THE FACTORS INFLUENCING THE ACCEPTANCE OF PLANNED MAINTENANCE SYSTEM INFORMATION TECHNOLOGY OF THE ROYAL THAI NAVY OFFICERS

CDR. ANUPONG SURACHAIPUNYA

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……………….…………..…..…………….
Cdr. Anupong Surachaipunya
Candidate

………………………….….…..…………….
Asst. Prof. Thanakorn Naenna,
Ph.D. (Engineering Science)
Major advisor

………………………….….…..…………….
Asst. Prof. Tanawut Tantimongcolwat,
Ph.D. (Medical Technology)
Co-advisor

………………………….….…..………
Prof. Banchong Mahaisavariya,
M.D., Dip Thai Board of Orthopedics
Dean
Faculty of Graduate Studies
Mahidol University

………………………….….…..…………….
Asst. Prof. Thanakorn Naenna,
Ph.D. (Engineering Science)
Program Director
Master of Engineering Program in
Industrial Engineering
Faculty of Engineering
Mahidol University

Thesis
entitled

THE FACTORS INFLUENCING THE ACCEPTANCE OF PLANNED MAINTENANCE SYSTEM INFORMATION TECHNOLOGY OF THE ROYAL THAI NAVY OFFICERS

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on
December 13, 2013

……………….……….…..………
Cdr. Anupong Surachaipunya
Candidate

…………………….…..………………
Lect. Poonpong Suksawang,
PH.D. (Education Measurement and Evaluation)
Chair

…………………….…...……………..……
Asst. Prof. Tanawut Tantimongcolwat,
Ph.D. (Medical Technology)
Member

…………………….…..…………..……
Asst. Prof. Thanakorn Naenna,
Ph.D. (Engineering Science)
Member

…………………….…..……………...…
Prof. Banchong Mahaisavariya,
M.D., Dip Thai Board of Orthopedics
Dean
Faculty of Graduate Studies
Mahidol University

…………………….…..……………...…
Lect. Worawit Israngkul,
M.S. (Technical Management)
Dean
Faculty of Engineering
Mahidol University

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Cdr. Anupong Surachaipunya

THE FACTORS INFLUENCING THE ACCEPTANCE OF PLANNED MAINTENANCE SYSTEM INFORMATION TECHNOLOGY OF THE ROYAL THAI NAVY OFFICERS

CDR. ANUPONG SURACHAIPUNYA 5236749 EGIE/M

M.Eng. (INDUSTRIAL ENGINEERING)

THESIS ADVISORY COMMITTEE : THANAKORN NAENNA, Ph.D., TANAWUT TANTIMONGCOLWAT, Ph.D.

ABSTRACT

The Royal Thai Navy use the planned maintenance system information technology (PMS.IT.) to maintain the weapons and equipment of the prepared battleship for operation to achieve the vision and mission. However using PMS.IT. is still a problem making it an issue to study the factors influencing the acceptance of PMS.IT. among the Royal Thai Navy officers. However, the recognition of users should not only consider the perception of the technology but also the appropriateness between the technology and the task. Consequently the Unified Theory of Acceptance and Usage of Technology (UTAUT) is integrated with the Task Technology Fit Model (TTF) as a framework to investigate the factors that influence users' acceptance and intention to use PMS.IT.. Goodness of fit measures indicate that the model was consistent with empirical data and reliability. This study found that behavior intention (BI) has more impact than facilitating condition (FC) towards use behavior (UB) in using PMS.IT.. Furthermore the direct effects : task – technology fit (TTF), social influence (SI), performance expectancy (PE) and effort expectancy (EE), and the indirect effects : task characteristics (TA) and technology characteristics (TE), have respectively lessening impacts on the behavior intention. The results implied that the definite task and duty RTN, the supporting commander, the beneficial job and easy use influences intent and actual use of PMS.IT. and applied to improve and develop PMS.IT. to suit the needs of users and to achieve the established objectives of RTN.

KEY WORDS: PLANNED MAINTENANCE SYSTEM INFORMATION TECHNOLOGY (PMS.IT.) / UNIFIED THEORY OF ACCEPTANCE AND USE OF TECHNOLOGY (UTAUT) / TASK- TECHNOLOGY FIT (TTF) / STRUCTURE EQUATION MODELING (SEM)

80 pages

ปัจจัยที่มีผลต่อการยอมรับการใช้ระบบสารสนเทศการซ่อมบำรุงตามแผนของข้าราชการทหารเรือ
THE FACTORS INFLUENCING THE ACCEPTANCE OF PLANNED MAINTENANCE SYSTEM INFORMATION TECHNOLOGY OF THE ROYAL THAI NAVY OFFICERS

อนุพงษ์ สุระชัยปัญญา 5236749 EGIE/M

วศ.ม. (วิศวกรรมอุตสาหการ)

คณะกรรมการที่ปรึกษาวิทยานิพนธ์ : ธนกรณ์ แน่นหนา, Ph.D., ธนาวุฒิ ตันติมงคลวัฒน์, Ph.D.

บทคัดย่อ

กองทัพเรือได้ใช้ระบบสารสนเทศการซ่อมบำรุงตามแผน (PMS.IT.) ในด้านการซ่อมบำรุงระบบอาวุธและยุทโธปกรณ์ของ ทร. เพื่อให้กองกำลังทางเรือมีความพร้อมต่อการปฏิบัติงานให้บรรลุตามวิสัยทัศน์และพันธกิจที่ ทร. กำหนดไว้ แต่อย่างไรก็ตามการใช้ระบบดังกล่าวใน ทร. ยังคงมีปัญหาในการใช้งาน จึงทำให้ต้องมีการศึกษาถึงปัจจัยที่มีผลต่อการยอมรับการใช้ระบบ PMS.IT. ของข้าราชการ ทร. เกิดขึ้น เพื่อหาแนวทางแก้ไขปัญหาข้างต้น ซึ่งปัจจัยที่มีผลต่อการยอมรับการใช้งานของผู้ใช้นั้น ไม่ควรพิจารณาเพียงแค่การรับรู้ทางด้านเทคโนโลยีเท่านั้น แต่ควรพิจารณาถึงความเหมาะสมระหว่างเทคโนโลยีกับงานด้วย ดังนั้น เพื่อให้ครอบคลุมประเด็นดังกล่าวจึงได้ประยุกต์รวมปัจจัยทฤษฎีรวมของการยอมรับและการใช้เทคโนโลยี (UTAUT) ของ Venkatesh และคณะ (2003) กับทฤษฎีความเหมาะสมระหว่างงานและเทคโนโลยี (TTF) ของ Goodhue & Thompson (1995) การวิเคราะห์ข้อมูลตรวจสอบความตรงเชิงโครงสร้างของโมเดล ผลการศึกษาปรากฏว่าโมเดลความสัมพันธ์เชิงสาเหตุของปัจจัยที่มีผลต่อการยอมรับการใช้ PMS.IT. ของกลุ่มตัวอย่างข้าราชการ ทร. มีความสอดคล้องกับข้อมูลเชิงประจักษ์อยู่ในเกณฑ์ดีและมีความน่าเชื่อถือ การศึกษาครั้งนี้พบว่า ความตั้งใจแสดงพฤติกรรม (BI) มีผลกระทบต่อพฤติกรรมการใช้งาน (UB) ระบบ PMS.IT.มากกว่าสิ่งอำนวยความสะดวกในการใช้งาน (FC) นอกจากนี้ ผลกระทบต่อความตั้งใจแสดงพฤติกรรม เรียงลำดับจากมีผลกระทบมากกว่าไปถึงมีผลกระทบน้อยกว่า ซึ่งในส่วนของผลกระทบโดยตรง ได้แก่ การใช้เทคโนโลยีที่เหมาะสมกับการใช้งาน (TTF), อิทธิพลของสังคม (SI), ประสิทธิภาพของระบบ (PE) และความพยายามใช้งานระบบ (EE) และในส่วนของผลกระทบทางอ้อม ได้แก่ ลักษณะของงาน (TA) และลักษณะของเทคโนโลยี (TE) ผลลัพธ์ดังกล่าวแสดงให้เห็นว่า ลักษณะของงานและหน้าที่รับผิดชอบของ ทร., การสนับสนุนจากผู้บังคับบัญชา, เป็นประโยชน์ต่อการปฏิบัติงานและการใช้งานระบบที่ง่าย มีผลต่อความตั้งใจและใช้ระบบ PMS.IT. และสามารถนำไปใช้ปรับปรุงและพัฒนาระบบ PMS.IT. เพื่อให้เหมาะสมกับความต้องการของผู้ใช้และบรรลุตามวัตถุประสงค์ของ ทร. ต่อไป

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CHAPTER I
INTRODUCTION

1.1 Origin and Significance of the Problem

Royal Thai Navy's vision.

"RTN will be regional leader with a modern well-balanced force under quality-enhanced management."

RTN mission.

1. Troops, weapons and logistics systems innovative are provided with balanced, compact and provided for protect and defend the national marine interests.

2. The naval force will be used to maintenance of sovereignty, national marine interests, offering security and giving honor to the monarchy as well as other military missions assigned.

3. The potential and capabilities of the naval force support the government to develop the country, to solve the social issues, to help the public and to relief the disaster.

4. The management of RTN is under the framework to good-manage the country.

The maritime zone has been established in accordance with the United Nations Convention on the Law of the Sea (UNCLOS), 1982. Under the UNCLOS there are six principle maritime zones. These are:

- the internal water
- the territorial sea
- contiguous zone
- exclusive economic zone
- the continental shelf
- the high seas.

The maritime zone of Thailand is the approximate areas 350,000 square kilometers that bring to the national marine interests valued more than 7.4 trillion baht. These areas are used to cover many aspects of the life and non-living resources on the sea with a variety of activities such as transportation, tourism, communications and navigation. The value of the national marine interests divided into the marine and coastal resources, the activity and the loss of opportunity (Padermsak et al., 2007).

Approximately 350,000 square kilometers of the maritime zone in Thailand and more than 7.4 trillion baht of the national marine interests valued, the naval forces of RTN have duty to protect and defend the sovereignty and the national marine interest. The important part of RTN to achieve vision and mission is the combat-ready naval forces capable at all times. The maintenance is influence factor to the combat-ready naval forces. RTN began to use the Planned Maintenance System (PMS) (Royal Thai Navy, 1986) since 1986. PMS is the preventive maintenance that includes planning, timing, controlling and monitoring system. PMS were developed and integrated from the maintenance systems of U.S. Navy, British Navy, German Navy and Navy in Singapore. The principles, guidelines, and models of them had been modified more suitability for PMS's RTN. PMS is used making the equipment available throughout the life-cycle and preventing deterioration of the equipment premature. From the implementation of PMS, the problems are (Nipon, 2004; Keaingkai, 2008)

1. An error has occurred in the process of the transferred schedule that consist of a maintenance plan in 1 cycle (004 PMS), a maintenance plan in 3 months (005 PMS) and the weekly maintenance plan (006 PMS). Those aren't consistent with the maintenance cycle of the equipment manufacturer which this can cause the lifetime and the deterioration of the equipment occurring prematurely.

2. Equipment within the battle ship are several main systems that difficult to learn and to practice them correctly. If the lack of understanding and expertise set up the plan, the established plan may be not related with the time of the withdrawal or supply spare parts for maintenance.

3. The more spaces are used to collect and store documents because of the plan make a lot of paperwork and keep them for a long time to be used as evidence of the government. When the equipment is damaged prematurely, the documents can be used as evidence and information for the analysis of the damaged cause.

4. The maintenance and spare part data each year aren’t collected statistically. It is impossible to search the required information quickly and accurately and difficult to present the budgets for providing a comprehensive and adequate supply of spare parts and maintenance each year.

5. From the paper report, the collected information are difficult to analyze and conclude the performance of PMS for the agency and the executive commander.

From the problems, Royal Thai Fleet has developed the planned maintenance system information technology (PMS.IT.) for the problem solving by adhering in the PMS founded in 1986 as guidelines in development process. In addition PMS.IT. has brought the advantages of the Integrated Logistics Support (ILS) to compound the improved system in order to completely cover the needs of users and departments.

The researcher has seen the benefits and importance to use PMS.IT. However, it should be studied and analyzed the data that influence transfer from PMS to PMS.IT. Because of many research works had been found the users’ attitudes and acceptance of a new information system have significant impacts on successful information system adoption (Davis, 1989; Succi and Walter, 1999; Venkatesh, Viswanath and Davis., 1996). Moreover the Royal Thai Navy never before studied the users’ attitudes and acceptance of a new information system (PMS.IT.). From interview the RTN officers, they have the problem using PMS.IT. such as network fall, difficult operating, never see the using advantage and so on. The researcher thinks studying with a focus on the influencing factors of the acceptance and adoption PMS.IT. that the results can solve these relevant problems. Consequently the researcher selects to integrate with the Unified theory of acceptance and usage of technology (UTAUT) (Venkatesh et al., 2003), and Task Technology Fit Model (TTF) (Goodhue and Thompson, 1995) as a framework to investigate the factors that influence users’ acceptance and intention to use PMS.IT. They will be applied to improve and develop PMS.IT. to suit the needs of users and to achieve the established objectives in RTN.

1.2 Objectives

The objectives of this research are following:

1.2.1 To study the influencing factors are the adoption of the planned maintenance system information technology (PMS.IT.) in the Royal Thai Navy officers.

1.2.2 To investigate the relationship of various factors relate to the adoption of PMS.IT. according to integrate theories, the Unified Theory of Acceptance and Use Technology (UTAUT) and Task Technology Fit Model (TTF).

1.3 Scope of work

Researchers have determined the scope of work to study the factors affecting the adopting PMS.IT. of the officers for specific tasks on the battleship only. Because of they are involved in the traditional PMS. and PMS.IT. rather than the other groups.

1.4 Expected Benefits

To investigate the factors that influence users' acceptance and intention to use PMS.IT. will be applied to improve and develop PMS.IT. to suit the needs' users and to achieve the established objectives of RTN to the future.

CHAPTER II
LITERATURE REVIEWS

Concepts, theories and literatures that involved in this research are divided into.

2.1 Types of Maintenance

2.2 Planned Maintenance System (PMS)

2.3 Planned Maintenance System Information Technology (PMS.IT.)

2.4 Concepts and related theories.

2.4.1 Unified theory of acceptance and usage of technology (UTAUT)

2.4.2 Task-technology fit Model (TTF)

2.5 Related researches

2.6 Research model and hypotheses

2.1 Types of Maintenance

From literature review, the researcher has found references to five different types of maintenance:

1. Corrective maintenance (Wireman, 2003): Actions carried out on the network, which are necessary to remedy or alleviate incidences producing degradation of services rendered through it.

2. Preventive maintenance (Herbaty,1990; Iung Benoît, 2006): A set of planned routines carried out on network elements in order to maintain them in an optimum level of performance to reduce the reoccurrence of incidence.

3. Predictive maintenance, based on condition (Moubray, 1997). A set of analysis aimed at estimating the occurrence and behavior of an incidence.

4. Proactive maintenance (Palmer, 2006; Andrew S., 1991): A set of activities designed to detect and correct an incidence before it occurs avoiding its effects within the network and in the service.

5. Perfective maintenance: In the spirit of continuous improvement (IEEE1219 - 93; (1993) this type of activities are included within a set of projects that are normally designed after the start of the operational phase of a distribution network. Their scope is to improve network performance and/or maintainability as well as the services provided through it. These activities are also called ‘‘design-out maintenance’’ by other authors (Gelders and Pintelon, 1988).

2.2 Planned Maintenance System (PMS)

"…PMS is a standardized method for planning, scheduling, and accomplishing preventive maintenance by ship's force. PMS maintenance procedures will be developed in accordance with Reliability-Centered Maintenance (RCM) concepts as specified in references (c) and (d). The procedures are to be developed by the activities of the Systems Commands (SYSCOMs) responsible for the development and procurement of the systems/equipment for active, new construction, major conversion and activation of ships, boats, and crafts. The procedures are to be the minimum required to maintain equipment in a fully operable condition within specifications. PMS supersedes all organizational level planned or preventive maintenance systems or programs. Where a difference between the requirements and/or procedures of PMS and other technical publications or systems exists, PMS requirements will prevail. Differences shall be reported using PMS feedback reporting procedures.

c. To reduce PMS requirements while in extended maintenance periods and other times when equipment is not operated, an Inactive Equipment Maintenance (IEM) system will provide modified PMS procedures for the maintenance of systems and equipment.

d. Maintenance Data System (MDS) is the means by which maintenance personnel can report applicable maintenance requirements and configuration changes on all categories of equipment. MDS will be set up so that maintenance personnel will record maintenance data only once (Department of the Navy Instruction, 2007)."

"…The PMS is a planning and control system that prescribes a logical and efficient approach to complex mechanical, electrical, and electronic maintenance. The

PMS was developed to provide supervisors at each maintenance level with methods for effectively planning, scheduling, and controlling shipboard maintenance. It includes a maintenance data collection system used to record important scheduled and corrective maintenance information, and electronic data processing capabilities used to retrieve this information for maintenance analysis (Steven and Allen, 1992)."

PMS in RTN is the preventive maintenance that includes planning, timing, controlling and monitoring system. PMS will be the responsibility of the organizational level, the intermediate level and depot level.

RTN began to use the Planned Maintenance System (PMS) since 1986. PMS were developed and integrated from the maintenance systems of U.S. Navy, British Navy, German Navy and Navy in Singapore. The principles, guidelines, and models of them had been modified more suitability for PMS's RTN (Royal Thai Navy, 1986).

2.2.1 The benefits of PMS include:

1. Used equipment throughout the lifetime.
2. Planning to use equipment efficiently and effectively.
3. Decreased cost of maintenance.
4. Prepared to supply the spare parts and maintain the collection in advance.
5. Maintenance operators at all levels are ready to work every time.
6. Operating thoroughly and effectively.

2.2.2 The reporting form of PMS consists of the following:

1. 001/PMS is list of the maintenance requirement
2. 002-1/PMS is list of the need equipment using Maintenance Requirement Card (MRC)
3. 002-2/PMS is list of the spare part using MRC
4. 002-3/PMS is all MRC of the devices in systems
5. 004/PMS is cycle schedules or … years
6. 005/PMS is quarterly schedules
7. 006/PMS is weekly schedules

8. 007/PMS is reporting form of the obstacles and objections
9. 008/PMS is reporting form of the maintenance operations

2.2.3 Maintenance Requirement Card (MRC)

Maintenance Requirement Card (MRC) provide detailed procedures for performing maintenance requirements and describes who, what, how, and with what resources a specific requirement will be accomplished.

บัตรจ่ายงาน

002/PMS

ระบบ	**ระบบย่อย**	**ส่วนของระบบย่อย**	**รหัสบัตร**
ขับเคลื่อน	เครื่องจักรใหญ่ MTU 12V 538 TB 81	ฝาสูบ	รขค.๑.๒- ๒ปต.(๑๕) ๑/๕

<u>สิ่งที่ต้องปฏิบัติ</u>	**ผู้ปฏิบัติ/เวลา**
๑. ตรวจสอบสภาพเรือนลูกเบี้ยวและกระเดื่อง	พ.๑.จ.๒/
๒. ตรวจสอบระยะกระเดื่องกดลิ้น	๓ ชม.

<u>ข้อระมัดระวังในการป้องกันอันตราย</u>

ก่อนประกอบฝาปิดแผ่นบนให้ตรวจความเรียบร้อยบนฝาสูบ ต้องไม่มีเครื่องมือหรืออุปกรณ์อื่นๆ ตกค้างอยู่

<u>เครื่องมือ, ชิ้นส่วน, วัสดุ, เครื่องมือตรวจสอบ</u>

๑. ประแจชุด MTU ๑ ชุด ๒. ท่อต่อน้ำมัน ๑ ชุด

๓. GAUGE วัดระยะ ๑ ชุด

<u>วิธีปฏิบัติ</u>

๑. ตรวจสอบสภาพเรือนลูกเบี้ยว และกระเดื่องกดลิ้น

๑.๑ เตรียมการเดินเครื่องตามบัตรจ่ายงาน รขค.๑.๒-ส.๑/๑

Figure 2.1 Maintenance Requirement Card (MRC).

2.2.4 Maintenance Scheduling

Maintenance Scheduling will tell us when the equipment is due to maintain. This work will be presented in cycle schedule (004/PMS), quarterly schedule (005/PMS) and weekly schedule (006/PMS).

Cycle Schedule

The Cycle Schedule is used by the combat system officer (CSO) to plan weekly, monthly, quarterly and other requirements. The Cycle Schedule is the main plan which includes the work of performers at all levels and all equipment required for maintenance of the plan. It is a visual display of preventive maintenance requirements based on the ship's overhaul cycle.

Quarterly Schedule

The Quarterly Schedule, planned from the Cycle Schedule, is a visual display that shows a quarter's worth of specific maintenance requirements, divided into weeks. The Quarterly Schedule assigns specific requirements in conjunction with the ship's operational schedule.

Weekly Schedule

The Weekly Schedule is a visual display that is posted in the working area of each maintenance group. The maintenance group supervisor uses the Weekly Schedule to assign specific personnel to perform maintenance on specific equipment. Assignments include system and equipment tests and servicing procedures.

2.3 Planned Maintenance System Information Technology (PMS.IT.)

Guidelines for making the PMS.IT.

The development of PMS.IT. was designed as follows;

1. Changing the performance of the maintenance department from using the action by hand (manual) to the information technology.

2. Taking advantage the information technology to manage and statistical analysis for the admiral and the department that see the action overview of the ship maintenance in RTN.

Objective

1. The PMS.IT. will cover PMS (1986) as follows;

1.1 Taking database of Maintenance Requirement Card (002-3)

1.2 Using computer planning schedules (004,005,006) and taking database for the action planning

1.3 Collecting the statistic of the performance, obstacles and failure

1.4 Managing the spare part of the ship in RTN (002-2)

1.5 Providing the report system of the obstacles and objections (007)

1.6 Making the statistical collection system of the concluding maintenance operations (008,008-1)

1.7 Providing the estimate system of the ahead using

1.8 Doing database of the electronic documents and the manual equipment within the ship in RTN

2. The PMS.IT. show the operating results of the PMS and the statistical data for the admiral and the department in RTN to estimate the preparation of a supply of spare parts in each year.

3. The PMS.IT. support the data as the ship configuration and the using equipment hours, with the technical department to use for planning the maintenance of ships.

Components of the PMS.IT. consist of:

1. The maintenance requirement card system
2. The performance planning system
3. The system of the operation collection and performance objection
4. The report system of the conclude performance
5. The report system of the obstacles and objections (007 type following)
6. The spare parts management system
7. The operating system of the using equipment hours
8. The ship configuration system
9. The system of the designated agency to comply with the maintenance requirement card of the technique
10. The cancel - planning system in case ship underwent repairs

User Group

Users in each group will operate differently following to relate PMS. Therefore, the applications will be placed or displayed in the user group. Users in each group can connect to the computer and information services (Database Server) from a RTN network or VPN (Virtual Private Network).The fifth users group consists of

1. Officers of the battleship
2. Officer of the squadron
3. Officers of the material inspection division, the Royal Thai Fleet
4. Officers of the maintenance department
5. Executives

Table 2.1 Compare PMS with PMS.IT.

Compare PMS with PMS.IT.			
No.	**Title**	**PMS**	**PMS.IT.**
1.	The maintenance requirement card system	Paper	Paper and collected as an electronic database
2.	The process of the transferred schedule (004,005 and006)	Using the officers	Using the computer
3.	The report system of the conclude performance	Paper	Printing report from Electronic database system
4.	The spare parts management system	Storage of paper forms and without processing systems	Processing systems and stored in electronic databases system
5.	The report system of the obstacles and objections (007)	Reporting by paper following inline	Reporting and monitoring by information system
6.	The system of the concluding maintenance operations (008,008-1)	Reporting by paper following inline	Using computer to process and conclude as report
7.	The system of the using equipment hours	-	When recording hours of use, the system will check the MRC for bring the using equipment hours to determine the operation days.
8.	The ship configuration system	-	Each ship makes the ship configuration system and associate the MRC with the ship configuration system.

Table 2.1 Compare PMS with PMS.IT. (cont.)

No.	Title	PMS	PMS.IT.
9.	Monitoring performance in overall	Summary the report from each ship	The system will process and conclude as the statistics
10.	Estimating to use the spare parts in advance on the PMS for each year	-	The system will process to estimate using the spare parts in advance

2.4 Concepts and related theories

2.4.1 Unified theory of acceptance and usage of technology (UTAUT)

Unified theory of acceptance and usage of technology (UTAUT) is a theory of user acceptance and use of information technology. The latest model was created by Venkatesh et al. (2003), which form was developed by reviewing eight prominent technology acceptance models. As follows

1. The theory of reasoned action (TRA) (Fishbein and Ajzen, 1975)

This model that the field of social psychology was developed by Fishbein and Ajzen (1975) using to predict and explain human behavior. In TRA the major constructs are attitudes and subjective norms that have an impact on behavioral intention, which subsequently influences actual behavior.

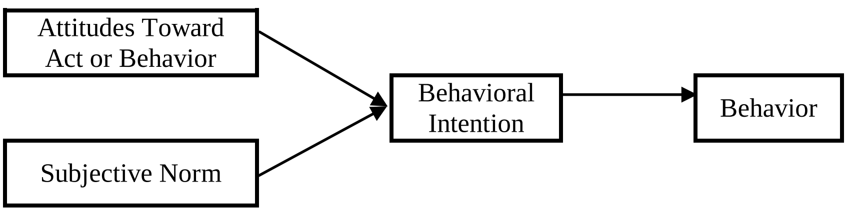


Figure 2.2 The theory of reasoned action (TRA) (Fishbein and Ajzen, 1975)

2. The technology acceptance model (TAM) (Davis, 1989)

TAM was introduced and developed from Theory Reasoned Action (TRA)by Davis (1986, 1989). It has been extensively accepted in the acceptance of technology. TAM determined two components; perceived usefulness (PU) and perceived ease of use (PEOU) that influence on the individual's attitude towards using technology.

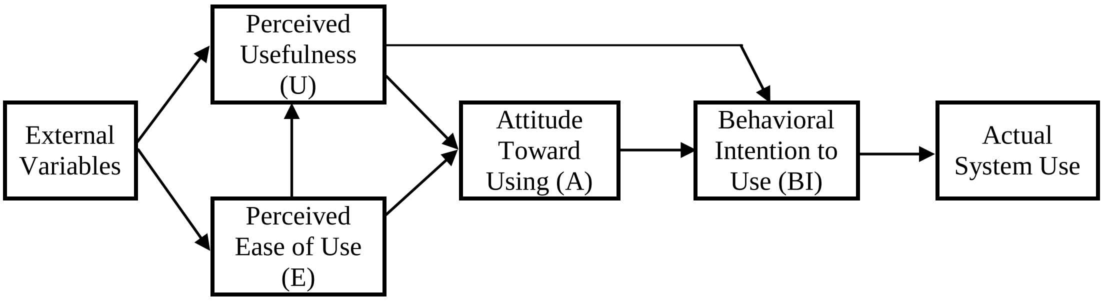


Figure 2.3 Technology Acceptance Model (TAM) (Davis, F.D., 1989)

3. The motivational model (MM) (Davis, Bagozzi and Warshaw, 1992)

In 1992, MM was developed by Davis, Bagozzi and Warshaw that determined two components;

- Extrinsic motivation associated perceived usefulness with performance resulting from the using.
- Intrinsic motivation related to the enjoyment and encouragement of the process of performing a behavior.

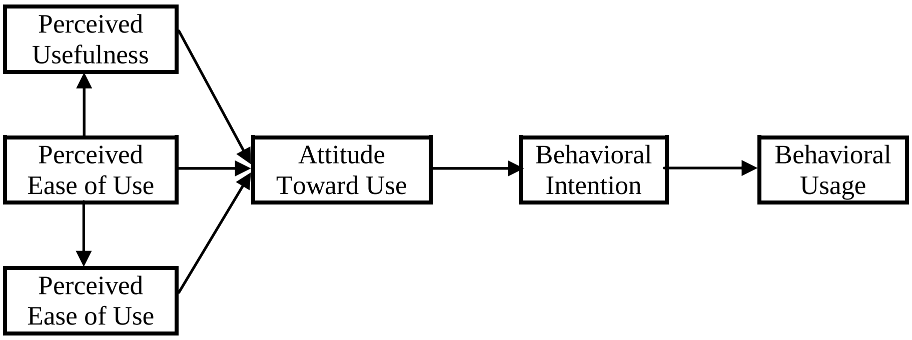


Figure 2.4 The motivational model (MM) (Davis, Bagozzi and Warshaw,1992)

4. Theory of Planned Behavior (TPB) (Ajzen, 1991)

The Theory of Planned Behavior (TPB) is an extension of the Theory of Reasoned Action (TRA) by Ajzen (1991) including the concept of perceived ease or difficulty of performing the behavior, also known perceived behavioral control (PBC). Thus, the TPB is determined by attitude toward the behavior, subjective norms, and perceived behavioral control. Ajzen (1991) argues that PBC may also have a direct effect on behavior if the individual does not have complete volitional control.

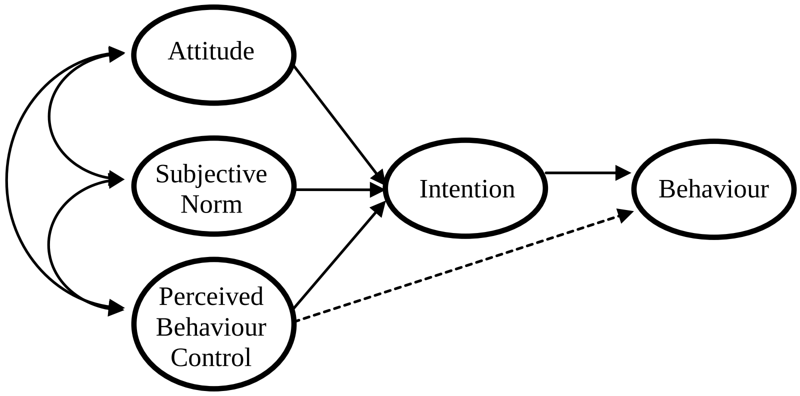


Figure 2.5 Theory of Planned Behavior (TPB) (Ajzen, 1991)

5. The Model of PC Utilization (MPCU) (Thompson, Higgins, and Howell, 1991)

The Model of PC Utilization (MPCU) was modified from Triand is (1980) model of human behavior to describe the acceptance and usage of information technologies (Thomson et al., 1991). The model distinguishes beliefs about how actions are tied to emotion or future consequences. MPCU have six core constructs: job-fit, complexity, long-term consequences, affect towards use, social factors and facilitating conditions.

6. The innovation diffusion theory (IDT) (Moore and Benbasat, 1991; Rogers, 2003)

This model explains the process by which innovations in technology are adopted by users. Innovation, as defined by Rogers (1995), is "an idea, practice, or object that is perceived as new by an individual or other unit of adoption". Rogers defines diffusion as "the process by which an innovation is communicated through certain channels over time among the members of a social system". IDT determined 7 components: relative advantage, ease of use, image, visibility, compatibility, results demonstrability and voluntariness of use. Empirical tests have shown that the model demonstrates moderate predictive ability and the influence that its constructs have on behavioral intention and use (Moore and Benbasat, 1991).

7. The social cognitive theory (SCT) (Bandura, 1986; Compeau and Higgins, 1995)

Social cognitive theory (SCT) provides a framework for understanding, predicting and changing human behavior. The theory identifies human behavior as an interaction of personal factors, behavior, and the environment (Bandura 1977; Bandura 1986). SCT determined 5 components; outcome expectations – performance, outcome expectations – personal, self-efficacy, affect and anxiety (Compeau and Higgins, 1995).

8. The integrated model of technology acceptance and planned behavior (C-TAM-TPB or Extended TAM) (Taylor and Todd, 1995).

Taylor and Todd (1995) proposed a model to explain IT use, which is largely based on TAM and TPB. They hypothesized that separating subjects into groups based on prior use of IT would reveal different strengths in the influence of the C-TAM-TPB constructs. C-TAM-TPB is 4 constructs: attitude toward behavior, subjective norm, perceived behavior control and perceived usefulness.

The UTAUT consists of four core components of intention and usage: performance expectancy, effort expectancy, social influence and facilitating conditions. Venkatesh et al. (2003) defined the four factors as follows:

1. Performance Expectancy (PE) is the degree to which an individual believes that using a system will help him or her attain gains in job performance. The five constructs that concerned with PE are perceived usefulness, extrinsic motivation, job-fit, relative advantage, and outcome expectations.

2. Effort Expectancy (EE) is the degree of ease associated with the use of the system. Three models are based on the concept of EE: namely perceived ease of use, complexity, and ease of use.

3. Social Influence (SI) is the degree to which an individual perceives that important others believe he or she should use the new system. This

definition of SI depends on resemblance of the three constructs: subjective norm, social factors, and image.

4. Facilitating Conditions (FC) refer to the degree to which an individual believes that an organizational and technical infrastructure exists to support use of the system. In the UTAUT, constructs essential FC were integrated from perceived behavioral control, facilitating conditions and compatibility.

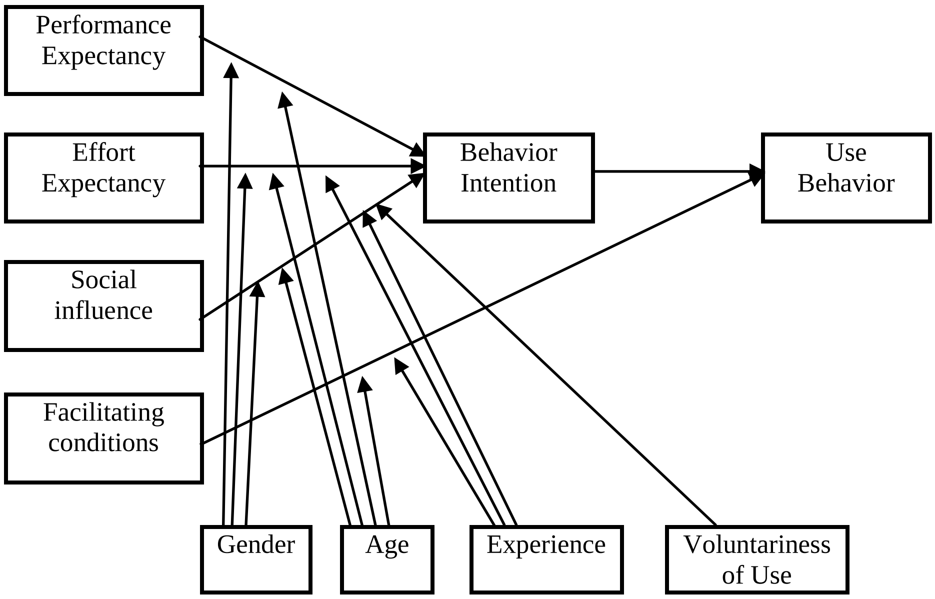


Figure 2.6 Unified theory of acceptance and usage of technology (UTAUT) (Venkatesh et al., 2003)

From these four constructs, UTAUT also contains four variables that moderate the relationships between the determination and predictors or use: gender, age, experience with the technology and voluntariness of use. UTAUT was found to explain up to 70% of the variance in behavioral determination, thereby outperforming its originating models.

2.4.2 Task-technology fit Model (TTF)

Task-Technology Fit (TTF) model is extensively used for the prediction and explanation of technology utilization. TTF was offered by Goodhue and Thompson in 1995. TTF is the “degree to which a technology assists an individual in performing their portfolio of tasks." The primary objective was to evaluate successful matching between task and information technology. Goodhue and Thompson proposed the idea that information technology should provide assistance to job performance that technology has to be accepted and willing to be used by people - tasks relative.

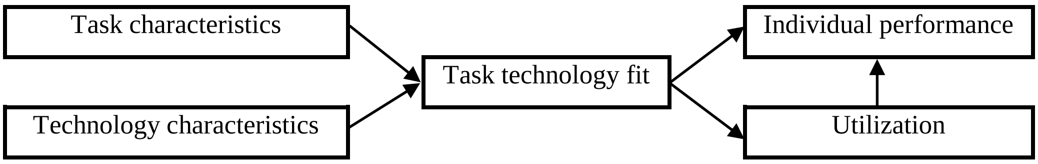


Figure 2.7 Task-Technology Fit (TTF) (Goodhue and Thompson, 1995)

2.5 Related researches

2.5.1 UTAUT

Gupta, B., et al. (2008) explore adoption of ICT to enhance government-to-employee interactions in a government organization in India, a developing country. They examine this adoption behavior by utilizing the UTAUT model and using the multiple regressions to test the UTAUT model. They found that performance expectancy, effort expectancy and social influence have a significant positive impact on the intention to use ICT, and facilitating conditions affect actual use in a government organization in India. They did not find a significant moderating effect of gender on these relationships.

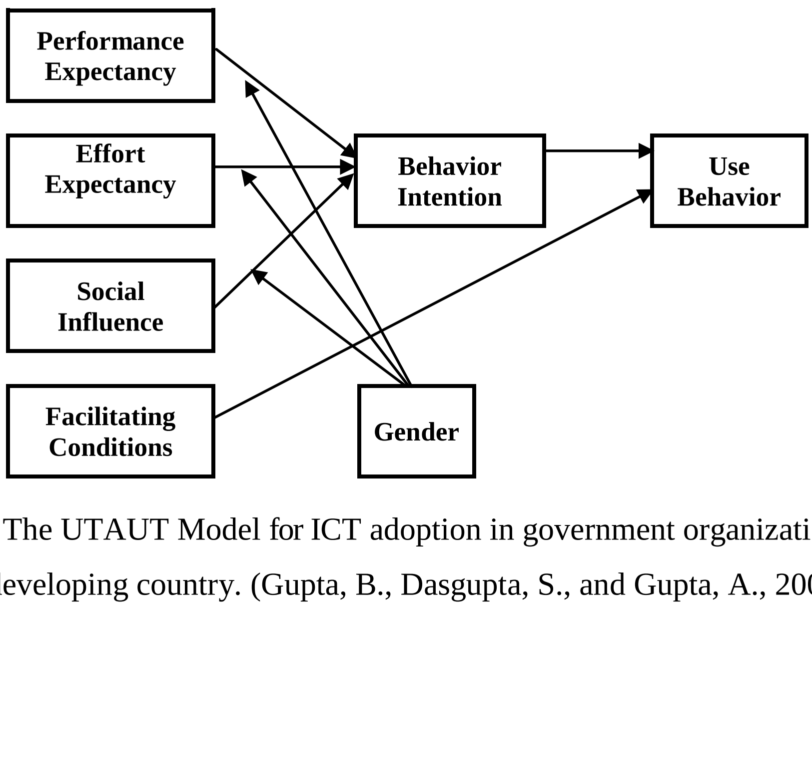


Figure 2.8 The UTAUT Model for ICT adoption in government organization in India, a developing country. (Gupta, B., Dasgupta, S., and Gupta, A., 2008)

Suha AlAwadhi and Anne Morris (2008) adopted the UTAUT model to explore factors that determine the adoption of e-government services in a developing country, Kuwait. 880 students were surveyed and limited to undergraduate and postgraduate students at Kuwait University. A regression analysis process was undertaken based on the research model (the amended UTAUT), which included predictors (independent variables), outcomes (dependent variables) and moderators. The findings showed that performance expectancy, effort expectancy, peer influence and facilitating conditions were significant in the adoption of e-government services in Kuwait.

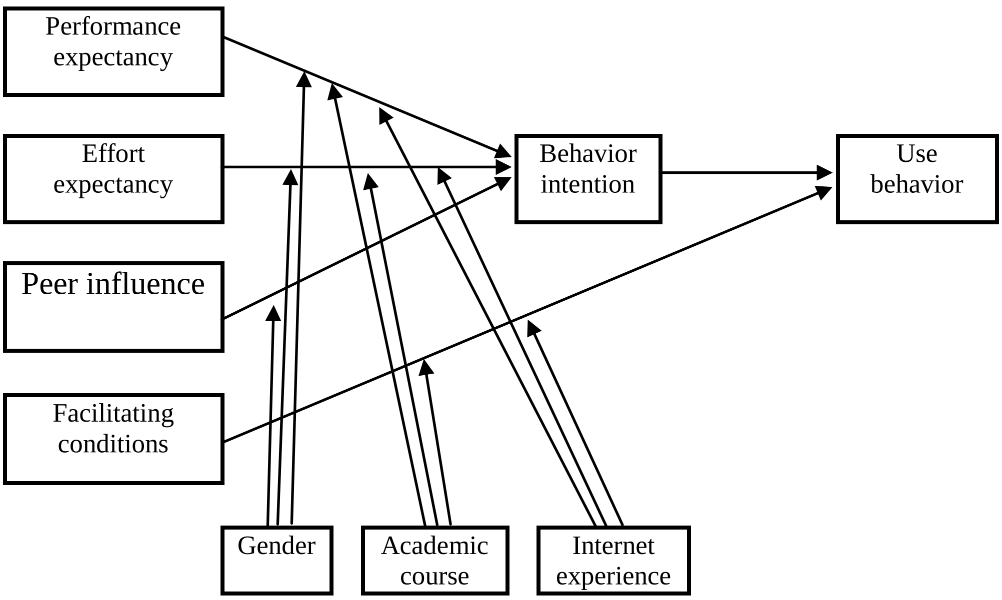


Figure 2.9 The UTAUT Model for the adoption of e-government services in a developing country, Kuwait. (AlAwadhi S. and Morris A., 2008)

Lee, C.-L., et al. (2010) adopt the viewpoint of the UTAUT model to examine the change agents' behavioral intentions in the implementation of an activity based costing/management (ABC/M) system. This research used Taiwanese companies as the sample. Confirmatory factor analysis was used to test the UTAUT model including: performance expectancy, effort expectancy, social influence, facilitating conditions, change agents' behavior intentions, the extent of usage of ABC/M, and performance improvement. The empirical results from 100 valid responses collected indicate that performance expectancy and social influence directly affect change agents' behavioral intentions. Both change agents' behavioral intentions and facilitation conditions are important constructs that affect the extent of usage of ABC/M systems.

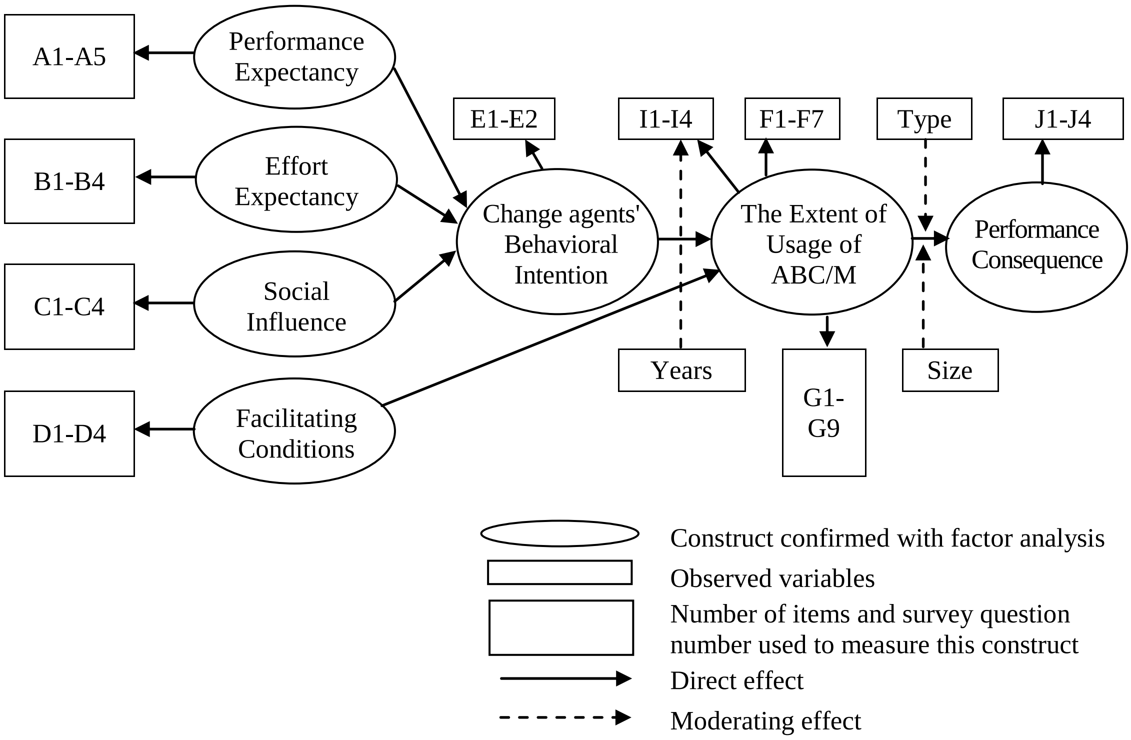


Figure 2.10 The UTAUT Model to examine the change agents' behavioral intentions in the implementation of an ABC/M system. (Lee, C.-L., et al., 2010)

2.5.2 TTF

Dishaw, M.T., and Strong, D.M., (1998) adopt a TTF model to explain the factors which lead to the use of the software maintenance support tools. Using this model, fit between maintenance task and technology characteristics is computed for two dimensions of fit derived from the task and technology models. The seven variables; production task activities, coordination task activities, production tool functionality, coordination tool functionality, production fit, coordination fit, and tool utilization measuring the constructs in the TTF model were measured with questionnaire items. All statistics were computed using SPSS for Windows. They conclude that TTF models are a useful way to think about IT utilization and a significant improvement over the models with task and technology variables alone.

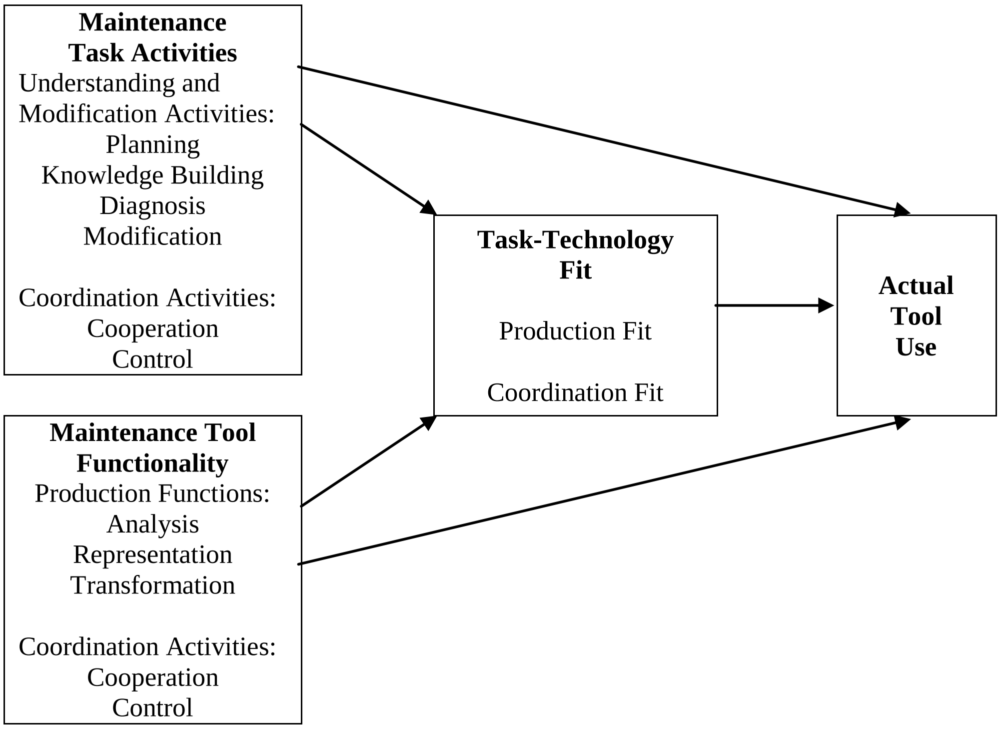


Figure 2.11 The TTF Model to explain the factors
which lead to the use of the software maintenance support tools.
(Dishaw, M.T., and Strong, D.M., 1998)

2.6 Research model and hypotheses

Task Characteristics

Goodhue and Thompson (1995) defined the mission as ‘‘the final result from input to output, derived from the individual’s use of information technology”. Task character means to explore whether the influence of using technology included characters of non-routine and dependency. Task characteristics’ maintenance in RTN refer to preventive maintenance that standardized method; planning, scheduling, controlling and monitoring, for remaining the ship's force to preserve and protect the sovereignty and the national marine interests (Royal Thai Navy, 1986; Department of the Navy Instruction, 2007; Steven and Allen, 1992).

Technology characteristics

In Goodhue and Thompson (1995), information technology comprises of various systems, such as: Information system mechanism, computer department service, etc. For PMS.IT., technology characteristics refer to a maintenance data collection system and electronic data processing that quality, stability, reliability, ease of use and integration to retrieve this information for maintenance analysis. (Royal Thai Navy, 1986; Nipon, 2004; Keaingkai, 2008; Department of the Navy Instruction, 2007; Steven and Allen, 1992).

The effects of task and technology characteristics on task-technology fit have been found in many researches. The researches (Goodhue and Thompson, 1995; Dishaw and Strong, 1998; Yen, D.C., et al., 2010; T. Zhou et al., 2010) showed that task and technology characters affect direct on task-technology fit. Gebauer and Ginsburg (2009) showed that task characteristics and technology performance determine the mobile information system's task technology fit. Therefore, the following hypothesis is proposed:

Hypothesis 1 : Task characteristics positively and significantly affect the task technology fit.

Hypothesis 2 : Technology characteristics positively and significantly affect the task technology fit.

Task–Technology Fit

Goodhue and Thompson define task–technology fit as "the degree to which a technology assists an individual in performing his or her portfolio of tasks". For maintenance in RTN, task–technology fit refer to the degree to which a PMS.IT. assists an individual in performing his file of maintenance on ship's force. The study (Yen, D.C., et al., 2010; Jung-Chi Pai and Fu-Ming Tu; 2011) also reinstated that task-technology fit positively affects behavioral intention. It can be seen that the CRM system can handle business issues for user; thus, the user is more willing to use it. Therefore, the following hypothesis is proposed:

Hypothesis 3 : Task-technology fit positively and significantly affects behavior intention.

From researches (Chang H.H., 2008 and 2010; Lin W.-S., and Wang C.-H., 2011; Zhou T., et al., 2010; ZHANG Jing et al., 2010) will affect a user's perceived usefulness (similar performance expectancy). Therefore, the following hypothesis is proposed

Hypothesis 4 : Task-technology fit positively and significantly affects performance expectancy.

Unified theory of acceptance and usage of technology

According to the definitions by Venkatesh et al. (2003),

Performance expectancy (PE) was defined as the degree to which an individual believes that the system will help him or her attain possible gains in job performance.

Effort Expectancy (EE) was defined as the degree of ease associated with the use of the system.

Social Influence (SI) was defined as the degree to which an individual perceives that important others believe he should use the new system.

Facilitating Condition (FC) was defined as the degree to which an individual believes that an organizational and technical infrastructure exists to support use of the system.

The research of Gupta, B. et al. (2008) shows that performance expectancy, effort expectancy and social influence have a significant positive impact on the intention to use ICT, and facilitating conditions affect actual use in a government organization in India. Suha AlAwadhi and Anne Moreferis (2008) indicate that performance expectancy, effort expectancy, peer influence and facilitating conditions were significant in the adoption of e-government services in Kuwait. Consequently, set of hypotheses is the base hypotheses of the UTAUT model:

Hypothesis 5 : Performance expectancy positively and significantly affects behavior intention.

Hypothesis 6 : Effort expectancy positively and significantly affects behavior intention.

Hypothesis 7 : Social influence positively and significantly affects behavior intention.

Hypothesis 8 : Facilitating condition positively and significantly affects use behavior.

Hypothesis 9 : Behavior intention positively and significantly affects use behavior.

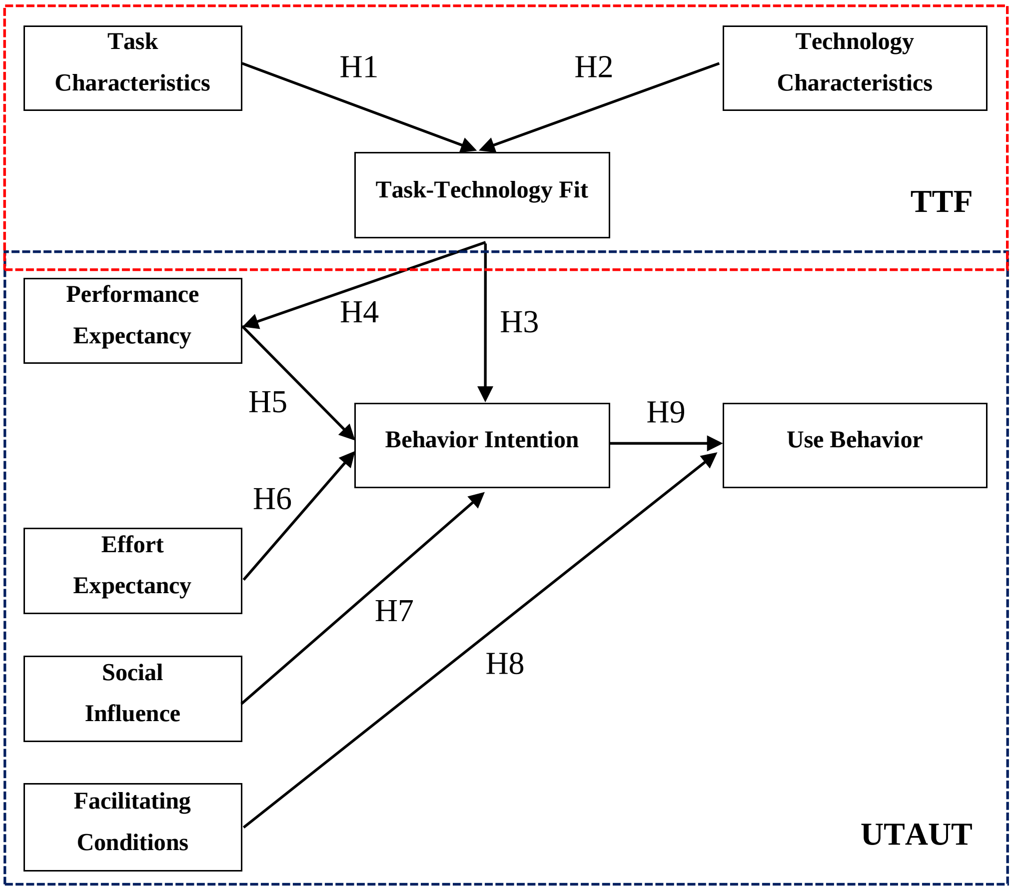


Figure 2.12 Research Model

CHAPTER III
RESEARCH METHODOLOGY

This research investigates the acceptance using PMS.IT. in the Royal Thai Navy officers. Questionnaires are used as a research's tool to collect information. The research methodology can detail as following:

3.1 Population and Samples
3.2 Research Instruments
3.3 Reliability and Validity
3.4 Data Collection
3.5 Data Analysis
3.6 Research Schedule

3.1 Population and Samples

This research studies only the officers on the battleship using PMS.IT. Because of they are involved in the traditional PMS. and PMS.IT. rather than the other groups. Population in this research is 526 officers on the battleship using PMS.IT. The types of population and sample are divided into seven groups with

1. Patrol Squadron
2. Frigate Squadron One
3. Frigate Squadron Two
4. Mine Squadron
5. Amphibious Combat Service and Support Squadron
6. Coast Guard Squadron
7. Riverine.

According to Gefen et al. (2000), at least 100 - 150 respondents are needed to conduct the structural equation modeling (SEM) using LISREL. From the rule of thumb, the ratio between number of parameter, or interest variable is 10 - 20 per 1 (Nonglak Wiratchai, 1999 and Hair et al.,2006). This research has 9 variables, so the sample size is

90 - 180 samples. The researcher defines the survey data more than the rule of thumb that 400 samples for the reliability of the data. The calculation finding the sample size show in table 3.1

Table 3.1 The sample size

List	Population	Sample size (400)	
1. Patrol Squadron	124	124 x (400/526) =	94
2. Frigate Squadron One	82	82 x (400/526) =	62
3. Frigate Squadron Two	48	48 x (400/526) =	37
4. Mine Squadron	56	56 x (400/526) =	43
5. Amphibious Combat Service and Support Squadron	82	82 x (400/526) =	62
6. Coast Guard Squadron	79	87 x (400/526) =	60
7. Riverine	55	55 x (400/526) =	42
Total	526	400	

3.2 Research Instruments

The questionnaires are the tool used in this research. The researcher developed this questionnaires based on from many concepts, theories and researches concerning with UTAUT and TTF. The questionnaires in this research are divided into two sections as follows:

Section 1 of the questionnaires are general information of simple groups which consist of age, rank, education, squadron, department, working experience and time to using PMS.IT.

Section 2 of the questionnaires are the questions of individual opinion regarding acceptance system that divided eight factor as following;

- Task Characteristics (TA)
- Technology Characteristics (TE)
- Task–Technology Fit (TTF)
- Performance Expectancy (PE)
- Effort Expectancy (EE)
- Social Influence (SI)

- Facilitating Condition (FC)
- Behavior Intention (BI)
- Use Behavior (UB)

There are 2 types of the questions; the closed - end questions to choice for respondents and the opened - end questions to prepare for them comments independently. All questions was developed from relevant the adoption of technology, which show in table 3.2.

Table 3.2 Recommendation to support the planned maintenance system information technology (PMS.IT.)

Construct	Measure	Source
Task Characteristics (TA)	(θ : Maintenance that preventive maintenance is standardized method ; planning, scheduling, controlling and monitoring, for remaining the ship's force to preserve and protect the sovereignty and the national marine interests.) 1. I think using the PMS.IT. in RTN leads to θ. 2. I think the functions of the PMS.IT. in RTN leads to θ. 3. I frequently repair or remedy an emergency before the due date to θ. 4. θ associate with a variety of systems and equipment.	Goodhue, D., & Thompson, R. L., 1995; Chang, H.H., 2008, 2010; Zhou, T., et al., 2010
Technology Characteristics (TE)	5. I think PMS.IT. was designed with the objective of the maintenance. 6. I think PMS.IT. suggesting to solve problems in the maintenance. 7. I think PMS.IT. having completely information to directly demand in the maintenance. 8. I think PMS.IT. having completely information to benefit in the maintenance.	Chang, H.H., 2008, 2010; Zhou, T., et al., 2010

Table 3.2 Recommendation to support the planned maintenance system information technology (PMS.IT.) (cont.)

Construct	Measure	Source
Task - Technology Fit (TTF)	9. The information on the PMS.IT. is accurate enough for my purposes. 10. The functionalities of PMS.IT. were appropriate for the purposes of PMS. 11. The functionalities of PMS.IT. were compatible with the task. 12. The functionalities of PMS.IT. were easy in the task. 13. The functionalities of PMS.IT. were best fit in the task.	Pai, J.-C. & Tu, F.-M., 2011
Performance Expectancy (PE)	14. I feel PMS.IT. is useful. 15. PMS.IT. improves my jobs efficiency. 16. PMS.IT. improves my jobs convenience and more quickly. 17. PMS.IT. will reduce my risk of making error.	Venkatesh et al., 2003
Effort Expectancy (EE)	18. Skillfully using PMS.IT. is easy for me. 19. Learning how to use PMS.IT. is easy for me. 20. PMS.IT. is a complete and clear system to easily use and understand. 21. PMS.IT. can find and collect easily the information.	Venkatesh et al., 2003
Social Influence (SI)	22. Commander are important to use PMS.IT. 23. Senior management of RTN (Admiral) support and assist to implement PMS.IT. 24. Workmate have a role in using PMS.IT. 25. Navy's the neighboring countries have a role in using PMS.IT. that RTN have forces to the availability and performance comparable to the Navy's the neighboring countries.	Venkatesh et al., 2003

Table 3.2 Recommendation to support the planned maintenance system information technology (PMS.IT.) (cont.)

Construct	Measure	Source
Facilitating Condition (FC)	26. I have the necessary resource to use PMS.IT. 27. I have the necessary knowledge to use PMS.IT. 28. If I have difficulty using PMS.IT., there will be professionals to help me. 29. I have the facilities to learn the system PMS.IT. such as books, documents, CD and so on.	Venkatesh et al., 2003
Behavior Intention (BI)	30. I am willing to use PMS.IT instead of PMS. 31. I am intending to use PMS.IT instead of PMS. 32. I am willing to take some time learning the application of PMS.IT. 33. I am ready to learn the utilization of PMS.IT.	Venkatesh et al., 2003
Use Behavior (UB)	34. The maintenance requirement card system 35. The performance planning system 36. The system of the operating collection 37. The report system of the conclude performance 38. The report system of the obstacles and objections 39. The spare parts management system 40. The system of the equipment operating hours 41. The ship configuration system 42. The cancel - planning system in case ship underwent repairs	Boonchai et al., 2009

The summate rating scale of questions based on Five-point Likert Scale measuring the dependent variable ranging from 1 (strongly disagree) to 5 (strongly agree) as following;

Likert's Scale	Positive Item
Strongly Disagree	1
Disagree	2
Moderate	3
Agree	4
Strongly Agree	5

The statistical analysis in this case item question has been used the mean ($\bar{x}$) of the statistic to analysis the data of survey. There are defined criteria for the rank of range as following.

Mean	The Rank of Range Positive
1.00 – 1.80	Lowest Level
1.81 – 2.60	Low Level
2.61 – 3.40	Medium Level
3.41 – 4.20	High Level
4.21 – 5.00	Highest Level

3.3 Reliability and Validity

The questionnaire founded based on the literature review. The researcher tested the questionnaire with 30 respondent samples to explain the reliability that used the Cronbach alpha coefficient to find the values of reliability. Cronbach's alpha of all construct exceeding the value of 0.7 was classified as adequate reliability (Cronbach, 1971). The all reliability is 0.967 as show in table 3.2.

Table 3.3 Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
0.967	0.967	42

Table 3.3 Reliability Statistics (cont.)

Item-Total Statistics

Construct	**Item**	**Corrected Item - Total Correlation**	**Cronbach's Alpha**
Task Characteristics (TA)	TA1	0.805	0.965
	TA2	0.759	0.965
	TA3	0.493	0.966
	TA4	0.509	0.966
Technology Characteristics (TE)	TE1	0.748	0.966
	TE2	0.682	0.966
	TE3	0.640	0.966
	TE4	0.701	0.966
Task–Technology Fit (TTF)	TTF1	0.662	0.966
	TTF2	0.715	0.966
	TTF3	0.586	0.966
	TTF4	0.622	0.966
	TTF5	0.757	0.965
Performance Expectancy (PE)	PE1	0.585	0.966
	PE2	0.650	0.966
	PE3	0.676	0.966
	PE4	0.712	0.966
Effort Expectancy (EE)	EE1	0.810	0.965
	EE2	0.758	0.965
	EE3	0.619	0.966
	EE4	0.516	0.966
Social Influence (SI)	SI1	0.501	0.966
	SI2	0.563	0.966
	SI3	0.713	0.965
	SI4	0.657	0.966

Table 3.3 Reliability Statistics (cont.)

Construct	Item	Corrected Item - Total Correlation	Cronbach's Alpha
Facilitating Condition (FC)	FC1	0.611	0.966
	FC2	0.703	0.966
	FC3	0.757	0.965
	FC4	0.832	0.965
Behavior Intention (BI)	BI1	0.546	0.966
	BI2	0.626	0.966
	BI3	0.311	0.967
	BI4	0.349	0.967
Use Behavior (UB)	UB1	0.655	0.966
	UB2	0.692	0.966
	UB3	0.613	0.966
	UB4	0.602	0.966
	UB5	0.551	0.966
	UB6	0.589	0.966
	UB7	0.613	0.966
	UB8	0.488	0.966
	UB9	0.461	0.967

For this study the factor analysis was used to confirm the validity of all question items. It was examined principal factor analysis by using SPSS (the varimax rotation). The factor loading should be close to or greater than 0.5 was acceptable for good construct validity as show in table 3.3.

Table 3.4 Factor loading for measures of constructs

Construct	Item	Factor loading
Task Characteristics (TA)	TA1	0.601
	TA2	0.534
	TA3	0.874
	TA4	0.694

Table 3.4 Factor loading for measures of constructs (cont.)

Construct	Item	Factor loading
Technology Characteristics (TE)	TE1	0.508
	TE2	0.612
	TE3	0.560
	TE4	0.543
Task–Technology Fit (TTF)	TTF1	0.659
	TTF2	0.582
	TTF3	0.500
	TTF4	0.660
	TTF5	0.513
Performance Expectancy (PE)	PE1	0.792
	PE2	0.755
	PE3	0.679
	PE4	0.500
Effort Expectancy (EE)	EE1	0.633
	EE2	0.840
	EE3	0.723
	EE4	0.766
Social Influence (SI)	SI1	0.852
	SI2	0.553
	SI3	0.609
	SI4	0.570
Facilitating Condition (FC)	FC1	0.751
	FC2	0.695
	FC3	0.663
	FC4	0.604
Behavior Intention (BI)	BI1	0.804
	BI2	0.753
	BI3	0.892
	BI4	0.841

Table 3.4 Factor loading for measures of constructs (cont.)

Construct	Item	Factor loading
Use Behavior (UB)	UB1	0.691
	UB2	0.724
	UB3	0.873
	UB4	0.873
	UB5	0.603
	UB6	0.761
	UB7	0.550
	UB8	0.749
	UB9	0.864

3.4 Data Collection

The researcher has collected the research data as follows.

3.4.1 Sending a recommendation letter from the Faculty of Graduate Studies, Mahidol University to Royal Thai Fleet to asking for cooperation to collected data.

3.4.2 Distributing the completed questionnaires to the sample groups and getting back.

3.4.3 Check data for perfection of the questionnaires and key code in computer for analysis.

3.5 Data Analysis

3.5.1 Descriptive statistical analysis is the basic statistics (percentage, means and standard deviation) using Statistical Package for Social Science for windows (SPSS).

3.5.2 Inference statistical analysis is used to test hypothesis, using Structural Equation Modeling (SEM) and running the model by LISREL program.

3.6 Research Schedule

Table 3.5 Research Schedule

Activities	Time (Months)											
	1	2	3	4	5	6	7	8	9	10	11	12
Preparatory study	→	→										
Define scope of survey		→	→									
Define hypothesis			→	→								
Design research instruments			→	→								
Data gathering				→	→	→						
Data Coding					→	→	→					
Analyzing data							→	→	→			
Summarize results							→	→	→	→	→	
Documentation	→	→	→	→	→	→	→	→	→	→	→	→

CHAPTER IV
RESULTS AND DISCUSSION

The analysis of the factors that influence users acceptance and intention to use PMS.IT. in the Royal Thai Navy officers are divided two section.

Section 1 show the survey results from collected questionnaires that relate general information of population samples.

Section 2 present the results of hypothesis testing the factors influencing the acceptance of PMS.IT. in the Royal Thai Navy officers. LISREL 9.10 was used to analyze the structure equation modeling (SEM) and investigate relationships all factors of research model.

4.1 The Survey Results

The target population in this research is 400 samples using PMS.IT. on the battleship. From the survey, the questionnaires were sent and received by letter to target population and researcher respective. Descriptive statistics respondent of questionnaires were shown in table 4.1.

Table 4.1 Characteristic of the respondent officers

Measure	Item	Number of Responses	Percentage
Gender	Male	400	100.00
Age	20-30 years	185	46.25
	31-40 years	120	30.00
	41-50 years	70	17.50
	More than 50 years	25	6.25

Table 4.1 Characteristic of the respondent officers (cont.)

Measure	Item	Number of Responses	Percentage
Ranks	Petty Officer 3 rd Class - Petty Officer 1 rd Class	233	58.25
	Chief Petty Officer 3 rd Class - Chief Petty Officer 1 rd Class	70	17.50
	Sub-Lieutenant - Lieutenant	90	22.50
	Lieutenant Commander - Captain	7	1.75
Education	Diploma	294	73.50
	Bachelor degree	95	23.75
	Master degree	2	0.52
	Other	9	2.25
Squadron	Patrol Squadron	94	23.50
	Frigate Squadron One	62	15.50
	Frigate Squadron Two	37	9.25
	Mine Squadron	43	10.75
	Amphibious Combat Service and Support Squadron	62	15.50
	Coast Guard Squadron	60	15.00
	Riverine	42	10.50
Departments	Sailing	92	23.00
	Operations and Communications	65	16.25
	Weapons and ships	113	28.25
	Mechanical Engineering	114	28.00
	Other	16	4.00
Working experience with PMS.	0-5 years	284	71.00
	6-10 years	68	17.00
	More than 10 years	48	12.00

Table 4.1 Characteristic of the respondent officers (cont.)

Measure	Item	Number of Responses	Percentage
Working experience with PMS.IT.	0-1 years	212	53.00
	2-3 years	167	41.75
	4-5 years	21	5.25
*** Respondent's profile (*N*=400)**			

The researcher founds that 400 officers respondents were mostly male (100%), age between twenty one to thirty (46.25%), ranks between Petty Officer 3 rd Class – Petty Officer 1 rd Class (58.25), Diploma (73.5%), Patrol Squadron (23.50%), Mechanical Engineering (28%), Weapons and Ships Departments (28.25%), 0-5 years in working experience with PMS. (71%) and 2-3 years in working experience with PMS.IT. (41.75%)

4.2 Descriptive Analysis

Table 4.2 Mean, Standard deviation and Interpretation of all constructs

Item	Mean	Standard deviation	Min	Max	Interpretation
Task Characteristics (TA)					
θ : Maintenance that preventive maintenance is standardized method ; planning, scheduling, controlling and monitoring, for remaining the ship's force to preserve and protect the sovereignty and the national marine interests.					
TA1:I think using the PMS.IT. in RTN leads to θ.	3.328	0.867	1	5	Medium
TA2:I think the functions of the PMS.IT. in RTN leads to θ.	3.320	0.836	1	5	Medium
TA3:I frequently repair or remedy an emergency before the due date to θ.	3.325	0.822	1	5	Medium

Table 4.2 Mean, Standard deviation and Interpretation of all constructs (cont.)

Item	Mean	Standard deviation	Min	Max	Interpretation
TA4:θ associate with a variety of systems and equipment.	3.570	0.810	1	5	High
Technology Characteristics (TE)					
TE1:I think PMS.IT. was designed with the objective of the maintenance.	3.418	0.843	1	5	High
TE2:I think PMS.IT. suggesting to solve problems in the maintenance.	3.330	0.841	1	5	Medium
TE3:I think PMS.IT. having completely information to directly demand in the maintenance.	3.313	0.858	1	5	Medium
TE4:I think PMS.IT. having completely information to benefit in the maintenance.	3.505	0.844	1	5	High
Task – Technology Fit (TTF)					
TTF1:The information on the PMS.IT. is accurate enough for my purposes.	3.350	0.771	1	5	Medium
TTF2:The functionalities of PMS.IT. were appropriate for the purposes of PMS.	3.350	0.790	1	5	Medium
TTF3:The functionalities of PMS.IT. were compatible with the task.	3.418	0.812	1	5	High
FFT4:The functionalities of PMS.IT. were easy in the task.	3.515	0.876	1	5	High

Table 4.2 Mean, Standard deviation and Interpretation of all constructs (cont.)

Item	Mean	Standard deviation	Min	Max	Interpretation
TTF5:The functionalities of PMS.IT. were best fit in the task.	3.428	0.819	1	5	High
Performance Expectancy (PE)					
PE1:I feel PMS.IT. is useful.	3.435	0.862	1	5	High
PE2:PMS.IT. improves my jobs efficiency.	3.420	0.895	1	5	High
PE3:PMS.IT. improves my jobs convenience and more quickly.	3.590	0.946	1	5	High
PE4:PMS.IT. will reduce my risk of making error.	3.455	0.866	1	5	High
Effort Expectancy (EE)					
EE1:Skillfully using PMS.IT. is easy for me.	3.393	0.886	1	5	Medium
EE2:Learning how to use PMS.IT. is easy for me.	3.363	0.856	1	5	Medium
EE3:PMS.IT. is a complete and clear system to easily use and understand.	3.295	0.827	1	5	Medium
EE4:PMS.IT. can find and collect easily the information.	3.555	0.877	1	5	High
Social Influence (SI)					
SI1:Commander are important to use PMS.IT.	3.692	0.895	1	5	High
SI2:Senior management of RTN (Admiral) support and assist to implement PMS.IT.	3.518	0.958	1	5	High

Table 4.2 Mean, Standard deviation and Interpretation of all constructs (cont.)

Item	Mean	Standard deviation	Min	Max	Interpretation
SI3:Workmate have a role in using PMS.IT.	3.290	0.888	1	5	Medium
SI4:Navy's the neighboring countries have a role in using PMS.IT. that RTN have forces to the availability and performance comparable to the Navy's the neighboring countries.	3.428	0.844	1	5	High
Facilitating Condition (FC)					
FC1:I have the necessary resource to use PMS.IT.	2.790	0.950	1	5	Medium
FC2:I have the necessary knowledge to use PMS.IT.	3.100	0.896	1	5	Medium
FC3:If I have difficulty using PMS.IT., there will be professionals to help me.	3.048	0.898	1	5	Medium
FC4:I have the facilities to learn the system PMS.IT. such as books, documents, CD and so on.	2.798	0.966	1	5	Medium
Behavior Intention (BI)					
BI1:I am willing to use PMS.IT. instead of PMS.	3.585	0.891	1	5	High
BI2:I am intending to use PMS.IT. instead of PMS.	3.583	0.933	1	5	High
BI3:I am willing to take some time learning the application of PMS.IT.	3.595	0.859	1	5	High

Table 4.2 Mean, Standard deviation and Interpretation of all constructs (cont.)

Item	Mean	Standard deviation	Min	Max	Interpretation
BI4:I am ready to learn the utilization of PMS.IT.	3.573	0.873	1	5	High
Use Behavior (UB)					
UB1:The maintenance requirement card system	3.343	0.789	1	5	Medium
UB2:The performance planning system	3.380	0.823	1	5	Medium
UB3:The system of the operating collection	3.473	0.819	1	5	High
UB4:The report system of the conclude performance	3.458	0.828	1	5	High
UB5:The report system of the obstacles and objections	3.315	0.808	1	5	Medium
UB6:The spare parts management system	3.053	0.944	1	5	Medium
UB7:The system of the equipment operating hours	3.355	0.831	1	5	Medium
UB7:The system of the equipment operating hours	3.355	0.831	1	5	Medium
UB8:The ship configuration system	3.288	0.852	1	5	Medium
UB9:The cancel - planning system in case ship underwent repairs	3.283	0.839	1	5	Medium

Table 4.3 All factor of perception PMS.IT.

Item	Mean	Standard deviation	Interpretation
Task Characteristics (TA)	3.386	0.669	Medium
Technology Characteristics (TE)	3.391	0.703	Medium
Task – Technology Fit (TTF)	3.412	0.682	High
Performance Expectancy (PE)	3.475	0.761	High
Effort Expectancy (EE)	3.401	0.729	High
Social Influence (SI)	3.481	0.720	High
Facilitating Condition (FC)	2.934	0.759	Medium
Behavior Intention (BI)	3.584	0.789	High
Use Behavior (UB)	3.327	0.636	Medium

Table 4.2 presents the mean, standard deviation and interpretation of all constructs. All factor of perception PMS.IT. are illustrated in table 4.3 to summarize from table 4.2. Following Table 4.3, most perception about behavior intention the score were high level. Next, the high level of perception was social influence, and performance expectancy follow by task – technology fit and effort expectancy, respectively.

However, a medium level of the mean value consist of technology characteristics, task characteristics, use behavior and facilitating condition, respectively. This suggested that the officers feel useful, easily, colleagues, commander and RTN supported using the PMS.IT. and satisfied with using technology to maintain equipment in military task for remaining the ship's force to preserve and protect the sovereignty and the national marine interests.

4.3 Hypothesis testing

In this study, research has conducted the following statistical analysis to test hypotheses. First, *t*-test is used independent samples difference between each squadron. Second, researchers used structural equation modeling (SEM) for confirming the theoretical hypothesis results.

4.3.1 Independent samples *t*-test

Comparison different between each squadron were made using independent sample *t*-test. The researcher shows mean, standard deviation (S.D.), and statistics were used in hypotheses testing of comparing between two service industries by influence factors, are given in Table 4.4.

From table 4.4 the result of analysis for differences in overall constructs that using compare mean of the same construct among each squadron into seven groups. The significant differences were found that task characteristics (p = 0.000), technology characteristics (p = 0.006), task – technology fit (p = 0.000), performance expectancy (p = 0.000), effort expectancy (p = 0.000), facilitating condition (p = 0.002), behavior intention (p = 0.000), and use behavior (p = 0.000) have the significant at the 0.01. These results can be described as user using PMS.IT. have the difference of squadron are significant difference perception on Task Characteristics, Technology Characteristics, Task – Technology Fit, Performance Expectancy, Effort Expectancy, Facilitating Condition, Behavior Intention and Use Behavior while Social Influence is not significant difference among seven groups of squadron.

Table 4.4 One way ANOVA analysis differences squadron in overall constructs

Squadron / Item	1 (n=94)	2 (n=62)	3 (n=37)	4 (n=43)	5 (n=62)	6 (n=60)	7 (n=42)	P-values
TA	3.133	3.266	3.392	3.570	3.665	3.300	3.643	0.000**
TE	3.226	3.177	3.378	3.552	3.532	3.446	3.518	0.006**
TTF	3.223	3.206	3.378	3.600	3.645	3.423	3.614	0.000**
PE	3.285	3.274	3.426	3.692	3.698	3.429	3.756	0.000**
EE	3.226	3.202	3.514	3.721	3.617	3.196	3.637	0.000**
SI	3.378	3.395	3.534	3.773	3.548	3.396	3.518	0.070
FC	2.721	2.867	3.230	3.233	2.915	2.888	3.036	0.002**
BI	3.402	3.423	3.608	3.942	3.855	3.346	3.780	0.000**
UB	3.079	3.192	3.294	3.579	3.514	3.398	3.476	0.000**

* significance at the 0.05
** significance at the 0.01

Squadron 1 = Patrol Squadron Squadron 2 = Frigate One Squadron
Squadron 3 = Frigate Two Squadron Squadron 4 = Mine Squadron
Squadron 5 = Amphibious Combat Service and Support Squadron
Squadron 6 = Coast Guard Squadron Squadron 7 = Riverine Squadron

4.3.2 Structure equation modeling Test

Structure equation modeling (SEM) is suitable to test and confirm the theoretical hypothesis result. Structural equation modeling or Confirm Factor Analysis (CFA) was used to test the sufficiency of the measurement model by Lisrel 9.1 (Student version). The sufficiency of the measurement model was examined in the model fit and multi-collinearity. Accordingly, this research testing the following:

The preliminary test to check multi-collinearity problem of data was analyzed by employs the correlations. This analyzed found, all factors has value below 0.8 and supported at 0.01, no multi-colinearity problem in the variables as shown in table 4.5.

Table 4.5 The result of correlation analysis of variables

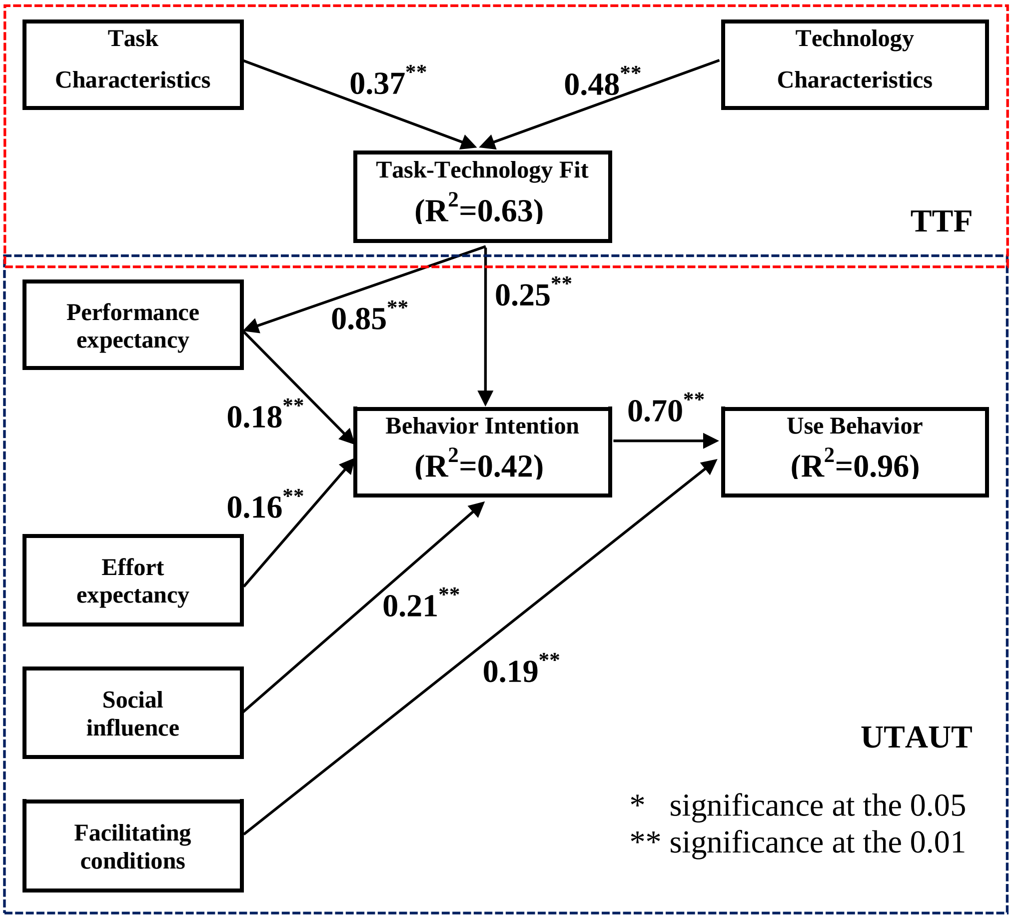
Variables	TTF	PE	BI	UB	TA	TE	EE	SI	FC
TTF	**1**								
PE	**0.762****	**1**							
BI	**0.575****	**0.626****	**1**						
UB	**0.622****	**0.544****	**0.593****	**1**					
TA	**0.709****	**0.698****	**0.582****	**0.598****	**1**				
TE	**0.748****	**0.715****	**0.498****	**0.552****	**0.699****	**1**			
EE	**0.650****	**0.658****	**0.670****	**0.580****	**0.535****	**0.577****	**1**		
SI	**0.590****	**0.586****	**0.622****	**0.606****	**0.526****	**0.524****	**0.619****	**1**	
FC	**0.466****	**0.380****	**0.407****	**0.579****	**0.391****	**0.392****	**0.591****	**0.554****	**1**

** Correlation is significant at the 0.01 level (2-tailed)

In Table 4.6 show overall model fit indices for measurement of officers. The Chi-square value normalized by degree of freedom (χ^2/d.f.) value was 0.547. Goodness of-fit was 0.999, Adjusted goodness-of-fit (AGFI) was 0.986. Normalized fit index (NFI) was 1.000, Non-normalized fit index (NNFI) was 1.000, Comparative fit index (CFI) was 1.000, Root mean square residual (RMR) was 0.003 and Root mean square error of approximation (RMSEA) was 0.000.

Table 4.6 Fit indices for measure

Goodness-of-fit measure	Recommended value	Model value
Chi-square (χ^2)	N/A	1.642
Degree of freedom (d.f.)	N/A	3.000
χ^2 / d.f.	<3.000	0.547
p-value	>0.050	0.651
Goodness-of-fit (GFI)	>0.900	0.999
Adjust goodness-of-fit (AGFI)	>0.800	0.986
Normalized fit index (NFI)	>0.900	1.000
Non-normalized fit index (NNFI)	>0.900	1.000
Comparative fit index (CFI)	>0.900	1.000
Root mean square residual (RMR)	<0.050	0.003
Root mean square error of approximation (RMSEA)	<0.050	0.000



Chi-square (χ^2) = 1.642 , d.f. = 3 , p-value = 0.651., RMSEA = 0.000

Figure 4.1 Direct standardized effect between the constructs of the proposed model

From table 4.6, the results indicated that the modified model was consistent with empirical data.

Table 4.7 Direct and indirect effect of the constructs

Factor	TTF			PE			BI			UB		
	TE	IE	DE	TE	IE	DE	TE	IE	DE	TE	IE	DE
TA	0.37** (0.04) 8.45		0.37** (0.04) 8.445	0.31** (0.04) 8.02	0.31** (0.04) 8.02		0.15** (0.03) 5.17	0.15** (0.03) 5.17		0.10** (0.02) 4.80	0.10** (0.02) 4.80	
TE	0.48** (0.04) 11.58		0.48** (0.04) 11.58	0.41** (0.04) 10.74	0.41** (0.04) 10.74		0.19** (0.03) 5.78	0.19** (0.03) 5.78		0.14** (0.03) 5.19	0.14** (0.03) 5.19	
TTF				0.85** (0.04) 23.46		0.85** (0.04) 23.46	0.40** (0.10) 6.59	0.15** (0.01) 3.87	0.25** (0.09) 2.72	0.28** (0.05) 5.81	0.28** (0.05) 5.81	
PE							0.18** (0.07) 2.75		0.18** (0.07) 2.75	0.13** (0.05) 2.79	0.13** (0.05) 2.79	
EE							0.16** (0.03) 5.33		0.16** (0.03) 5.33	0.11** (0.02) 5.44	0.11** (0.02) 5.44	
SI							0.21** (0.08) 2.66		0.21** (0.08) 2.66	0.15** (0.05) 2.69	0.15** (0.05) 2.69	
BI										0.70** (0.06) 11.32		0.70** (0.06) 11.32
FC										0.19** (0.04) 4.52		0.19** (0.04) 4.52

Chi-square=1.64, d.f.=3, p-value=0.65, RMSEA = 0.00, RMR = 0.003,
NFI = 1.00, NNFI = 1.00, GFI = 0.99, CFI = 1.00

Squared Multiple Correlations for Structural Equations (R^2)	TTF	BI	UB
	0.63	0.42	0.96

TA=Task Characteristics, TE=Technology Characteristics, TTF=Task–Technology Fit, PE=Performance Expectancy, EE=Effort Expectancy, SI=Social Influence, FC=Facilitating Condition, BI=Behavior Intention, UB=Use Behavior

LISREL 9.10 was used to analyze the causal relationship model. Result of study table 4.8 shows that the model was consistent with empirical data.

Table 4.8 Summary of hypotheses testing

Hypotheses	Description	Result
Hypotheses 1	Task characteristics positively and significantly affect the task technology fit.	Supported
Hypotheses 2	Technology characteristics positively and significantly affect the task technology fit.	Supported
Hypotheses 3	Task technology fit positively and significantly affects behavior intention	Supported

Table 4.8 Summary of hypotheses testing(cont.)

Hypotheses	Description	Result
Hypotheses 4	Task technology fit positively and significantly affects performance expectancy.	Supported
Hypotheses 5	Performance expectancy positively and significantly affects behavior intention.	Supported
Hypotheses 6	Effort expectancy positively and significantly affects behavior intention.	Supported
Hypotheses 7	Social influence positively and significantly affects behavior intention.	Supported
Hypotheses 8	Facilitating condition positively and significantly affects behavior intention.	Supported
Hypotheses 9	Behavior intention positively and significantly affects use behavior.	Supported

4.4 Discussion of findings

This research is the survey study to confirm users' acceptance and intention to use PMS.IT. from a framework that integrates with UTAUT and TTF . From table 4.8, all hypothesis are supported by experimental evidence. There were described as following:

Hypotheses 1: Task characteristics positively and significantly affect the task- technology fit.

Hypotheses 2: Technology characteristics positively and significantly affect the task - technology fit.

After testing, the research reveals both task characteristics and technology characteristics as main construct that also positively and significantly affect the task-technology fit. This provides support for previous research's findings (Goodhue and Thompson, 1995; Dishaw and Strong, 1998; Yen, D.C. et al., 2010; Zhou, T. et al., 2010; Gebauer and Ginsburg; 2009). This suggests that the task-technology fit should be system to meet the requirements and comply with the task characteristics and the technology characteristics. Thus, when RTN encourage to use PMS.IT., they need to consider the fit between users' task requirements and maintenance functions. PMS.IT. should also provide to design with the objective, solve problems and complete information for the maintenance. If users find PMS.IT. responding functions and requirements, they will more accept to use PMS.IT..

Hypotheses 3: Task-technology fit positively and significantly affects behavior intention.

From the empirical study, task-technology fit positively and significantly affects behavioral intention. This investigated is consistent with the previous studies (Goodhue and Thompson, 1995; Jung-Chi Pai, D.C. and Fu-Ming Tu, 2011 and Yen et al., 2010). It can be seen that PMS.IT. can manage task issues for user; thus, the user is more willing to use it. From the result, it can be implied that task-technology fit was encouraging users' behavioral intention because of the belief that PMS.IT. was useful, compatible, easy and best fit in the task.

Hypotheses 4: Task-technology fit positively and significantly affects performance expectancy.

Task-technology fit has a significant positive effect on the performance expectancy for using PMS.IT.. This study is consistent with the results of previous studies researchers (Chang, H.H., 2008 and 2010; Lin, W.-S. and Wang, C.-H., 2011; Zhou, T., et al., 2010; ZHANG Jing et al., 2010). This means when users find the functional characteristics of PMS.IT. match the tasks of them, they will think PMS.IT. improves their work performance. Thus, RTN should improve PMS.IT. to make task convenience and more quickly and reduce erroneousness for users' satisfaction. Finally the RTN officers using PMS.IT. also will perceive in usefulness more and more.

Hypotheses 5: Performance expectancy positively and significantly affects behavior intention.

Hypotheses 6: Effort expectancy positively and significantly affects behavior intention.

The research reveals that performance expectancy and effort expectancy positively and significantly affects behavior intention. This is again consistent with the results of previous researches (Gupta, B. et al., 2008; Suha AlAwadhi and Anne Moreferis, 2008). This implies that performance expectancy and effort expectancy would affect with decision of user to acceptance PMS.IT. of RTN officers. When they have positively performance expectancy (useful, efficiency, reduce error, convenience and more quickly) and effort expectancy (easy for learning, understanding and using PMS.IT. and the easily finding and collecting information), PMS.IT. should be improved by PMS.IT. staff to increase the perception and requirement of users. The factors are the main factors to found technology acceptance that if the users are known usefulness and ease of use the PMS.IT. to use in task of RTN

Hypotheses 7: Social influence positively and significantly affects behavior intention.

Social influence, this research result showed that it had a positively and significantly affects behavior intention. This finding is again consistent with previous research of the other researches (Gupta, B. et al., 2008; Boonchai et al.;2009 and Suha AlAwadhi and Anne Moreferis, 2008). This suggested that as social influence increase this leads to more intentions to use acceptance PMS.IT. of RTN officers. This indicates that they would use willingly PMS.IT. when they receive more influence from their workmate, commander or senior management including to forces navy's the neighboring countries. Thus, more social pressure was more essential to use PMS.IT. themselves until them feel accept technology for operating in work.

Hypotheses 8: Facilitating condition positively and significantly affects use behavior.

The research shows that facilitating condition positively and significantly affects use behavior of users. This is moreover invariable with the results of previous researches (T. Zhou et al., 2010; B. Gupta et al., 2008 and C.-L. Lee et al., 2010). Facilitating conditions have important to support users for operating PMS.IT. when have problem. The support of the adviser, the operator and handbook are availability to help operator using PMS.IT. properly, quickly and efficiently. Thereby, the facilitating conditions are the factor to lead users acceptance PMS.IT. in this study.

Hypotheses 9: Behavior intention positively and significantly affects use behavior.

The finding showed that behavior intention was positively and significantly affected by task-technology fit, performance expectancy, effort expectancy and social influence. This result found that behavior intention positively and significantly affects use behavior and the important factor of acceptance using PMS.IT.. This finding is again consistent with previous research of the other researches (Boonchai et al. 2009; Zhou, T. et al., 2010; Lee, C.-L. et al., 2010 and Suha AlAwadhi and Anne Moreferis, 2008). From the result, it can be replied that use behavior was encouraging users' behavior intention as the result of the belief that PMS.IT. was usefulness, easiness, auxiliary and support from RTN.

CHAPTER V
CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

The benefits and importance of PMS.IT. have been used for helping more easy and efficiency the task of officers and solving the problem of the PMS founded in 1986. Moreover the influencing factors of the acceptance and adoption a new information system have significant impacts on successful information system adoption like the acceptance and adoption PMS.IT. of RTN officers have significant impacts on successful using PMS.IT. in RTN too. The goal of this study was to explore factors which a focus on the influencing factors of the acceptance and adoption PMS.IT.. Consequently the researcher selects to integrate with the Unified theory of acceptance and usage of technology (UTAUT) and Task Technology Fit Model (TTF) as a framework to investigate the factors that influence users' acceptance and intention and actual behavior using PMS.IT.. The survey was conducted by collecting data from 400 simple who use PMS.IT. in RTN.

Research model that integrated factors of UTAUT and TTF has been tested by multivariate statistical analysis. The results of the structure equation model found the all hypothesis testing are support. For the modified model, the correlation error factor on the goodness-of-fit are well. This study found that behavior intention (BI) has more impact over facilitating condition (FC) toward use behavior (UB). to use PMS.IT.. Furthermore behavior intention has respectively more impact on direct effects from task – technology fit (TTF), social influence (SI), performance expectancy (PE) and effort expectancy (EE) and indirect effect from task characteristics (TA) and technology characteristics (TE). The results implied that the definite task and duty RTN, the supporting commander, the beneficial job and the easy using influence on intent and actual using PMS.IT.

5.2 Limitations and future research

This study has some limitation

Firstly, the data were gathered from officers' respondents that ranks about 75% noncommissioned. This is the research limitation so that the results might not be applied to the all population. For comparing the different results, the future research studies should include other ranks officers.

Secondly, the sample size in the future research should cover the fifth users group that consist of officers of the battleship, officer of the squadron, officers of the material inspection division on the Royal Thai Fleet, officers of the maintenance department and executives in RTN. For studying they have different attitude to accept using PMS.IT. and compare the impact results.

Finally, the future researches should study and integrate with the new factors of the critical success factors (CSF) in the maintenance management (Zawawi et al., 2011). It may be cover exploration in technology acceptance for RTN to improve and develop PMS.IT. to suit the needs of users.

5.3 Recommendations

The research provides some guideline to improve and develop PMS.IT. to suit the needs of RTN officers. The researcher gave recommendation for RTN as follows:

In the research results sorting by priority, task – technology fit (TTF) is the most important factors that directly affect behavior intention to use behavior. RTN should consider TTF that the first factors are improved and developed for users' acceptance and intention to use PMS.IT. The system developers should design to provide easy-to-use, accurate, and appropriate to meet the objectives of the PMS. For social influence, the commander and senior management of the RTN should pay more attention, support and assist in the implementation PMS.IT. such as supervision and adequate supply of spare parts iii use. From performance expectancy and effort expectancy, PMS.IT. must be able enhanced the tasks convenience and efficiency, the easy using and understanding but reduced error planning maintenance. Finally, RTN should prepare the sufficient facilities for the operating PMS.IT. For example, there will provide professionals training to learn the system and helping to solve problem , including media training for self-study.

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APPENDIX

DATE: 5/12/2013
TIME: 0:13

L I S R E L 9.10 (STUDENT)
BY

Karl G. Jöreskog & Dag Sörbom

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Scientific Software International, Inc.
http://www.ssicentral.com

The following lines were read from file E:\grad\Thesis\Data 400\Lisrel UTAUT-TTF400.spl:

```
!TTF-UTAUT MODEL
DA NI=9 NO=400 MA=CM
LA
TTF   PE     BI     UB     TA     TE     EE     SI     FC
KM
1.000
0.762 1.000
0.575 0.626  1.000
0.622 0.544  0.593  1.000
0.709 0.698  0.582  0.598  1.000
0.748 0.715  0.498  0.552  0.699  1.000
0.650 0.658  0.670  0.580  0.535  0.577  1.000
0.590 0.586  0.622  0.606  0.526  0.524  0.619  1.000
0.466 0.380  0.407  0.579  0.391  0.392  0.591  0.554  1.000
SD
0.682 0.761  0.789  0.636  0.669  0.703  0.729  0.720  0.759
MO   NX=5   NY=4   GA=FI   BE=FI   TD=SY   TE=SY
FR  GA(1,1)  GA(1,2)  GA(3,3)   GA(3,4)   GA(4,5)
FR  BE(2,1)   BE(3,1)   BE(3,2)   BE(4,3)
FR  TD(1,3)   TE(3,4)   TH(3,1)   TD(2,4)   TH(2,2)   TE(2,5)   TH(4,2)   TE(2,3)   TD(2,5)
FR  TH(3,4)   TD(3,4)  TH(2,4)   TH(4,3)    TD(3,5)
LK
TAS  TEC  EE  SI  FC
LE
TTF  PE  BI  USE
PD
OU  MI  EF  RS  AD=OFF
```

!TTF-UTAUT MODEL

Number of Input Variables 9
Number of Y - Variables 4
Number of X - Variables 5
Number of ETA - Variables 4
Number of KSI - Variables 5
Number of Observations 400

!TTF-UTAUT MODEL

Covariance Matrix

	TTF	PE	BI	UB	TA	TE	EE	SI	FC
	------	------	------	------	------	------	------	------	------
TTF	0.465								
PE	0.395	0.579							
BI	0.309	0.376	0.623						
UB	0.270	0.263	0.298	0.404					
TA	0.323	0.355	0.307	0.254	0.448				
TE	0.359	0.383	0.276	0.247	0.329	0.494			
EE	0.323	0.365	0.385	0.269	0.261	0.296	0.531		
SI	0.290	0.321	0.353	0.277	0.253	0.265	0.325	0.518	
FC	0.241	0.219	0.244	0.279	0.199	0.209	0.327	0.303	0.576

Total Variance = 4.639 Generalized Variance = 0.450279D-05

Largest Eigenvalue = 2.925 Smallest Eigenvalue = 0.105

Condition Number = 5.270

!TTF-UTAUT MODEL

Parameter Specifications

BETA

	TTF	PE	BI	USE
	------	------	------	------
TTF	0	0	0	0
PE	1	0	0	0
BI	2	3	0	0
USE	0	0	4	0

GAMMA

	TAS	TEC	EE	SI	FC
	------	------	------	------	------
TTF	5	6	0	0	0
PE	0	0	0	0	0
BI	0	0	7	8	0
USE	0	0	0	0	9

PHI

	TAS	TEC	EE	SI	FC
	------	------	------	------	------
TAS	10				
TEC	11	12			
EE	13	14	15		
SI	16	17	18	19	
FC	20	21	22	23	24

PSI

TTF	PE	BI	USE
------	------	------	------
25	26	27	28

!TTF-UTAUT MODEL

Number of Iterations = 33

LISREL Estimates (Maximum Likelihood)

BETA

	TTF	PE	BI	USE
TTF				
PE	0.851 (0.036) 23.462	- -	- -	- -
BI	0.248 (0.091) 2.718	0.180 (0.070) 2.754	- -	- -
USE	- -	- -	0.699 (0.062) 11.325	- -

GAMMA

	TAS	TEC	EE	SI	FC
TTF	0.368 (0.044) 8.445	0.481 (0.042) 11.582	- -	- -	- -
PE	- -	- -	- -	- -	- -
BI	- -	- -	0.160 (0.030) 5.327	0.208 (0.078) 2.658	- -
USE	- -	- -	- -	- -	0.193 (0.043) 4.519

Covariance Matrix of Y and X

	TTF	PE	BI	USE	TAS	TEC	EE	SI	FC
TTF	0.465								
PE	0.395	0.580							
BI	0.315	0.312	0.622						
USE	0.267	0.258	0.480	0.404					
TAS	0.322	0.274	0.306	0.251	0.446				
TEC	0.358	0.305	0.276	0.261	0.327	0.493			
EE	0.426	0.363	0.381	0.363	0.772	0.295	0.529		
SI	0.291	0.248	0.322	0.282	0.253	0.412	0.604	0.519	
FC	0.242	0.206	0.239	0.278	0.193	0.354	0.499	0.300	0.577

PHI

	TAS	TEC	EE	SI	FC
	------	------	------	------	------
TAS	0.446 (0.032) 14.087				
TEC	0.327 (0.029) 11.405	0.493 (0.035) 14.076			
EE	0.772 (0.079) 9.717	0.295 (0.030) 9.967	0.529 (0.037) 14.162		
SI	0.253 (0.027) 9.296	0.412 (0.040) 10.334	0.604 (0.145) 4.156	0.519 (0.037) 14.188	
FC	0.193 (0.027) 7.238	0.354 (0.043) 8.297	0.499 (0.147) 3.385	0.300 (0.031) 9.702	0.577 (0.041) 14.074

PSI
Note: This matrix is diagonal.

TTF	PE	BI	USE
------	------	------	------
0.174	0.243	0.359	0.015
(0.012)	(0.017)	(0.026)	(0.034)
14.115	14.141	13.761	0.439

Squared Multiple Correlations for Structural Equations

TTF	PE	BI	USE
------	------	------	------
0.626	0.580	0.422	0.963

NOTE: R for Structural Equatios are Hayduk's (2006) Blocked-Error R

Reduced Form

	TAS	TEC	EE	SI	FC
	------	------	------	------	------
TTF	0.368 (0.044) 8.434	0.481 (0.042) 11.567	- -	- -	- -
PE	0.313 (0.039) 7.965	0.410 (0.038) 10.657	- -	- -	- -
BI	0.148 (0.029) 5.088	0.193 (0.034) 5.734	0.160 (0.030) 5.320	0.208 (0.078) 2.655	- -
USE	0.103 (0.022) 4.760	0.135 (0.026) 5.154	0.112 (0.021) 5.401	0.145 (0.054) 2.669	0.193 (0.043) 4.514

Squared Multiple Correlations for Reduced Form

TTF	PE	BI	USE
0.626	0.363	0.364	0.486

Log-likelihood Values

	Estimated Model	Saturated Model
Number of free parameters(t)	42	45
-2ln(L)	-1322.687	-1324.325
AIC (Akaike, 1974)*	-1238.687	-1234.325
BIC (Schwarz, 1978)*	-1071.046	-1054.710

*LISREL uses AIC= 2t - 2ln(L) and BIC = tln(N)- 2ln(L)

Goodness of Fit Statistics

Degrees of Freedom for (C1)-(C2)	3
Maximum Likelihood Ratio Chi-Square (C1)	1.638 (P = 0.6508)
Browne's (1984) ADF Chi-Square (C2_NT)	1.642 (P = 0.6499)
Estimated Non-centrality Parameter (NCP)	0.0
90 Percent Confidence Interval for NCP	(0.0 ; 5.336)
Minimum Fit Function Value	0.00410
Population Discrepancy Function Value (F0)	0.0
90 Percent Confidence Interval for F0	(0.0 ; 0.0133)
Root Mean Square Error of Approximation (RMSEA)	0.0
90 Percent Confidence Interval for RMSEA	(0.0 ; 0.0667)
P-Value for Test of Close Fit (RMSEA < 0.05)	0.881
Expected Cross-Validation Index (ECVI)	0.217
90 Percent Confidence Interval for ECVI	(0.217 ; 0.231)
ECVI for Saturated Model	0.225
ECVI for Independence Model	12.646
Chi-Square for Independence Model (36 df)	5040.400
Normed Fit Index (NFI)	1.00
Non-Normed Fit Index (NNFI)	1.00
Parsimony Normed Fit Index (PNFI)	0.0833
Comparative Fit Index (CFI)	1.000
Incremental Fit Index (IFI)	1.000
Relative Fit Index (RFI)	0.996
Critical N (CN)	2764.631
Root Mean Square Residual (RMR)	0.00329
Standardized RMR	0.00621
Goodness of Fit Index (GFI)	0.999
Adjusted Goodness of Fit Index (AGFI)	0.986
Parsimony Goodness of Fit Index (PGFI)	0.0666

!TTF-UTAUT MODEL

Fitted Covariance Matrix

	TTF	PE	BI	UB	TA	TE	EE	SI	FC
TTF	0.465								
PE	0.395	0.580							
BI	0.315	0.376	0.622						
UB	0.267	0.258	0.298	0.404					
TA	0.322	0.353	0.306	0.251	0.446				
TE	0.358	0.382	0.276	0.243	0.327	0.493			
EE	0.325	0.363	0.381	0.267	0.258	0.295	0.529		
SI	0.291	0.318	0.355	0.282	0.253	0.265	0.323	0.519	
FC	0.242	0.206	0.239	0.278	0.193	0.205	0.323	0.300	0.577

Fitted Residuals

	TTF	PE	BI	UB	TA	TE	EE	SI	FC
TTF	0.000								
PE	0.000	-0.001							
BI	-0.006	0.000	0.001						
UB	0.003	0.006	-0.001	0.000					
TA	0.002	0.002	0.002	0.004	0.002				
TE	0.001	0.001	0.000	0.004	0.001	0.001			
EE	-0.002	0.002	0.004	0.002	0.003	0.001	0.002		
SI	-0.001	0.003	-0.001	-0.005	0.001	0.001	0.002	0.000	
FC	-0.001	0.014	0.004	0.001	0.005	0.005	0.004	0.003	-0.001

Summary Statistics for Fitted Residuals

Smallest Fitted Residual = -0.006
Median Fitted Residual = 0.001
Largest Fitted Residual = 0.014

Stemleaf Plot

```
- 6|0
- 4|9
- 2|2
- 0|547765533
  0|1357778011136777
  2|13336891579
  4|23615
  6|
  8|
 10|
 12|7
```

Standardized Residuals

	TTF	PE	BI	UB	TA	TE	EE	SI	FC
TTF	0.281								
PE	0.025	-0.299							
BI	-0.874	-0.110	0.209						
UB	0.688	1.020	-0.119	0.155					
TA	0.697	0.918	0.316	0.631	0.777				
TE	0.425	0.516	-0.108	1.152	0.667	0.555			
EE	-0.782	0.362	0.834	0.733	0.956	0.436	0.492		
SI	-0.697	0.518	-0.245	-0.568	0.250	0.267	0.404	-0.065	
FC	-0.375	0.823	0.541	0.430	0.918	0.839	0.680	0.497	-0.304

Summary Statistics for Standardized Residuals

```
        Smallest Standardized Residual   =  -0.874
        Median Standardized Residual     =   0.430
        Largest Standardized Residual    =   1.152
```

Stemleaf Plot

```
- 8|7
- 6|80
- 4|7
- 2|8004
- 0|2116
  0|36
  2|157826
  4|0334902246
  6|3789038
  8|234226
 10|25
```

!TTF-UTAUT MODEL

Qplot of Standardized Residuals

```
  3.5.......................................................................
    .                                                                      ..
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    .                                                       .               .
    .                                             x       .                  .
    .                                            x      .                    .
    .                                            x     .                     .
N    .                                            xx  .                        .
o    .                                           x .                         .
r    .                                         x*.                           .
m    .                                           *                            .
a    .                                        .xx                             .
l    .                                      .*x                              .
    .                                     . x                               .
Q    .                                    .  *x                              .
u    .                                  .   *                              .
a    .                                .   x*                                .
n    .                              .    x                                 .
t    .                            .    xx                                  .
i    .                          .    xx                                    .
l    .                        .     x*                                     .
e    .                        .     x                                      .
s    .                      .       *                                      .
    .                     .       x                                        .
    .                    .      x                                          .
    .                  .       x                                           .
    .                .                                                     .
    .               .         x                                            .
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    . .                                                                    .
 -3.5.......................................................................
   -3.5                                                                   3.5
                              Standardized Residuals
```

!TTF-UTAUT MODEL

Modification Indices and Expected Change

Modification Indices for BETA

	TTF	PE	BI	USE
	------	------	------	------
TTF	- -	0.202	0.850	0.699
PE	- -	- -	0.214	0.428
BI	- -	- -	- -	0.153
USE	0.569	0.560	- -	- -

Expected Change for BETA

	TTF	PE	BI	USE
	------	------	------	------
TTF	- -	-0.052	-0.094	-0.112
PE	- -	- -	0.087	0.075
BI	- -	- -	- -	0.169
USE	0.064	0.074	- -	- -

Modification Indices for GAMMA

	TAS	TEC	EE	SI	FC
	------	------	------	------	------
TTF	- -	- -	0.561	0.484	0.466
PE	0.325	0.803	0.562	0.027	0.577
BI	0.694	0.631	- -	- -	0.620
USE	0.084	0.327	0.064	0.612	- -

Expected Change for GAMMA

	TAS	TEC	EE	SI	FC
	------	------	------	------	------
TTF	- -	- -	0.076	-0.116	-0.143
PE	-0.071	0.087	0.044	0.014	0.028
BI	0.040	-0.144	- -	- -	0.132
USE	0.021	-0.167	-0.009	-0.053	- -

No Non-Zero Modification Indices for PHI

Modification Indices for PSI

	TTF	PE	BI	USE
	------	------	------	------
TTF	- -			
PE	0.213	- -		
BI	0.674	- -	- -	
USE	0.363	- -	- -	- -

Expected Change for PSI

	TTF	PE	BI	USE
	------	------	------	------
TTF	- -			
PE	-0.013	- -		
BI	-0.028	- -	- -	
USE	0.008	- -	- -	- -

Modification Indices for THETA-EPS

	TTF	PE	BI	UB
	------	------	------	------
TTF	0.510			
PE	0.100	- -		
BI	0.714	- -	- -	
UB	0.364	- -	- -	- -

Expected Change for THETA-EPS

	TTF	PE	BI	UB
	------	------	------	------
TTF	0.026			
PE	-0.009	- -		
BI	-0.012	- -	- -	
UB	0.008	- -	- -	- -

Modification Indices for THETA-DELTA-EPS

	TTF	PE	BI	UB
	------	------	------	------
TA	0.593	- -	0.117	0.001
TE	0.506	- -	0.616	- -
EE	- -	0.671	0.699	- -
SI	0.651	- -	- -	0.708
FC	1.121	0.853	0.234	0.240

Expected Change for THETA-DELTA-EPS

	TTF	PE	BI	UB
	------	------	------	------
TA	0.046	- -	0.007	0.000
TE	-0.055	- -	0.060	- -
EE	- -	-0.035	0.024	- -
SI	0.041	- -	- -	-0.013
FC	-0.020	0.015	-0.044	0.031

Modification Indices for THETA-DELTA

	TA	TE	EE	SI	FC
	------	------	------	------	------
TA	0.583				
TE	0.507	0.239			
EE	- -	0.145	0.490		
SI	0.162	- -	- -	0.642	
FC	0.001	- -	- -	0.648	0.157

Expected Change for THETA-DELTA

	TA	TE	EE	SI	FC
	------	------	------	------	------
TA	-0.077				
TE	-0.063	0.098			
EE	- -	0.061	-0.104		
SI	-0.069	- -	- -	0.081	
FC	-0.001	- -	- -	0.062	-0.107

Maximum Modification Index is 1.12 for Element (5, 1) of THETA DELTA-EPSILON

!TTF-UTAUT MODEL

Total and Indirect Effects

Total Effects of X on Y

	TAS	TEC	EE	SI	FC
TTF	0.368	0.481	- -	- -	- -
	(0.043)	(0.041)			
	8.453	11.581			
PE	0.313	0.410	- -	- -	- -
	(0.039)	(0.038)			
	8.025	10.738			
BI	0.148	0.193	0.160	0.208	- -
	(0.029)	(0.033)	(0.030)	(0.078)	
	5.170	5.777	5.333	2.661	
USE	0.103	0.138	0.112	0.147	0.193
	(0.022)	(0.022)	(0.021)	(0.054)	(0.042)
	4.797	5.193	5.442	2.690	4.521

Indirect Effects of X on Y

	TAS	TEC	EE	SI	FC
TTF	- -	- -	- -	- -	- -
PE	0.313	0.410	- -	- -	- -
	(0.039)	(0.038)			
	8.025	10.738			
BI	0.148	0.193	- -	- -	- -
	(0.029)	(0.033)			
	5.170	5.777			
USE	0.103	0.138	0.112	0.147	- -
	(0.022)	(0.027)	(0.021)	(0.054)	
	4.797	5.193	5.442	2.690	

Total Effects of Y on Y

	TTF	PE	BI	USE
TTF	- -	- -	- -	- -
PE	0.851	- -	- -	- -
	(0.036)			
	23.462			
BI	0.402	0.180	- -	- -
	(0.101)	(0.070)		
	6.588	2.754		
USE	0.281	0.128	0.699	- -
	(0.048)	(0.045)	(0.062)	
	5.810	2.788	11.325	

Largest Eigenvalue of B*B' (Stability Index) is 0.789

Indirect Effects of Y on Y

	TTF	PE	BI	USE
	------	------	------	------
TTF	- -	- -	- -	- -
PE	- -	- -	- -	- -
BI	0.153 (0.013) 3.870	- -	- -	- -
USE	0.281 (0.048) 5.810	0.128 (0.045) 2.788	- -	- -

Time used 0.047 seconds

Section 1: General information of respondents.

Explanation : Please mark √ in the box □ that the answer matching actually.

1. Age ……………………….…………… years

2. Ranks ……………………….……………

3. Education

□ 1) Diploma

□ 2) Bachelor degree

□ 3) Master degree

□ 4) Other……………

4. Squadron

□ 1) Patrol Squadron

□2) Frigate Squadron One

□ 3) Frigate Squadron Two

□ 4) Mine Squadron

□ 5) Amphibious Combat Service and Support Squadron

□ 6) Coast Guard Squadron

□ 7) Riverine

5. Departments

□ 1) Sailing □ 2) Operations and Communications

□ 3) Weapons and ships □ 4) Mechanical Engineering

□ 5) Other……….

6. Working experience with PMS. (Manual) ………………………years

7. Working experience with PMS.IT. (IT.) ………………………years

Section 2 : Recommendation to support Planned Maintenance System Information Technology (PMS.IT.)

Explanation : Please mark the circle ◯ that the answer matching your agreement.

Factors	Level agreement				
	Strong disagree	disagree	moderate	agree	Strong agree
Task Characteristics (TAC) θ : Maintenance that preventive maintenance is standardized method ; planning, scheduling, controlling and monitoring, for remaining the ship's force to preserve and protect the sovereignty and the national marine interests.					
1. I think using the PMS.IT. in RTN leads to θ.	1	2	3	4	5
2. I think the functions of the PMS.IT. in RTN leads to θ.	1	2	3	4	5
3. I frequently repair or remedy an emergency before the due date to θ.	1	2	3	4	5
4. θ associate with a variety of systems and equipment.	1	2	3	4	5
Technology Characteristics (TEC)					
5. I think PMS.IT. was designed with the objective of the maintenance.	1	2	3	4	5
6. I think PMS.IT. suggesting to solve problems in the maintenance.	1	2	3	4	5
7. I think PMS.IT. having completely information to directly demand in the maintenance.	1	2	3	4	5
8. I think PMS.IT. having completely information to benefit in the maintenance.	1	2	3	4	5

Factors	Level agreement				
	Strong disagree	disagree	moderate	agree	Strong agree
Task – Technology Fit (TTF)					
9. The information on the PMS.IT. is accurate enough for my purposes.	1	2	3	4	5
10. The functionalities of PMS.IT. were appropriate for the purposes of PMS.	1	2	3	4	5
11. The functionalities of PMS.IT. were compatible with the task.	1	2	3	4	5
12. The functionalities of PMS.IT. were easy in the task.	1	2	3	4	5
13. The functionalities of PMS.IT. were best fit in the task.	1	2	3	4	5
Performance Expectancy (PE)					
14. I feel PMS.IT. is useful.	1	2	3	4	5
15. PMS.IT. improves my jobs efficiency.	1	2	3	4	5
16. PMS.IT. improves my jobs convenience and more quickly.	1	2	3	4	5
17. PMS.IT. will reduce my risk of making error.	1	2	3	4	5
Effort Expectancy (EE)					
18. Skillfully using PMS.IT. is easy for me.	1	2	3	4	5
19. Learning how to use PMS.IT. is easy for me.	1	2	3	4	5
20. PMS.IT. is a complete and clear system to easily use and understand.	1	2	3	4	5
21. PMS.IT. can find and collect easily the information.	1	2	3	4	5

Factors	Level agreement				
	Strong disagree	disagree	moderate	agree	Strong agree
Social Influence (SI)					
22. Commander are important to use PMS.IT.	1	2	3	4	5
23. Senior management of RTN (Admiral) support and assist to implement PMS.IT.	1	2	3	4	5
24. Workmate have a role in using PMS.IT.	1	2	3	4	5
25. Navy's the neighboring countries have a role in using PMS.IT. that RTN have forces to the availability and performance comparable to the Navy's the neighboring countries.	1	2	3	4	5
Facilitating Condition (FC)					
26. I have the necessary resource to use PMS.IT.	1	2	3	4	5
27. I have the necessary knowledge to use PMS.IT.	1	2	3	4	5
28. If I have difficulty using PMS.IT., there will be professionals to help me.	1	2	3	4	5
29. I have the facilities to learn the system PMS.IT. such as books, documents, CD and so on.	1	2	3	4	5
Behavior intention (BI)					
30. I am willing to use PMS.IT instead of PMS.	1	2	3	4	5
31. I am intending to use PMS.IT instead of PMS.	1	2	3	4	5
32. I am willing to take some time learning the application of PMS.IT.	1	2	3	4	5
33. I am ready to learn the utilization of PMS.IT.	1	2	3	4	5

Factors	Level agreement				
	Strong disagree	disagree	moderate	agree	Strong agree
Use Behavior (UB)					
34. The maintenance requirement card system	1	2	3	4	5
35. The performance planning system	1	2	3	4	5
36. The system of the operating collection	1	2	3	4	5
37. The report system of the conclude performance	1	2	3	4	5
38. The report system of the obstacles and objections	1	2	3	4	5
39. The spare parts management system	1	2	3	4	5
40. The system of the equipment operating hours	1	2	3	4	5
41. The ship configuration system	1	2	3	4	5
42. The cancel - planning system in case ship underwent repairs	1	2	3	4	5

Failure or problems to use PMS.IT. (You can select more than one clause.)

☐ 1. PMS.IT. are difficult to understand.

☐ 2. The functionalities of PMS.IT. is complex.

☐ 3. Network connection fails frequently.

☐ 4. The equipment are insufficient or not supported to use PMS.IT.

☐ 5. I think that the results was not significantly different the using PMS. and PMS.IT.

☐ 6. I think that the change to use PMS.IT. is not worth.

☐ 7. Other ....

Other comments and suggestions.

…………………………………………………………………………………………

…………………………………………………………………………………………

…………………………………………………………………………………………

…………………………………………………………………………………………

ส่วนที่ 1 **สถานภาพส่วนบุคคลของผู้ตอบแบบสอบถาม**

คำชี้แจง **โปรดทำเครื่องหมาย √ ลงในช่อง □ หน้าตัวเลือกที่ตรงกับความเป็นจริงเพียง 1 ข้อ**

1. อายุ ………………………………..

2. ระดับยศ ………………………………..

3.ระดับการศึกษา

□ 1) ต่ำกว่าปริญญาตรี
□ 2) ปริญญาตรี
□ 3) ปริญญาโท
□ 4) อื่นๆ (โปรดระบุ)............................

4. กองเรือ

□ 1) กองเรือตรวจอ่าว (กตอ.)
□ 2) กองเรือฟริเกตที่ 1 (กฟก.1)
□ 3) กองเรือฟริเกตที่ 2 (กฟก.2)
□ 4) กองเรือทุ่นระเบิด (กทบ.)
□ 5) กองเรือยกพลขึ้นบกและยุทธบริการ (กยพ.)
□ 6) กองเรือยามฝั่ง (กยฝ.)
□ 7) กองเรือลำน้ำ (กลน.)

5. แผนก

□ 1) แผนกเดินเรือ
□ 2) แผนกยุทธการและสื่อสาร
□ 3) แผนกอาวุธและการเรือ
□ 4) แผนกช่างกล
□ 5) อื่นๆ (โปรดระบุ)...............................

6. ประสบการณ์ในการทำงานกับระบบ PMS. (แบบเดิม) ………………………ปี

7. ประสบการณ์ในการทำงานกับระบบ PMS.IT. (แบบใหม่) ………………………ปี

ส่วนที่ 2 ความคิดเห็นเกี่ยวกับ **Planned Maintenance System Information Technology (PMS.IT.)**

คำชี้แจง โปรดทำเครื่องหมาย ◯ ล้อมรอบตัวเลือกในช่องระดับความคิดเห็นที่ตรงกับตัวคุณมากที่สุด

ปัจจัย	ระดับความคิดเห็น				
	น้อยที่สุด	น้อย	ปานกลาง	มาก	มากที่สุด
ปัจจัยที่เกี่ยวข้องกับลักษณะงาน (Task Characteristics) θ หมายถึง การซ่อมบำรุงในลักษณะการซ่อมบำรุงป้องกันซึ่งมีการปฏิบัติอย่างมีแผนงาน, มีกำหนดระยะเวลาที่แน่นอน, มีการควบคุมอย่างใกล้ชิดและดำเนินงานอย่างเป็นระบบ เพื่อดำรงความพร้อมรบด้านกองกำลังทางเรือเพื่อรักษาและปกป้องอธิปไตยและผลประโยชน์แห่งชาติทางทะเล					
1. คุณคิดว่าการใช้ระบบ PMS.IT. จะสามารถทำให้นำไปสู่ θ	1	2	3	4	5
2. คุณคิดว่าเมนูการทำงานในระบบ PMS.IT. จะสามารถทำให้นำไปสู่ θ	1	2	3	4	5
3. คุณต้องซ่อมบำรุงหรือแก้ไขข้อขัดข้องฉุกเฉินก่อนถึงกำหนดเวลาตาม θ	1	2	3	4	5
4. θ เป็นงานที่เกี่ยวข้องกับหลากหลายระบบและยุทโธปกรณ์	1	2	3	4	5
ปัจจัยที่เกี่ยวข้องกับลักษณะเทคโนโลยี (Technology Characteristics)					
5. คุณคิดว่าระบบ PMS.IT. ถูกออกแบบให้สอดคล้องกับวัตถุประสงค์ของงานด้านการซ่อมบำรุง	1	2	3	4	5
6. คุณคิดว่าระบบ PMS.IT. มีข้อแนะนำที่จะสนับสนุนในการแก้ปัญหาในงานด้านการซ่อมบำรุง	1	2	3	4	5
7. คุณคิดว่าระบบ PMS.IT. มีข้อมูลสำคัญที่ครบถ้วนตรงตามความต้องการกับงานด้านการซ่อมบำรุง	1	2	3	4	5
8. คุณคิดว่าระบบ PMS.IT. มีข้อมูลสำคัญที่เป็นประโยชน์กับงานด้านการซ่อมบำรุง	1	2	3	4	5
ปัจจัยที่เกี่ยวข้องกับการใช้เทคโนโลยีที่เหมาะสมกับการใช้งาน (Task–Technology Fit)					
9. ข้อมูลในระบบ PMS.IT. มีความถูกต้องพอตามวัตถุประสงค์ของระบบ PMS.	1	2	3	4	5
10. ฟังก์ชันและเมนูการทำงานของระบบ PMS.IT. มีความเหมาะสมตามวัตถุประสงค์ของระบบ PMS.	1	2	3	4	5
11. ฟังก์ชันและเมนูการทำงานของระบบ PMS.IT. สามารถรองรับระบบ PMS. ได้เป็นอย่างดี	1	2	3	4	5
12. ฟังก์ชันและเมนูการทำงานของระบบ PMS.IT. ทำให้งานเกี่ยวกับระบบ PMS.ทำได้ง่ายขึ้น	1	2	3	4	5
13. คุณคิดว่าฟังก์ชันและเมนูการทำงานของระบบ PMS.IT. เป็นระบบงานที่เหมาะสมกับระบบ PMS.มากที่สุด	1	2	3	4	5

ปัจจัย	ระดับความคิดเห็น				
	น้อยที่สุด	น้อย	ปานกลาง	มาก	มากที่สุด
ปัจจัยที่เกี่ยวข้องกับประสิทธิภาพของระบบ (Performance Expectancy)					
14. คุณคิดว่าการนำระบบ PMS.IT. มาใช้จะเป็นประโยชน์ต่อการทำงานด้านการซ่อมบำรุง	1	2	3	4	5
15. ระบบ PMS.IT. ช่วยเพิ่มประสิทธิภาพของการทำงานด้านการซ่อมบำรุง	1	2	3	4	5
16. ระบบ PMS.IT. ช่วยทำให้การทำงานเกี่ยวกับระบบ PMS. มีความสะดวกรวดเร็วมากยิ่งขึ้น	1	2	3	4	5
17.ระบบ PMS.IT. ช่วยลดข้อผิดพลาดที่เกิดขึ้น (เช่น การถ่ายแผนงานที่ผิดพลาดของกำลังพล, การชำรุดเสียหายของเอกสารและข้อมูล)	1	2	3	4	5
ปัจจัยที่เกี่ยวข้องกับความพยายามใช้งานระบบ (Effort Expectancy)					
18. คุณคิดว่าการใช้ระบบ PMS.IT. เป็นเรื่องง่ายที่จะใช้งานได้อย่างชำนาญ	1	2	3	4	5
19. คุณคิดว่าการเรียนรู้ระบบ PMS.IT. เป็นเรื่องง่าย	1	2	3	4	5
20. คุณคิดว่าระบบ PMS.IT. มีความครบถ้วนชัดเจนทำให้คุณสามารถที่จะใช้งานและทำความเข้าใจได้อย่างง่ายดาย	1	2	3	4	5
21. คุณคิดว่าการใช้ระบบ PMS.IT. ทำให้มีการจัดเก็บข้อมูลในฐานข้อมูล ในด้านต่างๆ ได้อย่างเป็นระบบสามารถสืบค้นข้อมูลได้ง่าย	1	2	3	4	5
ปัจจัยที่เกี่ยวข้องกับอิทธิพลทางสังคม (Social Influence)					
22. ผู้บังคับการเรือให้ความสำคัญต่อการใช้ระบบ PMS.IT. ของคุณ	1	2	3	4	5
23. ผู้บังคับบัญชาระดับสูงให้การสนับสนุนและช่วยเหลือในการใช้ระบบ PMS.IT.	1	2	3	4	5
24. คุณคิดว่าเพื่อนร่วมงานมีบทบาทต่อความคิดในการใช้งานระบบ PMS.IT.	1	2	3	4	5
25. คุณคิดว่ากองทัพเรือของประเทศเพื่อนบ้านมีบทบาทต่อความคิดในการใช้งานระบบ PMS.IT. (เพื่อทำให้กำลังทางเรือของไทยมีความพร้อมและมีสมรรถภาพทัดเทียมกับกองทัพเรือของประเทศเพื่อนบ้าน)	1	2	3	4	5
ปัจจัยที่เกี่ยวข้องกับสิ่งอำนวยความสะดวก (Facilitating Condition)					
26. หน่วยเรือมีเครื่องมือที่จำเป็นเพียงพอต่อการใช้งานระบบ PMS.IT.	1	2	3	4	5
27. คุณมีความรู้ความเข้าใจที่พอเพียงต่อใช้งานระบบ PMS.IT.	1	2	3	4	5
28. คุณมีที่ปรึกษาหรือหน่วยงานที่คอยช่วยเหลือหากมีปัญหาข้อขัดข้องในการใช้งานระบบ PMS.IT.	1	2	3	4	5
29. คุณมีสิ่งอำนวยความสะดวกในการเรียนรู้ระบบ PMS.IT.(เช่น หนังสือ, เอกสาร, CD)	1	2	3	4	5

ปัจจัย	ระดับความคิดเห็น				
	น้อยที่สุด	น้อย	ปานกลาง	มาก	มากที่สุด
ความมุ่งมั่นหรือตั้งใจที่จะใช้ (Behavior Intention)					
30. คุณมีความยินดีจะใช้ระบบ PMS.IT. แทนระบบเดิม	1	2	3	4	5
31. คุณมีความตั้งใจที่จะใช้ระบบ PMS.IT. แทนระบบเดิม	1	2	3	4	5
32. คุณมีความเต็มใจที่จะใช้เวลาในการเรียนรู้ระบบและวิธีการใช้งาน PMS.IT.	1	2	3	4	5
33. คุณมีความพร้อมที่จะเรียนรู้ระบบและวิธีการใช้งาน PMS.IT.	1	2	3	4	5
พฤติกรรมการใช้ (Use Behavior)					
34. ระบบบัตรจ่ายงาน	1	2	3	4	5
35. ระบบการออกแผนงาน	1	2	3	4	5
36. ระบบการบันทึกผลการปฏิบัติ	1	2	3	4	5
37. ระบบรายงานและสรุปผลการปฏิบัติ	1	2	3	4	5
38. ระบบการรายงานอุปสรรคข้อขัดข้องในการปฏิบัติ	1	2	3	4	5
39. ระบบการจัดการอะไหล่	1	2	3	4	5
40. ระบบชั่วโมงใช้การอุปกรณ์	1	2	3	4	5
41. ระบบโครงสร้างอุปกรณ์ภายในเรือ	1	2	3	4	5
42. ระบบยกเลิกแผนงานการปฏิบัติ กรณีเรือเข้ารับการซ่อมทำ	1	2	3	4	5

ข้อขัดข้องหรือปัญหาการใช้งานระบบ PMS.IT. (เลือกได้มากกว่า 1 ข้อ)

☐ 1. ระบบ PMS.IT. ยากต่อการเข้าใจ

☐ 2. เมนูการใช้งานระบบ PMS.IT. มีความซับซ้อน

☐ 3. ระบบ Network เกิดข้อขัดข้องบ่อยครั้ง

☐ 4. อุปกรณ์ไม่เพียงพอหรือไม่สนับสนุนการใช้ระบบ PMS.IT.

☐ 5. คุณคิดว่าผลลัพธ์จากการใช้ระบบ PMS.IT. ไม่แตกต่างกับการใช้ระบบ PMS. (ระบบเดิม)

☐ 6. คุณคิดว่าไม่คุ้มค่ากับการเปลี่ยนเป็นระบบ PMS.IT.

☐ 7. อื่น……………………………………………………………

ข้อคิดเห็นและข้อเสนอแนะอื่นๆ ของผู้ใช้ระบบ PMS.IT.

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BIOGRAPHY

NAME	Cdr. Anupong Surachaipunya
DATE OF BIRTH	4 February 1975
PLACE OF BIRTH	Loei, Thailand
INSTITUTIONS ATTENDED	Royal Thai Naval Academy, 1996-2000: Bachelor of Engineering (Marine Engineering) Mahidol University Master of Engineering (Industrial Engineering)
HOME ADDRESS	200 Moo 1 Donyaihom Muang Nakhonpratum 73000 Tel. 084-1142266 E-mail : pram_36@hotmail.com
PUBLICATION / PRESENTATION	**Anupong s**, Thankorn N, The facots influencing the acceptance of maintenance system of the Royal Thai Navy officers. Suan Dusit National Conference: Science Researcher Day 2013, Faculty of Science and Technology, Suan Dusit Rajabhat University, 14 March 2013