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PERCEPTION ON ENTERPRISE RISK MANAGEMENT IMPLEMENTATION IN PUBLIC WORK DEPARTMENT

NURFITRI BINTI SENIN

A capstone project report submitted in partial fulfilment of the
requirements for the award of the degree of
Master of Project Management

Faculty of Civil Engineering
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JANUARY 2014

I declare that this project capstone report entitled *"Perception on Enterprise Risk Management Implementation in Public Work Department"* is the result of my own research except as cited in the references. The capstone project report has not been accepted for any degree and has not concurrently submitted in candidature of any other degree.

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To Raif Rusyaidi bin Mohd Redza

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ABSTRACT

Enterprise Risk Management approach has been taken seriously to increase the performance of the organization by identifying and mitigating any potential risks. The public sector also realizes the importance in managing risk through enterprise-wide approach to give a quality service delivery and improve governance. This paper examines managers' perception on ERM implementation in Public Work Department. The objectives of the study are to assess the perception on how ERM should be implemented in PWD and to identify the key success factors and challenges to implement ERM in PWD. Then, steps to implement ERM in PWD will be suggested to ensure it can be successfully implemented. The study has been conducted through survey and interview. The respondents of the study were officers who worked in the headquarters and districts offices. The results show that the respondents were totally agree and strongly agree that PWD should implement ERM by developing clear definition and objectives of ERM, integrating ERM with the department strategic framework, establishing types of risk which may affect its performance and reputation and establishing an open communication channel to facilitate top-down and bottom-up communication. The analysis also indicates that the top management support will be the key success factors to implement ERM. Nevertheless, lack of expertise in ERM would be the main challenge to implement ERM in PWD.

ABSTRAK

Pengurusan Risiko Peringkat Organisasi atau *Enterprise Risk Management* (ERM) merupakan satu pendekatan pengurusan risiko yang semakin banyak dilaksanakan secara serius bagi meningkatkan prestasi organisasi dengan mengenal pasti risiko dan mengurangkan kesan risiko tersebut. Sektor awam juga menyedari kepentingan pengurusan risiko melalui pendekatan secara menyeluruh untuk meningkatkan penyampaian perkhidmatan yang berkualiti dan memperbaiki tadbir urus. Kajian ini dilaksanakan bertujuan untuk mengkaji persepsi untuk melaksanakan ERM di Jabatan Kerja Raya. Objektif kajian ini adalah untuk mengkaji persepsi bagaimana pelaksanaan ERM di dalam JKR dan untuk mengenal pasti faktor-faktor kejayaan dan cabaran untuk melaksanakan ERM di JKR. Daripada persepsi tersebut satu garis panduan untuk melaksanakan ERM di JKR akan dicadangkan bagi memastikan ia dapat dilaksanakan dengan jayanya. Kajian ini dijalankan melalui edaran kaji selidik dan temubual. Responden kajian ini terdiri daripada pegawai-pegawai yang bekerja di JKR ibu pejabat dan JKR daerah. Hasil daripada kajian ini mendapati berdasarkan persepsi daripada responden JKR perlu melaksanakan ERM dengan membangunkan definisi dan objektif ERM yang jelas, mengintegrasikan ERM dengan rangka strategic jabatan, membangunkan jenis risiko yang boleh menjejaskan prestasi dan reputasi jabatan serta mewujudkan saluran komunikasi terbuka. Analisis juga menunjukkan bahawa sokongan pengurusan atasan akan menjadi faktor kejayaan utama untuk melaksanakan ERM. Walau bagaimanapun, kekurangan kepakaran dalam ERM akan menjadi cabaran utama untuk melaksanakan ERM di JKR.

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LIST OF ABBREVIATIONS

PWD	Public Work Department
ERM	Enterprise Risk Management
PROKOM	Project Complex Management Branch
MAMPU	Malaysia Administrative Modernization and Management Planning Unit
AS/ZN 4360	Australia/New Zealand Standard 4360-Risk Management
COSO	Committee of Sponsoring Organizations of the Treadway Commission
SSR	System Star Rating
KPI	Key Performance Index
CRO	Chief Risk Officer

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CHAPTER 1

INTRODUCTION

1.1 Background of Study

Risk is an inevitable event especially in organization. It is important to manage the risk occurrence as early as possible to ensure it is manageable and will not pose any negative impacts to the organization. There are various definitions of risk which are acceptably used within the organization and industries. The most common concept of risk was defined as the uncertainty of outcomes (Treasury Board of Canada Secretariat, 2001). Previously, risk was acknowledged as a threat. Thus, risk management becomes a separate function and is managed independently within silo (Beasley & Frigo, 2007).

Enterprise risk management (ERM) is the evolution of risk management. The popularity of ERM is increasing due to understanding of potential risks will help the organization to oversee the occurrence and control the probability of any uncertainties that may affect the service delivery. ERM integrates the potential risk across the entire activities in the organization and treats it holistically. ERM is looking at the risk exposure which is direct or indirectly affecting the organization by identifying the risk appetite.

1.1.1 Overview of ERM in Malaysian Government Organization

For non-financial entities such as the public sector, ERM promotes an important role especially in delivering the best quality services to the public and helping the Government to achieve its governance responsibilities. The Government organization will look at programs that give benefits to the public. Therefore, managing the public's risk is vital by spread, shift and reduce the public risk according to the organization's mission statement which has been defined earlier (Hardy, 2010).

In 2009, the Malaysia Prime Minister, in his direction under the movement to enhance the integrity of Malaysian government administration had declared "*all ministries, departments and agencies must practice risk management techniques before implementing a high risk project or program to minimize risks during its implementation*". Therefore, under 10th Malaysian Plan, the Government has introduced two major programs for National Transformation Agenda: Government Transformation Program (GTP) and Economic Transformation Program (ETP). The two programs have developed five major outcomes under the National Core Mission. One of the outcomes which convey the importance of treating risk diligently is Core 5: To strengthen the institutional and implementation (MAMPU, 2013).

The Malaysia Administrative Modernization and Management Planning Unit (MAMPU) is responsible for introducing ERM in Ministries, Departments and Central Agencies. In the early stage, MAMPU had developed a standard ERM reporting structure that can be used for all the agencies during the System Star Rating (SSR) evaluation. MAMPU was responsible as facilitators and conducted several meetings and lab together with the selected agencies to share and provide guidance. The lab was conducted in order to prepare a report of assessment and risk control strategies for the agencies. The report preparation involves three elements: input that need to be prepared to identify the department risk, the process that need to be done and the output expected from the report prepared. Then, the report will be evaluated as one of the main criteria in the star rating. (PWD, 2013).

1.1.2 ERM in Public Work Department

PWD is aware of the importance of risk management implementation especially in projects that contribute a huge interest and impact especially to the public and Government. In year 2006, the department through Complex Project Management Branch or PROKOM has developed Project Managed Change Program to institute the best practices of project management where risk management is one of the key functions that was highlighted in Project Management Body of Knowledge (PMBOK).

As one of the biggest technical agencies in Malaysia, Public Work Department (PWD) had taken the challenge to implement ERM in order to manage the possible risks that may occur within the department's strategic framework. The integration of ERM with the department's business processes is hoped to create an impact especially to the department's performance in giving services to the publics. PWD began adopting ERM in January 2012 after the star rating system criteria (SSR) for Ministries and Agencies made an improvement to add ERM as one of its main criteria.

Then, PWD together with MAMPU organized a risk management Lab to publish a report regarding assessing control risk management strategy for PWD. In December 2012, the Risk Management Unit presented the proposal to implement ERM governance to the top management steering committee where the proposal was well received by the department's top management. (PWD, 2012). In order to develop awareness and understanding of ERM implementation in the department, PWD has developed an ERM definition within the department's context as:

> "*the creation of a control system which is responsible to manage the risks that may affect the achievement of the Department towards world-class services and centers of excellence in project management, asset management and engineering services in the development of the national infrastructure*".
>
> (PWD, 2012)

The current PWD's ERM framework was developed by adopting the standard model of Australia/New Zealand Standard 4360-Risk Management (AS/ZN 4360). There are other models that can be chosen such as Committee of Sponsoring Organizations of the Treadway Commission (COSO) or ISO31000-2009. Nevertheless, the standard was chosen because it is considered appropriate to the organizational structure and operation of the PWD. The framework comprises of seven processes as shown in Figure 1.1.

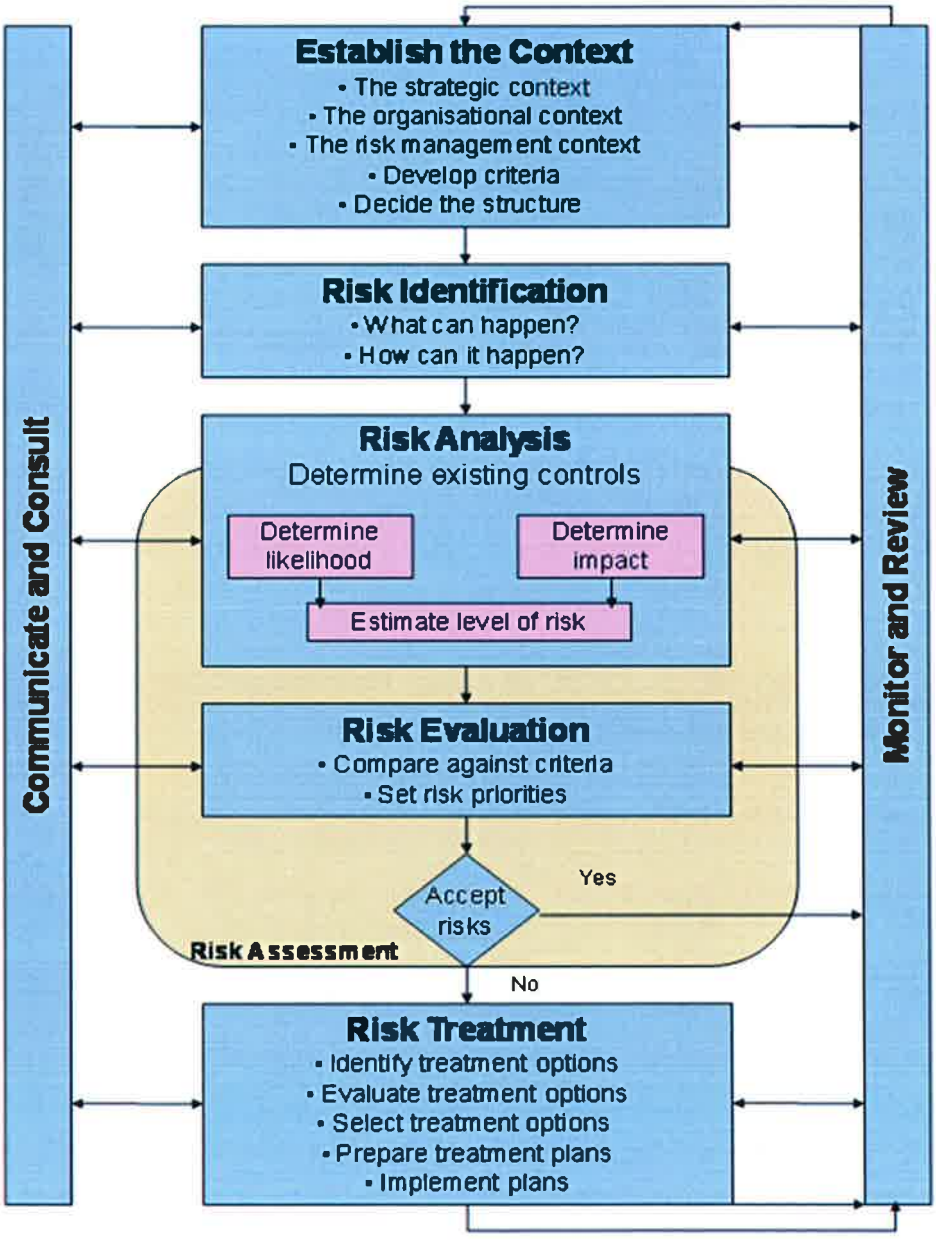

Figure 1.1: PWD's risk management framework

PWD had given the description for each process. The description of the processes was described in Table 1.1 as follows:

Table 1.1: PWD's Risk Process and Description

Risk Process	Description
Communication and Consultation	Involve dialogues and open communication between the stakeholders than a one way flow of communication
Establish the Context	Early procedures to manage risks. The outcome is Project Management Plan (PMP) or sub-plan to be referred under any PWD project plan or day to day operation
Risk Identification	Allows PWD to identify the various risks and categorize the risks according to suitable and controllable structure. The list of risky events will be consolidated and grouped under a suitable classification
Risk Analysis	A process to analyze all events by assessing each against two major parameters. First of all, an assessment takes place of the likelihood that an event might take place. Secondly, the impact of the event would be evaluated in numeric, financial value and time period terms. The analyst would then compute the Risk Exposure by multiplying the probability by the impact. The result of this process is the Risk Register (a list of risky events sorted by descending exposure), which gives the project manager the chance to address the most serious events first.

Table 1.1: PWD's Risk Process and Description (cont'd)

Risk Process	Description
Risk Evaluation	Part of project planning and covers the ways and means of responding to each risky event. Different types of responses are considered. One type would be to do the necessary to avoid such events happening altogether. Another would consider ways to reduce the probability of their occurrence.
Risk Treatment	Identification, evaluation and selection of the appropriate treatment options and the development and implementation of the required plans.
Risk Monitoring/Control	Presents the procedures needed to monitor and track risky events, revising the Risk Register and learning from the various results.

1.2 Problem Statement

Over the years, the glory days of PWD seems to have been tarnished. The good image and capabilities of PWD as technical advisor for the government's projects has been diminished. The negative perception has escalated due to the poor services to the clients: inadequate technical expertise, poor project delivery and asset management. Issues such as poor construction quality, extension of time, over budgeting and misleading in contract management has contributed to the low perception towards PWD's expertise.

Since 2005 PWD has only looked at risk in managing projects with a cost of above RM 50 million should impose risk management. Despite the current circumstances, PWD has taken the initiative to manage the risk enterprise wide to signify any risks that may jeopardize the department's performance in delivering

quality services. ERM will assist PWD to manage risks at the early stage by foreseeing any uncertainties and equip the department to develop actions to treat the risk. Thus, it will strengthen the ability of the department to decrease any incompliance and at the same time increase its value.

However, the ERM concept in Malaysia is still in progress and has not received much attention especially in the government organization (Yazid *et. al*, 2012). In PWD, the intention to implement ERM only started in 2012. PWD is still considering the best possible way to implement the ERM practice. Therefore, it is important to assess the perception among the officers in PWD on ERM to ensure the initiative can be accepted and implemented successfully. This study will be looking into the perception on how ERM should be implemented in PWD according to ERM attributes. Then, the study will identify the success factors and challenges to implement ERM in PWD which will support to the success or failure of ERM implementation. From the perception received, a guideline to implement ERM can be proposed to assist PWD in implementing ERM.

1.3 The Aim and Objectives

The aim and objectives of the study are as follows:

1. To assess the perception on how ERM should be implemented in PWD.
2. To identify the key success factors and challenges to implement ERM in PWD.
3. To develop a guideline for PWD in implementing ERM

1.4 Scope of Study

The scope of this study is to identify the perception on how ERM should be implemented in PWD, to identify the key success factors and the challenges of the implementation and to develop a guideline to implement ERM. This study will be

conducted through interview and questionnaire. The questionnaire will be assessing the perception among the officers in PWD on how ERM should be implemented in the department based on ERM attributes. The questionnaire also will identify the key success factors and the challenges to implement ERM in PWD. The questions will give an overview of factors which can contribute to the success or failure of ERM program in PWD. Then, interviews will be conducted among officers who had the awareness on ERM to seek on their perception on how ERM should be implemented in PWD among the success factors and the challenges.

The respondents of the study are officers in PWD which consist of officers working at the headquarters and districts. It is expected that among the respondents some may had heard about ERM and know it is a tool to manage risk enterprise wide; which are selected because their perceptions are more reliable. The results of the analysis will also provide reinforcement of information on the key success factors and the challenges to implement ERM in PWD which will help to develop guideline to implement and promoting ERM among the officers especially in PWD.

1.5 Organization of Chapters

This study report will consists of five (5) chapters. The first chapter is an introduction to the study on ERM. This chapter indicates a brief overview of ERM implementation in Malaysia's public sector especially in PWD. Chapter one will be focusing on the problem statement of the study, the aim and objectives of the study which is to assess the perception on how ERM should be implemented in PWD, the success factors and the challenges to implement ERM and to develop a guideline to implement ERM in PWD.

The second chapter includes vast of literature review on ERM which discussing on ERM concept and its implementation especially in financial based and non-financial based organization. The literature review also discusses some of the distinguished ERM framework which will be elaborated on within the context

including the advantages of ERM implementation to the organization, how should ERM be implemented in an organization, the key success factors and challenges in ERM implementation especially for the government organization.

The third chapter outlined the methodology conducted to gain the data needed to support this study. For data collection, the study will be conducted using methods such as interviewing, reviewing existing information of ERM within the department and distributing survey questions to the target respondents. Therefore, the data collected consists of two types of data which are primary data and secondary data. The main finding will be obtained from the statistical analysis that will be conducted for each objective. Then post-survey interviews were conducted to verify the results obtained from the statistical analysis.

Further in chapter four, the data gathered will be analyzed and discussed in detail. The data collected will be analyzed using software which includes determining the reliability and consistency of the questions. The statistical analysis was conducted using the frequency analysis and descriptive analysis to assess the perception, to determine the key success factor and the challenges to implement ERM in PWD. The questionnaire will indicate whether it achieves the aim of the study and assists to the developing of the guideline to implement ERM in PWD.

The final chapter will be discussing about the main findings which have been discovered through the analysis conducted in chapter four. This chapter also highlighted issues such as the limitation in conducting the study which may hinder the objectives and the expected results of the study. From the results, this chapter will be illuminating the suggestions on how ERM should be implementing in PWD and outline the success factor and the challenges to implement ERM. Finally, this chapter will signify its contribution especially towards the department and provide suggestions for area of improvement for future study on ERM in public sector.

1.6 Summary

This chapter discussed the introduction on ERM which related to the background of ERM especially in Malaysian Government Organization such as PWD. This chapter also elaborated the problem statement for conducting the study, the scope of the study and the objectives and aims to be achieved from this study. The next chapter will discuss on the overview on ERM and ERM implementation in Malaysia especially in the public sector. Thus, next chapter will provide a few of distinguished ERM framework, the advantages along with the key success factors and challenges to implement ERM which had been discovered by other researchers.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

This chapter will provide reviews of literatures in the area of ERM itself which include the ERM philosophy, knowledge and component especially for non-financial driven organizations such as public sector. This chapter will also be reviewing the importance of ERM in an organization to ensure the implementation will be successful in the existing system. The literature will expand into the benefits and advantages of ERM implementation in an organization which closely contribute to increase the organization performance, to increase the organization values and others. This chapter also will be examining the perceptions or appropriate steps to implement ERM in an organization especially in public sector. Lastly the literature will be looking into the key success factors and challenges to implement ERM in an organization especially in public sector.

2.2 Overview on Enterprise Risk Management

Risk is an occasion where it draws uncertainties or possibilities that something will hinder the achievement or goal of specific objectives either directly or indirectly. Risk can arise from the risk factors condition which contributes to the cause of the risk. It is important in managing risk, the risk properties should properly manage and controlled. Therefore, risk management is inevitable in today

challenging global environment. It is a dynamic tool which describes the management activities that focus on creating response to any uncertainties especially in managing complex organization and capital facilities (Hallowell, Molenaar and Furtano 2013).

Usually, an organization used two broad methods to manage risk. The first method known as traditional risk management which looked at risk in silo and being treated as a separate entity within the organization. The other approach, the enterprise risk management (ERM) method, consists of grouping and managing risks at the highest possible level within the organization (Nocco and Stulz, 2006). Therefore, there is a huge need for an integrated approache to tackle and look into the risk in an enterprise-wide approach. The contrast between traditional risk approach and enterprise approach is tabulated in Table 2.1.

Table 2.1: Difference between Traditional Risk Management and ERM

Traditional Risk Management	**ERM**
Risk as individual hazard	Risk in the context of business strategy
Risk identification and assessment	Risk portfolio development
Focus on discrete risks	Focus on critical risks
Risk mitigation	Risk optimization
Risk limits	Risk strategy
Risk with no owners	Defined risk responsibilities
'Risk is not my responsibility'	'Risk is everyone business'

Since the early 1990s, ERM has become a common acronym incorporate vocabulary. Globalization has added to the complexity in the environment; business, information technology, knowledge. "Silo" risk management is still a necessary business practice as each business unit, department, or functional area within a company has the best expertise to manage the risks within their area of responsibility. Consequently, the purpose of ERM is not to replace the risk efforts already occurring within the company. The purpose of ERM is to act as the central

repository for risk efforts occurring within the company and to serve as the single point of reference for knowledge about all risk management activity.

Berry and Phillips (1998) stated that ERM is able to increase the effectiveness of an organization because it can achieve long term objectives. ERM practices cover the enterprise level which the managers are able to evaluate the potential impact of risk-based decision towards the entire organization. Organizations with complex structure and function, in addition with high capital facilities are more likely to be exposed with risk which may be encountered from internal or external factors. ERM is a systematic and holistic approach to manage risk. It assumes such as the contribution of each stakeholder, values toward the organization, the multiple effects of every risk factors, mitigation programs which must be consider all such angle (Schneier and Miccolis, 1998).

ERM was implemented to meet the objectives of analyzing risks which surrounded the development of performance measures, critical success factors and efficient systems. ERM gives the ability for the organization to develop their corporate strategic module which is measurable in terms of target and performance. ERM will also facilitate the process to identify the risk which is perceived to prevent the accomplishment of the corporate objectives. As the risk has been identified, ERM will provide the control factors that would overcome those risks (Burnaby and Hass, 2009).

Others explain the objective of ERM is to increase the shareholder value by putting the financial performance as the baseline. ERM will help to improve the capital efficiency by allocating appropriate resources by reducing expenditures on immaterial risks and exploiting natural hedged to meet the objectives. Galloway and Funston (2000) explained that the need for enterprise risk was driven by the opportunity to lower the risk management cost and the desire to achieve the competitive advantages as the risk environment evolved rapidly.

The decision making process is much more reliable as in ERM the information of areas with high risk is available and suggestion of action of risk-based can be deployed in advance. ERM also build to increase the confidence level especially in investors which, by undertaking risk in its activities, the financial performance can be stabilized. This will demonstrate to the stakeholders that the organization practises sound risk stewardship (Quon, Zeghal and Maingot, 2012).

Fulfilling the objectives of ERM may bring major influences especially in making corporate decision and planning the managerial action plan. As such, most organizations will look upon the risk that should be treated as an opportunity to the business and rather than just a threat. Nevertheless, ERM absolutely has created a new paradigm where it breaks the fragmentation between layers of standard approach in risk management (Barton, Shenkir, and Walker 2002).

ERM was implemented as drivers to protect the organization against the risks by incorporated ERM in their core business process (Francis and Richard, 2007). In advanced countries such as U.S, ERM is important where several organizations including its government put risk management as its top priority by creating a reliable control and reporting system. In 1999, the Institute of Internal Auditors (IIA) Research Foundation found that many organizations acknowledge the effectiveness of risk identification and management where for operation and financial reporting, several organizations practicing ERM and performance measurement system as top preferences.

2.3 Implementing ERM in Organization

Each organization needs to identify the appropriate method to implement ERM to ensure the program will be a success and supports the improvement of the existing system. The components of ERM will be different as ERM is not a "one-size-fits-all" solution. The components usually depend on the organization's business

model and strategies, their organizational structure, culture, risk appetite and dedicated resources (DeLooch, 2004).

To manage risks properly, the organization needs to determine and choose its strategy such that its associated risks rests within the stakeholders' risk appetite and the established risk tolerance. Then, the Board needs to approve the risk policies to communicate throughout the organization that formalize expectations about how to manage each major source or category of risk. The senior management should identify events and scenarios that may impact strategy implementation and the achievement of the organizational objectives (Aureli and Salvatori, 2012).

In implementing ERM, risk indicators will help in event identification since it involves qualitative and quantitative measures that provide information on potential events, interrelation among events and risk. Then, the closest people to the source of the potential disturbance should carry the risk assessment considering the likelihood of occurrence of each identified event and their impact on the achievement of corporate objectives so as to prioritize events and set risk responses (Aureli and Salvatori, 2012). Burnaby and Hass (2009) also suggested an outline consisting of ten steps to develop a viable ERM system for any organization. The ten steps are:

1. Mandate from the top
2. ERM department and buy-in
3. Decide on control framework
4. Determine all risks
5. Assess risks
6. Business unit objectives and performance measures
7. Objective and control summary
8. Monthly ERM reporting system
9. Analysis by ERM department
10. Continuously monitoring the process

Gulloway and Funston (2000) describe for ERM implementation to be a success, organization needs to become the "risk capable organization" and to achieve it there are four characteristics – Focus and Simply Transparent. The description was tabulated in Table 2.2.

Table 2.2: Risk Capable Organization – FAST Characteristic

Risk Capable Organization Characteristics	**Description**
Focus	Enterprise risk can be immensely complex because risks can occur in all areas of the business. Risk capable organizations will focus and be selective on only a few of the most important risk issues at a time and take action. The risks acted will be reported regularly and refreshed periodically.
And	Refers to issue of balance both on innovation and speed with zero tolerance for error in three key areas: • Innovate AND manage the basics. • Enhance competence AND integrity • Adventurous AND resilient
Simple	Risk capable organizations will keep enterprise risk simple. In theory, it means that the same simple model of risk assessment works in each business unit and work team, at all levels of the organization.
Transparent	Making the responsibility and accountability for identifying and managing risk real. Everyone is able to identify their risks and measure them, follow through and understand why those risks are so important.

Despite many approaches for implementing ERM practice can be found, its common elements in the implementation include:

1. Top management commitment.
2. Risk policies and/or mission statements, including adapting any organization risk or audit committee charter to incorporate ERM.
3. Reporting.
4. Adoption or development of a risk framework.
5. Adoption or development of a common risk language.
6. Techniques for identifying risk.
7. Tools for assessing risks.
8. Tools for reporting and monitoring risk.
9. Incorporating risk into appropriate employees' job description and responsibilities
10. Incorporating risk into the budgeting function.
11. Integrating risk identification and assessment into the strategy of the organization.

2.4 Enterprise Risk Management in Malaysia

In Malaysia it is rather important to note that scholarly research and empirical evidence in relation to the determinants of ERM is obviously lacking. Therefore, it relatively shows that ERM is still not widely practiced in Malaysia. Equally important to note is that a few reasons have been cited for the companies' non-involvement in ERM program. The reasons include organizational structure that are not conducive to ERM, individuals who do not want to give up their specific responsibilities, a lack of understanding in respect of how to effectively implement ERM and measure the benefits, and also difficulties in measuring risks and correlations across risks within the company (Kleefner et al., 2003).

In Malaysia, the multinational companies are always deeply affected by intolerance of mismanagement of risks in the organization. For example, Malaysia Airline System (MAS) suffered losses of between RM300 million to RM400 million for the first six months of 1998 due to its foreign debt (Financial Express, November 28, 1998). The tremendous financial effect had triggered the need for risk management to become central to the organization's corporate governance (Yatim et al., 2006).

For the public sector, it is usually considered as nonfinancial entities. De Souza et. al (2012) indicates for nonfinancial companies, the activities are different from the activities of companies which are based on financial. The differentiation can be drawn especially in regards to the liquidity of assets. Nonfinancial firms have long-term assets such as factories, machinery, and equipment, which have differentiated liquidity of the portfolio of a financial institution. Therefore, the risks in nonfinancial companies are not restricted only to their operational flow. When the risk is treated outside the financial system by organizations operating in other sectors, its quantification becomes more complex and inaccessible.

There is a lack of information on ERM implementation in public sector in Malaysia. Nevertheless, public sector in other countries had made the move to integrate ERM in the system as recently many governments has been increasingly focused on achieving better performing public sector. Thus, the public sector not only taking their own risks, but also risks that come with joined-up government and inter-agency partnership. It indicated those public sectors now are concern in giving good quality services with less cost to the public (Carmen, 2006).

2.5 Enterprise Risk Management Framework

The practice of ERM varies among organization where it is depend on their business properties. There is no one size fits all approach to ERM. Each organization is unique from a risk standpoint but nevertheless the framework consists of the

important fundamental characteristics of ERM (Schneier and Miccolis, 1998). Framework emphasizes on the critical principles and components of an effective enterprise risk management process, setting forth how all important risks should be identified, assessed, responded to and controlled. It also provides a common language, so that when anyone in the organization talked about risk management, they are truly communicating.

Currently, there are various published of enterprise-wide risk management frameworks. The frameworks need to be studied and considered to suit with the organization properties and able to help to navigate the complexity of the risk within the organization. Most frameworks were developed in due to assist the organization to risks in an integrated manner, recognize the interdependencies within the enterprise and enable the identification of the company's aggregated risk exposure. Moreover, the frameworks also suggested specific activities (i.e., risk identification, assessment, responses, and control) and share a common focus on the link between risk management and the strategic process (Aureli and Salvatori, 2012).

2.5.1 Committee of Sponsoring Organizations of the Treadway Commission (COSO)

COSO ERM focuses on two parts: integrated framework and application techniques. COSO ERM provided the key principles and clear direction to fulfill the need of all the stakeholders. Therefore COSO ERM will increase the assurance in business operations. COSO defines ERM as a process, effected by the entity/s board of directors, management, and other personnel, applied in strategy setting and across the enterprise, designed to identify potential events that may affects the entity's and manage risk to be within the risk appetite, to provide reasonable assurance regarding the achievement of objectives (COSO, 2011).

ERM presented by COSO consists of eight interrelated components by looking the risks within the internal and external factors from a wider ethical

approached which illustrated in a three-dimensional model as shown in Figure 2.1. The three dimensions are categorized as Organizational Objectives, Management Operations and Entity's Units. Pickett (2006) explained the dimension elaborate the main considerations of enterprise views risk at strategic level, operations, with full consideration of corporate reporting, obligation and compliance with laws, regulations and procedures.

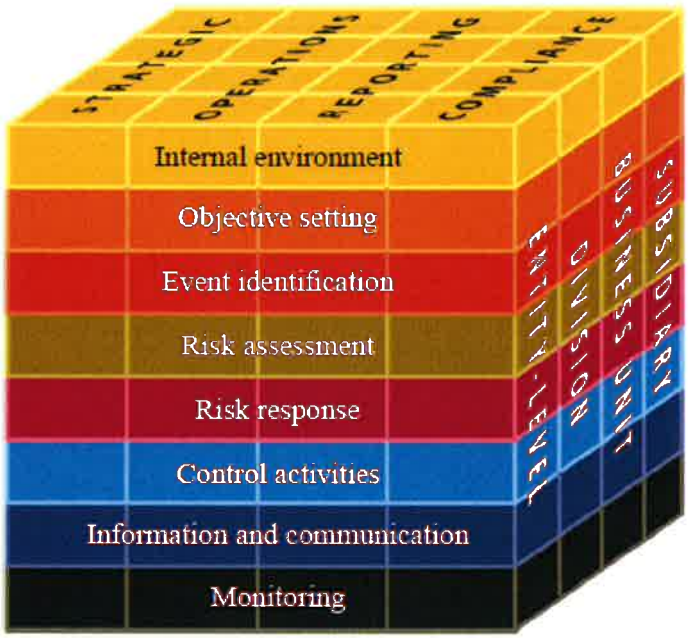

Figure 2.1: COSO ERM Frameworks

In 2010, COSO had conducted COSO ERM Framework Survey which targeted to individuals who are involved in leading ERM related processes or knowledgeable about those efforts within their organization. The survey objective was to seek the respondent perceptions on the strengths and weakness of the framework. COSO ERM Framework has been widely recognized on the topic of enterprise risk but it also identified that COSO lacked with concrete information on the extent of its adoption within organizations or market perceptions about its usability.

The finding from the survey showed that the majority of the respondents agreed that the framework were fairly familiar or very familiar compare to other risk management framework such as Australia/New Zealand AS/NZ 4360-2004, the Turnbull Guidance and the ISO standard. Overall, result from the survey stated COSO's Framework was an overwhelming choice as the basis for implementing ERM within the respondent's organizations.

2.5.2 ISO 31000: 2009

ISO 31000 provides a standard risk management framework for use across various entities, sectors and organizations where the standard establishes a number of principles considered essential to make risk management effective. The standard was published in 2009 and it is the first international standard on the practice of risk management. The standard can be applied to any type or size organization in any country (Gjerdrum, 2009).

ISO 31000 recommended implementing risk management, the organizations required to develop, implement, and continuously improve a framework whose purpose is to integrate the process for managing risk into the organization's overall governance, strategy and planning, management, reporting processes, policies, values, and culture. The strength of ISO 31000 is the identification of risk owners and the necessary widespread education about risk both within the internal and external of the organization. Therefore, it helps to increase the accountability and strengthen the communication where risk management will become the central to the success of the organization with supportive key processes such as planning, management and governance (Gjerdrum, 2009).

ISO 31000 provides principles and guidelines for managing any form of risk in a systematic, transparent, and credible manner and within any scope and context. This international standard has the potential to meet the needs of a wide range of stakeholders. However, the implementation is strictly voluntary. In term of the

standard practices, this standard is expected to be adopted widely as the norm for risk management practices, though it is not intended to be a compliance standard.

2.5.3 Australia/New Zealand Standard 4360-Risk Management (ASNZ 4360)

The Australian and New Zealand standard AS/NZS 4360:2004 become an accepted and proven better practice approach to risk management. The standard outlines the processes that contributes to good governance and provides some protection for directors and office holder. The protection occurs on two levels in the process: the adverse outcomes may not be as strict as they might otherwise have been and those accountable can, in their defence, demonstrate that they have exercised a proper level of diligence (Demidenko and McNutt, 2010).

AS/NZS 4360 states that ERM is an integral part of good business practice and quality management. It is an iterative process of continuous improvement that is best embedded into existing practices of business processes. The standard further specifies that ERM means inter alia identifying and taking opportunities to improve performance as well as taking action to avoid or reduce the chances of something going wrong. The standard encourages an organisation to manage proactively rather than reactively, facilitating a degree of accountability in decision making by balancing actions in terms of the cost of avoiding threats or enhancing opportunities and the benefits to be gained. Good governance would then ensure an improved effectiveness and efficiency of performance for the enterprise (Demidenko and McNutt, 2010).

Now, the AS/NZS 4360:2004 was revised and replaced by the new international standard. The latest revision called AS/NZS ISO 31000:2009. Since AS/NZS 4360:2004 has been adopted throughout the world, it is the main reason it was used to integrate with the new ISO standard. In the AS/NZS ISO 31000:2009, the definition of risk has been shift. The definition of risk in the new standard is *"The effect of uncertainty on objectives"*.

The shift of definition emphasis from, in AS/NZS 4360, 'the event' (something happens) to 'the effect', particularly, the effects on the objectives. Clearly, both the old and new definitions clearly place risk in the context of what every organization wishes to achieve: its objectives. The organization may set its objectives diligently, but to achieve them it often has contend with internal or external factors. Risk arises because those objectives are pursued against uncertain background, thus not in control. These factors may assist or speed up the achievement of each set of objectives. However they might also delay or hinder the organization to achieve its objectives (Society for Risk Analysis, 2009).

The standard also introduced eleven principles for the management of risk. Table 2.3 tabulated the principles and description of each principle in the AS/NZS ISO 31000:2009.

Table 2.3: Eleven Principles in AS/NZS ISO 31000:2009

No	Principles	Description
1	Creates and Protect Value	Good risk management contributes to the achievement of agency's objectives through continuous review of its processes and systems.
2	Be an integral part of organisational processes	Risk management needs to be integrated with agency's governance framework and become part of operational and strategic level.
3	Be part of decision making	The process of risk management assists the decision makers to make informed choices, identify priorities and select the most appropriate action.
4	Explicitly address uncertainty	By identifying potential risks, it can be controls and treat to maximize the chance of gain while minimizing the chance of loss.
5	Systematic, structured and timely	The process should be consistent across an agency to ensure efficiency, consistency and the reliability of results.

Table 2.3: Eleven Principles in AS/NZS ISO 31000:2009 (cont'd)

No	Principles	Description
6	Based on the best available information	It is important to understand and consider all available information relevant to an activity and to be aware the existence of any limitations on the information. It is then important to understand how all this information informs the risk management process.
7	Be tailored	The risk management framework needs to include its risk profile, as well as take into consideration its internal and external operating environment.
8	Take into account human and cultural factors	Risk management needs to recognise the contribution that people and culture have on achieving the objectives.
9	Transparent and inclusive	Engaging stakeholders throughout the risk management process to recognise that communication and consultation is keys to identifying, analysing and monitoring risk.
10	Dynamic, iterative and responsive to change	Managing risk needs to be flexible. The challenging environment requires consideration of managing risk as well as continuing to identify new risks that emerge, and make allowances for those risks that no longer exist.
11	Facilitate the continual improvement of organizations	A mature risk management culture is those that have invested resources over time and are able to demonstrate the continual achievement of their objectives.

2.6 Advantages of ERM

There are many literatures referring to case studies and surveys which have been conducted among successful firms to describe some of the advantages of implementing ERM. The knowledge of ERM implementation will provide useful information of risks and opportunities to the stakeholders' especially the top management. The information will provide more confidence and create more value in the organization model regarding the system that has been implemented, analyzed, and effectively managed on enterprise-wide basis (DeLoach, 2004).

The benefits of ERM can be gained either both at "macro" and "micro" level. Macro level is looking at organization-wide level by creating values through giving assess to the senior management to quantify and manage the risks which aligned with its strategy and business plan. At the micro level, ERM become a culture and way of life in all levels of the organization which importance to develop it as a practice (Nocco, 2006). The ability to inform the risk profile throughout the enterprise to stakeholders in an objective and comprehensive manner will make the internal or external evaluation of the risk viability easier.

Research had shown a direct connection between successful ERM, stakeholder confidence, and organization value (Hoyte 2008). Overall, the ERM framework will not only identify risk within the internal environment but forces the organization to focus on external factors that are considered as highly improbable. Such risks are more difficult or impossible to quantify accurately. ERM contribute a comprehend values among the shareholders by increase the usage of resources efficiently, the ability to evaluate the risk interdependent strategically, improve financial stability and adaptation of risk management as culture (Hallowell, Molenaar and Furtano 2013). ERM helps organization to quantify the appropriate task weightage to avoid risks being managed multiple times by different functions within the department. Meulbroek (2002) stated organization that implement proper ERM strategies, had increased the efficiencies in technical knowledge, human and physical resources.

Hoyte (2008) indicates that ERM approach may reduce the volatility of the risk. In silo approach, the dependencies of each risk often been addressed and related risks are rarely aggregated. Therefore, to implement the program, knowledge to identify the risk is important because it is the first stage of risk management. Then the process will be developed to the next steps: analysis and risk control. The risk will be treated enterprise-wide which help to avoid the risk being managed multiple times from different angles of functions in the department. An effective framework can be translated from the strong commitment given especially from the upper management, performance evaluations and incentives given based on the success of achieving targets.

ERM conveys a healthy message by getting the involvement of various professionals from different functions in the organization to work together in managing risks. Therefore, ERM will develop a system thinking environment among members which contribute to multiple perspectives during the decision making process (Nocco and Stulz 2006). This supported cross-discipline integration which will improves the effectiveness of risk managers,who have been traditionally been outliers managing a satellite activity (Champion 2009; Aguilar 2010). ERM also promotes good governance in the organization by ensuring values such as ethics, codes, roles and responsibilities are implemented and also clearly define the sets of accountabilities (Demidenko and McNutt et. al 2010).

Despite the advantages of ERM to the organization, there are also growing argument on ERM implementation and its advantages to improve the organization improvement. Some studies have been conducted to seek the relation between ERM and performance measurement especially the effect of this management in the financial market. Simkins and Smithson (2005) had attempted to analyse the ability of financial risk management to add value to organizations. These authors found a number of recent studies that show a clear positive correlation between stock prices and greater use of derivatives to manage currency risk and interest rate risk. However, it appears that the aggregate value hedging by those mechanisms depends on the types of risks that a company is exposed to.

Meanwhile, Gordon et. al (2009) have outlay five factors that are critical to achieve better understanding the relation between ERM and form performance. These five factors are: environment uncertainty, industry competition, firm size, firm complexity and board of director's monitoring. This suggestion was also supported by empirical examination in the argument that ERM is related to business performance. Gordon, Loeb, and Tseng (2009) had analysed 112 U.S. companies that disclose ERM activities where form the finding it is confirm there are positive relationship between ERM and business performance .They also suggested, this relationship depends on the compatibility between the ERM and variables such as environmental uncertainty, industry competition ,company size, firm complexity, and board support.

Other explained that ERM implementation can only be achieved and more effective in contributing toward managing risks when reinforced by reward specifically monetary incentives which was given to the top managements (Aureli and Salvatori, 2012). The study conducted confirm the feasibility of linking risk dimension to reward system and suggesting that firm that implementing ERM should move forward to this direction, However, the nature of government organization does not conducting their core business to gain profit. Therefore other incentives can be suggested and applied to suit with the government organization policy.

2.7 Key success factors for ERM implementation

There are numbers of research that outline the key success factors to implement ERM. Freund (1998) explain that it is important to determine the key success factors which is appropriate to the organization to fulfill the organization's objectives. The success factors represent the foundation especially for organization that begins to start ERM in their organization system. The key points also will help the management to recognize the weakness and barriers in adopting ERM.

Institute of Management Accounts (2007) explained that ERM implementation can take into different shapes either giving responsible to only one person to take charge or employ a large team to organize and manage it. For a small unit that managed the ERM unit, it will encourage the whole organization to support, become highly involved and share responsibility for the program. A great number of factors would be difficult to monitor. Therefore, most of the organization which had successfully implemented ERM focusing only on five to ten factors, which should be enough to indicate the success factor for ERM implementation.

State Departments of Transportation (DOT) agreed that creating the risk culture in the department will be one of the success factors to ERM implementation. The most effective means of overcoming the cultural barriers is to create an active and passive support from executives and other upper level managers. Passive support involves assigning responsibilities and explaining the importance of ERM to the every level in the organization. Meanwhile, active support involves actual participation in ERM activities, including ERM in performance evaluations, and assigning valuable resources to key ERM functions.

It is important to receive a great support from the top management to ensure the objective, resources and attention for ERM at the right direction. The effectiveness of ERM, therefore, is closely related with both of the integrity and ethical values of senior management who set the "tone at the top". (Demidenko and Mcnutt, 2010). As it is very clear that upper management are critical to the success factor on ERM, Sandrick (2010) and Aguilar (2010) had describes four ways for upper managers to show their support in the processes. The upper managers need to be familiar, inquisitive, knowledgeable and willing to spend some time on the process itself. Figure 2.2 illustrates the flow of the processes for the upper managers to support ERM implementation.

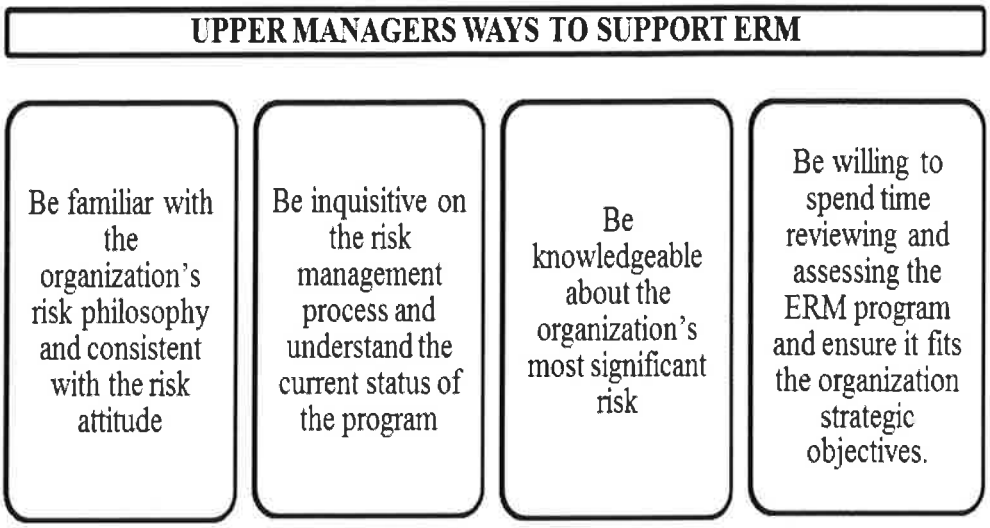

Figure 2.2: Upper manager's ways to support ERM

Ranong and Phuenngam (2009) had tabulated as per Table 2.4, a different set of success factors. The key success factors were composed from various authors who had previously conducted studies on ERM.

Table 2.4: Key success factors of ERM

Authors	Key success Factors
Grabowski and Roberts (1999)	Communication Organizational culture Organization structuring Design Trust
Daniel Galorath (2006)	Top level management support Acknowledge that risk is reality Commitment to identify and manage risk
Anthony Carey (2001)	Verifying your judgments Change management Embedding risk-developing of risk training The importance of sound judgment Identification issues Keep control of reputation Assessing the importance of risk Remuneration issues

Table 2.4: Key success factors of ERM

Authors	Key success Factors
Farida Hasanali (2002)	Leadership Culture Structure Role and responsibility IT structure Measurement
NSW Department of State and Regional Development (2005)	Setting clear objectives and guideline for risk management Training staff appropriately Implementing systems for monitoring and reviewing risk Allocating adequate resources

2.8 Challenges in ERM implementation

ERM is a process that is ongoing and lowing throughout the entity. Some of the leaders in the organization misunderstand the concept of ERM. They falsely view ERM as a fad, a project to be completed, a technology to be installed, or a new business unit or function to be created and funded. Even though ERM may involve some of these characteristics, the more important aspect of enterprise risk management is the need to design and implement a set of actions that can be continuously and iteratively applied throughout the organization (COSO, 2004).

Surprisingly in implementing the initiatives of risk management, mostly it does not start at the beginning. The first step "begin" mostly being neglected as mostly the organization start the process in the middle or even at the end. The beginning process is about working up with the board and the executive team to determine and identify the type of risk system that is required and compatible. It is difficult to develop the clarity on the desired strategic direction for the ERM. The risk system that the organization required shall answer the properties, but not limited,

such as: What is the enterprise-wide risk system got to deliver the organization?; Is the system developing a change in risk capability throughout the organization?; Is the system focusing on any specific issues?; What are the design criteria for the system? (Galloway and Funston, 2000).

Nocco (2006) also support the challenges in putting the effort to initiate ERM. The first step in operationalizing ERM is to identify the risks to which the company is exposed. A common approach is to identify the types of risks that will be measured. Risk identification is the first stage in risk management. Correct risk identification ensures risk management effectiveness and developed the basis for the next step: analysis and control (Tchankova, 2002). In the early days of corporate risk management, financial institutions focused mainly on market and credit risks. Eventually operational risk was added.

In a study conducted by Choudry and Iqbal (2013), the respondents were asked to identify the most important barriers in implementing risk management. From the survey result, lack of formal risk management system is at top ranked compare to other variables. Loosemore et al. (2006) suggests that the best practice to implement a risk system was to ensure the presence of clear aim and strong policies. In order to manage the risk accordingly, it is important to integrate the ERM strategies by all the related stakeholders to achieve the intended objectives. This is to ensure that the objectives are more transparent and can be achieved in an efficient way where conflicts among the stakeholder due to different objectives can lead to confrontation.

One of the significant obstacles to implement ERM is the insufficient investment to escalate the importance of ERM implementation. Studies conducted by Meulbroek (2002), Hoyt et al. (2008), and Sandrick (2010), found that there are positive consequences of ERM investment. The qualitative feedback from experienced executives and upper-level managers provided strong evidence that the initial investments in implementing ERM are more than outweighed by the long-term benefits. The investment may involve a few exercises in the organization, such as

developing contingency fund or develop programs to raise culture of risk management which can extends to all the employees

IBM Centre for the Business of Government had identified several challenges that the government agencies in States had to face during ERM implementation. The challenges of ERM include:

1. Providing the appropriate foundation, assessment, and management platform
2. Insufficient sponsorship of ERM at the executive level
3. Positioning ERM as a strategic management practice and not as an additional task
4. Competing priorities—key ERM staff participate in various special projects and initiatives that are risk-related, but do not directly support the implementation of an ERM program
5. Government regulations and requirements
6. Lack of understanding about risk management
7. Lack of qualified risk management professionals and expertise
8. An internal competitive culture prone to stove piping
9. Aligning risk reward and incentive programs with strategic objectives

Other studies by Gates (2006) found major three obstacles in implementing ERM: competing priorities, insufficient resources, and difficulty establishing consensus among decision makers. These obstacles need unified support from senior management where it may be the most crucial challenge for an organization to overcome. Another major barrier to ERM implementation is the inability of analysts to adequately identify and accurately quantify risks.

2.9 Summary

This chapter provided the introduction on ERM which consist the overview of ERM implementation in financial organization and in public organization. This

chapter discussed the ERM implementation by using three (3) different frameworks: COSO, ISO 31000:2009 and AS/NZ 4360 Risk Management. Then some literature was discussed on the advantages of ERM for the organization. Further, it also covers the key success factors and the challenges to implement ERM which had been reviewed and discovered by other researchers and literatures.

Next chapter will discussed the methodology used in the study which includes the research design, the target population, data collection method, developing the questionnaire design, pilot testing and analysis that will be conducted to obtain the results to support the aims of the study.

CHAPTER 3

RESEARCH METHODOLOGY

3.1 Introduction

This chapter outlines the research methodology which has been applied for the study. This chapter will explain the design of this research which includes the pilot testing, the construction of the questionnaire and interview question to achieve the aim of this study. Further, this chapter will explain the procedures involved in order acquiring the required data and the analysis performed to achieve the expected result.

The chosen research methodology was applied to meet the objective of the study. The objectives of the study are to assess the perception on how ERM should be implemented in PWD and to identify the key success factors and challenges to implement ERM in PWD.

3.2 Research Design

The study was conducted in PWD. The expected population of the study was not limited only to the officers in the headquarter office but extended to the district officers. This study will be assessing the perception of the officers in PWD on how

ERM should be implemented. Thus, this study will seek the perception on the success factor and the challenges to implement ERM in PWD.

This study was design using one of the most common and well known study design; the cross-sectional study design. In this type of research study, either the entire population or a subset thereof is selected, and from these individuals, data are collected to help answer research questions of interest. By using the cross-sectional study design, the researchers will have the decision in deciding what is the relevant questions which will be appropriates for the study (Olsen and George, 2004).

Using qualitative research methodology, the data was gathered by way using semi-structured interview and distributing questionnaire. Indeed, qualitative research was preferable in this study as the research refers to the meanings, concepts, definitions, characteristics, metaphors, symbols and description of things. Nevertheless, the quality of the research is directly depending upon the respondent's skills, experience and the sensitivity of the respondents and the researchers (Anderson, 2006).

3.3 Population

The study was focusing on gathering data among the officers in PWD. Therefore the primary population of the study was officers in PWD which located in Headquarter offices and the district officers. The questionnaire was distributed among the officers in the headquarters because the headquarter performing several core businesses which are divided into different sector: design and technical advice expertise, managing project, management and maintenance. The district offices were selected because it representing one of the main function in PWD – executing the operational task on the ground.

The population was varies and was not limited only for professional officers. The reason to neglect the limitation for survey distribution as the objective of this

study is to seek the current level of awareness and how should the ERM be implement in the department. Not separating the staff position will allow the researcher to be neutralized and not bias with the result. Therefore, the result will show the respected views which answered the objectives of this study.

The questionnaire was distributed to selected respondents which had been identified serving in the different sectors. The questionnaire was converted to online form to make it much easier for the respondent to fill and complete the form. Therefore, some respondents received the online form and some received the survey in hard copy.

3.4 Data collection and Method

Data collection is a compulsory exercise in any studies. Data can be collected from the two main sources: primary source and secondary source. Primary source will be gathered directly through various interactions between the researchers and the respondents and / or subjects targeted using methods such as interviews, focus group, surveys and participant observation. The selections of methods are depending on the researcher themselves as the methods have their own advantages and disadvantages (Durance and Fisher, 2005).

Table 3.1 outlines several methods which are most frequently used in gaining the primary data with advantages and disadvantage.

Table 3.1: Method in collecting primary data, advantages and disadvantages

Method of Data Collection	Advantages	Disadvantages
Focus Group	Excellent approach to gather in-depth attitudes, beliefs, and anecdotal data.	Requires staff time Requires strong facilitator to guide the discussion

Table 3.1: Method in collecting primary data, advantages and disadvantages (cont'd)

Method of Data Collection	Advantages	Disadvantages
	Able to generate more ideas. Effectively used to focus on details regarding issues found through surveys or other data collection methods.	Requires special equipment to record and transcribe the discussion.
Interviews	Good approach to gather in-depth attitudes, beliefs, and anecdotal data from individual patrons. Personal contact with participants might elicit richer and more detailed responses. Provide excellent opportunity to probe and explore questions.	Requires staff time and appropriate area to conduct interviews. Requires special equipment to record and transcribe interviews.
Observation	Excellent approach to discover behaviors Provides indicators of the impact of programs that might be more reliable than data gained by asking people. Good technique for observable products and outcomes	Requires staff time to observe and record observations. Not appropriate to ask questions during observation. Follow-up interviews might necessary to verify observations.
Survey	Good at gathering large amount of data from different resources. Allow wide range of information such as attitudes, beliefs, values and past behaviors. Easy to develop standard instrument to minimize errors	May end up with an unrepresentative response rate if not administered properly. Only get answers to the questions that the researcher asked.

Table 3.1: Method in collecting primary data, advantages and disadvantages (cont'd)

Method of Data Collection	Advantages	Disadvantages
	Easy to administer as the work is usually routine and repetitive. Possible to ask specific and focus questions for a very specific area	Depend on the respondent's motivation to respond the questions honestly. Not suitable for affective issues, complex social phenomenon or for exploring issues in depth because the questionnaires design need to be focused. There will be certain amount of self-selection in the respondents. Therefore there is an element of non-probability in the sample

This study will be conducted using interview and survey method to collect the primary data. Other documentations from various publications will be also considered to attain secondary data. The information for the secondary data obtained from PWD publication focusing in risk management area such as PWD Strategic Framework, SSR report, ERM presentation, Risk Management Manual and others.

3.5 Questionnaire and Interview Design

The questionnaire was divided into three section; Section A, Section B and Section C. For Section A was designed to obtain the information on the professional

background of respondents. Generally, the respondents were asked on the background professional area, working experiences and their current professional involvement. In this section, the respondents were asked their risk position in the department as PWD had implemented risk management in managing projects.

Section B was constructed to assess the perception among the respondents on how ERM should be implemented in PWD. Section B will obtain some information on general acknowledgement from the respondents on ERM existence especially in PWD. Then the perception was anticipated by using Likert Scale with the five points numerical. The five point numerical scale consist of "1- Strongly Disagree", "2 - Disagree", "3 - Neutral", "4 - Agree" and "5 – Strongly Agree". The perception was referred on essence of ERM implementation - Definition and the philosophy of ERM, ERM governance, risk identification and response and effective communication.

Each element was constructed in a simple manner for better understanding in order to assess the perception of how ERM should be implemented in PWD, since the program was still at 'baby steps'. The perception on ERM definition and philosophy is crucial to anticipate the respondent understanding on ERM in PWD's context. The ERM governance is to ensure for organization to implement ERM, it must be well structured and embedded with the corporate governance. Then, the respondents were asked on the ability and the efficiency of the department to identify their risks and subsequently taking charge to respond each risk are crucial. Lastly, ERM can be only being a successful when everyone in the department communicates on risk with the same language.

Section C was constructed to identify the success factor and the challenges in implementing ERM. To identify the key success factor and the challenges to implement ERM in PWD, the factors were structured based on four common factors which had been found many in other researches and literature review – Top management, Organization structure, Communication and Culture.

Further validation on the study was done by conducting post-survey interview with identified officers who had awareness on ERM. The targeted respondents to be interview was officers (but not limited to) who currently work in the risk unit and hold a risk responsibility in PWD. During the interview, the respondents will be asked on three questions:

- In is your perception on how ERM should be implemented in PWD?
- What are the key success factors to implement ERM in PWD?
- What are the challenges to implement ERM in PWD?

3.6 Pilot Testing

Pilot testing was conducted to test the consistency and the effectiveness of the questionnaire. The test of the questionnaire was conducted by distributing the question to 10 respondents which selected among officers who worked under risk unit in PWD and other branches. The survey was sent using the respondents particular e-mail addresses and was answered by 7 respondents.

Through the pilot test, the respondents had the opportunity to analysed and made suggestions to aspects of the structure and content of the questionnaire. In addition, officers in risk unit were interviewed with the aim of clarifying questions and collecting suggestions and recommendations for improving the questionnaire to reflect the current situation in PWD's reality. Some of the questions have been deleted, relocated or upgraded and others entered in the questionnaire. After this consideration, the questionnaire was adjusted to the sample application in this research.

3.7 Data Analysis

All data collected need to be organized before it go through to analyze. All data then coded and keyed in into the statistical form, which at the end analyzed using Statistical Package for Social Scientist (SPSS) software. The reliability test was conducted on the survey by using the Cronbach's Alpha test, it indicate the internal consistency and reliability of the study. The value of the coefficient with less than 0.6 was considered to be poor, 0.6 to 0.7 was acceptable and for value over 0.8 was considered as good.

The study used the frequency analysis and descriptive analysis to analyse the collected data for Section B and Section C. Nevertheless, the analysis was done only for selected respondents – respondents who are aware the basic concept on ERM as tool to manage risk enterprise wide. The respondents were chosen because they have some awareness on ERM which indicate the response would be much reliable. Therefore, the analysis can assess the perception and making comparison between respondents who are aware on ERM and who are not.

The descriptive statistics was applied to obtain the values such as maximum, minimum, mean, mode, standard deviation and standard error. According to Field (2005), standard error value is the standard deviation of sample means and it is a measure of how representative a sample is likely to be to the population. A large standard error (relative to the sample mean) suggests that there is a lot of variability between means of different samples. A small standard error suggests that most sample means are similar to the population mean and so the sample is likely to be an accurate reflection of the population. Therefore, for standard deviations which less than 1.0 indicate that there is little variability in the data and consistency in agreement among the respondents. The value was ranked to determine which element was the most highly nominated and the least nominated among the respondents.

3.8 Summary

In this chapter, explanations of the demographic of the respondents, the research design, data collection and method, questionnaire design are included. This also including the pilot testing and how the data should be analyse. The discussion of all the data and its finding will be further elaborate in the next chapter.

CHAPTER 4

RESULT AND DISCUSSION

4.1 Introduction

This chapter explains the details of the data analysis which had been collected and the main findings of the study. The analysis conducted includes the response rate, demographic analysis and statistical analysis. The statistical analysis was conducted to determine the findings of each objective which are relevant for this study. The findings are discussed and reported in this chapter.

4.2 Response Rate

The main data for this study was through questionnaire which was distributed using both online form and hardcopy. The data collection duration was done within a two (2) weeks period, from 4th until 16th November 2013. The online form of the survey was distributed to selected branches of PWD at the headquarter office, but only a few branches were selected to participant in the survey.

The branches selected will represent the functions of each sector in PWD. For managerial sector, the form was distributed among selected respondents who currently serve in Corporate Management Branch and Complex Project Management Branch. Respondents from Architect Branch, Electrical Engineering Branch, Mechanical Engineering Branch and Quantity Survey Branch were chosen to

represent the Expertise Sector. To represent the operational function which covers the Business Sector, the respondents were among the district officers. They were given the hardcopy booklet which was distributed during the district officers meeting.

The respondents are officers who are currently positioned between Grade J41 to Grade J54.They were chosen as they are professional officers in the department and decision making is involved as part of their process in doing work. The professional officers were expected to be exposed with new area to enhance their knowledge and skills. From 450 respondents who were expected to answer the survey, only 200 respondents returned the questionnaire which gives an approximate response rate of 44 percent. Table 4.1 tabulates the overall response rate for this study.

Table 4.1: Response Rate

Distribution Method	**Respondent's Location**	**Total Distributed**	**Total Received**	**(%)**
Online Form	Corporate Management Branch	183	55	30
	Complex Project Management Branch	100	40	40
	Architect Branch	20	10	50
	Electrical Engineering Branch	25	14	56
	Mechanical Engineering	25	15	60
	Quantity Survey	25	10	40
Hardcopy	District Engineers Meeting	72	56	80
	Total	450	200	100

4.3 Demographic Analysis

For demographic analysis, the respondents were asked to provide general information on their professional background. The respondents were asked several general questions on their professional area, the number of years working in the department, their current working involvement and their current risk position if they hold any.

From the total respondents received, more than 50 percent of the respondents who answered the question are from civil background. For other backgrounds such as architect, electrical, mechanical and quantity survey, each was less than ten percent respondent rate. There were also respondents from other background professions such as building engineer but the respond rate was less than five percent. The frequency of the respondent's background was tabulated in Table 4.2 as shown below.

Table 4.2: Frequency of Respondent's Background

Background	Frequency	Percentage
Civil	130	45.0
Architect	15	7.50
Electrical	14	7.00
Mechanical	20	10.0
Quantity Survey	17	8.50
Others	4	2.00
Total	200	100.0

Table 4.3 shows that the majority of the respondents have experience of between 6 to 10 years in the department, which represent 30.5 percent from overall population. Respondents who have experienced of more than 20 years and those who have worked between 1 to 5 years in the department represent 26 percent and 24.5 percent. Therefore, since the highest percentages of responses is represented by officers who have worked between 6 to 10 years and some with more than 20 years

of experience, the results for the study are considered reliable as the respondents were considered familiar with the PWD current system.

Table 4.3: Frequency of Respondent's Years Working Experience

Years Working Experience	Frequency	Percentage
1 – 5 years	49	24.5
6 – 10 years	61	30.5
11 – 20 years	38	19.0
21 years and above	52	26.0
Total	200	100.0

The respondents were asked on their current professional involvement in PWD. Table 4.4 indicates that 36 percent are currently involved in operational function where 56 of respondents from the percentage hold the position as district engineer. As district engineer, they have a huge responsibility to manage the operations at the district level. The table also exhibits that 33 percent of respondents currently perform management work in the department.

Table 4.4: Frequency of Respondent's Current Professional Involvement in PWD

Professional Involvement	Frequency	Percentage
Project Team	24	12.0
Design Team	32	17.0
Operational/District Engineer	72	36.0
Management	66	33.0
Others	6	2.00
Total	200	100.0

Currently, PWD supports project risk implementation especially in managing high impact projects. Therefore, the respondents were asked to state their current risk position (if any) in the department referring to their understanding of the roles of each risk position. Table 4.5 tabulates half of the respondents stated that they were not involved in any risk position in the department.

Table 4.5: Frequency of Respondent's Current Risk Position in PWD

Risk Position	Frequency	Percentage
Chief Risk Officer	3	1.50
Risk Champion	3	1.50
Risk Owner	25	12.5
Risk Officer	57	28.5
Secretariat	12	6.00
Not Involve in any risk position	100	50.0
Total	200	100.0

The results show that some of the respondents may not really understand the roles and responsibilities of the risk position especially in ERM context. For example, the survey result shows that there are three respondents who had answered that their risk position is the Chief Risk Officer. Referring to the presentation on ERM during the Senior Officer Conference 2013, the proposed governance structure for PWD explained that the CRO was positioned in the executive committee, led by the Deputy General Director (Sector Management), which represents only one position in the department (PWD, 2013). Therefore, the results gained from this question gives the general overview that some of the respondents may not fully understand with the terminology in ERM.

4.4 Validity and Reliability Test

The value of Cronbach's Alpha was determined to scrutinize the validity and reliability of the survey. The Cronbach's Alpha was determined by using SPSS software. The Cronbach's Alpha will indicate the internal consistency of the measurement by providing a coefficient of inter-item correlations with the sum of all the other items. Cronbach' Alpha quantified the reliability by proposing a coefficient which theoretically ranges from 0 to 1. If alpha *(α)* is near 0 then the quantified answers are no reliable, and if alpha *(α)* is close to 1 the answers are very reliable.

(Cronbach,L. J., 1951). The reliability level is acceptable at 0.6 or above. For this study, the number of Cronbach's Alpha is 0.931 for 44 items. Therefore the questionnaire achieved the acceptable level which is considered reliable.

4.5 Statistical Analysis

4.5.1 General Perception

The first objective of the study was to assess the perception of the respondents on how ERM should be implemented in PWD. In order to assess the perception, a general question was asked - if they had heard about ERM. Figure 4.1 indicates that 75 percent of the respondents have heard about ERM compared to 25 percent who has never heard about ERM.

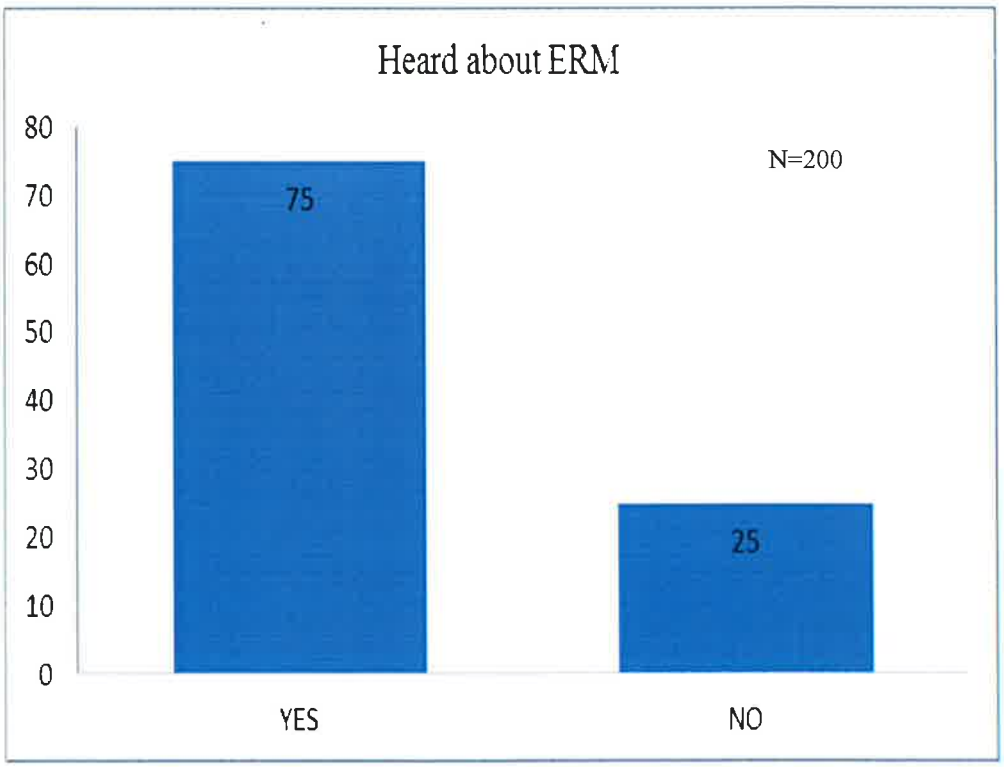

Figure 4.1: General Response on ERM

Then the respondents were asked to inform their sources on ERM. Respondents were allowed to select several options of sources given. Figure 4.2 indicates most of the respondents have heard about ERM through training or courses on risk. The training or courses may be conducted by PWD or any organizers which provide the information on ERM. The respondents also stated the sources of ERM come from guidelines, conference or articles, and others sources on ERM include from PWD's website, colleagues and from this survey itself. Nevertheless, the respondents who answered that they had no idea or did not receive any information on ERM represent 20 percent from overall respondents.

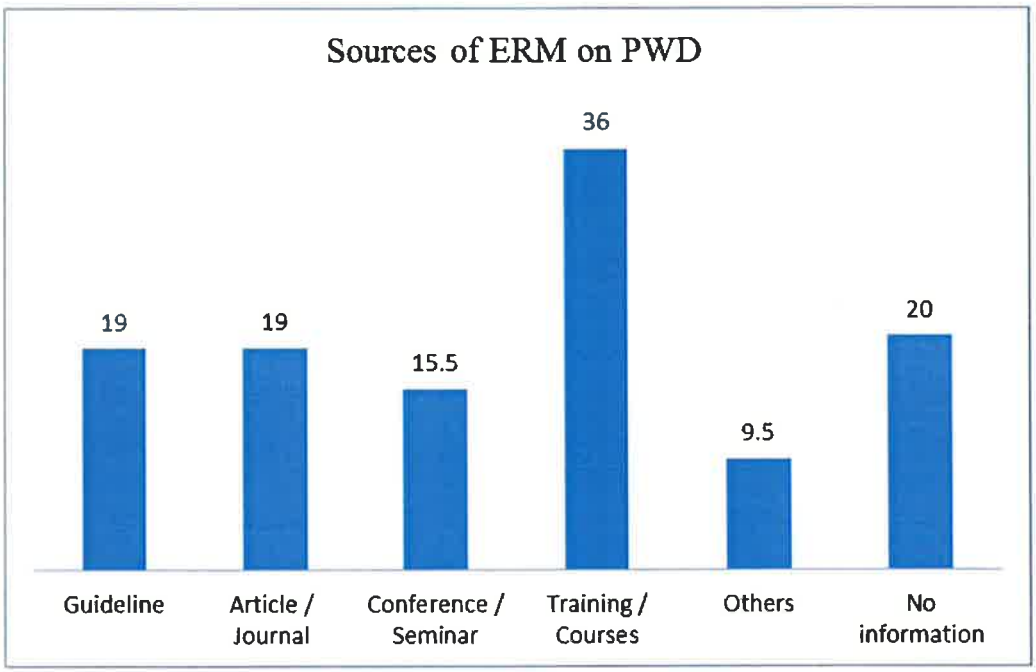

Figure 4.2: Sources of ERM in PWD

For PWD, the introduction on ERM has been presented during the steering committee meeting, where the members are the top management of PWD, including all the Directors in Headquarter branches and states. Then it was presented during the Senior Conference Meeting in May 2012, where majority of the participants were senior officers of Grade 48 and above. The purpose of the presentation was to give an overview and introduction on ERM to the participants. At the same time, participants of the conference were expected to share the presentation to other officers

Despite the high rate of respondents who have heard about ERM, it may not replicate whether the respondents understand the basic foundation of ERM. ERM basically allows common risks that have been managed traditionally to be more efficiently and consistently managed across the enterprise. Therefore, the respondents were asked - are they aware that ERM is an approach to manage risk enterprise wide? Figure 4.3 indicates that 43.5 percent of the respondents were aware that ERM is an approach to manage risk enterprise wide, while 56.5 percent was not aware that ERM is an approach used to manage risk enterprise wide

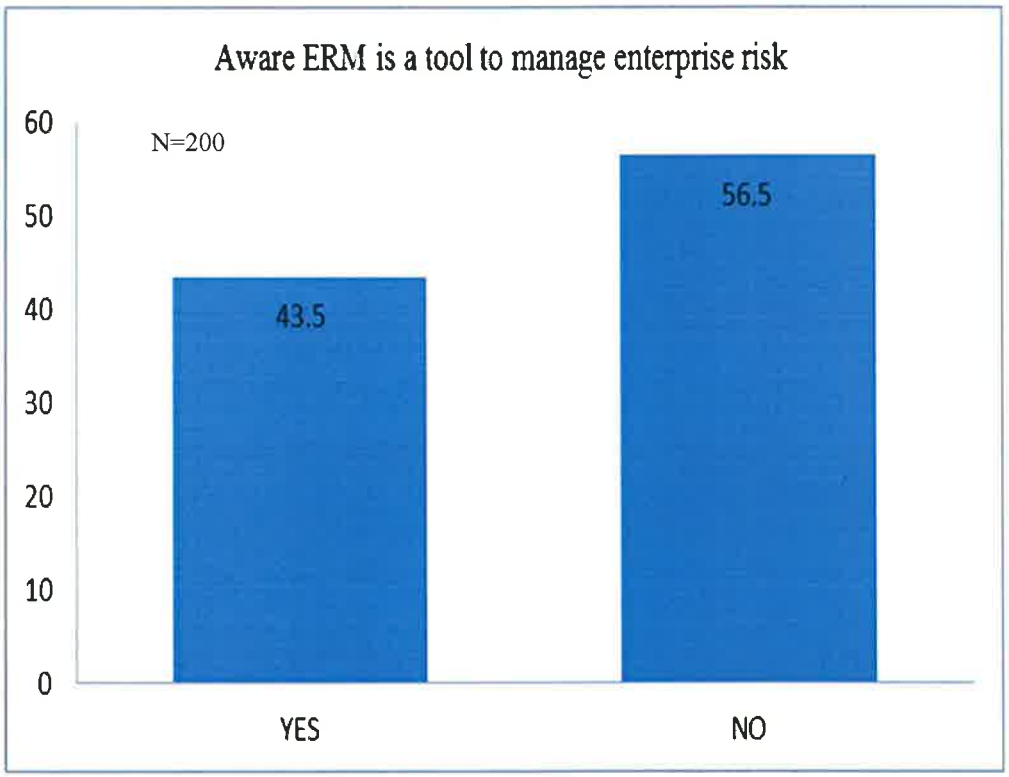

Figure 4.3: ERM is a tool to manage risk enterprise wide

Out of 200 respondents, Figure 4.4 shows only 47.5 percent are aware that ERM will be implemented in PWD. Therefore, information on ERM needs to be spread at every level in the department. It also shows that the information on ERM introduction, which had been presented to the top management meeting and during senior conference meeting, was not disseminated accordingly to the others. The situation is a common occurrence in the department as the officers who acquired the latest information tend to keep the information to themselves rather than share it with others.

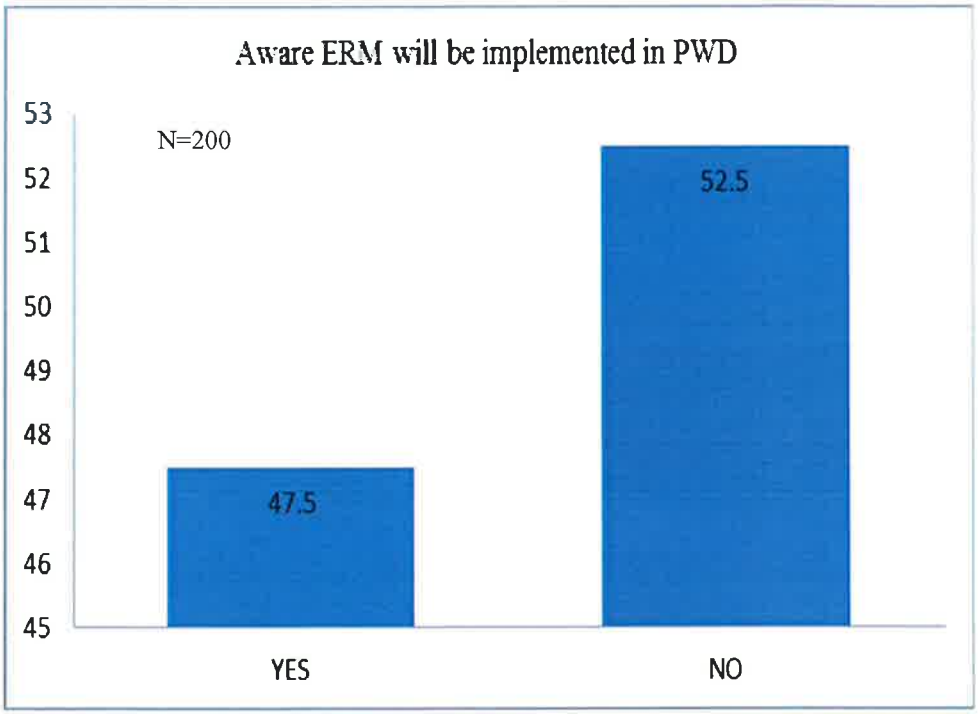

Figure 4.4: Respondents Aware ERM will be implemented in PWD

As ERM was only introduced in 2012, the respondents were asked on their support towards ERM implementation in PWD. Figure 4.5 indicates that majority of the respondents which is 80 percent will support ERM implementation in PWD. The results show an indication that ERM can be successful initiative in PWD if it was implemented strategically. Currently risk management activity in PWD is often limited to project management. For ERM to be successful, PWD needs to develop appropriate steps so that ERM can be understood at every level in the department by focusing on the strategic framework and the emerging risks which may impact the objectives.

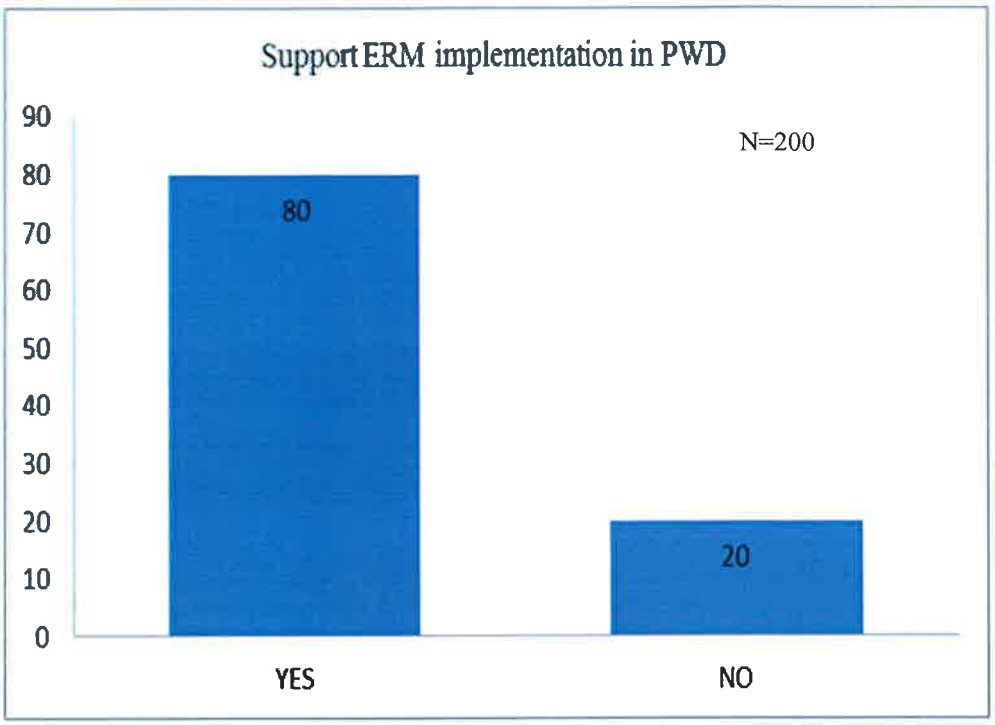

Figure 4.5: Respondents Support on ERM implementation in PWD

Further information on this matter was obtained to attain the respondents who have heard about ERM and are aware on what is ERM. Figure 4.6 indicates 80 respondents or 40 percent who had heard about ERM are aware that ERM is an approach to manage risk enterprise wide. Thus, 70 respondents or 35 percent who had heard about ERM did not aware that ERM is an approach to manage risk enterprise wide. The same figure also showed 50 respondents who has never heard about ERM, are not aware that ERM is an approach to manage risk enterprise wide.

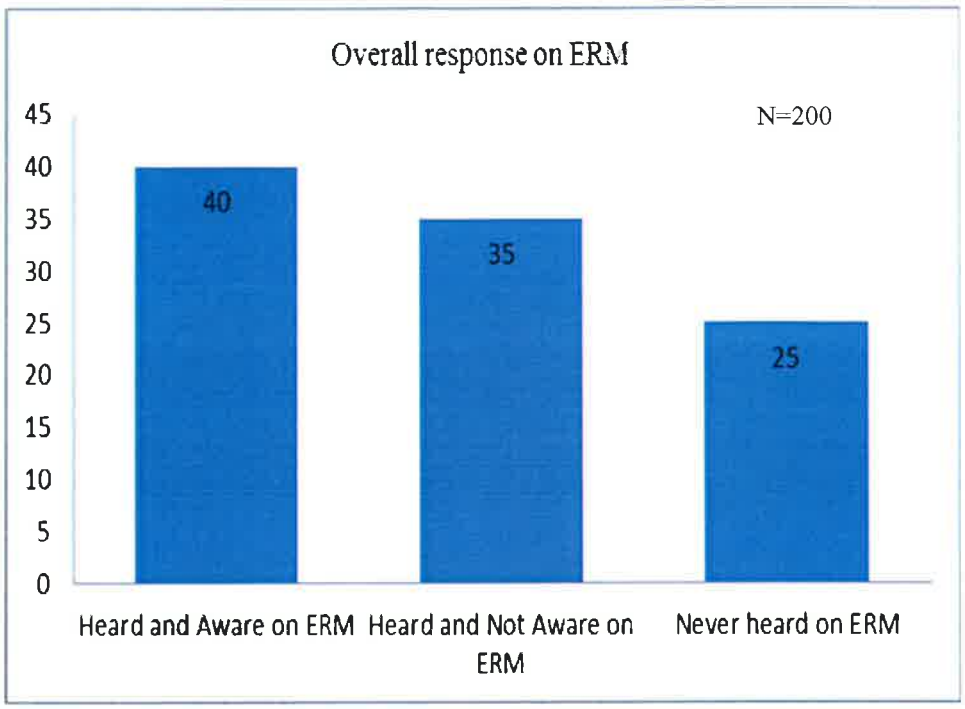

Figure 4.6: Overall Responses on ERM

To determine the perception of ERM implementation, this study will only consider the perception of respondents who have heard about ERM and are aware on what is ERM. This means that this study will be looking into only the perception of 80 respondents as their perceptions on ERM will be much more reliable as the respondents have a foundation on ERM attributes. For the rest of the respondents, their perception will not be further analysed as they were considered to have no knowledge on ERM.

Further analysis was conducted to determine which professional background had the most exposure on ERM. From the 80 respondents, Figure 4.7 indicates 50 respondents or 62.5 percent were from civil engineering background, while other professional backgrounds were – mechanical engineer (12.5%), architect (10.0%), electrical engineer (7.50%), quantity survey (7.50%) and others (0.0%). Until 2013, the total professional officers in PWD was 3722, which 2057 (55%) are from civil background and other professional backgrounds, each represent less than 15 percent from the total number (PWD, 2013). As the largest professional group in the department, civil engineers are expected to receive more exposure in any initiative

because their placement covers the majority in the headquarters, states, districts and other government agencies.

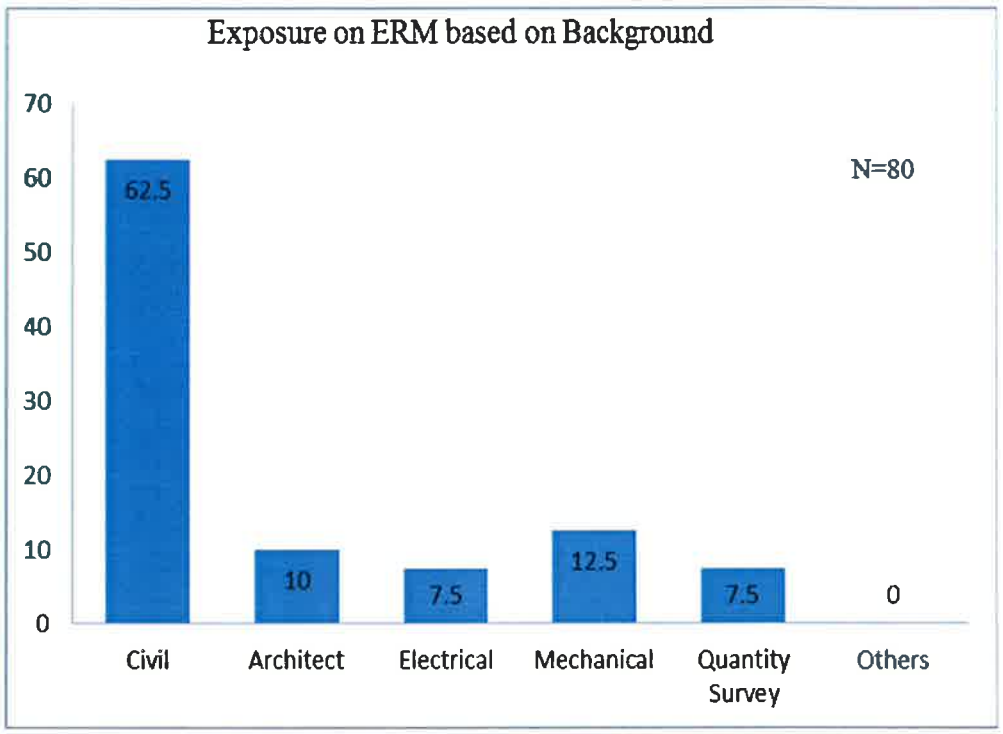

Figure 4.7: Exposure on ERM base on professional background

Figure 4.8 exhibits the analysis between the respondent's current placement in PWD and ERM. From 80 respondents, 45 percent currently placed in management offices; represented the Corporate Management Branch and Complex Project Management Branch. Nevertheless, only 22 respondents or 27.5 percent of district engineers in PWD are aware that ERM is an approach to manage risk enterprise wide. The number is considered very low compared to the total number of district engineers in the department. It is really important to leverage information on ERM especially among the district engineers as they are the head of district and will be monitoring the operational jobs at the ground level. Lack of understanding on ERM will encounter problems to manage risks at the district level; failure to manage the risks at the operational level can endanger the department.

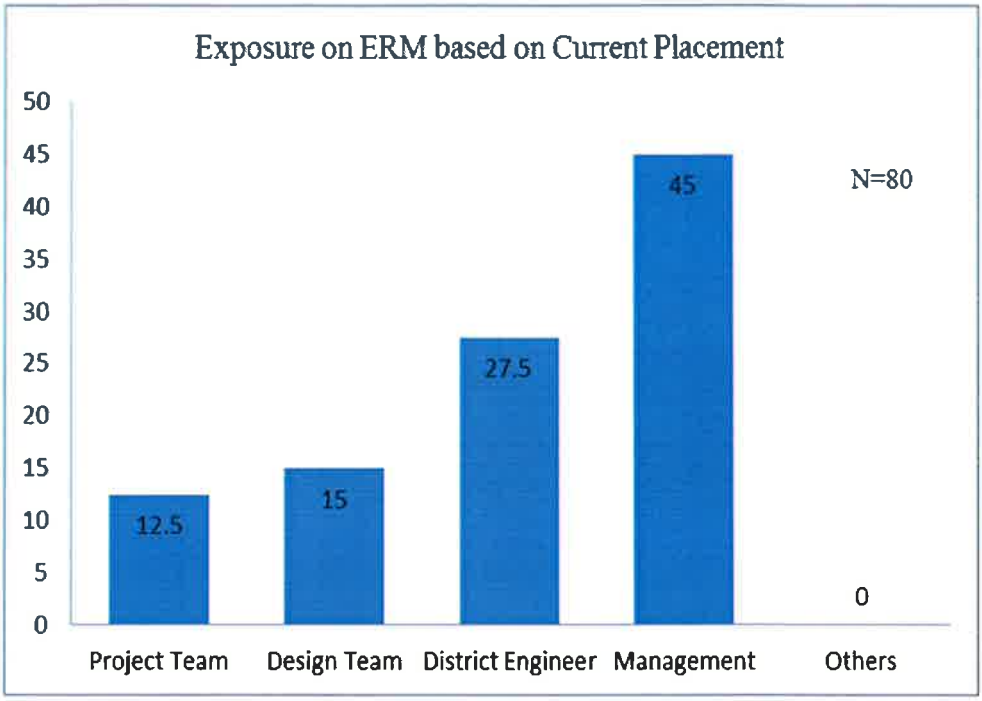

Figure 4.8: ERM exposure based on current placement

The analysis continues by looking at the perception on how ERM should be implemented in PWD within four elements; ERM definition and philosophy, ERM governance, risk identification and responses and ERM effective communication. ERM definition and philosophy because it is important to understand the definition on what ERM really means and its contribution to the department. For organization to implement ERM, it must be embedded with the corporate governance. Thus, the integration within the governance and process, with the organization business strategy is necessary in order to attain competitive advantages. The ability and the efficiency of the department to identify their risks and subsequently taking charge to respond to each risk are crucial. Lastly, ERM can only succeed in implementation through effective communication when everyone in the department understands and have clear information about not only the program, but the type and nature of risks which are really relevant to the department.

4.5.2 Research Objective 1

4.5.2.1 ERM Definition and Philosophy

The respondents were asked about their perception on ERM definition and philosophy, which covers four elements: the need to develop clear definition and objective on ERM, the necessity to provide common understanding upon ERM's objectives for PWD, the need aligned ERM objectives with the department strategic framework and the need to align PWD's ERM definition with standard definition. The definition and philosophy derived on how ERM should be understood and accepted at every level in the department, and they should be integrated with the management process. Table 4.6 refers to the elements of each category was labeled accordingly for analysis purposes.

Table 4.6: ERM definition and philosophy

Label	Description	Percentage
C1.1	PWD should develop clear definition and objectives of Enterprise Risk Management	95
C1.2	PWD should align its Enterprise Risk Management definition with standard definition	80
C1.3	PWD should align the Enterprise Risk Management objectives with the department strategic framework	90
C1.4	PWD should provide common understanding of Enterprise Risk Management objectives	93

C1.1 in the questionnaire refers to the perception that PWD should develop clear definition and objectives of Enterprise Risk Management. Figure 4.9 shows that 76 respondents or 95 percent totally agree and strongly agree that PWD should develop clear ERM definition and objectives in order to implement ERM. ERM deals with risks and opportunities affecting value creation or preservation. It is significant to define ERM and its objectives to ensure it fit into the department activities.

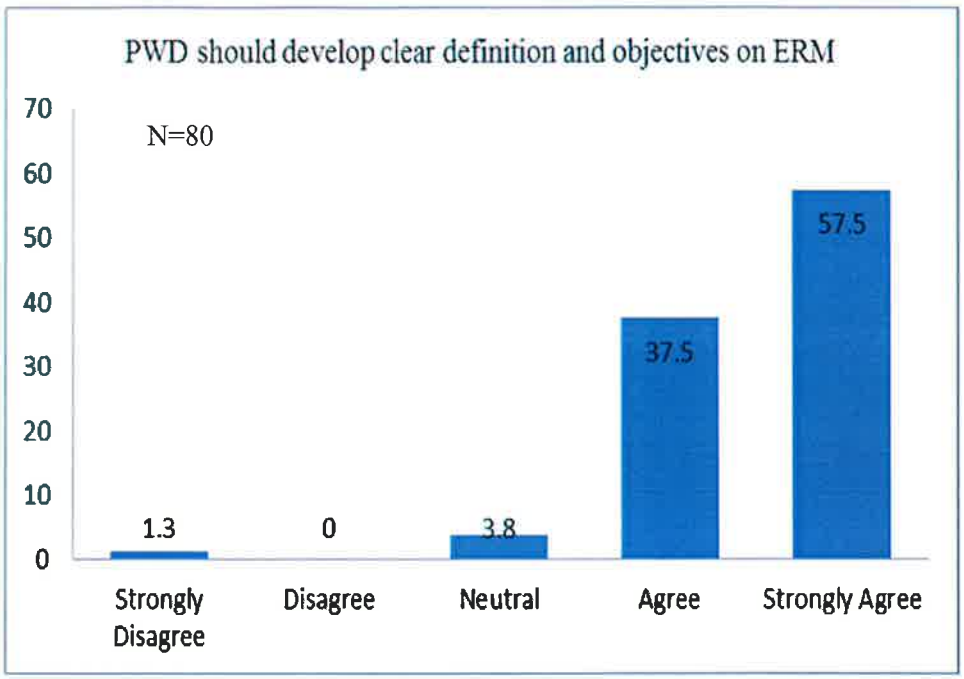

Figure 4.9: PWD should develop clear definition and objectives on ERM

C1.2 in the questionnaire refers to the perception PWD should align its ERM definition with standard definition. Figure 4.10 shows the perception from 68 respondents or 80 percent totally agree and strongly agree that PWD should align the department's ERM definition with standard definition. Nevertheless, 8.8 percent strongly disagree on the perception PWD should refer and align the department's ERM definition with the existing standard definition of ERM. Therefore, to develop the definition and objective on ERM for PWD, the department shall refer to the existing standard which can be found in COSO, AS/NZ 4360 or ISO 13000.

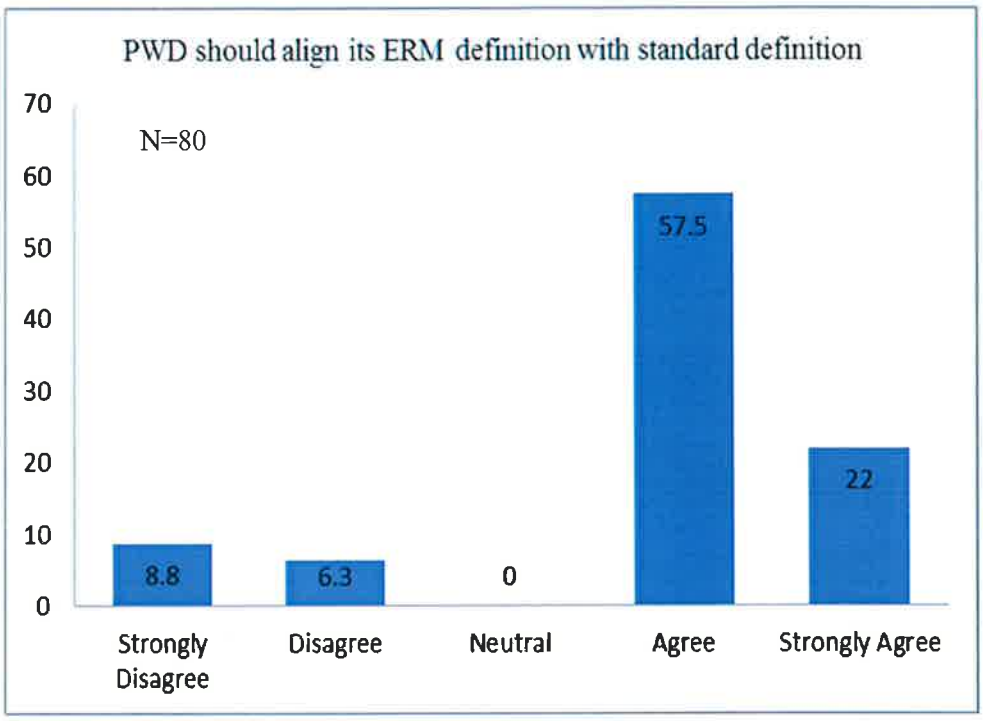

Figure 4.10: PWD should align ERM definition with standard definition

Figure 4.11 indicates C1.3 which refers to the perception that PWD should align the ERM objectives with the department strategic framework. From the figure, 72 respondents or 90 percent totally agree and strongly agree with the perception that to define ERM definition, the objectives should be aligned with the strategic framework. From an interview conducted by Department of Transportation on ERM implementation, one of the findings was to ensure the ERM protocol was included as an integral component of all organization functions (DOT, 2013). The implementation should be associated with awareness program such as training.

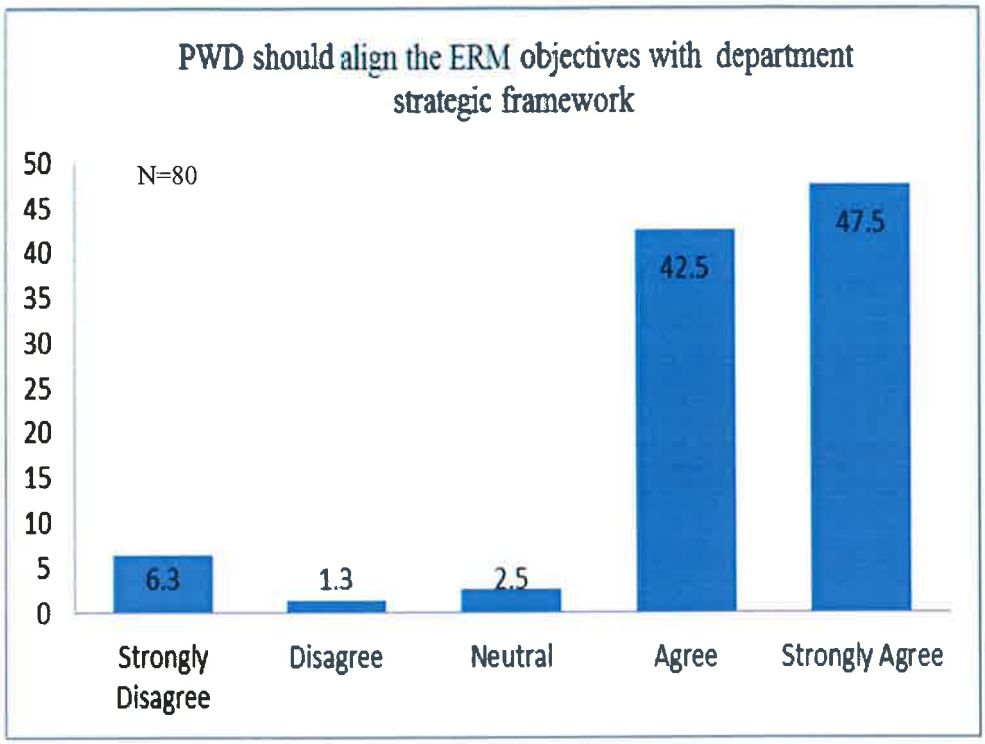

Figure 4.11: PWD should align ERM objectives with department strategic framework

C1.4 was referred to the perception that PWD should provide common understanding on ERM objectives. The common understanding of ERM objectives in term of goals, expectations and factors which are needed to ensure the initiative was successful and must be established. Figure 4.12 indicates that 74 respondents or 93 percent totally agree and strongly agree with the perception.

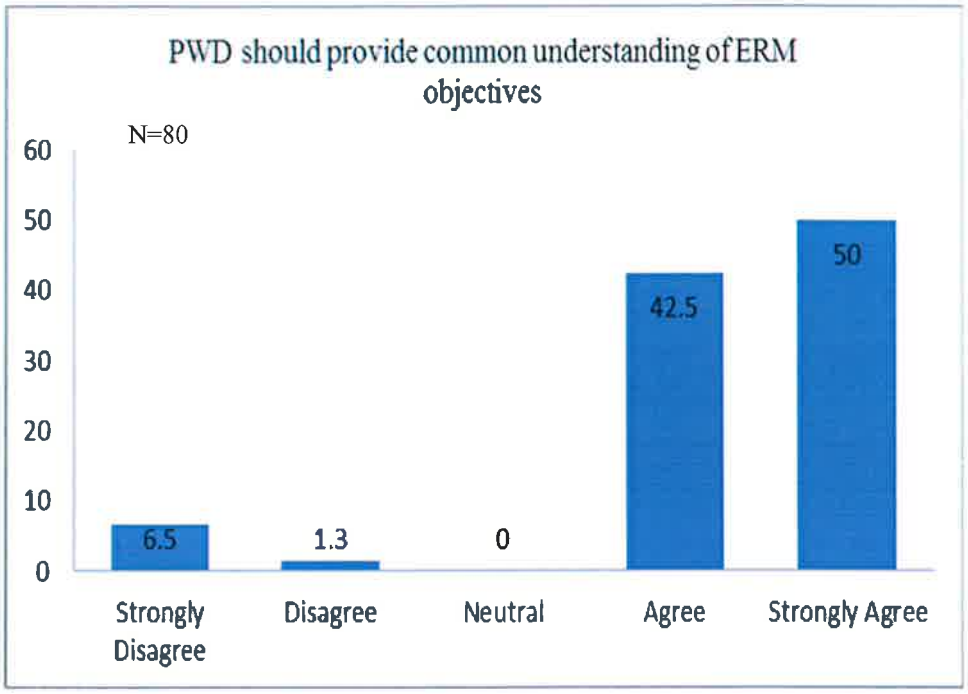

Figure 4.12: PWD should provide common understanding of ERM objectives

Among the four perceptions under ERM definition and philosophy, the highest percentage was the perception that PWD should develop clear definition and objectives on ERM. Further analysis was done using the descriptive analysis to rank the perceptions. The analysis also obtains the standard deviation value. If the standard deviation values are all less than 1.0, it will represent a small variability in the data and consistency agreement among the respondents. Table 4.7 tabulates the descriptive analysis of the perception on ERM definition and philosophy.

Table 4.7: Descriptive analysis of the perception on ERM definition and philosophy

	N	Minimum	Maximum	Mean		Std. Deviation
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic
C1.1	80	1.00	5.00	4.5000	.07754	.69355
C1.2	80	1.00	5.00	3.9500	.11920	1.06617
C1.3	80	1.00	5.00	4.2500	.11321	1.01258
C1.4	80	1.00	5.00	4.3418	.10487	.93213
Valid N (listwise)	80					

The results in Table 4.7 indicates the perception on ERM definition and philosophy is by giving more attention on developing a clear definition and objective as it gives the highest mean value of 4.500. Nevertheless, the results showed a very low perception on aligning the ERM definition with the standard definition as the mean value is 3.950. The foundation of ERM is built on the internal control processes and monitoring which may be differ, due to different business characteristic and risks for each organization. Thus, in the ERM proposed guideline, PWD had referred to the definition of risk management to align accordingly with the international standard of MS ISO 31000:2010.

To initiate the ERM framework which consists of the elements above entails a need to designate a senior-level position responsible for ERM and appointing a person to fill the position. This responsibility should be under the Chief Risk Officer (CRO). The CRO and ERM business function are distinct roles within the organization. CRO should unequivocally have the responsibility for ERM, which it is very important to understand the definition and overall objectives of ERM in order to streamline and create an effective ERM function (Utter, 2005). One of the important roles of CRO is to communicate and coordinate efforts within the main core business of PWD in order to have a streamlined and effective ERM function.

4.5.2.2 ERM Governance

The governance in ERM can be defined as the relationship between the organization's management with its board and stakeholders. The relationship recognizes corporate governance which provides the structure through the objectives of the organization, and the means of attaining those objectives and monitoring performance are determined (OECD, 2011). Based on the definition, the perception of ERM governance in PWD was developed as per Table 4.8.

Table 4.8: ERM Governance

Label	Description	Percentage
C2.1	PWD should establish a clear Enterprise Risk Management framework for the department	96
C2.2	PWD should establish strong Enterprise Risk Management structure	95
C2.3	PWD should establish a dedicated Enterprise Risk Management team	89
C2.4	PWD should establish a clear role and responsibilities for each risk position in the ERM structure	95
C2.5	PWD should developed an integration between ERM and PWD strategic framework	94

C2.1 represents the perception of PWD should establish a clear ERM framework for the department. The framework must be suitable for the department to ensure it can be implemented at every level in the department. Figure 4.13 describes that 77 respondents or 96 percent totally agree and strongly agree with the perception PWD should establish a clear ERM framework for the department. PWD had referred to AS/NZ 4360 – Risk Management in order to establish the ERM Framework.

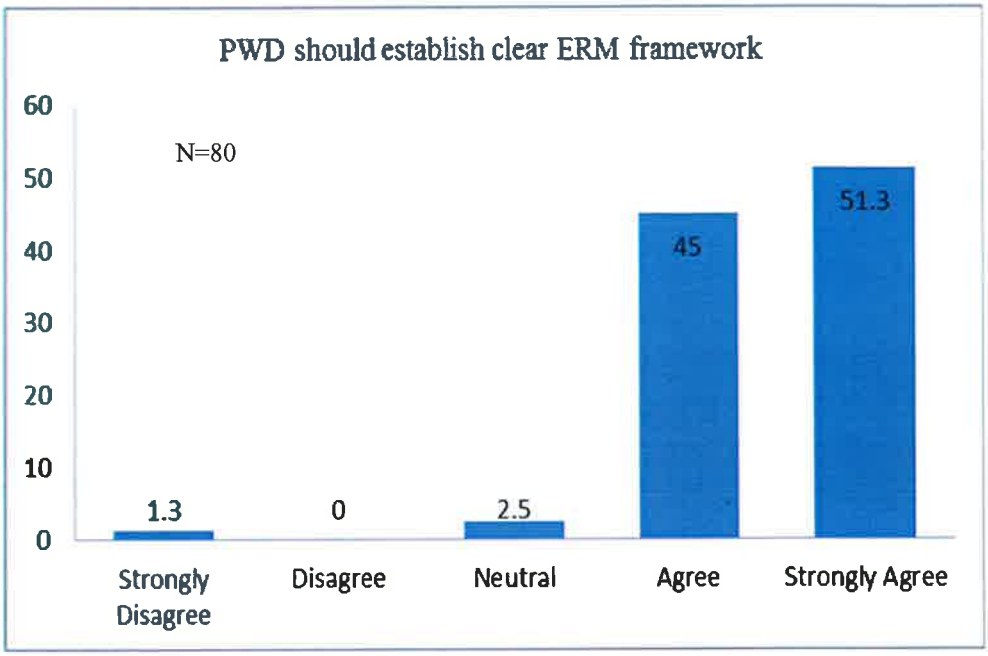

Figure 4.13: PWD should establish clear ERM framework

C2.2 represents the perception that PWD should establish a strong ERM structure. Figure 4.14 indicates that 76 respondents or 95 percent totally agrees and strongly agree on the perception that PWD should establish a strong ERM structure. To provide strong backing for its ERM effort, an organization should consider creating a senior-level Risk Management Committee or Working Group as the vehicle through which the designated risk leader can implement the ERM initiative (COSO, 2011). In the governance structure for PWD, there are three committees to overview the ERM initiative: Risk Management Steering Committee, Executive Risk Management Committee and Operational Risk Management Committee.

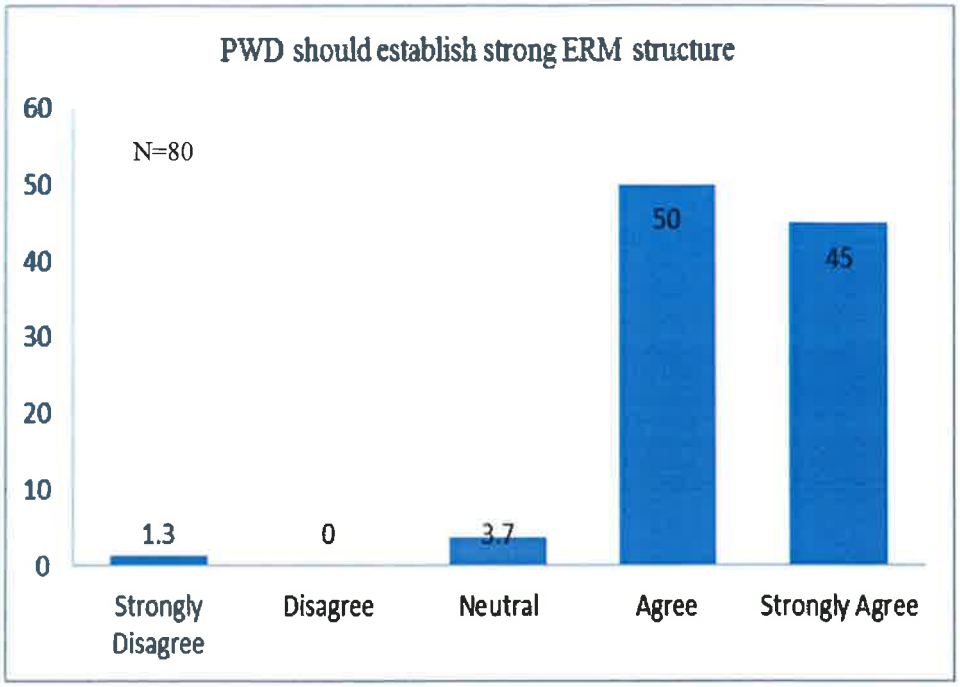

Figure 4.14: PWD should establish strong ERM structure

C2.3 represents the perception that PWD should establish a dedicated ERM team. Figure 4.15 indicates that 71 respondents or 89 percent totally agree and strongly agree with this perception. ERM in PWD is still in its formative level where a lot of programs need to be steered especially to increase the awareness of ERM in the department. The dedicated team to promote ERM in PWD was Risk Management Unit. The role to be played by the unit is essential as their responsibilities include, but are not limited to: managing the top-level risks, supporting each branch and states' PWD in their risk management operations, and providing training on policies, procedures, tools, and resources.

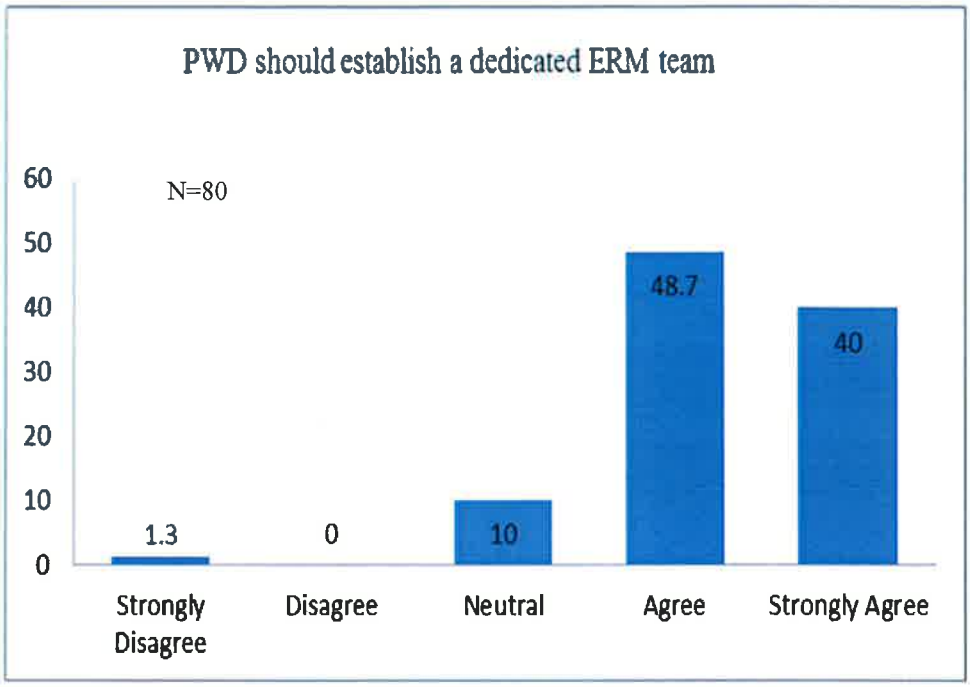

Figure 4.15: PWD should establish a dedicated ERM team

Figure 4.16 indicates the perception that PWD should establish a clear role and responsibilities for each risk position in the ERM structure. The figure shows that 76 respondents or 95 percent totally agree and strongly agree with the perception. With clear roles and responsibilities of each risk position, it will ensure the risk management process are firmly embedded within the department's core business activities as it will receive the appropriate attention and support from others. Therefore, it can be very useful in building and communicating the risk culture across the organization. The role and responsibilities for each position in PWD's ERM structure has been established in the guideline and the information needs to be circulated throughout the department.

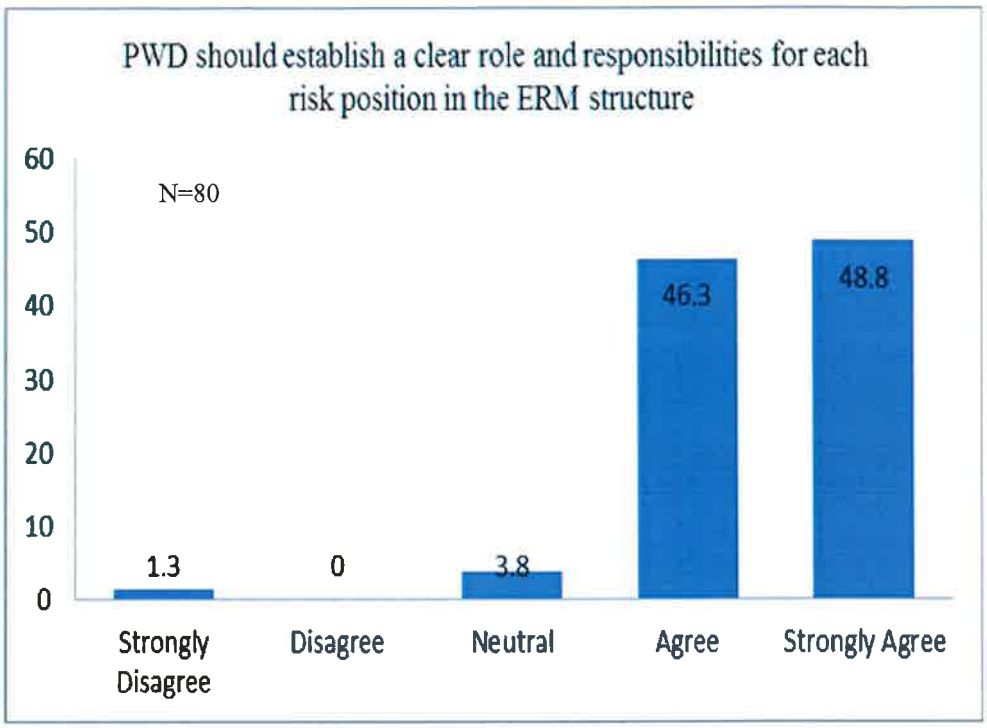

Figure 4.16: PWD should establish a clear role and responsibilities for each risk position in the ERM structure

C2.5 represents the perception that PWD should develop integration between ERM and PWD's strategic framework. Figure 4.17 indicates that 75 respondents or 94 percent totally agree and strongly agree with the perception. ERM is an initiative that applies across the department. Therefore, ERM cannot be viewed or implemented as a stand-alone staff function or unit outside the department strategic objectives. The strategic objective for PWD was developed by the department core business which entailed the development of the strategic framework.

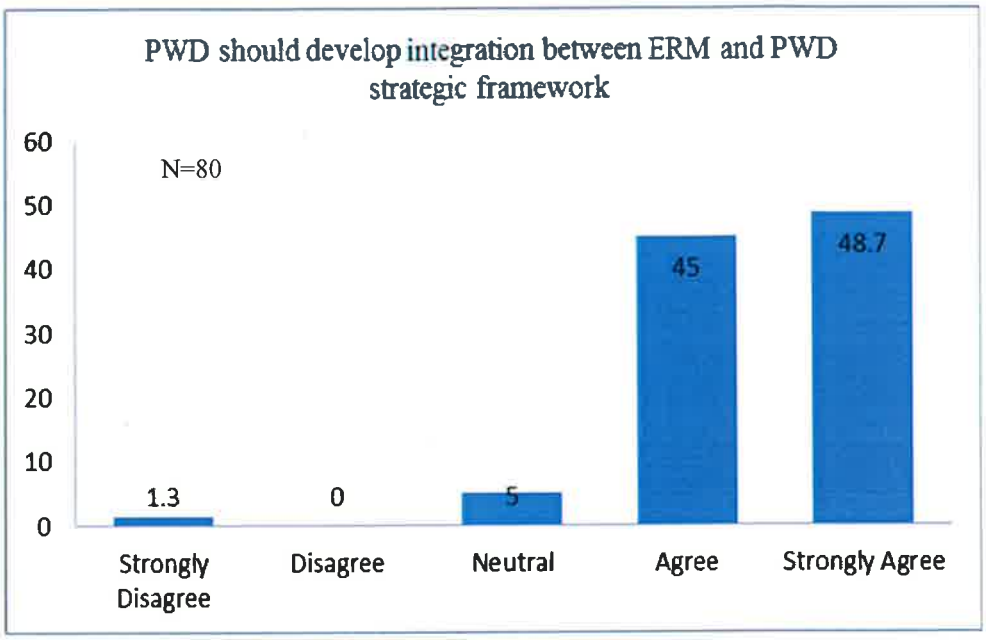

Figure 4.17: PWD should develop integration between ERM and PWD strategic framework

Among the five perceptions for ERM governance, the highest percentage was for the perception that PWD should establish clear ERM framework for the department. Further analysis was done using the descriptive analysis to rank the perceptions. The analysis also obtained the standard deviation value. If the standard deviation values are all less than 1.0, it will represent a small variability in data and consistency agreement among the respondents. Table 4.9 tabulated the descriptive analysis of the perception on ERM governance.

Table 4.9: Descriptive analysis of the perception on ERM governance

	N	Minimum	Maximum	Mean		Std. Deviation
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic
C2.1	80	1.00	5.00	4.4500	.07526	.67317
C2.2	80	1.00	5.00	4.3750	.07626	.68205
C2.3	80	1.00	5.00	4.2625	.08295	.74194
C2.4	80	1.00	5.00	4.4125	.07691	.68794
C2.5	80	1.00	5.00	4.3875	.08247	.73766
Valid N (listwise)	80					

From the descriptive analysis, the highest mean value of 4.450 was for the perception that *PWD should establish clear ERM framework for the department.* PWD had chosen AS/NZ 4360 as the basis to develop the department's ERM framework. The standard was referred to because it can be applied at all stages in the life of an activity, function, project, product or asset which is parallel with PWD's core business in project, asset management and function as technical expertise. Nevertheless, the standard provides maximum benefit which is usually obtained by applying the risk management process from the beginning. The standard will guide PWD to achieve better ERM implementation by providing a more confident and rigorous basis for decision-making and planning, better identification of opportunities and threats, better corporate governance and improve stakeholders confidence and trust.

4.5.2.3 Risk Identification and Responses

Risk identification is a process to determine the possible risks in the organization. By doing risk identification, the organization will be able to study the activities and places where the resources of risks are exposed (Wiliams *at al.*, 1998). For the perception of risk identification and response, the description was tabulated in Table 4.10.

Table 4.10: Risk identification and response

Label	Description	Percentage
C3.1	PWD should increase the department efficiency to risk identification	90
C3.2	PWD should established types of risk which may affect reputation and performance	97
C3.3	PWD should align the risk incident to type of risk	93
C3.4	PWD should establish suitable alternatives of risk responses. Eg: Avoidance, Mitigation, Sharing or Acceptance	95
C3.5	PWD should established suitable treatment for each risk incident	96

Figure 4.18 indicate that 72 respondents or 90 percent totally agree and strongly agree with the perception referred to in C3.1 which is PWD should increase the department's efficiency in risk identification. Correct risk identification will lead to effectiveness of risk management. Risk identification will be the basis for the next step in risk management: analysis and control of risk (Tchankova, 2002). For PWD, the efficiency in risk identification can be done by implementing various risk identification methods such as brainstorming, root cause analysis, among others. The risk identification methods will allow PWD to investigate the department's activities in all directions and at managerial levels.

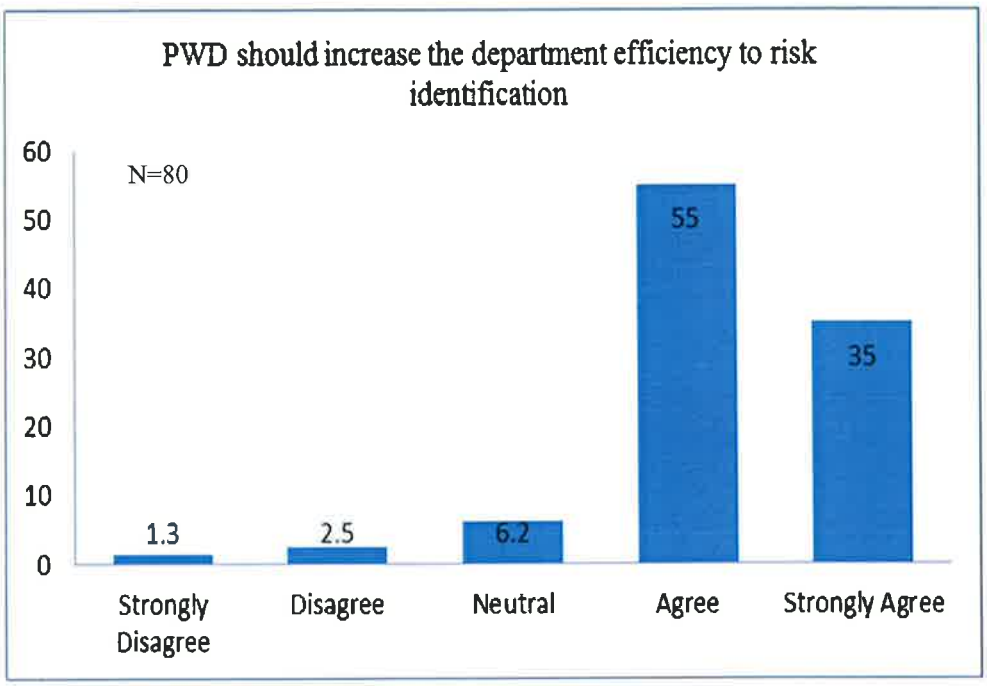

Figure 4.18: PWD should increase the department efficiency to risk identification

C3.2 was the perception that PWD should establish types of risk which may affect reputation and performance. Figure 4.19 indicates 78 respondents or 97 percent totally agree and strongly agree that PWD should establish types of risk which may affect reputation and performance. PWD had identified the risks which may occur in different levels in the organization both at the Department and Branch, State PWD or the Special Projects Unit. The risks that are related to the department are human, legal, reputational, financial and operational risks.

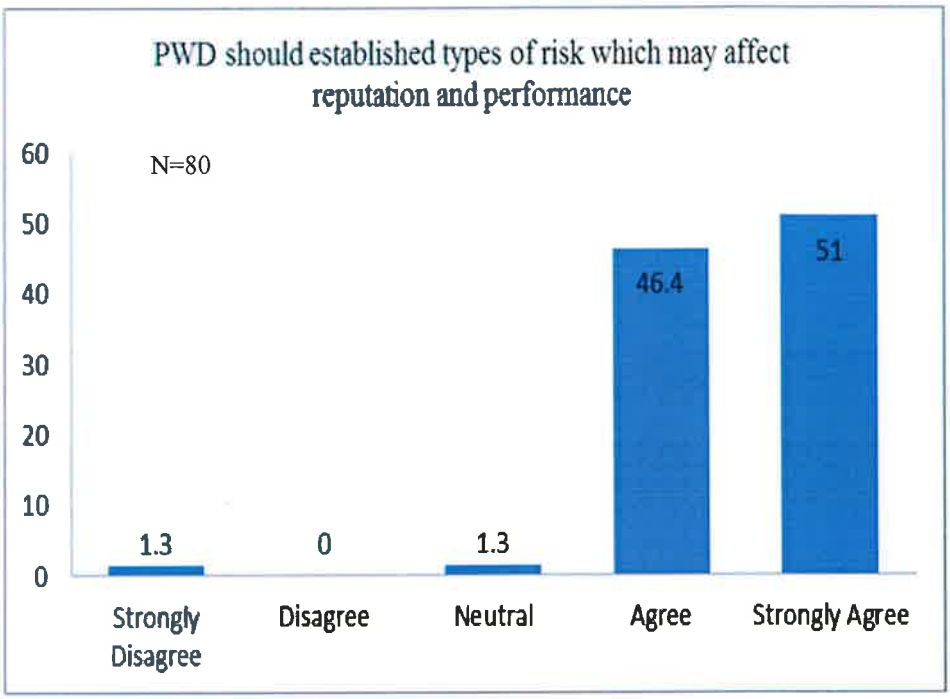

Figure 4.19: PWD should established types of risk which may affect reputation and performance

Figure 4.20 indicates C3.3 the perception PWD should align the risk incident to type of risk where 75 respondents or 93 percent totally agree and strongly agree with the perception. The risk incident needs to be grouped under the risk which had been identified earlier as the risk needs to be investigated in order to evaluate the existing controls. The evaluations were done by comparing the estimated levels of risk against the pre-established criteria and consider the balance between potential benefits and adverse outcomes. This enables decisions to be made about the extent and nature of treatments required and the priorities of such treatment.

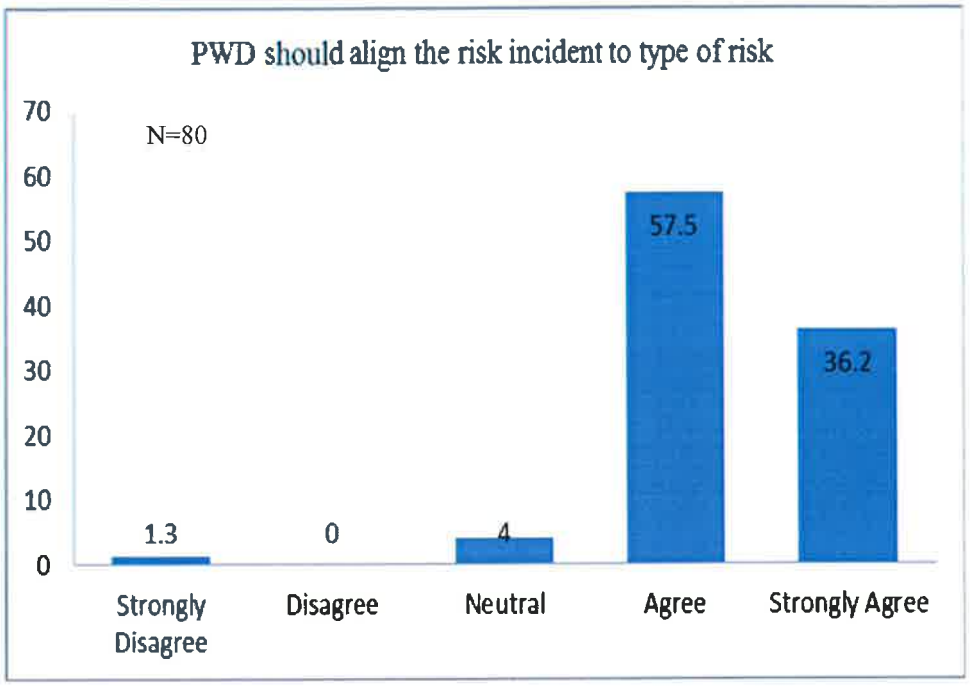

Figure 4.20: PWD should align the risk incident to type of risk

C3.4 establishes the perception PWD should establish suitable alternatives of risk responses. This is the process where risk treatment need to be identified and developed. Figure 4.21 indicates that 76 respondents or 95 percent totally agree and strongly agree with the perception. The alternatives of risk responses can be done by accepting, mitigating, reducing, avoiding or transferring the risk. For example, if the risk was treated by accepting the risk, probable steps that can be taken are: it can increase the price of the product to absorb the potential cost of the risk, self-insure, or plan on the risk by setting up reserves.

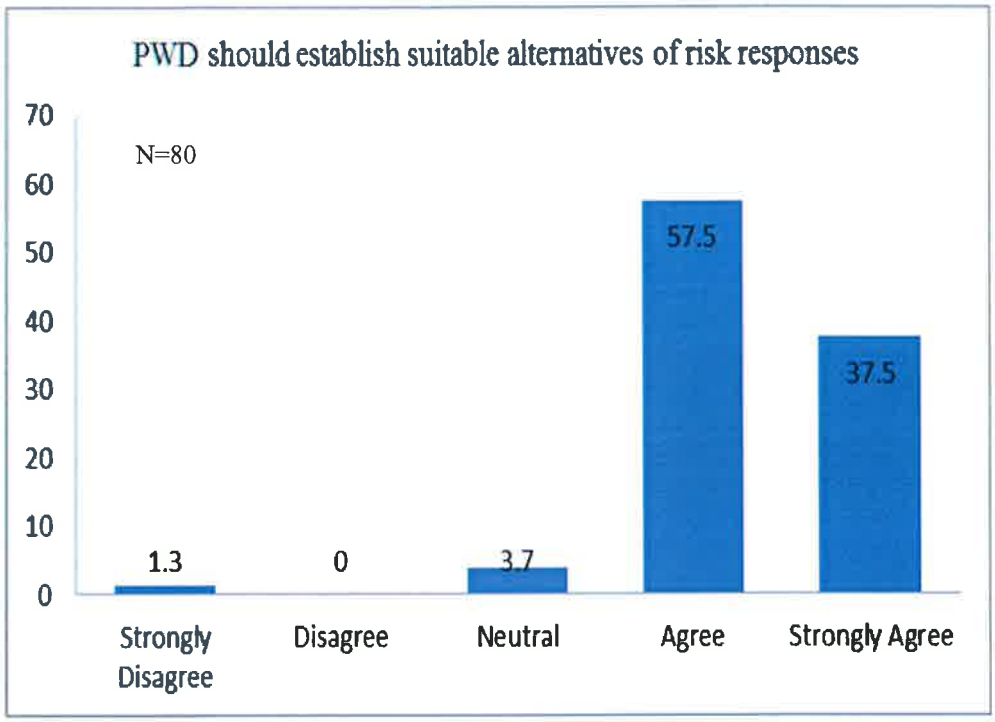

Figure 4.21: PWD should establish suitable alternatives of risk responses

C3.5 indicates the perception that PWD should establish a suitable treatment for each risk incident. Figure 4.22 showed that 77 respondents or 96 percent totally agree and strongly agree with the perception. After the treatment had been identified, there should be a plan action to initiate the treatment. The plan needs to be executed and monitored to ensure the risks can be treated according to the expected outcome.

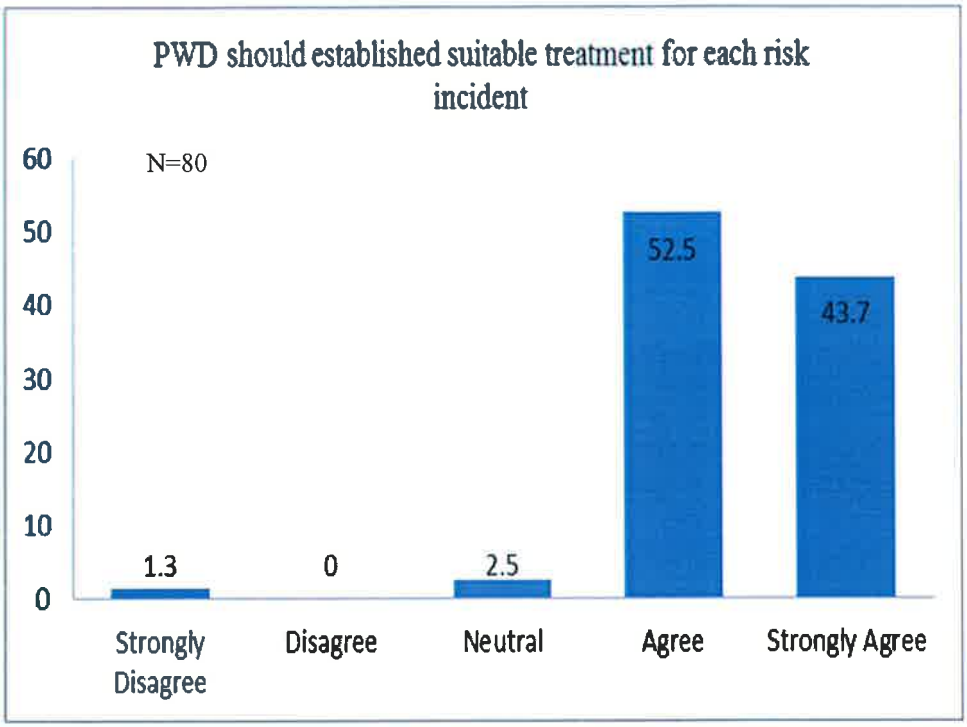

Figure 4.22: PWD should established suitable treatment for each risk incident

Among the five perceptions for the ERM governance, the highest percentage was for the perception that PWD should establish the types of risk which may affect PWD's reputation and performance. Further analysis was done using descriptive analysis to rank the perceptions. The analysis also obtains the standard deviation value. If the standard deviation values are all less than 1.0, it will represent a small variability in data and consistency agreement among the respondents. Table 4.11 tabulated the descriptive analysis of the perception on risk identification and responses.

Table 4.11: Descriptive analysis of the perception on risk identification and responses

	N	Minimum	Maximum	Mean		Std. Deviation
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic
C3.1	80	1.00	5.00	4.2000	.08605	.76968
C3.2	80	1.00	5.00	4.4625	.07323	.65495
C3.3	80	1.00	5.00	4.2750	.07542	.67458
C3.4	80	1.00	5.00	4.3000	.07420	.66371
C3.5	80	1.00	5.00	4.3750	.07415	.66323
Valid N (listwise)	80					

Table 4.11 tabulated that C3.2 perception *PWD should establish the types of risk which may affect reputation and performance* had the highest mean value of 4.462. As PWD has just started with ERM, the department should focus on risks that can be managed and are related to the department's objectives. This approach will keep the ERM initiative in focus to those strategic risks that are deemed critical to achieve its strategic business objectives. Focusing on manageable number of risks would be beneficial especially in developing related processes such as monitoring and reporting. This focused approach also keeps the developing ERM processes simple and lends itself to subsequent incremental steps to expand the risk.

4.5.2.4 ERM Effective Communication

Getting communication right is vital to making change happen inside organisations. Therefore, the respondents were asked about their perception on ERM effective communication, which covers three elements: PWD should provide clear information of the types and risk incident which are relevant to the organization, PWD should provide clear information on roles and responsibility in ERM structure to officers in the organization and PWD should establish open communication channels to facilitate top-down and bottom-up communication on ERM. Table 4.12 refers to the elements of each category which are labeled accordingly for analysis purposes.

Table 4.12: ERM Effective Communication

Label	Description	Percentage
C4.1	PWD should provide clear information of types and risk incident which relevant to the organization	95
C4.2	PWD should provide clear information on roles and responsibility in ERM structure to officers in the organization	95
C4.3	PWD should establish open communication channel to facilitate top-down and bottom-up communication on ERM	96

C4.1 refers to the perception that PWD should provide clear information of types and risk incident which are relevant to the organization. Figure 4.23 indicates that 76 respondents or 95 percent totally agree and strongly agree with the perception that PWD should provide clear information of the risks which are related to PWD. With such information, each level in the department will understand the risks which could hinder the progress to achieve the strategic objectives. Therefore, risk management activities should be expanded and not only limited to training and courses only.

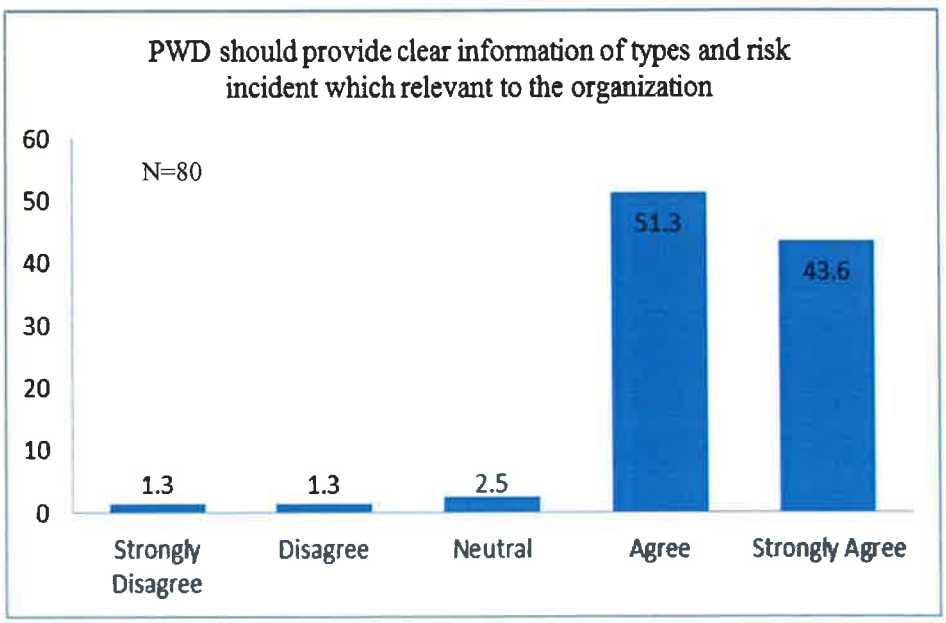

Figure 4.23: PWD should provide clear information of types and risk incident which relevant to the organization

C4.2 represented the perception that PWD provide clear information on roles and responsibility in ERM structure to officers in the organization. Figure 4.24 indicates that 76 respondents or 95 percent totally agree and strongly agree with the perception. With clear information on the roles and responsibilities of the ERM governance structure, the decision making process can be done effectively. As each level in the department will be managing the risks, there should be a platform or committee to escalate the risk which cannot be managed especially at the operational level. The information on roles and responsibilities in the risk structure will develop supportive action from others.

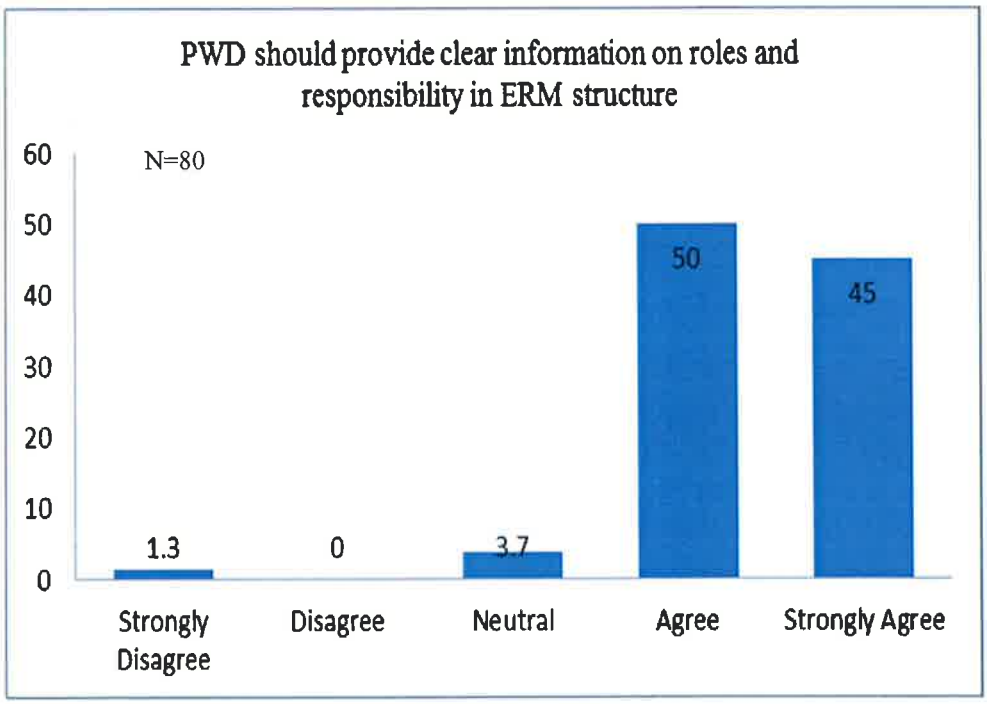

Figure 4.24: PWD should provide clear information on roles and responsibility in ERM structure

Figure 4.25 indicates 77 respondents or 96 percent totally agree and strong agree with the perception that C4.3 PWD should establish open communication channel to facilitate top-down and bottom-up communication on ERM. The perception on open communication is really important as to be successful ERM programs must break down the "silos" that have been erected in communication. Open communication will ensure all members in the department understand their roles and responsibility in regard to the risk. Open communication between top-down

and bottom-up will improve the cooperation, resource constraints and encourage ERM culture within the department.

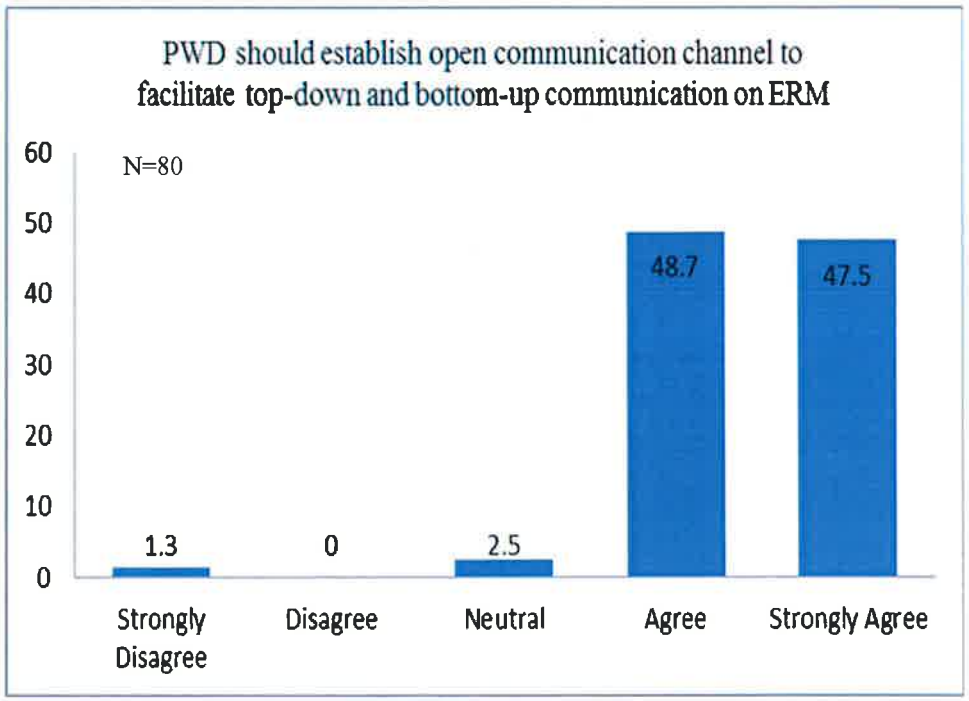

Figure 4.25: PWD should establish open communication channel to facilitate top-down and bottom-up communication on ERM

Further analysis was done to determine the perception of ERM effective communication. From the three perceptions the highest percentage was for the perception that PWD should establish open communication channel to facilitate top-down and bottom-up communication on ERM. Further analysis was done using the descriptive analysis to rank the perceptions. The analysis also obtains the standard deviation value. If the standard deviation values are all less than 1.0, it will represent a small variability in data and consistency agreement among the respondents. Table 4.12 tabulates the descriptive analysis of the perception on ERM effective communication

Table 4.13: Descriptive analysis of perception on ERM Effective Communication

	N	Minimum	Maximum	Mean		Std. Deviation
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic
C4.1	80	1.00	5.00	4.3500	.07975	.71334
C4.2	80	1.00	5.00	4.3750	.07626	.68205
C4.3	80	1.00	5.00	4.4125	.07483	.66929
Valid N (listwise)	80					

Table 4.13 tabulates that C4.3 perception *PWD should establish open communication channel to facilitate top-down and bottom-up communication on ERM* had the highest mean value of 4.412. As PWD just started with ERM, open communication is important to enhance understanding of the development process of ERM programs in the department including timelines, phasing, procedural requirements, and potential obstacles. Therefore, it will leverage the strategic planning and performance measurement. The open communication in PWD will establish a culture of risk management that extends to all employees within the department at all levels.

4.5.3 Research Objective 2

The second objective of the study is to identify the key success factors and challenges to implement ERM in PWD. Referring to the literature reviews from the previous chapter, the success factors and challenges to implement ERM in PWD can be summarized into four (4) categories: Culture, Top Management, Organization Structure and Communication. Based on the categories, there are eleven variables which can possibly ensure the success of the program. Meanwhile, to determine the challenges in implementing ERM in PWD, there are eight variables which can possibly hinder the success of ERM in PWD. The success factors and challenges discussed were based on the perception of 80 respondents earlier by undergoing crosstabs analysis. Then, for each element, the average value, standard deviation and the standard error mean was obtained for each variable.

4.5.3.1 Key Success Factors to implement ERM in PWD

The success factor may distinct as the limited number of areas in which results, if they are satisfactory, will ensure successful competitive performance for the organization (Rochart, 1979). The implementation of ERM cannot guarantee that it is enough to protect the organization from system-wide failures. It is important for the organization to keep the competitiveness and effectiveness. The key to successful enterprise risk management practices depends on the behavioral attributes of the organization at all levels (RIMS, 2009).

The success factors to implement ERM in PWD will be looked at for four (4) categories: Culture, Top Management, Organization Structure and Communication. Table 4.14 refers to the elements of each category were labeled accordingly for analysis purposes.

Table 4.14: Key Success Factors to Implement ERM in PWD

Label	Category	Description	Percentage
D1.1	Culture	Instilled strong and effective ERM culture in PWD	92
D1.2	Top management	Strong support from the top management	95
D1.3	Organization Structure	Clear ERM definition	96
D1.4	Organization Structure	Clear ERM objectives	96
D1.5	Organization Structure	Strong ERM policies, procedure and internal control	94
D1.6	Organization Structure	Integrate ERM with PWD's strategic framework	91
D1.7	Organization Structure	Integrate ERM with branch/ states business plan	91
D1.8	Organization Structure	Integrate ERM with department KPI (performance)	84

Table 4.14: Key Success Factors to Implement ERM in PWD (cont'd)

Label	Category	Description	Percentage
D1.9	Communication	Introduce ERM as main agenda in departmental meeting	79
D1.10	Communication	Promote high involvement of officers in ERM development	91
D1.11	Organization Structure	Allocate appropriate resources (budget, human resources, technology etc.) to support ERM in PWD	87

D1.1 refers to instilled strong and effective ERM culture in PWD as the key success factor. Figure 4.26 indicates 92 percent of the respondents totally agree and strongly agree - instilled strong and effective ERM culture. This shows that PWD need to cultivate risk management at each level in the department by embedding risk as a culture in the day-to-day operations of the department.

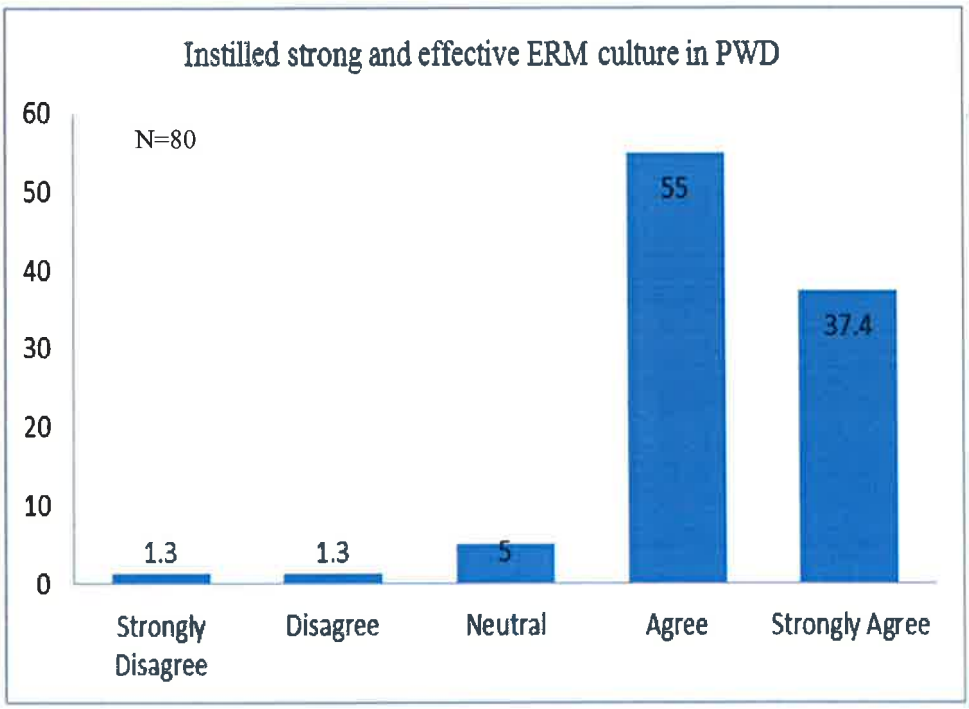

Figure 4.26: Instilled strong and effective ERM culture in PWD

Figure 4.27 exhibits D1.2, which refer to the strong support from the top management. The top management support may include, but not be limited to a

broad range of activities in an organization, including developing risk management procedures starting from initiation stage, training programs and so on. The same figure indicates that 95 percent of the respondents totally agree and strongly agree, in their perception choose strong support from the top management. The top management formulates and decides objectives and strategies for organizational risk management activities, mission and overall objectives (Henriksen and Uhlenfeldt, 2006).

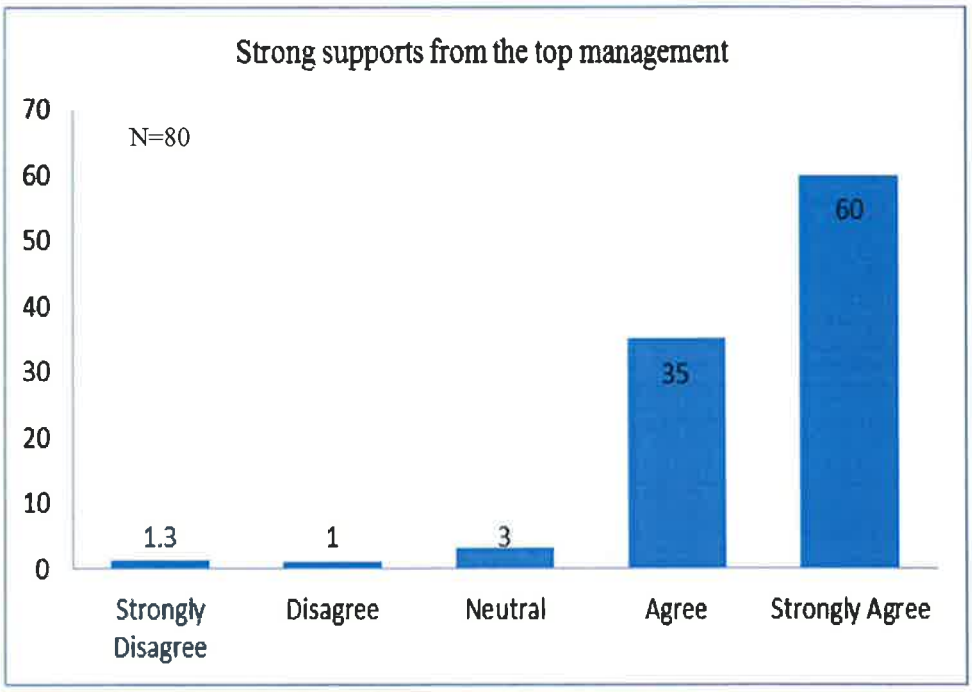

Figure 4.27: Strong supports from the top management

Figure 4.28 exhibited D1.3, which refer to clear ERM definition as the key success factor to implement ERM in PWD. The figure indicated 77 respondents or 96 percent totally agree and strongly agree that clear definition of ERM will be the success factor to implement ERM. The definition of ERM within PWD context is referred to as an establishment of a control system to manage the risks that may affect the performance of the department to provide world-class services and become the centre of excellence in project management, asset management and engineering services (PWD, 2012).

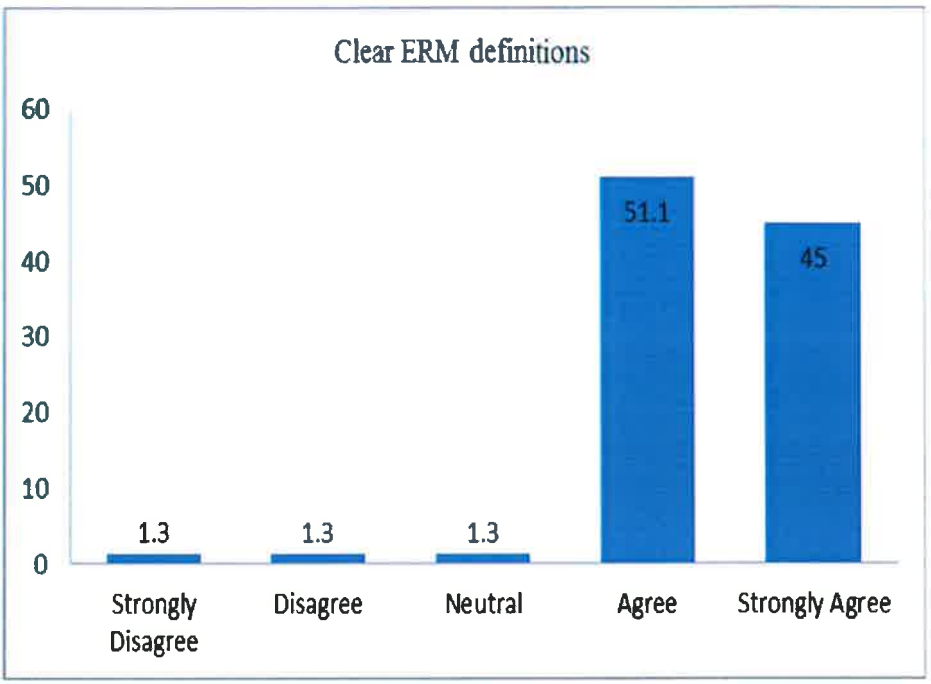

Figure 4.28: Clear ERM definitions

Figure 4.29 exhibits clear ERM objectives as the key success factor to implement ERM in PWD. ERM ensure that the objectives defined are aligned with the department's mission. Without clear objectives, it is impossible to identify any potential event that may affect the achievement of the objectives. From the figure, it showed that 77 respondents or 96 percent totally agree and strongly agree with the statement. Referring to the ERM definition within PWD context, the objective of the department is to provide world class services and become the centre of excellence to the clients in three core business of the department - project management, asset management and engineering services. Hence it is important to reinstate the ERM objective to ensure the uncertainties will not jeopardize PWD achieving its objectives.

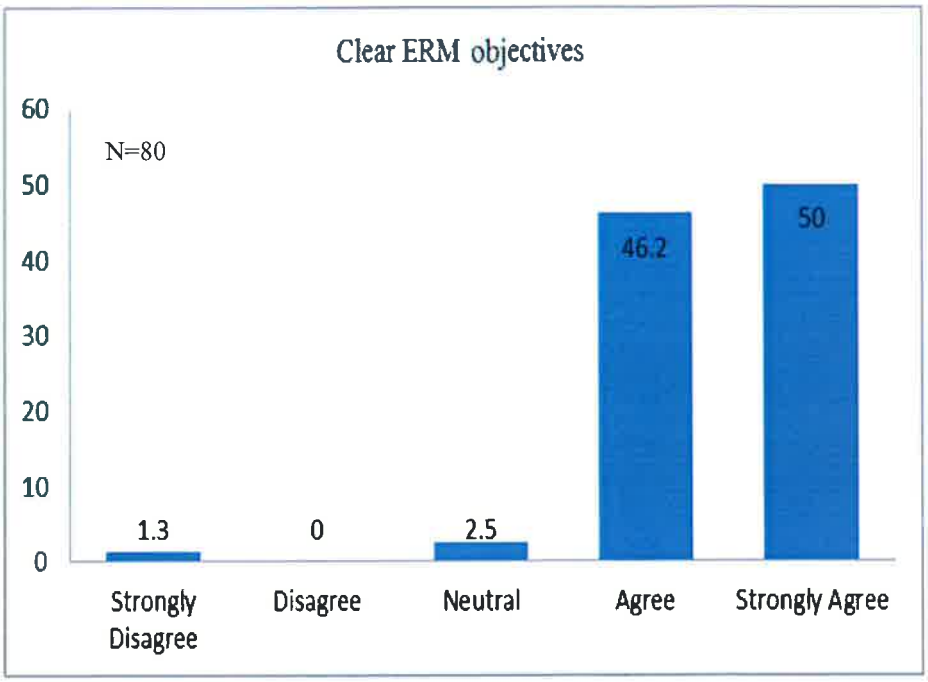

Figure 4.29: Clear ERM objectives

Figure 4.30 indicates 75 respondents or 94 percent totally agree and strongly agree that strong ERM policies, procedure and internal control would be the success factor to implement ERM in PWD. The policies, procedure and internal control were embedded with the ERM definition and the objectives.

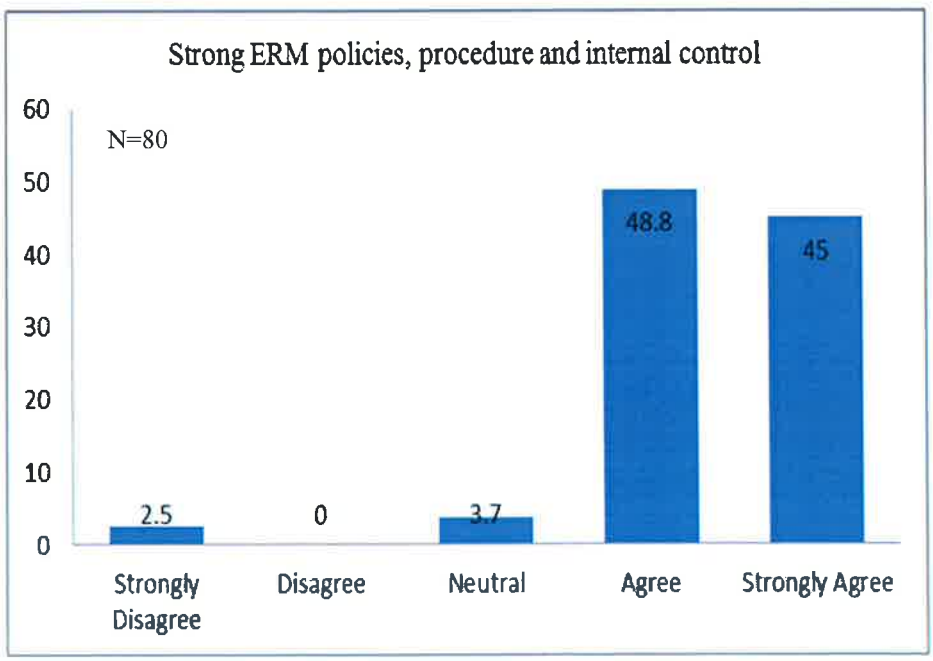

Figure 4.30: Strong ERM policies, procedure and internal control

The ERM definition within PWD's context is embedded with the department strategic framework. The strategic framework defines the direction of PWD in project management, asset management and giving technical expertise. Figure 4.31 shows that 73 respondents or 91 percent totally agree and strongly agree that integrates ERM with PWD's strategic framework will be the success factor to implement ERM in the department.

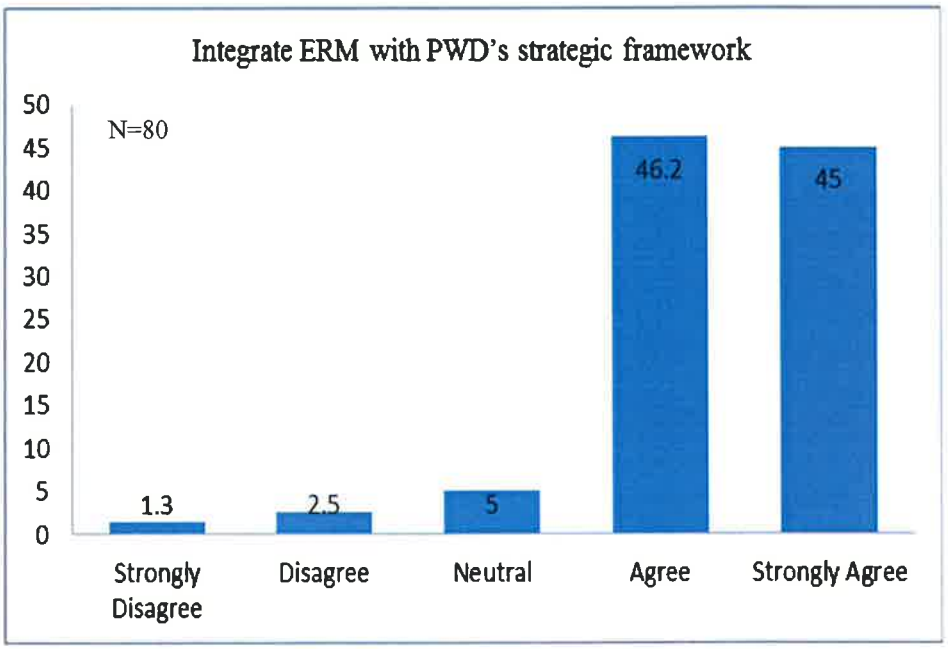

Figure 4.31: Integrate ERM with PWD's strategic framework

For each branch and PWD's state, they were encouraged to develop their business plan which is embedded together with the strategic framework. Hence, there will be risks in order to achieve the target business plan. Figure 4.32 indicates the same results as the previous figure. 73 respondents or 91 percent totally agree and strongly agree to integrate ERM with each branch or PWD's state business plan.

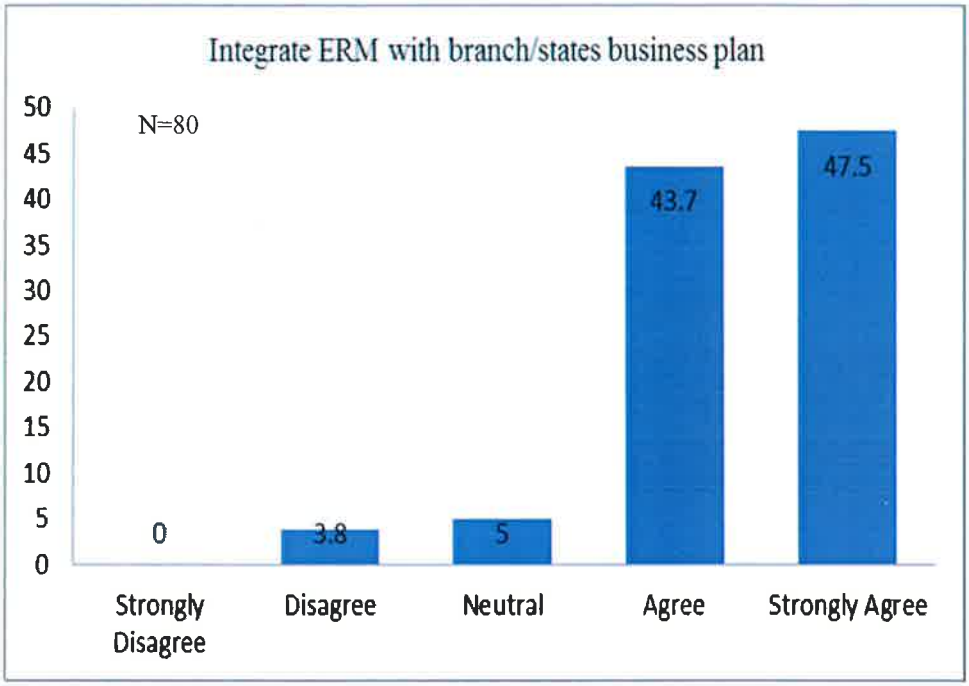

Figure 4.32: Integrate ERM with branch/states business plan

Figure 4.33 indicates 67 respondents or 84 percent totally agree and strongly agree that integrate ERM with department KPI (performance) would be the key success factor to implement ERM in PWD. KPI's of an organization can be viewed by four different perspectives: financial, customers, internal business process and learning and growth; which integrate with the department vision and strategy. Significantly, the results showed a low degree of agreement of the factor among the respondents. Hence, it relatively showed the perception that ERM was a separate initiative from the KPI. Eventually ERM had its role to achieve the KPIs by providing a control measure to reduce the uncertainties within the perspectives.

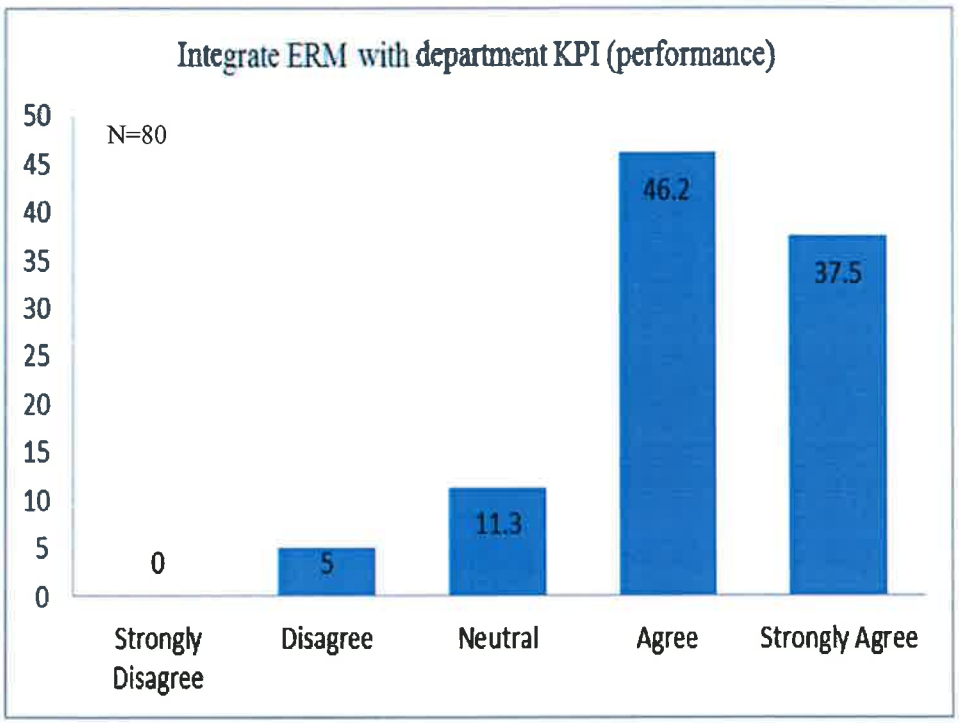

Figure 4.33: Integrate ERM with department KPI (performance)

ERM should be a continuous activity by providing leverage communication. In PWD, meetings are one of the effective communication tools. Nevertheless, Figure 4.34 shows that 63 respondents or 79 percent totally agree and strongly agree that introducing ERM as the main agenda in the meeting would be the key success factor to implement ERM in PWD. Thus, to review the progress of the initiative, meetings should be an appropriate tool. As ERM is still new in PWD, issues regarding with risks may be separately conducted in a meeting solely to discuss risk management. In the future, it can be included as one of the main agenda to monitor and report the progress of the strategic objectives.

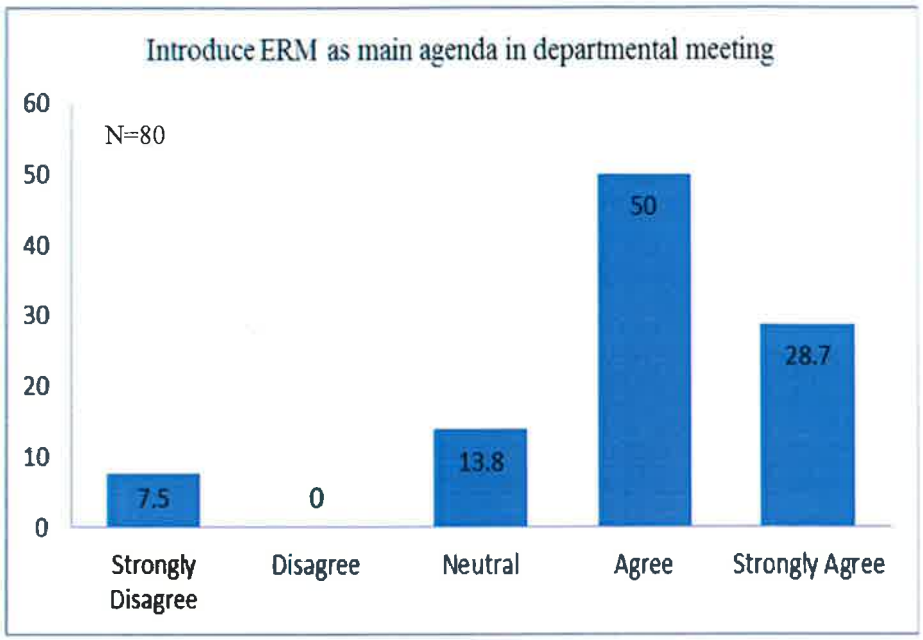

Figure 4.34: Introduce ERM as main agenda in departmental meeting

Figure 4.35 indicates that 73 respondents or 91 percent totally agree and strongly agree that promoting high involvement of officers in ERM development, the success factor to implement ERM in PWD. The involvement of officers in ERM development was not limited to developing the initiative; it will involve the participation in other activities such as training and education programs.

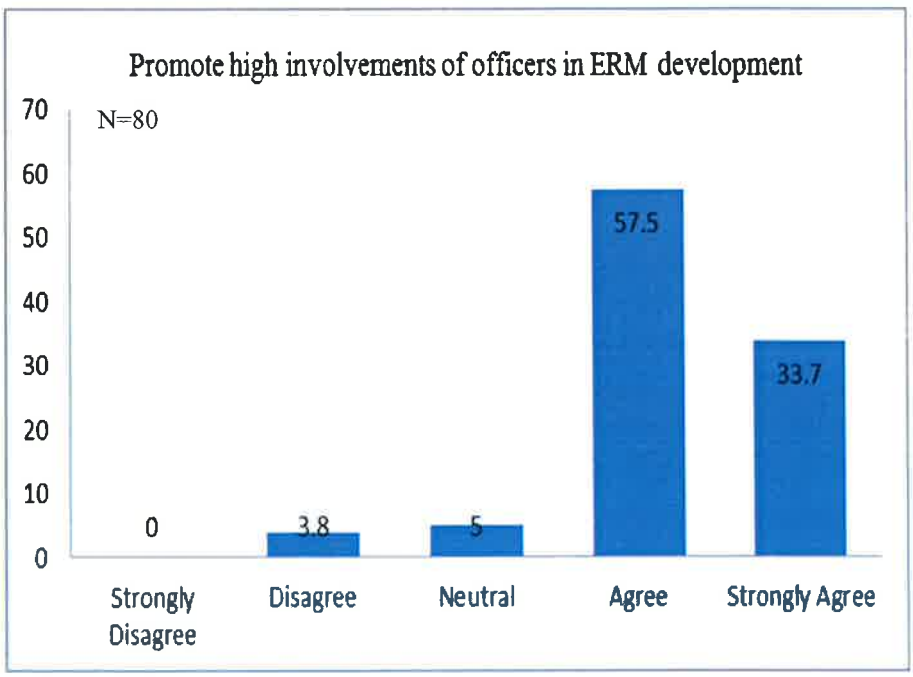

Figure 4.35: Promote high involvements of officers in ERM development

Figure 4.36 indicates that 87 percent or 70 of the respondents totally agree and strongly agree that allocating appropriate resources is the success factor to implement ERM in PWD. To increase the awareness of ERM in PWD the allocation of sufficient budget, technical resources and human capital is greatly needed. The appropriate resources will assist in creating awareness and educational programs on ERM in PWD.

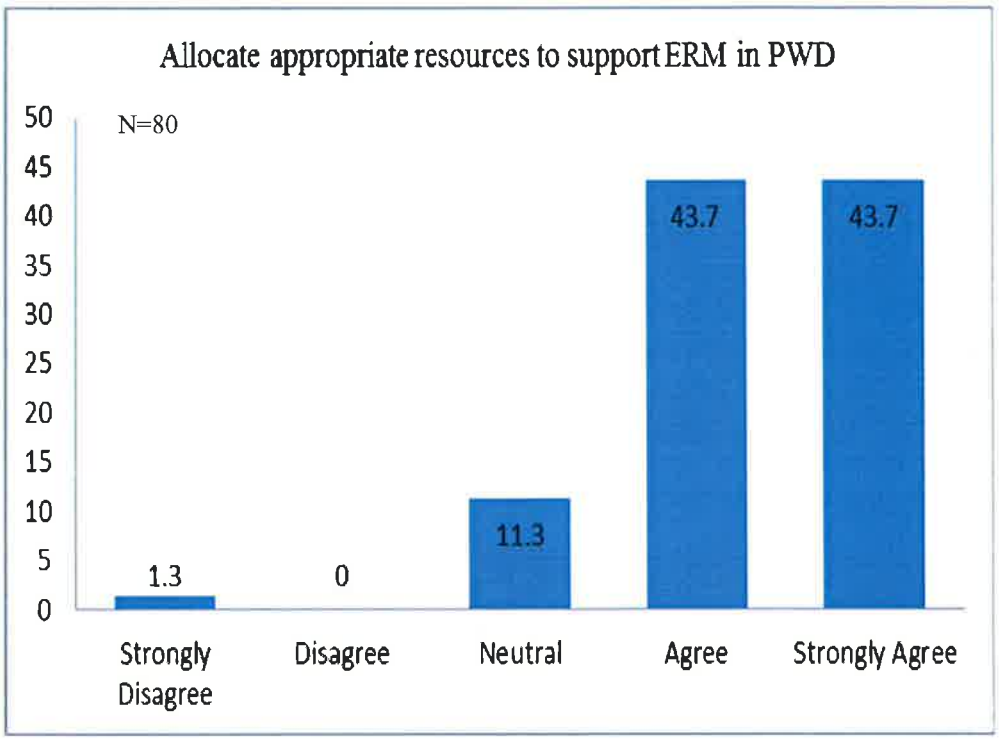

Figure 4.36: Allocate appropriate resources to support ERM in PWD

Based on the frequency analysis conducted, the preferred key success factor to implement ERM in PWD was chosen among factors which received at least 90 percent answers of totally agree and strongly agree from the selected respondents: strong support from the top management, clear ERM definition, clear ERM objectives, integrate ERM with PWD's strategic framework, establish strong ERM policies, procedure and internal control, integrate ERM with with branch/states business plan and promotes high involvement of officers in ERM development.

Table 4.15 shows the descriptive analysis which displays the highest to the lowest mean of the key success factors to implementing ERM in PWD. The table

also indicated the standard error and the standard deviation values. If the standard error of all the means for each variable was small and fairly close to zero, it signifies that the chosen sample is an accurate reflection of all the population. Moreover, if the standard deviation values are all less than 1.0, it denotes a small variability in data and consistency agreement among the respondents.

From eleven factors, Table 4.15 indicates that *strong support from the top management* has the highest mean value of 4.482 compared to other elements; which refer to the highest degree of perception among the respondents. The same table also verified that D1.9: *Introduce ERM as main agenda in departmental meeting* was not the preferred success factor in the respondents' perception. It has the lowest mean value of 4.012 among other key success factors.

Table 4.15: Descriptive Analysis of key success factor to implement ERM (N=80)

	N	Minimum	Maximum	Mean		Std. Deviation
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic
D1.1	80	1.00	5.00	4.2529	.08046	.75048
D1.2	80	1.00	5.00	4.4828	.08784	.81927
D1.3	80	1.00	5.00	4.3678	.07861	.73318
D1.4	80	1.00	5.00	4.4253	.07604	.70928
D1.5	80	2.00	5.00	4.3563	.07665	.71491
D1.6	80	1.00	5.00	4.2989	.08669	.80860
D1.7	80	2.00	5.00	4.3218	.08416	.78495
D1.8	80	2.00	5.00	4.1609	.08936	.83351
D1.9	80	2.00	5.00	4.0115	.09320	.86930
D1.10	80	2.00	5.00	4.2184	.07913	.73809
D1.11	80	1.00	5.00	4.2644	.08874	.82771
Valid N (listwise)	80					

The respondents had identified strong support from the top management as the key success factor to implement ERM in PWD. In PWD, the top management consists of the Director General, three Deputy Director Generals and Directors in headquarters and PWD's States branches. The top management is representing the steering committee and executive committee level within the department. Generally

the responsibility of top management is to decide the direction and strategies for the department by looking at the overall objectives, mission and core businesses. Thus, support from top management plays a key role in influencing the success in almost any initiative within an organization (Hasanali, 2002).

PWD had proposed different sets of roles and responsibilities for the steering committee and the executive committee. The steering committee will be responsible to determine and set the strategic direction and policies of the department's risk management, monitor the performance and effectiveness of the ERM implementation and approve any amendments, if applicable, to the policy.. Meanwhile, the executive committee will be responsible for the development of the strategy and infrastructure for risk management department. The activities would include monitoring the implementation at branch and state level, escalating the risk to the steering committee and approving the risk documents and training programs for development (PWD, 2013).

Support from the top management is needed to get the right focus, resources and attention for ERM. Although it is not the job of the top management to manage ERM activities, they need to demonstrate clear support for the ERM initiative, as well as oversee what management has designed and implemented to manage top risk exposures. ERM must be enterprise wide, and it must be understood and embraced by its personnel, and driven from the top down through clear and consistent communication. It is the top management's responsibility to ensure that management is devoting the right attention and resources to ERM and is setting the right tone for ERM (COSO, 2011)

The result also indicates that *introduce ERM as main agenda in departmental meeting* has the lowest priority to be the key success factor to implement ERM in PWD. Introducing ERM in the meeting is part of monitoring and control, which is embedded with communication where reporting and feedback on the implementation and the impact on the department performance can be discussed. At the moment ERM in PWD has just started, thus introducing ERM in the departmental meeting as

one of the main agenda is probably appropriate to be as one of the monitoring and reporting tool for ERM performance in the future. Nevertheless, PWD need to establish a reporting system to ensure that the program is on the right track. At the same time, ERM need to be embraced and accepted fully in the department so that when personnel talks about enterprise risk, it will be discussed using the same language and understanding.

4.5.3.2 Challenges to implement ERM in PWD

The challenges to implement ERM in PWD were categorized under four (4) categories: Culture, Top Management, Organization Structure and Communication. In Table 4.16, the elements of each category were labeled accordingly for analysis purposes. Then each element for these categories will be analyzed using the frequency analysis and descriptive analysis.

Table 4.16: Challenges to implement ERM in PWD

Label	Category	Description	Percentage
D2.1	Top management	Lack of commitment from top management	70
D2.2	Top management	Lack of commitment from the officers	75
D2.3	Organization Structure	Lack of drivers to sustain ERM implementation	86
D2.4	Communication	Lack of understanding on ERM value to increase PWD reputation	86
D2.5	Communication	Lack of understanding on ERM value to increase PWD performance	87
D2.6	Communication	Lack of information on ERM across the department	88
D2.7	Organization Structure	Lack of expertise in ERM area to increase awareness in PWD	86

Table 4.16: Challenges to implement ERM in PWD (cont'd)

Label	Category	Description	Percentage
D2.8	Culture	Resistance to implement ERM as it will changed current culture and work procedures	69

Figure 4.37 indicates that 56 respondents or 70 percent totally agree and strongly agree that lack of commitment from top management will be a challenge to implement ERM. Nevertheless, it showed that 28.5 percent of the respondents are neutral on that statement. Risk management acknowledges that risk is a reality and the commitment to identify and manage risk (Galorath, 2006). Therefore, this concept acquires high support and approval from top management for risk management. PWD's top management must always give positive support in any initiative and their acknowledgement is very important in order to start the program.

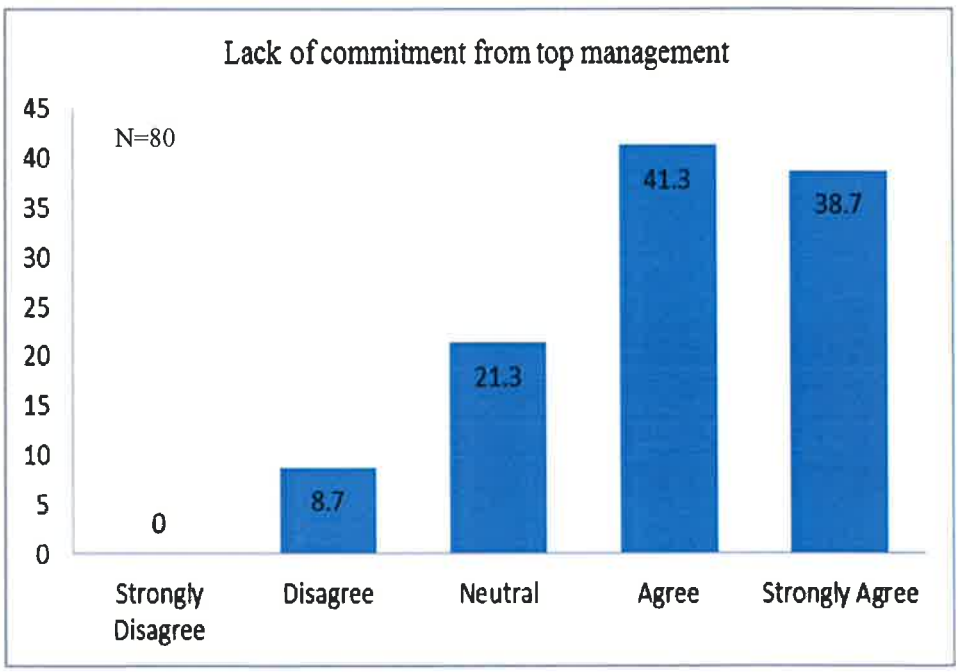

Figure 4.37: Lack of commitment from top management

Lack of commitment from the officers can be a challenge because it requires time to change the way of thinking and the way to view ERM as a whole. Figure 4.38 indicates the perception of 60 respondents or 75 percent totally agree and strongly agree in the element that lack of commitment from the officers will be a challenge to

implement ERM in PWD. Rather, it demonstrates that developing ERM into a culture and living process can be very difficult as it is not an annual task but a continuous program – and need to be reviewed at certain periods of time for the purpose of improvement. Nevertheless, with understanding and awareness programs on ERM at every level in the department, the commitment to implement the program will increase.

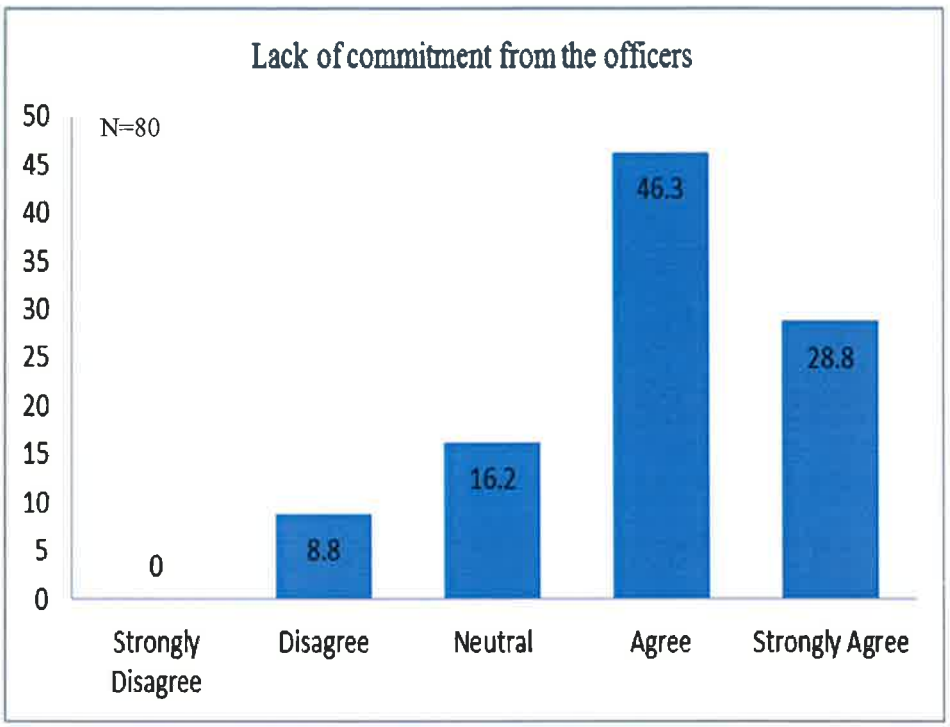

Figure 4.38: Lack of commitment from the officers

Figure 4.39 indicates lack of drivers to sustain ERM implementation, will be a challenge. It showed that 69 respondents or 86 percent totally agree and strongly agree that this will be one of the challenges in implementing ERM. For ERM to be successfully implemented, each officer in the department should be the main driver as risks should be everyone's responsibility. Then, the program will be supported by other resources such as financial, training and technology. Therefore, it would be a challenge at the beginning of the program especially to initiate and provide the appropriate foundation, assessment, and management platform to implement ERM in the department

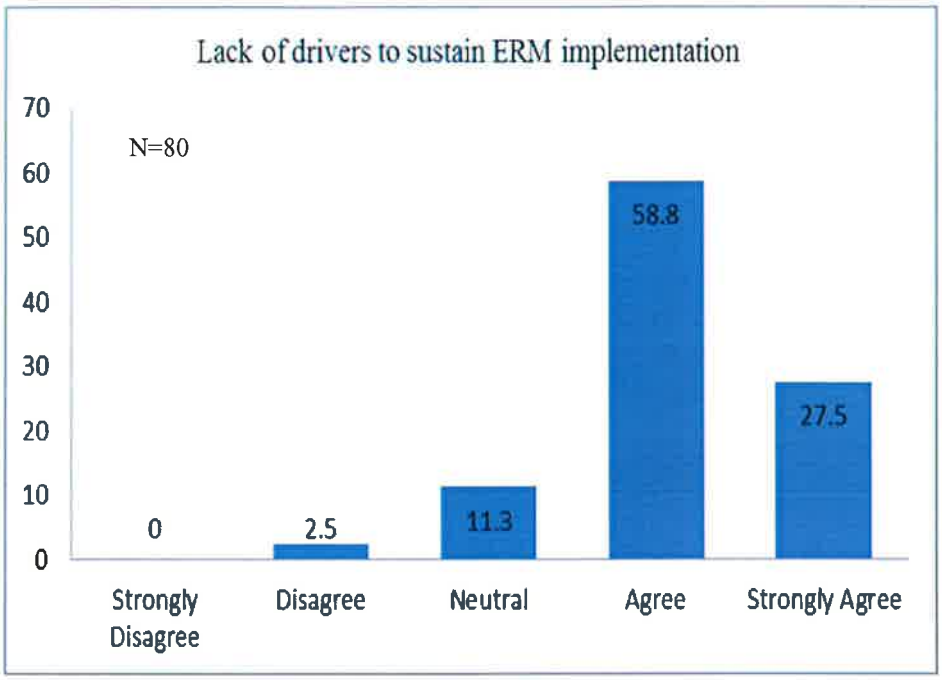

Figure 4.39: Lack of drivers to sustain ERM implementation

It is relatively difficult to grasp ERM implementation especially as there are very limited resources on its benefits especially for the public sector because for non-profit organization, risk is usually formalized as uncertainty to achieve the organization's stated objective – where there is no discussion on the financial return. The government had realized that gaps between the public and private sectors are becoming more porous, in providing better services that are less costly and of higher quality. Nowadays, many governments have been increasingly focused on achieving better performance by looking at the efficiency and effectiveness in the services which encounter risks (Carmen, 2006). Therefore, ERM will provide the assistance in managing increasingly complex risk, to accomplish better performance and relish its reputation.

Figure 4.40 showed that 69 respondents or 86 percent totally agree and strongly agree that lack of understanding on ERM value to increase PWD reputation will be a challenge to implement ERM. Reputation of an organization replicates the organization value. The presumed link between a holistic approach to risk management and an organization's value is clearly noted in the definition of ERM by the Casualty Actuarial Society Committee which ERM is the discipline by which an organization in an industry assesses, controls, exploits, finances, and monitors risks

from all sources for the purpose of increasing the organization's short- and long term value to its stakeholders.

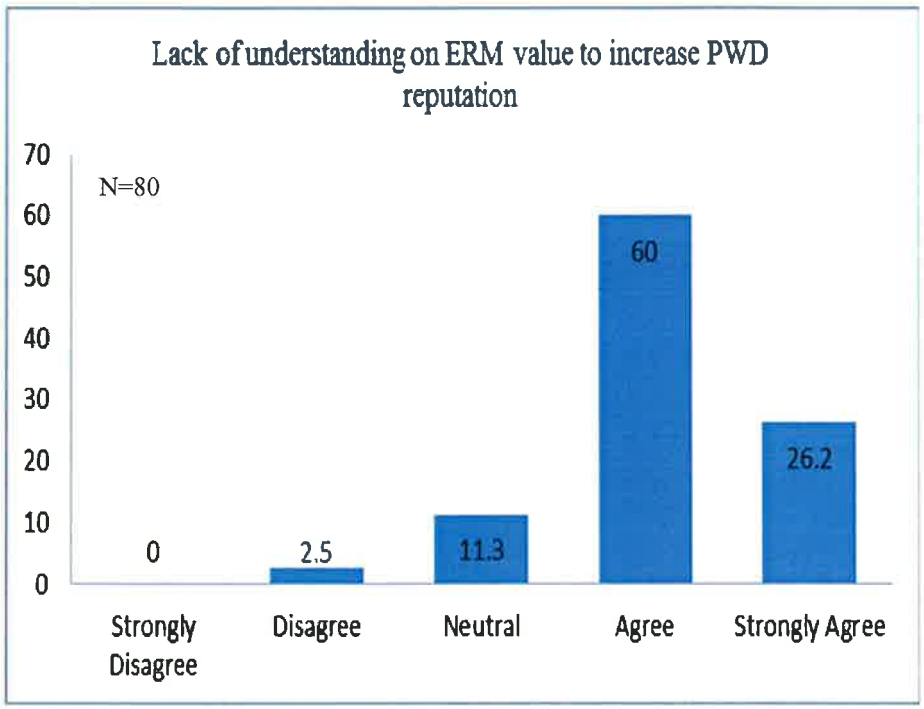

Figure 4.40: Lack of understanding on ERM value to increase PWD reputation

Figure 4.41 indicates that 70 respondents or 87 percent totally agree and strongly agree that lack of understanding on ERM value to increase PWD performance is a challenge to implement ERM. By adopting a systematic and consistent approach to managing all of the risks confronting an organization, ERM is presumed to lower the overall risk of failure in the organization and thus increase the performance of the organisation. Nevertheless, the performance improvement could be influenced by the maturity of risk management practices and the way that risk is pondered into organizational planning (De Souza *et. al*, 2012). The figure discloses that PWD faces the challenge to escalate the ERM benefits in order to increase its performance and, in turn, the value of the department.

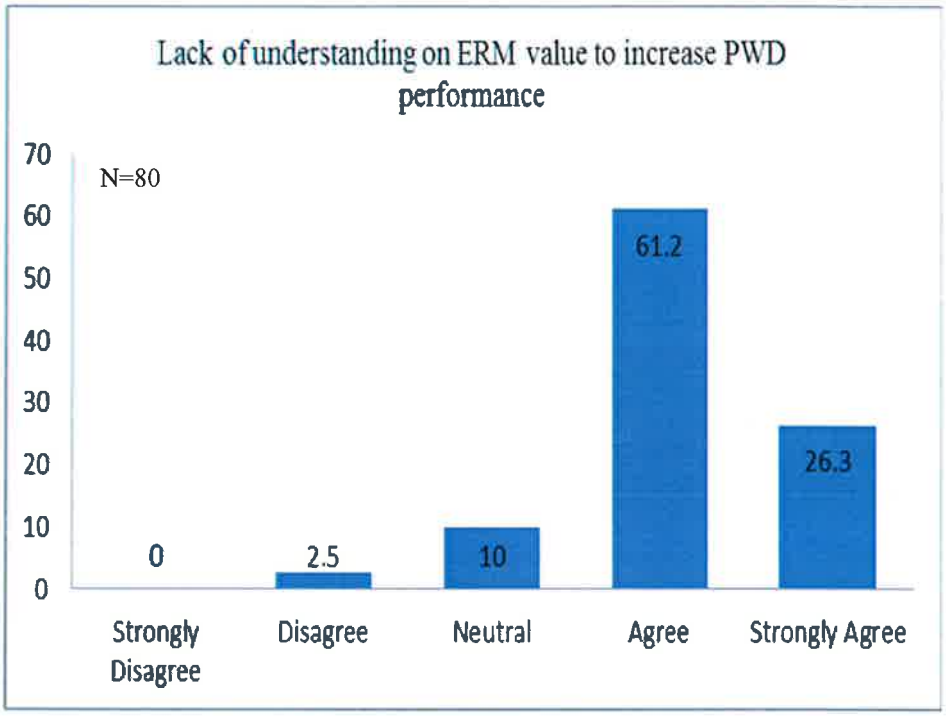

Figure 4.41: Lack of understanding on ERM value to increase PWD performance

Figure 4.42 indicates 70 respondents or 88 percent totally agree and strongly agree that lack of information on ERM across the department is a challenge. ERM had only started in 2012 for PWD and the information on ERM was dispersed to the top management and also some selected officers in the department. Information dissemination on ERM was done progressively. Therefore the information across the department is rather limited and needs to be highlighted.

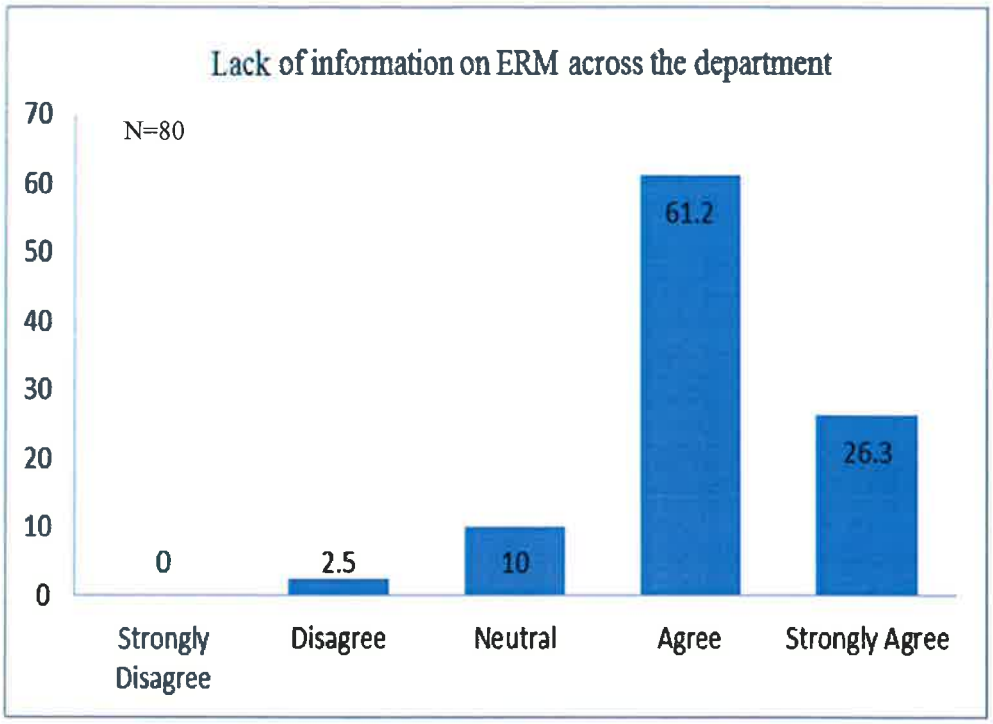

Figure 4.42: Lack of information on ERM across the department

The respondents were asked whether lack of expertise in ERM area to increase awareness could be a challenge to implement ERM in PWD. Figure 4.43 indicates that 69 respondents or 86 percent totally agree and strongly agree with that perception. After getting the mandate from the top management, ERM needs to be promoted at every level in the department. The information should be disseminated from the officers knowledgeable on ERM to others in the department. As ERM in PWD is still new, there are not many officers that are familiar with ERM except the officers who are currently placed in PROKOM.

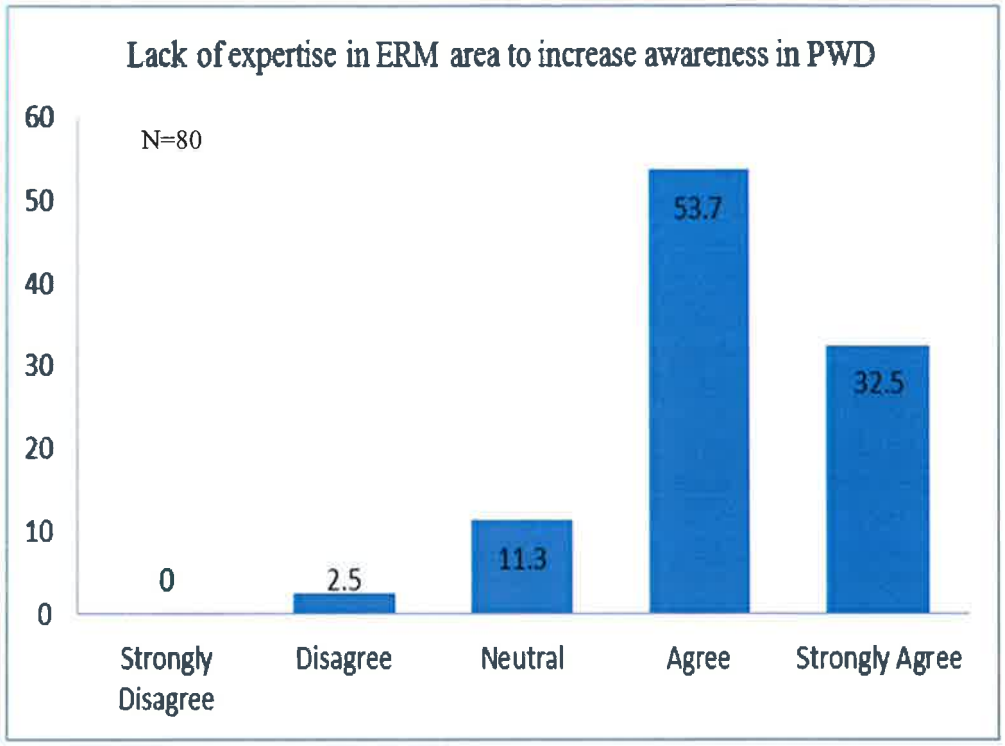

Figure 4.43: Lack of expertise in ERM area to increase awareness in PWD

Figure 4.44 indicates that only 55 respondents or 69 percent totally agree and strongly agree on the statement that there will be resistance to implement ERM as it will change current culture and work procedures. This shows that if ERM was understood and embraced by employees in the department, resistance towards ERM should not be an issue. The challenge can be overcome by involving all employees of PWD in ERM development. Finding from a survey conducted by the Department of Transportation United States (2013) on ERM implementation indicates involvement of employees in ERM can help with cooperation, communication, resource constraints, and resistance to change.

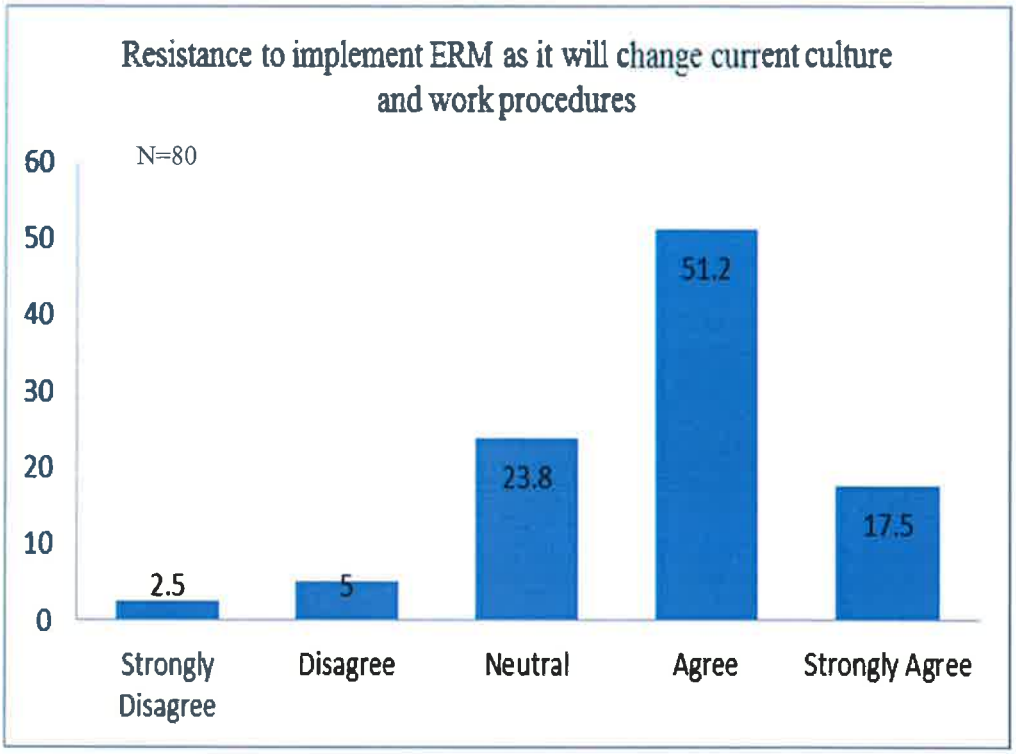

Figure 4.44: Resistance to implement ERM as it will change current culture and work procedures

Among the challenges that PWD could face to implement ERM include, lack of drivers to sustain ERM implementation, lack of understanding on ERM value to increase PWD reputation, lack of understanding on ERM value to increase PWD performance, lack of information on ERM across the department and lack of expertise in ERM area to increase awareness received were recognized by more than 80 percent of the respondents (totally agree and strongly agree). Then, these challenges were ranked accordingly to discover the most challenging factor by obtaining the mean value.

Table 4.17 shows the average of each variable from 80 respondents (N=80) indicates the standard error and the standard deviation values. If the standard error of all the means for each variable were small and fairly close to zero, it signifies that the chosen sample is an accurate reflection of the total population. Moreover, if the standard deviation values are all less than 1.0, it denotes a small variability in data and consistency agreement among the respondents.

Table 4.17 also indicates that D2.7: *Lack of expertise in ERM area to increase awareness in PWD* had the highest mean value of 4.149 compared to other elements; which refers to the most challenging elements in implementing ERM in PWD. The same table also verified that D2.8: *Resistance to implement ERM as it will change current culture and work procedures* has the lowest mean value 3.77 which will not be a foreseeable challenge to implement ERM in PWD. .

Table 4.17: Descriptive Analysis of Challenges to implement ERM (N=80)

	N	Minimum	Maximum	Mean		Std. Deviation
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic
D2.1	80	1.00	5.00	3.8621	.10491	.97852
D2.2	80	2.00	5.00	3.9195	.09974	.93035
D2.3	80	2.00	5.00	4.0575	.08394	.78290
D2.4	80	1.00	5.00	4.0230	.09100	.84876
D2.5	80	1.00	5.00	4.0575	.08394	.78290
D2.6	80	1.00	5.00	4.0920	.08114	.75686
D2.7	80	2.00	5.00	4.1494	.08097	.75527
D2.8	80	1.00	5.00	3.7701	.09631	.89833
Valid N (listwise)	80					

Findings show that lack of expertise in ERM area to increase awareness is the main challenge to implementing ERM in PWD. Understanding the nature of risks and developing expertise in that area is not easy. It will possibly take years to develop an expert in the ERM field, considering how ERM is newly introduced in PWD. While formal training for project risk management was very common in PWD, this is not the case in ERM field. Therefore, there is a need to develop ERM education and to provide continuous training to enhance the officer's knowledge and skills in managing risk enterprise-wide. Expertise is very important as implementing ERM can take into many shapes. Some organizations may only have one person in charge, while others recruit a large team.

Currently PROKOM has been made responsible in initiating ERM in PWD. It shows that PWD has assigned a dedicated staff during the formative year of ERM

implementation but it is rather difficult to develop an expertise among the staff, especially for the junior officers (working experience less than 5 years), as the officers often will be relocated after 3-4 years to comply with the department placement policy.

An effective ERM function should be covered by staff professionals with a good understanding of the risks impacting the enterprise in that given area as well as techniques for limiting the risk exposure. This might involve expertise within the risk management groups, contact with specialized help when needed, or close coordination with other functions within the enterprise (COSO, 2011). Currently PWD had set a small risk unit, for not only looking at risk management in projects but also ERM. Having a small ERM staff has encouraged the unit to become highly involved and share the responsibility to promote ERM in the department. The unit is responsible to look into the nature of the risk, the legal and regulatory requirements related to risk management, knowledge of ERM frameworks, facilitation skills, expertise in identifying risks and knowledge for building risk maps. .

Without understanding, ERM will be only seen as a project that needs to be done. The perception that ERM will change the current culture and work procedure will definitely exist. From the perception of respondents, the resistance to implement ERM will not be a challenge because the program will be promoted at every level in the department. Hence, the mandate and enforcement from the top management will support the implementation ERM and slowly the resistance in implementation of ERM will gradually diminish.

4.6 Post-survey Interviews

In order to verify the findings of the study, post-survey semi structured interviews were carried out. The interviews were carried out with six respondents that have been identified to be aware about ERM or risk management in PWD ERM i.e head of risk unit and staff in the risk unit and others. All of the respondents agree

that level of awareness on ERM in PWD need to be enhanced greatly since it is still new. As PWD practices their project using the PMBOK, risk management is one of the initiative but generally managing risks in the projects only looks at one of the main objectives in PWD's definition in managing risk enterprise wide.

The first respondent holds the risk position as the Risk Champion for PWD. In his perception, to implement ERM in PWD:

The organization must believe that ERM is an initiative to foresee any uncertainties that will hinder the objectives of PWD. Belief in ERM will develop after PWD has establish the definition, the objectives, the policy, the governance structure and the process to implement ERM which has recently been documented in a guideline. PWD should establish strong governance in ERM to ensure that it can be accepted at every level in the department [...]. The awareness, knowledge, skills and motivation will be the outcome when belief had instill as then the value and behavior to accept ERM in the department will be developed. Then ERM will be a culture in PWD.

[...] The top management is always supportive of any best practice initiative in the department. However, it is important for the department to have the ability and knowledge to identify the risks that impede the strategic objectives. Therefore it is a challenge to develop the expertise especially for officers that can really identify the risks and understand the risk appetite.

In his view, the second respondent, who holds the position as head of risk unit in PWD said:

ERM will help PWD to foresee any uncertainties from the commencement of the project and not only focusing on the project itself. Since 2005, PWD had implemented risk management in practicing the projects, but introduction of ERM in PWD only begun in 2012 during the exercise of star rating. Therefore, there will be a

need for a lot of effort to increase the awareness on ERM among each level in the department in order for ERM to be successfully implemented in PWD [...]

ERM implementation in PWD was mandated from the Central Agency and the top management. Therefore it is important that the established policy is to be approved and supported by our top management because it is difficult to implement the policy without support from the top management. The policy will consist of the definition, the governance structure, the roles and responsibilities, the risk identification and responses to risk. Besides, the policy will provide the communication attributes by monitoring and reporting [...]

Regarding the key success factor and challenges to implement ERM in PWD, the respondent added:

In order for ERM to be a successful program, the support of top management is essential.. Top management has the power to determine the level that they want ERM to be implemented in the department. It is like playing football. The ball is at our feet and we need the courage to make a strike in order to score [...] Besides the support from the top management, it is very important that the top management fully understand what is ERM and how to take initiative that can help the department to achieve our strategic objectives. Without the understanding and support, the ERM activities will be difficult to implement. Now we are preparing an extensive plan to promote ERM at every level in the department. Some of the activities that will be undertaken are to support the risk management plan development at branch level and by conducting continuous training [...]

[...] Yes it is very difficult to develop expertise of ERM because of the department's policy. Therefore our policy needs to be strengthened as expertise on risk is not easy to develop. Officers are constantly moving after serving a certain number of years, and it is a challenge to sustain the expert staff especially among junior officers. Even our training center had centralized the training program; thus the officers who attended the risk training have not had the opportunity to practice

the knowledge gained during training. Therefore, only when awareness on ERM has seeped into the department, the acceptance will be much easier. Thus, the expert in risk management area can be developed concurrently.

The third respondent, who currently works in the risk unit addresses:

Risks in PWD can easily be identified as eventually everybody knows what they have to deal with. ERM eventually will help the department to manage the risks in a structured manner [...] Each level in the department needs to embrace the importance of managing risks and open up to the idea of not merely looking at risks in project management. . Managing risk does not mean giving promises that the event would be a success. However it will help PWD to manage the critical risk in order to improve its reputation [...]. Risk definition, risk identification, risk response, effective communication are elements that need to be known in depth.

The fourth respondent, who currently works in the risk unit address:

The implementation of ERM in PWD should start from the top to the bottom, reaching at every level in the department. After receiving the mandate from the top management, the risk management process should be gradually implemented. The risk management process will include the risk identification, risk evaluation, risk treatment. Thus the risk identification must be related to the strategic objectives [...]. Open communication is very important to share the information on ERM. One of the important information is the roles and responsibilities in PWD's ERM structure, which will assist the risk escalation to the higher level. In PWD, it is important to get full commitment from both the top level and everyone in the department to ensure the initiative can be implemented successfully. Without the top management strong support and drive the direction, ERM implementation would be a failure [...]

Overall, the post survey interview indicates the perception that clear definition and objectives of ERM, governance by established ERM framework, managing the risk process by identifying the types of risk which may affect the

reputation and performance and establish open communication channel on ERM. Moreover, the support from top management is very crucial to guarantee successful ERM implementation. However, all respondents are in agreement that developing expertise in ERM is the main challenge to implement ERM in PWD. Overall, the interviews are consistent with the statistical findings which had been obtained earlier.

4.7 Research Objective 3

RIMS (2009) state that ERM implementation in the organization will show and test on how competent the organization is in their risk management practices e, and the degree to which the organization instills risk management behaviors into its culture and management's decision-making process. Therefore, PWD need to build its own risk culture to escalate ERM awareness, behaviors, skills and competences within the organization.

The first objective is to assess the perception on how ERM should be implemented in PWD. The perception that were considered in this study were based on the ERM definition and it philosophy, governance, risk identification and responses and its effective communication. Thus, the first objective had a close relation to achieve the second objectives of this study, to determine the key success factor and the challenges to implement ERM in PWD. Nevertheless, the success factors and the challenges to implement ERM in PWD are divided into four (4) categories: Culture, Top Management, Organization Structure and Communication.

From the results analysis, PWD should implement ERM by looking into the perceptions: PWD should develop clear definition and objectives of ERM, PWD should establish clear ERM framework, PWD should established types of risk which may affect reputation and performance and PWD should establish open communication channel to facilitate top-down and bottom-up communication on ERM. The success factor for ERM to implement ERM is strong support from the top

management and the challenge to implement ERM is the lack of expertise in ERM area to increase awareness in PWD.

Based from the findings above, the third objective can be developed to introduce a guideline on ERM implementation for PWD. The guideline will assist PWD to understand the attributes of ERM and ensure it become a culture in the department.

4.7.1 Step 1: Mandate from the top management

Based on the analysis, the main key success factor to implement ERM in PWD is by gaining the support of the top management. The support of the top management can be shown by giving the mandate by setting the ERM policy. Mandate from the top management is much needed to assure the risk management team's success especially in establishing the ERM program to aid the department strategic objectives. It also established the coordination of risk management and strategy development, which will assure both internal and external stakeholders consistently manage the risks effectively and efficiently.

4.7.2 Step 2: Establish definition and objective of ERM to leverage buy-in

ERM was initiated by the Risk Management Unit. One of the responsibilities was to develop ERM governance structure for PWD which include established definition and objective of ERM. This is the perception that was strongly agreed upon among the respondents. The definition and objective must be understandable and accepted at each level within the department in order to leverage departmental buy-in on ERM. The definition and objective will be part of the formal and documented ERM process for PWD. Without everyone in the organization

understanding the importance of a successful risk management initiative, PWD may be at risk for significant loss due to little known, but not unknown, risks.

4.7.3 Step 3: Decision on ERM Framework

From the perception of respondents, the governance of ERM in PWD can be established through a strong ERM framework. Therefore, PWD must decide on the appropriate ERM framework and establish a strong structure to commit the internal control framework. The purpose for internal control will reduce the probability of errors and irregularities during the implementation. PWD had selected AS/NZ 4360 framework as the basis for the department ERM framework. The components in the internal control will assist PWD to manage the enterprise risk.

4.7.4 Step 4: Determine the Risks and establish a Risk Dictionary

Risk identification is very important especially risks which affect the organization's reputation and performance. From the perception of respondents, PWD should establish the types of risk which may affect reputation and performance. Hence, the effort to identify and determine the risk must be made across the department to gather all known or anticipated risks. Risks can be identified using several techniques such as brainstorming, risks inventories, technologies, risks surveys and others to increase the efficiency of risk identification.

As risks need to be understood and embraced, PWD should develop a Risk Dictionary so that everyone agrees on the meaning of each risk term. All documentation should be formalized as it will be used for educational purposes to roll out the ERM program to each branch and PWD's states. Currently PWD had considered five groups of risks which may affect the department. Table 5.1 describe the risk group and its description. Nevertheless, the risk group can be reviewed over

time as risks must includable of internal risks and external risks, which may consistently change beyond time (Delooch, 2000).

Table 5.1: PWD's Risk Group

Risk Group	Description
Human	Risks ascending from the poor performance of the staff that caused the department failed to achieve the strategic objectives
Legislation	Risks against the policy and legislation that could lead to a solution using the legislative procedures
Reputation	Risks ascending from poor performance or events as a result of poor management or misconduct that could damage the image and reputation of the department
Financial	Risks ascending from poor financial management especially in financial projections.
Operational	Risks ascending from operating activities that may affect the department departmental program

4.7.5 Step 5: Risk response through assessment and treatment

Risk response can be done through assessing and consolidating the risks according to the risk group. Then, the risks were categorized using risk mapping, which classified the risks according to priorities. This process should consider the impact of the risks by evaluating the potential consequences of the risk to PWD. The mapping process should consider the existing environment, the corporate strategy, and those risks that could hinder the achievement of the objectives.

Next, alternatives were developed to treat the risks and the decisions of the control techniques should consider the appropriate and suitable control according to

the risks. The suitable alternatives to treat risks such as accepting the risk, mitigate the risk, reduce the risk, avoid the risk or transfer the risk.

4.7.6 Step 6: Open Communication to establish performance measurement

The implementation of ERM needs to be reviewed in order to determine if the strategy can be implemented to achieve the objectives. The objectives should contain defined targets where it is specific, measurable and achievable. Based on the targets, the performance measures can be developed to compare with the actual results of the targets. Therefore, open communication is very important to develop the appropriate performance measures.

4.7.7 Step 7: Feedback through reporting and control

Feedback is an important tool to ensure the ERM plan is adequate for the organization. Reporting is part of the communication channel to ensure the ERM progress and to monitor the key targets. This process can be used to alert the area when corrective action needs to be taken. The Risk Management Unit should summarize the information for the top management to assess the current progress towards achievement of overall corporate goals. The information could also be used to share best practices for each level in the department and used to alert high-risk areas that may need to be reviewed for adequacy of internal controls.

4.7.8 Step 8: Continuous improvement and monitoring

There is always room for improvement and revision for ERM. The Risk Management Unit should establish a timeline to review the internal and external risks events which involve other officers and the top management which could force

revision of the overall strategic plan. Then continuous training and spreading information on ERM through the department's website, seminar or conference will increase the understanding on ERM implementation at every level in the department.

4.8 Summary

This chapter describes the data gathered and the analysis which had been done to achieve the aim of the study. Majority of the respondents will support ERM implementation in PWD but the analysis was done by selecting the respondents which had the awareness on basic attributes of ERM – ERM is a tool to manage risk enterprise wide as their perception is more reliable. From the analysis, it was found that ERM should be implemented in PWD by complying the perception of establishing clear definition and objectives of ERM, establish strong ERM framework, identify the types of risk which may affect reputation and performance and establish open communication channel between top-bottom and bottom-up level in order for information can be disseminated. This chapter also established the key success factors, challenges and suggests steps as a guideline to implement ERM in PWD.

CHAPTER 5

CONCLUSION

5.1 Introduction

This chapter discusses the main findings of the study based on the objectives and analysis which had been determined earlier in the previous chapter. Issues and suggestions from the findings of the analysis for each objective will be highlighted and reviewed. This chapter explains some limitations faced in undergoing the study. Besides that, this study outlines the implicit contribution of the study in promoting ERM implementation in PWD. Finally, this chapter also constructs a proposal which consist of suggestions for improvements in certain areas through future research on ERM.

5.2 Conclusion of the study

This study was conducted to assess the perception on how ERM should be implemented and the key success factor and the challenges to implement ERM in PWD. The study was conducted by undergoing several steps to achieve the above objectives. The information on the current level of awareness on ERM was received from 200 respondents from various professional backgrounds, experiences and knowledge. A set of questionnaire was developed to obtain the data from the respondents, then it was analyzed by using frequency analysis and descriptive. To determine the perception of ERM implementation, this study will only consider the

perception of 80 respondents who have heard about ERM and are aware on what is ERM. Their perceptions on ERM will be much more reliable as the respondents have a foundation on ERM attributes.

Post interview was conducted to acknowledge the results which were obtained from the analysis. The respondents selected were considered to have the awareness and knowledge on ERM in PWD. The post interview was conducted to assure and validate the results which had been achieved from the analysis.

In conclusion, the study had assessed the perception on how ERM should be implemented in PWD. Majority of the respondents had agreed for ERM to be successfully implemented, the following perception should be acknowledged. PWD should develop clear definition and objectives of ERM, establish clear ERM framework for the department, established types of risk which may affect reputation and performance and establish open communication channel to facilitate top-down and bottom-up communication on ERM.

PWD need to ensure that every level in the department understands by increasing the awareness on ERM and its benefits to the department. For PWD to succeed in implementing ERM, majority of the respondents believe that support from the top management swill contribute a huge impact. Nevertheless PWD need to increase the expertise in ERM in order to escalate the awareness on ERM. Therefore the risk management process needs to be done continuously.

5.3 Limitation of the study

The limitation for the study was very obvious. The main limitation is that in PWD currently ERM is known only on the surface. PWD is not aware that managing risk is very important. Hazlin (2010) in her study had suggested that PWD is in need to develop some initiative to increase maturity in project risk management. Unfortunately, the department only looked at risk to improve project performance

and did not look at risk need to be treated holistically. In the current policy, risk management is only compulsory to incorporate for managing projects which cost above RM50 million, and considered as a huge scale project with high impact especially for the Government and to the public. Meanwhile, for projects that cost less than RM50 million, risk management is just an option.

The number of respondents that were interested and committed to participate in the study was considered low and may not represent the department as a whole. Literally, out of 450 respondents that were expected to receive the questionnaire the study only received 200 returns which can be considered small. Therefore, the time to redistribute the study should be extended to acquire more respondents. For further studies, the study should extend the survey to more branches within PWD to obtain more respondents which will make the data are more reliable.

Other limitation is the usage of perception study through five (5) point Likert scale. Study using Likert scale is likely to produce high reliability scale. The method is simple to construct and easy to read. Therefore, the respondents can easily complete the survey in a short time. As the questions are based on the perception of the respondents, there are possibilities where central tendency bias exists, as the respondents may avoid extreme response categories. Acquiescence bias may also exist as there is possibility that the respondents may agree with the statement in order to "please" the researcher. The result of the study may not be consistent over time and it may not give an actual reflection of the current level of awareness on ERM and on how ERM should be implemented in PWD

5.4 Contribution of the study

The findings of this study provide the perception on how ERM should be implemented in PWD. The information is very interesting as PWD can use the findings to plan the appropriate method and resources in promoting ERM. Therefore the dedicated team may plan and propose appropriate allocation to develop a

program to guide and train other officers in order to embrace ERM. It is important to instil the awareness and knowledge within the department to ensure that ERM in PWD can be continuously strengthened.

This study will assist the dedicated ERM team to determine and look at the pattern which had been analysed in the survey to ensure the ERM framework in PWD is efficient and acceptable at all levels. The framework shall look into closely and take high consideration especially on how ERM should be implemented in the organization, the success factors and the challenges that will hinder the progress of ERM implementation.

5.5 Suggestions for future study

In order for improvement to the study, it is suggested that the study should be extended to other Government organizations by reviewing and reconstructing a comprehensive survey question. The study will determine the perception on how Government organizations should implement ERM. Thus, it is also suggested that in the future, the study should look into the preparedness and readiness of the public sector to implement ERM in the current system. The findings should be an indicator and strategy for PWD to facilitate other Government organizations to develop its own ERM framework which can be accepted and implemented. Hereby, it will convey the responsibility of PWD as the 'think tank' and pioneer to promote ERM implementation in public sector.

PWD may also look into the success factors and challenges in different periods of ERM stages, as the implementation requires continuous effort. The success factors and challenges to implement ERM may be considered the most important elements during a certain period, but some must be more important that others towards certain periods of time. Therefore, it is important that the elements in success factors and the challenges need to be ranked, particularly in terms of the attention that should be given to them in different stages of ERM implementation.

Meanwhile, in the current situation, ERM in PWD is still at the stage of constructing a proper foundation as the department is still at the stage of introducing the practice at every level within the department. Therefore, the ERM practice in PWD needs to be in place and a few good years are needed to ensure the risk culture can be embraced by all PWD personnel. It will be interesting to investigate and measure the maturity level of ERM in PWD and compare with maturity level for other organization.

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APPENDIX A

PERCEPTION ON ENTERPRISE RISK MANAGEMENT IN PUBLIC WORK DEPARTMENT

Risk Management is an important action to manage the occurrence of risks as early as possible. As the risk management evolved, risks should be integrated within the organization business plan where Enterprise Risk Management (ERM) had been introduced.

PWD had given the responsibility to be the pioneer in developing ERM guideline for department itself and convey it throughout other public sector in the future. The objectives of the study:

4. To assess the perception on how should ERM be implemented in PWD.
5. To identify the key success factors and challenges to implement ERM in PWD.

This survey has three (3) sections:

Section A: General information about the respondents.
Section B: Perception on how ERM should be implemented in PWD.
Section C: Key success factors and challenges to implement ERM in PWD

For each question please mark (X) for the appropriate answer
Section A: Respondent general background

1. Please state your work background

☐ Civil
☐ Architect
☐ Electrical
☐ Mechanical
☐ Quantity Survey
☐ Others: _____ (please specify)

2. Years with the department

☐ 1 – 5 years
☐ 6 – 10 years
☐ 11 – 20 years
☐ 21 years and above

3. Please state your professional involvement

☐ Project Team
☐ Design Team
☐ Management
☐ Operational / District Engineer
☐ Others:_____ (please specify)

4. Please state your risk position

☐ Chief Risk Officer (CRO)
☐ Risk Champion
☐ Risk Owner
☐ Risk Officer
☐ Secretariat
☐ Not involve in any risk position

Section B: Perception on how ERM should be implemented in PWD.
(To determine the respondents perception on how ERM should be implemented in PWD)

1. Have you heard about Enterprise Risk Management (ERM)
   - ☐ Yes
   - ☐ No

2. Your source of information on ERM (You can select more than 1 option)
   - ☐ Guideline
   - ☐ Article / Journal
   - ☐ Conference / Seminar
   - ☐ Training / Courses
   - ☐ Others: _____

3. You are aware Enterprise Risk Management is an approach to manage risk enterprise-wide
   - ☐ Yes
   - ☐ No

4. You are aware Enterprise Risk Management will be implemented in PWD to manage the department risk holistically
   - ☐ Yes
   - ☐ No

5. You will support Enterprise Risk Management implementation in PWD
   - ☐ Yes
   - ☐ No

(Please rate your level of agreement with the following statements)

"1"– Strongly Disagree, "2" – Disagree, "3" – Neutral, "4" – Agree, and "5" – Strongly Agree

Elements	Description	Scale				
Enterprise Risk Management Definition and Philosophy	PWD should develop clear definition and objectives of Enterprise Risk Management	1	2	3	4	5
	PWD should align its Enterprise Risk Management definition with standard definition	1	2	3	4	5
	PWD should align the Enterprise Risk Management objectives with the department strategic framework	1	2	3	4	5
	PWD should provide common understanding of Enterprise Risk Management objectives	1	2	3	4	5
Enterprise Risk Management Governance	PWD should establish clear Enterprise Risk Management framework for the department	1	2	3	4	5
	PWD should establish strong Enterprise Risk Management structure	1	2	3	4	5
	PWD should establish a dedicated Enterprise Risk Management team	1	2	3	4	5
	PWD should establish a clear role and responsibilities for each risk position in the ERM structure	1	2	3	4	5
	PWD should developed an integration between ERM and PWD strategic framework	1	2	3	4	5
Risk Identification and Responses	PWD should increase the department efficiency to risk identification	1	2	3	4	5
	PWD should established types of risk which may affect reputation and performance	1	2	3	4	5
	PWD should align the risk incident to type of risk	1	2	3	4	5
	PWD should establish suitable alternatives of risk responses. Eg: Avoidance, Mitigation, Sharing or Acceptance	1	2	3	4	5
	PWD should established suitable treatment for each risk incident	1	2	3	4	5

Elements	Description	Scale				
Enterprise Risk Management Effective Communication	PWD should provide clear information of types and risk incident which relevant to the organization	1	2	3	4	5
	PWD should provide clear information on roles and responsibility in ERM structure to officers in the organization	1	2	3	4	5
	PWD should establish open communication channel to facilitate top-down and bottom-up communication on ERM	1	2	3	4	5

Section C: Key success factors and challenges to implement ERM in PWD
(To determine the respondents perception on the key success factors and challenges to implement ERM in PWD)
(Please rate your level of agreement with the following statements)

"1"– Strongly Disagree, "2" – Disagree, "3" – Neutral, "4" – Agree, and "5" – Strongly Agree

	Category	Description	Scale				
Key Success Factors in Implementing ERM	Culture	Instilled strong and effective ERM culture in PWD	1	2	3	4	5
	Top management	Strong support from the top management	1	2	3	4	5
	Organization Structure	Clear ERM definition	1	2	3	4	5
	Organization Structure	Clear ERM objectives	1	2	3	4	5
	Organization Structure	Strong ERM policies, procedure and internal control	1	2	3	4	5
	Organization Structure	Integrate ERM with PWD's strategic framework	1	2	3	4	5
	Organization Structure	Integrate ERM with branch/JKR states business plan	1	2	3	4	5
	Organization Structure	Integrate ERM with department KPI (performance)	1	2	3	4	5
	Communication	Introduce ERM as main agenda in departmental meeting	1	2	3	4	5
	Communication	Promote high involvement of officers in ERM development	1	2	3	4	5
	Organization Structure	Allocate appropriate resources (budget, human resources, technology etc.) to support ERM in PWD	1	2	3	4	5

	Category	Description	Scale				
Challenges in Implementing ERM	Top management	Lack of commitment from top management	1	2	3	4	5
	Top management	Lack of commitment from the officers	1	2	3	4	5
	Organization Structure	Lack of drivers to sustain ERM implementation	1	2	3	4	5
	Communication	Lack of understanding on ERM value to increase PWD reputation	1	2	3	4	5
	Communication	Lack of understanding on ERM value to increase PWD performance	1	2	3	4	5
	Communication	Lack of information on ERM across the department	1	2	3	4	5
	Top management	Lack of expertise in Enterprise Risk Management area to increase awareness in PWD	1	2	3	4	5
	Culture	Resistance to implement Enterprise Risk Management as it will changed current culture and work procedures	1	2	3	4	5