RISK MANAGEMENT PROCESS IMPACTED TO THE PROJECT PERFORMANCE IN OIL AND GAS INDUSTRY AT KUALA LUMPUR

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Thesis submitted in fulfillment of requirements for the award of the degree of Project Management

Faculty of Industrial Management

UNIVERSITI MALAYSIA PAHANG

DECEMBER 2014

SUPERVISOR'S DECLARATION

I hereby declare that I have checked this project and in my opinion this project is adequate in term of scope and quality for the award of the Degree in Project Management.

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STUDENT'S DECLARATION

I hereby declare that the work in this thesis is my own except for quotations and summaries which have been duly acknowledge. The thesis has not been accepted for any degree is not concurrently submitted for award of other degree.

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DEDICATION

I would like to dedicate my Final year Project to my beloved parents Mr Rosli Bin Othman and Siti Patimah Binti Ishak. Thank you for always supporting and helping in everything I do. The support and your love is one of the reasons for me to be what I am today. The lesson you though make me proud and confident in myself. This achievement is special dedicated for both of you.

ACKNOWLEDMENT

Very special thanks to my supporting and helpful supervisor Madam Airin Bt Abdul Ghani for always supervised and guided me all along the process to complete my research paper.

To our dean Dr Ridzuan Darun, Final Year Project Coordinator Miss Nur Haizan Bin Zainuddin and Head of Programme Madam Fadzida Bt Ismail, Project management lecturer and all lecturers in Faculty of Industrial management, thank you for your sincerely help and contribution.

Not to forget all the respondent from the oil and gas companies thank you very much for willing to participate in my research. Without the respond from all of you it is impossible for me to complete my research. Hopefully this research can give a little contribution in the future for oil and gas industries.

Lastly, to all my friends and peoples that had help me directly or indirectly from the start till the end, thank you very much to all of you.

ABSTRACT

Oil and gas industry is the industry that yield profit to every nation. It will involves with various step of risk. This research study will is trying to study the relationship between the risk management processes with the project performance. This research will be conducted in Kuala Lumpur which is a hub for the management oil and gas organization. A questionnaire that contain of demographic section, personal information and any related question to the risk management that might give contribution to the project performance every employee know about. Every question will contribute to the hypothesis that already develop in the beginning of the research study. A total 100 questionnaire were distributed and about 80 are requiring representing the population of the research study. The questionnaire was distributed by using male that contain link to the online questionnaire that very helpful in collecting data. After a few week the data already collected. The first step is test the reliability of the questionnaire that answer by the respondent by using SPSS software. Next the first objective also using the SPSS software to rank the important step of the risk management process to the project performance. To determine the hypothesis, once again the SPSS software being used to determine the hypothesis accepted or rejected. The risk management process are very important in determine the project performance. In this research study, there is two indicator for project performance which is time and cost. The finding shows the relationship between risk management process with time and cost. The relationship can be negative or positive to the project performance.

ABSTRAK

Industri minyak dan gas adalah industri yang menghasilkan keuntungan kepada setiap negara. Ia akan melibatkan dengan pelbagai langkah risiko. Kajian penyelidikan akan cuba untuk mengkaji hubungan antara proses pengurusan risiko dengan prestasi projek. Kajian ini akan dijalankan di Kuala Lumpur yang merupakan hab bagi organisasi pengurusan minyak dan gas. Pada peringkat permulaan soalan di buat sebanyak 4 bahagian. Bahagian pertama mengenai maklumat peribadi responden, dan yg kedua adalah maklumat organisasi responden. Seterusnya adalah maklumat tentang prestasi projek yang pernah pekerja terlibat. Dah bahagian terakhir adalah factor yang ada didalam proses mengenal pasti risiko. Soalan diedar melalui laman web dan dihantar kepada para pekerja. Setelah tamat tempoh masa untuk menjawab soalan dikira menggunakan perisian SPSS. Perisian ini digunakan untuk menentukan onbjektif kajian ini yang pertama iaitu menegenal pasti proses yang manakah yang paling menyumbang kepada prestasi projek. Dengan menggunakan perisian ini juga, objektif kedua juga dapat dicapai iaitu utntuk menentukan kehadiran hubungan antara proses mengenal pasti risiko dengan prestasi projek. Sebanyak 100 soal selidik telah diedarkan dan kira-kira 80 yang memerlukan bagi mewakili populasi kajian penyelidikan. Proses pengurusan risiko adalah sangat penting dalam menentukan prestasi projek. Dalam kajian penyelidikan ini, terdapat dua petunjuk untuk prestasi projek yang merupakan masa dan kos. Dapatan kajian menunjukkan hubungan antara proses pengurusan risiko dengan masa dan kos. Hubungan boleh menjadi negatif atau positif kepada prestasi projek.

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INTRODUCTION

1.1 BACKGROUND STUDY.

Malaysia is a country in southern Asia that divided into two regions by the South China Sea, the two regions include of peninsular Malaysia bordering with Thailand and Singapore. While east Malaysia are bordering with Indonesia and Brunei. With the huge area of natural resources on the agriculture, forestry, and minerals. After collapse the tin market on 1980's, petroleum and natural gas took over the as a stronghold contributor to the Malaysia economy. In 2004, Malaysia on 24th in terms of world oil reserves and 13th for natural gas. According to the PETRONAS, oil and gas asset that have by Malaysia equivalent to 20.18 billion and the government estimation on the production rate, the supply of the petroleum will last for 18 years, meanwhile that natural gasses will last for 35 years

In the oil and gas industry the risk management is very important in term of safety or in business sector. Risk is a measure of a probability and consequences of not completing the goal that was set up (Harold, 2009). In risk it contain of two component, which is a probability of occurrence of that event and impact of event happen. To handle this risk, they have a few frame work, techniques, and formula to handle the occurrence of the risk. According to the PMBOK 4th edition 'risk management is the act or practices of dealing with risk that include planning, identifying, analyzing, developing, response, and monitoring and controlling the risk to determine how they have changed.' Risk

analysis is a systematic process to estimate the level of risk for identified and approved risk (Harold, 2009). In pipeline industry it tend to more technical risk evaluation that highlight a few things. Such as provides technical foundation, determine the program risk, relates and analyze the internal and external risk, prioritizes risk impact. There is two type of risk that can be study; qualitative and quantitative. Qualitative risk is more to assumptions the risk with the help of matrix diagram and expert opinion with the relevant reasons and logical data (Edmund, 2003). Quantitative is more to mathematical process that involve probability to develop a model of the risk.

The risk management in oil and gas industry needed because it will provide a technical information or basic about technical process, a programs risk can be describe and identify, investigate the risk and relationship with the internal and external factor that contribute to the risk, prioritizes the risk of the after effect of the programs, and record the documents technical basic and risk for the risk evaluation. To do the evaluation of the risk on the pipeline there are several tools that can be used such as Delphi technique, estimating relationship, expert judgment, fault tree analysis, network analysis, and risk mapping matrix with risk scales results. The benefit by performing the risk management in pipeline sector, it can change the result on the technical risk into risk level. When qualitative risk technique apply the outcome will show the cost risk, schedule risk, or technical risk, or technical risk boundaries. When the quantitative risk analysis performed a risk rating can determine the output on the indication of the potential importance of risk program that usually measure by probability of how many times the event occur in certain times.

In this kind of field that dealing with high risk in the technical part it need to focus every time when dealing with the job. The issue will arise if management did not apply risk management. The first problem that may came out is unclear vision of on risk that exist on surrounding either on the aspect of business of the workplace safety. Other challenges is did not have good strategy to reduce, mitigate, or transfer the risk that have in the management or workplace. By not concerning on risk management they also may have a lack of information to make informed decision on issue critical to project success.

1.2 PROBLEM STATEMENT

Risk has always been perceived negatively. In oil and gas industry also happen the same problem, actually risk also have type that can give a positive impact to the organization. Nowadays Malaysia are developing country and have so many oil and gas company that located here. Most of the process of the risk management process are focus to the negative impact and when they mitigate the risk, they only at there and doesn't create any profit from the risk mitigation process. Base on statement from the (David V. Tennnant, 2005) mostly of us are anticipated with the problem with the will develop when the project are initiate and the thinking are focus to negative side. On the other hand, actually have a positive risk that exist that can give benefit in triple constraint and in this study it will help to reduce the duration of the completion date of a project. In the process risk management it will have the step to identify the risk either the risk is positive or negative. The first process is communicate and consult the risk.

Base on the framework that suggested by (T. Aven, 2005) the process of finding risk are not only focus in the internal site of the organization, it also focused on externally. For an example the shortage of the expertise in the pipeline inspection or welder, it will give a bad impact to the project. The management tends to find a solution like appoint someone else that are not familiar and might contribute to the high risk impact if accident or error occur. In a positive side, the management can hire an outsource expert that have a qualified in the process that potential risk. If this outsourcing are conducted, the risk will reduce and it will give a low level of risk and it can give positive impact on the time to complete the project that related. The framework also have the table that rank every risk according to the level of the priority to concern about. Then the final step in the framework is developing the mitigation strategies in the form of table that have the list of the positive risk and negative risk that already rank according to the level of importance. In the table also stated a few strategies to handle the risk.

After complete the risk mitigation strategies that according to (Kerzner, 2009) the framework will be continuing reevaluating it and developing contingency plans or fallback position. And the process is the risk review that have relationship between the risk analyses and this risk review, which is after risk already determine and rank into level of the risk. The risk will be review back during the process of the project. The result of

the analysis it can help increase the effectiveness of work and it lead to the short the duration of the project and it will focus more to the resources.

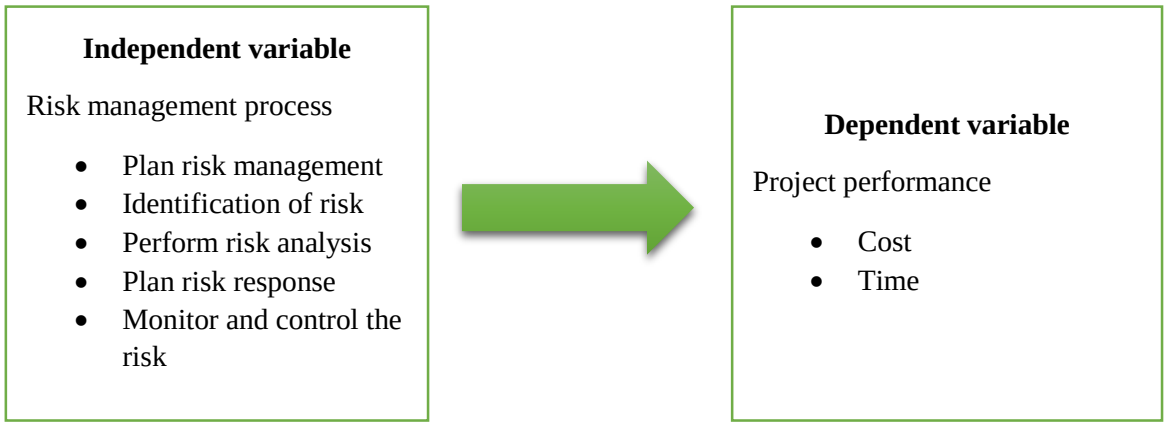
For the problems that facing by the industry right now is they are more focus on the negative risk and will put more effort to mitigate it. There are gap in this kind of situation and by performing the process of management risk it will fill the gap, which is the gap refer to the positive risk that might positive impact to the duration and the cost of the project. for an example at the beginning stage of the process to develop the plan for the risk where the process communicate and consult will take place between internal and external stakeholder their brief on the more positive impact suggestion and can give advantage in the duration of the project (Carmen, 2007). Next is the process of the identifying the risk and it should more focus on the internal and external positive risk than follow by the negative risk. By doing this way it can help the oil and gas industry alert with the opportunity that have and it will become the competitive advantage to the organization. Then is performing the risk analysis of the listed risk and the positive should rank in the top of the ranking and give priorities to develop a strategies to receive or avoid the risk. Further step is the risk response, for an example a research team will calculate what the impact is if the risk are considered to the duration of the project and the cost of the project. And lastly, the monitoring and controlling the risk to make sure the risks are treated well various perspectives.

1.3 RESEARCH OBJECTIVES

1. To identify the effectiveness of risk management process towards project performance.
2. To explore the relationship between the risk management process and the project performance.

1.4 CONCEPTUAL FRAMEWORK

The framework that are used in this research study about the relationship between risk management process impact to the duration of the project are consist of component like establish the context, identify the risk, analyze the risk, evaluate the risk, communicate and respond, treat the risk, and monitor and review the risk.



1.5 RESEARCH QUESTION

1. How does the risk management process give impact on project performance?
2. Is there positive risk in project?

1.6 RESEARCH HYPOTHESIS

There is a relationship between risk management process and project performance. The hypothesis can be determined as:

H1: There is significant positive relationship between risk management processes to the project time performance

H2: There is significant positive relationship between risk management processes with the project cost performance.

1.7 RESEARCH SCOPE

This research study will be conducted at the Kuala Lumpur, according to (Koh|, 2013) in the Kuala Lumpur have about 1500 thousand of employee in the oil and gas industry and they are come from various company such as PETRONAS, SHELL, EXXON, Kencana Petroleum and many more. This research will use small sample from the amount of the workers to carry out the test. Base on the monthly bulletin of the institutional of engineers on 2013 the total resources.

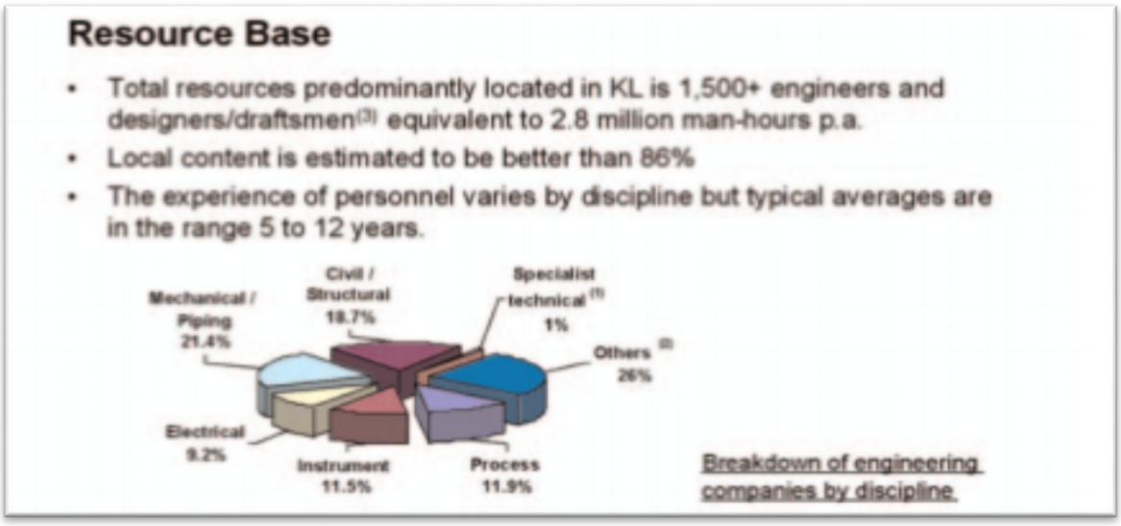


Figure 1.7: Percentage of the workers that works in oil and Gas Company in Kuala Lumpur.

Source: The Monthly Bulletin of the Institutional Of Engineers, 2013

1.8 SIGNIFICANT OF STUDY

This study is will contribute to the effectiveness of the risk management process towards the project performance. The project performance can divided into 2 terms which is cost and time (schedule). This risk management process will obtain from the literature review related to the risk management system that applies in the oil and gas company in Kuala Lumpur. The study will explore the component in risk management process that influences the successfulness of the project performance. The

The study also investigates the relationship between risk management process and the project performance. Risk management process is process to identify the component that might give impact to the project performance. It also will help other organization to not only focus on the negative risk that exist but try to find and prioritize the positive risk as a first step. This research also can be apply in any field that playing with the risk such as manufacturing, private sector, customer service, engineering, food industry, and also business risk.

1.9 OPERATIONAL DEFINITION

Risk

Long definition: the probability and magnitude of a loss or profit from a disaster, unexpected event or risk from opportunity.

Risk management process

According to (V M Rao Tummala, 1999) are structured approaches to identify and understanding potential risk factors and assessing consequences and uncertainties associated with the base these identified risk factors. This process will contain a few steps that need to be following for dealing with any types of risk in various fields.

Project performance

The successfulness of a project achieves the initial objectives in terms of time and cost.

1.10 EXPECTED RESULT

This research study has a goal to help an organization that deals with the risk every day in term of safety or management decision process. The risk management process also will determine the factor that will help to give positive impact toward the project performance. Next is the aim of this it will valid and can be apply to the other industry and it will help any field to get better result in project performance of the project that they are performed.

CHAPTER 2

LITERATURE REVIEW

2.0 RISK MANAGEMENT PROCESS

Before start a project, the important things that need to be view is the risk that exist in the project. If the risk ignore by the organization or project team it tends to give a negative impact to the organization or the project that are running. Risk are not typically refer to technical issue of finance and now it more to safety, business entering risk and many more (Emblemsvåg, 2010). To deal with the risk there a few techniques to reduce, eliminate or mitigate. There is a plan to deal with the risk. In the plan, it can also contribute to the successfulness of the project in term of duration. For an example, the identification process are tends to search on negative risk, it will lead to the poor project performance. In the risk management process there a few steps that must be follow to make sure the risk are did not affect the project performance. The steps start with the plan of risk management that will focus more on to the management work such as documenting, dividing a task and responsibility of the team. The next step is the process of risk identifying by the organization and project team. This process are examine the high probability field, place, or situation that have risk to the project duration. The third steps is the performance risk analysis and according to (Kerzner, 2009) this process are identify risk and measure the probability and find the impact to the project or organization. After completed the analysis of the risk, risk response plan are develop to selects, evaluates, identifies, and implements the solution to the risk to make sure the risk

are not threatening the duration of the project. The last steps in risk management process are the step of monitoring and control risk. This process is existing to make sure that the risk are treated well and will have small probability impact to the project that are currently execute.

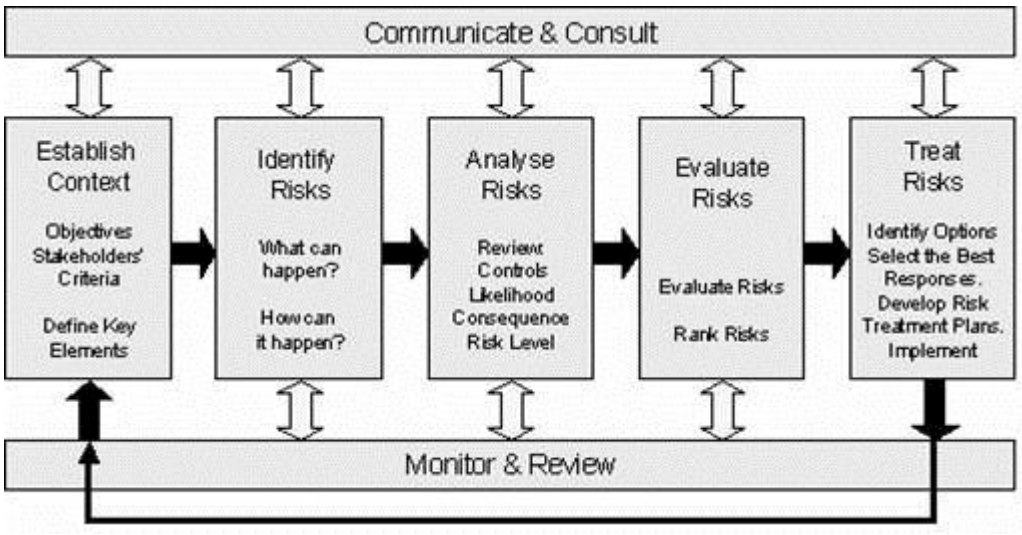


Figure 2.0: The risk management process and flow.

Sources: Australian and New Zealand Standard for Risk Management AS/NZS 4360

2.1.1 Plan Risk Management

These processes are the first step of the risk management process to deal with the risks that exist in the organization or project. In this initial phase, a team will be formed, document that relate to the risk management will develop. Planning of the risk management also will formed the risk management strategy that are include both the process and implementation for the project. According to (Kerzner, 2009) it very easier to develop from the beginning of the project rather than developing the risk for already ongoing project. this is because the development of the risk management plan on the problematic project will tends to extends the duration of the project and it will incurred high cost.

According to (Berg, 2010) the component that should have in the risk management plan is purpose of the risk management plan, objective, alternative expertise that needed, forming of responsibilities for identified area, determine the assessment process and

department involve and also rate the risk in scale. This risk management plan also need to start the development of the procedure the response strategies.

This risk management plan need to performed well because according to (Mu, Peng, & MacLachlan, 2009) if problem related to the risk happen it will delay the project and will consume additional resources and will inflate project cost and lead to project failure. This initial step also will be guidelines for the team that to deal with the risk information and lead them to understand clearly the goals, objectives, method and techniques, reporting, communication and documentation. In the risk management plan the content should have the appropriate definitions of risk that exist in the organization or project, ground rules, reliable technique to analysis the technique to deal with risk.

2.1.1.1 Risk Management Strategy

According to (Aldridge, 2103) the function of the risk management strategy is to control risk that might happen in the company such as the relationship in existing business between the client and the management. The FMD Consultant Limited highlight publish that the risk management strategy is the subset of the corporate Risk Management Strategy have a relationship in development of software applications, presentation of information to the public and the provision of methodology documentation.

The strategy that will help the risk management plan is being more specific to the area that has high probability impact. According to that statement, the efficient techniques must be develop to deal with the risk that exist in the area compare to the other area that also have risk but not giving a high impact to the project duration. An example of statement of process techniques that propose some method to conduct a risk analysis is reasonable since it will give good advantages to the project.

2.1.1.2 Risk Management Training

Next component that are important in risk planning process is the training. The training module need to be exposed to the person or organization that will face the risk. specialist must be appointed to teach the project team how to make risk management work and implement the steps and bypass the consideration, focus on a minor subset of risk management. This training are effectively if it conducted by individuals. The individual can be the person in the project or outsourcing firms relate to the risk management. This

person must have experience dealing with the risk that almost or similar to the current project that are planning or performing. According to (Mu et al., 2009) it will be redundant if the training are conducted only with the academic exercise. Finally, the training must be divide into several group that performed different job in the project and it will lead more focus of the team to the risk surround them.

2.1.2 Risk Identification

Risk identification is the process of the finding the risk that exist in the project or organization (Hubbard, 2009). In this step, the risk are initially classify into several type of risk before proceed to the next step. This information can get from the survey of the project, customer, and stakeholder involve. The risk always have in the form of technical, production, logistic and other things. These can contribute to the increasing of duration project if the risk are not take serious action. Technical risk more refer to the technology of engineering and mostly risk that exist in this field is machine problem, equipment not function, design problem and many more. Production risk more focus on the manufacturing field such as packaging, lead times, and resources availability. Other type of risk that suggest by (Kerzner, 2009) is and PMI, is external risk, which is divide in to two section; predictable and unpredictable. Next is the internal risk that refer to the risk that relate to the internal management such as employee turnover, cash flow problems. Next that suggest by the PMI is technical risk that contain of process of change to the new technology. This change might have risk that can give impact to the duration if the project. The last type of risk is legal risk, which is it involve licensing, government law, and contractual failure.

2.1.2.1 Type of risk

1. ***Predictable and unpredictable***

   According to (Sawant, 2010) Predictable risk is the risk that are already identify and already ready with the plan to deal with it. For an example, availability of the raw materials is predictable risk and if this risk are not taking seriously, it will lead to the delaying the project completion date. Unpredictable risk is the most dangerous risk that are worried by any organization because of the effect of the risk absolutely will give impact to the duration, cost, and work of the project. Example of the unpredictable risk natural disaster, accident of the

workers, government regulations. Every organization must include these types of risk in their risk management process and if this risk occurs, the organization is ready to face the consequences.

2. Internal risk (non-technical)

According to (M.A., 2000) the internal risk may be in the organization itself and it can be control by the project manager and also it can affect the duration of the project. One of the source of this internal risk is employee turnover. If this kind of things happen to the organization that currently performing project and it in the crucial phase and this problem happen the project will delay because of the no employee will be performed the work at the crucial stage and it will consume more time to get a new employee and to train them. Another source is the safety issue in organization or project. If accident happen during the project it will lead to the delaying a work. The process of investigation the accident will consume a lot of time until the report is produce and after that the project will be execute back but it already increase the duration of the project. at the beginning of the risk identification, risk that related to the safety of the employee or the project team need to be prioritizes and put it in the high probability risk that might be occur during the project.

3. Technical Risk

According to (Division, 2010) this risk significantly occur in the organization or project, this risk might exist in the stage of planning and executing. Example of the risk is the changes in technology. The changes of the technology can give impact to the duration of the project by the process of adaptation with the new changes. The new technology require team in the project learn how to use or operate the new technology. This will contribute to time consuming and incur a lot of cost. To adapt with the new technology time will spend to training how to use, how to deal with the technology if have problem with the technology.

According (Simon, 2007) the other example of the technical risk is design or plan of the project that can be extracting from the WBS. In the beginning of the project all the project design and scope of work already determine and agree by

the two party, suddenly in the middle of the project the design need to be change due to the design that change the responsible person. This problem will be the risk that can give impact to the duration of the project. When the design change, all the scope of work will change, and everything that already made need to dismantle back and build the new one and this process will extends the duration of the project that currently performing.

4. Legal risk

According to the (Malyshev, 2011) legal risk are risk that related to law. For an example the risk involve the licensing process. This licensing process are very important because if the project are conducted without get the appropriate licensing, responsible bodies might take an action to the organization such as terminate the operation and contribute to the increase of the project duration also will need a lot of cost to pay the fine.

2.1.2.3 Method That Use In Risk Identification

1. WBS decomposition

According to (T.Rajani Devi, 2012) the WBS or the Work Breakdown Structure is essential as parts of the project cycle and it is very important part of project planning. The used of this WBS is to help the organization to develop the scope of work for each team or department, it also will help in determine the responsibilities and the most important parts and relate to this research study is it can determine the accurate project estimation of coast, risk and time of the project that performed. In the WBS it contains work packages, key elements, and work breakdown structure and milestone. What is the purpose of this work breakdown structure? The main purpose of this technique is clearly state and sort the scope of project in details, accurate, and specifically. The common mistake in doing the WBS most of the organization are make it as organizational hierarchy and it not describe and explain the scope of the project and is not outcome oriented.

2. Expert judgment

According to (Rosqvist, 2003) expert judgment have a generic roles in risk identification qualification it has the role as decision maker, referenda, normative expert, domain experts, and stakeholders. The expert judgment will help the organization to identify the risk based on their expertise and experience deal with the related risk that can give impacts to the projects performance in term of cost and time.

3. Lesson learned files

Another source of the risk identification is the come from the lesson learned files. Example of the lesson learned file is like report after the accident or risk occur, journal, case study, research in related topic and many more (Graf, 2011). From this source, the risk identification are more effectively identify. Every conclusion and component in the lesson learned files might be happen again to the existing project and it also might give same impact like previous case. Mostly, the impact are affect the project cost and project duration.

4. Schedule analysis

Next source is the schedule analysis that performed in the early stage of the project. One of the component or example schedule analysis is at critical path method. From the CPM it wills shows where the potential risk exists and normally it will interpreted (David T. Hulett, 1995) the high probability risk. This source provides the timeline of the project and also states the scope of work in the project. The schedule also will have the information about the resources usage, resources availability, and resources cost. When have some lack in the schedule arrangement on the schedule in term of resources and scope of work that must assigned to the specific tasks in the schedule the performance on the project completion date will affected and lead to low performance of project on cost.

2.1.3 Risk Analysis

According to (Kerzner, 2009) risk analysis is a few strategic steps to calculate the level of risk to approve the identified risk. This process involving the process of estimating the probability of occurrence and consequences of occurrence and converting

the risk to the risk level. In the risk it be categorize in to three level which is low, medium and high. The low risk is risk that give small impact to the cost, schedule performance (duration of the project), and technical performance. Meanwhile, the medium level is regular effect to the cost, schedule performance, and technical performance. The most give impact to the cost, schedule and technical performance is the high level risk and at this stage it needs an attention from the top management.

2.1.3.1 Tools For Risk Analysis

Delphi technique

This technique is the technique that require the expert in related field present their outcome to deal with the risk. This technique are develop by the Daley and Helmer (1963). This method was exist to get the outcome and solution from various expertise within certain topic. They also quote "two heads are better than one, or..n head is better than one" (dalkey, 1972). This technique was performed in forms of group and it require a communication between the group members with the aim to check on the examinations and discussion on specific issue for finding the risk, set up policy, predicting the risk.

This technique was apply to the various field such as policy development, need assessment and resource utilization (Ven & Gustafon, 1975) and they also indicate that this technique can performed this:

1. To find the alternative in the possible program
2. To investigate and expose the assumptions or information leading to different judgment.
3. To seek out information that can build consensus on the part of the respondent group.
4. To correlate information judgments on a topic spanning a wide range of discipline.
5. To educate the respondent group as to the diverse and interrelated aspects.

The characteristic Delphi technique is made series of questionnaire to collect data form a panel of selected subjects. This technique only focus to the concerning topic only (Ludwig, 1994). In this technique the expert are allowed the expert to recheck the initial judgment and provide the alteration of the opinion. This technique can provide anonymity

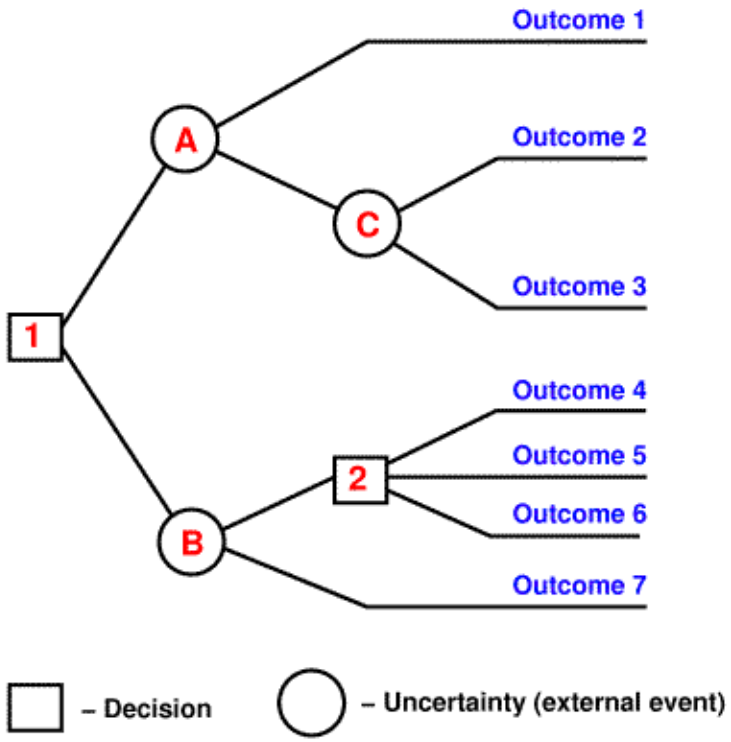
to respondent, a process of controlled feedback process, and provider to the variety of statistical tool techniques to present the data (Dalkey, 1972).

The process of Delphi technique have 4 step and it begin with step 1 which is the where the open ended questionnaire serves as cornerstone of the specific information about the area that currently working. And the next step is where the Delphi panel get a second questionnaire and is stated to review the summary item by the investigation. Next is the panelist will get a questionnaire that includes the topic and ranking summarize by the investigators in the last step and are need to revise the judgment to specify the reason for remaining outside the consensus (Pfeiffer, 1968). The last step is the process of get the list remaining items, their rating, minority opinions, and items achieving the consensus are distributed to the panelist.

Decision tree

Decision tree is another method to analysis the risk in nowadays. This techniques usually use when someone wants to get into business and the risk will be calculate by using this technique. This technique are consider the most popular approaches for representing the classifiers. A decision tree is explain the method as a recursive partition of instance space (Oded Maimon, 2000). This technique contain of points that form a rooted tree, meaning it is a directed tree with a point called root that no input because it started the process of the decision tree. A point that arrow pointing out is called an internal point or test point. At the decision tree, every point break the instance space into two more sub-spaces according to the decision.

Each of the component is points to one class representing the most appropriate target value. And the component have the value of probability and have a value. Instances are classified by navigating them from the root of the tree down.



(Time managemet-guide,2005)

Figure 2.1.2: shows the example of the decision tree to get the decision and it apllicable to apply in the risk management process.

Source: Time management guide.com

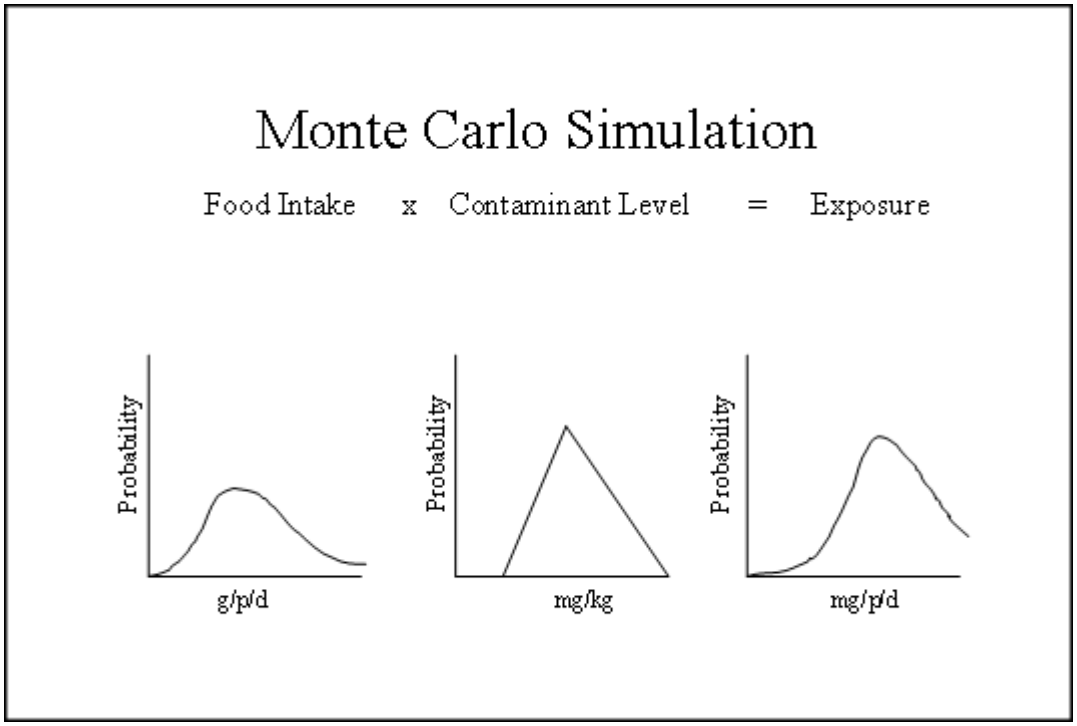
Simulation

The simulation in risk management is the process of making situation same with the reality that might happen. In this simulation process all the input will be exactly like the reality but not very same. The process are conducted by doing some calculations and lastly it will determine the output that can consider as the result if the risk is taking by the organization. One of the example that always performed by the industry including oil and gas industry. This is because this common simulation technique are very effective in determine the outcome of the project risk analysis. This common method is called 'The Monte Carlo analysis' this technique are apply to construct a series of probability distribution for potential risk, randomly sample the se distribution to determine all the risk and interprate all the data into report based on the technical, cost, and schedule

performance (Kerzner, 2009). This process are develop base on WBS of the project and it emphasizes in this evaluation process, because of the result of the simulation technique are significant when comparing with the risk analysis method. There a few steps in developing the Monte carlo simulation;

1. Construct and confirm the suitable cost or schedule detrministic the model without the risk and uncertainty.
2. Develop cost each point of the WBS and activity that contain in the project.
3. Check and recheck the information on the WBS to ensure that the input are correct and will produce output that have quality.
4. Identify the lowest WBS or activity level for which probability distribution will be constructed.
5. Investigate the WBS elements that might have uncertainty.
6. Develop suitable probability distribution for each WBS elements.
7. Aggregate the the WBS elements.
8. Analyses the the sensitivity and scenario on the cost and schedule performance.

(Kerzner, 2009)



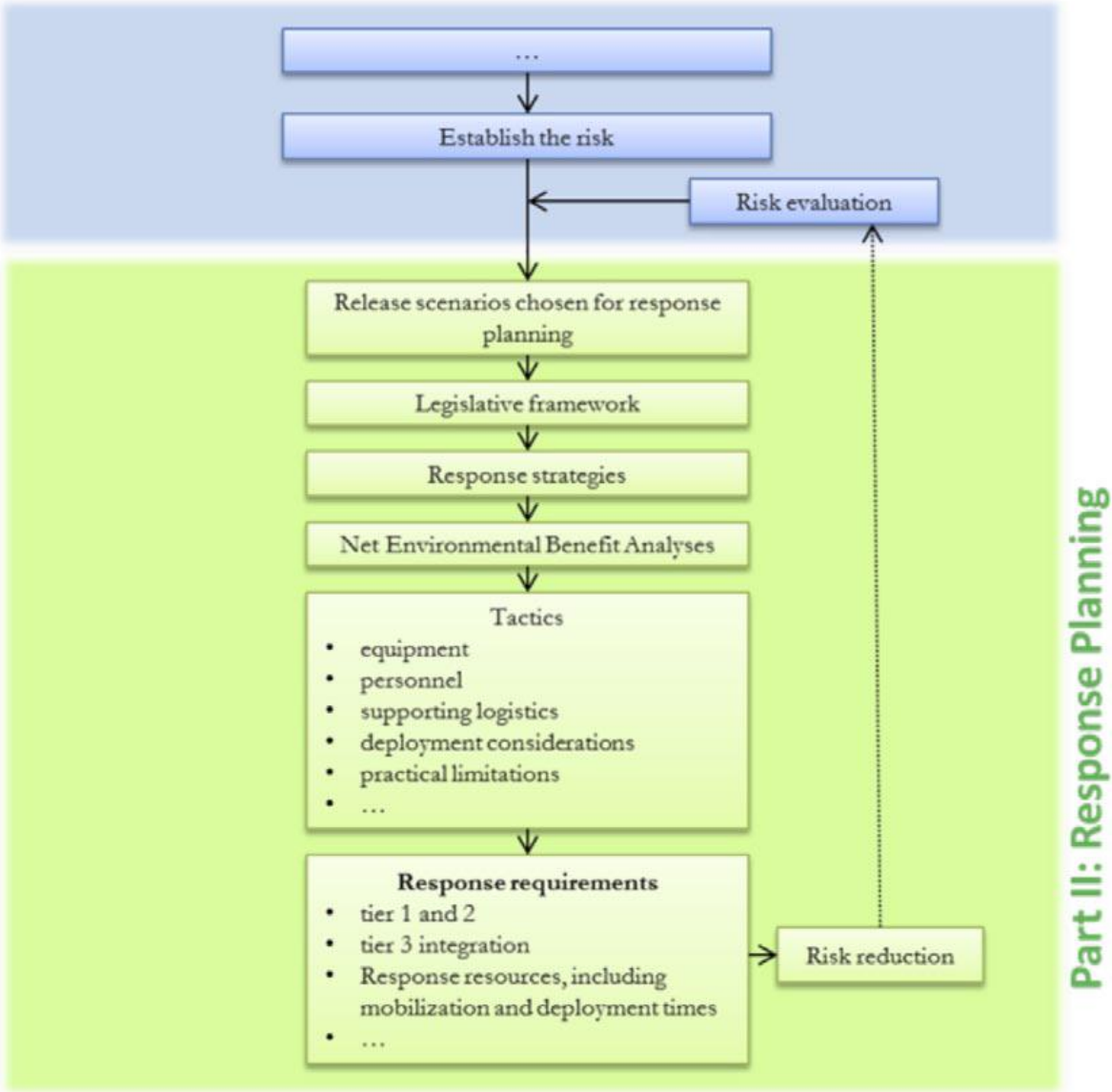
(Edwards, 2006)

Figure 2.1.3: shows the example of the outcome from the Monte Carlo Simulation used by the U.S. Food and Drug Administration

2.1.4 Plan Risk Response

According to Minnesota Health Insurance Exchange (MNHIX) risk responses planning is process of taking the risk information and translate it into the report which is contains of decision and step to avoercome the risk. This process are tends to to the selected approach to find the risk mitigation or resolution. Base on the case study report in the oil and gas industrytheir response plan begin after completed the risk assesment. After they determine the situation they will release the scenarios chosen for the response planning then they will develop a legislative framework. Then they will response with the strategies. At this moment a four response are will be choose to make the better understanding on the response. The first is the team will acceptance the risk, which mean the team will be ready to face the risk and ready for the consequences. Another response is avoidance which mean the team avoid the risk by not approving aything that might contribute to the development of the risk. Next response is the control the risk. The team in the sector will take the risk and ready to mitigate the risk with the help of the plan to control it. The last response might consider by the team is the transfer the risk. This

response is the team will share the risk with any related things that might have effect by the risk. All the response will be choose by the risk response team and after that the next plan is use the tactics to perform the response planning and it willl contain a few component suca as equipment, personnel, supporting logistics, deployment consideration, practical limitations. Than the last step in the response plan is response requirement which will highlight the responses resources, including mobilization and deployment times. And after completed this response plan the risk will reduce the probability.



(IPIECA, 2013)

Figure 2.1.4: Shows the response planning in oil spill response joint industry project

Source: The Report On Oil Spill Risk Assessment And Response Planning For Offshore Installation, 2013

Alternative Design

Alternative design in the plan risk response is the process of developing a method to back up the existing plan of response to make sure the use lower risk response. The alternative design should cover the scope that related to the risk and when the initial plan are not work, it will help to avoid inadvertent requirements, errors, and misunderstanding in the project management plan(Emblemsvåg, 2010). By using this alternative it can provide the solution to make sure the resources will be enough for the project in oil and gas industry. The alternative design also will cover the cost related risk to make sure the financial situation must continue to the project and avoid the shortage of the cash flow. The alternative design should base on the up to date issue and economic that related to the oil and gas industry. The mitigation alternative design should also cover the performance aspect because it also involve the time of completion project.

According (Ludwig,1994) another process that can be added and can be consider as alternative design basic is performed more research to get better information that more details through research and another criteria is reserves is by using a backup plan on funds and flexible schedule. Last criteria that can be added is the reduce impact by find the techniques to reduce on impacts such as limiting the extend of possible damage.

Demonstration event

This actions are focused in the program (normally test) that determine the successfulness of the risk already reduce. Referring to the template form the Royal Society of Chemistry (RSC) the demonstration event will be conducted before the event occur It should follow the actual process but in terms of simulation, this demonstration should have the planning event that will coordinate the location that risk exist and it must include the nature of the organization such as the department in oil and gas industry.

They also must know alternative controls or arrangement and necessary action that will be performed in the real situation. The alternative should conducted also in the demonstration event. After perfoming the demonstration event, evaluation need to performed to make sure the effectiveness of the plan that already demonstrate and reflect

the outcome. The improvement should be added if they any problem with the current plan (Rosqvist, T. 2003).

2.1.5 Monitor And Control Risk

According to (Kerzner, 2009) monitor and control risk is the process systematically to find and evaluate the risk response plan to the established metrics. This step not only end at here, at this process also can be develop back the additional risk response strategies or updating the response strategies and find the misplace risk. The main objectives of the monitor and control risk process is the to establish the cost, technical performance and the duration of the project.the previous step is more to proactive tecchnique notthe solution to the risk, at this process the proactive action will be take place to obtain the objective to reducing the risk to the level that can be negligible.

According to the PMBOK risk monitoring is the process of keeping the tracks of identified risk, monitoring residual risk and find the new risk, make sure the plan are conducted and check the effectiveness in reducing risk. This is process of an ongoing process for the life of the project (Edelkamp, 2004). The risk change when the projecr are initiate and it will exist a different risk at every stage of the project deliverables.

In PMBOK there are few tools to for the risk monitoring and control. The first technique is project response audits, where the auditing process will be conducted during the life cycle of the project to monitor the existing of new risk. Next is the technical performance measurement that measure the performance of the project and it will they determine the positive risk that can be accepted to imply to the project and it will give positive impacts to the projects performance. A additional risk response planning should include in the monitor and control risk process, because if suddenly the risk appear that was not anticipated risk response plan and if that happen it will give a big impact to the project performance.

The output of the risk monitoring and control include the workaround plans. This plans is the unexpected response to the appear risk that are previously misplace or the risk consider negligible but suddenly it give big impacts to the projects performance. According to (Karen Yvonne Lucas, 2009) after process performed, the corrective actions must apply the contingency plan or workaround and proceed by the project change request where the implementing contingency plan or workarounds frequently results in a

requirement to change the project plan to respond to risks. The result it issuance of a change request that is managed by integrated change control. The output of the risk monitoring and controlling is the updates on the risk response plan. At this stage risk have probability to occur and not occur and if the risk exist it will be recorded and evaluate, so the ranking of the risk need to rearrange back due to the existing of the new risk with contingency plan.

2.2 PROJECT PERFORMANCE

2.2.1 Cost performance

Cost is the important things in the project in any field. In the oil and gas industry a cost that involve in the project are huge and need to handle carefully. If have slippage in the cost it will cause huge loss to the organization. According (Walter, 2013) for producing a good cost performance, the project scope, risk management process must be fully identified and all accompanying work scope must be calculated. At the cost performance, the cost management plan need to be develop and need to cover a few aspects such as cost management approach, how to measure project cost, the cost reporting format, cost variance response processes. Related to the outcome of this research study, cost performance are the important things to test the independent variables; Risk management Process. The relationship of this two variables need to be test at the end of this research.

According to (Amran Md Rasli & Wan Maseri Wan Mohd, 2008) cost performance is the essential criteria of project performance because it represents the soundness of construction contract, profitability and productivity of contractors. The successfulness of the cost performance are when the actual cost of the total project are lower than the planned budget.

There a few techniques to measure the cost performance in the fast way, firstly is cost performance index (CPI) and its measure the value of work completed compare to the actual cost performed. Next is cost variance (CV), its measure of cost performance on a project and the indicator is if the negative value it shows the project are over budget and if the value are positive the project are on budget.

2.2.2 Time performance (schedule performance)

Time performance is the performance of the project and its ability to complete the project according to the plan without confront any project risk or problem. If the risk problem are arise it will disturb the time performance of the project and lead to the project failure. According to the t (Meempol & Ogunlana, 2006, time performance is as essential as cost performance and both strongly interrelated. This is due to the delay project in oil and gas industry normally result in extra cost and reduce the profitability to the organization and the successfulness of the time performance are consider when the project are finish before the planned schedule.

There a few techniques to measure the time measure the time or schedule performance, schedule performance index (SPI) is the technique to determine the project are over schedule or not and another techniques is schedule variance (SV), the result of the calculation if produce negative value it means the project are over schedule and if positive it means the project on track and not overschedule.

2.3 RELATIONSHIP BETWEEN RISK MANAGEMENT PROCESSES WITH THE PROJECT PERFORMANCE

The risk cannot be avoid but it predict to start develop the risk management plan (Tzvi Raz, 2002). The risk management process produce a step to identify risk consist in the oil and gas project or organization. If the organization are ignore on the risk management process the project will lead to failure and lead to poor project performance ant the project success rate is low (Morris and Hough, 1987). Mostly organizations are not performing the risk management tools and they did not make it as part of the practice in the organization. By choosing the right tool follow the step that contain in the risk management process the risk will be clearer and know how to deal with it. The mitigation plan for the risk will be develop to avoid or reduce the impact to the project performance.

2.4 CONCLUSION

Firstly, this study will present about the risk, risk management process and the project performance. The present literature review is useful making in in this study to identify the risk management process and project performance that can be classified into 2 parts; time (schedule) and cost. This research study will investigate the relationship of risk management process towards the cost and time of a project.

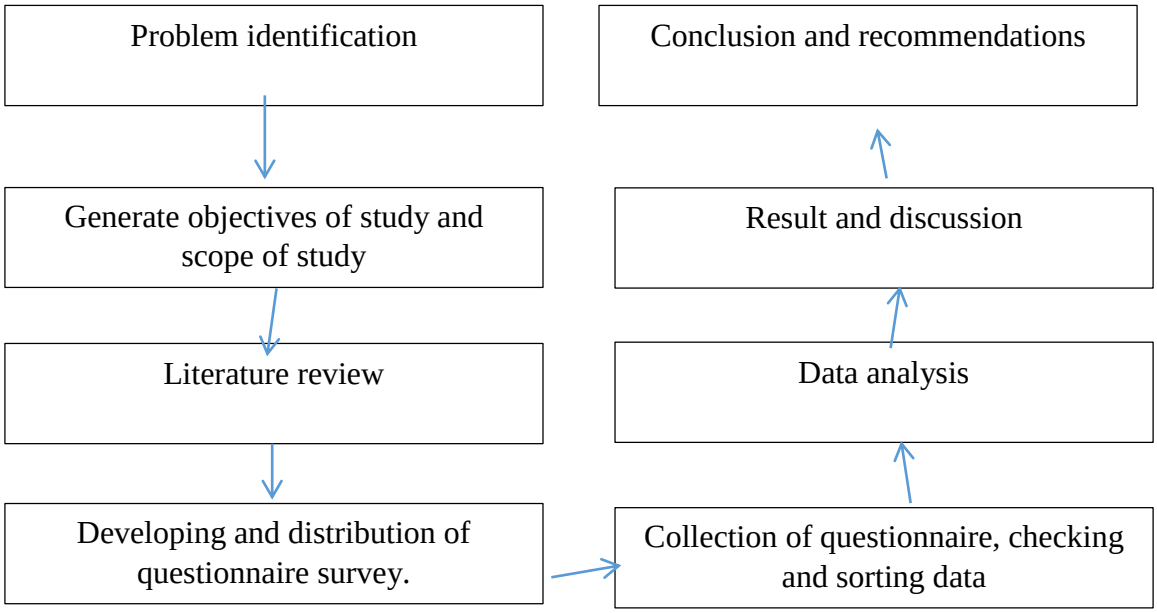
CHAPTER 3

RESEARCH METHODOLOGY

3.1 Introduction

This research study will be design according to the topic of research which is the process of risk management impact to the duration project in oil and gas industry. The research design are different according to the different types of research. This research are need to design it structure first before conduct the experiment. This research will involve an oil and gas industry that is much related to the core of this research study, which is the risk management process. The sampling method that will be used in this study is stratified sampling and the sample will answer the questionnaire. The data analysis will be conducted by using SPSS software to test the validity of the research study.

3.2 Flow Chart of Methodology



3.3 Theoretical Framework

After completed the chapter 2 on the literature review, the framework of the research variable of the study is showed in the picture below.

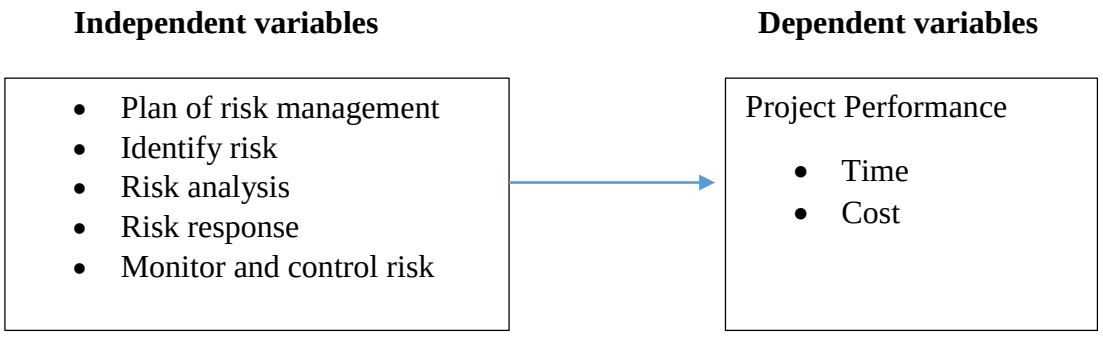


Figure 3.3: Theoretical framework of the research study

3.3.1 Independent variable

The independent variable in this research study is the following:

1. Plan of risk management
2. Identify risk
3. Risk analysis
4. Risk response
5. Monitor and control risk

3.3.2 Dependent Variable

The dependent variable in this research study is the project performance. There are two components in this variable; time and cost. Cost performance can be determine as the usage of money to complete the project are followed the initial budget or over the budget that provide and it consider as low performance if the budget are over. In term of time performance, the project performance consider high when the project are able to complete right on the expected completion date or early that that.

3.4 SAMPLING

3.4.1 Population

The targeted population of the research study will focus to the respondent that is in the field of oil and gas industry. The targeted respondent must work with organization that performed any related work to the oil and gas industry around Kuala Lumpur. The

population that I choose to conduct this research study is 100 employees in working in the oil and gas industry in Kuala Lumpur.

3.4.2 Sample

For getting a data, a suitable for the research study, the sample must have enough desired level of precision (Salant & Dillman, 1994). A very efficient method is requiring to determining the sample size to represent the population (Morgan, 1970). In conclusion the sample of this study choosing only 80 employees that work in the oil and gas company located at Kuala Lumpur. This total sample number of employees that will represent the population is about 80 and it's enough to perform the statistical process. Basically it will involve the top management, middle manager and employee of the organization.

TABLE 1

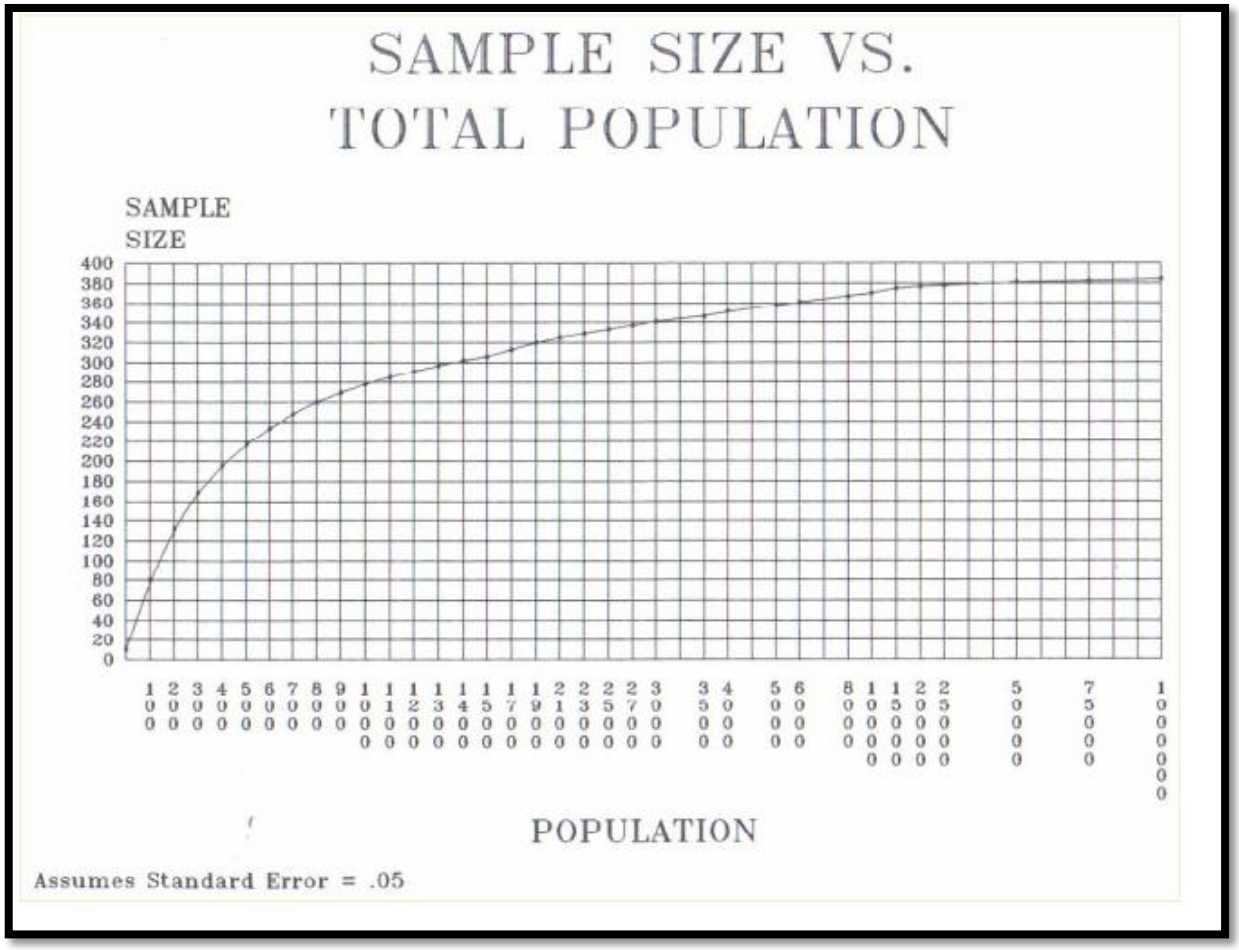
Table for Determining Sample Size from a Given Population

N	*S*	*N*	*S*	*N*	*S*
10	10	220	140	1200	291
15	14	230	144	1300	297
20	19	240	148	1400	302
25	24	250	152	1500	306
30	28	260	155	1600	310
35	32	270	159	1700	313
40	36	280	162	1800	317
45	40	290	165	1900	320
50	44	300	169	2000	322
55	48	320	175	2200	327
60	52	340	181	2400	331
65	56	360	186	2600	335
70	59	380	191	2800	338
75	63	400	196	3000	341
80	66	420	201	3500	346
85	70	440	205	4000	351
90	73	460	210	4500	354
95	76	480	214	5000	357
100	80	500	217	6000	361
110	86	550	226	7000	364
120	92	600	234	8000	367
130	97	650	242	9000	368
140	103	700	248	10000	370
150	108	750	254	15000	375
160	113	800	260	20000	377
170	118	850	265	30000	379
180	123	900	269	40000	380
190	127	950	274	50000	381
200	132	1000	278	75000	382
210	136	1100	285	1000000	384

Note.—*N* is population size.
S is sample size.

Source: Krejcie and Morgan 1970

By using table in the table, no calculations are needed to know the sample size of the research study. For an example, if the research population is 100, then to obtained the required sample size to represent entire population is refer to N=100 and the sample size will shows as S=80.



(Morgan, 1970)

Figure 3.4.2: the relationship between sample size and total population

Source: Krejcie and Morgan 1970

Figure 6: shows the relationship between sample size and total population. (Morgan, 1970) As the total increase the sample size increases at diminishing rate and remains relatively constant a slightly more than 380 cases.

3.4.3 Sampling Technique

The sampling technique that use in this research is convenience sampling. The subject are selected because of the accessibility to them are easiest and the process to get the data are more effective.

By using this technique also it suitable to test the entire population, but in most cases, the population is to large that it is impossible to include every individual. The

advantages of this technique the result are fast, not costly, easy and subject are readily available.

3.5 DATA COLLECTION TECHNIQUE

There is two techniques in data collection, there classify as primary and secondary data. The primary data is data that are new and it is raw. The secondary data is the data that get from already exist source like analysis on something that already made by other researcher.

The source a primary data usually come from questionnaire, interview, mail, and observation to the surrounding research area. Meanwhile the secondary source from personal record, publications, statistic report, and others. This research study will use to technique, which is face to face interview and mail the questionnaire to collect data.

The advantages by spread the questionnaire by using mail is it can easily get feedback from the respondent and also it will save the cost of printing paper. When using the email the tabulation of respondent is high and the feedback percentage also will be increase and from that the outcome will shows the positive result.

3.5.1 Development of Instrument

This in this research study was built to determine the effectiveness of project performance among oil and Gas Company in Kuala Lumpur. The objectives to determine either the risk management process affected the project performance of the organization or project and it is also to find relationship between risk management process and project performance.

The questionnaire will develop with 4 different section which is section A will require the respondent to answer about their general demographic information about the organization, section B will cover questionnaire about the company profile or background, section C will contains of the project performance outcome and at the section D the questionnaire will cover process risk management part.

The construction of this questionnaire of this research study indicator base on the Likert scales, this scale using data analyses using nominal, internal data, and ratio and easily to indicate and transparent (Allen & Seaman, 2007) this Likert scales have the

indicator 1 to 5 and it can categorize as 1: Strongly agree, 2: Agree, 3: Normal, 4: Disagree, 5: Strongly Disagree.

3.6 MEASUREMENT

3.6.1 Section A

Section A was developing to get the information on the demographic profile of the respondent. There is 4 question contains in this section, which is question about the gender, the category of the age respondent, educational level of the respondent and their experience in the oil and gas industry.

The question on gender have two choice answer between male and female and this will also affected the outcome of this research study. The category of respondent age divided into 5; less than 20 years, between 21-30 years, between 31-40 years, between 41-50 years, and over than 51 years. The next question was asking about the education level of the respondent. The level of the education was divided into 6 types; PMR, SPM, Diploma, Degree, Master Degree, and PhD.

The last question in the section A is about the experience in involvement oil and gas industry. The option answer has in the question is just started, less than 1 year, between 1-3 years, between 4-6 years, more than 6 years.

3.6.2 Section B

This section is developing to get the information on the organizational background of the company. The question will have in this section like the total number of the employee in the organization currently, the position of the respondent in the organization, the level of the organization, specialization of the organization in oil and gas industry, the current project involvement, organization experience involvement in oil and gas industry, scale of the project involve and lastly the customer satisfaction survey.

The size of the employee will be asking in this section, there is about 5 choice of answer which is less than 50, between 51-100, between 101-150, between 151- 200, and more than 200 workers. The purpose of this questions is to determine the workforce size available in the organization and it also have relationship with the risk management process and project performance.

Next is the position of the respondent in the organization will be ask in this part, there are about top manager, middle manager, supervisor, and normal worker. This past also important to see the different view about the risk between top management and bottom management. On the next question is the level of the organization are require and it have choice of small organization, medium organization, and big organization. From the result it can shows different views between big organization and small organization on the relationship between risk and project performance.

The question about the organization are require to be answer by the respondent to determine the specialization of their organization in oil and gas industry. There are few answer provided such as exploration, extraction, refining, transporting, and marketing. On the next question, the current place project involvement will be ask with the options of answer offshore and onshore. This part is to differentiate the risk that exist at surrounding and it impacts to the project performance.

The organization experience involve in the related field will be asking in the next question and have the 4 optional answer which is less than 1 year, between 2-5 years, between 6-10 years, more than 10 year. And followed by question about the size of the project that normally respondent organizations involve either small, medium, or big project. And lastly, the question will be on the customer and stakeholder satisfaction feedback toward respondent organization service.

3.6.3 Section C

This part of the question is looking to the project performance. This part will be ask about the risk management process to the project performance. The aim of this question to identify the performance of the project in the respondent organization. So the measurable process are determine by answering the question using Likert scale. The scale start from 1= Very Low, 2= Low, 3= Medium, 4= High, 5=Very High. The characteristic of project performance divide in to 6 choice, 3 on time performance and 3 cost performance.

3.6.4 Section D

This part will highlight on the risk management process influences the project performance. The component of the risk management process are plan risk management, risk identification, risk analysis, plan of risk response, monitor and control risk. The risk

management plan is about the strategy of the organization to deal with the risk. The identification of risk is about the experience face with the risk and their thought to the impact to the different types of risk. Risk analysis is part where the techniques using by the company apply to deal with the risk. Next is part where the plans risk response will question on the organization plan to face the risk. Lastly the monitor and control risk is about the monitor and control plan towards risk that already identify.

The benchmarking, this research wants to know the level of benchmark information to provide information at the best level. Respondent need to indicate the latest project performance by using the Likert scale. The scale start with 1= Strongly Disagree, 2= Disagree, 3= Neutral, 4= Agree, 5= Strongly Agree.

3.7 STATISTICAL TECHNIQUES

In this research study techniques, after the collection of data be made. The data will be analyze by using a software based from windows based program. The software is Statistical Package for the Social Science (SPSS). This software are used to conduct data entry and analysis and produce the tables and graphs. It advantage is can handle large amount of data and can perform all of the analysis covered in the text much more. This software are use commonly use in social science and business world. From this software the data outcome will translate how the risk management process influence the project performance. The data output can prove the reliability of the data and may use for the next research study.

3.7.1 Descriptive Analysis

3.7.1.1 Mean

Mean is the sum of the values divided by the total number of values is the data taken from sample. The formula is:

$$y = (y1 + y2 + y3 + \cdots + yn)/n(Pni = \sum_{i}^{n} = 1Yi$$

∑= sum of each measurement y

i= 1

n= omitted since there no restriction-add up everything and divided by the number of observation.

The mean is calculated to get another statistic data such as variance, it also unique, and not necessary one of the data values. The mean will show big different if the data are big or low values, and if that happen the average are redundant and not suitable.

To get the real mean group which number fall, by using midpoint calculation it can calculate the position of rating from lowest to highest. Thus, to consider which point; 1= Strongly Disagree, 2= Disagree, 3= Neutral, 4= Agree, 5= Strongly Agree.

3.7.1.2 Median

Median is the middle number of ***n*** ordered data (smallest to largest); if the ***n*** is odd the median is given by;

The median data for data that is grouped by cell:

Where L= the lower limit of t $\boldsymbol{L} + \frac{\left(\frac{n}{2}\right)-f}{fm}$**c** taints the median.

***fm*=** the frequency of the median cell

c= the cell width

f= the sum of the frequencies of the cell

n= sample size

The median function when one must find the center or middle value of the data. This is to make sure the data get the result at upper half or lower half of the data distribution. The median is also giving impact to the mean by extremely high or extremely low values.

3.7.1.3 Mode

Mode is the data that repeat frequently in the data selection. It can be one or more modes in the data and it will contribute to ensure the data have a useful method for

describing a population that bimodal. The modes can be one or two in the data but not like mean and median, it will have only one outcome.

3.7.2 Reliability analysis

Reliability is the consistency of the research study measurement, or the degree to which an instrument measures the same way each time it will use back with the same scope of study and conditions of subject. According to (Joppe, 2000) reliability is the consistency of the result over the time and it shows the total population under study is preferred to as reliability and the outcome can use back with same methodology, the research is reliable.

According to (Kirk & Miller, 1986) there are three types of reliability referred in the quantitative research;

1. The degree to which a measurement, give repeatedly, remains the same.
2. The stability of a measurement over time.
3. The similarity of measurement within time given period.

If this research study are stable the result should be similar (Golafshani, 2003) after performing the process of test and retest. If the stability increase it can determine as high degree of reliability. The test and retest is the old fashioned or conservative technique to estimate reliability and it will have small problem. (Joppe, 2000) the method may sensitize the respondent to the subject matter, and hence influence the response given. Supported by (Crocker & Algina, 1986) which found that when the respondent do the scoring in the questionnaire, the result only limited sample of the characteristic. The outcome will not tally because of the changes of the characteristic of the respondent and lead to reducing the accuracy and consistency of the questionnaire test score. (Crocker & Algina, 1986) says that "Test developers have a responsibility of demonstrating the reliability of scores from their test".

3.7.3 Validity

Validity is research conclusion, inferences, or proposition stability and can define as the best available approximation to the truth or falsity of a given inference, proposition or conclusion (Mohd Ghani, 2012). According (Joppe, 2000) the validity means the measures of the research are intended and how reliable the research result are.

(Weiner & Braun, 1998) describe that validity is development of the beginning concept, notion, question, or hypothesis to identify which data is to be collected and how it will be collected and the definitions of reliability and validity, reliability is about the result replicable or not and the validity the accuracy of measurement whether they are measure the real objectives.

CHAPTER 4

RESEARCH FINDINGS

4.1 INTRODUCTION

This chapter will interpreted the result from the analysis of data from the Google docs and SPSS outcome. The data was collected from the survey sent to oil and Gas Company in Terengganu. According to the previous chapter that describe the methodology, the data are analyzed and result are presented in alignment with the main objective of the study. The result form the data analyses will be used for the recommendation.

This process of getting the result and analysis are by distributed by the mail and contain of the every aspect that are related to the risk management process. The section was divide into several part which contain of demographic and profile of the company. The other 2 parts are more focused on the element that contain in the risk management process and also their dependent variable, project performance.

Consequently, reliability analysis and factor analysis will be reported to assess the goodness of measure, including the descriptive analysis of the major variable in the research. Finally, the research hypothesis from the early framework that already proposed testing by the regression analysis followed by the summary of the result.

4.2 DATA COLLECTION

Table 4.1: Numbers of Questionnaire

Item	Number
Number of questionnaire distributed By mail	50
Number of questionnaire respond	100
Number of questionnaire useful	80

The qualitative data generate from the questionnaire survey was analyzed using the frequency analysis and related index technique as explain before, the summary of the finding will be explain next section. The questionnaire was distributed to the oil and gas industry in Kuala Lumpur.

About 100 set of mail questionnaire mailed to the selected company in Kuala Lumpur. Total of the questionnaire that answer by the respondent is 100 that means all the questionnaire are answer by the target respondent.

4.2 DEMOGRAPHIC ANALYSIS

4.3.1 Educational qualifications

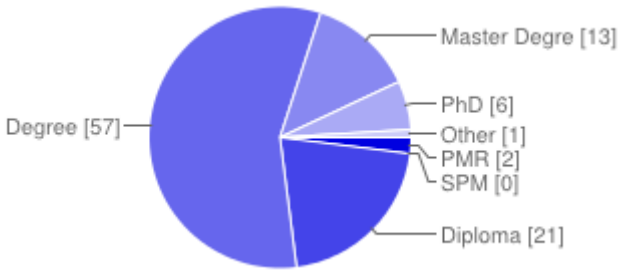


Figure 4.1: Educational Qualifications

Figure 4.1 shows the educational qualifications of the respondent, 57% of the respondent are degree holder. Then it followed the second highest is diploma, 21%. Only 21 respondent have diploma work in the oil and gas industry. The third one is master degree which is 13% respondent have the master degree followed by 6% respondent hold the Phd qualifications and the rest 2% for PMR and 1% for others qualifications.

4.3.2 Personal Experience in Oil and Gas Industry

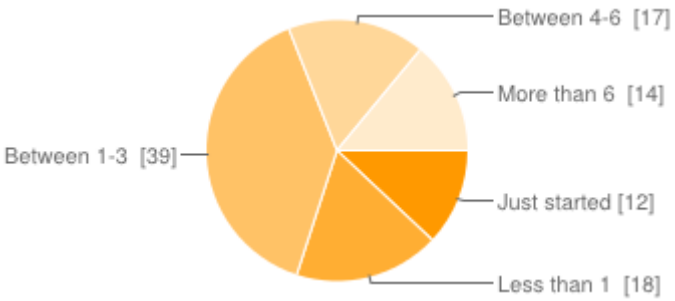


Figure 4.2: Personal Experience in Oil and Gas Industry

Figure 4.2 shows the pie chart of the personal experience of the respondent. There are five categories which is just started, less than 1 year, between 1-3 years, between 4-6 years, and more than 6 years. The figure chart 39% of the respondent have experience between 1-3 years and it followed by the 18% of the respondent have less than 1 year experience in this field. 17% of the respondent have experience about 4-6 years in the related field. 14% of the respondent have the highest experience which is more than 6 years' experience in related field and it followed by the 12% of the respondent are just started in field.

4.3.3 Total Employee of the Organization

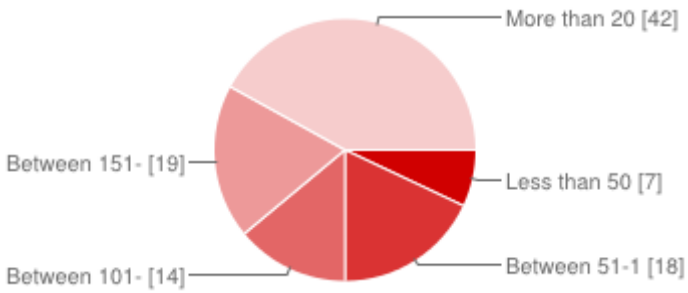


Figure 4.3: Total Employee of the Organization

Figure 4.3 shows the total employee of the organization that respondent work. 42% of the respondent working with the company that have more than 200 employees and it shows the company is a big company. 19% company have 151-200 employee and followed by 18% company have 51-100 employee working with them. The company that have 101-150 employee working with them only 14% from the respondent feedback and lastly the company that have less than 50 workers shows only 7%.

4.3.4 Position in Organization

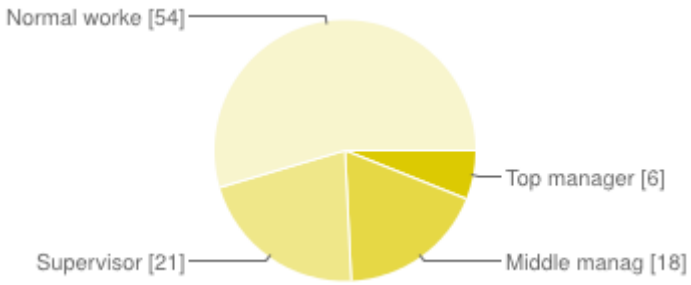


Figure 4.4: Position of the Respondent in the Organization

In this figure it shows the highest of the respondent for this research study is a normal worker the amount is 54% from the respondent. The second highest position of the respondent is supervisor which is 21% from the total. Next is the middle manager which is hold about 18% of the total of the respondent answer and lastly, the respondent that have position top manager are less with 6% only. In summary it shows that most of

the respondent came from the normal worker and the top manager is the less take part in answering this research question study.

4.3.5 Organization Level

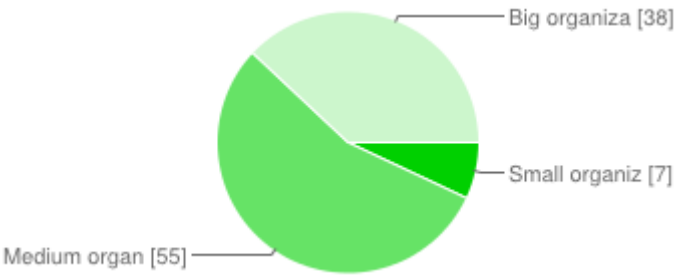


Figure 4.5: Organization Level

The figure 4.5 shows the pie chart of the organization level that receive the questionnaire for this research study. More than half with 55% is the medium organization followed by 38% big organization and lastly 7% of the organization are the small organization. It shows that in the research area there more medium organization than big organization that working on this oil and gas industry.

4.3.6 Company Specialization

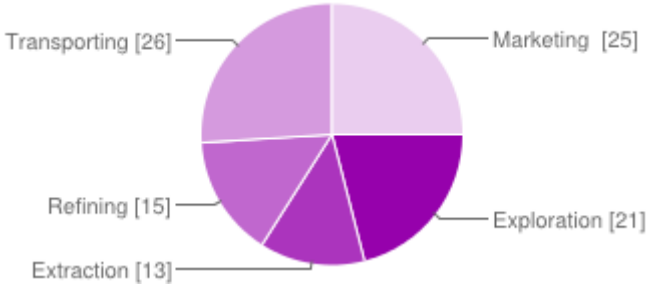


Figure 4.6: Company Specialization of the respondent

The result in figure 4.6 showed that the highest company specialization come from transporting pipelines which is 26% or 26 respondent. In means that majority of the oil and gas industry in Kuala Lumpur is transporting base company that make a pipeline for the project that related oil and gas project.

With on 1% different with value of 25% the marketing fall into second highest of the respondent company specialization and it followed by exploration base organization

with 21% or 21 person. Next is the respondent company specialization is the refining sector with value 15% and last is extraction with 13% or 13 person.

4.3.7 Current Project Involvement

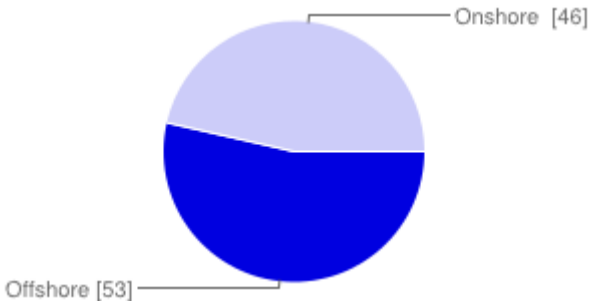


Figure 4.7: Current Project Involvement of the Respondent Organization

Based on the figure it shows that most of the project that involve by the respondent is the offshore project with 53% or 53 person pf the respondent organization involve in latest project is offshore project. Next is the 46% of the respondent organization are involve in the onshore project.

4.3.8 Organization Involvement

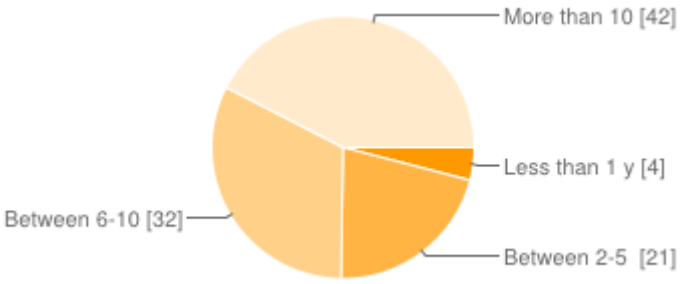


Figure 4.8: Respondent Organization's Involvement in Oil and Gas Industry

Most of the respondent organizations is more than 10 years involve in the oil and gas industry with the highest percentage with value 42%. Next is the respondent company have experience between 6-10 years with 32% and followed by between 2-5 years with 21% and respondent working with organization that less than 1 years on 4% or 4 person only.

4.3.9 Project Scale

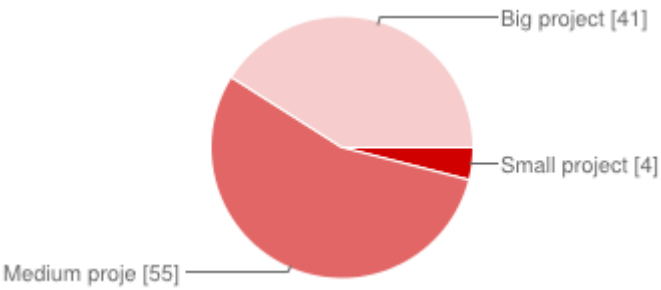


Figure 4.9: Respondent Organization Project Scale Normally Involve

Figure 4.9 shows that the most of the respondent organization right now involve in the medium project with amount of 55% and it followed by the big project with 41% of the respondent organization are currently involve with big project. And lastly, only 4% of the respondent organization involve in the small project.

4.3.10 Organization Stakeholder Satisfaction Survey

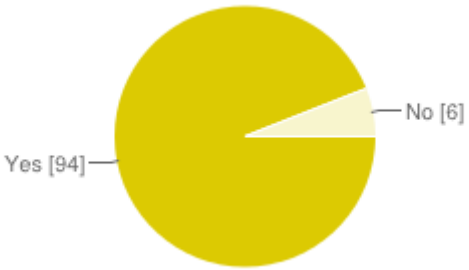


Figure 4.10: Satisfaction of Respondent Stakeholder's Surveys

Based on the figure 4.10 majority respondent conduct the stakeholder with 94% and only 6% organization of the respondent did not conduct the survey on the customer or stakeholder satisfactory.

4.4 RELIABILITY ANALYSIS

Table 4.2: Reliability of the Questionnaire

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.819	.845	29

1) Risk management planning

Item	Cr Alpha
Organization need risk management strategy.	.819
A strategy should include positive risk and solution.	.818
Ordinary workers take place in risk management plan.	.816
Risk management training conducted before project begin.	.815
Top management only involve in the risk management training	.821
Organization must have plan of mitigate, control, or eliminate risk.	.816

2) Risk identification

Item	Cr Alpha
Organization often face predictable risk and have impact to the project performance.	.819
Organization often face the unpredictable risk	.817
Unpredictable risk give impact to the project performance	.817
Internal risk give impact project performance	.814
Technical risk give impact to the project performance	.812
Legal risk give impact to the project performance	.813

3) Risk analysis

Item	Cr Alpha
Rating the risk important to determine impacts to the project performance	.812
A specific tool need to perform risk analysis	.809
Delphi technique determine the impacts of the risk to the project performance	.810
Decision tree technique help to deal with risk at the beginning of the project	.819
Simulation is very important technique	.806

4) Risk response

Item	Cr Alpha
An organization should take action to avoid the risk	.817
A plan risk response should cover the project performance	.810
An alternative design of control action is appropriate to apply	.808
A demonstration event need to perform to determine if risk is successful reduce.	.809
Risk response plan design of experiment will give view on project performance	.808

5) Monitor and control risk

Item	Cr Alpha
Schedule performance monitoring should be developing	.811
Technical performance measure should be developing	.812
Prevention action can give impacts to the project performance	.813
All employee need to take place in the process of control and monitoring	.814
A training to control risk should be conducted	.809

Reliability of the means that data have a stable and consistence formed with which the instrument is measuring the concepts and helps to assess the goodness of measure (Sekaran, 1992). In this study, internal consistency is used to test the degree of inter-correlation among items (Sekaran, 2003).

The table shows on every items that consist in the Risk Management Process shows the Cronbach's alpha more than 0.7 which determine the question are reliable to the topic. For the first process which is risk management planning, Cronbach Alpha shows more than 0.7. The higest Cronbach's Alpha is 0.821 and it shows the question of involvement top management are very important question. The lowest Cronbach's Alpha is 0.815 on the question of training of risk management but the range in a very good result.

Next is the table that shows the result of the risk identification process the highest value of the Cronbach alpha is on the effect of the predictable risk on the project performance and that means the question is most reliable and the lowest with value 0.812 on the technical risk give impact to the performance and it still can consider good according (Nunally, 1978) stated in exploratory studies the value of alpha 0.6 is generally considered sufficient and acceptable, even though a value of cronbach alpha more than 0.7 is generally considered good.

Next, shows the risk analysis table of reliability on each question that contain a high value of 0.819 on the question of the decision three decision making question and it fall into good range. The lowest is on the simulation question with a value .806 which is also fall into good range too.

On the next table shows the forth process in the risk management process which is Risk response plan. The highest value is 0.817 and consider good and acceptable, the lowest value is 0.808 and have two question that have this value and it still fall in the range of good and reliable.

Lastly, the process of monitor and control risk have 5 question in this process that are related each other and the highest value Cronbach's alpha is 0.814 and the lowest is 0.809. This two value are fall into range that are acceptable and considered as good.

4.5 MEAN & STANDARD DEVIATION ANALYSIS

Table 4.3: Mean & Standard Deviation Analysis

	N	Minimum	Maximum	Mean	Std. Deviation
Time	114	1	5	3.80	1.023
Cost	114	1	5	3.35	.950
Planning	113	2.50	5.00	4.1342	.45034
Identifying	113	2.50	5.00	4.0162	.49047
Analysis	114	2.20	5.00	3.7982	.66172
Response	114	2.80	5.00	4.1474	.46927
Monitor	114	2.80	5.00	4.2404	.46253
Valid N (listwise)	113				

According to the table the highest mean achieved risk monitoring and controlling process with value 4.2404. This mean that Monitoring and controlling process is the greatest independent variable that influenced independent variable namely time and cost in this research study. This is the process that are good to be focused in the industry.

The lower means is 3.7982 that refer the process of analyzed risk, and it not influenced too much on the project performance.

The standard deviation analysis, the smaller of the standard deviation analysis the better quality of this research, the smaller standard deviation is 0.46253 and it fall to the monitoring process and the dependent variable hold the lowest value of the standard deviation with value 1.023 on the time and 0.950 on the cost. The larger standard deviation that has been recorded is risk analysis process with value 0.66172 and it means this part are low quality to this research study.

4.6 CORRELATIONS

The correlation analysis is statistical method to measure the strength of the linear relationship between variables (Wang, 2010). The value of the correlation is to measure the strength and importance of a relationship the variables. The range of the Pearson correlation is -1 to +1. The magnitude of the absolute value with ignoring the sign provides indication of the strength of the relationship between two variables. The perfect correlation of 1 or -1 indicates that the value of one variable can be determine exactly by knowing the value of other variable. If the value 0 it shows that there is no value between two variables.

Table 4.4: Reliability Statistical for Variable

	Cost	Planning	Identify	Analysis	Response	Monitor
Time	.438**	.185*	.101	.146	.103	.133
Cost	1	.084	.205*	.071	.141	.181
Planning		1	.311**	.313**	.279**	.208*
Identify			1	.265**	.278**	.274**
Analysis				1	.547**	.392**
Response					1	.597**

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

*. Correlation is significant at the 0.05 level (2-tailed).

From the result all the dependent variable are positively correlated each other. Time correlate with variable following Planning (r=0.438), identifying risk (r=0.101), analysis the risk (r=0.146), response plan (r=0.103), monitor and control the risk (r=0.133) at $p<0.05$. Next is the dependent variables of cost also has positively related with all independent variables, risk management process. Risk management planning (r=0.084), risk identifying (r=0.205), risk analysis (r=0.071), risk response plan (r=0.141), monitor and control the risk (r=0.181). The table also showed all independent

variable have relationship with each other. The dependent variables also correlates each other and is shows positive correlation (r=0.438).

The independent variable, risk management process also correlate each other, according to the table, risk management planning positively correlate to identifying risk (r=0.311), risk analysis (r=0.313), risk response plan (r=0.279), and monitor the risk (r=0.208) at $p<0.05$. Identifying risk is correlate with the risk analysis (r=0.265), risk response plan (r=278), and monitor and control (r=0.274). It shows all the variable positively relationship at $p<0.05$. The next process, risk analysis also correlated positively with response (r=0.547), monitor and control the risk (r=0.392). Lastly is relationship between risk response plan and monitor and controlling the risk (r=0.597) at 0.05 significance level.

4.7 MULTIPLE REGRESSION ANALYSIS

4.7.1 Dependent Variable 1 (Time)

Table 4.5: Model summary of dependent variable 1 (time)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.220[a]	.049	.004	1.026	2.255

a. Predictors: (Constant), Planning, Identifying, analysis, risk response plan, monitor and controlling.

b. Dependent Variable: Time

By referring to the table above model summary of regression analysis for the independent variable and time. This output shows the value of R^2 is 0.049. the value show that the risk management planning, risk identifying, risk analysis, risk response plan, and monitoring and controlling can together explain only 4.9% of the various in the project performance in term of time. The Durbin Watson, D=2.225, shows the acceptable range ($1.5<D<2.5$). So that, it is no autocorrelation problem in the data.

Table 4.6: Coefficients Table For Dependent Variable 1 (Time)

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.301	1.237		1.052	.295
	Planning	.333	.235	.146	1.415	.160
	Identifying	.044	.215	.021	.206	.837
	analyze	.126	.179	.082	.705	.482
	response	-.092	.285	-.042	-.321	.748
	monitor	.199	.264	.090	.753	.453

a. Dependent Variable: Time

The regression coefficient, B, shows the value of dependent variable of time will effect by if the independent variable changes by one unit. The B coefficient for the planning 0.333 it can interpreted that means on average of time performance will improve 33.3% if respondent go up 1 point on the planning scale (i.e. from strongly disagree to strongly agree).

Risk response plan shows negative value –0.092, this means that on average, if the respondent in this research study go up 1 point on the risk response plan scale (i.e. from strongly disagree to strongly agree) time performance will improve -0.092 points. Lastly, the process of identifying risk, risk analyze, and monitor and control with value 0.044, 0.126, and 0.199. If this increasing process happen the value will improve by 4.4%, 12.6%, and 19.9% points.

Beta is standardized regression coefficient, this can allow us to compare the effect of variables measured on other scales. The table shows the planning have the highest value, 0.146 and represent the strongest predictor of time performance achievement. The

beta value of identifying, analyzing the risk, and monitor and control the risk are 0.021, 0.082, and 0.090. Risk response have the weaker predictor of time performance which is -0.042. The indicator is the higher the value the greater the impact of the predictor variable on the criterion variable.

The sigma or p-value is to test the relationship between the independent variable and the dependent variable. To ensure the relationship exist the p-value must $p<0.1$. Base on the table all the value are more than 0.1, $p>0.1$ and it means that the independent variable did not have relationship between time performance.

4.7.2 Dependent Variable 2 (Cost)

Table 4.7: Model Summary for Dependent Variable 2 (Cost)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.249[a]	.062	.018	.937	2.006

a. Predictors: (Constant), Risk management planning, risk identifying, risk analyze, risk response, monitor and control the risk.

b. Dependent Variable: Cost

For the dependent variable cost, R^2 showed that 0.062. This means only 6.2% of the independent variable has been told by the dependent variable, cost. The Durbin Watson, D=2.006 showed the autocorrelation because it still in the range of acceptable which is ($1.5<D<2.5$).

Table 4.8: Coefficients Table for Dependent Variable 2 (Cost)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.770	1.130		.681	.497
	Planning	.012	.215	.006	.057	.955
	Identifying	.322	.197	.167	1.637	.105
	Analyzing	-.055	.164	-.039	-.335	.738
	Response	.075	.260	.038	.289	.773
	Monitor	.271	.241	.133	1.124	.264

a. Dependent Variable: Cost

The table on the dependent variable of cost, the regression coefficient that b, represent the amount the dependent variable of cost will change by one unit. The b coefficient for identifying the risk is the highest with value 0.322, this means that on average, if respondent go up 1 point on the identifying scale (i.e. from strongly disagree to strongly agree) cost performance will increase 0.322 points which is in this case is equivalent to 32.2%.

The analyzing risk shows negative b coefficient which are -0.055, this means on the average if respondent go up 1 point on the analyzing the scale (i.e. from strongly disagree to strongly disagree) cost performance will improve -0.055. Finally the risk planning, risk response, and risk monitoring and controlling. It have the value b coefficients 0.012, 0.075, and 0.271. This means if respondent go up 1 point on the planning, risk response, and risk monitoring and control scale (i.e. from strongly disagree to strongly agree).

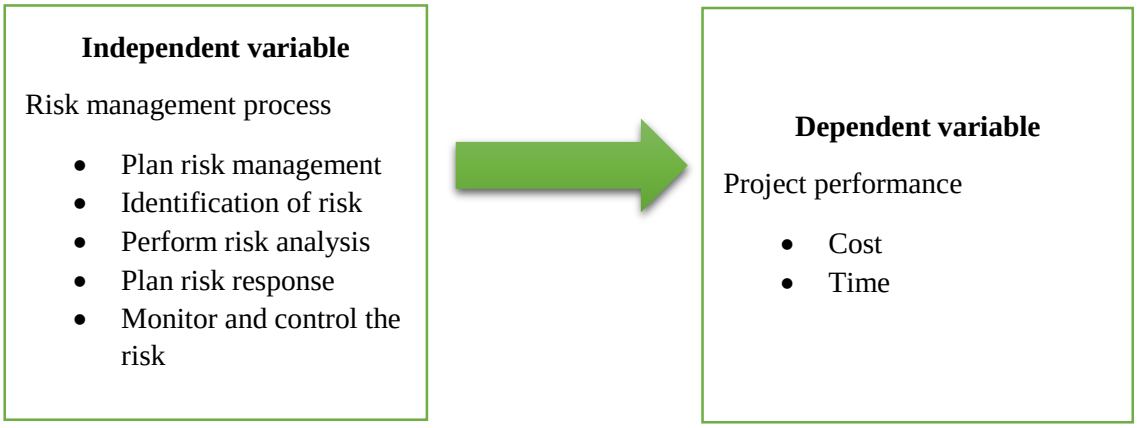
For Beta is the standardized regression coefficient we can see that identifying risk is the strongest predictor of cost performance achievement, with a beta of cost performance achievement, with a value 0.167. a beta of risk management planning, response planning, and monitoring with a value of 0.006, 0.038, and 0.133. Analyzing

has the weaker predictor of cost performance which is -0.039. Thus, the higher the beta value the greater the impact of the predictor variable on the criterion variable.

The sigma of p value is our measure of statistical significance and will tell us whether it is likely that we would have found relationship of this sample size in the sample if there was no relationship in the population. Based on the table above, all variable that is no significant with a p-value of $p<0.1$. The variables have values over 0.1 ant its means that independent variable did not have relationship between dependent variable, cost performance.

4.8 HYPOTHESIS TESTING

Concept framework is depicted below again and the hypothesis for the framework is listed once more.



The research hypotheses are:

H1: There is significant positive relationship between risk management processes to the project time performance

H2: There is significant positive relationship between risk management processes with the project cost performance.

4.8.1 Test of Hypothesis

Table 4.9: Coefficient Table for Hypothesis (Time)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.526	1.106		1.380	.170
	IV	.558	.271	.192	2.061	.042

a. Dependent Variable: Time

Table 4.10: Coefficient Table for Hypothesis (Cost)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.231	1.016		1.211	.228
	IV	.524	.249	.196	2.105	.038

a. Dependent Variable: cost

H1: There is significant positive relationship between risk management processes to the project time performance.

The first hypothesis is to know the relationship between independent variable, project risk management process and the first dependent variable, time. The result of analysis that shown in the table indicates that there is a significant relationship between risk management process and time performance. There result shows that it has a positive

relationship at t=2.061, p<0.1. It show that the higher risk management process, the higher the time performance. Therefore, hypothesis rejected because p<0.01 which is p=0.042.

H2: There is significant positive relationship between risk management processes with the project cost performance.

The second hypothesis is to know the relationship between independent variable, project risk management process, and the second dependent variable, cost. The result of analysis that shown in the table indicates that there is a significant relationship between risk management process and cost performance. The result shown that it has a positive relationship at t=2.105, p<0.1. It show the higher risk managem0nt process, the higher the cost performance. Therefore, hypothesis rejected because p<0.01 which is p=0.038.

4.9 **SUMMARY**

Base on the objective at the beginning of this research the data analysis have been made and already fulfill the requirement of this research study. In this chapter, the data analysis have been made.

Hypothesis	Result
There is significant negative relationship between risk management processes to the project time performance	Not supported
There is significant negative relationship between risk management processes with the project cost performance.	Not supported

CHAPTER 5

DISCUSSION AND CONCLUSION

5.1 INTRODUCTION

This chapter will further explain on the result that already interpreted in previous chapter. Summary of this will be discussed in this research. This chapter will conclude the study based on the objective of the study. The main purpose of this research is to study risk management process impacted to the project performance in oil and gas industry at Kuala Lumpur. This objective of this research have been through a review of the literature review and questionnaire survey as describe in previous chapter and are summarize in this chapter. In this side the research question also will be discussed in this part.

5.2 CONCLUSION

The output of this research study shows that risk management process (risk management planning, risk identification, risk analysis, risk response plan, monitor and control risk) have a negative impact to the project performance. This means that, the risk management process cannot influence on the projects performance and if effect it might be in a small amount.

5.2.1 Discussion on Research Objective

This research are purposed to study risk management process impacted to the project performance in oil and gas industry at Kuala Lumpur. The risk management process have five step which is risk management planning, identifying the risk, analyze the risk, response to the risk, and monitor and control the risk toward the project performance. The objectives of this study are following:

1. To identify the effectiveness of risk management process towards project performance.
2. To explore the relationship between the risk management process and the project performance.

This first objective is about to identify the effectiveness of risk management process towards project performance. At this first objective, the result is o interpreted what is the step that are highly contributed to the project performance.

Every step that contain in the risk management process have their own contribution to the cost and time of the project performance. For an example the first step of the risk management process, risk management planning. To start a new project in oil and gas industry the first thng need to develop is develop risk management planning. If did not have the planning the other process to counter the risk cannot be executed because there is no a specific plan or person who involve to deal with the risk.

For the project performance of the project can be measured based on the completing the project within time and cost, project delay will make cost increase. For an example the process of analyzing risk to detect the internal and external risk, the effect of the external risk also can bring to the project delay. So, if the process of risk identifying are skip huge loss might be happen that caused by the unforeseen problem.

The next objective of this study is to study the relationship between the risk management t process and project performance. This research wants to identify either the process in risk management process have positive relationship with time and performance (project performance).

Research Question

The research question in this research are following:

3. How does the risk management process give impact on project performance?
4. Is there positive risk in project?

The risk management process have a small impacted to the project performance when the sequence and the component are not followed there will be small impact and might be a big impact to the project performance in terms of cost and time. In every step of the risk management process it have a factor that support the every process. In every step there a few technique need to consider to perform any specific step. If the technique are negligible by organization and it might be not seen the consequences of the risk that have in every project that they involved.

In the questionnaire, there some part of the question asked on the positive risk or in other word opportunity. Some of the technique are made to identify the positive risk in certain project such as decision tree method. Basically this method are more to find the positive risk. Example of the positive risk in oil and gas industry is to make a decision on participating a new project and by performing the technique we can know the involvement will give profit or loss to the organization.

H1: There is significant positive relationship between risk management processes to the project time performance.

According to the first hypothesis, which is to find the relationship between risk management processes to the project performance, there is insignificant relationship between risk management process and the time performance at $t=2.061$, $p<0.01$. This shows that the hypothesis does not support because $p>0.01$ which is $p=0.042$ and is therefore rejected.

H2: There is significant positive relationship between risk management processes with the project cost performance.

According to the second hypothesis, which is to find the relationship between risk management processes to the project performance, there is insignificant relationship between risk management process and the cost performance at $t=2.105$, $p<0.01$. This

shows that the hypothesis does not support because p>0.01 which is p=0.038 and is therefore rejected.

5.3 LIMITATIONS

Based on the result of the research in previous chapter, there is limitation to this research study. The outcome didn't shows the positive relationship between two variable that have been listed in this research. Every step of the risk management process only have a small contribution to the project performance and this is because maybe the project performance more affected by other factor that have an major impact that contribute to the project performance. The result not totally reject but it only have a small value that contributed to the project performance in terms of time and cost. There is more component that are important in risk management area and it was not listed and the risk management process only help a few percent to the project performance but it still can consider as an important thing to be highlighted. This is because in the each of the process have an important component to the risk management development. Lastly, risk management have a broad area and scope and it have more impact to the project performance and the risk management process only give a minor impact to the project performance.

The limitation to the researcher in this research study is the choosing process of selected question from the questionnaire reference. The selected question maybe did not contribute much on the risk management process so the respondent might not understand the objective or meaning of the question. It also the process of choosing component of each process of risk management. The unsuitable component have been chosen and it not contribute much on the project performance and it maybe have a major contribution from another factor that researcher did not highlighted. Next is the process of answering the questionnaire, the respondent might not answer sincerely and there is certain question that are maybe private to them and their organization. This also can contribute to the low outcome of the result. Some of the respondent are not answer very well and simply answer without read properly the question and it also can contributed to the small amount of percentage of the risk management process contributed to the project performance.

5.4 RECOMMENDATIONS

The recommendations to this research study is the process of choosing important element in every step of risk management process. The element of the each step in risk management process must be suitable with the main point and it can contribute to the understanding of the respondent to the main purpose of each question. This suggestion might can help increase the contribution of risk management process towards the project performance. There is other factor other than risk management process that might contribute more to the project performance.

Next is the number of question that asked in the questionnaire need to be reduced because if research question so many it can affect the result of the reliability of the questionnaire and also can get more accurate feedback from respondent. The method of spreading the questionnaire also need to be improve. In this research study the questionnaire sent to the respondent by mail and the questionnaire in form of online questionnaire. This technique have a small disadvantage and it lead to the irrelevant answer from the respondent. The result of this study also can increased by make live interview to the respondent and make explanation to the respondent about each question. Half of the result can come from online questionnaire and the other half from the live interview.

REFERENCE

Aldridge, J., 2103. [Online]
Available at: www.fmdconsultants.co.uk/p2_risk_management_strategy_example_v0...
[Accessed 28 april 2014].

Amran Md Rasli, & Wan Maseri Wan MOhd. 2008. *Project performance framework; the role of knowledge management and information technology infrastructure*. Asian Journal of Bussiness and Accounting, 1(2), 39-64.

Anon., n.d. *Oil spill risk assessment* , London: International Association of Oil & Gas Producers.

Berg, H.-P., 2010. *Risk Managament: Procedures, Methods and Experiences*. International Journal of Project Management, pp. 79-85.

Crocker, L., & Algina, J. 1986. *Introduction to classical and modern test theory*. Toronto: Holt, RineHart, and Winston, Inc.

David T. Hulett, 1995. *http://www.prmyazilim.com/.* [Online]
Available at: http://www.prmyazilim.com/docs/riskanalysissimplified.pdf
[Accessed 26 April 2014].

Division, P. a. R., 2010. *Technical Risk Assessment Handbook (TRAH).* Canberra, Australia: Defence Science and Technology Organisation..

Edwards, A., 2006. *U.S. Department of health & human services.* [Online]
Available at:
http://www.fda.gov/food/guidanceregulation/guidancedocumentsregulatoryinformation/ingredientsadditivesgraspackaging/ucm074725.htm
[Accessed 30 April 2014].

Emblemsvåg, J. (2010). The augmented subjective risk management process. *Management Decision, 48*(2), 248-259. doi: 10.1108/00251741011022608

Graf, L., 2011. *TARDEC Systems Engineering.* [Online] Available at:
http://www.mors.org/UserFiles/file/2011%20%20Sept%20Risk%20Trade%20Space/Ou

tbriefs/WG1%20Risk,%20Issues,%20and,%20Lessons%20Learned.pdf
[Accessed 27 April 2014].

Golafshani, N. 2003. *Understanding Reliability and Validity in Qualitative Research*. The Qualitative Report, *Volume 8*(Number 4).

IPIECA, 2013. *Oil Spill risk Assessment Response Planning for ofshore installation,* London: International Association of Oil & Gas Producers.

Joppe, M. .2000. *The Research Process*. Retrieved February 25, 1998, from http://www.ryerson.ca/~mjoppe/rp.htm

Kirk, J., & Miller, M. L. 1986. *Reliability and validity in qualitative research*. Beverly Hills:Sage Publications.

Karen Yvonne Lucas, 2009. *Effective Risk Management, Measurement, Monitoring and Control.* [Online]

Meeampol, S., & ogunlan, S,O. 2006. *Factors affecting cost and time performance on highway construction project: evidence from Thailand: journal of financial management of property and construction.*

Mu, J., Peng, G., & MacLachlan, D. L. 2009. Effect of risk management strategy on NPD performance. *Technovation, 29*(3), 170-180.
doi:10.1016/j.technovation.2008.07.006
Available at: http://www.pmibaltimore.org/pmi/events/attachments/Effective-Risk_23-Feb-09_presentation_Columbia.pdf
[Accessed 30 April 2014].
Morris, P.W. and Hough, G.H 1987. *The Anatomy of Major Projects.* New York: John Wiley

Koh|, Q., 2013. Malaysia's Oil, Gas Worker Needs to Rise amid Ambitious Growth Plans. 26 february.

M.A., A. A. C. E. C. F. L. V. R., 2000. *Analysis of external and internal risks in project early phase,* s.l.: s.n.

Malyshev, P. Y., 2011. *Legal Risks in Crude Oil & Gas Markets: The Dodd-Frank Act.* [Online] Available at:

https://www.google.com.my/search?q=risk+management+process&oq=risk+manage&aqs=chrome.2.69i57j0l5.8740j0j8&sourceid=chrome&es_sm=93&ie=UTF-8#q=legal+risk+in+oil+and+gas+industry
[Accessed 30 April 2014].

Mohd Ghani Awang, 2012. Research design & Data Analysis in Social Science Research,

Morgan, R. V. K. a. D. W., 1970. determining sample size for research activitites. educational and pscychological measurement, pp. 607-610.

Rosqvist, T. 2003. On the use of expert judgement in the qualification of risk assessment

Sawant, R. J., 2010. The economics of large-scale infrastructure FDI: The case of project finance. *Journal of International Business Studies,* pp. 1036-1055.

Simon, D. H. a. P., 2007. Technical Risk Checklist. In: *Risk Checklist.* s.l.:s.n., pp. 3-5.

T. Aven, J. V. H. W., 2005. The Decision Framework for Risk Managemen, with Application to the offshore oil and gas industry. *Reliability Engineering and System Safety* , pp. 433-448.

Tzvi Raz, A. J. S. A. D. D., 2002. Risk management, Project Success, And technological uncertainty. *R&D management,* pp. 101-109.

Wainer, H., & Braun, H. I. 1988. Test validity. Hilldale, NJ: Lawrence Earlbaum Associates.

T.Rajani Devi, V. S. R. 2012. Work Breakdown Structure of the Project. *International Journal of Engineering Research And Applications, 2*(2), 683-686.

V M Rao Tummala, J. F. B. 1999. Applying A risk management process to manage cost risk for an EHV transmission line project. *international of project management, volume 17*(4), 223-235.

APPENDIX

QUESTIONNAIRE

SECTION A: Demographic Profile

On this part we seeks the general information about yourself as respondent.

We would like you to give cooperation on your general information about your profile. Please note that all the data that collected for the purpose of this study and will be strictly confidential. Please mark at the box that suit to your profile.

1. What is your educational qualification?

   PMR ( )
   SPM ( )
   Diploma ( )
   Degree ( )
   Master Degree ( )
   PhD ( )

   Others please state:

   _____

2. How many years your involvements in the oil and gas industry?

   Just started ( )
   Less than 1 years ( )
   Between 1-3 years ( )
   Between 4-6 years ( )
   More than 6 years ( )

SECTION B: Organizational Background

On this part we seeks the general information about your organizational background.

We would like you to give cooperation on your general information about your organizational background. Please note that all the data that collected for the purpose of this study and will be strictly confidential. Please mark at the box that suit to your organizational background.

1. What is the current total of employee in this organization?
   Less than 50 *( )*
   Between 51-100 *( )*
   Between 101-150 *( )*
   Between 151-200 *( )*
   More than 200 *( )*
2. What is your position in the organization?
   Top manager *( )*
   Middle manager *( )*
   Supervisor *( )*
   Normal worker *( )*
3. What is your organization level?
   Small organization *( )*
   Medium organization *( )*
   Big organization *( )*
4. What is your organization specialization in oil and gas industry?
   Exploration *( )*
   Extraction *( )*
   Refining *( )*
   Transporting: pipelines etc *( )*
   Marketing *( )*
5. What are your organization currently project involvement?
   Offshore *( )*
   Onshore *( )*
6. How many years your organization is involve in oil and gas industry?
   Less than 1 year *( )*

Between 2-5 year *( )*

Between 6-10 year *( )*

More than 10 year *( )*

7. What scale of project that normally your organization involves?

   Small project *( )*

   Medium project *( )*

   Big project *( )*

8. Did your organization conduct a survey on customer or stakeholder satisfactory?

   Yes *( )*

   No *( )*

SECTION C: Projects Performance

This section is developing to identify about your organization project performance based on time and cost aspects.

This part will focuses on project performance influence by risk management process; mark the suitable box to describe your thought about the question.

Please indicate the scale below based on current or latest project that performed or already performed by your organization.

For your information, please use scale below to indicate your opinion

1. Very low
2. Low
3. Medium
4. High
5. Very high

No	The project	1	2	3	4	5
I.	Before schedule					
II.	On schedule					

III.	Over schedule					
IV.	Under budget					
V.	On budget					
VI.	Over budget					

SECTION D: Risk Management Process Component

In this organization, the project performance depends on this risk management process as follows:

1. Strongly Disagree
2. Disagree
3. Neutral
4. Agree
5. Strongly Agree

No	Plan risk management	1	2	3	4	5
I.	An organization need risk management strategy					
II.	A strategy should include positive risk and solution					
III.	Ordinary worker should take place in the risk management plan.					
IV.	Risk management training is conducted before project begins.					
V.	Top management only involve in the risk management training.					
VI.	An organization should have plan of mitigate, control or eliminate risk					

No	Risk identification	1	2	3	4	5
I.	Your organization often face the predictable risk and have impact to the project performance (e.g. cost of money, borrowing rates, raw materials availability)					
II.	Your organization often face the unpredictable risk (e.g. government regulations, natural hazard, acts of god)					
III.	Unpredictable risk gives impacts to the projects performance.					
IV.	Internal risk gives impacts to the project performance. (e.g. labor stoppages, cash flows problem, safety issue, health and benefit plan)					
V.	Technical risk gives impacts to the projects performance. (e.g. changes in technologies, changes in state of art, design issue)					
VI.	Legal risk gives impacts to the project performance. (e.g. licenses, patent right, lawsuit, subcontractor performance, contractual failure)					

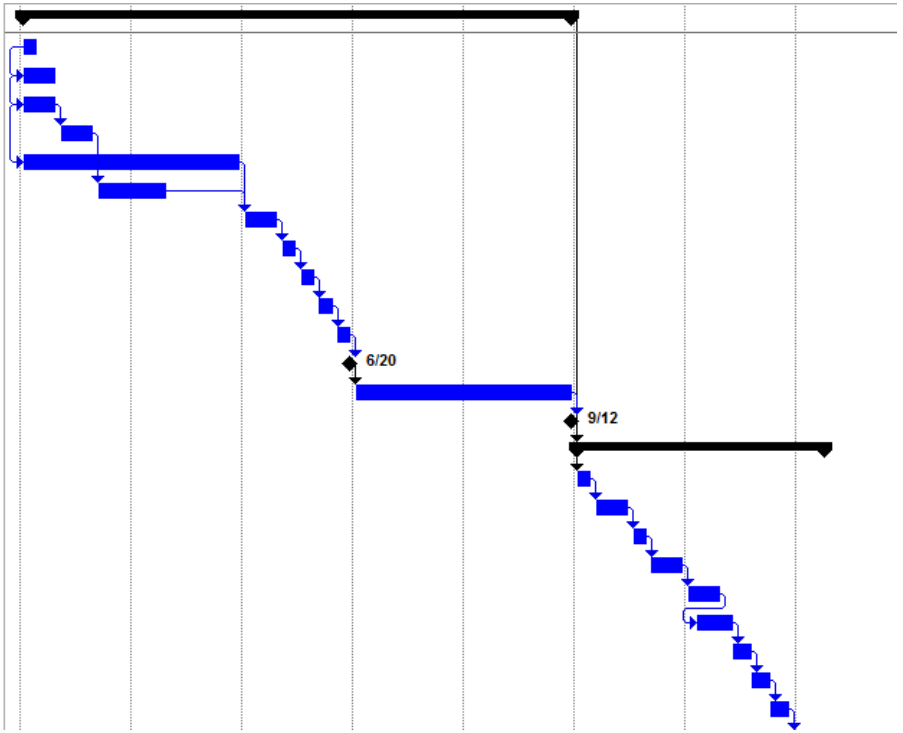
No	Risk analysis	1	2	3	4	5
I.	Rating the risk is important to determine the impacts on project performance.					
II.	A specific tools need to perform risk analysis.					
III.	A company should use Delphi technique to determine the impacts of the risk to project performance.					
IV.	Decision tree technique help to deal with risk at the beginning of the project.					
V.	Simulation is very important technique to analysis risk.					

No	Plan of risk response	1	2	3	4	5
I.	An organization should take action to avoid the risk.					
II.	A plan risk response should cover the cover project performance.					
III.	An alternative design of control action is appropriate to apply.					
IV.	A demonstration event need to perform to determine if risk is successful reduce.					
V.	In risk response plan design of experiment will give view on project performance.					

No	Monitor and control risk	1	2	3	4	5
I.	Schedule performance monitoring should be developing.					
II.	Technical performance measure should be developing.					
III.	Prevention action can give impacts to the project performance.					
IV.	All employee need to take place in the process of control and monitoring.					
V.	A training to control risk should be conducted.					

GANTT CHART

	Task Name	Duration	Start	Finish
1	**Final Year Project 1**	**150 days**	**Mon 2/17/14**	**Fri 9/12/1**
2	Identify the interested current issue	1 wk	Mon 2/17/14	Fri 2/21/1
3	Meet potential supervisors, develop project title and objective	2 wks	Mon 2/17/14	Fri 2/28/1
4	Approval of the title and objective of the research	2 wks	Mon 2/17/14	Fri 2/28/1
5	Development of project Chapter 1 (Introduction)	2 wks	Mon 3/3/14	Fri 3/14/1
6	Construction of project Chapter 2 (Literature Review)	12 wks	Mon 2/17/14	Fri 5/9/1
7	Preparation of project Chapter 3 (Research Methodology)	4 wks	Mon 3/17/14	Fri 4/11/1
8	Submitting draft of Chapter 1, 2 and 3	2 wks	Mon 5/12/14	Fri 5/23/1
9	Correcting and editing Chapter 1, 2,and 3	1 wk	Mon 5/26/14	Fri 5/30/1
10	Submitting full report of FYP 1	1 wk	Mon 6/2/14	Fri 6/6/1
11	construct slide and attend oral presentation	1 wk	Mon 6/9/14	Fri 6/13/1
12	Presenting the FYP 1	1 wk	Mon 6/16/14	Fri 6/20/1
13	FYP 1 complete!	0 days	Fri 6/20/14	Fri 6/20/1
14	Sem break!	3 mons	Mon 6/23/14	Fri 9/12/1
15	Sem break complete!	0 days	Fri 9/12/14	Fri 9/12/1
16	**Final Year Project 2**	**68 days**	**Mon 9/15/14**	**Wed 12/17/1**
17	Develop the online questionnaires	1 wk	Mon 9/15/14	Fri 9/19/1
18	Distribute through mail the questionnaires	2 wks	Mon 9/22/14	Fri 10/3/1
19	Collecting the questionnaires from the respondent	1 wk	Mon 10/6/14	Fri 10/10/1
20	Conduct data analysis	2 wks	Mon 10/13/14	Fri 10/24/1
21	Pursuing the Chapter 4 and 5	2 wks	Mon 10/27/14	Fri 11/7/1
22	Add on information of data analysis	2 wks	Thu 10/30/14	Wed 11/12/1
23	Submitting draft of the full report	1 wk	Thu 11/13/14	Wed 11/19/1
24	Correcting and editing of full report	1 wk	Thu 11/20/14	Wed 11/26/1
25	Submitting full report of FYP 2	1 wk	Thu 11/27/14	Wed 12/3/1



APPENDIX-SPSS OUTPUT

1. Frequencies table

Qualification

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	PMR	2	1.0	1.8	1.8
	Diploma	25	12.1	21.9	23.7
	Degree	66	31.9	57.9	81.6
	Master Degree	14	6.8	12.3	93.9
	PhD	6	2.9	5.3	99.1
	others	1	.5	.9	100.0
	Total	114	55.1	100.0	
Missing	System	93	44.9		
Total		207	100.0		

Involvements

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Just started	13	6.3	11.4	11.4
	Less than 1 years	21	10.1	18.4	29.8
	Between 1-3 years	44	21.3	38.6	68.4
	Between 4-6 years	21	10.1	18.4	86.8
	More than 6 years	14	6.8	12.3	99.1
	6	1	.5	.9	100.0
	Total	114	55.1	100.0	
Missing	System	93	44.9		
Total		207	100.0		

Total employee

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less than 50	7	3.4	6.1	6.1
	Between 51-100	21	10.1	18.4	24.6
	Between 101-150	16	7.7	14.0	38.6
	Between 151-200	21	10.1	18.4	57.0
	More than 200	49	23.7	43.0	100.0
	Total	114	55.1	100.0	
Missing	System	93	44.9		
Total		207	100.0		

Position

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Top manager	5	2.4	4.4	4.4
	Middle manager	19	9.2	16.7	21.1
	Supervisor	26	12.6	22.8	43.9
	Normal worker	64	30.9	56.1	100.0
	Total	114	55.1	100.0	
Missing	System	93	44.9		
Total		207	100.0		

Organization level

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Small organization	8	3.9	7.0	7.0
	Medium organization	61	29.5	53.5	60.5
	Big organization	45	21.7	39.5	100.0
	Total	114	55.1	100.0	
Missing	System	93	44.9		
Total		207	100.0		

Specialization

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Exploration	25	12.1	21.9	21.9
	Extraction	16	7.7	14.0	36.0
	Refining	16	7.7	14.0	50.0
	Transporting: pipelines etc	30	14.5	26.3	76.3
	Marketing	27	13.0	23.7	100.0
	Total	114	55.1	100.0	
Missing	System	93	44.9		
Total		207	100.0		

Current Project

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Offshore	61	29.5	53.5	53.5
	Onshore	53	25.6	46.5	100.0
	Total	114	55.1	100.0	
Missing	System	93	44.9		
Total		207	100.0		

Org Involvement

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less than 1 year	4	1.9	3.5	3.5
	Between 2-5 year	25	12.1	21.9	25.4
	Between 6-10 year	35	16.9	30.7	56.1
	More than 10 year	50	24.2	43.9	100.0
	Total	114	55.1	100.0	
Missing	System	93	44.9		
Total		207	100.0		

Scale

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Small project	5	2.4	4.4	4.4
	Medium project	58	28.0	50.9	55.3
	Big project	51	24.6	44.7	100.0
	Total	114	55.1	100.0	
Missing	System	93	44.9		
Total		207	100.0		

stakeholder

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	107	51.7	93.9	93.9
	No	7	3.4	6.1	100.0
	Total	114	55.1	100.0	
Missing	System	93	44.9		
Total		207	100.0		

2. Reliability analysis

Reliability Statistics

Cronbach's Alpha	N of Items
.819	29

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
time	113.17	92.963	.233	.819
cost	113.60	93.349	.241	.818
P1	112.32	95.290	.295	.816
P2	112.54	94.018	.295	.815
P3	112.81	94.813	.167	.821
P4	112.73	94.857	.294	.816
P5	114.03	89.740	.219	.827
P6	112.55	95.125	.273	.816
I1	113.03	93.955	.216	.819
I3	113.23	92.429	.278	.817
I4	112.65	95.157	.239	.817
I5	112.95	92.836	.329	.814
I6	112.81	92.497	.394	.812
I7	113.03	92.294	.362	.813
A1	112.87	92.491	.391	.812
A2	112.91	91.171	.471	.809
A3	113.50	87.074	.427	.810
A4	113.52	90.287	.283	.819
A5	113.04	88.489	.526	.806
R1	112.79	95.062	.239	.817
R2	112.72	92.008	.447	.810
R3	112.75	91.545	.567	.808
R4	112.96	90.918	.467	.809
R5	112.88	91.360	.529	.808
M1	112.73	92.625	.454	.811
M2	112.74	93.175	.434	.812
M3	112.71	93.262	.367	.813
M4	112.81	93.301	.350	.814
M5	112.64	91.840	.541	.809

Scale Statistics

Mean	Variance	Std. Deviation	N of Items
116.96	98.642	9.932	29

3. Regression analysis

4.1 Regression analysis variable time

Variables Entered/Removed[b]

Model	Variables Entered	Variables Removed	Method
1	Planning Identifying Analysis Response monitor	.	Enter

a. All requested variables entered.

b. Dependent Variable: Time

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.220[a]	.049	.004	1.026	2.255

a. Predictors: (Constant), Planning, Identifying, Analysis, Response, Monitoring

b. Dependent Variable: Time

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	5.743	5	1.149	1.092	.369[a]
	Residual	112.576	107	1.052		
	Total	118.319	112			

a. Predictors: (Constant), Planning, Identifying, Analysis, Response, Monitoring

b. Dependent Variable: Time

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.301	1.237		1.052	.295
	Planning	.333	.235	.146	1.415	.160
	Identifying	.044	.215	.021	.206	.837
	Analysis	.126	.179	.082	.705	.482
	Response	-.092	.285	-.042	-.321	.748
	Monitor	.199	.264	.090	.753	.453

a. Dependent Variable: Time

4.2 regression analysis variable cost

Variables Entered/Removed[b]

Model	Variables Entered	Variables Removed	Method
1	Planning Identifying Analysis Response Monitor	.	Enter

a. All requested variables entered.

b. Dependent Variable: Cost

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.249[a]	.062	.018	.937	2.006

a. Predictors: (Constant), Planning, Identifying, Analysis, Response, Monitor

b. Dependent Variable: Cost

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	6.203	5	1.241	1.413	.225[a]
	Residual	93.921	107	.878		
	Total	100.124	112			

a. Predictors: (Constant), Planning, Identifying, Analysis, Response, Monitor

b. Dependent Variable: Cost

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.770	1.130		.681	.497
	Planning	.012	.215	.006	.057	.955
	Identifying	.322	.197	.167	1.637	.105
	Analysis	-.055	.164	-.039	-.335	.738
	Response	.075	.260	.038	.289	.773
	Monitor	.271	.241	.133	1.124	.264

a. Dependent Variable: Cost

Correlations Analysis

Correlations

		Time	Cost	Planning	Identifying	Analysis	Response	MOnitor
Time	Pearson Correlation	1	.438**	.185*	.101	.146	.103	.133
	Sig. (2-tailed)		.000	.050	.287	.122	.276	.158
	N	114	114	113	113	114	114	114
Cost	Pearson Correlation	.438**	1	.084	.205*	.071	.141	.181
	Sig. (2-tailed)	.000		.377	.029	.450	.134	.054
	N	114	114	113	113	114	114	114
Planning	Pearson Correlation	.185*	.084	1	.311**	.313**	.279**	.208*
	Sig. (2-tailed)	.050	.377		.001	.001	.003	.027
	N	113	113	113	113	113	113	113
Identifying	Pearson Correlation	.101	.205*	.311**	1	.265**	.278**	.274**
	Sig. (2-tailed)	.287	.029	.001		.005	.003	.003
	N	113	113	113	113	113	113	113
Analysis	Pearson Correlation	.146	.071	.313**	.265**	1	.547**	.392**
	Sig. (2-tailed)	.122	.450	.001	.005		.000	.000
	N	114	114	113	113	114	114	114
Response	Pearson Correlation	.103	.141	.279**	.278**	.547**	1	.597**
	Sig. (2-tailed)	.276	.134	.003	.003	.000		.000
	N	114	114	113	113	114	114	114
Monitor	Pearson Correlation	.133	.181	.208*	.274**	.392**	.597**	1
	Sig. (2-tailed)	.158	.054	.027	.003	.000	.000	

	N	114	114	113	113	114	114	114

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

*. Correlation is significant at the 0.05 level (2-tailed).

Correlations

		Time	Cost	Planning	Identifying	Analysis	Response	MOnitor
Time	Pearson Correlation	1	.438**	.185*	.101	.146	.103	.133
	Sig. (2-tailed)		.000	.050	.287	.122	.276	.158
	N	114	114	113	113	114	114	114
Cost	Pearson Correlation	.438**	1	.084	.205*	.071	.141	.181
	Sig. (2-tailed)	.000		.377	.029	.450	.134	.054
	N	114	114	113	113	114	114	114
Planning	Pearson Correlation	.185*	.084	1	.311**	.313**	.279**	.208*
	Sig. (2-tailed)	.050	.377		.001	.001	.003	.027
	N	113	113	113	113	113	113	113
Identifying	Pearson Correlation	.101	.205*	.311**	1	.265**	.278**	.274**
	Sig. (2-tailed)	.287	.029	.001		.005	.003	.003
	N	113	113	113	113	113	113	113
Analysis	Pearson Correlation	.146	.071	.313**	.265**	1	.547**	.392**

	Sig. (2-tailed)	.122	.450	.001	.005		.000	.000
	N	114	114	113	113	114	114	114
Response	Pearson Correlation	.103	.141	.279**	.278**	.547**	1	.597**
	Sig. (2-tailed)	.276	.134	.003	.003	.000		.000
	N	114	114	113	113	114	114	114
Monitor	Pearson Correlation	.133	.181	.208*	.274**	.392**	.597**	1
	Sig. (2-tailed)	.158	.054	.027	.003	.000	.000	
	N	114	114	113	113	114	114	114

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

*. Correlation is significant at the 0.05 level (2-tailed).