ)				**High**(สูง)
	1	**2**	**3**	**4**	**5**
Items (คำถาม)	**Strongly disagree** ไม่เห็นด้วยอย่างยิ่ง	**Disagree** ไม่เห็นด้วย	**Moderately agree** ค่อนข้างเห็นด้วย	**Agree** เห็นด้วย	**Extremely agree** เห็นด้วยอย่างยิ่ง
I intend to use automotive telematics while driving as often as needed (ฉันมีแนวโน้มที่จะใช้เทเลมาติกส์ในรถยนต์ขณะขับขี่เมื่อมีความจำเป็น)					
I would extend possibly use automotive telematics while driving (ฉันจะใช้เทเลมาติกส์บนรถยนต์มากขึ้นเรื่อยๆ ขณะขับขี่)					
I intent to use automotive telematics while driving rather than discontinue (ฉันมีแนวโน้มที่จะใช้เทเลมาติกส์บนรถยนต์ขณะขับขี่มากกว่าหยุดใช้งาน)					

Part III: Demographic of respondent (ข้อมูลทั่วไป)

7. Do you live in Bangkok? (ท่านอาศัยอยู่ในกรุงเทพหรือไม่?)

❒ Yes (ใช่) ❒ No (ไม่ใช่)

8. What is your marital status? (Single answer) (กรุณาระบุสถานภาพของท่าน เลือกเพียงข้อเดียว)

❒ Single (โสด) ❒ Married (แต่งงาน) ❒ Divorced/ Widowed (หม้าย/ หย่าร้าง)

9.Which is the best description of your current job? (Single answer) (กรุณาระบุอาชีพของท่าน เลือกเพียงข้อเดียว)

❒ Employee Fulltime (พนักงานประจำ) ❒ Employee Part-time(พนักงานจ้างชั่วคราว)

❒ Unemployed (ตกงาน) ❒ Retired (เกษียณอายุ)

10. What is your total monthly personal income? (Single answer) (ท่านมีรายได้ต่อเดือนเท่าไหร่ โปรดระบุข้อเดียว)

❒ Less than 15,000 baht (ต่ำว่า 15,000 บาท) ❒ 15,000-30,000 baht (ระหว่าง 15,000-30,000 บาท)

❒ 30,0001–45,000 baht (ระหว่าง 30,001-45,000 บาท)

❒ 45,001 – 60,000 baht (ระหว่าง 45,001-60,000 บาท)

❒ 60,001 – 75,000 baht (ระหว่าง 60,001-75,000 บาท)

❒ Higher than 75,000 baht (สูงกว่า 75,000 บาทขึ้นไป)

Thank you very much for your time (ขอบคุณสำหรับความร่วมมือ)

Appendix B –Qualitative Questionnaire Items

Qualitative interview of understanding Customers' acceptance of Telematics: the linkage of attitudinal, normative, and control belief structure with Technology Acceptance Model (TAM)

แบบสอบถามเพื่อความเข้าใจในการยอมรับการใช้เทมาติกส์ของลูกค้า: ความเกี่ยวโยงของทัศนคติ, บรรทัดฐานและปัจจัยการรับรู้ถึงการควบคุมพฤติกรรมของตน โดยทฤษฎีการยอมรับการใช้เทคโนโลยีสารสนเทศ

This interview item is conducted by a master individual study student from College of Management Mahidol University to better understand customers' motivations to use telematics. Related goals are how to best communicate the benefits and stimulate its adoption in Thailand. Filled-in information will be kept confidential and will be used for this research only. Please kindly answer all the questions; it will take you only 10 minutes. Thank you for your collaboration.

แบบสอบถามนี้จัดทำโดยนักศึกษาชั้นปริญญาโทจากวิทยาลัยการจัดการ มหาวิทยาลัยมหิดล เพื่อให้มีความเข้าใจว่าลูกค้ามีแรงจูงใจใดในการใช้เทเลมาติกส์ นอกจากนี้เพื่อให้ทราบว่าจะมีการสื่อสารเกี่ยวกับประโยชน์ของเทเลมาติกส์เพื่อกระตุ้นแรงจูงใจในการยอมรับการใช้งานเทเลมาติกส์ในประเทศไทย กรุณาเตอบคำถามซึ่งจะใช้เวลาประมาณ 10 นาที ขอบคุณสำหรับความร่วมมือ

(1) What kind of action can company take to increase telematics acceptance?
(บริษัทมีการดำเนินการใดที่ช่วยให้เกิดการยอมการการใช้เทเลมาติสก์มากขึ้นบ้าง?)

(2) Which telematics characteristics create and support telematics acceptance?
(ลักษณะของเทเลมาติกส์ใดที่ช่วยและส่งเสริมให้เกิดการยอมรับขึ้นบ้าง?)

Thank you very much for your time. (ขอบคุณสำหรับความร่วมมือ)