THE DETERMINANTS OF RMPnet SYSTEM ADOPTION AMONG SENIOR POLICE OFFICERS OF ROYAL MALAYSIA POLICE

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DOCTOR OF BUSINESS ADMINISTRATION
UNIVERSITI UTARA MALAYSIA
January 2013

THE DETERMINANTS OF RMPnet SYSTEM ADOPTION AMONG SENIOR POLICE OFFICERS OF ROYAL MALAYSIA POLICE

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Dissertation Submitted to
Othman Yeop Abdullah Graduate School of Business
Universiti Utara Malaysia
In Partial Fulfillment of the Requirement of the
Doctor of Business Administration
January 2013

Kolej Perniagaan
(College of Business)
Universiti Utara Malaysia

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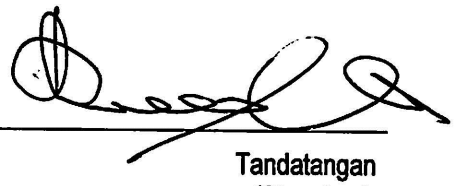
Program Pengajian *(Programme of Study)*	:	**Doctor of Business Administration**
Nama Penyelia/Penyelia-penyelia *(Name of Supervisor/Supervisors)*	:	**Prof. Dr. Rosli bin Mahmood**



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ABSTRACT

Technology adoption has emerged as an important determinant in understanding its acceptance by end-users in many government organizations. However, there has not been much research focused on technology adoption in government organization in Malaysia especially in law enforcement agencies. This study investigates the determining factors that affect the end-users' technology adoption in a government organization in Malaysia. Specifically, the aim of this study was to determine the system technology adoption among senior police officers of Royal Malaysia Police (RMP). A survey methodology was employed to collect the data. Senior police officers from the contingents of Bukit Aman, Selangor, Kuala Lumpur, Central Brigade General Operations Force, RMP College Kuala Lumpur, Negeri Sembilan, Melaka, Johor and RMP Technical College were chosen as the sample for this study. A systematic sampling procedure was used to select respondents from the respective police contingents. Ten hypotheses were proposed regarding the determinants of RMPnet System technology adoption. Structured questionnaires comprising 41 questions that were used to measure seven variables; RMPnet System adoption, innovativeness, top management support, RMPnet System experience, perceived usefulness, behavioural intention, and user support were adopted in this study. Out of the 700 questionnaires, only 521 were usable, thus yielding a response rate of 74.4 percent. The findings revealed that significant relationships exist between four of the determinants (top management support, perceived usefulness, user support and system experience) and RMPnet System adoption. The findings also revealed that innovativeness moderated the relationships between all the determinants (top management support, perceived usefulness, user support, technology experience and system experience) and the RMPnet System adoption. The study concluded with a discussion on theoretical and practical implications and suggestion for future research.

Keywords: Technology Adoption, Top Management Support, Perceived Usefulness, User Support

ABSTRAK

Penggunaan teknologi telah muncul sebagai penentu penting dalam memahami penerimaan teknologi oleh pengguna akhir dalam banyak organisasi kerajaan. Walau bagaimanapun, tidak terdapat banyak penyelidikan yang memberi tumpuan kepada penggunaan teknologi dalam organisasi kerajaan di Malaysia terutamanya di agensi-agensi penguatkuasaan undang-undang. Kaji selidik ini mengkaji faktor-faktor penentu pengguna akhir untuk menerima pakai teknologi dalam organisasi kerajaan di Malaysia. Khususnya, matlamat kajian ini adalah untuk menentukan penggunaan sistem teknologi di kalangan pegawai-pegawai kanan polis, Polis Diraja Malaysia (PDRM). Satu metodologi kaji selidik telah digunakan untuk mengumpul data. Pegawai kanan polis dari kontinjen Bukit Aman, Selangor, Kuala Lumpur, Briged Tengah Pasukan Gerakan Am, Maktab PDRM Kuala Lumpur, Negeri Sembilan, Melaka, Johor dan Maktab Teknik PDRM telah dipilih sebagai sampel bagi kajian ini. Satu prosedur pensampelan sistematik telah digunakan untuk memilih responden daripada kontinjen polis yang terlibat dalam kajian ini. Sepuluh hipotesis dicadangkan mengenai penentu penggunaan teknologi sistem RMPnet. Soal selidik berstruktur yang terdiri daripada 41 soalan telah digunakan untuk mengukur tujuh pembolehubah; penggunaan sistem RMPnet, inovasi, sokongan pengurusan atasan, pengalaman sistem RMPnet, tanggapan kegunaan, niat tingkah laku, dan sokongan pengguna telah diterima pakai dalam kajian ini. Daripada 700 soal selidik, hanya 521 boleh digunakan yang menghasilkan kadar tindak balas 74.4 peratus. Dapatan kajian menunjukkan bahawa hubungan signifikan wujud antara empat ramalan hipotesis (sokongan pengurusan atas, tanggapan kegunaan, sokongan pengguna dan pengalaman sistem) dengan penggunaan sistem RMPnet. Hasil kajian juga menunjukkan bahawa inovasi menyederhanakan hubungan antara semua ramalan (sokongan pengurusan atasan, tanggapan kegunaan, sokongan pengguna, pengalaman teknologi dan pengalaman sistem) dengan penggunaan sistem RMPnet. Kajian ini diakhiri dengan perbincangan mengenai implikasi teori dan praktikal, dan cadangan untuk kajian akan datang.

Kata Kunci: Penggunaan Teknologi, Sokongan Pengurusan Atasan, Tanggapan Kegunaan, Sokongan Pengguna

ACKNOWLEDGEMENT

With the deepest gratitude I wish to thank every person who has come into my life and inspired, touched, and illuminated me through their presence. To my supervisor Professor Dr Rosli Mahmood, I would like to express my sincere gratitude for his inspirational teaching, comments, guidance and patience throughout the programme. This work would not have been completed without his invaluable input and expertise.

Special word of thanks to acknowledge and express my sincere gratitude also goes to my most amazing DBA friend, Dr Azmi for his support, motivation, inspiration, encouragement and assistance throughout the process of my DBA study. Not forgeting my other PhD/DBA colleagues, Charanjit, Dato' Sabri and Tan for their enthusiastic support and interest shown in my work was not heartening and encouraging.

I would like to thank the Director of Logistics of RMP, the Principal Assistant Director of Logistics (Communications) who recognise the value of this project. I would also like to thank Dato' Dr Chai, DSP Jamaludin, ASP Rosmawati, ASP Jimmy, Insp Tajudin, Insp Salleh, Sgt Baha, Sgt Hamdan and Kpl Mobin for their support and assistance.

To Hans, Jenna, Medina, Radha, and many other friends and family too many to name, who were no doubt sick and tired of asking and hearing about "the DBA", thanks for your support.

Finally, my greatest appreciation goes to my dear children Rozaini and Aida Shereena, my grand children Anis Ameera, Muhammad Saifullah and Lily Syuhadah for their patience, understanding good humor and love. I especially appreciated Aida Shereena's hugs and encouragement during the long writing sessions. There were plenty of challenges during the course of this study but you always make every bad day good. I hope that my example has helped my children and grand children grow to love learning. Thank you for your enthusiastic support from the start to the finish. Without your support, nothing that I have accomplished would be possible.

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CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND

The adoption of technology has grown tremendously in the past decades, providing companies with new opportunities to support their activities (Manning, 2008). The technology adoption process involved a series of processes that an organization must undertake. It could only be decided whether or not to implement the new technology after all the processes had been undertaken (Kamal, 2006). Technologies were important tools for organizational change and occurred at the same time as the adoption of new ideas or behavior by an organization (Daft, 1978). Adopting technology to support organizational needs was a crucial prerequisite because of the opportunity of exploiting the potentials actual benefits of technology. Innovation and adoption could be conceptualized as being a series of temporal processes where a person had to undergo from the initial phase of acquiring the know how until he or she came to a state where he or she would be capable of making decision whether to adopt or reject the new technology (Rogers, 1995).

Research on the determinants of individual technology adoption in organizations continues to be a significant area for academicians, and though organizations had the authority to introduce new technology, the persons who made the final decision to reject or adopt the technology would be the end-users (Agarwal, 2000; Lewis, Agarwal & Sambamurthy, 2003). Innovation is what individuals made presumptions that the technology to be adopted was new (Rogers, 1995).

The process an individual had to undergo before adopting a technology could be considered as a process of acquiring information to reduce any uncertainty that might occur as a result of using new innovations (Kamal, 2006). Therefore the organization needed to maximize technology used, avoiding individual resistance to changes that obstructed performance improvements tied to the introduction of technology. This would help in reducing the gap between technology potentials and its actual usage and adoption. Individual technology adoption was critical as it contributed in enhancing productivity and the competitive advantage of an organization (Joshi, 1991).

Many researchers had found the importance of individual technology adoption for government organizations (Kamal, 2006). Furthermore, there was considerable literature gap in technology adoption in government organizations (Kamal, 2006). It was essential to examine its success during the implementation and adoption process of the project (Kamal, 2006). Almost all government departments especially police organizations adopted information system technology (Nunn & Quinet, 2002). The governments' adoption of technology and implementation was very crucial for the growth of nations (Yalcinkaya, 2007). In many cases, implementation, that failed could cause losses in time and resources to the government because end-users did not support and adopt the system technology (Kamal, 2006; Manning, 2008). The adoption of technology was a necessity; the information technology and prerequisite for effective utilization by its end users especially for police organization (Manning, 2008). Police organization adopted technology as a means to support police officers with their tasks at hand (Gottschalk, 2006).

The adoption of technology among police personnel was crucial for information exchanged in order to accomplish their day-to-day crime prevention activities involving broadcast of real-time information (*Laporan Tahunan* PDRM, 2010). Therefore, it was important to evaluate the level of individual adoption of technology that could improve the quality of policing and performance of police organization namely; Royal Malaysia Police (RMP). In relation to the above discussion, the general information of APCO Project 25 and RMPnet system; the system technology project being implemented in RMP would be provided in the next sub-sections.

1.1.1 APCO Project 25

The notion of trunking came about in the early 1980s when there was increasing congestion in airwaves. It was a concept of providing network access to many clients by sharing a set of lines or frequency channels instead of providing them individually (MCMC, 2009). Unlike other common telecommunications services such as mobile cellular, trunked radio communications was not intended for general public usage (MCMC, 2009). Despite the existence of sophisticated communications technology, trunked radio systems still remained the preferred communications technology for some niche users in the market.With regards to the telecommunications service in this study, a trunked radio system is a computer-controlled radio system which is technically more complex than conventional radio (MCMC, 2009). In Malaysia, the development of trunked radio services had reached a stable stage due to the rapid growth in coverage of mobile cellular services. There were two key players in the Malaysian market – the Government and the commercial sector, with their own

subscriber segments serving different needs (MCMC, 2009). Today, wireless communications using radio frequencies of the electromagnetic spectrum are widely used as opposed to wired communications and this includes the two-way radio. Though conventional radio technology was previously the main means of communication, the increasing crowding of radio spectrum bands has caused the introduction of trunked radio techniques.

Previously, most trunked radio systems relied much on proprietary standards containing software licensed exclusively to a manufacturer. For the most part, relying on proprietary standards would made interoperability between radio systems very complex if not impossible. Trunked radio systems involved multi-vendor interoperability and compatibility and thus standards were set which could support digital trunking systems. Example of open standards that could support trunked radio systems were APCO P25 and Terrestrial Trunked Radio (TETRA). The major difference between an APCO P25 technology and TETRA, is that APCO P25 is a digital trunking standard for the United States public safety market and based on frequency division multiple accesses (FDMA), 12.5 kHz technology while the TETRA is based on Time Division Multiple Access (TDMA) on a 25kHz bandwidth technology (Glass, Muthukkumarasamy & Portmann, 2009; MCMC, 2009). However, this study only involved P25 technology standards. The APCO P25 is also known as P25 where P25 standard used cross channel rate 9.6kbp/s and provided typical cell radius 7.6 km (handheld surburban) 35 km (mobile rural) for interference limited system (Glass et al., 2009).

The P25 standards were jointly administered by the Telecommunications Industry Association (TIA) and the American National Standards Institute (ANSI).

TIA is the leading trade association representing the global information and communications technology (ICT) industry through standards development, policy initiatives, business opportunities, market intelligence and networking events (ANSI, 2009). TIA is responsible to coordinate U.S. standards that were developed by representatives of standards developing organizations, government agencies, consumer groups, companies, and others to ensure the characteristics and performance of products were consistent (ANSI 2009). ANSI on the other hand, is a private non-profit organization overseeing the development standards for products, services, systems, and personnel in the U.S and to coordinate U.S standards with international standards so that American products can be used worldwide (ANSI, 2009).

To ensure the interoperability of P25 equipment and the P25 standards a Common Air Interface (TIA, 2003) was defined. This was the core specification document and defined the modulation techniques, the frame types, their meanings and the typical layer representation that must be implemented by all P25-compliant equipment (Glass et al., 2009). The P25 standard emphasized both hardware and software interconnections based on industry standards and open-interface specifications to maximize flexibility and to facilitate progressive upgrades and repairs (Glass et al., 2009). General purpose computing facilities, voice and data radio communications, and special purpose devices were integrated and centrally-controlled using system software (Miller, Kun, & Lenharth, 2004).

1.1.2 RMPnet system

The RMPnet system was a set of different elements connected or related as to perform a unique function not performabled by the elements alone (Sussman, 2000). A system could be complex when composed of a group of related units (sub-systems) for which the degree and nature of the relationships were known. Its overall emerging behaviour was difficult to predict, even when sub-system behaviour was readily predictable. The time-scales of various sub-systems might be very different. Behaviour in the long-term and short-term might be marked different and small changes in inputs or parameters might produce large changes in behaviour. The sub-systems within RMPnet system were integrated, closely coupled, growing in complexity in system architecture and engineering (Sussman, 2000).

In order to create radio trunking communications system, there would be some components of equipment needed to make connection. In this study, the trunked radio systems included both fixed and mobile equipment where fixed stations fulfilled the roles of base stations, trunking controller and repeater and other accessories (MCMC, 2009). A fixed station might provide data services and gateways to the public switched telephone network, private automatic branch exchanges and to other radio systems (Glass et al., 2009). Mobile radios might be either hand-held or vehicle-mounted and either fixed or mobile. All P25 radios could operate in either analog frequency modulation (FM) or digital mode (Warren, 2004). The digital mode could use an operator chosen cryptographic cipher to protect message confidentiality. However, the P25 standard did not mandate the provision of encryption capabilities and so this feature was available on some of P25 compliant equipments (Warren, 2004). In order to create radio trunking communications

(RMPnet system), there would be some components of equipment needed to make the connection and the equipment explained includes the dash mount, remote mount, motorcycle, handheld and other accessories used. Brief descriptions of the equipments are provided in Table 1.1.

Table 1.1
Equipment Composition of RMPnet system

Types of Equipment	Explanation
Dash Mount	The dash mount can also be base station radio equipment that is fixed station, comprising of a receiver and a transmitter. The radios are powered by an external electrical system connected to the antenna. Due to this, the base station has the most powerful transmitters compared to mobile and portable radios, including the most sensitive receivers. The microphone can be handheld or desktop models and the speaker can be an external or internal type.
Mobile Radio	This equipment can be typically installed in a vehicle or a car. The size and weight of the mobile radio can be larger and heavier than a portable radio. Generally, mobile radio has higher power output than portable radio due to its form factor which facilitate more components to produce higher power. There is no issue on battery life as it uses the vehicle battery for power. Thus, the range of a mobile radio would usually be superior to portable radio.
Handheld Radio	The size of handheld radios or generally known as portable radios are small and lightweight wireless devices that contained a microphone and speaker, rechargeable battery for power supply and an antenna. Since users carry this device most of the time, the ergonomics of portable radio (the size and weight) is an important factor for users. Portable radios regularly have lower power output compared to mobile or fixed-station radios due to the above limiting factors. Thus, the range of portable radio is typically smaller than mobile or fixed-station radio.

(Source: Guide for the Selection of Communication Equipment for Emergency First Responders Volume 1, February 2002, National Institute of Justice.)

The decision to adopt a technology had a mixture of "push" and "pull" influences (Warren, 2004). The factors that drove the adoption of new technologies such as RMPnet system was complex and context specific and various studies had been used in the past two decades to identify the contingent factors which influenced technology adoption within the individual context (Warren, 2004). In general, these studies seek to define the factors that influenced or hindered individual adoption of technology. Sometimes, the successful implementation of technology (RMPnet system) would be dependent on end-user adoption in order to justify cost, investment of time, mental effort and financial resources (Sorenko, 2008). It is very important to establish and understand what factors and facts would facilitate and drive the end-user's decision whether to adopt or reject a system (RMPnet system) (Sorenko, 2008).

Infact, the RMPnet system would be one of the largest projects ever implemented in a public sector organization in Malaysia (Motorola Country President, 2009). Being the biggest and most complex, the successful implementation and how well it would be accepted by all levels of end-users in RMP was the priority of top management of RMP (PDRM Annual Report, 2010). Similarly, the lack of the function's strategic importance of a project (e.g. RMPnet system) would contribute to project failure in many organizations (Kamal, 2006). Many factors had impede the successful implementation of projects that include technological (Holden, Norris & Fletcher, 2003; Roy, 2003), financial (Heeks, 1999; Irani, Themistocleous & Love, 2003), and organizational constraints (Ho, 2002; Moon, 2002). These impeding barriers have contributed to about 85% of e-government information technology projects failure, especially in developing countries because of lack of

communications, poor project management and poor acceptance by end-users (Heeks, 2003). Hence, it is hoped through this study that factors can contribute to acceptance and adoption of technology by senior police officers, providing insights not only to public sector but also to private sector organizations in Malaysia.

The Home Affairs Minister, Dato' Seri Hishamuddin Tun Hussein said the nationwide implementation and installation of the system was on-going where the implementation would be divided into four phases in peninsular Malaysia, one phase in Sabah and one phase in Sarawak (The Star, 2010). He further stressed that, the implementation of the project would be over a 10-year period where the four phases in peninsular Malaysia would cover the states and contingents of Bukit Aman, Kuala Lumpur, Selangor, Central Brigade of General Operations Force and RMP training college for the 1st phase and group as the Central Region (CR), 2nd phase the state of Negeri Sembilan, Melaka, Johor and RMP Technical College in Bakri as the Southern Region (SR), 3rd phase for the state of Perak, Penang, Kedah, Perlis and the Northern Brigade of General Operations Force as the Northern Region (NR) and the final phase; 4th phase, the Eastern Region (ER) for peninsular Malaysia that covered the state of Pahang, Terengganu, Kelantan and South Eastern Brigade of General Operations Force. The region of Sabah (SHR) would cover the state of Sabah and Sabah Brigade of General Operations Force and finally in Sarawak (SWR) that involve the state of Sarawak and the Sarawak Brigade of General Operations Force. The installation, testing, commissioning and acceptance of systems in CR begun in May 2010 and the SR was in July 2011. End-users from these two regions would currently be using the RMPnet system on a trial basis until the country-wide implementation of RMPnet system which was scheduled to be fully implemented in

2013. For the nationwide integrated general purpose computing facilities, voice and data radio communications, and special purpose devices is known as RMPnet system (The Star, 2010).

1.2 PROBLEM STATEMENT

Implementing a new system without adoption by the users creates a performance gap and resulted in unintended consequences. Law enforcement officers like the RMP officers were reported to be reluctant adopter of new technology (Lin & Lee, 2004). However, there is lack of research in technology adoption in goverment organizations especially law enforcement agencies (Colvin & Goh, 2005; Lin, Hu & Chen, 2004). To the knowledge of the researcher, there is no research conducted on digital communications system in Royal Malaysia Police to date. With the implementation of the new digital communications system (code named RMPnet), the RMP's officers decision to adopt the system are crucial to the success of the system in supporting the national agenda in reducing crime. Thus, it was the purpose of this research to study the various determinants that predict the adoption and the moderating effect of innovativeness affecting the strength and/or direction of those relationships. The determinants investigated were top management support, perceived usefulness, computer experience, behavioural intention and user support.

1.3 RESEARCH QUESTIONS

Based on the discussions of background information and research problem, this study attempts to answer the following research questions:

1. What is the level of RMPnet adoption among senior police officers of Royal Malaysia Police?
2. Are there significant relationships between determinants of technology adoption (top management support, experience, perceived usefulness, behavioural intention, and user support) and RMPnet system adoption among senior police officers of RMP?
3. Does innovativeness moderate the relationship between determinants of technology adoption (top management support, experience, perceived usefulness, behavioural intention, and user support) and RMPnet system adoption among senior police officers of RMP?

1.4 RESEARCH OBJECTIVES

In response to the research questions, this research seeks to investigate the relationship between the five independent variables and the moderating effect of innovativesness on RMPnet system adoption. The justification of this research was that adopting higher levels of technology in law enforcement required considerable resource commitments (Manning, 2003). Similarly, intention played an important role as a variable that influenced actual behaviour (Ajzen & Fishbein, 1980). Empirical research conducted by Pavlou (2003), Taylor and Todd (1995), Venkatesh and Davis (1996), Venkatesh, Morris, Davis and Davis (2003) showed that intention to use was a strong predictor of actual system adoption. On the other hand, intention and actual behavior were separate constructs, such that although individuals intended to adopt a new technology, intention might not always result in the actual adoption behavior due to other effects such as availability of resources and skills. Therefore it

was necessary to determine whether increased level of technology adoption had increased the level of RMPnet system adoption. By conducting this research on RMPnet system adoption this study intended to test empirically the determinants of technology adoption as suggested by Jeyaraj et al. (2006) in his meta-analysis among senior police officers of Royal Malaysia Police. Thus, the following research objectives:

1. To determine the level of RMPnet system adoption among senior police officers of RMP.
2. To identify the determinants (Top Management Support, Computer Experience, Perceived Usefulness, Behavioral Intention and User Support) and RMPnet system adoption among senior police officers of RMP.
3. To examine the moderating effect of innovativeness on determinants that influenced the adoption of RMPnet system adoption among senior police officers of RMP.

1.5 SIGNIFICANCE OF STUDY

The present study would be significant in two aspects: theoretical development and practical implications. If the research objectives of this study are met, the findings of the research could be used to improve the RMPnet system adoption of police organization. From the theoretical standpoint, it is hoped that this study could expand the model developed by Jeyaraj et al. (2006) by introducing a moderating variable as means of improving the RMPnet system adoption. It was also hope that the findings of this study could extend the current body of knowledge in information system area because technology changes frequently due to the rapid technology development.

In addition, the findings of the study would be helpful to validate and strengthen the argument in providing useful information to the government sectors especially in law enforcement organizations on how they could enhance the adoption of new technology in their organizations. Finally, this research provides some important determinants of RMPnet system adoption which would be useful in Malaysia, especially for the policy makers and top management of RMP to enhance technology adoption and implemention in their organizations.

1.6 SCOPE OF THE STUDY

The research was conducted among senior police officers in Royal Malaysia Police (RMP) for the year 2012 from the central and southern region of peninsular Malaysia. However, the senior police officers were selected based on being active users of RMPnet system.

1.7 DEFINITION OF TERMS

In order to fully understand this research, it is important to be familiar with some of the main variables which will be used in this research. Thus, its description is explained in this section.

1.7.1 RMPnet system Adoption

RMPnet system adoption is the process through which an individual decides to either adopt or reject an innovation.

1.7.2 Innovativeness

Innovativeness describes the adoption of an idea or behaviour, whether a system, policy, program, device, process, product or service, that is new to the adopting organization and most of the innovation is technological in nature (Damanpur, 1992; Rogers, 1995). The technological innovation in this research is based on a digital communications system which is known as RMPnet system of RMP.

1.7.3 Top Management Support

Top management is the group of stakeholders who have the ultimate responsibility for setting goals and objectives, and for allocating organizational resources to achieve these objectives (Jones, 2007). Top Management Support is the critical determinant of technology adoption (Al-Gahtani, 2001).

1.7.4 RMPnet system Experience

The RMPnet system experiences describe the intended knowledge with respect to usage and operation of RMPnet system for day-to-day policing.

1.7.5 Perceived Usefulness

Perceived usefulness is the extent that an individual believes that using RMPnet system would improve ones' job performance (Al-Gahtani, 2001).

1.7.6 Behavioural Intention

Behavioural intention is a proxy to examine in predicting users' behaviour toward a particular technology or system (Rogers, 1995).

1.7.7 User Support

User support is the end-user support to use the RMPnet system provided by RMP where these end-users are provided with assistance twenty four hours by the technical support team.

1.8 ORGANIZATION OF THE DISSERTATION

The structure of this thesis provides a critical review of relevant information on technology adoption and the theories of technology adoption. This research consists of five chapters presented as follows:

Chapter 1 provides brief background introduction of the study including the research problem and research questions. This chapter also outlines the objectives of this study together with the significance, contributions, scope and the definitions of terms.Chapter 2 reviews the literature of related technology adoption that includes definition of main variables, and the theories of technology adoption. Chapter 3 reviews and examines the literature and theories related to the adoption models. The theoretical framework which comprised of key determinants that were expected to influence the RMPnet system adoption by senior police officers, together with the moderator that was expected to moderate the relationship of the key predictors of the research. Research methodology and methods as well as the justification of choices used. In addition, the research process, design, development of the instrument, pretest and pilot study, population, sample and data collection, data analysis methods, and data management of multivariate analysis will be presented. The

development of the relevant instrument and outliers of survey problems are discussed.

Chapter 4 presents the results of the data analysis. The descriptive statistics where analysis on missing data, assessment of outliers, tests for violations of assumptions for multiple regressions is presented. Factor analysis by using SPSS version 18.0 is also discussed and modification of framework and hypotheses presented. The statistical results of multivariate analysis are also presented.Chapter 5 highlights the key findings of the study. In addition, the research implications including theoretical and managerial implications are discussed along with the limitations of the study and suggestions for further research.

CHAPTER TWO

LITERATURE REVIEW

2.1 INTRODUCTION

This chapter provides discussion on previous studies in the field of information system technology and adoption. It will begin with a general discussion related to literature of technology and technology adoption. This chapter will be structured as follows. Section 2.1 presents the literature on technology and technology adoption, followed by Section 2.2 which will discuss the determinants of technology adoption and Section 2.3 the discussion on innovativeness. In Section 2.4 theories on technology adoption will be provided. Section 2.5, where the development of conceptual model will be discussed. The summary of this chapter is provided in Section 2.6.

2.2 TECHNOLOGY AND TECHNOLOGY ADOPTION

Technology is the making, usage, and knowledge of tools, machines, techniques, crafts, systems or methods of organization in order to solve a problem or perform a specific function (Schatzberg, 2006). The word technology came from Greek technologia meaning art, skill, craft, and logia meaning study of (Schatzberg, 2006). In addition, technology could be broadly defined as the entities, both materials and immaterial, created by the application of mental and physical effort in order to achieve some value. Similarly, technology could also be the entire process of transforming input into output, and delivery of that output to the end users (Jaworski & Kohli, 1991). Technology consisted of various elements that individuals used to

leverage their behaviour so that they could improve their life quality it has become very important to the success of an organization (Jones, 2007). Technology could also be used to refer to a collection of techniques. In this context, it is the current state of humanity's knowledge on how to combine resources to produce desired products, to solve problems, fulfill needs, and satisfiy wants. This includes technical methods, skills, processes, techniques and tools (Akubue, 2002; Gopalakrishnan & Santoro, 2004). When combined with another term such as radio communications technology, it refers to the state knowledge in the respective field and tools of niche-technology refer to the high technology available to humanity in any field (Bernard, 1998).

People view technology differently, some consider it as a tangible outcome of science and engineering that provides individuals with desirable assets (Lundquist, 2003). Others consider technology as acquired knowledge and skills required for developing working skills (Rogers, 1995). As technology comprised of knowledge that would enhance performance of an organization through its usage and acceptance and adoption by end users; several studies had discussed technology in the perspective of diffusion, adoption and acceptance (Rogers, 1995).

Technology adoption theories were developed as assumptions that voluntary decisions and choices made by individuals either to adopt or reject innovation was dependent on their belief that they would gain from the adoption of technology (Fichman, 1992). The decision to adopt or reject would happen at any stage of the adoption (Bayer & Melone, 1989). In addition, the decision to adopt a technology was also dependent on the dynamic coverage levels of the adoption because of network externalities (Katz & Shapiro, 1986; Markus, 1987).

Studies found that contextual factors affecting individuals' use of new technologies are linked to user perceptions about the technology (Kamal, 2006). Comprehensive knowledge of adoption behaviour was essential to ensure a model that was able to explain the adoption process from diverse multiple contexts (Plouffe, Hulland & Vandenbosch, 2001).

In addition to technology characteristics, DiMaggio and Cohen (2005) suggested that versatility of the technology, which referred to the number of uses to which the technology could be put. The diversity of content that one could find on it, might affect individual perceptions about the value of the technology. DiMaggio and Cohen (2005) further argued that individuals would be more likely to adopt technologies that could be put to many uses and had greater content diversity since these tended to increase perceived usefulness of the technology. Empirical studies had also examined adoption of different technologies and had incorporated the contextual factors unique to the technology in question into their proposed adoption model (DiMaggio & Cohen, 2005).

As for usage context of the technology, availability of other more advantageous options would also affect individual's adoption of technologies. Based on this view, individuals made comparisons to see whether the innovation was more economical, socially prestigious, more convenient and more satisfying than the available alternatives that could be more advantageous. If it is adopted, there is an extra benefit to make the change (Hebert & Benbasat, 1994; Kimberly& Evanisko, 1981; Rogers, 1995; Tornatzky & Klein, 1982). In other words, if individual had other more advantageous options, they might be less likely to adopt the innovation.

Another feature of a technology related to adoption context was whether there was incentive associated with the adoption of the technology.

Existence of incentives on technology was related to perceived benefits of the technology. As such, incentives might positively influence individual's perception about the usefulness of the technology and the consequences of technology adoption, and motivate users to adopt a new technology (Ely & Thomas, 2001). This body of research focused on the personal and demographic characteristics that related to individuals' technology adoption behaviour. The literature suggested various different styles, preferences, skills, and experiences shared and brought by individuals helped in facilitating limited choice and adoption related with technology (King & Xia, 1997; Sitkin & Pablo, 1992). Factors related to individuals include, openness to change, innovativeness, awareness about the technology, perceptions about ability to use the adopted the technology, actual differences in skills and resources necessary for the use of technology and compatibility of the individuals' lifes tyle with technology, and dissatisfaction with status quo.

2.3 DETERMINANTS OF TECHNOLOGY ADOPTION

There had been a rapid evolution of information technology and an increase in investment in technology within an organization to enhance the overall organizational performance (Dasgupta, 1997). Increasingly, organizations demanded and expected future growth and profitability, attained from productivity gains achieved through the continous investment in information technology (Kamal, 2006). Clegg et al. (1997) reported in their findings that 80 to 90 percent of technology investments were not able to achieve the target and objectives because most of the

time the nature of the technology was non-technical. Furthermore, changing the technical context that influenced adoption, development and implementation, the diversity of users, organizational factors, managers and end users characteristics were critical determinant factors in the adoption of technology. Therefore, successful implementation and adoption of technology depended upon acceptance by organizational targeted end users of the project where individual who are low in the organizational hierarchy could slow or halt the diffusion process if they rejected or reluctant to use the technology (Dorothy & Isabelle, 1988). End-userswho were involved in evaluation of the technology were affected not only by organizational leaders' attributes, opinions, or actions but also depended heavily upon individual's personal interests, needs, and skills (Leonard-Barton, 1985). Thus, the major assumption underlying the individual adoption decisions by the target end users was the process of diffusion and adoption (Leonard-Barton, 1988).

2.3.1 Individual technology adoption

Individual adoption research was normally restricted to a single organization (Fichman, 1992). Thus, the more experienced users were the more likely they would adopt the technology because they were more capable of absorbing the benefits to create a more maintainable code; or in other words, their adoption capacity with respect to this innovation was higher (Leonard-Barton, 1988). Literature suggested that highly innovative individuals usually engaged in more extensive and elaborate information searches (Agarwal & Prasad, 1998).

In addition, individual characteristics had been reported to play a key role in management information system (Zmud, 1979). Leonard-Barton and Deschamps

(1988) reported that personal innovativeness was a good predictor of successful technology implementation. Other researchers concurred and identified innovativeness as the willingness of an individual to try out any new system technology (Agarwal & Prasad, 1998). The researchers further suggested that individuals with higher level of innovativeness with respect to the implemented system technology could be expected to develop more positive perceptions about the innovation in terms of usefulness, compatibility and therefore had higher intentions toward adoption of the system technology (Lu, Yu, Liu & Yao, 2003).

As noted above, according to Rogers (1995) the extent of adoption of innovation was seen as approximately normally distributed over time. With regards to this, there was more evidence that suggested that most of the traditional models neglected the realities of implementing new technology within an organization especially when individual adoption decisions were made at the organizational, division, or workgroup levels (Fichman & Kemerer, 1997; Orlikowski, 1993).

In addition, the theory of diffusion of innovation provides the comprehensive theory in the field of information technology especially in assisting how to implement technology. Prior studies of information technology research on would be adopters who were given the choice to use the technology independently and without imposing any burden produced strong evidence that the adoption level was very high (Fichman, 1992). Individuals might adopt a new technology because it served their goal and they found it a comparatively better alternative; individuals might not adopt a new technology because they might be unaware of it due to limitations in information access and processing; and individuals might choose not to adopt it

because they had a routine that was already working or there might be other alternatives easily available to them without effort (Fichman, 1992).

2.3.2 Top Management Support

Top management is the group of stakeholders who have the ultimate responsibility for setting goals and objectives, and for allocating organizational resources to achieve these objectives (Jones, 2007). If the top management establishes appropriate goals, identifies critical technology that the business needed, and allocates financial resources then the technology adoption is possible (Manueli, Latu & Koh, 2007).

Literature suggested that top management support influenced perceived usefulness, which in turn affected system usage and adoption (Jones, 2007). Similarly, other researchers also suggested that top management support in a work place had been found to predict new technology adoption by individuals (Lewiset al., 2003). Needless to say, adoption of technology in a work place could be quite different than adoption of a technology for personal use because the technology in organizations was readily available and was usually not an option but a requirement. The users were also not affected by costs (Sun & Zhang, 2006).

While some studies had recently focused on applying these theories to the adoption of personal technologies like cell phones, PDAs, and personal computers at home, individuals' adoption of government processes such as RMPnet system had been less explored and theorized (Kamal, 2006). Besides, government technology adoption research had been mostly concerned with the adoption of online government services using web technologies; however, there were other technologies

that were recently being used in government context, such as radio communications, which were less explored in available literature (Kamal, 2006).

In order to understand factors affecting citizens' adoption of new technologies used in the government context and increase the adoption of such service, it is important to extend the theories beyond the work place and beyond computer and Internet technology (Kamal, 2006). The present study aims to contribute to the literature by proposing an integrated model of technology adoption, by looking at the technology adoption cases where most of the usage and adoption has a variety of features, different requirements, and benefits for the users. In addition, there is a good body of research in the form of empirical studies that document and highlight the importance of top management support in terms of leadership, commitment and understanding for the successful adoption and deployment of new innovations and technologies (Armstrong & Sambamurthy, 1999). A look into information technology literature elaborates the importance of top management leadership and support (Bhattacharjya & Chang, 2008; Cater-Steel, 2009; Willson & Pollard, 2009; Winniford, Conger & Erickson-Harris, 2009).

Hence, the implementation success and adoption of the RMPnet system in RMP which was implemented by the Federal Government under the 9th Malaysia Plan was not just a functional responsibility but entailed other responsibilities such as the top managements authority to hold people accountable for their actions and to make decisions concerning the use of organizational resources; the RMPnet system.

2.3.3 RMPnet system Experience

Findings indicated that computer experience (RMPnet system Experience) was a determinant of behavior (Ajzen & Fishbein, 1975). In addition, Taylor and Todd (1995) compared the determinants of technology usage and adoption for experienced and inexperienced users, and inexperienced users placed a different emphasis on the determinants of intention, usage and adoption.

Infact, prior experience refered to users' previous experience affects perceptions of usefulness of specific systems positively and hands-on experience with systems that might or might not include coaching provided by experts (Ndubisi & Jantan, 2003). Venkatesh and Davis (1996) found that before a direct experience with system characteristics did not play a significant role in the formation of early usage of adoption perceptions. Moreover, the case of adoption of two different sub-systems did not differ significantly before direct experience, but differed after direct experience, system characteristics became significant determinants usefulness perceptions. In addition to the theoretical and intuitive biase to believe that experience could have relationships with perceived usefulness, there was empirical support in Malaysia (e.g. Ndubisi & Jantan, 2003; Ndubisi, Jantan & Richardson, 2001) to suggest that prior experience determined adoption perceptions.

Other researchers concurred and also suggested increased direct use of system had been found to influence end-user beliefs in information systems (King & Xia, 1997; Venkatesh & Davis, 2000; Venkatesh et al., 2003) and enhanced the end-users confidence in their ability to understand the use of the system in performing their tasks (DeLeone, 1988; Kraemer, Danziger, Dankle & King, 1993). As the end-users direct-use experience with the information system increased over time, their

perceptions and adoption intention subsequently changed (Venkatesh & Davis, 2000; Xia & Lee, 2000). Research by Gumussoy, Calisir and Bayram (2007) on 75 potential end-users of ERP systems in Turkey indicated that computer experience was positively corelated with perceived usefulness as a determinant of technology usage and adoption.

Hence, the implementation success and adoption of the RMPnet system in RMP would depend on the experience of users in operating and making full use of the various sub-systems (e.g. handheld radios) for their day-to-day general policing.

2.3.4 Perceived Usefulness

Perceived Usefulness is the extent to which a person believes that a system would enhance his/her performance, and perceived ease of use was the extent to which a person believed that using the system would be free of effort and risk. These have been confirmed as important factors that influence user technology adoption and therefore had received a great deal of attention from prior researchers (Sun & Zhang, 2006). The reliability of this construct was previously demonstrated in studies by Lin and Lu (2000), and Moon and Kim (2001).

Davis (1989) defined perceived usefulness as a belief by an individual that using a new system or technology would increase his or her performance. This was to say that, perceived usefulness was seen as an important determinant in measuring how effectively the job was being performed, the level of productivity related with work in terms of financial and time saving in motivating effective usage and adoption of certain technology (Yanga & Yoo, 2004). In this research, perceived usefulness refers to the concept that senior police officers perceive RMPnet system

as being useful. A measure of usefulness found as is the system's ability to increase performance, productivity, and effectiveness. Many empirical studies had found perceived usefulness as an important determinant of intention to adopt and thus this variable was included in this research to examine the intention level of users to adopt RMPnet system.

Collier (2006) indicated that the reason why adoption of intelligence system failed was because the nature of the system was not user friendly. Another reason was due to rejection by some police officers and the unwillingness to disseminate the collected intelligence because of the nature of work and security procedures (Yalcinkaya, 2007). Therefore, it was hoped that senior police officers of RMP would adopt the technology applied in RMPnet system provided that they wereof the opinion that the system would assist them in their performance outcomes (Amoko-Gyampah & Salam, 2004). Consequently, the greater the perceived usefulness of using the RMPnet system, the more likely that RMPnet system would be adopted. Previous researchers had often linked perceived usefulness to adoption (Agarwal, Erramilli & Chekitan, 2003; Venkatesh, 2000). Similarly, Ramayah (2010) in his research on the role of voluntariness in distance education students' usage of a course website, survey of 155 students which registered 67 responses found that of these 64.1%; viewed perceived usefuless as having significant impact on the usage of thecourse website. These findings concured with the findings of previous researchers (Chan & Lu, 2004; Chau & Hu, 2001; Davis, 1989; Featherman, 2001; Gefen& Straub, 2002; Guriting & Ndubisi, 2006; Jantan, Ramayah & Chin, 2001; Mathieson, 1991; Mohd Suki, Ramayah & Mohd Suki, 2008; Ndubisi et al., 2001; Taylor & Todd, 1995; Venkatesh & Davis, 2000). Similar to other studies the literature further

suggested that newly implemented technology within an organization was perceived as good to have (Jantan et al., 2001; Ndubisi et al., 2001; Ramayah & May-Chiun, 2007). Therefore, perceived usefulness was considered as an important determining factor in technology adoption.

Tests of the relationships in the diffusion of innovation model had produced consistent results of the importance of perceived usefulness as a direct determining factor of intention (Taylor & Todd, 1995). Similarly, studies had found that users' adoption decisions about government system technology was influenced by users' belief that technology was reliable and secure and their degree of trust in the agency's ability to use the technology to provide the services (Carter & Belanger, 2005; Pavlou, 2003). As a result, individuals would adopt the innovation when they perceived the innovation as something prestigious to have and valued by the society where a good image of an innovation was likely to increase its perceived usefulness by the individual (Beiglo, 2011). Hence, the individuals' perception of perceived usefulness regarding RMPnet system would have considerable impact towards explaining adoption of RMPnet system in this study.

2.3.5 Behavioral Intention

Behavioural intention was asserted to have a direct impact upon individuals' adoption of a given technology (Hennington & Janz, 2007). This construct originated from the Theory of Reason Action (Fishbein & Ajzen, 1975) and was defined as a measure of strength of one's intention to perform a specified behaviour (Davis, Bagozzi & Warshaw, 1989). Davis (1989) introduced the behavioural intention construct to the MIS discipline via his Technology Acceptance Model, an adaptation

of TRA designed specially in the information systems context. Davis retained TRA's operationalization of behavioural intention in TAM. Although no definition of behavioural intention was provided by Venkatesh et al. (2003) in their development of the UTAUT model, they did mention that they measured behavioural intention using items adapted from Davis et al. (1989) that had been extensively used in much of the previous individual acceptance research (Venkatesh et al. 2003). These items were consistent with the original TRA definition of behavioural intention.

Prior researchers implied that behavioural beliefs had influence on individual intention to use and adopt technologies (Rogers, 2003). In contrast to perceived usefulness, which referred to process and outcome expectancy respectively where behavioural intention would lead to actual usage and adoption of technologies (Liaw, 2002). This claim was valid because there was empirical evidence comprising of various aspects of technology usage and adoption (Chau, 2001; Fusilier & Durlabhji, 2005). It is important to note that behavioural intention would predict the adoption behaviour of individuals who had previously used the technology more accurately (Taylor & Todd, 1995).

In addition, literature also suggested that intentions were assumed to capture the motivational factors that influenced a behaviour and to indicate how hard people were willing to try or how much effort they would exert to perform the behaviour (Ajzen, 1991).The direct effect of a belief towards system adoption (e.g. RMPnet system) has provided theoretical justification and empirical evidence of direct belief-intention links (Bagozzi, 1982; Triandis, 1977). The relationship between adoption and behaviour was based on the idea that, within an organizational setting, people form intentions towards behaviour they believed would increase their job

performance, over and above whatever positive or negative feelings might be evoked toward the behaviour per se (Davis, Bagozzi & Warshaw, 1989). This was because enhanced performance was instrumental to achieving various rewards that were extrinsic to the content of the work itself, such as commendation certificate and promotions (e.g. Vroom, 1964). Intentions toward such means-end behaviour were theorised to be based largely on cognitive decision rules to improve performance, without each time requiring a reappraisal of how improved performance contributed to purposes and goals higher in one's goal hierarchy, and therefore without necessarily activating the positive affect associated with performance-contingent rewards (Bagozzi, 1982).

Hence, the relationship between behavioural intention and adoption results in end-users intentions towards adopting a system technology being based largely on a cognitive appraisal of how it would improve their performance. Thus, the individuals' perception of intentions to adopt the system would have considerable impact towards explaining adoption of RMPnet system in this study.

2.3.6 User Support

User support is an important factor in evaluating new versions of a system or technology as to whether it would be supported in future (Foo, Hui, Leong & Liu, 2000). User support includes technical support specialists who assist end-users with system problems that they could not resolve on their own (Regan & O'Connor, 1994). User support is defined as assistance provided to end users of information systems by knowledgeable people (Noll & Wilkins, 2002).

Users constantly voice their need for systems that are easier to use. However further down the system, it gets more complicated, not in terms of doing the task but in the rigid system of controls over the task (Sandhu & Corbitt, 2003). What then constitutes user friendliness? Many end-users require performance support aids (Regan & O'Connor, 1994). When faced with new technology, end-users inevitably came across situations when they did not know what to do when faced with operating problems with equipment. Sometimes error messages were confusing and not meaningful (Regan & O'Connor, 1994).Further more end-users frequently found that, technical manuals, even when well written, were of limited value in solving problems. The reason might be due to the fact that these manuals generally contained everything that anyone would ever need to know about the general operations of the system but they helped little in solving problems of end-users (Sandhu & Corbitt, 2003). Since new users had limited experience on which to discriminate, or even formulate their questions, it was often difficult to locate the applicable sections of the manual, thus, the level of control in supporting end-users to overcome problems in their tasks might require careful understanding of the end-user expertise based on their knowledge and experience of the system (Sandhu & Corbitt, 2003).

In relation to RMPnet system, user support for the system, equipment and sub-systems is 24 hours a day for 365 days of the year. When a failure was detected, technical personnel would diagnose the problems and necessary actions would be taken to resolve the issue. The user support provided the following service (ALMR, 2010):

a) Remote technical support

b) Issue/dispatch management

c) System monitoring 24/7

d) Network security monitoring

e) Advanced technical support

f) Engineering support for field technicians to resolve maintenance issues

g) Software support for field technicians to resolve maintenance issues

h) Infrastructure depot repair for equipment that has failed

i) Diagnosis and resolution of system performance issues

j) Response to system events

k) Coordination and dispatch of on-site response service

l) Information Assurance Security updates

m) Subscriber programming assistance

Hence, user support would have a positive outcome when maintenance, close monitoring and round the clock support is provided (e.g. RMPnet system) and this concurs with suggestions by prior researchers (Bergeron, Rivard & DeSerre, 1990; Buyukukkurt & Vass, 1993; Mirani & King, 1994; Schillewaert, Ahearne, Frambach & Moenaert, 2005; Vijayaraman & Ramakrishna, 1990). Thus, the user support provided by the project, would enhance the level of RMPnet system adoption by senior police officers of RMP.

2.4 INNOVATIVENESS

Innovativeness is defined as the adoption of an idea or behavior, whether a system, policy, program, device, process, product or service, that is new to the adopting organization (Damanpur, 1992). Innovativeness was most frequently used as a

measure of the degree of newness of an innovation (Garcia & Calantone, 2002). Researchers suggested that innovativeness was the capacity of new innovation to influence skills, knowledge and capabilities where a person with optimism, innovativeness, and little discomfort and insecurity would likely use a new technology (Walczuch, Lemmink & Streukens, 2007). Findings indicated that the concept of individual innovativeness changed drastically from its original definition, where it was defined as the visible occurance that was related to the time that the adoption first started (Rogers & Shoemaker, 1971). Further more, innovativeness was often identified as a personality construct (Hirschman, 1980; Venkatraman & Price, 1990; Wood & Swait, 2002) that had been employed to predict end-user innovative tendencies to adopt a wide variety of technological innovations. It was then reconceptualized by other researchers (Agarwal & Prasad, 1998) as individual trait that would lead the individual to behave innovatively and voluntarily to try the new technology (Rogers & Shoemaker, 1971). The assumption was that individuals with high innovative behavior would be more likely to take advantage of the new technology (Agarwal, & Karahanna, 2000).

In addition, individuals with high level of innovativeness were prone to develop positive attitude towards the innovation in terms of usefulness and therefore would voluntarily use the technology (Agarwal & Prasad, 1998). Prior research had also shown that personal characteristics of an individual would make a decision either to adopt or reject the innovation (Rogers, 1995). Other researchers concurred and were also in the opinion that personal innovativeness was the basis to shape ones attitude towards the innovation (Hung, Ku & Chang, 2003).

With regards to this, most of the innovation analysed in Roger's book 'Diffusion of Innovations' (1995) were technological innovations. Since, this study would be based on technological innovation on a digital communication system called APCO Project P25 which is known as RMPnet system of Royal Malaysia Police, hence, it was hoped the individuals' innovativeness towards the RMPnet system would have considerable impact on the RMPnet system adoption in this study.

2.4.1 Moderating variable between the independent and dependent variables

A moderating variable could improve the relationships of predictive variable towards criterion variable of a research (Sharma, Durand & Gur-Arie, 1981). The purpose of introducing a moderating variable was when there existed inconsistency and weak relationship between the predictor and criterion variable (Baron & Kenny, 1986). In general, a moderating variable that could affect the direction and/or strength of the relation between an independent or predictor variable and a dependent variable or criterion variable (Baron & Kenny, 1986). In relation to this, Jeyaraj et al. (2006) had conducted analysis on information technology adoption involving 48 empirical studies from 1992 to 2003 where they suggested potential moderating variable to be introduced to further strengthen moderating effect relationship of the independent variables and the dependent variable of this research.

Many researchers were also in the opinion that moderating factor was possible cause of limitation in explanatory power and also the inconsistencies between studies (Sun & Zhang, 2006). In prior research (Adams, Nelson & Todd, 1992) had suggested that there were more studies required to examine the

moderating factors. Similarly, other researchers (Lucas & Spitler, 1999; Venkatesh et al., 2003) had also suggested the inclusion of more moderating factors in future research. The exclusion of moderating variables in technology adoption researches received critism by researchers (Agarwal & Prasad, 1998). It was also argued by researchers that the inclusion of moderating elements to technology adoption models would enhance and improve the relationships of variables under study (Venkatesh et al., 2003). Similarly, researchers were also in the opinion that the moderating variables exceeded its initial specification (Venkatesh et al., 2003). In lieu of this, Chin, Marcolin and Newsted (2003) conducted a study and their finding showed that moderating variables significantly influenced current technology adoption model. Though previous research had suggested including various possible moderators, only four, those were experience, voluntariness, gender and age were examined by Venkatesh et al. (2003). Other researchers further suggested that moderating factors were not confined to the four variables that had been examined by Venkatesh et al. (2003) in his research. To understand the dynamism of technology adoption environment, the significance of moderating factor must be extended. Therefore, to fill the literature gap, this research introduced innovativeness as the possible moderating factor that moderated the relationship between the independent variables as determinants and dependent variable of this research with respect to technology adoption.

2.5 THEORIES OF TECHNOLOGY ADOPTION

Researchers had proposed several theories such as Innovation Diffusion Theory (Rogers, 1995), Perceived Characteristics of Innovations (Moore & Benbasat, 1991),

Social Cognitive Theory (Bandura, 1986), Technology Acceptance Model (Davis, 1989), Technology Acceptance Model II (Venkatesh et al., 2003), Theory of Planned Behavior (Ajzen, 1991), Theory of Reasoned Action (Fishbein & Ajzen, 1975), and Unified Theory of Acceptance and Use of Technology (Venkatesh et al., 2003) to examine the adoption behavior of individual adoption (Jeyaraj et al., 2006).

Studies found that diffusion of innovation theory (DOI) had been broadly used in technology adoption research and had also been tested in several rersearch areas such as comprehensive instrument designed to examine the technology adoption decision (Agarwal, 2000; Moore & Benbasat, 1991), operating system (Karahanna, Straub & Chervany, 1999), Internet banking (Tan & Teo, 2000). Innovation Diffusion Theory stands out as the only theory listed in both individual and organization adoption domain (Jeyaraj et al., 2006).

2.6 TECHNOLOGY DIFFUSION

Technology diffusion is the process during which an innovation is communicated among members over time (Rogers, 1995). In other words technology diffusion referred to the accumulated level of users of an innovation in a market (Rogers, 1995). Valente (1995) described the technology diffusion of innovations as spreading of new ideas, opinions, or products throughout the society and there was a distinction between ideas or products throughout the society. With diffusion research, a distinction between different models could be found where diffusion models focus on the understanding of the diffusion process as a whole at the aggregrated level. In contrast, adoption models emphassized the disaggregate pespective and the factors of individual adoption decisions. The outcome of developing adoption over time was

expressed in so-called diffusion curves, which described adoption from the first to the last customer. As the researcher focused on the adoption of an innovation/technology and the determinants influencing its adoption and diffusion issues were touched upon only later in the literature.

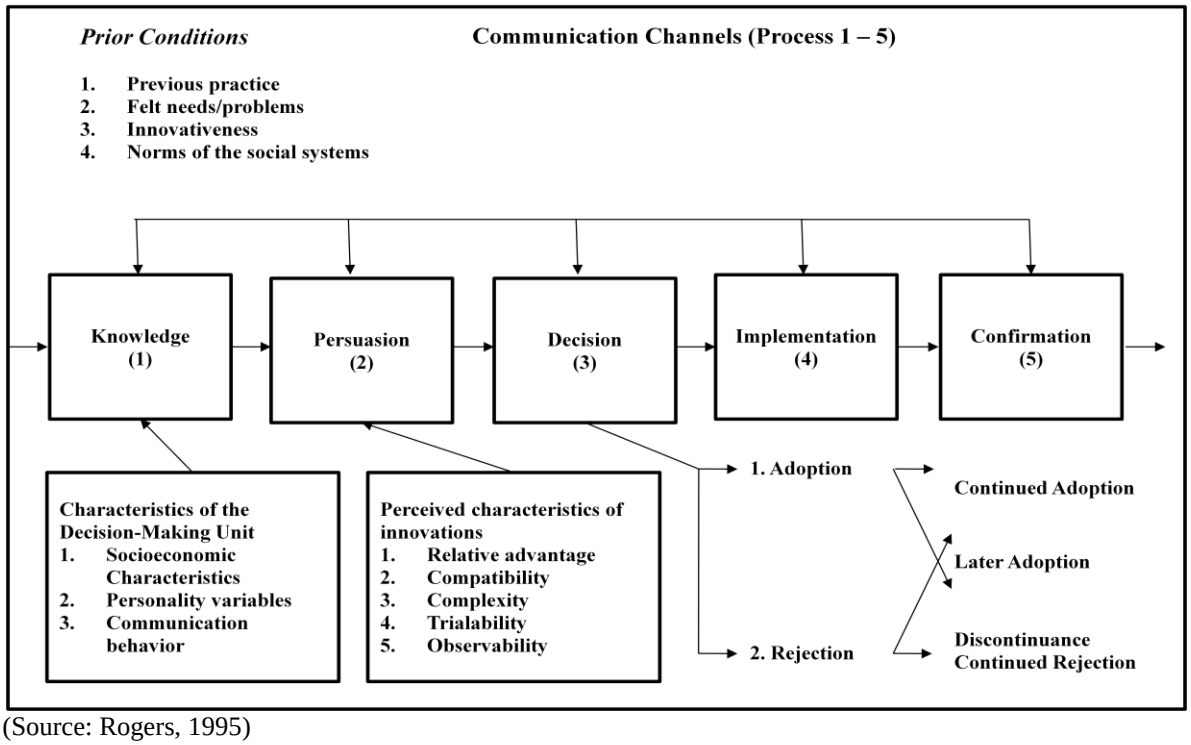
The research on technology diffusion was first conducted by Tarde and Parson (1903) where the innovation curve was plotted. The innovation curve was important to show the rate of adoption (Rogers, 1995). Impelemtation of new technology was faced with diffusion issues that must be overcome to ensure the successful adoption of the technology (Bradford & Florin, 2003; Taylor & Todd, 1995; Young, 2006). Information exchanged across a network considered as innovation where the task was exchanged through electronic media which required individual to adopt a technology in order to perform the task (Melville & Ramirez, 2008; Troshani & Doolin, 2007).

2.6.1 The Theory of Diffusion of Innovation

The Theory of Diffusion of Innovation (Rogers, 1995) was widely used to explain the process of innovation where an individual had to decide and pass through the stages. First the individual must acquire knowledge of the innovation. Secondly the individual must form innovative attitude, make a decision either to adopt or reject the innovation, implement the acquired new idea and finally confirm the decision.In addition, this theory was acknowledged by many researchers in empirical studies relating to the intention of potential adopters of a given innovation (Rogers, 2003). Furthermore, Diffusion of Innovation theory was a general theory of how new ideas were spread and adopted in a community, and it sought to explain how

communication channels and opinion leaders shaped adoption (Rogers, 2003). In addition, Diffusion of Innovation theory also hypothesized that information was transacted through communications infrastructure within the communities and channels in society and the diffusion of an innovation was formed in this society by being effected through these channels (Russell & Hoag, 2004).

Studies on widely accepted technologies had revealed that in the beginning only a few individuals adopted newly innovated technologies (Rogers, 1995). Following this early adopters and relatively slow diffusion process that included 10 to 20% of the potential adopters, more and more individuals adopted the technology causing the diffusion curve to climb. Perceptions of individuals about the features of the innovation help explained these differences in diffusion rate (Rogers, 1995) as illustrated in Figure 2.1.



(Source: Rogers, 1995)

Figure 2.1
Schematic diagram Diffusion of Innovation Model

Literature suggested innovation theories and models had been integrated and modified as comprehension to innovation characteristics and the modification and examples of some of the theories are Theory of Reasoned Action (Moore & Benbasat, 1991), Theory of Planned Behavior (Taylor & Todd, 1995), and the concepts helped in intergrating and factoring a model from various technology models and theories easily (Rogers, 1995). Therefore, based on the above discussion, this diffusion and innovation theory could be suitable for this study to examine the diffusion of new technology adoption in RMP.

Researcher (Rogers, 1995) also suggested Diffusion of Innovation also helped to enhance confidence. At the initial stage, individuals had no confidence towards certain innovation and once they acquired sufficient knowledge their confidence in using the technology and the rate of adoption improved (Dillon & Morris, 1996). Different theories had also been formulated to examine organizational adoption as well (Rogers, 1995). Literature suggested in a meta-analysis, Innovation Diffusion Theory stood out as the only theory listed in both individual and organization adoption domain. Simarly, researcher further stressed that the best predictors of individual information technology adoption included top management support, computer experience, perceived usefulness, behavioral intention, and user support (Jeyaraj et al., 2006). Thus, Diffusion of Innovation research could assist in determining the factors of successful adoption of new technology by end users as proof of empiral research was not sufficient to support this and therefore further study is required into the subject.

2.6.2 Perceived Characteristics of Innovations scale

Perceived Characteristics of Innovations (PCI) scale was developed by Moore and Benbasat (1991) for investigating information technology innovations by individuals within organizations. In their research, two new characteristics were added to Rogers' attributes of innovation:

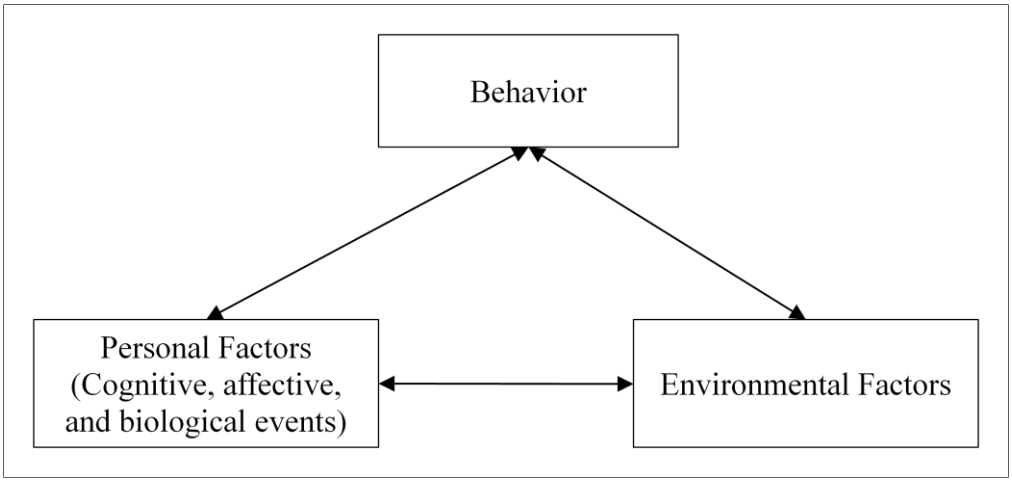
a. Image – as perceived improvement of the social status by adopting the innovation, operationalises the theory of planned behaviour (TPB) construct subjective norms.
b. Voluntariness – the degree to which an innovation was adopted voluntarily, operationalises the TPB construct perceived behavioural control.

Thus, Perceived Characteristics of Innovations scale could not assist in determining the factors of successful adoption of new technology by end users as proof of empirical research was not sufficient to support this study and therefore could not be primarily connected to the proposed RMPnet system adoption model.

2.6.3 Social Cognitive Theory

Social Cognitive theory (SCT) was introduced by Bandura (1986) and proposed that human actions should be considered as the result of dynamic interplay of personal, behavioural and environmental impact. It was related to the process of how individuals comprehended the results and outcome of their own behaviour and how they modified the environmental and personal factors they had to alter succeeding behaviour. Bandura (1986) stated that the foundation of SCT was as follows: 1) personal factors, cognition, affective, and related biological events; 2) behaviour; and 3) environmental influences that established interactions that lead to a triadic

reciprocally. In short SCT was a notion based on both social learning and social cognition whereby it detached from common up-to-date social learning theories and focused on the comprehension that cognition had a crucial role in individual capability to establish reality, self-regulated, encoded information, and performed behaviours. Figure 2.2 depicts the schematic diagram of Social Cognitive Theory model.



(Source: Bandura, 1986)

Figure 2.2
Social Cognitive Theory

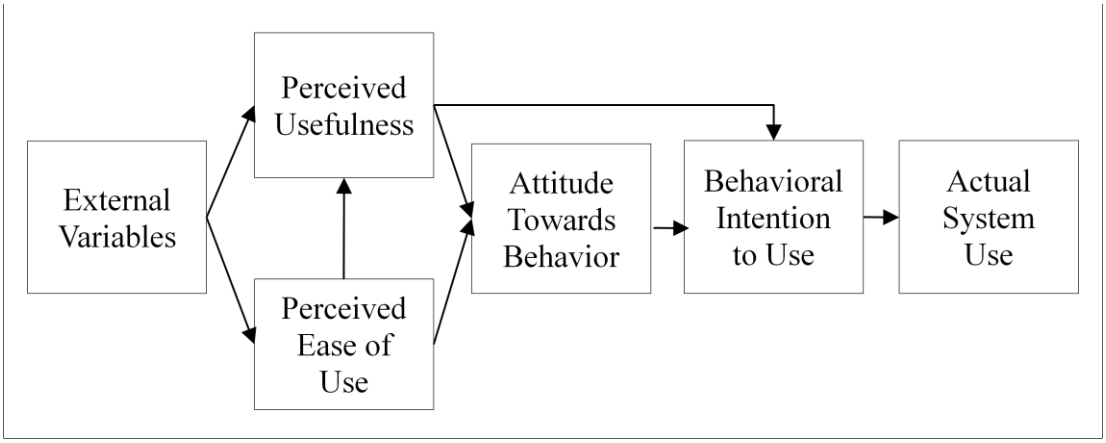
Thus, Social Cognitive Theory could assist in determining the factors of successful adoption of new technology by end users as proof of empiral research was not sufficient to support this and therefore further study was required into the subject.

2.6.4 Technology Acceptance Model

Technology Acceptance Model (TAM) consists of social psychology elements to provide predictive value for computer usage, including generic information system adoption. It was established by Davis et al. (1989) and was primarily based on

Theory of Reasoned Actions and Theory of Planned Behavior. Later this model was extended and simplified by Davis (1989).

Furthermore, Technology Acceptance Model provided high recognition of system characteristics by affecting the "attitude towards behaviour" factor. It did not include other factors such as social norms. Davis (1989) further stated that subjective norms had no significant influence on personal intentions apart from the perceived usefulness and perceived ease of use. As a result, they omitted subjective norms from TAM. The main basic TAM model had a substantial empirical confirmation in a diversity of technology areas that involved computer usage (Davis et al., 1989), information system (Wu, 2005), software application, various internet applications such as e-mail and a number of web-application (Gefen & Straub, 1997; Macharia & Nyakwende, 2010). Many researchers (Venkatesh et al., 2003; Amoako-Gyampah & Salam, 2004; ErnestChang & Heng, 2006; Porter & Donthu, 2006; Teo 2009) had tested and extended this model because it involved a variability of specific areas of adoption. Figure 2.3 showed the schematic diagram of Technology Acceptance Model.



(Source: Davis et al., 1989)

Figure 2.3
The Technology Acceptance Model

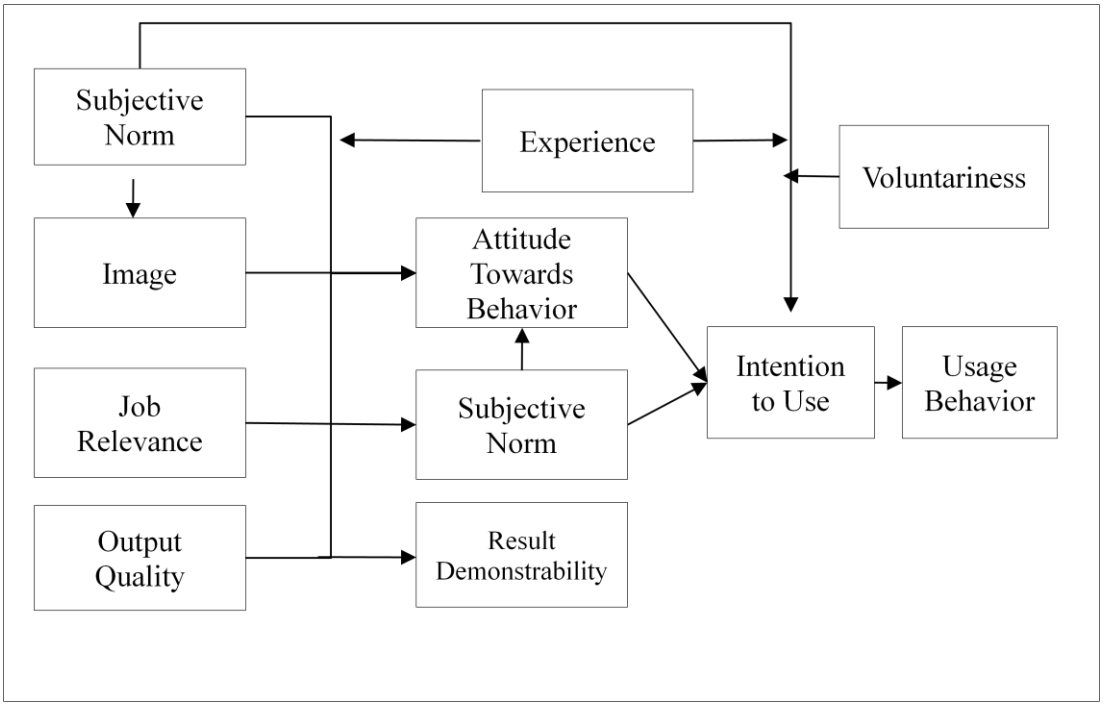
Thus, these results had important implications for potential RMPnet system adoption and diffusion among consumers. The perceived usefulness, perceived ease of use, acceptance and usage aspect of RMPnet could be primarily connected to a proposed RMPnet system adoption model.

2.6.5 Technology Acceptance Model 2

Venkatesh and Davis (2000) put forward a decomposed version of TAM which they called TAM 2 (see Figure 2.4). One of their objectives was to give better comprehension of the determinants of perceived usefulness for organizational interventions that would increase user acceptance and usage of new systems. Thus, they incorporated subjective norm into TAM2 – emulated the studies undertaken by Hartwick and Barki (1994) where they found that subjective norm had an important effect on intention in mandatory situations but not in voluntary situations.

In other words, TAM2 postulated that the effect of subjective norm compliance on utilization, over and above perceived usefulness and perceived ease of use, would occur in mandatory but not voluntary system usage settings (Venkatesh & Davis, 2000). In addition to this, Venkatesh and Davis (2000) introduced another factor called “image”, which also influenced perceived usefulness. They assumed that subjective norm would positively influence image if important people of a social group at work believed that he or she should carry out behaviour so that his or her standing could be elevated. In order to differentiate between mandatory and voluntary usage settings, Venkatesh and Davis (2000) introduced voluntary as a moderating variable whereby it was defined as the extent to which potential adopters

perceived the adoption decision to be non-mandatory (Venkatesh& Davis, 2000). They also assumed that voluntary moderated both social norm and image.



(Source: Venkatesh and Davis, 2000)

Figure 2.4
The Technology Acceptance Model 2

In order to recapitulate there was need to consider some of TAMs's items as a supporting framework when developing the proposed conceptual model for this research. This was because the strong role that experience could play in determining the adoption behaviour towards RMPnet system adoption. Thus, experience was incorporated in the proposed conceptual framework of this research.

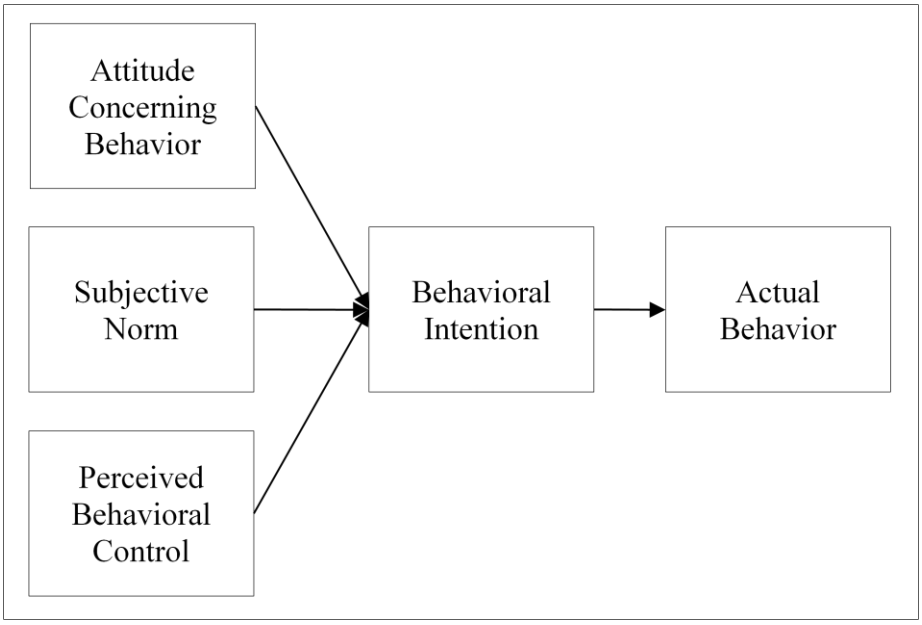
2.6.6 Theory of Planned Behavior

This theory was an extended form of Theory of Reasoned Action (TRA), which was developed to overcome the TRA's limitations that dealt with an incomplete volitional

control (Fishbein & Ajzen, 1975; Ajzen & Fishbein, 1980). After Ajzen (1985) had realised that TRA contained some empirical significances and variances than predicted, he modified the TRA by integrating a third determinant that took into consideration the perceived ease or difficulty of performing the behaviour (Ajzen, 1991). This was known as "perceived behavioural control". This theory had been implemented productively in a wide range of settings and technologies (Mathieson, 1991; Taylor & Todd, 1995: Legris, Ingham & Collerette, 2003; Herrero Crespo & Rodriguezue, 2008). It was widely adopted and adapted by information system researchers to the study of information technology adoption, implementation and use (Benbasat & Zmud, 1999). The concept of perceived behavioural control related to the personal point of view of the presence or absence of necessary resources and opportunities to perform the behaviour (Ajzen & Fishbein, 1980).

According to TPB human action such as individual's adoption or use of a technology (e.g. RMPnet system) was affected by three types of beliefs: first, behavioural beliefs that created a favourable attitude toward the behaviour; second, normative beliefs that produced perceived social pressure or subjective norms; and third, control beliefs that generated perceived behavioural control (Ajzen, 1988; 1991; 2002). The aforementioned three types of factors lead to the formation of a behavioural intention (Ajzen, 1991; Ajzen, 2002). The more favourable the attitude and subjective norm were and the greater the perceived control by potential adopters (e.g. RMPnet system), the stronger should be the person's intention to carry out the behaviour in question (Ajzen, 1991; Ajzen, 2002). Finally, if the end-users had strong actual control over the behaviour, they were more likely to execute their intentions in favourable circumstances. This indicated that intention was an

immediate antecedent of bahaviour (Ajzen, 2002). In addition to intention, it was also useful to consider perceived behavioural control as a direct antecedent of behaviour (Ajzen, 2002). This was because to the extent that perceived behavioural control was stronger, it could serve as a substitute for actual control; hence it could contribute to the prediction of the behaviour in question (Ajzen, 2002). Figure 2.5 depicts the schematic diagram of TPB.



(Source: Ajzen, 1985)

Figure 2.5
The Theory of Planned Behavior

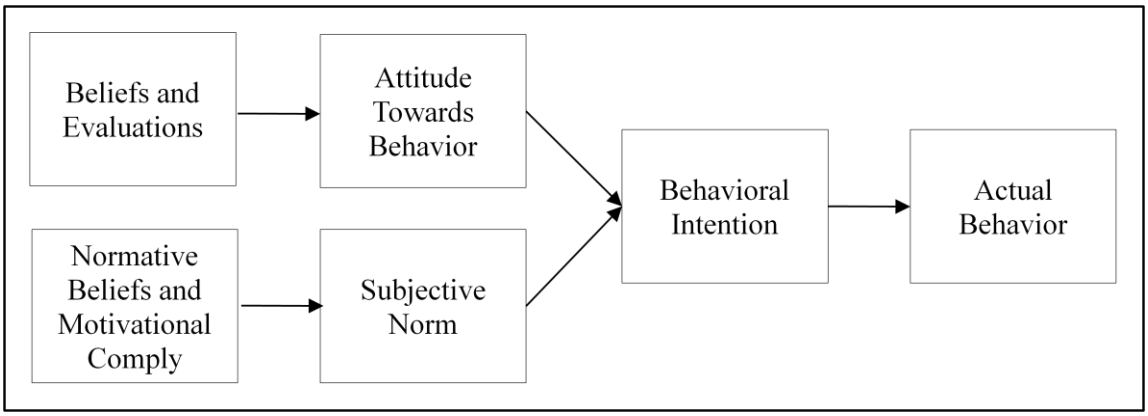
Although the TPB did not describe the process of implementation in a specific context, but it had a high degree of predictive validity and could be used to identify areas of concerns for a specific context (Benbasat & Zmud, 1999). According to the information system literature, TPB could serve as an effective diagnostic tool when examining information technology adoption (Benbasat & Zmud, 1999). Therefore, the TPB could be considered as a guiding framework when developing the proposed conceptual model of this research.

2.6.7 The Theory of Reasoned Action

This theory originated from social psychology and was first used by Fishbein and Ajzen (1975). It was introduced to provide a theoretical basis for predicting social behaviour. Since then, the theory has been used by many researchers in the area of adoption such as Chang, Cheung, Cheng and Yeung, (2008), Davis et al., (1989), and Selamat and Rawashdeh (2009). These scholars had used TRA theory in the process of technology adoption and had given a basis for a number of modified adoption model (Davis, 1989; Taylor & Todd, 1995; Karahanna & Straub, 1999). It was a predictor model that used individuals' intention as a basic predictor in the obtained behaviour. This means that if an individual wished to do something he or she would possibly do it. But if an individual did not intend to do, he or she was likely not to do it (Fishbein & Ajzen, 1980). The theory of reasoned action proposed that there were two basic influences of intentions, they were; attitude towards the behaviour where an individual's positive or negative feelings about performing the targeted behaviour (Fishbein & Ajzen, 1980); and the subjective norms where the person's point of view that most people who were important to him thought that he should or should not perform the behaviour in question (Ajzen & Fishbein, 1980).

According to Ajzen and Fishbein (1980), an attitude towards the behaviour was what the individual earlier attitude toward doing that behaviour was. This theory proposed that individuals thought of the result of their decision before making a decision. This was an attitude established concerning the entire decision and the subject on which the decision was made. In addition, TRA proposed that the influence of personal intention was considered as 'subjective norms' that was established by the person's belief that specific individuals or groups thought he

should or should not perform the behaviour and his motivation to comply with the specific referent (Fishbein & Ajzen, 1980). The decision, prediction and thought of the outsiders or influence play an important role in the subjective norms. Shown in Figure 2.6; the schematic diagram of TRA.



(Source: Ajzen & Fishbein, 1980)

Figure 2.6
The Theory of Reasoned Action

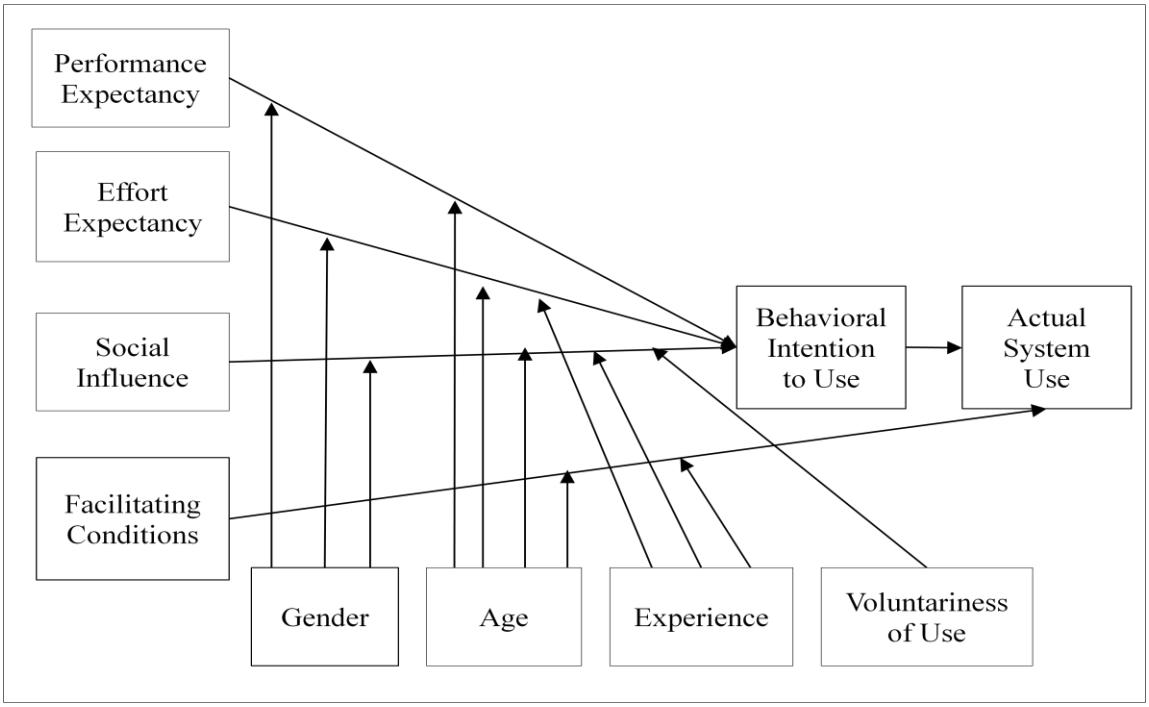
In short, TRA was drawn from a set of behavioural beliefs by the potential adopter about the resultant behaviour and outcome. Therefore, the TRA could be considered as a guiding framework when developing the proposed conceptual model of this research.

2.6.8 The Unified Theory of Acceptance and Use of Technology

This model was introduced by Venkatesh et al. (2003) and was established as a result of the combination between TAM, TAM2 and six other socio-psychological models, including TRA and TPB. Venkatesh et al. (2003) conducted a study to compare eight socio-psychological models and established a unified model that incorporated components across the eight models. The unified model was then further validated, tested, and evaluated by conducting case studies in four organizations over a period

of six months. Thereafter, Unified Theory of Acceptance and Use of Technology (UTAUT) was further validated and confirmed as a model through the analysis of data collected from two additional organizations. The experimental outcomes from UTAUT out performed the precedent models (Venkatesh et al., 2003). The UTAUT model had four moderating and facilitating components which were gender, age, experience and voluntariness of use. It had four causal components that were performance expectancy, effort expectancy, social influence and facilitating conditions.

In short, UTAUT was a very successful model in terms of studying individual intention of technology adoption where its application was yet to be investigated by senior police officers of RMP. In this study, there is a need to consider UTAUT as a supporting framework when developing the proposed conceptual model for this research. Figure 2.7 shows the schematic diagram of UTAUT model.



(Source: Venkatesh et al., 2003)

Figure 2.7

The Unified Theory of Acceptance and Use of Technology

Based on the above discussions, depicted in Table 2.1 the summary of theories used in individual and organizational adoption research.

Table 2.1
Theories used in individual and organizational adoption research

Theory	Main author (s)	Individual adoption	Organizational adoption
Innovation Diffusion Theory	Rogers (1983, 1995)	X	X
Perceived Characteristics of Innovation	Moore and Benbasat (1991)	X	
Social Cognitive Theory	Bandura (1986)	X	
Technology Acceptance Model	Davis (1989)	X	
Technology Acceptance Model II	Venkatesh et al. (2003)	X	
Theory of Planned Behavior	Ajzen (1991)	X	
Theory of Reasoned Action	Fishbein and Ajzen (1975)	X	
Unified Theory of Acceptance and Use of Technology	Venkatesh et al. (2003)	X	

(Source: Jeyaraj et al., 2006)

2.7 DEVELOPMENT OF CONCEPTUAL MODEL

Taylor and Todd (1995) stated that there were two basic criteria for the selection of a successful model. Firstly, a suitable model should be parsimonious in that it had the ability to provide good predictors and met expectations. Secondly, a suitable model should have enough contribution on the point of view, comprehension of the occurance within investigation as well as contain suitable predictive ability. The second criterion was utilised for formulating the conceptual model for this study since RMPnet system adoption needed predictive ability and contribution on the point of view of the phenomenon. The term "conceptual model" was first used by Norman (2002) to describe how a system was. It allowed the researcher to formulate a logical sense of the link between many factors which had been recognised as significant to the research problem (Norman, 2002). Developing such a conceptual

model helped the researcher to postulate or hypothesize and test certain relationships and ultimately improve comprehension of the situation. In short, the conceptual model discussed the interrelationships among the variables that were considered important to the study (Selamat et al., 2008). It was essential to understand what a variable meant and what the differences between the variables were (Selamat et al., 2008). After the conceptual model had been formulated, the testable hypotheses were developed to examine whether the formulated theory was valid or not (Sekaran, 2003).

2.7.1 Model applied to study RMPnet system adoption

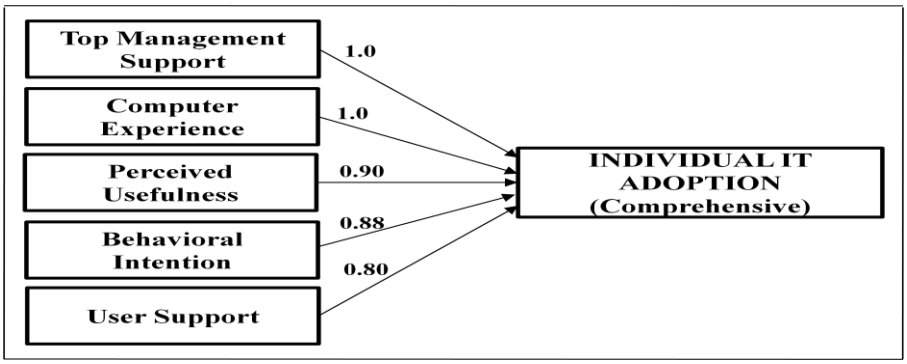
Past literature at large, had mentioned variations and similarities from one study to another on the technology adoption models. However, for the sake of this study, only the identical dominant determinants from the past research had been selected as the main variables for further investigation. This was due to the fact that there was a lack of similar study being conducted in public sector (e.g. RMP) in Malaysia (Kamal, 2006). Yalcinkaya (2007) and Manning (2008) mentioned that so far the research investigating the adoption of technology by police organizations was still small in number and insufficient. By choosing the most researchable determinants from the past studies, it was expected that the result could be more precise in representing the predictors to RMP in the communications technology industry. Hence, as illustrated in Table 2.2, five determinants identified from past research namely, top management support, computer experience, perceived usefulness, behavioural intention, computer experience and user support would be the independent variables for this research.

Table 2.2
Independent variables used to examine the IT adoption in individuals

Variable	Individual		
	Number of times tested	Number of times significant	Weight
Top Management Support	7	7	1
Computer experience	8	8	1
Perceived Usefulness	29	26	0.90
Behavioral intention	8	7	0.88
User Support	5	4	0.80

(Source: Jeyaraj et al., 2006)

From the result of meta-analysis by Jeyaraj et al. (2006) it was clearly seen that the selected five predictors were found to be dominant in the research model from 48 empirical studies on individual identified and reviewed. Based on the frequency, top management support (examined 7 times, significant 7 times, computer experience (examined 8 times, significant 8 times), perceived usefulness (examined 29 times, significant 26 times), behavioural intention (examined 8 times, significant 7 times), user support (examined 5 times, significant 4 times). Nevertheless, the study was not intended to leverage the predictors based on their weightage from the past outcome of the study. It was used merely to represent determinants that could potentially influence adoption of RMPnet system by senior police officers of Royal Malaysia Police. These variables had also shown historical predictability and these are depicted in Figure 2.8.



(Source: Jeyaraj et al., 2006)

Figure 2.8
Best predictors of IT adoption (comprehensive) by individuals

2.8 SUMMARY

This chapter had discussed topics related to general background of theoretical aspects of technology adoption from previous research. Eventhough the benefits of adoption were in abundance, due to its complicated nature, various facets must be outlined in order to materialize the expected results (Noor, 2010). A model might work in previous research but it might not be applicable in a different research. Therefore, theories were used in research that provided initial guidelines to understand technology adoption. For the sake of this only dominant determinants from past research would be applied to examine technology adoption levels by the end users. Moreover, it was important to identify the impact of technology adoption by the end users which was under researched. This chapter also looked at the impact of technology adoption by senior police officers to overcome possible weaknesses of technology adoption in police organizations, namely in the context of RMP.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 INTRODUCTION

In the previous chapter literature related to this research was discussed. In this chapter, a detailed exposition on how the present study was carried out will be presented. This chapter is structured as follows. Section 3.2 presents the unit of analysis of this study; senior police officers followed by section 3.3 which present the research framework and section 3.4 provides the discussion on hypotheses development. In section 3.5 the research design is provided. Followed by section 3.6, where discussion on sampling method is provided, section 3.7 the data collection method is discussed, in section 3.8 discussions on questionnaire design are provided. Next, section 3.9 provides the discussions on method of data analysis. Lastly, section 3.10 is the chapter summary. To start with, it is important to define the unit of analysis for the present study; individual senior police officers of RMP and discussion are provided in the next section.

3.2 RESEARCH FRAMEWORK

A research framework is defined as a collection of theories and models from the literature which underpins a positivitic research study (Hussey & Hussey, 1997). In other words, it is a conceptual model of how the researcher theorised or made logical sense of the relationship among the several factors that had been identified as important to the problem. Developing such a conceptual framework helped to postulate or hypothesize and test certain relationships and thus to improve the

understanding of the dynamics of the situation. In total, the theoretical framework discusses the interrelationship among the variables that were considered important to the study. It was essential to understand what a variable meant and what the different types of variables were. After the theoretical framework had been formulated, then testable hypotheses could be developed to examine whether the theory formulated was valid or not (Sekaran, 2003).

Taylor and Todd (1995) suggested that the basic criteria to choose an appropriate model for a research, is that the models must be parsimonious and have predictive capability. These researchers further suggested that development of conceptual models involved theories that had their own strengths and capabilities to predict and enhance the level of individual adoption. Many researchers had proposed theories that could be applied to examine individual adoption behavior such as Innovation Diffusion Theory (Rogers, 1983) in predicting individual adoption behavior, Theory of Reasoned Action (Fishbein & Ajzen, 1975) in explaining the individual's behavioral intention, Technology Acceptance Model (1989) to predict usage of computer and generic information system adoption, and The Social Cognitive Theory (1986) to predict how an individual overcomes and comprehends their capabilities towards external factors to achieve their suitable level of behavior. From this literature, there are vast variations and similarities between studies of the various technology adoption models. After careful consideration based on the literature and problem statements, the following research framework as shown in Figure 3.1 was proposed.The dependent variable was RMPnet system adoption. There were five independent variables which comprised of top management support, RMPnet system experience, perceived usefulness, behavioral intention and user

support. This research also intended to examine the role of innovativeness in moderating the relationship between the determinants of independent variables and RMPnet system adoption as the dependent variable.

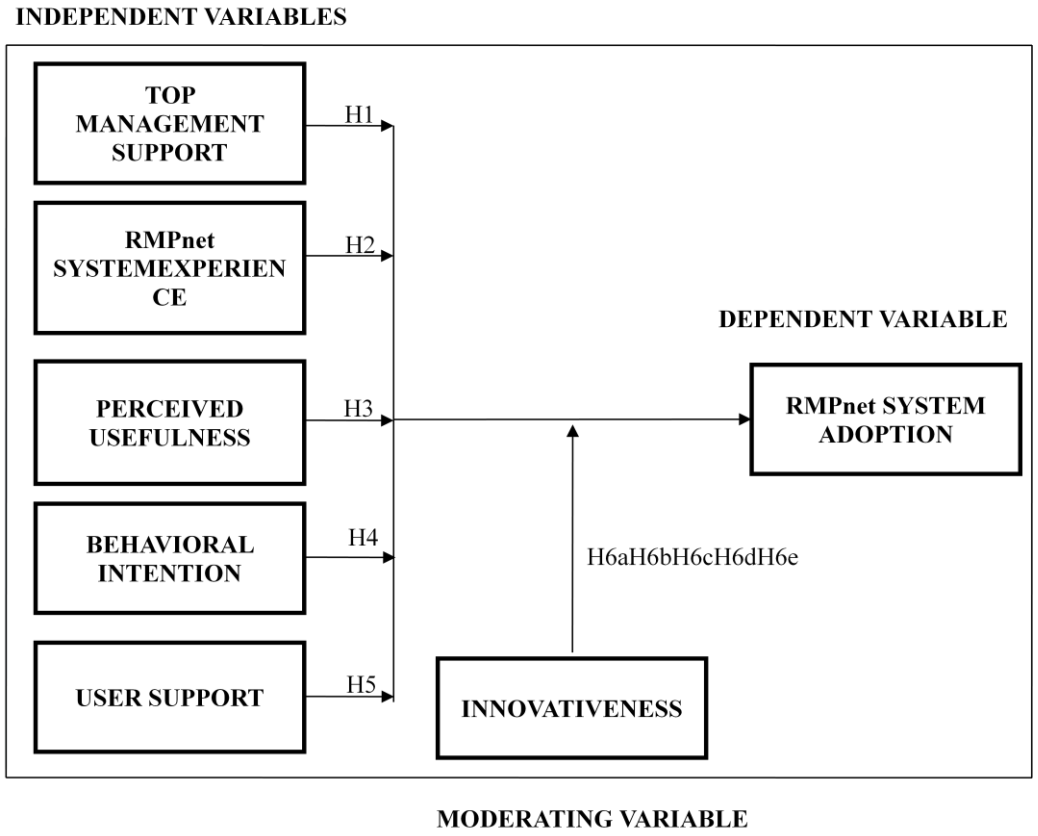


Figure 3.1
Proposed Research Framework

3.2.1 Top Management Support and RMPnet system adoption

Among the most important factors in the literature for successful adoption and implementation of technology was top management support (Bradford & Florin, 2003; Ngai & Gunasekaran, 2004). This had been emphasized by Fichman (2000) that top management support was recognized as a critical determinant of technology adoption. Early diffusion of innovation studies found top management support had positive influence on technology adoption (Fichman, 2000; Zhu, Kraemer & Xu,

2003). As suggested by previous researchers, top management support provided better access to information, resources and enhanced user adoption it also led to a smoother implementation process (Ngai, Poon, Chan, Chan & Wu, 2009). Hence, top management support was recognised as a critical determinant of information technology adoption.

It was also suggested that top management support influenced the adoption decision and successful implementation of a project (Wamba & Chatfield, 2009). Therefore RMPnet system adoption has been predicted to have a significant relationship to top management support. Furthermore, the nature of work in police organization was generally quasi-military and therefore, the morale and the encouragement of top management influenced a police officer's behavior in adopting new technology (Ozdemir, 2004). As RMPnet system adoption required a high level of organizational transformation (e.g. business process reengineering, technological and organizational integration) and to realize the full business benefits from RMPnet system project, top management support may have a significant relationship with RMPnet system adoption. Thus, the following hypothesis was proposed for RMPnet system adoption.

H1: There is a significant relationship between top management support and RMPnet system adoption among senior police officers of RMP.

3.2.2 RMPnet system Experience and RMPnet system adoption

Computer experience is refered to individual's prior experience in using computer system technology (Venkatesh & Morris, 2000; Venkatesh et al., 2003). Literature suggests that there is significant difference between experienced and inexperienced

users of computer technology as experience was one of the influencing determinants of adoption (Ajzen & Fishbein, 1980). A study conducted by Taylor and Todd (1995) found individual computer system technology experience had a direct effect on usage and adoption. Similar to this study, other researchers confirmed in their study that prior experience that an individual had would enable him or her to assess the benefits in relation to the computer system technology adoption (Venkatesh & Morris, 2000).

Based on the above discussion, it ispossible that adoption of technology of RMPnet system was influenced by individual prior computer skills and experience. The specific hands-on experience of individuals on the new computer system would directly influence the usage and adoption behaviour of the users (Vankatesh & Davis, 1996). Therefore, it is crucial to examine the relationship of prior computer experience with the new technology and thus the following hypothesis was proposed for RMPnet system adoption.

H2: There is a significant relationship between Computer system experience and RMPnet system adoption among senior police officers of RMP.

3.2.3 Perceived Usefulness and RMPnet system adoption

Perceived usefulness is the extent that an individual believes that using a particular system would improve his or her job performance (Al-Gahtani, 2001; Davis, 1989; 1993; Mathwic, Rigdon & Malhotra, 2001). Another research by Tan and Teo (2000) suggested that perceived usefulnessis an important factor in determining the technology adoption. Prior studies had also indicated that when people consider using a new technology, they were strongly influenced by perceived usefulness (Bhattacherjee, 2002; Schepers & Wetzels, 2007). As emphasized by Bhattacherjee

(2002) a person's willingness to transact with a particular system was already a perceived usefulness. Consequently, the greater the perceived usefulness of the system, the more likely it was that the system would be adopted (Amoako-Gyampah & Salam, 2004). Previous researchers had often linked perceived usefulness to technology adoption (e.g. Agarwal et al, 2003; Guriting & Ndubisi, 2006; Venkatesh, 2000; Venkatesh and Morris, 2000; and Venkatesh & Davis, 1996). Thus, it is expected that users would adopt RMPnet system if they perceived RMPnet system would assist them to attain desired performance outcomes. Based on the argument above, the following hypothesis was proposed:

H3: There is a significant relationship between perceived usefulness and RMPnet system adoption among senior police officers of RMP.

3.2.4 Behavioral Intention and RMPnet system adoption

Rogers (1995) asserted that intention was a proper proxy to examine and predict a user's behavior toward a particular technology or system. Results from previous researches had shown consistent results showing a significant correlation between behavioral intention and adoption. Moreover, the path from behavioral intention to behavior was significant in technology adoption and adoption models where the user behavior was largely influenced by behavioral intention, so behavioral intention played an important role in predicting usage or adopting behavior (Wu & Lederer, 2009). Accordingly, the following hypothesis was introduced:

H4: There is a significant relationship between behavioral intention and RMPnet system adoption among senior police officers of RMP.

3.2.5 User Support and RMPnet system adoption

User support refers to the technical support and help given to users when operating the systems in an organization (Hussein, Selamat & Karim, 2005). The importance of user support in the successful usage of computer systems technology had been highlighted by various researches (e.g. Amoroso, 1988; Amoroso & Cheney, 1991; Igbaria, Zinatelli, Cragg & Cavaye, 1997). In lieu of this, many researchers found significant relationship between personal computing success and user support (Bergeron et al, 1990; Mirani & King, 1994; Vijayaraman & Ramakrisha, 1990). It was also suggested that user support in police organization was crucial as users would most likely seek help in using the systems in their daily operations (Manning, 2003). Thus from here, hypothesis 5 was developed as follows.

H5: There is a significant relationship between user support and RMPnet system adoption among senior police officers of RMP.

3.2.6 Innovativeness moderates the adoption of RMPnet system

Based on earlier studies on diffusion of innovation Adams et al. (1992), Lucas and Spitler (1999) and Venkatesh et al. (2003) suggested the inclusion of moderating factors to measure the modified strength of the relationship between a predictor and a criterion variable (Sharma et al., 1981). According to Sun and Zhang (2006) a moderating factor might account for both the limited explanatory power and inconsistencies between studies. This was also in line with Jeyaraj et al. (2006) who had suggested adding potential moderating variable that could strengthen the relationship of information technology between the independent and dependent variables in future information technology adoption. In lieu of this, Omoush and

Shaqrah (2010), Cauberghe and Pelsmacker (2011) and Faziharudean and Li-Ly (2011) suggested the inclusion of innovativeness as the possible moderator to better understand the dynamics of user technology adoption phenomenon in future researches.

Agarwal and Prasad (1998) further suggested that individuals with high innovativeness would view innovation as easy to use and therefore were excited to adopt the technology. Rogers (1995) suggested that individual characteristics would affect ones decision either to adopt or reject an innovation. While Hung et al. (2003) asserted that innovativeness played an important role in shaping individual's attitude towards technology adoption. Since the adopters in RMPnet system are the senior police officers, thus these officers are the ones who must adopt the technology before the others. Therefore, innovativeness was introduced as a moderator in this study as the variable that influenced end users intention to adopt the technology. Based on the argument above, the following hypotheses were proposed:

H6a: Innovativeness moderates the relationship between top management support and RMPnet system adoption among senior police officers of RMP.

H6b: Innovativeness moderates the relationship between RMPnet system experience and RMPnet system adoption among ~~by~~ senior police officers of RMP.

H6c: Innovativeness moderates the relationship between perceived usefulness and RMPnet system adoption among senior police officers of RMP.

H6d: Innovativeness moderates the relationship between behavioral intention and RMPnet system adoption among senior police officers of RMP.

H6e: Innovativeness moderates the relationship between user support and RMP netsystem adoption among senior police officers of RMP.

Hence, in Table 3.1 a summary of hypotheses of this study is depicted.

Table 3.1
Summary of Research Hypotheses

Hypotheses	
H1	There is significant relationship between top management support and RMPnet system adoption among senior police officers of RMP.
H2	There is significant relationship between RMPnet system Experience and RMPnet system adoption among senior police officers of RMP.
H3	There is significant relationship between perceived usefulness and RMPnet system adoption among senior police officers of RMP.
H4	There is significant relationship between behavioural intention and RMPnet system adoption among senior police officers of RMP.
H5	There is significant relationship between user support and RMPnet system adoption among senior police officers of RMP.
H6a	Innovativeness moderates the relationship between top management support and RMPnet system adoption among senior police officers of RMP.
H6b	Innovativeness moderates the relationship between RMPnet system experience and RMPnet system adoption among senior police officers of RMP.
H6c	Innovativeness moderates the relationship between perceived usefulness and RMPnet system adoption among senior police officers of RMP.
H6d	Innovativeness moderates the relationship between behavioral intention and RMPnet system adoption among senior police officers of RMP.
H6e	Innovativeness moderates the relationship between user support and RMPnet system adoption among senior police officers of RMP.

3.3 RESEARCH DESIGN

Research design is the framework that guides the researcher in data collection and data gathering in order to answer the research questions. This research will be using quantititative methods because it could easily identify certain concepts or ideas and were more suitable to make the decisions in hand (Anderson, Sweeney & Williams, 2002). Quantitative methods provided a better understanding of the relationship between the variables in a certain situation (Sekaran & Bougie, 2010). Furthermore, various factors must be considered so that the quantitative research was free from bias, confounding, extraneous variables and using statistical precision for testing hypotheses was important to ensure that the study had a good research design (Wiersma, 1993).

3.3.1 Time dimension of the research

There are two options of time frame in conducting a research; firstly, the longitudinal study where the data collection was within a certain time frame (Cooper & Schindler, 2006). Secondly, cross-sectional research is where data was collected once to examine issues at a specified point. This was the most popular method used in the area of technology adoption studies such as studies by Hainsbuchner (2005), Kumar (1996) and Yalcinkaya (2007).

3.3.2 Research design strategies

This study utilizes the survey method whereby it describes issues and examines the relationship of all variables under study (Zikmund, 1994). It was assumed that survey method would explain or at least describe statistically the relationship of the

independent variables consisting of top management support, computer experience, perceived usefulness, behavioral intention and user support towards the dependent variables namely technology adoption and also the moderating effect of innovativeness on independent and dependent variable of the research (Meyers, 1997; Straub, Boudreau & Gefen, 2004; Dwivedi, 2007). Sefindi (2007) suggested that cross sectional research was deemed to be a more appropriate research design in meeting the research objective and understanding the relationship between its variables. Kumar (1996) concurred and suggested that cross-sectional studies were suitable to analyze certain phenomena, situations, problems, attitudes or issues with the population.

Babbie (1990) suggested that survey methods provide generalizability results of the entire population. Survey methods permit researchers to collect big volumes of data within a limited time frame (Yalcinkaya, 2007). He further argued the survey method was most appropriately conducted using a quantitative method. On top of this, the survey method provided researchers the choice to collect data from multiple respondents to assist in the examination and testing of hypotheses of many variables (Neuman, 1997). From the above discussion, it could be concluded that although a range of research approaches was available to information system researchers, a survey approach was widely employed for examining technology adoption and related issues.

The choice of this approach seemed appropriate when the unit of analysis that was selected by the researchers and scholars were individuals (Gilbert, 2001). This was due to several reasons such as being less expensive, easier to access and the degree to which a researcher could be part of the context being studied (Dwivedi,

2007). Furthermore, the aim of this research was to study the RMPnet system adoption within the individual user's point of view. Further details on data collection would be discussed in a later part of this chapter.

3.3.3 Unit of analysis

Unit of analysis is defined as the type of unit used by a researcher to measure variables under study (Neuman, 1997). It was used to explain the units themselves that referred to what was being analyzed in the study. In this research, the unit of analysis would be the individual senior police officers of RMP and the study attempts to determine technology adoption of RMP. The unit of analysis chosen would be the individual whereby the data would be collected using survey method from the target respondents at the senior level. These senior police officers were chosen because they were active users of the RMPnet system and close to the decision-making process involving the successful implementation of the RMPnet system and were also involved in the utilization of the system.

With respect to the unit of analysis in this study, a police officer is defined as any member of Royal Malaysia Police (RMP) from the rank of police constable to the rank of Inspector General of Police bestowed by His Royal Highness the *Yang di-Pertuan Agong* under section 5 of Police Act, 1967 (Act 344). On the other hand, a senior police officers is defined as any member of the Royal Malaysia Police from the rank of Probationary Inspectors to the rank of Inspector General of Police bestowed by His Royal Highness the *Yang di Pertuan Agong* under section 5 of Police Act, 1967 (Act 344). Senior police officers selected for this research were police officers from all units from the contingent of Bukit Aman, Kuala Lumpur,

Selangor, General Operation Force of Central Brigade, Negeri Sembilan, Melaka, Johor and police colleges of Kuala Lumpur and Bakri, Muar who were active users of RMPnet system and serving RMP in 2012. These individual senior police officers are the units of analysis for this study.

3.4 SAMPLING METHOD

The process of sampling started with the identification of the population. The population refers to the whole group of people or organization that were of interest to the researcher (Sekaran, 2006). The target population were senior police officers of Royal Malaysia Police. The population frame was large and the listing of names were taken from the human resource database of the federal police headquarters of RMP in Bukit Aman.

The sample size was dependent on how accurate the requirement was, the heterogenity of the sample, the total number of variables, appropriateness of statistical measuring instruments used in this study (Hussey & Hussey, 1997; Neuman, 1997). The samples were selected from the list of population provided by the Human Resource Manager of Administration Department of RMP at the federal police headquarters of RMP. The senior police officers were selected as they were active users, who were provided with special system features and could provide recommendations to the top management on the suitability of nation-wide implementation of the RMPnet system. They were also directly involved in the decision making process on the suitability of types of equipment to be deployed in various locations according to the communications coverage of the RMPnet system. The research population for this study were 6,000 senior police officers from RMP

who were equipped with the relevant communications equipment with special access and authorisation to operate the RMPnet system from various departments of RMP. The sample frame constituted of the senior police officers who worked in various departments located at federal police headquarters, Bukit Aman, the contingents of Kuala Lumpur, Selangor, Central Brigade General Operation Force, RMP College from the central and the contingents of Negeri Sembilan, Melaka and Johor from the southern region, and also RMP technical college in Muar. These police contingents used the RMPnet system for their daily operational activities.The senior police officers in RMP from central and southern region of the peninsular Malaysia had used the RMPnet system since its implementation in the respective regions from May 2010. Furthermore the senior police officers who were selected for this research from these two regions had undergone user-training on how to operate the RMPnet system equipment and therefore had good knowledge and experience of the RMPnet system. Their knowledge and experience could influence the results directly. It was also perceived that the respondents from these two regions would be able to provide accurate responses as compared to senior police officers from other region as they understood the RMPnet system better. Respondents from other regions might only know partial operation and integration of the RMPnet system and the knowledge level could be lacking in responding to the questionnaire. In addition, it was assumed that senior police officers from central and southern regions could provide more accurate responses than other police officers because of their understanding of the RMPnet system.

The systematic sampling procedure is used as this method helps in reducing costs and also less time consuming associated with data collection from the entire

population. It is easier to draw a sample and also to execute without mistakes. Systematic sampling design involved drawing every nth element in the population starting with a randomly chosen element between 1 and n (Sekaran, 2005). In this study, 700 were chosen as sample where the sample size was determined by a number of factors namely, confidence level, margin of error that was tolerable, type of analysis, time constraints, budget limit and whether the findings could be generalised (Hair, Babin, Money & Samouel, 2003). The 6,000 names were then divided by 700 which equals to 8 and hence from the list every 8^{th} name of a senior police officer from the 6,000 names in the list was selected.

Based on the total population of 6,000 senior police officers, the appropriate sample size as suggested by Sekaran (2005) of 361 is adequate to for further data analysis. Internal survey will generally receive a 30% to 40% respond rate or more on average. However the respond rate can soar past 85% when the respondent population is motivated and the survey is well executed. Therefore, to overcome the probability of not getting the approximate responses, the number of questionnaires sent out should be higher than the intended sample needed and a a total of 700 questionnaires were distributed in this study to meet the required sample size (Salleh, 2012).

3.5 DATA COLLECTION

This study used survey method as the main method to collect data for this research and this method was selected because it provides high reliability (Babbie, 1990). In this research, self-administered questionnaires were considered suitable because it could cover wide geographical area, had low costs, and were very convenient for the

respondents. Besides, respondents were assured of anonymity and the measuring instruments were standardised throughout the study (Zikmund, 1994).

3.5.1 Administration of questionnaire

During the process of administering the questionnaire, several procedures were taken to make sure that the instrument was presentable, precise, and displayed a professional outlook. The objectives and factors that would create interest towards end users were given high emphasis so that the objectives of the research would be achieved. Before conducting the research, the researcher had written to the RMP's Director of Logistics, seeking his permission to conduct the survey in Royal Malaysia Police organization through a letter of reference G/12037 dated 27th October, 2010. Permission was granted on the same day (appended in Appendix A). Several other steps were also taken to elicit interest among the respondents. First, the questionnaire had to be attractive, concise and professional looking to make the respondents interested in responding. The questionnaire was developed taking into consideration the objectives of the study and the elements that might interest respondents to respond. The questionnaire was printed in color with size 12 font for easier reading by the respondents. Then, the HRMs from the respective police formations were contacted so that they were aware of the questionnaires. A telephone call was also made to each HRM to ensure that they had received the questionnaire posted through mail to them.

3.6 QUESTIONNAIRE DESIGN

The designing and administration of the questionnaire underwent various processes. To develop the measuring instruments, the designed principles of questionnaire should focus on wordings of the questions, how the variables would be categorised, scaled, and coded after the receipt of responses and also on the general appearance of the questionnaire. Literature suggested that, these were important issues that must be handled first in order to minimise bias in research and the description of each issue is as follows (Sekaran & Bougie, 2010).

3.6.1 Wording of the questions

The principle of wording refers to appropriateness of the content of questions, wordings and level of sophistication of language used, type and form of questions asked, sequencing of questions and personal data sought from the respondents. The nature of variables tapped would determine the kind of questions asked, and comprehensive literature search related with the research was conducted.

3.6.2 Language and wording of the questionnaire

The language used in the questionnaire would approximate the level of understanding of the respondents. The choice of words would depend on educational level, usage of terms in the organization and frames of reference of the respondents. In this study, in order to minimize error and ambigious questions, a back to back translation was made. First, the questionnaire was translated into Bahasa Melayu by a lecturer. Then the Bahasa Melayu questionnaire was translated into English again.

Once this was done, a comparision was made to check the clarity between the original and final versions of the questionnaire.

3.6.3 Type and format of questions

The type of questions refers to open-ended or closed, and the form of questions refers to whether the questions were worded positively or negatively. For the purpose of this study, closed questions were employed where respondents were asked to make choices from a set of alternatives. This type and format of questions helped the respondents to make quick decisions to choose among the several alternatives and this also helped the researcher to codify the responses easily for analysis. There were also positively and negatively worded questions included in this study and this was to minimise the tendency of respondents to mechanically select the points towards one end of the scale.

After the above steps were taken, the questionnaire was handed to the project director of RMPnet system for evaluation and to check whether the contents were relevant and that the length was adequate. The final step taken by the researcher on the questionnaire was administering them to the respondents through heads of human resource of the respective formations that would oversee the data collection.

3.7 OPERATIONALIZATION OF MEASUREMENTS

3.7.1 RMPnet system adoption

The indication of success of any new technology being implemented in an organization is when the new innovation and technology is adopted by the end-users (Dorothy & Isabelle, 1988). The objectives that organizations hoped to achieve

through technology innovation for its employees were the introduction of new applications and work flow process on how they acquired and generated new knowledge, and also enhanced new techniques. However, technology adoption was a process and the model had been used by many researchers in the area of information system to examine diffusion of technologies (Bradford & Florin, 2003; Taylor & Todd, 1995; Young, 2006). As such stages of technology adoption were slow due to certain complicated problems during the adoption process (Young, 2010). As this research is attempting to examine the level of adoption of technology within the organization, the adopted measures must comprehend the implemented technology. In line with the result of previous research that provided complete guidelines on the status of technology adoption success, the measuring instruments were adapted from Young (2010). See Table 3.2.

Table 3.2
Questions on RMPnet system adoption

1. I am not interested in the APCO P25 technology.
2. I am not interested to use RMPnet system in my daily work.
3. I have no need for APCO P25 technology.
4. I have no need for the RMPnet system.
5. I would use the APCO P25 technology to protect my identity.
6. I can protect my identity without the RMPnet system.
7. I would use APCO P25 technology for my day-to-day work.
8. I would use the RMPnet system for my day-to-day work.

3.7.2 Innovativeness

Innovativeness describes the willingness of an end user to readily use new technology (Lu & Su, 2009). Research findings were similar with prior studies from Taylor (2007), Joaguin, Carlos, Carla and Silvia (2009), Liu, Li and Carlsson (2010) in which innovativeness influenced the intention to adopt a technology. A study on

innovativeness by Agarwal and Karahanna (2000) suggested that an individual who liked experimenting on new technology would react instantaneously and the usage would provide the individual knowledge, exposure and the ability to cope well because of his or her experience of total engagement with the technology. In addition, Lu and Su (2009) suggested that individuals who were very innovative were always exploring for new technology to experiment with and were able to overcome uncertainties.Thus they easily developed a positive intention towards new technology adoption.

Sorenko (2008) adapted Agarwal and Prasad's (1998) four-item scale which was suggested as reliable and valid by Agarwal, Sambamurthy and Stair (2000) in measuring innovativeness. In determining the innovativeness, measuring instruments from Sorenko (2008) were adapted with some modification. The respondents were required to explain how to adopt the technology in relation to their acquired experience until they achieved the level of innovatinevess. Hence, this research used a single dimension of effect and the study attempted to examine the moderating factor between the independent and the dependent variable. Table 3.3 displays the questions.

Table 3.3
Questions on Innovativeness

1. If I heard about a new technology, I would look for ways to experiment with it.
2. Among my peers, I am usually the first to try out new technologies.
3. In general, I am hesitant to try new technologies.
4. I like to experiment with new technologies.

3.7.3 Top management support

Several authors (e.g. Bennett & Savani, 2011; Thiesse, Staake, Schmitt & Fleisch, 2011; Zain, Rose, Abdullah & Masrom, 2005) had suggested that top management

support was a critical determinant that influenced the adoption of new technology in technology adoption research. Hence, top management support in an organization helped to enhance the adoption rate of new technology and it also influenced the attitude of end users towards the technology. The questions here required the respondents to indicate the commitment, support and the willingness of their top management to take risks in order to motivate them to adopt the RMPnet system.

The questionnaire adapted for this study was from Thiesse et al. (2011). There were five questions that rated the support of top management towards the implementation of RMPnet system adoption and the questions are shown in Table 3.4.

Table 3.4
Questions of Top Management Support

1. Our top management provides strong and involved leadership when it comes to information systems in RMP.
2. Our top management supports the implementation of APCO P25 technology.
3. Our top management has a desire to portray RMP as a leader in the use of APCO P25 technology.
4. Our top management is willing to take the risk (financial and organizational) involved in adopting APCO P25 technology.
5. Our top management has established clear goals and clear picture of how APCO P25 technology can help these goals.

3.7.4 RMPnet system Experience

Several authors (e.g. Igbaria, Guimaraes & Davis, 1995; Jiang, Muhana & Klein, 2000; Venkatesh & Davis, 2000; Zolait, Mattila, & Sulaiman, 2009) had suggested that computer system experience was an important determinant of technology acceptance and adoption research. Hence, computer experience (RMPnet system experience) indicated how users in an organization helped to enhance the adoption rate of new technology and it also influenced the attitude of end users towards the

technology through their experience. The questions here required the respondents to indicate their level of experience in using and adopting the RMPnet system. The measuring instruments adapted for this study was from Zolait et al. (2009) and that they adapted from Gardner and Amoroso (2004). There were six questions that rated the RMPnet system experience in adopting the RMPnet system. The measuring instruments were related to RMPnet system experience of the end-users to adopt the RMPnet system and all the RMPnet system experience questions are shown in Table 3.5.

Table 3.5
Questions of RMPnet systemExperience

1. I've been using APCO P25 technology for many months.
2. I've been using RMPnet system for many months.
3. I've been using the RMPnet system features in my work for many months.
4. I have great deal of experience using the RMPnet system.
5. I have great deal of experience using the APCO P25 technology.
6. I have great deal of experience using RMPnet system features.

3.7.5 Perceived Usefulness

Several authors (e.g. Brown, Montoyo-Weiss & Burkman, 2002; Davis et al., 1989; Davis and Venkatesh, 1996; Hainsbuchner, 2005; Morris & Dillon, 1997; Ngai, Poon & Chan, 2005; Phillips, Calantone & Lee, 1994) had suggested that perceived usefulness was an important determinant of technology adoption research. Hence, perceived usefulness indicated how users in an organization perceived the usefulness of technology to enhance the adoption rate of new technology and it also influenced the attitude of end users towards the technology. The question here required the respondents to indicate their intentions to adopt the RMPnet system.

The 8-item measuring instruments adapted for this study was from Hainsbuchner (2005). The questions were related to perceived usefulness of the end-

users to adopt the RMPnet system and all the perceived usefulness measurement questions is are in Table 3.6.

Table 3.6
Questions of Perceived Usefulness

1. The RMPnet system makes my day-to-day work simpler.
2. The RMPnet system makes my current work processes safer.
3. The RMPnet system is helpful in my day-to-day work.
4. RMPnet system applications are superior in terms of service performance compared to GSM ones.
5. Using various RMPnet system services (private call, group call, Direct_mode) is valuable to me.
6. In my working area the radio coverage is satisfactory.
7. RMPnet system applications are superior in terms of service performance compared to GSM ones.
8. RMPnet system terminals provide a good speech quality

3.7.6 Behavioral Intention

Several authors (e.g. Brown et al., 2002; Davis and Venkatesh, 1996; Davis et al., 1989; Hainsbuchner, 2005; Morris & Dillon, 1997; Ngai et al., 2005; Philips et al., 1994) had suggested that behavioral intention wasan important determinant of technology acceptance and adoption research. Hence, behavioral intention indicates how users in an organization helped to enhance the adoption rate of new technology and it also influenced the adoption of end users towards the technology. The questions here required the respondents to indicate their intentions to adopt the RMPnet system.

The measuring instruments adapted for this study was from Hainsbuchner (2005). There were two questions that rated the behavioral intention of senior police officers towards the RMPnet system adoption. The questions were related to behavioral intentions of the end-users to adopt the RMPnet system and all the behavioral intention questions are shown in Table 3.7.

Table 3.7
Questions of Behavioral Intention

1. Due to the required operational procedures I intend to use the RMPnet system more frequently
2. Due to the required operational procedures I intend to increase my use of voice (phone interconnect calls) and data transmission (i.e. Text Messaging System (TMS)) in as many cases as possible.

3.7.7 User Support

User support was important as it indicated that users received support in case there was a need for assistance on how to operate and use the technology (Igbaria & Chakrabarti, 1990; Thomson, Higgins & Howell, 1991). In addition, the greater the user support the greater the proficiency of the users and enhanced rate of technology adoption (Amoroso, 1988; Buyukkurt & Vass, 1993; Mahoney, 2011). For this research, user support dimensions were adapted and modified from Mahoney (2011) where in his research he suggested that user support was one of the most important elements that impacted implementation and adoption of the technology. A 9-item measuring instrument for user support is provided in Table 3.8.

Table 3.8
Questions of User Support

1. Relative to other ICT projects, the degree of my commitment to support RMPnet system project is very strong.
2. If I want, I can easily support RMPnet system project.
3. All things considered, supporting the RMPnet system project would be easy.
4. People who have influenced over me think that I should support the RMPnet system project.
5. Compared to other ICT projects,my desire to suport the RMPnet system project is strong.
6. Supporting the RMPnet system project is entirely within my control.
7. Most people who are important to me would approve of me supporting the proposed project.
8. Supporting the RMPnet system project is one of my top priorities.
9. It is how likely that I will aggressively support the RMPnet system project.

Depicted in Table 3.9 is the summary of all the scales and items used in this study.

Table 3.9
Summary of Scales and items for this research

Variables	Code	Section	Source of Construct
Technology Adoption	ADP	B	ADP 8 –item scale (adapted by researcher from Young, 2010).
Innovativeness	INV	C	INV 4-item scale (adapted by researcher from Sorenko, 2008).
Top Management Support	TMS	D	TMS 5-item scale (adapted by researcher from Thiesse et al., 2011).
RMPnet system Experience	EXP	E	EXP 6-item scale (adapted by researcher from Zolait et al., 2009).
Perceived usefulness	PU	F	PU – 8 item scale (adapted by researcher from Hainsbuchner, 2005).
Behavioral Intention	BI	G	BI 2-item scale (adapted by researcher from Hainsbuchner, 2005).
User Support	US	H	US 9-item scale (adapted by researcher from Mahoney, 2011).

3.7.8 Measurement scale

A 7-point Likert scale was used for the questions. Likert scale was employed as it was the easiest to construct and adapt and normally it had high reliability (Babbie, 1990; Nunnaly, 1978). Using Likert scale respondents were provided with given options to choose their response. Thus, this helped the researcher to solicit answers relating to the given statement using set of response keys. Researchers also suggested that 7-point Likert scale is more sensitive in eliciting responses (Sekaran & Bougie, 2010). Furthermore, Cooper and Schindler (2006) stated that when the number of scales increased, the realibility of the measure also increased. Therefore, the use of 7-point scale was appropriate for this research.

3.8 RELIABILITY AND VALIDITY

Reliability is related to the findings of a research; if the findings provided the same result after repeated research, the findings were considered reliable. The Cronbach

alpha was used as indication of instrument reliability and this was the most common method used to estimate the internal consistencies of constructs (Onwuegbuzie & Daniel, 2002). Likert scale would be employed on instruments as this was appropriate and an alpha value of 0.6 was considered reliable (Sekaran, 2005). In case of the alpha value being closer to 1, it was an indication that the instrument used was very reliable with high internal consistency.

In order to validate the findings of a study, validity tests must be conducted. As questions were adapted from prior studies and due to insufficient measuring scale, the measuring instruments were re-defined to suit the present research. The face validity was an issue because the measuring instruments were adapted from prior studies and therefore the face validity was already available. A face-validity is seen as the measuring instrument that was used to measure the overview concept of the research (Sekaran, 2005). Another important element was the content validity and it referred to whether the measuring instrument was suitable for the concept of the study (Babbie, 1990; Sekaran, 2005). Factor analysis was also used in this study to test construct validity where it was to confirm the all dimensions of constructs were related with the sample of the research. Further explanation of factor analysis and reliability test of every dimension would be provided in chapter 4.

3.9 PRE-TEST AND PILOT STUDY

3.9.1 Pre-Test

Before conducting the main study, a pre-test was conducted where some experts were consulted to seek their opinions in improving the questionnaire. Pre-testing was a trial run with a group of respondents for the purpose of detecting problems in the

questionnaire instructions or design, whether the respondents had any difficulty understanding the questionnaire or whether there were any ambiguous or biased questions (Sekaran, 2003). The pre-testing should be administered to a sample that was expected to respond similarly to the samples on which the scale eventually would be applied. The pre-testing objective was to evaluate the items used in the design questionnaire (Hair, Black, Babin, Anderson & Tatham, 2006). Sekaran (2003) suggested that it was important to pre-test the questionnaire used in the survey to ensure that the respondents understood the questions posed and that there was no ambiguity and problems associated with wording or measurement. Pre-testing might rely on colleagues, respondent surrogates, or actual respondents for the purpose of refining a measuring instrument (Cooper & Schindler, 1998). During the pre-test study, experts were requested to comment on the questionnaire to detect ambiguity and the relevence of the questions.

3.9.2 Pilot Study

After the pre-test, a pilot study was conducted to detect weaknesses in design and instrumentation and to provide proxy data for selection. The initial objective of the pilot test was to ensure that all items of the research questionnaire demonstrated a high level of reliability. The pilot test also enabled the researcher to appraise the actual response rates. Moreover, the pilot test could highlight the difficulties that the participants could face when completing the questionnaire or the instructions may not be extensive enough to assist the participants to complete the questionnaire (Moore & Benbasat, 1991). The pilot study should draw subjects from the target population and simulate the procedures and protocols that had been designed for data

collection. For example if the survey was to be distributed by mail, the pilot questionnaire should be mailed (Cooper & Schindler, 1998). The pilot study was a small-scale version of the larger survey, and it related particularly to questionnaire survey but could relate to any type of research procedure. Ticehurst and Veal (2000) suggested that the purposes of pilot survey are as follows:

a. Testing questionnaire wording
b. Testing question sequencing
c. Testing questionnaire layout
d. Gaining familiarity with respondents
e. Estimating response rate
f. Estimating questionnaire completion time
g. Testing analysis procedures

A total of 50 questionnaires were posted to the Deputy Commandant of Kuala Lumpur Police Training College for a pilot study and the selected participants were those from the research population. It was suggested that the pilot study was important as it helped to improve the questionnaire (Neuman, 1997). Through pilot study, the weaknesses in design and instruments could be detected and it also provided proxy data by selecting a probable sample (Cooper & Schindler, 2001). Only 36 questionnaires were returned to the researcher after seven days, with a response rate of 72.0%. The duration of the pilot survey was from 5th December 2011 to 11th December 2011. It was clear that the pilot survey could be used to test out all aspects of the survey and not just question wording (Ticehurst & Veal, 2000; Wiersma, 1993).

A reliability test was conducted to examine the internal consistency of the instruments employed in this study. This test helped to detect respondents' consistency in answering all questions, the degree of independence and their correlation of similar concepts with one another (Sekaran, 2000).

The result of the pilot study showed the alpha value of 0.562 before Q5 was excluded. Q5 of Section B: I would use APCO P25 technology to protect my identity. To meet the required alpha value Q5 was excluded and the new alpha coefficient was 0.886. The result before Q5 was excluded is depicted in Table 3.10a.

Table 3.10a
Cronbach's alpha of the pilot study

Variables	Section	Total items	Alpha Coefficient
RMPnet system adoption	B	9	0.562
Innovativeness	C	4	0.808
Top management support	D	5	0.922
RMPnet system experience	E	6	0.908
Perceived usefulness	F	8	0.960
Behavioural intention	G	2	0.921
User support	H	9	0.897

The reliability (Cronbach's Alpha) resulting from the pilot test after Q5 was excluded confirmed the internal consistency of the measurement. Cronbach's Alpha for pilot test varied between 0.96 for perceived usefulness and 0.80 for innovativeness. Overall, the obtained value for Cronbach's alpha was above 0.80. As suggested in previous information studies, Cronbach's Alpha should be more than 0.60 for the exploratory study and 0.70 for the confirmatory study (Straub et al., 2004; Sekaran, 2006). This illustrated that the obtained Cronbach's Alpha values in this study were accaptable. This in turn affirmed that the measuring instrumentwas internally consistent and has acceptable reliability level. Table 3.10b depicts the new alpha value of the pilot study after Q5 was excluded.

Table 3.10b
Cronbach's alpha of the pilot study

Variables	Section	Total items	Alpha Coefficient
RMPnet system adoption	B	8	0.886
Innovativeness	C	4	0.808
Top management support	D	5	0.922
RMPnet system experience	E	6	0.908
Perceived usefulness	F	8	0.960
Behavioural intention	G	2	0.921
User support	H	9	0.897

From the results of the pilot study, a minor change was made to the measuring instrument that was to exclude question 5 from section B to improve reliability.

3.10 METHODS OF DATA ANALYSIS

Several methods were used to analyze the data in this research. The first method was to screen and clean the data to identify and ensure there was no abnormality. After this, descriptive statistics, such as percentage of response from each formation and the number of respondents was analysed. Another analysis to reduce measurement error, the validity and reliability measurement was also conducted. In addition, factor analysis was also performed to provide criterion validity of this research.

This study also used Pearson correlation and analysis of multiple regressions to analyze the research findings. The purpose of using Pearson correlation was to measure whether there was association among the independent variables which were top management support, computer experience, perceived usefulness, behavioral intention and user support and the dependent variable which wasRMPnet system adoption. The association between the independent and dependent variable would enable the reader to identify if a relationship existed between the variables. The

strength and direction of the relationship were also shown. A regression test was also conducted to examine the predictive capability of every factor associated with RMPnet system adoption.

In this research, innovativeness was introduced as the moderating variable and its effect as a determining factor moderating the relationship of the independent and dependent variable was examined. Thus, innovativeness was the contingent factor determining and strengthening the relationship of the independent variable and adoption of technology by senior police officers of RMP. Therefore multiple hierarchical regression analysis was employed to test the moderating effect of this moderator.

3.11 SUMMARY

This chapter discussed and explained the research methodology employed in this study. There was an exploratory research using survey method. Respondents were from RMP and the selection was by using the systematic sampling method. Before data collection was conducted the measuring instruments must undergo validity and reliability tests so that the measuring instruments were suitable for this research. In ensuring the suitability of measuring instruments, a pre-test was carried out, followed by a pilot study. After the data collection for the pilot study was completed, the data was analyzed using SPSS to test its reliability.

CHAPTER 4

FINDINGS

4.1 INTRODUCTION

This chapter aims to present the result of the research. In particular, it would highlight whether the research hypotheses set for the research were supported or otherwise. This chapter would be structured as follows. Section 4.2 presents the preliminary analysis where demographic profiles of the respondents are provided; section 4.3 descriptive statistics for all variables, tests for violations of assumptions for multiple regressions are presented. There after section 4.4 presents the factor analysis of the research instrument, section 4.5 the reliability of analysis, section 4.6 presents the modification of framework and hypotheses of the study. Section 4.7 presents the multivariate analysis. Section 4.8 the results of the tests, section 4.9 revisiting of research hypotheses and finally, the summary of the chapter is provided in section 4.10.

4.2 PRELIMINARY ANALYSIS

The first analysis conducted in this study was the preliminary analysis which included the descriptive statistics. Descriptive analysis was essential as a means in providing the initial examination of the collected data before other tests were conducted. Researchers suggested that the purpose of descriptive analysis focus on the following points (Diamantopoulos & Schlegelmilch, 2000):

a. providing preliminary insights on the responses obtained
b. detecting of errors in coding process

c. presenting data through usage of tables and graphs
d. checking whether distribution assumptions of statistical tests are likely to be satisfied.

4.2.1 Response Rate

In this research, the study targeted senior police officers of Royal Malaysia Police (RMP). The sampling frame was derived from the list of population provided by the Human Resource Manager of Administration Department of RMP at the federal police headquarters in Bukit Aman. The total numbers of mailed questionnaires were 700 with a required minimum sample of 361 (Krejcie & Morgan, 1970). Finally, the number of returned questionnaires was 648; this made the response rate 92.57%. After checking for missing data and assessment of outliers; of the 648 responses collected, 521 were usable for further analysis making a valid response rate of 74.40%. Hence, the response rate was adequate, where a required response rate of 30% was acceptable for the survey (Sekaran, 2006).

4.2.2 Demographics of the respondents

The statistical frequency distribution of key variables in the questionnaires were objectively classified and presented in logical categories to reflect the originality of the study. The demographic profile characteristics selected for this research are as follows:

a. Gender
b. Age
c. Qualification

d. Type of work

e. Formation

f. Department

A description of each of the demographic variables mentioned-above follows in this section. Figure 4.1 depicts one of the demographic profiles of the respondents; where 78.0% were male and 22.0% were female.

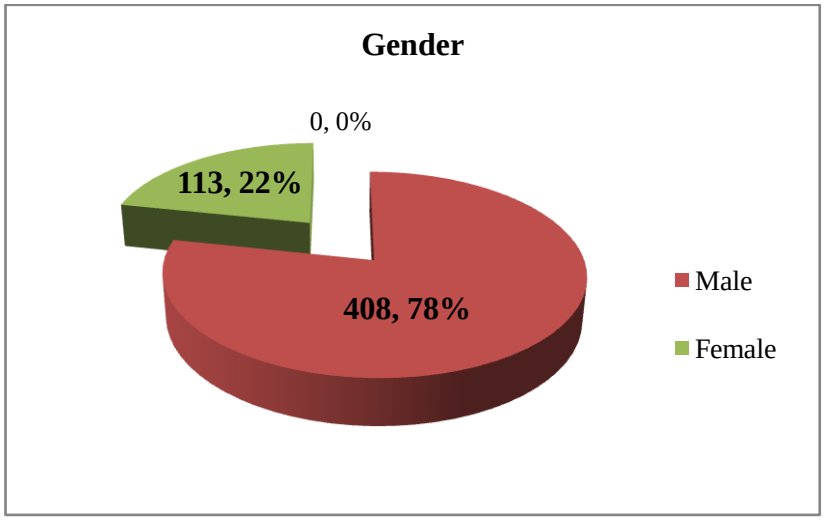


Figure 4.1
Respondents' demographic factors

Figure 4.2 illustrates the different age groups of the respondents. 44.0% of the respondents were between 30 to 39 years old. 28.0% were between 40 to 49 years old, 18.0% between the age of 20 to 29 years and 10.0% were between 50 to 59 years of age.

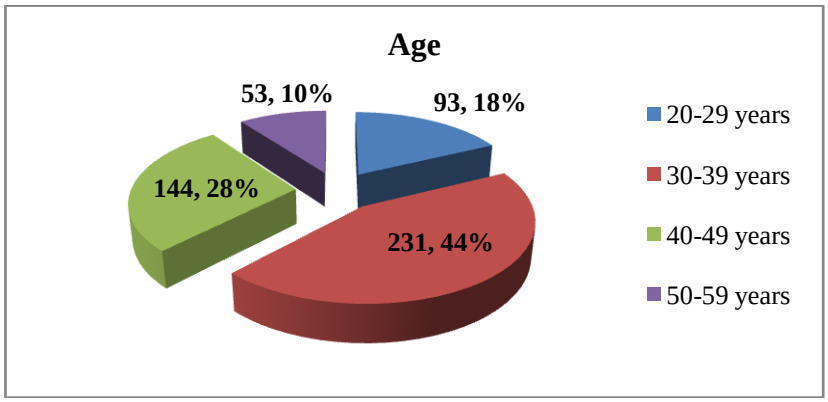


Figure 4.2
Age of respondents

Majority of the senior police officers who responded to this survey had a diploma qualification with 224 responses (43.0%) those with secondary education had 156 responses (30.0%), those having basic degrees had 127 responses (24.0%), 8 respondents (2%) had masters degrees and 6 responses (1%) had other qualifications. The information is shown in Figure 4.3.

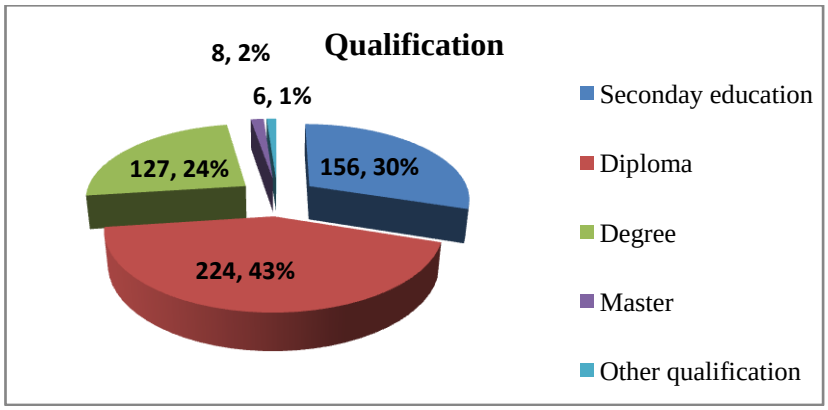


Figure 4.3
Qualification of respondents

Majority of the senior police officers who responded to this survey had served the police organization between 1 to 9 years with 211 responses (40.0%), 10 to 19 years with 136 responses (26.0%), 20 to 29 years with118 responses (23.0%), more than 30 years with 48 responses (9.0%) and less than 1 year; 8 responses (2.0%). The information is depicted in Figure 4.4.

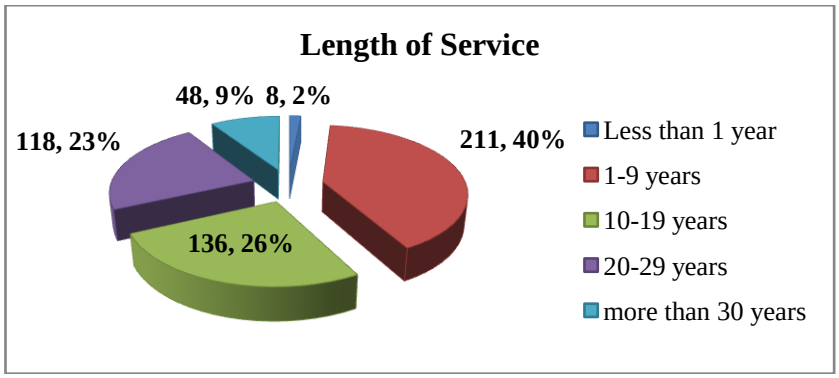


Figure 4.4
Length of Service of respondents

Next, responses from senior police officers performing different types of duties where 197 responses (38.0%) were from those in investigative work, administrative work with 186 responses (36.0%), operations and special task with the same number of responses (63; 12.0%) and technical staff with 12 responses (2.0%). The information is shown in Figure 4.5.

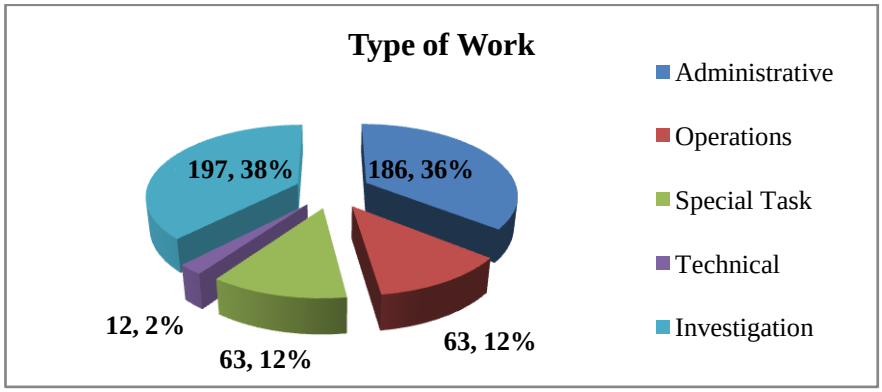


Figure 4.5
Type of work of respondents

From the responses, the majority of the senior police officers were from Selangor (22.0%) followed by Melaka (17.0%), Bukit Aman (14.0%), Johor (13.0%), Kuala Lumpur (12.0%), Central Brigade, General Operations Force (11.0%), Negeri Sembilan (6.0%) and finally RMPKL/Bakri College (5.0%). Figure 4.6 showed the details.

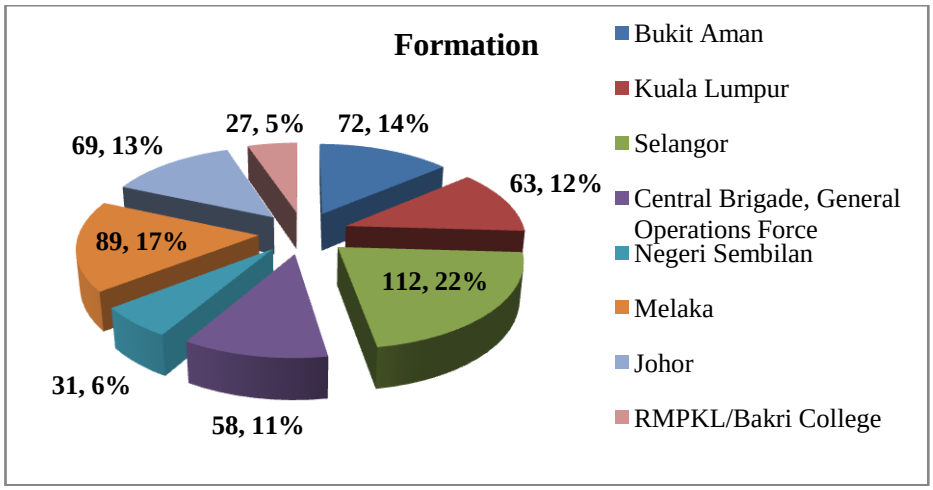


Figure 4.6
The respondent according to formation

Most of the response were from the department of Criminal Investigation with 121 responses (23.0%), followed by Logistics department with 108 responses (21.0%), Internal Security and Public Order with 107 responses (21.0%), Administration department with 69 responses (13.0%), Special Branch with 44 responses (8.0%), Narcotics with 34 responses (7.0%), Commercial Crime with 33 responses (6.3%) and finally Counter Terrosim with 5 responses (1.0%). The information is shown in Figure 4.7.

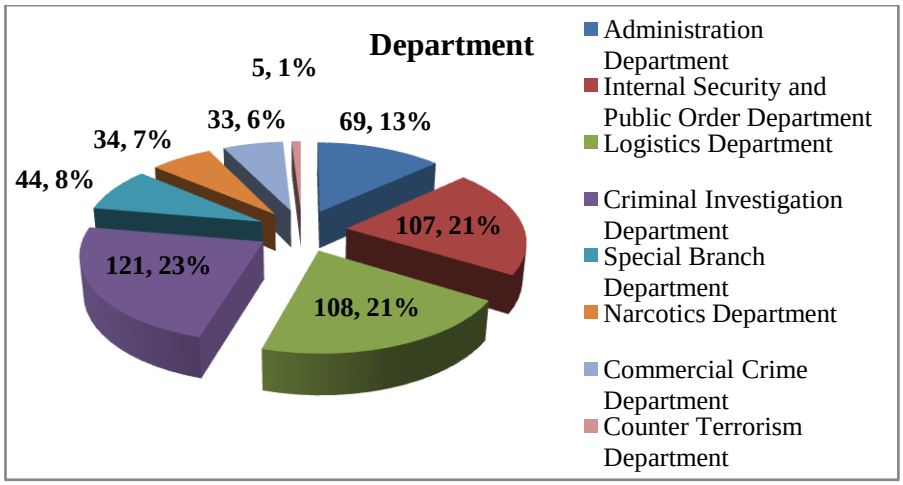


Figure 4.7
The respondent according to department

4.3 DESCRIPTIVE STATISTICS

The descriptive statistics showed the minimum and maximum scores, mean values and standard deviation of key variables in the questionnaires using seven Likert-scale criteria ranging from 1 to 7 where 1 is strongly agree and 7 strongly disagree. Further interpretation of data in RMPnet system adoption scales were based on the score category breakdown adapted and extrapolated from the 5-point Likert Scale Interpretation of SitiRahaya and Salbiah (1996) as follows: 1.0-2.52 (Very Low), 2.53-3.64 (Low), 3.65-4.76 (Moderate), 4.77-5.88 (High) and 5.88-7.00 (Very High). Therefore based on the extrapolated and the seven Likert-scale criteria used in this research, the mean of value 2.52 and below is very high, mean between 2.53 to 3.62 is high, mean between 3.63 to 4.76 as moderate, mean between 4.77 to 5.88 is low and mean between 5.88 to 7.00 is very low.

4.3.1 RMPnet system adoption

Table 4.1 shows specific RMPnet system adoption items that were asked in the study. As indicated earlier, in general the level of adoption of RMPnet is 'moderate' where the mean value is between the range of 3.80 to 4.29 and SD from 1.65 to 1.92. The level of adoption is reflected in specific dimensions of RMPnet adoption namely the interest in APCO P25 technology (mean = 3.99, SD = 1.76), interest to use RMPnet system in daily work (mean = 4.29, SD = 1.65), need for APCO P25 technology (mean = 4.00, SD = 1.75), need for RMPnet system (mean = 4.16, SD = 1.92), use APCO P25 technology as identity protection (mean = 3.86, SD = 1.80), use RMPnet system as identity protection (mean = 4.03, SD = 1.84), use APCO P25 technology for day-to-day work (mean = 3.94, SD = 1.86), and use RMPnet system for day-to-day work (mean = 3.80, SD = 1.79).

Table 4.1
Means of RMPnet system adoption items

RMPnet system items	Mean	Standard Deviation (SD)
1. I am not interested in the APCO P25 technology	3.9923	1.76176
2. I am not interested to use RMPnet system in my daily work	4.2898	1.64740
3. I have no need for APCO P25 technology	4.0096	1.74915
4. I have no need for the RMPnet system	4.1612	1.91976
5. I would use the APCO P25 technology to protect my identity	3.8599	1.79998
6. I can protect my identity without the RMPnet system	4.0250	1.84113
7. I would use APCO P25 technology for my day-to-day work	3.9405	1.86112
8. I would use the RMPnet system for my day-to-day work	3.8004	1.79274

4.4 TESTS FOR VIOLATIONS OF ASSUMPTIONS REGRESSIONS

The regression analysis was used to predict a continuous dependent variable from a number of independent variables. Multiple regression analysis to predict values of

independent variables predicting the dependent variable and the hierarchical multiple regression was similar to multiple regression analysis. When independent variables were added to the regression on different steps, this would affect the significance levels associated with each of the independent variables.To achieve the underlying assumption of the regression analysis, the variables were checked for the followings (Hair, Black, Babin & Anderson, 2010).

4.4.1 Missing data

On receiving the completed questionnaires, all the questions were checked to see whether the respondents had answered them, but some missing data values existed in the data file. In multivariate analysis, valid values on one or more variables were usually not available. According to Hair et al. (2010) the general impact of missing data (particularly in survey research) in multivariate analysis was (1) missing data would impact on the reduction of the sample size available for analysis from an adequate sample to an inadequate sample if the remedies for missing data were not applied, (2) from an importance perspective, any statistical results based on data with a non-random missing data process could be biased if the missing data leads to erroneous results.

In the case of unanswered questions detected, the missing data was dropped. Hair et al. (2010) suggested that when observed missing data was more than 15% of the data required it should be deleted provided the sample met the minimum criteria required for the research. This suggestion was in line with Tabachnick and Fidell (2007) that a case of missing data should be simply dropped.

4.4.2 Assessing outliers

The checking of data for outliers in this study was also conducted where extreme values on a particular item were seen. With respect to managing the data before analysis, the step after missing data analysis was multivariate outlier detection. Outliers are observations (cases) with a unique combination of characteristics identifiable as distinctly different from the other observations. A unique characteristic was judged to be an unusually high or low value on a variable, or a unique combination of values across several variables that made the observation stand out from the others. Outliers cannot be categorically characterised as either beneficial or problematic but should be considered within the context of the analysis and evaluated by the types of information they might provide. Beneficial outliers might be indicative of characteristics of the population that would not be discovered in the normal course of analysis. In contrast, problematic outliers are not representative of the population, were counter to the objectives of the analysis and could seriously distort statistical tests (Hair et al., 2010).

In testing multivariate outliers, SPSS18 was used. The extreme case scores that might have a significant effect on the results being too high, too low or have a unique combination of values across several variables cases were deleted (Hair et al., 2010). Therefore, using multivariate analysis necessitated identification and treatment of outliers accordingly. Mahalanobis Distance was used to identify and deal with outlying cases. These meant that cases with values out of the normal Mahalanobis value range were considered multivariate outliers. 127 such cases were deleted from further analysis.

4.4.3 Normality analysis

The normal distribution of data for this study was also checked. The earlier data management steps for missing data analysis and outlier detection attempted to clean the data to a format suitable for multivariate analysis. The final data management step in association with examining the data involved testing the data for compliance with the statistical assumptions underlying the multivariate techniques and dealt with the foundations upon which the techniques made statistical inferences and results. Some robust techniques were less affected when violating certain assumptions, but in all cases complying with some of the assumptions critically determined a successful analysis (Hair et al., 2010).

The most fundamental assumption in multivariate analysis is assuming multivariate normality. Normality corresponds to the normal distribution which is the benchmark for statistical methods (Hair et al., 2010).The simplest diagnostic test for normality is a visual check of the histogram that compares the observed data values with a distribution approximating the normal distribution (Hair et al., 2010). A more accurate method is the normal probability plot, where the normal distribution takes the shape of a straight diagonal line, and the plotted data values were compared with the diagonal. When the observed data distribution largely follows the diagonal, the distribution was normal. Besides the distribution's shape, the kurtosis and skewness of the distribution might also be considered for testing the assumptions of multivariate analysis. Kurtosis is a measure of the heaviness of the tails in a distribution relative to the normal distribution. Skewness was another common pattern indicating a positively or negatively skewed distribution. The statistic z values for skewness and kurtosis were offered as part of the basic descriptive

statistics by the statistical program SPSS V18.0 used in this research. In addition, the specific statistical test (Kolmogorov-Smirnov-Test) calculating the level of significance for the differences from a normal distribution was also carried out to ascertain the normal distribution of a given variable (Coakes & Ong, 2011).

One of the approaches to assess the normality assumptions was through histogram residual plots. It referred to the shape of data distribution for an individual continous variable and its correspondence to normal distribution. To meet the assumptions, the distribution of the plot needed to appear normally distributed. The ultimate objective of the research was to make inference, and then screening for normality was an important step in almost all multivariate analysis (Tabachnick & Fidell, 2007). From Figure 4.8, it showed the normal histogram pictorially depicted that the normality assumption was achieved since all the bars of the histogram were close to a normal curve.

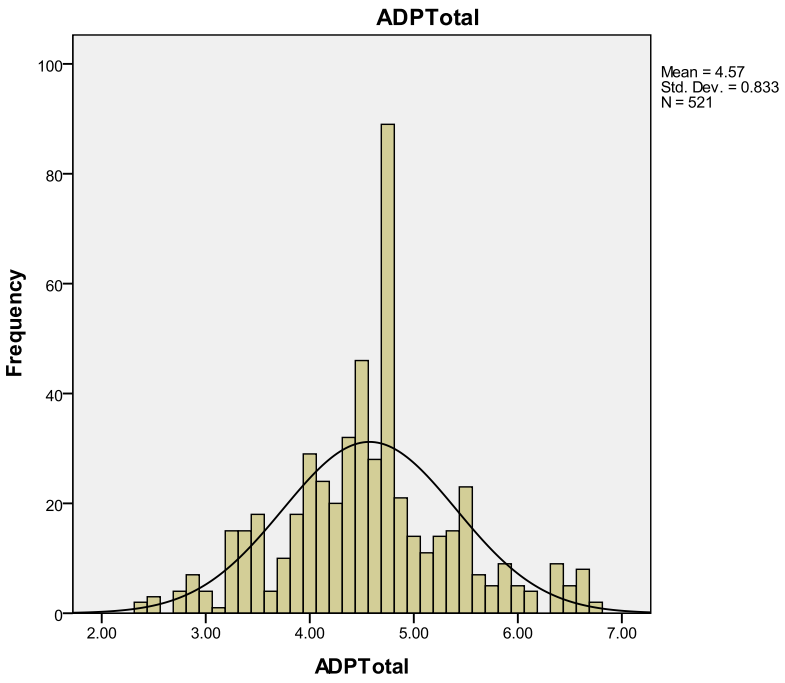


Figure 4.8
Dependent Variable histogram residual plots

On the other hand, the normal probability plot satisfied the homocedasticity assumptions of the variance of the random error component since all the points lie along 45^{o} diagonal line. Similarly, the normality assumption for other variables was not violated. Figure 4.9 depicts the normal probability plot.

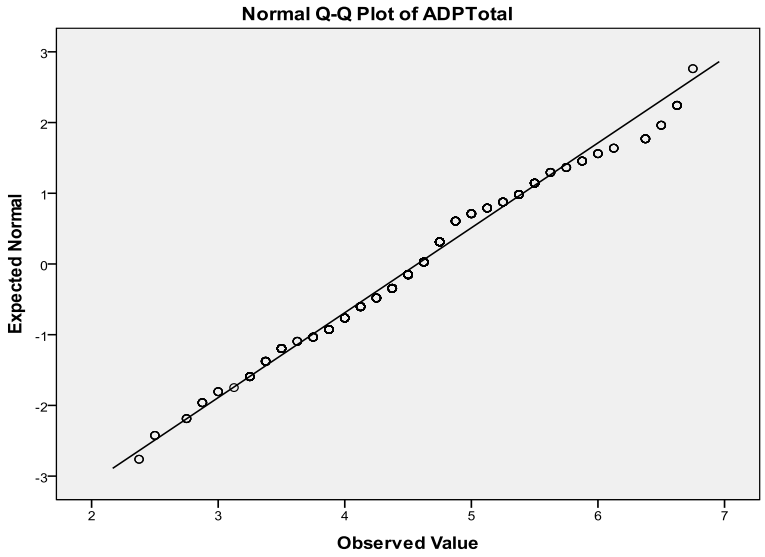


Figure 4.9
Normal probability plot of dependent variable

In addition the assumption of Collinearity also needed to be met. These assumptions when applied to the independent and dependent variables showed the relationship between them to be linear. According to Hair et al. (2010), if the analysis didnot show any non-linear pattern to residuals, it ensured that the overall equation was linear and could be examined through residual plots. Meanwhile homocedasticity implies equal variance of dependent variable at each observation of the independent variable and similarly could be examined from the histogram of the standardized residuals and the Q-Q plots (Hair et al., 2010). The assumption of independence implies that the samples were independent from one another. In this research, the independent assumption was met because the samples were randomly selected from the population.

4.4.4 Linearity

Regression analysis also had an assumption on linearity. Linearity meant that there would be straight line relationships between the independent variables and the dependent variables. This assumption was important because regression analysis only tested for a linear relationship between the independent and the dependent variables. To check for linearity, this research used the residual scatter plot. If the assumptions were satisfied, the residuals should scatter around 0 or most of the scores should concentrate in the centre along the 0 point (Flury & Riedwyl, 1988). Figure 4.10 displays the scattered plot between the independent factors and the dependent factor. The plot showed that the residual scores were concentrated at the centre along the zero (0) point, thus, suggesting the linearity assumption was met. Similarly, it appeared that the other variables also demonstrated that the linearity assumption was not violated.

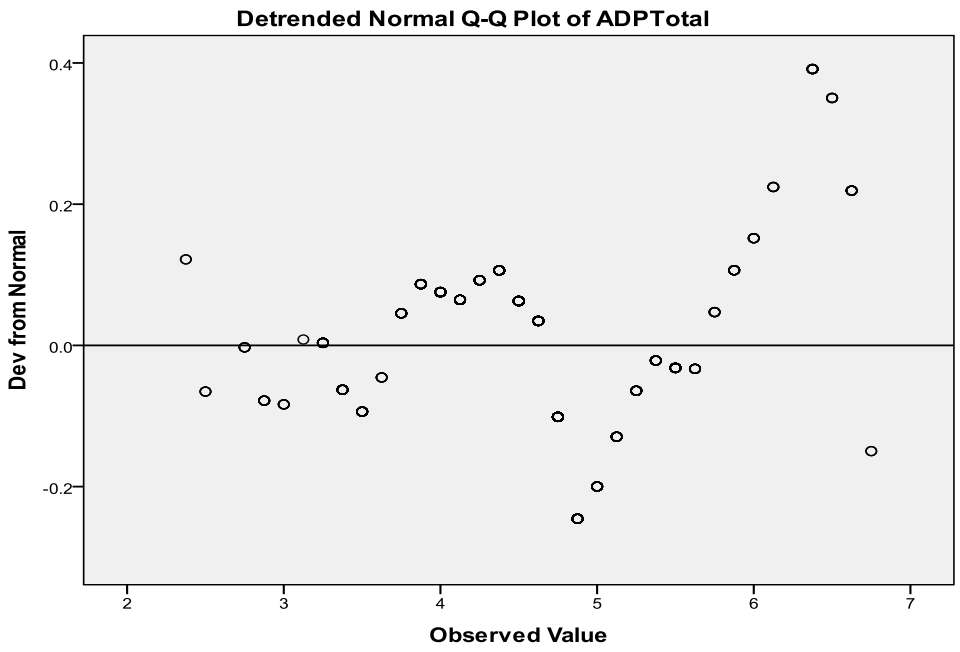


Figure 4.10
Residual Scatter plot of dependent variable

4.4.5 Homoscedasticity

The assumption of homoscedasticity was that there was no residual pattern in the data distribution and residuals were scattered randomly around the horizontal line through 0 (Norusis, 1999). The assumption of homoscedasticity required that the variance of the dependent variable was the same at all values of independent variable or constant variance of error term (Hair et al., 2010). Durbin-Watson could also be used to test independence of error terms (Norusis, 1999). The general rule of the term was, if the Durbin-Watson value was between 1.50 and 2.50, the assumption of independence of the error terms was not violated (Norusis, 1999). The Durbin-Watson value of each independent variable of this study met the general rule of thumb, and assured that the assumptions of independence of error terms was not violated. Table 4.2 shows that the homoscedasticity did not violate the independence of error term because the Durbin-Watson value for top management support was 1.58, perceived usefulness 1.59, user support 1.66, technology experience 1.58 and perceived knowledge 1.61 which were within the value of 1.50 and 2.50.

Table 4.2
Durbin-Watson Value

Independent Variables	Durbin-Watson
(Constant)	
Top Management Support	1.578
Perceived Usefulness	1.592
Behavioral Intention	1.592
Experience	1.609
User Support	1.659

Dependent Variable: RMPnet system adoption

4.4.6 Multicollinearity

Multicollinearity is defined as the degree of correlation among independent variables. Independent variables were highly correlated (above 0.90) among

themselves (Hair et al., 2010). In this study, multicollinearity had been excamined from the variance inflated factor (VIF) and tolerance value. It was generally believed that any variance inflation factor that exceeded 10 and tolerance value lower than 0.10 indicated a potential problem of multicollinearity (Hair et al., 2010). Results in Table 4.3 showed that multicollinearity did not exist amongt all independent variables because the tolerance value were more than 0.10 and VIF values were less than 10. The result indicated that the study did not have any multicollinearity problem. The hierarchical regression was subjected to criticism because the interactions often lead to multicollinearity problem (Cohen & Cohen, 1983; Frazier, Baron & Tix, 2004). As a result of centered mean, VIF and tolerances values were within acceptable required range. Thus, multicollinearity was not a problem in this study.

Table 4.3
Tolerance Value and the Variance Inflation Factor

Independent Variables	Collinearity Statistics	
	Tolerance	Variance Inflated Factor (VIF)
(Constant)		
Top Management Support	0.480	2.084
Experience	0.670	1.492
Perceived Usefulness	0.339	2.948
Behavioral Intention	0.305	3.283
User Support	0.949	1.053

4.5 FACTOR ANALYSIS OF THE RESEARCH INSTRUMENT

Before further tests were performed, the construct was subjected to validity and reliability tests. Factor analysis was carried out to test the construct validity of the questionnaire. Factor analysis addresses the problem of analyzing the structure of the correlations among large number of variables (i.e. test items) by defining a set of

common underlying dimensions known as factors. First, the researcher identified separate dimensions of the structure and then determined the extent to which a variable was explained by each factor. This was then followed by the primary use of factor analysis for the summarization of data reduction (Hair et al., 2010). The interdependence technique described supported the formation of factors in order to maximise the explanation of the entire variable set, not to predict a dependent variable. In order to find a way to condense the information contained in the 30 items used in this study, the researcher created a new, smaller set of factors with a minimum loss of information.

Factor analysis was conducted using a principal component analysis (PCA) with varimax rotation method to analyze the underlying structure of the inter-relationship among the variables into a set of common dimensions. This analysis would assess the measurement of convergent and discriminant validity. Convergent validity refers to the degree to which the scale correlated positively or in the same direction with other measures of the same construct. Discriminant validity refers to the degree to which the measurement scale did not correlate or diverged from other measures (Malhotra, 1996). PCA was a method that was used to help researchers represent a large number of relationships among interval-level variables in a simpler way. The method would determine which, of a fairly large set of items, grouped together as a group, were answered most similarly by participants. The PCA was carried out for the items of the variables of this research. The central idea of PCA was to reduce the dimensionality of data sets in which there were a large number of inter-related variables, while retaining as much as possible of the variation presented in the data set. This reduction was achieved by transforming to new set of variables,

the principal components, which were uncorrelated, and which were ordered so that the first few retained most of the variation present in all of the original variables. Computations of the principal components reduced to the solution of an eigenvalue problem for a positive semi-definite symmetric matrix. As for the sample size, guidelines by Coakes and Steed (2003) and Hair et al. (2010) indicated that a minimum of five subjects per variable were needed for factor analysis. In this study, with 30 variables, a sample size of 521 was higher than the minimum requirement of the desired cases for factor analysis. Hence, the minimum requirement for factor analysis was fulfilled in this research.

4.5.1 Dependent Variable – RMPnet system adoption

Table 4.4 showed the factor loadings and communality values for factor analysis of dependent variable (RMPnet system adoption). At interception the dependent variable was measured by 8-items in 1 dimension and subjected to PCA using SPSS version 18. Prior to performing PCA, the suitability of data factor analysis was assessed. The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was 0.94 (Table 4.4) exceeding benchmark value of 0.60. It showed that the sample size was adequate for factor analysis to be conducted. That showed that the ratio of the sample size to the number of items was sufficient for factorability. On the other hand, Bartlett's test of sphericity was statistically significant, supporting the factoribility of the correlation matrix, as the p-value was 0.005. This implied the adequacy of applying the factor analysis. PCA revealed the presence of 1 component with eigenvalue exceeding 1. The percentage of the variance was 82.19%.

Table 4.4

Total variance of the dependent variable – RMPnet system Adoption

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			KMO	Bartlett's Test
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %		
1	6.575	82.193	82.193	6.575	82.193	82.193	0.940	0.005
2	0.414	5.172	87.364					
3	0.284	3.550	90.914					
4	0.229	2.862	93.776					
5	0.179	2.244	96.020					
6	0.140	1.755	97.775					
7	0.116	1.456	99.231					
8	0.062	0.769	100.000					

Extraction Method: Principal Component Analysis and KMO and Bartlett's Test

4.5.2 Moderating Variable – Innovativeness

Table 4.5 showed the factor loadings and communality values of the results for factor analysis of innovativeness. At the beginning, the moderating variable was measured by 4-item in 1 dimension, which was subject to PCA using SPSS version 18. Prior to the process of performing PCA, the suitability of data for factor analysis was assessed. The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy of 0.71 (Table 4.5) exceeded the benchmark value of 0.60. This implied that the sample size was adequate for factor analysis to be conducted. Also, the ratio of the sample size to the number of items, was sufficient for factorability. On the other hand, Bartlett's test of sphericity was statistically significant, supporting the factoribility of the correlation matrix, as the p-value is 0.005. This indicated the adequacy of applying the factor analysis. PCA revealed the presence of 1 component with eigenvalue exceeding 1. The percentage of the variance was 55.34%.

Table 4.5
Total variance of the moderating variable – Innovativeness

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			KMO	Bartlett's Test
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %		
1	2.214	55.341	55.341	2.214	55.341	55.341	0.709	0.005
2	0.975	24.369	79.710					
3	0.471	11.779	91.489					
4	0.340	8.511	100.000					

Extraction Method: Principal Component Analysis and KMO and Bartlett's Test

4.5.3 Independent Variables

The independent variables of this study were individual factors measured as uni-dimensional which included: 1) Top Management Support, 2) RMPnet system Experience, 3) Perceived Usefulness, 4) Behavioral Intention, and 5) User support. The total items measuring the factors were 30 items. These items and dimensions were analyzed using factor analysis to check for their validity. Using the criteria for conducting factor analysis as discussed in section 4.3. The Kaiser-Meyer-Olkin value was 0.89, exceeding the recommended value of 0.60 and the Bartlett's Test of Sphericity reached statistical significance, supporting the factoribility of the correlation matrix (Coakes & Ong, 2011). The details are shown in Table 4.6.

In order to decide on the number of factors to extract, the researcher applied both the eigenvalue and the scree test criterion. The first and most commonly used technique determined the variables contributing a value of 1 to the total eigenvalue. Thus, only the factors having eigenvalues greater than 1 were considered significant. The scree test was used to identify the optimum number of factors that could be extracted before the amount of unique variance began to dominate the common variance structure (Coakes & Ong, 2011).

Figure 4.11 plotted the factors extracted from all independent variables used in this study. Starting with the first factor, the plot slopped steeply downward initially and then slowly became an approximately horizontal line. The cut-off point at which the curve first begins to straighten out was considered to indicate the maximum number of factors to extract. Here, the first five factors would qualify. As a general rule, the scree test results included at least one or sometimes two or three factors to consider for inclusion than did the eigenvalue criterion.

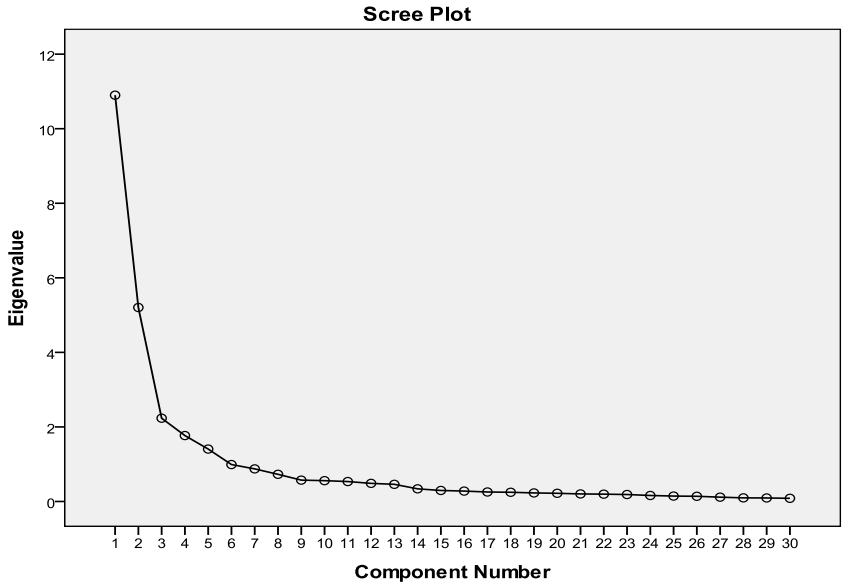


Figure 4.11
Scree plot of independent variables

Table 4.6 presented the variance values for the independent variable of the study. According to the eigenvalues criterion, the extract number of factors was five. The first factor explains 36.33% of the total variance, the second factor 17.35%, the third 7.45%, the fourth 5.89%, and fifth 4.69% respectively.

As a next step, the factors had to be interpreted, for which purpose a tool called factor rotation was used. The rotated component factor matrix summarized statistically single items to form one factor (Table 4.6).

Table 4.6

Confirmatory Factor Analysis

	Component				
	1	2	3	4	5
PU2	.839	-	-	-	-
PU4	.819	-	-	-	-
PU1	.815	-	-	-	-
PU5	.814	-	-	-	-
PU3	.787	-	-	-	-
PU8	.770	-	-	-	-
BI1	.711	-	-	-	-
PU7	.691	-	-	-	-
PU6	.623	-	-	-	-
BI2	.620	-	-	-	-
US5	-	.850	-	-	-
US8	-	.845	-	-	-
US3	-	.822	-	-	-
US9	-	.809	-	-	-
US7	-	.806	-	-	-
US6	-	.799	-	-	-
US2	-	.785	-	-	-
US4	-	.661	-	-	-
US1	-	.608	-	-	-
TMS2	-	-	.832	-	-
TMS4	-	-	.825	-	-
TMS3	-	-	.822	-	-
TMS1	-	-	.740	-	-
TMS5	-	-	.731	-	-
EXP4	-	-	-	.847	-
EXP6	-	-	-	.847	-
EXP5	-	-	-	.823	-
EXP2	-	-	-	-	.723
EXP1	-	-	-	-	.671
EXP3	-	-	-	-	.648
Eigenvalue	10.899	5.203	2.234	1.768	1.406
% Variance Explained	36.330	17.345	7.446	5.894	4.687
Cumulative %	36.330	53.674	61.014	67.014	71.701

The extraction method was principal component analysis and the rotation method was Varimax with Kaiser normalization.

(independent variables: Top management support, RMPnet system experience, perceived usefulness, behavioral intention, user support)

4.6 RELIABILITY ANALYSIS

According to Hair et al., (2010), reliability analysis needed to be conducted in order to determine the stability and consistency of the construct measurement. To assess the interim consistency reliability of all variables, Cronbach's Alpha was used. Cronbach's alpha (α) was a measure of internal consistency and was one of the many tests of reliability. Cronbach's alpha determined the degree to which all items were measuring the same constructs (Cronk, 2006), and detected whether the indicators of a construct had an acceptable fit on a single factor model (Cooper & Schindler, 2003). It was the most widely and popular reliability coefficient test used to examine the reliability of multi-pointed scaled items (Sekaran, 2003).

A value of 0.7 in the Cronbach's alpha was considered adequate to ensure reliability of the internal consistency of the questionnaire (Nunally, 1978). Flynn, Schroeder, and Sakakibara (1994) argued that a Cronbach's alpha of 0.60 and above was considered an effective reliability for judging a scale. Researchers suggested that the reliability coefficient of variable less than 0.60 was consider to be poor, those exceeding 0.70 range were acceptable. A good reliability measurement would be close to 1. The generally agreed lower limit for Cronbach's alpha might decrease to 0.60 in exploratory research (Hair et al., 2010). Hence, instrument had excellent reliability as far as internal consistency was concerned. The instrument could give consistent results on the effect of individual adoption of RMPnet system adoption in Royal Malaysia Police organization.

The reliability test for each dimension emerged after factor analysis was conducted. Cronbach's alpha coefficient was widely used as a measure of reliability. Since the result of factor analysis reduced some of the dimensions and required other

dimensions to be renamed, the previous hypotheses needed to be amended. Five extracted factors combined the 30 items of final factors together with the number of items used to measure the particular variable. The Cronbach's alpha range from 0.69 to 0.97 for the variable in the questionnaire used for this study implied that the instrument was reliable and the result of the relationship between the independent and the dependent variables is shown in Table 4.7.

Table 4.7
Reliability of the Measurement

Construct	Number of items	Cronbach's Alpha (α)
Adoption of RMPnet system	8 items	0.97
Innovativeness	4 items	0.69
Top Management Support	5 items	0.93
Perceived Usefulness	10 items	0.94
User Support	9 items	0.89
Technology experience	3 items	0.86
System experience	3 items	0.86

4.7 MODIFICATION OF FRAMEWORK AND RESTATEMENT OF HYPOTHESES

The results of the analysis indicated that the hypotheses need not be restated from that referred to throughout the study. Prior to factor analysis major variables such as perceived usefulness, behavioural intention and RMPnet system experience were measured as uni-dimensional. However, after factor analysis behavioural intention was loaded together with perceived usefulness into one dimension. The RMPnet system experience was split into two dimensions.

The first factor was defined by 10 items and reflected the perceived usefulness and behavioural intention to adopt RMPnet system, thus, this factor was named Perceived Usefulness as this variable dominated the items. The second factor was dominated by items relating to user support and there was no change of dimension after factor analysis and therefore, the name of this factor as user support was maintained. The third factor was dominated by items relating to top management support and there was also no change in dimensions on this variable and thus, the name of this factor was also maintained as top management support. The fourth factor consisted of items pertaining to the longer term experience of using the technology and RMPnet system, thus, this factor was named RMPnet technology experience. The fifth factor consisted of items related to the knowledge of new users of RMPnet system features. Therefore, this factor was named system experience of RMPnet systems. There was also no change of dimension for the dependent variable and the moderating variable of this study. Depicted below were the restatements of hypotheses after the factor analysis.

4.7.1 Hypotheses after factor analysis

H1 There is significant relationship between top management support and RMPnet system adoption among senior police officers of RMP.

H2 There is significant relationship between perceived usefulness and RMPnet system adoption among senior police officers of RMP.

H3 There is significant relationship between user support and RMPnet system adoption among senior police officers of RMP.

H4 There is significant relationship between technology experience and RMPnet system adoption among senior police officers of RMP.

H5 There is significant relationship between perceived knowledge and RMPnet system adoption among senior police officers of RMP.

H6a Innovativeness moderates the relationship between top management support and RMPnet system adoption among senior police officers of RMP.

H6b Innovativeness moderates the relationship between perceived usefulness and RMPnet system adoption among senior police officers of RMP.

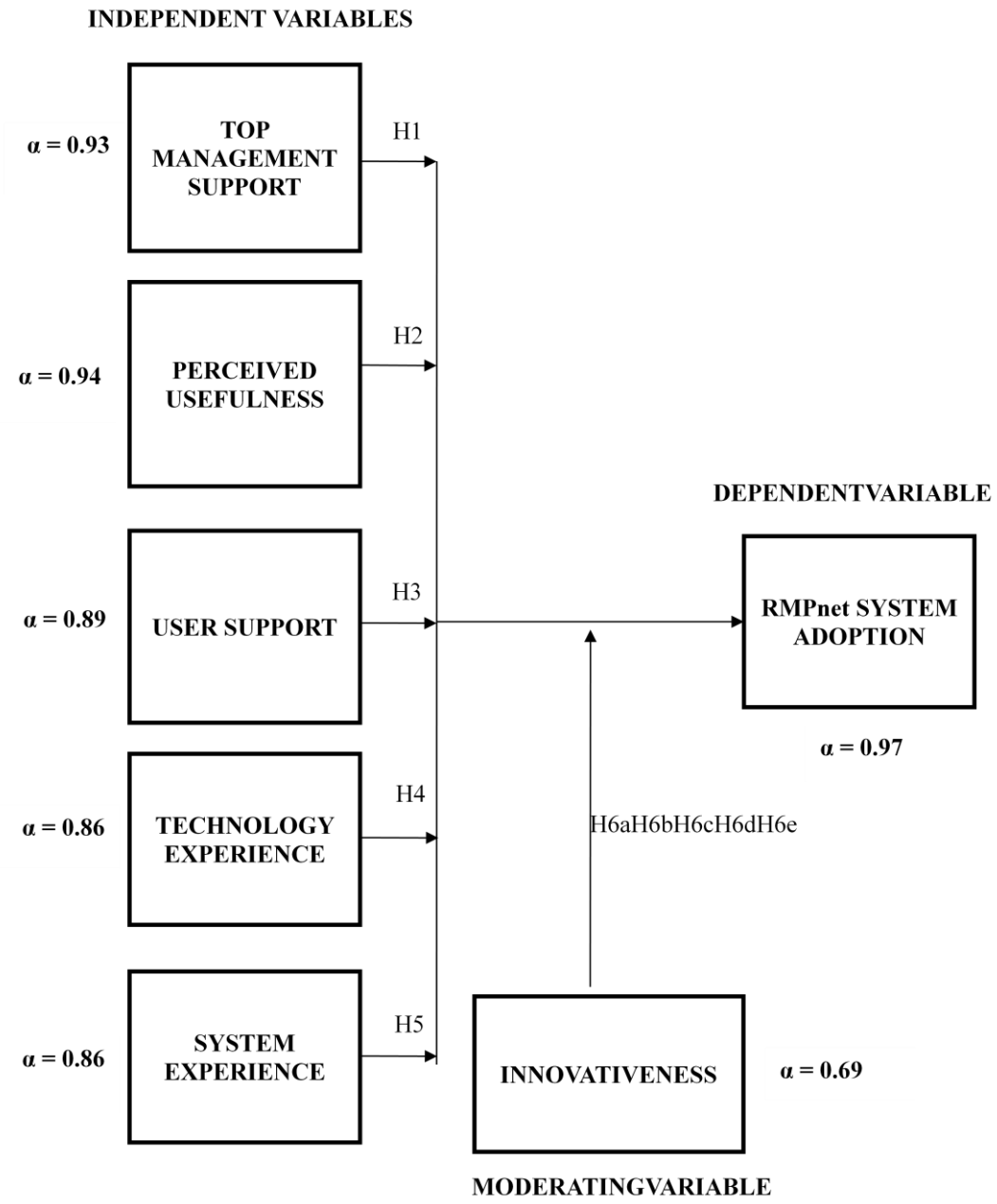
H6c Innovativeness moderates the relationship between user support and RMPnet system adoption among senior police officers of RMP.

H6d Innovativeness moderates the relationship between technology experience and RMPnet system adoption among senior police officers of RMP.

H6e Innovativeness moderates the relationship between perceived knowledge and RMPnet system adoption among senior police officers of RMP.

The research model was also modified after the factor analysis. Anyway the modification only involved changing of names and dimensions of items of the independent variables. The information is depicted in Figure 4.12.

Figure 4.12
The revised research framework



4.8 CORRELATION ANALYSIS

A Pearson correlation matrix was conducted to see direction, strength and significance of relationships among all variables. Correlation could range between -1.0 or +1.0 and it is important to know if any correlation found between two variables is significant or not, that is, whether it occurred solely by chance or if there is a high probability of its actual existence (Sekaran & Bougie, 2010). This study attempted to identify the relationships, if any, between the predictors of independent variables and the dependent variable. In order to determine the relationship between the variables, Pallant (2004) suggested that when correlation value was 0, it indicated that there was no relationship (either positive or negative). To interpret the values between 0 (no relationship) and 1 (relationship) Cohen (1988) suggested that r = $\pm$0.1 to $\pm$0.29, the relationship was said to be small, when r = $\pm$0.30 to $\pm$0.49, the strength was medium, and when r = 0.50 and above, the strength was large. The correlation coefficient between top management support, perceived usefulness, user support, technology experience and system experience (the independent variables) and RMPnet system adoption, the dependent variable is depicted in Table 4.8.

Table 4.8
Correlation matrix amongst variables under study

Variables	1	2	3	4	5	6
RMPnet system adoption (1)	1	-	-	-	-	-
Top Management Support (2)	.201**	1	-	-	-	-
Perceived Usefulness (3)	.252**	.674**	1	-	-	-
User Support (4)	.857**	.154**	.209**	1	-	-
Technology Experience (5)	.038	.272**	.339**	.029	1	-
System Experience (6)	.213**	.458**	.597**	.248**	.411**	1

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

The correlation coefficients for the variable under investigation were ranging from 0.154 to 0.857. Top management support, perceived usefulness, user support,

and system experience have a positive correlation with RMPnet system adoption. The result indicated that there was a significant relationship between the top management support and RMPnet system adoption with a correlation r = 0.201, p<0.01. The relationship between perceived usefulness and RMPnet system adoption also showed a significant relationship with r = 0.252, p<0.01 and the relationship between user support and RMPnet system adoption was also significant with r = 0.857, p<0.01. However, the technology experience did not show significant relationship, where r value was 0.038, p>0.01. As for the relationship between system experience and RMPnet systemadoption, there was significant relationship with r = 0.213, p<0.005 (confidence level of 99%).

According to Hair et al. (2010), multi-collinearity occurs if the r-value between each pair in Pearson's correlation exceeds 0.90. The highest coefficient of correlation in this research was 0.674 which was below the cut-off point of 0.90 for collinearity problem. Therefore, it indicated that the data was not affected by the multi-collinearity problem. Furthermore, the correlation was also further evidence of validity and reliability of the measurement scales used in this study. Table 4.8 depicts the result of Pearson's correlation tests of this study.

4.9 REGRESSION ANALYSIS

A multiple regression analysis was performed with the purpose of examining the research model and its proposed hypotheses. This statistical dependent (criterion) variable and several independent (predictors) variables might be found in the underlying research model (Hair et al., 2010). Multiple regression referred to a regression model in which the fitted value of the response variable Y was a function

of the values of one or more predictor (X) variables (Diamantopoulos & Schlegelmilch, 2000). The most common form of multiple regression was multiple linear regression, a linear regression model with more than one X variable.

The regression coefficients (or β coefficients) represents the independent contributions of each independent variable to the prediction of the dependent variable. In the regression equation, the value βo refers to the intercept or constant term. In the case of complete absence of the independent variable, the intercept represented a predictive value but this was a rare situation.

The purpose of the multiple linear regressions was to estimate the coefficients of the regression equation. The (β) value provides a useful interpretation of the relationship between independent and dependent variables. The (β) value, which may be either positive or negative, indicates the amount of increase or decrease in a dependent variable for one unit of difference in the independent variable. The p value is also an important indicator in the regression analysis. The p value corresponding to each coefficient of estimate refers to the level of significance of that independent variable and as to whether the p value of the independent variable had a significant relationship with the dependent variable. In addition, the regression output provides the correlation coefficient (r), coefficient of determination (R^2), and adjusted coefficient of determination (adjusted R^2), both of which indicate how well an independent variable predicts the dependent variable. The coefficient of determination (R^2) was the measure of the propotion of the variance of the dependent variable about its mean that was explained by the predictor (Hair et al., 2010). The (F) value is a criterion to evaluate the overall usefulness of the regression model in analysing, predicting, or explaining the variation in the dependent variable (Sekaran,

Bougie, 2010). Morever, the Durbin-Watson test was performed in order to test autocorrelation. The multiple regression analysis was used to test the hypotheses. The purpose of the regression analysis was to relate the dependent variable to a set of independent variables. To determine the relationships among the variables, β was very important as it compared the contribution of each independent variable. In this study, the relationship is statistically significant if the value of F is larger than 0.05 (Prob >F) which is the level of significance.

Regression analysis was performed to analysed the distinction between the dependent and the independent variables, and in the extent to which dependent variables are explained (or influenced) by the independent variables. In this analysis, the enter method technique was used. In the enter method technique all the determinants of the independent variables are entered in a single step. The purpose is to check any colinearity problem.

Typically, Y will be entered in the dependent box, and X1, X2 and X3 in the independent box. In the regression analysis, attention will be given to the following criteria in the output: (Adjusted) R-squared. This tells us how much variance in the dependent variable is explained by the independent variables in the model. For the Adjusted R-square, but since the latter is more conservative estimates it is preferable to choose Adjusted R-square.

From the F-value, the result predicts whether the proportion of variance explained by the model is significant. In other words is whether the (Adj) R-square is significant, if the model has enough explanatory power to be valuable. If the F-value is not significant, that means it makes no sense to continue the analysis.

The Beta can be compared to the correlation coefficient, and tells us how strong the relationship between the independent and the dependent variables are, and what direction it has (positive or negative). Typically, Beta values will lie between -1 and 1, and the most important thing here is whether the Beta value is significant (p=<0.005) or p-value is smaller than alpha value.

4.9.1 Hypotheses Testing

Depicted in Table 4.9 are the statistical test results of the analysis testing the relationship between the independent variables as the determinant of RMPnet system adoption as the dependent variable of this study. Firstly, a regression analysis was conducted to test hypotheses H1 to hypotheses H5 and observe all the relationships between the independent and the dependent variable under study.

Testing hypotheses H1

Hypothesis 1: Independent variable Top Management Support as determinant of RMPnet system adoption was observed for statistical significance. From the statistical results the regression coefficient and determination for top management support were (β = 0.201, t = 4.663, F = 21.741, R^2 = 0.040, p < 0.005). The statistical test results showed there was a significant relationship between Top Management support and RMPnet system adoption. Thus, H1 was supported.

Testing hypotheses H2

Hypothesis 2: Independent variable Perceived Usefulness as determinant of RMPnet system adoption was also observed for statistical significance. From the statistical

result, the regression coefficient and determination for perceived usefulness were (β= 0.252, t = 5.931, F = 35.176, R^2 = 0.063, p < 0.005). The test results showed there were significant relationship between Perceived Usefulness and RMPnet system adoption. Thus, H2 was supported.

Testing hypotheses H3

Next, Hypothesis 3: Independent variable User Support as determinant of RMPnet system adoption was observed for statistical significance. From the statistical result, the regression coefficient and determination for user support were (β = 0.857, t =37.886, F = 1435.384, R^2 = 0.734, p < 0.005). The test results showed there were significant relationship between user support and RMPnet system adoption. Thus, H3 was supported.

Testing hypotheses H4

The next hypothesis to observe for statistical significance was Hypothesis 4: Independent variable technology experience as determinant of RMPnet system adoption. From the statistical result, the regression coefficient and determination for technology experience were (β = 0.038, t = 0.871, F = 0.759, R^2 = 0.001, p>0.005). The test results showed that there was no significant relationship at alpha value <0.005 between technology experience and RMPnet system adoption. Thus, H4 was not supported.

Testing hypotheses H5

Hypothesis 5: Independent variable system experience as determinant of RMPnet system adoption was also observed for statistical significance. From the statistical result in table 4.9, the regression coefficient and determination for system experience were (β = 0.213, t = 4.975, F = 24.752, R^2 = 0.046, p < 0.005). The test results showed there was significant relationship at alpha value <0.005) between system experience and RMPnet system adoption. Thus, H5 was supported.

Table 4.9
Results of the Regression Analysis

Variables	Standardized Coefficient		R^2	F	Sig.
	β	t			
Top Management Support	0.201	4.663	0.040	21.741	0.005*
Perceived Usefulness	0.252	5.931	0.063	35.176	0.005*
User Support	0.857	37.886	0.734	1435.384	0.005*
Technology experience	0.038	0.871	0.001	0.759	0.384
System experience	0.213	4.975	0.046	24.752	0.005*

*P<0.005

Finally, to measure the effect of moderating variable innovativeness in order to verify hypotheses H6a to H6e, a hierarchical regression analysis was conducted. Indeed, in the verification of hypotheses H6a to H6e that followed, the effect of a moderator would be significant only if, the path between the independent and the dependent variables was significant, as well as if the change in R2 coefficient was equal to 0 (Gerard, 2010). Depicted in Table 4.10 are the statistical results of the analysis testing the moderating effect of innovativeness as the moderating variable between the relationship of the independent variables as the predictors of RMPnet system adoption as the dependent variables of this research.

Testing hypotheses H6a

The next observation for statistical significance was to observe Hypothesis H6a: Innovativeness as the moderating variable that moderated the relationship between the independent variable top management support and RMPnet system adoption as the dependent variable. The regression coefficient and determination for top management support were ($\beta = 0.142$, $t = 8.732$, $F = 11.233$, $R^2 = 0.042$, $p < 0.005$) and there was a change in R^2 ($\blacktriangle R^2 = 0.100$). Thus, as expected, the moderating variable innovativeness had significant moderating effect between relationship of top management support and RMPnet system adoption and therefore, H6a was supported.

Testing hypotheses H6b

Hypothesis H6b: Innovativeness as the moderating variable of the relationship between the independent variable, perceived usefulness and, the independent variable, RMPnet system adoption was observed for statistical significance. The regression coefficient and determination for perceived usefulness were ($\beta = 0.283$, $t = 5.248$, $F = 18.989$, $R^2 = 0.068$, $p < 0.005$) and there was a change in R^2 ($\blacktriangle R^2 = 0.215$). Thus, as expected, the moderating variable innovativeness had significant moderating effect on the relationship betweenperceived usefulness and RMPnet system adoption. Thus, H6b was also supported.

Testing hypotheses H6c

Hypothesis H6c: Innovativeness as the moderating variable moderating the relationship between the independent variable user support and RMPnet system

adoption as the dependent variable was observed for statistical significance. The regression coefficient and determination user support were ($\beta = 0.853$, $t = -0.589$, $F = 759.588$, $R^2 = 0.746$, $p < 0.005$) and there was a change in R^2 ($\blacktriangle R^2 = 0.107$). Thus, as expected, the moderating variable innovativeness had significant moderating effect on the relationship between user support and RMPnet system adoption. Thus, H6c was supported.

Testing hypotheses H6d

Hypothesis H6d: Innovativeness as the variable moderating the relationship between the independent variable technology experience and RMPnet system adoption as the dependent variable was observed for statistical significance. The regression coefficient and determination for user support were ($\beta = 0.009$, $t = -0.368$, $F = 5.026$, $R^2 = 0.190$, $p > 0.005$). Thus the moderating variable innovativeness had no significant moderating effect between relationship of technology experience and RMPnet system adoption. Thus, H6d was not supported.

Testing hypotheses H6e

Finally, Hypothesis H6e: Innovativeness as the variable moderatingthe relationship between the independent variable system experience and RMPnet system adoption as the dependent variable was observed for statistical significance. The regression coefficient and determination for system experience were ($\beta = 0.208$, $t = 3.974$, $F = 13.004$, $R^2 = 0.048$, $p < 0.005$) and there was a change in R^2 ($\blacktriangle R^2 = 0.160$).Thus, as expected, the moderating variable innovativeness had significant moderating effect

between relationship of system experience and RMPnet system adoption and hence, H6e was supported.

Table 4.10
Results of the Hierarchical Regression Analysis

Variables	Standardized Coefficient		R^2	▲R^2	F	Sig.
	β	t				
Top Management Support	0.142	8.732	0.042	0.100	11.233	0.005*
Perceived Usefulness	0.283	5.248	0.068	0.215	18.989	0.005*
User Support	0.853	-.589	0.746	0.107	759.588	0.005*
Technology experience	0.009	-0.368	0.190	-0.181	5.026	0.007
System experience	0.208	3.974	0.048	0.160	13.004	0.005*

*P<0.005

4.10 RESULTS

The intent of this research was to test a conceptual model of RMPnet system adoption. Several adoption factors; top management support, perceived usefulness, user support, and system experience, were found to be significant in predicting senior police officers adoption of RMPnet system. Innovativeness had also been found to moderate the relationship of all independent variables and the RMPnet system adoption. Some of the hypotheses proposed in chapter one stated were supported by the data and others were not not.Restatement of hypotheses was done after the factor analysis and a total of 10 hypotheses were tested: 5 to ascertain the effect of independent variables on dependent variables, and the other 5 to test the moderating effect between the dependent variables and the dependent variables. Depicted below are the results of the tests:

4.10.1 Significant Results

Top Management Support

Top management support had been shown to positively influence technology adoption (Schepers et al., 2005; Peltier, 2005; Myler & Broadband, 2006; Jones, McCarthy, Halawi & Mujtaba, 2010). Hypotheses H1 was supported in that top management had a strong impact on technology adoption of RMPnet. The result of this research would help the project director and team members to understand the factors that promote employee adoption and to encourage positive attitudes toward these measures. The ability to promote adoption of RMPnet system would help RMP better achieve the benefits of technology within the organization. Widespread employee adoption of the RMPnet system should have material financial benefits.

Perceived Usefulness

Hypothesis 2 was also supported. Senior police officers' intention to adopt RMPnet system would increase if they perceived the system to be useful. The features, such as private call, group call or direct mode were activities that many senior police officers currently lack awareness of. These activities arerequired for basic policing job. The features wereimportant for communicating directly when necessary.

This finding concurred with the findings of previous researchers (Davis, 1989; Matheson, 1991; Taylor & Todd, 1995; Ramayah, Ignatius& Aafaqi, 2005; Guriting & Ndubisi, 2006; Mohd Suki et al., 2008; Abdelghaffar & Magdy, 2012). Researchers suggested that system (e.g. RMPnet system) must be better to have than to be without and easy to use before end-users would even think about using it

(Jantan et al., 2001; Ndubisi et al., 2001; Ramayah & Lo, 2007). Hence, perceived usefulness was an important factor in determining RMPnet system adoption.

User Support

Hypothesis 3 was also supported. From the results, it indicated that user support was positively related and had direct effect on the adoption of RMPnet system. The findings were consistent with studies of previous researchers (Schillewaert et al., 2005; Hussein et al., 2006; Ngai, Poon & Chan, 2007). The positive outcome might be due to the implementation of the RMPnet system that needed to be maintained, monitored and supported from time to time.

System Experience

The hypothesis H5 was also supported. From the results, perceived knowledge positively influenced technology adoption and this concurred with previous research (Brown & Venkatesh, 2005; Dwivedi, Choudrie & Brinkman, 2006). This clearly suggested that efforts are required from top management and the project team to develop positive attitudes towards RMPnet system amongst senior police officers by making them more aware of the benefits of implementation of RMPnet system.

Innovativeness

Hypotheses H6a to H6e were supported. As predicted and expected, the moderator variable, innovativeness had influence on the relationship between the predictors of independent variables and RMpnet system adoption by senior police officers.

4.10.2 Non-significant Results

It was often interesting to evaluate not only significant results, but also unexpected results, especially in a relatively new field, such as RMPnet system. One of the hypothesised relationships did not prove to be significant. Appended below the interpretation of the result:

Technology Experience

Hypothesis 4 and H6d; the technology experience (β=.109, p>0.005) and (B=0.009, p>0.005) were not supported. Logically, they should have adopted by now RMPnet system, but very few did so. This indicated that the technology experience factor did not mean that senior police officers would use RMPnet system. Findings were consistent with prior research (Abdelghaffar & Magdy, 2012; Abdelghaffar, 2009).

4.10.3 Relationships of independent variables as determinant and the dependent variable with and without moderating factors

Specifically in results, it is important to notice that a model with moderating factors shared higher explanatory powers in comparison to the model without moderating factors impact. Factors such as perceived usefulness without moderating effect explained 6.30% variance while with moderating effect slightly higher at 6.80%. User support without moderating effect was 73.40% variance while with moderating effect slightly higher at 74.60%. Top management support without moderating effect 4.0% and with moderating effect 4.20 % and system experience without moderating effect 4.60% and with moderating effect 4.80%. Table 4.11 depicts the relationship of predictors and criterion variable without and with moderating factors.

Table 4.11
Summary of relationships between predictors and criterion variable without and with moderating factors

	Without Moderator				With Moderator			
	β	t	R^2	Sig.	β	t	R^2	Sig.
Top Management Support	0.201	4.663	0.040	0.005*	0.142	8.732	0.042	0.000*
Perceived Usefulness	0.252	5.931	0.063	0.005*	0.283	5.248	0.068	0.000*
User Support	0.857	37.886	0.734	0.005*	0.853	-0.589	0.746	0.000*
Technology experience	0.038	0.871	0.001	0.384	0.009	-0.368	0.190	0.007
System experience	0.213	4.975	0.046	0.005*	0.208	3.974	0.048	0.000*

*P<0.005

4.11 REVISITING RESEARCH HYPOTHESES

This section summarizes the numbers of hypotheses proposed in this study and states whether they were supported by the data or not. Table 4.12 showed that a total of 10 hypotheses were tested to ascertain the effect of independent variables on the dependent variable and also the moderating effect between the independent and the dependent variable. Out of the 10 research hypotheses (H1, H2, H3, H4, H5, H6a, H6b, H6c, H6d, H6e), H4 and H6d were rejected. The remaining 8 hypotheses significantly influenced senior police officers of RMP to adopt RMPnet system.

Table 4.12
Summary of research hypotheses

HN	Research hypotheses	Result
H1	There is significant relationship between top management support and RMPnet system adoption among senior police officers of RMP.	Supported
H2	There is significant relationship between perceived usefulness and RMPnet system adoption among senior police officers of RMP.	Supported

H3	There is significant relationship between user support and RMPnet system adoption among senior police officers of RMP.	Supported
H4	There is significant relationship between technology experience and RMPnet system adoption among senior police officers of RMP.	Not Supported
H5	There is significant relationship between perceived knowledge and RMPnet system adoption among senior police officers of RMP.	Supported
H6a	Innovativeness moderates the relationship between top management support and RMPnet system adoption among senior police officers of RMP.	Supported
H6b	Innovativeness moderates the relationship between perceived usefulness and RMPnet system adoption among senior police officers of RMP.	Supported
H6c	Innovativeness moderates the relationship between user support and RMPnet system adoption among senior police officers of RMP.	Supported
H6d	Innovativeness moderates the relationship between technology experience and RMPnet system adoption among senior police officers of RMP.	Not Supported
H6e	Innovativeness moderates the relationship between perceived knowledge and RMPnet system adoption among senior police officers of RMP.	Supported

4.12 ANSWERS TO RESEARCH QUESTIONS

The answers to the three research questions raised in section 1.3 are briefly summarized below. As response to research question 1, based on the descriptive statistic provided in section 4.3, the level of RMPnet adoption among senior police officers of RMP is moderate. Therefore the top management of RMP and project team members must continue to improve and make the services of RMPnet system more user-friendly to attract all levels of end-users to use and adopt the system for daily policing. To answer research question 2, four out of five determinants (top management support, perceived usefulness, user support and system experience) of technology adoption have significant relationship with the RMPnet system adoption and the statistical result is provided in section 4.9. Finally, to answer research

question 3, the statistical result provided in section 4.9 shows innovativeness does moderate the relationship between predictors (top management support, perceived usefulness, user support, and system experience) of technology adoption and RMPnet system adoption.

4.13 SUMMARY

As a summary, the findings of this research were presented in this chapter. The data screening was performed and the data was cleaned with a low level of biasness. The majority of the respondents were from the central region (total 59%). The geographical distribution among them was fairly distributed with main concentration in the central region of peninsular Malaysia. Then, factor analysis was conducted to validate the dimensions. Factors analysed produced different dimensions compared to the previous conceptual framework which lead to restatement of the hypotheses. After descriptive tests waere done, correlation test and regression tests were done to answer the hypotheses questions. Several of the findings under Pearson correlation were as expected and concurrent with previous findings. The multiple regression results showed that the predictive factors of the independent variables contributed to the RMPnet system adoption. The moderating variable did moderate the relationship between the independent variable and the dependent variable of the study. The findings in this study were interesting as it pointed to several relationships between the variables. Further discussion and conclusion in the next chapter would be provided on the elaboration of the research findings and their implications.

CHAPTER 5

DISCUSSION AND CONCLUSION

5.1 INTRODUCTION

This chapter provides the overview of the findings discussed in previous chapter. Firstly, the study would revisit the objectives and purpose of the study in 5.2. Then a section on general discussion of the findings would be covered under Section 5.3. Section 5.4 will be on the recommendations for future studies and Section 5.5 presents the contributions of the study. Section 5.6 provides the limitations of the study and finally section 5.7 presents the suggestion for future research. The conclusion of the study is provided in section 5.8.

5.2 OVERVIEW OF THE STUDY

This research has examined the factors affecting the RMPnet system adoption among senior police officers of Royal Malaysia Police. It also determines the moderating effect of innovativeness towards the relationships of all predictors of the independent variables and the dependent variable; the RMPnet system adoption. This study uses sample of RMP from contingents of Bukit Aman, Selangor, Kuala Lumpur, Central Brigade of General Operations Force, Police Training College Kuala Lumpur, from contingents of Negeri Sembilan, Melaka, Johor and the Police Technical College Bakri. The unit of analysis is individual with senior police officers as respondents to the survey questionnaire. A total of 700 questionnaires were distributed with a required minimum sample of 361 (Krejcie & Morgan, 1970). The questionnaires were distributed through the HRM of the respective formations with general

information about the research between 5th May, 2012 to 4th June 2012.The number of returned questionnaires was 648 making the response rate 92.57%. Anyway, out of the 648 collected responses, only 521 were usable for analysis making a response rate of 74.40%.

5.3 GENERAL DISCUSSION AND FINDINGS

The following section addresses the second research question exploring the factors that determines the RMPnet system adoption. A cross tabulation test was conducted on the descriptive analysis. The data was then analysed with multiple linear regression to test the relationship of uni-dimension variables and hierarchical regression analysis to test the relationship of moderating variables between the independent and the dependent variable of the study. A factor analysis was conducted on each of the dimensions in this study. The resultfor factor analysis with satisfactory loading produced different dimensions for the independent variables adapted from Jeyaraj et al. (2006). Meanwhile, there was no change in dimension for the dependent and moderating variables for this study. In addition, the result of factor analysis required the previous questions on perceived usefulness and behavioral intention to be loaded into one factor with perceived usefulness as the new name. Top management support and user support remained as one dimension and thus, there was also no change in their names. Anyway, RMPnet experience was loaded into two dimensions; one dimension labelled as technology experience and the other dimension as system experience.

The findings of this studycan provide a foundation for technology adoption theory in law enforcement, e.g. RMP in explaining why senior police officers using

RMPnet system in Malaysia would adopt or reject the technology. Moreover, the goodness-of-fit statistical results of the measurement models indicate that the model may explain the senior police officers' behaviour about their adoption of the technology with high probability.

Initially, the data was analysed using descriptive statistics and from the demographic informations suggested that majority of the senior police officers who responded to this research were from the contingent of Selangor (22%). This might be due to the reason that, the RMPnet system had already been in operation in CR (Selangor) since May 2010. Thus, the senior police officers from the contingent of Selangor of Criminal Investigation Department (23%) who were investigations officers perceived the RMPnet system to be usefulness in assisting them in their day-to-day policing as basic communications to exchange operational information. When performing special intelligence gathering duties, RMPnet systems provided the best secured communications for RMP especially for crime prevention and this could be seen from the statistical results where majority of the users were senior police officers from the Criminal Investigation Department who were doing investigation work with 38% responses.

The first objective of this study was to determine the level of RMPnet system adoption among senior police officers of RMP. The statistical result of the descriptive analysis showed that the mean result scores for RMPnet system adoption were moderate with a mean between 3.80 to 4.29 and standard deviation between 1.65 to 1.92.

The second to sixth objectives of this study were to investigate the significant relationship between the five independent variables with the dependent variables. These were achieved through linear regression analysis tests. Significant relationship existed between top management support and RMPnet system adoption, perceived usefulness and RMPnet system adoption, user support and RMPnet system adoption, system experience and RMPnet system adoption.

The first proposed determining variable; top management support had significant relationship with RMPnet system adoption. This study revealed the necessity of top management support for system technology (e.g. RMPnet) and this issue was previously covered in very little detail in existing literature with the exception of Soong, Chan, Chua and Loh (2001). It was evident that the benefits and drawbacks of successful implementation and adoption of technology systems were criticaliy influenced by whether top management supported its adoption. According to Jones (2007), unless organization had the support of top management, the system would not work because inherently organizations like RMP had a tendency to cling on to what they had. At present some of the drawbacks that impede top management support for RMPnet system adoption are, the difficulty involved in finding the right staff and developing the competencies necessary to work with radio communications technology. Other drawbacks include the lack of ownership and lack of support issues. Anyway, RMP personnel who had adopted RMPnet system revealed that top management were supportive of its adoption because of the high cost associated with the project.

Based on the statistical results, it was expected that experience with RMPnet systems might be predictive of RMPnet system adoption. The survey of this study

separated experience with a range of computer-based technologies, so that it might determine which experience was most important. For technology usage, experience with the P25 technology was not important but experience with RMPnet system was important. It could be that the similar method of access to the Network Operation Centre was important in making senior police officers more comfortable with the systems. It was also interesting that the analysis was not able to account for significant variance in technology experience. One explanation for this could be that technology experience was in fact a different measure of the underlying set of skills, since RMPnet system was a necessary basic communications tool for day-to-day policing where technology adoption was mandated.

The second proposed determining variable; perceived usefulness had significant relationship with RMPnet system adoption.Based on the statistical results, it was expected that perceived usefulness with RMPnet system might be predictive of RMPnet system adoption. Furthermore, the senior police officers adoptedthe RMPnet system because they perceived it could assist them to attain desired performance oucome.

The third proposed determining variable; user support had significant relationship with RMPnet system adoption. The result provided insight to the top management, project director and team members of the project team of RMP on the importance of user support. Hence, police organizations should not only focus on project implementation and adoption of the system but must also providecomprehensive user support to the end users. Furthermore, the availability of user support was one of the important determining factors of technology adoption especially at the beginning stage of the technology adoption. With regards to this,

researchers also suggested that projects that were not given access to support and advice were unlikely to achieve their goals (Alexander & McKenzie, 1998; Soong et al., 2001).

The fourth proposed determining variable, technology experience hadno significant relationship with RMPnet system adoption.A similar result was also discovered from the linear regression analysis that showed technology experience did not contribute significantly to RMPnet system adoption. The result provided strong argument for RMP to pay more attention to the RMPnet system adoption by senior police officers in police organization. Hence, police organizations should not be too anxious to adopt any advanced technologies without evaluating their own abilities. Studies by Kartiko, Stewart and Moore (2003) suggested that successful implementation of technology required consideration of inter-related technologies. Furthermore, Madanmohan, Kumar and Kumar (2004) suggested that the type of technology that employees couldutilisewas important to ensure the technology as fully operational and beneficial. Technology should be compatible and suitable with the organizational needs, structure and capabilities as shown in Contractor and Narayanan (1990) and Fernandez-Caamano and Johnson (2005). Hence, it was of great importance that when complex technology is being introduced into an organization, the level of know-how of its employees must be given the highest priority.

The fifth determining variable; system experience had significant relationship with RMPnet system adoption. It was not surprising to find that RMPnet system had the gate keeping attribute for RMPnet system adoption. While most of the senior police officers in this study were able to adopt the system, this helped in allowing

them to do a better adoption of the system. Similarly, experience with the RMPnet system was an advantage for the senior police officers for their daily communications in performing their day-to-day policing. Similar previous studies also showed that experience, being defined as the past use of aninformation system, was an important predictor of information system technology adoption in addition to a person's intention to use the system. Thompson, Higgins and Howell (1994) found that the direct effect of experience on system utilization was statistically and substantially significant while the indirect effect was presented but less profound. A possible explanation for this was that senior police officers were more critical towards RMPnet system adoption as they were aware that the newest developments and possibilities of all aspects of P25 technology and standards were taken care by the project team members to fulfil the highest demands and international standards. Contrary to the research prediction, senior police officers' perceived technology experience was less important as the technological issues and standards were taken care by the project team of the RMPnet system project.

The next five objectives of this study were achieved through the use of hierarchical regression analysis where the test on the moderating effect of innovativeness between all the determinants of the independent variables and the dependent variables was conducted. With the moderator variable, the adjusted R^2 increased slightly from 0.04 to 0.19 for the relationship between top management support and RMPnet adoption. Hence, the moderator strengthened the prediction of the top management support and the RMPnet system adoption. As predicted, innovativeness also moderated the relationship between user support, and system experience with RMPnet system adoption. All in all, as predicted innovativeness

moderated the relationship between all the determinants of independent variables and the RMPnet system adoption as the dependent variable in this study.

In addition, this research also attempted to empirically test conceptual models of best predictors of individual technology adoption adapted from meta-analysis by Jeyaraj et al. (2006). The statistical test results confirmed that the conceptual model could be applied to test system and technology adoption research. Anyway, further tests on the predictor variables must be conducted.

5.4 RECOMMENDATIONS

This study has important ramifications for policy implementation for executives and policy makers of communications technology management practices in RMP. As the main focus was on senior police officers of RMP adopting the technology, caution wasneeded when analysing the study as human beings are complex that it isdifficult to determine all factors at one time when considering their adoption behavior. As the technology spread out within the organization gradually, understanding the usability factors of RMPnet system adoption gives an important advantage to the administrators in the organizations.

The empirical findings of this study offer strategic directions by suggesting a policy or even greater adoption capability that could be achieved by considering the importance of results by top management; administrators, or policy makers whoare responsible for the successful implementation of the RMPnet system project. Administrators must also pay attention to promoting, commenting on or rewarding the users of the systems by improving the user support in handling the various sub-systems. Examples are the mobile and portable systems like mobile and handheld

radios in the work environment. In RMP, usage and adoption can be achieved by giving extra credit or recognition to all levels of users. The research findings also imply that policy makers and adminitrators should be clear about the purpose of the RMPnet system and its usefulness. It is important to develop implementation strategies that show how useful the systems are. If adequate explanation and emphasis are provided to the end-users on how the RMPnet system can increase performance and the ease of use, this study asserts that they are more likely to adopt this new RMPnet system at any time. Thus, top management and project team members must be keen on obtaining feedback from the adopting users regarding the perceived usefulness of the system, and respond to all the adaptations requirements needed to increase performance. In addition, to increase adoption, all levels, from top management to otherl levesl of police officers of RMP must be encouraged to use the RMPnet system as the basic communications means in performing day-to-day policing. This situation can also be achieved by increasing the social networking within the organization.

Since the allocation of system hardware and software, increases the adoption byend-users, the project director and team members must be careful about deploying the system. Senior police officers who readily adopt communications technology systems might optimize the resources which are deployed to assist policing. Thus, having recognized these factors found in this study, it is assumed that the project director and team members can create an environment which fosters communications technology adoption by senior police officers.

Since increasing senior police officers' perception of usefulness will increase their intention to use RMPnet system, project director and team members should

intensify promotion of the advantages of using the system. The project team should assume a proactive role in communicating the benefits of RMPnet system services to all levels of police officers in RMP. An understanding of these advantages will increase awareness and hence increase senior police officers usage of the RMPnet system services.

In order to achieve greater adoption of RMPnet services it is recommended that RMPnet system project director and team members rearrange their priorities regarding which factors to focus on. RMPnet project director and team members must also focus on identifying which services areuseful for police organizations and focus on delivering them rather than focusing on providing innovative interim solutions to low priority services. Consequently, all levels of users within police organization will start using the RMPnet system.

5.5 CONTRIBUTIONS

The contribution of this research can be divided into two, which isthe theory and managerial contribution. The following subsections shall discuss this in detail.

5.5.1 Contributions to Theory

Integrates various Models and Theories

The first contribution of this research towards theory is that it integrates various models and theories so as to increase the knowledge of RMPnet system adoption from the police organization perspective. This research tests a conceptual model that integrates factors from different technology adoption models and theories to study RMPnet system adoption from the perspective of police organization.

Validation the Conceptual Model

The second contribution was to empirically determinethe appropriateness of various factors and validate the conceptual model in the context of RMPnet system adoption. This study empirically validates and confirms the conceptual model suggested by Jeyaraj et al. (2006) in his meta-analysis.

Development and Validation of a Survey Instrument

The third theoretical contribution is the development and validation of a survey instrument. In a situation where theory is advanced but previous instrumentation is not available and validated, it is important to create and validate new measures. Such efforts are understated as a contribution to scientific practice ininformation system technology. As Straub et al. (2004) recommended researchers who are able to engage in the extra effort to create and validate instrumentation to establish theoretical factors, are testing the robustness of the factors and theoretical links to method/measurement changes. This practice, thus, represents a major contribution to scientific practice in the field (Straub et al., 2004).

Moore and Benbasat (1991), and Davis (1989) provide examples of such work on the instrument development and validations, which the authors consider as a major contribution towards the information system technology field. Although the factors use d in this research have been adapted from established theories and models such as TPB, DTPB, TAMs, and the diffusion of innovations, prior instrumentation to research RMPnet system adoption and diffusion was not developed and validated as new research instruments for factors included in the conceptual model.

Since this research meets all the above criteria (Straub et al 2004), it makes a significant contribution towards the research methodology. This is achieved by modifying, creating and validating measures that represent various factors included in the conceptual model. The research instruments developed and validated in this research can be used to examine various emerging standards within the context of system technology adoption.

5.5.2 Managerial Contributions

As discussed before RMPnet system may face various key challenges. First there are senior police officers who cannot comprehend the complexity of RMPnet system. Therefore, the project team members must consider providing alternative modes of training so as to reduce the complexity issues and make the system more user friendly, which is currently being emphasized. Second, some of the senior police officers with higher ranks are reluctant to use the RMPnet system due to an inability to operate and utilise various features provided for them in the system; hence, the challenge to the project team is to integrate and simplify system usage and make it easy to operate and access for all levels of users in RMP.

The implications of the research findings for management are important: personality influences technology adoption. Thus, top management or project director must be aware of this relationship when initiating system technology. Simply providing employees with system technology plus standard training sessions may not be sufficient to gain full benefit from the project investment.

Top management and project director can adopt his or her strategy on how to stimulate use of the information technology system by employees, based on their personalities.

Top Management Support and project director must be well-advised to be aware of the technology readiness of his or her employees and adjust the training schedule and management activities to optimise information technology system usage: e.g., a highly innovative person can be asked to be the champion for the new technology or a person with a high level of insecuritycan be directed to utilise it using the security mode of the system to safeguard the organization from security leaks. The researcher strongly believes that each personality type can have positive as well as negative effects on the use and adoption of the information technology system in an organization. It is the task of the project director to use differences between people to the advantage of the organizations; putting the right people in the right place.

5.6 LIMITATIONS OF THE STUDY

The research has several limitations that must be noted and addressed in any future research. First, in terms of generalizability of the participants of this study are senior police officers of RMP, so the results of this study may not be generalized to other police officers of different ranks because of the fact that specific adoption predictors may change with different user groups.

Secondly, the impact of changes in perception, with regard to the adoption of new technology, has not been investigated in this research over any significant period of time. However, it has been demonstrated in some of the prior studies, such as

Venkatesh and Davis (2000) that these factors have an influence on the adoption of technology and may have different predictive power, over time. For example, the effects on adoption with top management support may well subside over time with increased experience. It is therefore recommended that further research be undertaken to examine whether, with increasing experience over time, there is any reduction in the strength of the factors influencing technology adoption compared to the initial stage of adoption.

Third, the findings of this study are based on a single study by testing a specific technology, the RMPnet system using P25 technology. Longitudinal studies may give different perspectives or outcomes from that presented in this study (Venkatesh & Davis, 2000). In addition, the adoption perceptions of the senior police officers may have a different effect before and after the project implementation.

Fourth, the constructs and survey items administered in this study are mostly drawn from previous research written in English. Although the translated and rephrased survey items are reviewed by several researchers who arefluent in both English and Bahasa Melayu, there is always the possibility of the slight loss of meaning in the translation, though reliability and validity tests were re-conducted.

5.7 SUGGESTIONS FOR FUTURE RESEARCH

While the results confirm and fit the research framework, further research is needed to confirm either this model or create another model which may be more fit for the given data. Although explaining a great deal of the variance in factors depicted in the study, the scope of this study can be expanded to gain a more complete picture of the RMPnet system adoption by police officers in future research.

This research intends to examine whether the obtained findings are specific to senior police officers,and whether the results willbe the same across specific countries with regards to RMPnet system adoption and usage in the future. This will require a cross-sectional approach when investigating RMPnet system adoption. The questionnaire findings wouldhave been strengthened if it is supplemented withinterviews. The findings would also been reinforced if the research had been a longitudinal one. The data for this research has been collected over a short period of time and provides a snapshot. However, it can be expanded over a longer period of time to offer longitudinal research.

Future research can redesign the model by treating the independent dimensions as moderators of the relationship of innovativess with technology adoption. By making the independent variables as moderators, one can better understand the level or extent of influence that the predictors of respective technology adoption have on the adoption of a given technology. It is hoped that this understanding will assist in developing designs and interventions in reaching different groups of potential adopters in future research.

Lastly, future research should investigate this potential development using a more longitudinal approach, since the research result has shown that perceived usefulness is important in shaping people's attitude towards the RMPnet system, which is an antecedent to the extent of adoption. A longitudinal study to determine whether factors influencing adoption of the RMPnet change over time (Venkatesh & Davis, 2000) can be considered in order to fully validate the findings.

This research presents a conceptual model based on meta-analysis tested on senior police officers using RMPnet system, in accordance with the confirmatory

perspective. Although statistical results of this study show a good fit for this model, there is always the possibility that other factors may affect the technology adoption by senior police officers. In future research, researchers may also want to consider other possible psychosocial or contextual variables that may affect RMPnet system or other systems in communications technology adoption.

5.8 CONCLUSION

This study has provided a theoretical perspective for successful RMPnet system design and implementation and contributes towards determining the problems before the systemcanbe fully implemented. Design and usage of advanced technology systems can improve the quality of policing from various perspectives, especially, crime fighting and crime prevention. The core elements of policing can be enhanced by optimum adoption of technology in today's world. To fully utilize these anticipated technological benefits, it is obvious that police organizations must consider end-users ability to adopt technology. However, the relevant literature and theories indicate that various dynamics in technology adoption depend on end-users and task characteristics including the structure of their environments. In this context, organizational and the basic structure of technology adoption play important roles in the adoption of specific technology.

Thus this study has produced insight into factors that affect the technology adoption by senior police officers by presenting a conceptual model inspired by Jeyaraj et al. (2006). Overall, the results indicate that the model fits the data drawn from RMP senior police officers using RMPnet system. In doing so, it is assumed

that this study helps to fill the gap of empirical and theoretical knowledge about communications technology in RMP since there is lack research in this area.

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Pengarah Jabatan Logistik
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Melalui: Ketua Penolong Pengarah Jabatan Logistik (Komunikasi)

(DATUK MASHURI BIN ZAINAL) CP
PENGARAH JABATAN LOGISTIK
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DATO' DR. CHAI KHIN CHUNG) SAC
Ketua Penolong Pengarah
Jabatan Logistik (Komunikasi)
Polis Diraja Malaysia
Bukit Aman

MOHON KEBENARAN UNTUK MELAKSANAKAN KAJI SELIDIK PROGRAM *DOCTOR OF BUSINESS ADMINISTRATION* (DBA) UNIVERSITI UTARA MALAYSIA KAMPUS KUALA LUMPUR

Saya, G/12037 Saadiah bt Kadir, bertugas di Bahagian Komunikasi, Ibu Pejabat Polis Bukit Aman sebagai DSP Pengoperasian dan Keperluan Pengguna sedang melanjutkan pengajian *Doctor of Business Administration* (DBA) di Universiti Utara Malaysia, Kuala Lumpur secara separuh masa. Saya telahpun menamatkan semua kerja kursus (surat pengesahan dari Pengarah UUM Kuala Lumpur bertarikh 11 Februari 2010 dilampirkan).

2. Untuk memenuhi syarat pengijazahan, saya dikehendaki melaksanakan satu penyelidikan. Bagi meksud ini, saya bercadang untuk menjalankan kaji selidik mengenai *User Technology Acceptance of Complex Communications System, the case of APCO Project 25* di Bahagian Komunikasi, Jabatan Logistik Polis DiRaja Malaysia.

3. Semua maklumat yang diperolehi dari hasil kaji selidik ini adalah sulit dan dijangka akan disiapkan dalam tempoh setahun dari sekarang. Kaji selidik ini adalah untuk tujuan akademik.

Kebenaran YDH Dato' amat dihargai dan didahului dengan ucapan terima kasih.

Sekian,

Saya yang menurut perintah

(SAADIAH BT KADIR) P/DSP
DSP Pengoperasian dan Keperluan Pengguna RMPnet
Bukit Aman

Appendix B

Questionnaire

Survey on the determinants of RMPnet system adoption among senior police officers of Royal Malaysia Police.

Dear Sir/Madam,

My name is Saadiah binti Kadir. I am currently a doctoral candidate in the College of Business, Universiti Utara Malaysia. As part of the doctoral research, I am conducting a survey among the senior police officers of Royal Malaysia Police from the central and southern zone of peninsular Malaysia. The main purpose of this study is to determine the system technology adoption among senior police officers of Royal Malaysia Police. This knowledge may assist in the generation of ideas on how the adoption level of the RMPnet system in RMP can be enhanced.

I would greatly appreciate your participation in this research by completing the enclosed questionnaire. It should require only about 10 to 15 minutes of your time, and your input is most critical to the success of this research. I respect your anonymity and assure you that all information will be held in the strictest confidence. Kindly complete the Questionnaire and return it to your respective formation HRM officers.

Thank you in advance for your participation.

Yours sincerely,

Saadiah binti Kadir
Othman Yeop Abdullah Graduate School of Business
College of Business
Universiti Utara Malaysia.

Email: saadiah@rmp.gov.my

QUESTIONNAIRES
(SOAL SELIDIK)

INSTRUCTION: -
The questionnaire consists of 8 parts in 7 pages. Please complete the questionnaire by marking your chosen answer with an 'X' as you can see in the given example.

ARAHAN: -
Soal selidik ini mengandungi 8 bahagian dalam 8 muka surat. Sila jawab kesemua soalan yang dikemukakan dengan menandakan 'X' pada jawapan anda mengikut contoh yang diberikan.

Example/*Contoh*: -

Items *Perkara*	Strongly Agree *Sangat Bersetuju*						Strongly Disagree *Sangat tidak bersetuju*
	1	2	3	4	5	6	7
1. This telephone makes my work easier. *(Telefon ini memudahkan kerja saya).*							X

SECTION A: ABOUT YOURSELF

1. Your age (years) [*Umur anda (tahun)*]
- ❑ 20 – 29
- ❑ 30 – 39
- ❑ 40 – 49
- ❑ 50 – 59
- ❑ 60 and above (60*dan lebih*)

2. Your gender [*Jantina anda*]
- ❑ Male (*Lelaki*)
- ❑ Female (*Perempuan*)

3. Your qualification [*Kelulusan anda*]
- ❑ Sekolah Rendah [Primary education]
- ❑ Secondary edu. [Sekolah Menengah]
- ❑ Diploma
- ❑ Degree [*Ijazah*]
- ❑ Master [*Sarjana*]
- ❑ Doctorate
- ❑ Other qualification – (specify): .....
  [*Kelulusan lain*– (*nyatakan*)] : .....

4. Length of Service with RMP (years)
[*Tempoh berkhidmat dengan PDRM* (*tahun*)]
- ❑ less than 1 year [*Kurang 1 tahun*]
- ❑ 1 – 9
- ❑ 10 – 19
- ❑ 20 – 29
- ❑ 30 and above [*30 dan lebih*]

5. Your department
[*Jabatan tempat anda bertugas*]
- ❑ Jabatan Pengurusan
- ❑ Jabatan KDN/KA
- ❑ Jabatan Logistik
- ❑ Jabatan Siasatan Jenayah
- ❑ Cawangan Khas
- ❑ Jabatan Siasatan Jenayah Narkotik
- ❑ Jabatan Siasatan Jenayah Komersil
- ❑ Jabatan Counter Terrorism

6. Please state your current formation.
[*Sila nyatakan formasi tempat anda bertugas sekarang*]
- ❑ Bukit Aman
- ❑ Kuala Lumpur
- ❑ Selangor
- ❑ Briged Tengah Pasukan Gerakan Am
- ❑ Negeri Sembilan
- ❑ Melaka
- ❑ Johor
- ❑ Maktab/Latihan

7. Please specify your current work.
[*Sila nyatakan tugas yang anda laksanakan sekarang*]

- ❑ Administration
- ❑ Operation
- ❑ Special Task
- ❑ Technical
- ❑ Investigation

SECTION B: RMPnet SYSTEM ADOPTION

Items *Perkara*	Strongly Agree *Sangat bersetuju*						Strongly Disagree *Sangat tidak bersetuju*
	1	2	3	4	5	6	7
1. I am not interested in the *APCO P25 technology.*Saya tidak berminat dengan teknologi *APCO P25.*							
2. I am not interested to use **RMPnet system in my daily work. *Saya tidak berminat menggunakan sistem **RMPnet dalam kerja harian saya.*							
3. I have no need for APCO P25 technology. *Saya tidak ada keperluan terhadap teknologi APCO P25.*							
4. I have no need for the RMPnet system. *Saya tidak ada keperluan terhadap sistem RMPnet.*							
5. I can protect my identity without the RMPnet system. *Saya boleh mengekalkan indentiti saya tanpa menggunakan sistem RMPnet.*							
6. I would use APCO P25 technology for my day-to-day work. *Saya akan menggunakan teknologi APCO P25 untuk kerja harian saya*.							
7. I would use the RMPnet system for my day-to-day work. *Saya akan menggunakan sistem RMPnet untuk kerja harian saya*.							

*APCO P25 is a suite of digital protocols and standard design for use in land-mobile wireless two-way communications system.
**APCO P25 merupakan protokol digit dan rekabentuk piawai bagi kegunaan sistem komunikasi tanpa wayar dua hala untuk kegunaan tetap dan mobil.*
**RMPnet System is Royal Malaysia Police nationwide land-mobile wireless two-way communications system using APCO P25 technology.
***Sistem RMPnet merupakan sistem komunikasi dua hala Polis Diraja Malaysia yang menggunakan teknologi APCO P25.*

SECTION C: INNOVATIVENESS

Items *Perkara*	Strongly Agree *Sangat bersetuju*						Strongly Disagree *Sangat tidak bersetuju*
	1	2	3	4	5	6	7
1. If I heard about a new technology, I would look for ways to experiment with it. *Jika saya mendengar tentang teknologi baru, saya akan mencari jalan untuk mengujinya.*							
2. Among my peers, I am usually the first to try out new technologies. *Di kalangan rakan sekerja, kelazimannya saya merupakan yang pertama mencuba penggunaan teknologi baru.*							
3. In general, I am hesitant to try new technologies. *Secara umum, saya ragu-ragu untuk mencuba teknologi baru*.							
4. I like to experiment with new technologies. *Saya suka mengujiguna teknologi baru*.							

SECTION D: TOP MANAGEMENT SUPPORT

Items *Perkara*	Strongly Agree *Sangat bersetuju*						Strongly Disagree *Sangat tidak bersetuju*
	1	2	3	4	5	6	7
1. Our top management provides strong and involved leadership when it comes to information systems in RMP. *Pengurusan tertinggi kami menyediakan ketua yang ampuh dan melibatkan diri dengan sistem maklumat dalam PDRM.*							
2. Our top management supports the implementation of APCO P25 technology. *Pengurusan tertinggi kami menyokong pelaksanaan teknologi APCO P25.*							
3. Our top management has a desire to portray RMP as a leader in the use of APCO P25 technology. *Pengurusan tertinggi kami mempunyai keinginan untuk menunjukkan bahawa PDRM merupakan peneraju penggunaan teknologi APCO P25.*							

4.	Our top management is willing to take the risk (financial and organizational) involved in adopting APCO P25 technology. *Pengurusan tertinggi kami bersedia mengambil/menanggung risiko (kewangan dan organisasi) yang terlibat dalam penerapan teknologi APCO P25.*							
5.	Our top management has established clear goals and clear picture of how APCO P25 technology can help these goals. *Pengurusan tertinggi kami telah menetapkan matlamat dan gambaran yang jelas tentang bagaimana teknologi P25 boleh membantu matlamat ini.*							

SECTION E: RMPnet SYSTEM EXPERIENCE

Items *Perkara*		Strongly Agree *Sangat bersetuju*						Strongly Disagree *Sangat tidak bersetuju*
		1	2	3	4	5	6	7
1.	I've been using APCO P25 technology for many months. *Saya telah menggunakan teknologi APCO P25 dalam beberapa bulan.*							
2.	I've been using RMPnet system for many months. *Saya telah menggunakan sistem RMPnet dalam beberapa bulan*.							
3.	I've been using the RMPnet system features in my work for many months. *Saya telah menggunakan feature sistem RMPnet dalam kerja saya dalam beberapa bulan*.							
4.	I have great deal of experience using the RMPnet system. *Saya mempunyai pengalaman yang luas menggunakan sistem RMPnet.*							
5.	I have great deal of experience using the APCO P25 technology. *Saya mempunyai pengalaman luas menggunakan teknologi APCO P25.*							
6.	I have great deal of experience using RMPnet system features. *Saya mempunyai pengalaman yang luas menggunakan fitur sistem RMPnet.*							

SECTION F: PERCEIVED USEFULNESS

Items *Perkara*	Strongly Agree *Sangat bersetuju*						Strongly Disagree *Sangat tidak bersetuju*
	1	2	3	4	5	6	7
1. The RMPnet system makes my day-to-day work simpler. *Sistem RMPnet memudahkan kerja-kerja harian saya.*							
2. The RMPnet system makes my current work processes safer. *Sistem RMPnet menjadikan proses kerja saya sekarang lebih selamat*.							
3. The RMPnet system is helpful in my day-to-day work. *Sistem RMPnet membantu kerja-kerja harian saya*.							
4. RMPnet applications are superior in terms of service performance compared to GSM ones. *Aplikasi RMPnet lebih baik dari segi perkhidmatan berbanding perkhidmatan GSM.*							
5. Using various RMPnet services (private call, group call, Direct mode) is valuable to me. *Menggunakan pelbagai kemudahan RMPnet (private call, group call, Direct Mode) sangat berguna kepada saya.*							
6. In my working area the radio coverage is satisfactory. *Di kawasan tempat tugas saya litupan radio adalah memuaskan*.							
7. Even in exceptional situations like power breakdown, RMPnet is a reliable system. *Walaupun dalam keadaan sukar contohnya terputus bekalan kuasa, RMPnet adalah sistem yang boleh diharap.*							
8. RMPnet terminals* provide a good speech quality. *Kualiti suara terminal* RMPnet adalah baik.*							
* A terminal may be a handheld, mobile or dispatcher that are you used in the RMPnet system. * *Terminal sama ada portable radio, dash/remote mount atau dispatcher yang digunakan dalam sistem RMPnet.*							

SECTION G: BEHAVIORAL INTENTION

Perkara *Items*	Strongly Agree *Sangat bersetuju*						Strongly Disagree *Sangat tidak bersetuju*
	1	2	3	4	5	6	7
1. Due to the required operational procedures I intend to use the RMPnet system more frequently. *Disebabkan peraturan pengoperasian yang ditetapkan saya bercadang untuk menggunakan sistem RMPnet lebih kerap.*							
2. Due to the required operational procedures I intend to increase my use of voice (phone interconnect calls) and data transmission (i.e. Text Messaging System (TMS)) in as many cases as possible. *Disebabkan peraturan pengoperasian saya bercadang meningkatkan penggunaan suara (panggilan telefon 'interconnect') dan penghantaran data (iaitu Sistem Pesanan Text (TMS) dalam sebanyak mungkin kes.*							

SECTION H: USER SUPPORT*

Items *Perkara*	Strongly Agree *Sangat bersetuju*						Strongly Disagree *Sangat tidak bersetuju*
	1	2	3	4	5	6	7
1. Relative to other ICT projects, the degree of my commitment to support RMPnet project is very strong. *Berbanding projek ICT yang lain, tahap komitmen saya untuk menyokong projek RMPnet adalah sangat kuat*.							
2. If I want, I can easily support RMPnet project. *Jika saya nak, saya boleh dengan mudah menyokong projek RMPnet*.							
3. All things considered, supporting the RMPnet project would be easy. *Semua perkara diambilkira, menyokong projek RMPnet adalah mudah*.							
4. People who have influence over me think that I should support the RMPnet project *Orang-orang yang boleh mempengaruhi saya memikirkan yang saya sepatutnya menyokong projek RMPnet.*							

5. Compared to other ICT projects, my desire to suport the RMPnet project is very strong. *Dibandingkan dengan projek ICT yang lain, keinginan saya menyokong projek RMPnet adalah tinggi.*							
6. Supporting the RMPnet project is entirely within my control. *Menyokong projek RMPnet adalah dalam kawalan saya sepenuhnya.*							
7. Most people who are important to me would approve of me supporting the proposed project. *Kebanyakan orang yang penting bagi saya akan membenarkan saya menyokong projek yang dicadangkan.*							
8. Supporting the RMPnet project is one of my top priorities.. *Menyokong projek RMPnet adalah salah satu daripada keutamaan saya.*							
9. It is likely that I will aggressively support the RMPnet project *Ada kemungkinan yang saya akan menyokong projek RMPnet secara agresif.*							
*user support is user readiness and commitment to use the RMPnet system. **merupakan sokongan pengguna terhadap penggunaan sistem RMPnet.*							

☺ Thank you for your time and co-operation ☺