



Thesis PM 147501

FORMULATING CORPORATE STRATEGY TO SUSTAIN THE COMPETITIVENESS OF PT. APX (DRILLING RIG COMPANY)

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PROGRAM PASCA SARJANA
INSTITUT TEKNOLOGI SEPULUH NOPEMBER
SURABAYA
2015

APPROVAL SHEET

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Master of Management of Technology (MMT) degree
in

Institut Teknologi Sepuluh Nopember

by

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ABSTRACT

The increasing domestic consumption of oil and gas followed by the decreasing national production has pushed Government to put more effort to increase drilling activities in Indonesia. PT. APX as one of the contractor providing drilling services to many oil and gas operator needs to stay competitive in the industry that demands high capital investment with high technology and management knowhow. PT APX is therefore required to formulate his corporate strategy considering the business environments to sustain its competitiveness. The corporate strategy for PT APX is formulated using David's comprehensive strategy formulation model, which consists of the input stage, the matching stage and the decision stage. The Analytical Hierarchy Process is used to calculate the weight of internal and external factors. From the QSPM analysis, the strategy with the highest TA (Total Attractiveness) score is selected. For Offshore Drilling Division the highest TA score is 5.94 and 3.77, with the strategy to find partners to open and explore new market and to increase number of offshore fleet to acquire larger market share. For Onshore Drilling Division, the highest TA score is 7.13 and 5.21 with the strategy to build stronger relationship with clients and authority and to increase number of onshore fleet to acquire larger market share.

Keywords: Strategic Management, Analytical Hierarchy Process, Corporate Strategy, David's Formulation Model, Oil & Gas

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ACKNOWLEDGMENT

This thesis is submitted as one of the requirements to complete the Magister Manajemen Teknologi (MMT) Program in Institut Teknologi Sepuluh Nopember (ITS). It has been a great challenge for me to meet all the demand of the courses and at the same time to maintain a good performance as an employee. During that period I have received lots of assistance and support from colleagues, friends and families whom I cannot mention one by one, but in particular I would like to express my appreciation and thanks to:

1. Prof. Dr. Ir. Buana Ma'ruf , MSc, MM, MRINA as my advisor and mentor for the guidance, insight and encouragement to finalize this writing.
2. Dr. Sony Sunaryo, MSi as my co-advisor and co-mentor, for his input and comment to this writing.
3. Prof. Dr. Yulinah Trihadiningrum, MAppSc and Ir. I Putu Artama Wiguna, MT, PhD as the Management of the MMT Program, for the encouragement and support to me as a graduate student.
4. The Lecturers of the MMT Program who have been very serious and cooperative in the teaching and learning process during the courses.
5. The Academic and Administration staff of the MMT Program who have given great support and assistance during the study period.
6. The class-mates from Total E&P Indonesia for the great *esprit de corps* during the good times and the bad times.
7. My wife Metiyana Utama 'joayu' and my children Anya and Kai for their patience and understanding when I missed all the good weekends during the last two years; and for their love and spirit that keep me going on until the end.

I realize that this writing is far from perfect and therefore any mistakes and errors are surely unintended and they remain mine. Any feedback and suggestion to improve this writing will be highly appreciated.

Balikpapan, January 2015

Sanggam P. P. Lumban Gaol

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CHAPTER 1

INTRODUCTION

1.1. Background

Indonesian economic growth based on the basic assumption of RAPBN 2014 was estimated to reach the rate of 6 percent. This growth rate is considered high and most certainly will require a large amount of energy supply to fuel the national economy. Until now, oil and gas is still the main commodity that supported the national economy. According to the Ministry of Energy and Mineral Resources (ESDM), about 48 percent of national energy is still using crude oil while around 21 percent is using natural gas.

Statistics from the Ministry of Energy and Mineral Resources and SKK Migas showed that within the last three decades, the oil reserves in Indonesia are steadily decreasing, from 12 billion barrels of oil in 1980 to become only 4 billion barrels in 2011. These facts signify the importance of urgent efforts to find new reserves as the cycle of oil and gas projects could lead up to many years from the exploration stage to production stage. High capital investments are therefore needed to anticipate the declining reserves.

With the ever increasing national energy consumption, Indonesia is no longer an oil producing country like it was in the 1980's. The natural declining of the old oil fields could reach up to 20 percent per year making the oil production decrease sharply. Nowadays the national oil production is only around 890 thousands of barrels per day while domestic consumption has reached 1.5 million barrels per day. To meet the domestic consumption Indonesia must routinely importing crude oil from several countries like Saudi Arabia and Nigeria.

The era of Oil Boom is long gone and Indonesia must face the difficult situation of steadily depleted reserves and an ever increasing national consumption as the result of economics development and population growth. Natural gas is firmly taking a new position as the next best energy commodity that contributes more and more to the revenues of Indonesia. In 2010 the production of natural gas peaked at the level of 1.59 million bpd according to BP Statistical

Review of World Energy 2012, and thus the era of Oil has become the era of Natural Gas. The quest to find more oil and natural gas has brought the focus on exploration and exploitation shifting from the western part to the eastern part of Indonesia, like East Kalimantan, Sulawesi, Maluku and Papua. The level of technical difficulties is consequently increasing as the exploration and exploitation activities is moving further into the more remote area and the deeper part of the ocean.

Drilling is one of the most important activities in the effort to discover new oil or gas reserves in the exploration area or to produce oil and gas from the production area. Only by drilling a well, an economic decision could be made to go or not to go further in the quest. Drilling Rig company is therefore plays a very important role in the success of an Oil & Gas Company (Operator) in finding new reserves or in producing oil and gas from the concession area.

Drilling is a vital activity in the success of an oil and gas operator. The risks are high for both the operator and the drilling company but then if the activities are successful the rewards are also very interesting. For a drilling company to be successful it must have the capability to formulate the right strategy to win the competition and to maintain its position in the market especially knowing that the drilling business is a very risky and very capital intensive business. Strategy not well defined could bring the company to failure.

PT. APX is a national company operating as drilling contractor in the oil and gas industry in Indonesia. The company specializes in providing oil, gas and geothermal drilling services to many oil and gas or energy company mainly in Indonesia and also actively participating in the tender for rig in the South East Asia region and the Middle East. PT. APX has substantial experiences performing onshore and offshore drilling activities in Indonesia during the last three decades with many oil and gas operator like Total E&P Indonesia, Vico, Chevron, Exxon Mobil, Conoco Phillips, Pertamina, Hess, BP, Petrochina etc.

PT. APX is operating in a clearly separated business units, the onshore business unit and the offshore business unit. In the onshore business unit PT APX is supported by a fleet of eight land rigs with current operational location spread all over the main islands of Indonesia, like Sumatra, Kalimantan, Sulawesi and

Java. Its offshore business unit on the other hand is mainly operating in East Kalimantan, with a fleet of 2 JackUp Rigs and 4 submersible swamp-barge rigs. PT. APX has also one FPSO operating in Selat Madura, Jawa Timur.

This research is conducted to formulate the right corporate strategies for PT. APX to sustain its competitiveness in the market. The strategy formulation will be based on the model developed by Fred R. David (David, 2013). The reason this particular model is selected because it has several advantages like its systematic approach and step by step comprehensiveness compare to other strategic formulation model. Another reason is because the model includes the QSPM (Quantitative Strategic Planning Matrix) analysis method that could finally recommend the right strategy for the company.

1.2. The formulation of problems

Based on the background of the situation, the problems could be formulated into research thesis as follow:

1. How to identify and to analyze the most important business environment factors that highly impacted the drilling rig sector?
2. How to formulate the business strategies of the two business unit of PT. APX as the basis of decision making in the corporate level.
3. How to select the corporate strategies of PT. APX to sustain and to enhance its competitiveness?

1.3. The objectives of research

By making reference to the formulation of problems above, the objectives of this research are as follows:

1. To identify factors of business environment which are the most important to the drilling rig sector.
2. To define and select the appropriate corporate strategies for PT.APX in order to sustain and to enhance its competitiveness.

1.4. The benefit of research

The benefits expected from this research are:

1. For the business organization, the results are expected to contribute to the corporate strategy formulation process of PT. APX for the next five years.
2. For the academia, this research could be useful in extending and enriching the current knowledge and methodology in defining corporate strategy and could also be used as a benchmark and reference for anyone conducting similar research.

1.5. The scope of research and the assumptions

The scope of this research is as follow:

1. The business sector being researched is the drilling rig sector, both offshore rig business sector and onshore rig business sector.
2. Data and information collected were acquired during the period 2012 to 2013.
3. Researcher only utilized the Analytical Hierarchy Process (AHP) methods developed by Thomas L. Saaty (Saaty, 1988) and Fred R. David (David, 2013) approach in the formulation of management strategy of PT. APX.
4. The period of the proposed corporate strategies is five years (2015-2020), with the assumption that there are no significant changes in the internal and external business environment during the period.

The assumptions being used in this research are as follow:

1. There is no change in the working/operation activities of PT. APX during the time the research is conducted.
2. In the pair wise matrix of internal and external factors, each element is explained within the criteria set by researcher based on literature study and the discussion with the management team of PT. APX.

1.6. The Thesis Outline

CHAPTER I: INTRODUCTION

Chapter one describes briefly and completely the background of the research, the formulations of problems, the objectives, the benefits, the scope and the assumptions of the research.

CHAPTER II: REVIEW OF LITERATURE

Chapter two explains the underlying theories and concepts of the research related to the condition of drilling rig sector, the application of AHP method and the formulation of corporate strategy based on Fred R. David approach.

CHAPTER III: METHODOLOGY OF RESEARCH

Chapter three details the framework of the research by describing the different stages in the research from preliminary studies, literary studies, data collection and processing, strategy formulation stages until conclusions and recommendations.

CHAPTER IV: STRATEGY FORMULATION

Chapter four illustrates the data collection and processing as well as the strategy formulation stages.

CHAPTER V: RESULTS AND DISCUSSION

Chapter five conducts analysis and discussion on the results obtained from the strategy formulation stages, in line with the objectives of the research.

CHAPTER VI: CONCLUSIONS AND RECOMMENDATIONS

Chapter six draws conclusion from the results of the research and provides recommendation for PT.APX and further research work to be done.

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CHAPTER 2

LITERATURE REVIEW

2.1 General Overview of Drilling Industry

SKKMIGAS, Indonesia's upstream oil and gas regulator, has announced the year 2013 as the "Drilling Year" and this announcement has sent a clear signal to the industry that the drilling activities will increase significantly and that the drilling rig will be in high demand. This announcement has become the golden opportunity for many drilling contractors in Indonesia to extend its market share in order to get a bigger piece of the market.

The target from SKKMIGAS is to complete 1.106 development wells and 121 exploration wells (SKKMIGAS, 2014), and this target is set in order to increase the national oil and gas output which is by nature continuously decreasing. The Indonesia Association of Drilling Contractor (APMI) estimates that it will require at least 500 drilling rig to meet the target set by SKKMIGAS. This means that the market are very much widely open to for any drilling contractors to make a good profit in this business.

However the challenges facing the drilling contractors are also enormous. It is widely known that the industry requires big capital investment; it also requires high quality and high competence personnel to run the drilling rig. The profitability of the drilling contractor is also depending on the macroeconomic conditions of the county where it operates and also on the global economic conditions. The price of crude oil will certainly impacted the drilling business. High oil price will certainly push more drilling activities and thus the demand for drilling rig will increase while low oil price will definitely slowing down the business.

Other challenges are the fact that the oil and gas industry, where the drilling activities took place, is heavily regulated. The local regulation and the international regulation set the rule of the game for the contractors in their effort to get more business. Local rules from SKKMIGAS set a strict procedure in all tender process where drilling contractors participate during a tender process

launched by operator. International rules also set a high requirement related to health and safety requirement, technical requirement, and also many certification that a drilling contractors must meet in order to be considered qualified.

According to the latest information released by Rigzone in October 2014 (www.rigzone.com), there are currently around twenty two (22) offshore jack up rig with 300-400ft operated in Indonesia. The owners of these 22 jack up rigs are distributed among eleven (11) drilling contractors, which make each drilling contractors in average is having only two (2) jack up rigs. Here PT. APX owns four (2 + 2 new build) jack up rigs, which is equivalent to 19 percent of market share (in terms of number of rigs). If we include the swamp barge rig (4 rigs), then for offshore rigs, PT. APX owns eight (8) of twenty two (22) rigs operating in Indonesia, equivalent to 38% market share (in terms of number of rigs).

This situation is very a clear indication that market is in tight competition between the rig owners with a very limited numbers of drilling units available. A drilling contractor is forced to develop strategy that will make them capable to compete in the market and to make significant profit in order to continue to exist in the industry.

2.2 General Overview of PT. APX

PT. APX was established on June 20th, 1984 and specializes as a drilling service provider for exploration and production firms engaged in Indonesia's oil and gas industry. In its initial stage PT. APX only served offshore drilling services with two units of submersible swamp barges, Maera and Rasis, and one jackup rig, Raniworo.

In 2001, with the aim to creating an integrated oil and gas drilling Services Company, PT. APX merged with PT Medco Antareja, an affiliated company at that time and one which engaged in onshore drilling, with twelve onshore fleets. Incorporations of these two companies had created PT. APX as a much larger enterprise capable of handling projects, either in Indonesia or overseas such Brunei Darussalam, Myanmar, Australia, Middle East and the United States.

In 2002, to support the business expansion strategy, PT. APX had listed its shares in Indonesia Stock Exchanges (IDX), with APEX as its ticker. PT. APX was the first domestic drilling company listed in IDX. This successful IPO inspired the company to expand, through the addition of three more offshore rigs, making total of fourteen rigs, comprising of six offshore rigs and eight onshore rigs.

PT. APX also owns a floating, production, storage and offloading system (FPSO), a floating type tank system, which is used to develop satellite or marginal fields in shallow or deep water as they can be secure when reservoirs are consumed or moved for consumption to other places.

2.2.1. Vision, Mission and Corporate Values

The mission and vision statements of PT. APX are as follow:

Vision: To be a world class drilling contractor offering quality without compromise.

Mission:

- Maintaining a high standard of Safety, Health, and Environment (SHE) to ensure the safety and welfare of employees and to protect the surrounding environment.
- Providing maximum value to all of stakeholders while making a positive impact on society and the environment.
- Developing human resources with global-standard quality and competency

Corporate Values:

- Trust: Integrity, Commitment, Honesty
- Dedication: Loyalty, Enthusiasm, Devotion
- Performance: Competence, Professionalism, Leadership, Result.

2.2.2. Overview of Company's Operation

PT. APX categorizes its business operations into two segments, the Offshore Drilling Services and Onshore Drilling Services. PT. APX owns eight land rigs, two jack-up rigs, four submersible swamp barge rigs plus one unit Floating Production, Storage and Offloading (FPSO). Jack-up rig is a mobile drilling unit with self-elevating drilling platform equipped with legs that are lowered to the

ocean floor until a foundation is formed to support the drilling platform. With this fleets PT. APX has become the most well-known drilling contractors with operating areas covering domestic and foreign region.

Onshore Business Unit

The onshore fleet consists of eight (8) rigs where all rigs are operating only in Indonesia. Its main clients are Chevron, Vico Indonesia, Pertamina Hulu energy and Supreme Energy. Here PT. APX has more advantages than its competitor as most of its onshore rigs have a higher horse power, more than 1000 HP (Horse Power), that allows the rigs to work more efficiently.

The overall performance of the onshore business unit is showing good results with 16 percent increase in performance in 2013 and overall utilization rate of 63 percent (Annual Report PT. APX, 2013).

In the onshore business unit, PT. APX is in competition with mainly local companies as foreign companies are not really interested to play on this segment.

Offshore Business Unit

For the offshore business unit, PT. APX has two (2) jack-up rigs and four (4) submersible swamp-barge rigs. The first jack-up rig acquired was the rig Raniworo in 1995, while the more recent super premium rig, Soehanah, was completely build in 2007. The jack-up rigs are mobile units that could move and have self-elevating platform with legs that could go down until the sea bed. The submersible swamp-barge rig is used for drilling in the shallow water like in the swamp area or river delta with water depth around 30 feet. Currently all the offshore rigs are operating in the Mahakam Block of Total E&P Indonesia, a main client of PT.APX.

PT. APX has also one (1) unit Floating Production, Storage and Offloading (FPSO) which is used as offshore facility to do the processing and the storage of oil and gas. The FPSO is named Sea Good 101 and it was made in a shipyard in Guangxi Wuzhou in 1998. The FPSO could process 20.000 barrel of oil and 16.000 barrel of water per day and has the capacity to store 40.000 barrel of oil and 60 million standard cubic feet of gas per day. In Indonesia, PT APX is the only drilling company who owns an FPSO and this fact put PT. APX as the only

player in this niche market. The FPSO recorded a 100 percent utilization rate secured through a solid contract with Santos (Sampang) Ltd.

In the offshore business unit, PT. APX is in competition with mainly foreign companies. This business segment is marked by high capital intensive which correspond directly to high business risk. The aggregate supply of offshore rigs in the country is always below the aggregate demand, mainly due to the limited number of fleets currently available and also due to the fact that there is local regulation that put control to the hire of floating rigs with foreign flags (Cabotage Law, INPRES no.5/2005).

2.2.3. Overview Company's Performance

In the year 2013, PT. APX has been successful to improve the utilization rate of its fleet to become 91 percent for the offshore business unit and 63 percent for the onshore business unit. The increase in the utilization rate is clearly reflected in the number of wells completed, which are 124 wells from only 111 wells in the previous year.

The increased utilization of the rigs directly impacted the financial performance of the company with increasing revenue of 24.3 percent (to become USD 259.6 M) and increasing net income of 26 percent (to become USD 49.2 M). The recorded EBITDA (USD 113.1 M) is also showing 21 percent increase from last year record.

In terms of safety, PT. APX has not been successful in reaching its own target of zero TRFR (Total Recordable Frequency Rate), but managed to maintain a score of 2.42, still below the standard score of 3.23 set by International Association of Drilling Contractors (IADC).

2.3 Strategic Management

2.3.1. Concept and Definition

Fred R David defined strategic management as the art and science of formulating, implementing, and evaluating cross functional decisions that enables an organization to achieve its objectives. Strategic management is therefore focused on integrating management, marketing, marketing, finance/accounting,

production/operations, research and development, and information system to achieve organizational success (David, 2013).

Thompson (Thompson, Peteraf, Gamble, & Strickland III, 2014) explained strategy as company's action plan for outperforming its competitors and achieving superior profitability. Strategy here is representation of managerial commitment to integrated choices about how to compete. The choices involved here includes How to attract and please customers; How to compete against rivals; How to position the company in the marketplace; How to best respond to changing economic and market conditions; How to capitalize attractive opportunities to grow business; and How to achieve company's performance targets. The objective of good strategy is not only to gain competitive success in the short run, but rather to gain lasting success that can support growth and secure the company's future in the long run.

Company strategy provides direction and guidance in terms of what company should do and should not do. Knowing what not to do can be as important as knowing what to do, as making wrong strategic moves will prove distraction and a waste of company resources. The essence of any strategy is the action and moves that managers are taking to gain competitive advantage over rivals.

2.3.2. Strategic Management Model

A model can be used to represent the process of strategic management. Even though a model cannot guarantee a success, it can represent a clear and practical approach to formulate, implement and evaluate strategies. There are several models of strategic management that have been developed to date, and according to Ma'ruf (Ma'ruf, 2013) they can be summarized as seen in Table 1. Strategic Management Models .

Table 1. Strategic Management Models

Models	Description	Level	Framework
David, 2013	Formulation model with 9 steps integrated in 3 stages, 14 alternatives strategy	Corporate	Application oriented, procedural, quantitative
Kartajaya, 2003	Marketing as strategic business concept, environmental audit : company, customer, competitor and changes	Business	Conceptual, qualitative
Thompson-Strickland, 2001	The five tasks of strategic management	Corporate	Conceptual, qualitative
Pearce-Robinson, 2000	Adopting the Porter Generic Strategies, 12 alternatives strategies	Business	Conceptual, qualitative
Mintzberg, 1998	Basic Design School Model	Business	Conceptual, qualitative
Treacy & Wiersema, 1997	Basic Model: Price Leadership, customer intimacy, operational excellence	Business	Conceptual, qualitative
Wheelen-Hunger, 1994	Model formulation of SWOT analysis, with 9 alternatives strategy	Corporate	Conceptual, qualitative
Porter, 1995	Generic Competitive Strategy: focus, cost leadership, differentiation	Business	Conceptual, qualitative

Source: (Ma'ruf, 2013)

Fred R David developed a comprehensive model of strategic management process which will be used on this research to formulate the strategy for PT. APX. The reason why David's model is selected is because it is the only model that provides a quantitative and comprehensive framework for formulating corporate strategy. The other models developed by Thompson (Thompson-Strickland, 2001) and Wheelen (Wheelen-Hunger, 1994) provides only conceptual and qualitative framework.

preparing budgets, developing and utilizing information systems, and linking employee compensation to organizational performance.

The strategy evaluation stage is where strategies are evaluated to know whether they are working well or not. Strategies are subject to future review if the external and internal factors are significantly changed. Three fundamental strategy evaluation activities are: 1. reviewing external and internal factors that are the bases for current strategies, 2. measuring performances, and 3. taking corrective actions.

This thesis will utilize the three stages approaches to strategic management developed by David to formulate the strategy for PT. APX.

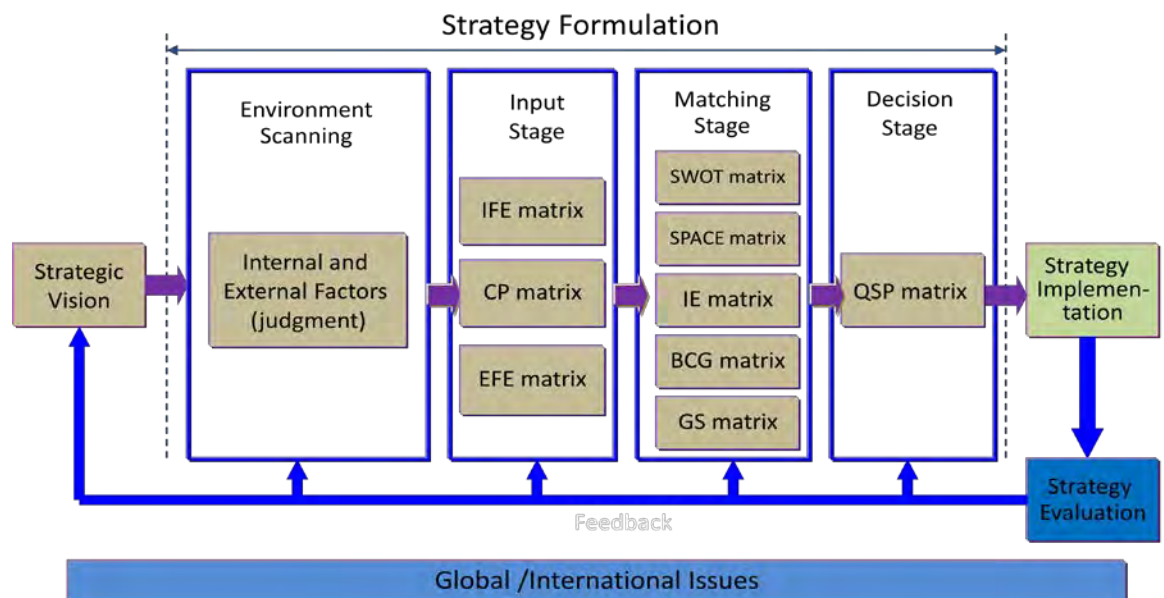


Figure 2. The Developed David's Formulation Model

Source : (Ma'ruf, 2013)

2.4 Types of Strategies

According to David (David, 2013), there are eleven alternative strategies that a company could pursue; they are forward integration, backward integration, and horizontal integration under Integration Strategies Group; market penetration, market development and product development under Intensive Strategies Group;

related diversification and unrelated diversification under Diversification Strategies Group; retrenchment, divestiture and liquidation under Defensive Strategies Group.

Integration Strategies:

1. Forward Integration: this strategy aims to gain ownership or to increase control over distributors or retailers.
2. Backward Integration: this strategy aims to seek ownership or to increased control over company's suppliers. This strategy will work best when a company's current suppliers are unreliable, too costly, or cannot meet the firm's needs.
3. Horizontal Integration: this strategy aims to seek ownership or to increased control over a company's competitors.

Intensive Strategies:

4. Market Penetration: this strategy aims to increase market share of company for present products or services in present markets through greater marketing efforts.
5. Market Development: this strategy will develop market by introducing present products or services into new geographic areas.
6. Product Development: this strategy aims to increase sales by improving or modifying present products or services.

Diversification Strategies:

7. Related Diversification: this is a strategy to diversify product or services across businesses with related value chain.
8. Unrelated Diversification: this is a strategy to diversify product or services across businesses with unrelated value chain.

Defensive Strategies:

9. Retrenchment: this is a strategy to regroup a company through cost and assets reduction to reverse declining sales and profit.
10. Divestiture: this strategy will sell a division or part of a company to raise capital for further strategic acquisition or investments.
11. Liquidation: this strategy will sell all company's assets, part by part, for their tangible worth.

2.5 Analysis of Business Environment

Formulating or developing strategy begins with assessment of company's current situation. Within this framework two aspect of company's situation are therefore necessary to be analyzed: 1. the competitive situations in the industry where the company operates or its external environment; and 2. the company's resources and organizational capabilities or its internal environment.

Analysis of the external environment of a company or external audit is aimed at identifying and evaluating trends and events beyond the control of a company. The purpose of external audit is to show the key opportunities and threats faced by company and to help managers to formulate the right strategy taking advantage of the opportunities and avoiding or reducing the impacts of threats (David, 2013).

External audit will be able to identify the key external forces that must be considered before formulating the right strategy for a company. The external forces are normally classified into five categories: 1. economic forces; 2. social, cultural, demographic and natural environment forces; 3. political, governmental and legal forces; 4. technological forces; 5. competitive forces (David, 2013).

On the other hand, analysis on the internal environment will focus on identifying and evaluating the strength and weaknesses of the company's business, including management, marketing, finance/accounting, productions/operations, research and development, and management information system. The objectives and strategy of the company after an internal audit will focus on capitalizing internal strength while overcoming weaknesses.

Performing the external audit and internal audit for each different business unit, the onshore business unit and the offshore business unit, will be the first step to do before establishing the long term objectives of a company.

2.6 Analytical Hierarchy Process (AHP)

AHP is a decision making support model developed by Thomas L Saaty in 1988. This model is commonly used to solve complex problems with multi criteria and multi factor by structuring the problems into hierarchy. Hierarchy is

defined as a representation of a complex problem in a multi-level structure where the first level being the objective, followed by level of factors, criteria, sub-criteria and so on until the lowest level of the decision alternatives. With this hierarchical model, the problem can be translated into a systematical and structural way for decision analysis.

The principle of this model is to accommodate cognitive aspects, experiences and subjectivity of decision makers as the basic input for the decision analysis process.

To make decision in organized way the common steps are:

1. Construct the hierarchical decision elements
 - a. Define the problem
 - b. Structure the decision hierarchy from the top with the goal of the decision, then the objectives from a broad perspective, through the intermediate levels (criteria on which subsequent elements depend) to the lowest level (which usually is a set of the alternatives).
2. Construct a set of pairwise comparison matrices using the Saaty Scale (Table 2. Saaty Scale). Each element in upper level is used to compare the element in the level immediately below with respect to it.
3. Define the priority level and the importance weight of each criteria (decision element) from the pairwise matrices of each level of hierarchy.
4. Conduct the consistency test for each pairwise comparison for each level of hierarchy.
5. Synthesize and aggregate each decision element for all level of hierarchies

Table 2. Saaty Scale

Intensity of importance	Definition	Explanation
1	Equal importance	Two elements contribute equally to the property
3	Moderate importance	Experience and judgments slightly favor one element over the other
5	Strong importance	Experience and judgments strongly favor one element over the other
7	Very strong importance	An element is strongly favored and its dominance is demonstrated in practice
9	Extreme importance	The evidence favoring one element over another is of the highest possible order of affirmation
2, 4, 6, 8	Intermediate values between two adjacent judgments	Compromise is needed between two judgements

2.7 Previous Studies

Several researches had been conducted with the topics of corporate strategy development. Arif Fadjar Nugraha (2006) used the method of Fred R. David and the tools AHP in his research about strategy formulation for power generator project to gain market share by utilizing local resources.

Another research had also been conducted for the war vessel division of PT PAL Indonesia by Cahyono (2006) using the framework developed by Fred R David and also using AHP in processing the data. He started the research as the respond to the significant decrease in the war vessel division's sales. Here he found that the current strategies of PT PAL Indonesia were already out-dated and cannot support the competitiveness of the company in the industry as they were no longer relevant in the business environment where the company operated.

A more recent research was conducted by Taufiqurrohman (Taufiqurrohman, 2013) where he tried to developed the right corporate strategy for a chemical company in order to survive the competition using also the Fred R David approached and AHP.

This particular research that is now being conducted will focus to formulate strategy for a National Drilling Rig Company in order to sustain his

competitiveness in the local and regional market. The business environment of drilling industry is heavily influenced by external and internal factors, locally and globally, considering the nature of high capital investment and high technology requirement, to survive in the industry the company management will have to develop and to set the right strategy so that the company could take advantages from its strength and gain the most business opportunity that are available by ensuring that its weaknesses will not be the obstacles to grow. This research will try to identify the main external and internal factors that are present in the industry for each different business units of PT. APX and will formulate the corporate strategy based on the David's approach.

CHAPTER 3

RESEARCH METHODOLOGY

The research methodology is very important to be used as guidance to ensure that the research is going systematically in accordance with the selected methodology and will get a satisfactory results and benefits for the stakeholder. In order to achieve desirable objectives, a clear research outline is necessary to assist and to guide the researcher with step by step action in solving the problems. With a systematic research outline, the research will be easier to be conducted.

3.1.Methods and Research Outline

3.1.1. Research Methodology

According to Hussey (Hussey & Hussey, 1997), methodology refers to the overall approach to the research process from the underpinning to the collection and analysis of the data. Here methodology concerned with the following main issues:

- Why certain data is collected?
- What data is collected?
- From where the data is collected?
- When the data is collected?
- How the data is collected?
- How the data will be analysed?

According to Arikunto (Arikunto, 2006), research methodology is the methodology used by researcher in collecting research data through questionnaires, interviews, observations, testing and documentation. The methodologies are basically a scientific way to get data for certain objectives and purposes.

The approach used in this research is by collecting data through questionnaires, interviews and observation. For data analysis, the methodology of Analytical Hierarchy Process (Saaty, 1988) will be utilized along with the methodology of strategic management developed by Fred R. David (David, 2013).

3.1.2. Research Framework

This research will consist of several stages which will be started by identification stage, where data collection will be conducted by doing preliminary studies of PT. APX or through internet to ensure the availability of data. Data will be acquired through primary sources or secondary sources. Questionnaires and interviews will be the primary sources to get primary data while review of literature and company's publications will be the way to get secondary data.

The next stage of the research will be data processing where several methods will be used. The last stage will be analysis and discussion followed by conclusion and recommendation. The research framework is described on the picture below.

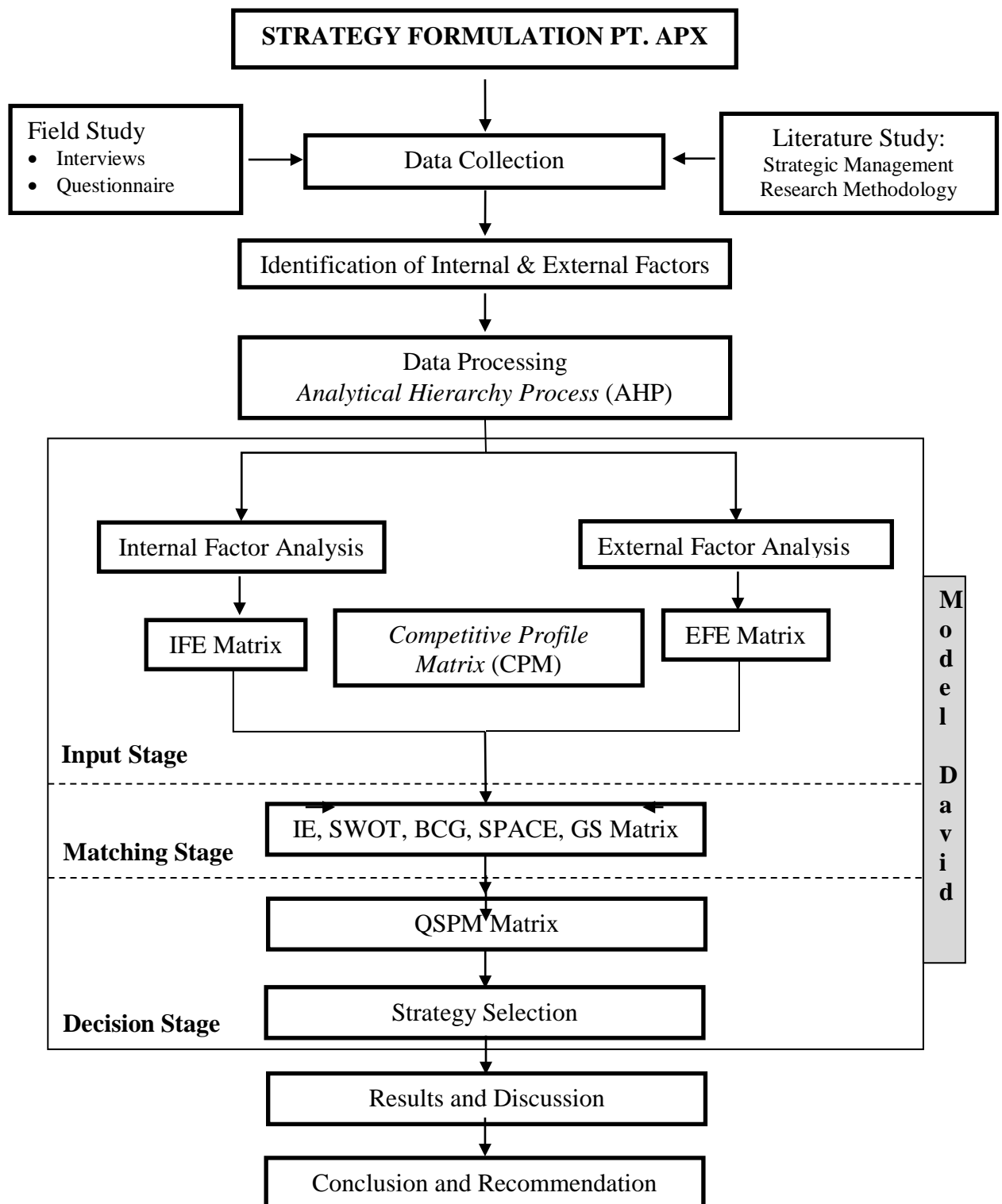


Figure 3. Research Framework

3.2.Collecting and Processing Data

3.2.1. Collecting Data

Data collection is the stage to acquire information from various sources in order to feed the research for further analysis. In this research, data is mainly acquired through literature and field study.

The literature study is required in order to have a good platform and framework for the research. The study will be conducted to the literature related to research topic to ensure that the concept is systematic, logic and acceptable in the academic environment. The literature study is also important to find the underlying theory related to the topic of research.

The purpose of field study is to know the real conditions of the object being studied so that researcher could get a clear picture before processing the data. It is well understood that some data might be un-available or missing, and in this case logical assumption will be used whenever required. The field study will allow the researcher to know the vision and mission of the company, its objectives and its core business. The study will also help to understand the external and internal conditions of the company along with its competitiveness.

On this research, the field study is conducted by making direct observation, doing interviews and launching questionnaires to respondents. The respondents are selected from internal parties in PT. APX and also from external parties who have direct relations with PT. APX, or un-direct business relation in the industry. Some experts from Market Survey Company and from drilling services industry are also invited to participate in the questionnaire.

There are five (5) different questionnaires developed for this research with different but related purposes. The questionnaires are:

1. Questionnaire #1: to identify the internal and external factors which impact the company and the degree of importance among the internal and external factors of the industry.
2. Questionnaire #2: to analyze the degree of importance between sub-factors
3. Questionnaire #3: to analyze company's position related to its competitors.
4. Questionnaire #4: to analyze the attractive score (AS) of different factors against different strategy alternatives.

The questionnaires used on this research are the type of closed questionnaires using the Likert Scale, where respondent is requested to select the scale which is closely reflected their opinion or knowledge/experience. By using this type of questionnaires, respondents will not need long time to respond and the data processing will become easier.

3.2.2. Processing Data

After all the data is collected, the next step is to do validity and reliability testing to the data. The validity testing is aimed to know if the data is valid or not, while the reliability testing is to measure whether the questions reliable or not.

When the data testing is completed, the next steps are to analyze the impacts of different variables to the given factors. This is done by giving weight on the factors using the Analytical Hierarchy Process (AHP) method. The AHP will be run with the software Expert Choice. The weight will later be used to construct the strategic management model based on Fred R. David as explained in chapter two (2) which consists of developing the IFE / EFE matrix, the SWOT matrix, the IE matrix etc.

3.3. Analysis of Business Environment

Environment analysis of a firm will consist of external analysis and internal analysis (David, 2013). An external analysis focuses on identifying and evaluating trend and event beyond the control of a firm, like increased of foreign competition, changes in demography or population, stock market volatility and unstable exchange rate. The external audit would reveal key opportunities and threats confronting an organization so that management can formulate to take advantage of the opportunities and to avoid or reduce the impact of the threats. On the other hand, the internal analysis will focus on identifying and evaluating a firm's strengths and weaknesses in the functional area of business, including management, marketing, finance/accounting, production/operations, research and development and management information system.

When the external analysis and internal analysis have been conducted and management has acquire the information related to its strengths and weaknesses and also the opportunities and threats, then management will be able to establish

the company's long term objectives as the first step to develop the corporate strategy.

3.3.1 External Factor Evaluation (EFE) Matrix

External Factor Evaluation (EFE) matrix is used to summarize and evaluate the external factors impacted the company like economic, social, cultural, demographic, environmental, political, governmental, legal, technological and competitive information. This matrix can be developed in five steps (David, 2013):

1. List key external factors as identified in the external evaluation process. The factors will be grouped separately under the heading of “opportunities” and “threats”.
2. Assign to each factor weight that ranges from 0.0 (not important) to 1.0 (very important). The weight indicates the relative importance of that factor to being successful in the firm's industry.
3. Assign a rating between 1 and 4 to each key external factor to indicate how effectively the firm's current strategies respond to the factor, where 4 = the response is superior, 3 = the response is above average, 2 = the response is average and 1 = the response is poor.
4. Multiply each factor's weight by its rating to determine a weighted score.
5. Sum the weighted score for each variable to determine the total weighted score for the organization.

3.3.2 Internal Factor Evaluation (IFE) Matrix

Internal Factor Evaluation (IFE) matrix is used to summarize and evaluate the major strengths and weaknesses in the functional areas of business, and it also provides a basis for identifying and evaluating relationship among those areas. Intuitive judgments are required in developing an IFE matrix. This matrix can be developed in five steps (David, 2013):

1. List key internal factors as identified in the internal evaluation process. The factors will be grouped separately under the heading of “strengths” and “weaknesses”.

2. Assign to a weight that ranges from 0.0 (not important) to 1.0 (all important) to each factor. The weight assign to a given factor indicates the relative importance of that factor to being successful in the firm's industry.
3. Assign a 1 to 4 rating to each factor to indicate whether the factor represent a major weaknesses (rating = 1), a minor weaknesses (rating = 2), a minor strength (rating = 3) or a major strength (rating = 4).
4. Multiply each factor's weight by its rating to determine a weighted score for each variable.
5. Sum the weighted score for each variable to determine the total weighted score for the organization.

3.3.3 Competitive Profile Matrix (CPM)

The Competitive Profile Matrix (CPM) identifies the company's major competitors and its particular strengths and weaknesses related to that of company. The weights and total weighted scores in both a CPM and an EFE matrix have the meaning. The difference is that on the CPM matrix, the critical success factors include both internal and external issues. The rating assigned to each of the critical success factor refer to strength and weaknesses, where 4 = major strength, 3 = minor strength, 2 = minor weakness, and 1 = major weakness.

3.4. Strategic Analysis

3.4.1. Internal External (IE) Matrix

The IE matrix (also called the portfolio matrix, a similar name given also to BCG matrix) is useful to explain the position of different division within an organization into a nine-cell display. This matrix is constructed by combining the EFE matrix and the IFE matrix into one graph where the IFE total weighted score will be the x-axis and the EFE total weighted score in the y-axis. The IE matrix is divided into three different parts where each part will have different strategy alternatives.

3.4.2. SWOT Matrix

The SWOT matrix is a matching tool that is used to develop four types of strategies: SO (Strength-Opportunities) strategies, WO (Weakness-Opportunities) strategies, ST (Strength-Threats) strategies and WT (Weakness-Threats) strategies. Good judgment and expert discussion might be required in developing SWOT matrix.

3.4.3. SPACE Matrix

As explained by David (David, 2013), the SPACE matrix is a four quadrant framework that indicates whether aggressive, conservative, defensive, or competitive strategies are most appropriate for any one organization. The axes of the SPACE matrix represent two internal dimensions (financial position [FP] and competitive position [CP]) and two external dimensions (stability position [SP] and industry position [IP]).

3.4.4. BCG Matrix

The BCG matrix described graphically the differences among divisions of a company in terms of relative market share position and industry growth rate. The BCG matrix allows multidivisional organization to manage its portfolios of businesses by examining the relative market share position and the industry growth rate of each division relative to all other divisions in the organization.

3.4.5. Grand Strategy (GS) Matrix

The GS matrix is based on the two evaluative dimensions: competitive position and market (industry) growth. Any organization can be positioned in one of the GS matrix four strategy quadrants (David, 2013).

3.4.6. Quantitative Strategic Planning Matrix (QSPM)

The QSPM is an analytical technique designed to determine the relative attractiveness of feasible alternative actions. It is also a tool that allows a strategist to evaluate alternative strategies objectively, based on previously identified external and internal critical success factors.

The positive features of this technique are that sets of strategies can be examined sequentially or simultaneously. Another positive feature is that it requires a strategist to integrate pertinent external and internal factors into the decision process.

The limitation of this technique is that it always requires intuitive judgments and educated assumptions. Another limitation of QSPM is that it can be only as good as the prerequisite information and matching analysis upon which it is based. To minimize misjudgment, expert discussion maybe conducted.

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CHAPTER 4

STRATEGY FORMULATION

4.1 Evaluation of Vision and Mission

The evaluation of PT. APX' vision and mission is conducted in accordance with the approach developed by Fred R David (David, 2013), where he introduced nine characteristics that must be met by good vision and mission. The nine characteristics are described below and it will be used to explain how the vision and mission fit in the framework:

Table 3. Vision & Mission Evaluation

	Criteria	Description	Explanation	Rating
1	Customers	Who are the firm's customers?	The drilling activities could be performed in many business sector like oil & gas sector, mining sector and geothermal sector and considering the corporate vision to be “ a world class drilling contractor “ , it can be concluded that the customers are all the companies who is actually doing drilling activities in their operation.	***
2	Products or services	What are the firm's major products or services?	The vision clearly explains that the major services are drilling services.	*****
3	Markets	Geographically, where the firm competes?	The vision clearly indicated that PT. APX wants to be world class contractor or to compete in the global market.	*****
4	Technology	Is the firm technologically current?	The vision and mission do not explicitly mention anything about technology, but it could be inferred that to be a world	**

			class contractor PT. APX must always employ the most current technological know-how available.	
5	Concern for survival, growth and profitability	Is the firm committed to growth and financial soundness?	The mission clearly said that it will provide maximum value to all stakeholders. The maximum value here is clearly related to growth and financial soundness.	***
6	Philosophy	What are the basics beliefs, value aspirations, and ethical priorities of the firm?	PT. APX's philosophy is clearly defined in the corporate values, like trust, integrity, loyalty, professionalism, leadership etcetera.	*****
7	Self-concept	What are the firm distinctive competences or major competitive advantages?	PT. APX believes in developing human resources to meet standard global quality and competence. This will be the area where the competitive advantages will be built.	*****
8	Concern for public image	What is the firm responsive to social, community, environmental concerns?	PT. APX is committed to maintain a high standard of safety and welfare to the employees and will protect the surrounding environment.	****
9	Concern for employee	Are employees a valuable of the firm?	The mission statement has clearly mentioned that PT. APX will ensure the safety and welfare of employees and will develop human resources to meet global standard.	****

From the above description it could be concluded that the vision and mission of PT. APX are well constructed as it can explain clearly the nine characteristics or criteria set by David for a good vision and mission.

4.2 Data Collection and Processing

The data is collected from various sources either from primary or from secondary sources. Primary data is collected from the questionnaires and from interviews with company's management and several experts from PT APX's client while secondary data is collected from industry report, technical journal and other information from the internet.

The process to identify the internal and external factors for both business division of PT.APX is conducted by reviewing industrial or market report related to drilling sector and also by having interviews with the key management personnel from the company (president director, GM operations) and several experts from Oil & Gas Company. Some interviews are also conducted with persons who are conducting market intelligence or market watch in the drilling sector. All the persons being interviewed are considered to have good knowledge and good experiences in the drilling industry to provide valuable information related to the business environments factors that influence the drilling sector.

4.2.1. Data Analysis

This research conducted the strategy formulation of two business division of PT. APX, the Offshore Drilling Division and the Onshore Drilling Division. In formulating the strategies, it is important to first identify the internal and external factors of the industry where both the business division is operating and to understand how the factors will impact the business division. David's strategic management model is used to formulate the strategies where the formulation is divided into three main steps, the input stage, the matching stages and the decision stage. Besides the internal and external factors of the industry, additional information is also required for the input stage of the strategy formulation, like market share and profit per year to measure the growth rate of both business divisions.

The internal and external factors are identified based on the theory of strategic management developed by Fred R David (David, 2013), and also from several reference like technical report, market intelligence report and from discussion and interview with PT. APX key personnel. Several questionnaires were sent to the respondents to get the weight of importance of each different factor compare to other factors.

The respondents selected in this research are key personnel from PT. APX (President Director, GM Offshore, SC Manager), Head of Drilling Operation from client's company and Market Intelligence Experts. All respondents are considered experts with significant experiences and knowledge about the industry. The validity and reliability of the results of the discussion, interviews and questionnaires are therefore justified.

In calculating the weight of each factor, the AHP method is used and the method provides an indicator to measure the consistency (Consistency Ratio) of each different respond. Here a valid respond should have a consistency ratio of less than or equal to 0.1.

Questionnaire #1 produced the weight of importance of each different factor and sub-factors of External and Internal environments that would impact the industry. Here there are five (5) criteria for each internal and external factor as per the theory of David (David, 2013) with three factors to explain further each of the criteria. In total there are fifteen (15) factors for Internal & External Environment respectively. The weight calculation is conducted using the AHP method, where each factors and sub-factors are compared to each other and the degree of importance are determined in order to get the weight.

Questionnaire #2 produced the respond of company on each different sub-factor of External and Internal environments which has been further classified as strengths and weakness for the internal factors and as opportunity and threat for the external factors. The classification and the rating were determined after discussion and interviews with key personnel of PT APX. It could therefore be concluded that the rating (respond) is valid.

Questionnaire #3 produced the success factors that are required to develop the competitive profile matrix. Here the critical success factors are identified and

the weight is determined using the AHP method. With the critical success factors and the weight of each success factor the CP matrix could be completed.

Questionnaire #4 identify the rating (respond) of PT APX on each of the critical success factors relative to other competitor. For Offshore Business Division, the competitors are foreign companies who are actively operating in Asia Pasific including Indonesia and are considered as the direct competitor of PT. APX, i.e Japan Drilling, Ensco and Transocean. For Onshore Business Division, the competitors are mainly local companies who are actively operating in Indonesia only and are considered as the direct competitor of PT. APX, i.e PT ELNUSA, PT. BORMINDO and PT. PDSI. The rating will be multiplied with weight of each success factor to give the final score of CPM for PT. APX and its competitors.

Questionnaire #5 produced the attractive score of each strategy selected by assigning a rating of each selected strategy to each internal and external factor which are applicable. From here, the QSP matrix could be completed and total attractive score of each selected strategy could be determined.

4.2.2. Data Validity Testing

The data from the questionnaire are obtained from respondents with good knowledge and experiences in the business, some of them can be considered experts and some are high level management from the PT. APX who is making day to day decision for its operations. The validity of the data is fully justified by the competencies of the respondents involved. The data acquired is therefore considered valid.

4.2.3. Calculating Weight of Factors & Sub-Factors

The internal and external factors for both Offshore Business Division and Onshore Business Division identified are described in Table 4. There are five main internal factors and external factors in the drilling business environment and each factor has three aspects of sub factors that would explain in a more detail the extension of the factor (see Table 4).

Table 4. Internal & External Factors - Offshore and Onshore Drilling Business

No	External Factors	Internal Factors
1	ECONOMIC FACTORS	MANAGEMENT FACTORS
1.1	Oil & Gas Prices	Management Know How
1.2	National Economic Growth	Capability to adopt New Technology
1.3	Interest Rate	Corporate Governance
2	SOCIO CULTURAL & ENVIRONMENT FACTORS	RESOURCES FACTORS
2.1	Energy Demand	Quality of Personnel
2.2	Environnent Régulations	World Class Certification
2.3	Natural Resources Conservation	Human Resources Development
3	POLITICAL, LEGAL & GOVERNMENTAL FACTORS	FINANCE FACTORS
3.1	Oil & Gas Applicable Laws	Financial Cash Flow
3.2	Local Government (Provincial) Regulation	Access to Capital Market
3.3	Local Content Requirement	Long Contracts with Multinationals
4	TECHNOLOGICAL FACTORS	MARKETING FACTORS
4.1	Offshore/Onshore Technological Progress	International Market Experiences
4.2	Drilling Rig Capacity	Pricing Strategy
4.3	Exploration Trends in Indonesia	Operational Achievement
5	COMPETITIVE FACTORS	OPERATIONS FACTORS
5.1	Low Cost Competitors	Excellent Performance
5.2	Operation Know How	Good Customers Service
5.3	Financial Strength	Numbers of Drilling Units

The next process after identifying the internal and external factors is to get the weight of the degree of importance between the factor and between the sub-factor within the same group factor. The methodology to calculate the weight is by doing the pair-wise comparison as explained in the Analytical Hierarchy

Process (AHP) where one factor (in the left side) is compared by its degree of importance to other factor (in the right side) by using a scale of 1 to 9. The scale explained the degree of importance of one factor compared to another factor where scale one (1) means that both factors are equally important and scale nine (9) means that the one factor is absolutely more important than the other.

The data is processed by using AHPcal K.P. Goepel version 08.05.2013. The final result is the weight for each factor and the weight of each sub-factor within the same group factor. In calculating the weight, it is very important to ensure that the consistency of the comparison as different respondent will tend to have different view. The Analytical Hierarchy Process (AHP) has set a threshold for consistency ratio of less than 0,1 for each weigh to be considered valid.

The tables below described the weight for each external factor for Offshore Drilling Division and Onshore Drilling Division. Table 4 described the weight for each external factor of Offshore Drilling Division and Table 5 for each external factors of Onshore Drilling Division. The sum of the weight for each external factor is equal to one.

Table 5. Weight of External Factors – Offshore & Onshore Drilling Division

No	External Factors	Weight	
		OFFSHORE	ONSHORE
1	Economic Factors	0.22	0.22
2	Social, Cultural & Environment Factors	0.07	0.11
3	Political, Legal & Governmental Factors	0.17	0.21
4	Technological Factors	0.33	0.11
5	Competitive Factors	0.21	0.35
	Total	1.00	1.00

From Table 5, the highest weight for offshore business division is the weight of Technological Factor (0.33) followed by the weight of Economic Factor (0.22) and followed by Competitive Factor (0.21). It is understood from the

weight that technology is a significant factor for the offshore business division. The technology factors here are explained as first the offshore technological progress. The progress of technology will highly impacted the direction of offshore drilling as nowadays the complexity and the difficulty of offshore drilling is increasing, New area of exploration is going to the deeper part of the ocean where technology will be the key to do the job. Thus the technological capacity of drilling rig will also determined how far or how deep a rig can perform the drilling operation, for example the longer the leg of an offshore rig the deeper it could go to perform the drilling activities. Technology will be the key driver of the drilling trend to go into a more complex and difficult areas.

For Onshore Drilling division the highest weight is the Competitive Factor (0.35) followed by Economic Factor (0.22) and Political, Legal and Governmental Factor (0.21). In this onshore drilling business, especially in Indonesia, the challenge of doing in-land drilling is already well known by most of the drilling contractor. For the in-land exploration area, technology doesn't play as big a role as for the offshore drilling business to make a company becoming more competitive. Business will be more subjected to the price competition where normally the most cost effective company will be the one to get the project. This explained why the weight for the sub factor Low Cost Competitors is quite high from the questionnaires (0.53).

For the internal factors,

Table 6 below described the weight for each internal factor for Offshore Drilling Division and Onshore Drilling Division. The sum of the weight for each external factor is equal to one.

Table 6. Weight of Internal Factors – Offshore & Onshore Drilling Division

No	Internal Factors	Weight	
		OFFSHORE	ONSHORE
1	Management Factors	0.19	0.15
2	Resources Factors	0.14	0.14
3	Finance Factors	0.21	0.17

4	Marketing Factors	0.193	0.26
5	Operations Factors	0.27	0.28
	Total	1.00	1.00

From Table 6, the highest weight for Offshore Drilling Division is for Operations Factor (0.27) followed by the weight for Finance Factor (0.21) and Marketing Factor (0.19) while for Onshore Drilling Division the highest weight is Operations Factor (0.28) followed by Marketing Factor (0.26) and Finance Factor (0.17). The weight of each internal factor for both offshore and onshore drilling business is quite similar with the only difference of the rank between marketing and finance factor for each business division

After determining the weight of the factor, the weight of the sub-factor under each external and internal factor is calculated and the result are described in Table 7, Table 8, Table 9 and Table 10 respectively.

Table 7. Weight of Sub-Factor External – Offshore Drilling Division

No	External Factors	OFFSHORE	
		Weight	Normalized Weight
1	ECONOMIC FACTORS	0.22	
1.1	Oil & Gas Prices	0.62	0.136
1.2	National Economic Growth	0.24	0.053
1.3	Interest Rate	0.14	0.031
2	SOCIO CULTURAL & ENVIRONMENT FACTORS	0.07	
2.1	Energy Demand	0.66	0.046
2.2	Environnement Régulations	0.17	0.012
2.3	Natural Resources Conservation	0.17	0.012
3	POLITICAL, LEGAL & GOVERNMENTAL FACTORS	0.17	
3.1	Oil & Gas Applicable Laws	0.52	0.088
3.2	Local Government (Province) Regulation	0.15	0.026

3.3	Local Content Requirement	0.33	0.056
4	TECHNOLOGICAL FACTORS	0.33	
4.1	Offshore Technological Progress	0.31	0.102
4.2	Drilling Rig Capacity	0.19	0.063
4.3	Exploration Trends in Indonesia	0.50	0.165
5	COMPETITIVE FACTORS	0.21	
5.1	Low Cost Competitors	0.30	0.063
5.2	Operation Know How	0.34	0.071
5.3	Financial Strength	0.36	0.076
	TOTAL		1.00

From Table 7, for offshore drilling division the highest weight under the technological factor is the sub factor Exploration Trends in Indonesia (0.165) followed by Offshore Technological Progress (0.102). This explains that for offshore drilling business the exploration trends will define the future of the drilling business. Company will have to always review its strategy based on where the exploration trend is heading. If the exploration trend is going to the deeper part of the ocean then company will have to consider having additional unit that has the capacity and the technological capability to drill deeper.

Other external sub-factor for Offshore Drilling Division that has high weight is the Oil & Gas Prices and this sub-factor is the second highest weight after the Exploration Trends in Indonesia. The other sub-factor that followed closely is the Oil & Gas Applicable Law.

Table 8. Weight of Sub-Factor External - Onshore Drilling Division

No	External Factors	ONSHORE	
		Weight	Normalized Weight
1	ECONOMIC FACTORS	0.22	
1.1	Oil & Gas Prices	0.57	0.125

1.2	National Economic Growth	0.21	0.046
1.3	Interest Rate	0.22	0.048
2	SOCIO CULTURAL & ENVIRONMENT FACTORS	0.11	
2.1	Energy Demand	0.33	0.036
2.2	Environnent Régulations	0.35	0.039
2.3	Natural Resources Conservation	0.32	0.035
3	POLITICAL, LEGAL & GOVERNMENTAL FACTORS	0.21	
3.1	Oil & Gas Applicable Laws	0.36	0.076
3.2	Local Government (Province) Regulation	0.20	0.042
3.3	Local Content Requirement	0.44	0.092
4	TECHNOLOGICAL FACTORS	0.11	
4.1	Offshore Technological Progress	0.21	0.023
4.2	Drilling Rig Capacity	0.57	0.063
4.3	Exploration Trends in Indonesia	0.22	0.024
5	COMPETITIVE FACTORS	0.35	
5.1	Low Cost Competitors	0.53	0.186
5.2	Operation Know How	0.24	0.084
5.3	Financial Strength	0.23	0.081
	TOTAL		1.000

For the onshore drilling division (Table 8), the highest weight under the competitive factor is the sub factor Low Cost Competitors (0.186). This is in line with the situation that for onshore drilling (Land Rigs), the competition is mainly come from the Low Cost Country (LCC), where the competitors could bring a cheap land rig from China or India and then drive the other local company to run out of business. The onshore drilling doesn't depend too much on a sophisticated technology to run a land rig as the technology for land rig are not as high or as special as the technology for offshore rigs.

The other significant sub-factor with high weight is the Oil & Gas Prices (0.125). This showed the same results with the Offshore Business Division where Oil & Gas Prices factor is also significant factor.

Table 9. Weight of Sub-Factor Internal – Offshore Drilling Division

No	Internal Factors	Offshore Drilling Division	
		Weight	Normalized Weight
1	MANAGEMENT FACTORS	0.19	
1.1	Management Know How	0.37	0.07
1.2	Capability to adopt New Technology	0.43	0.08
1.3	Corporate Governance	0.20	0.04
2	RESOURCES FACTORS	0.14	
2.1	Quality of Personnel	0.34	0.05
2.2	World Class Certification	0.22	0.03
2.3	Human Resources Development	0.44	0.06
3	FINANCE FACTORS	0.21	
3.1	Financial Cash Flow	0.28	0.06
3.2	Access to Capital Market	0.31	0.07
3.3	Long Contracts with Multinationals	0.41	0.09
4	MARKETING FACTORS	0.19	
4.1	International Market Experiences	0.24	0.05
4.2	Pricing Strategy	0.22	0.04
4.3	Operational Achievement	0.54	0.10
5	OPERATIONS FACTORS	0.27	
5.1	Excellent Performance	0.62	0.17
5.2	Good Customers Service	0.14	0.04
5.3	Numbers of Drilling Units	0.24	0.06
	Total	5.00	1.00

From Table 9, for offshore drilling division the three highest weights are Excellent Performance (0.17), Operational Achievement (0.10) and Long Contracts with Multinationals (0.09).

Table 10. Weight of Sub-Factor Internal –Onshore Drilling Division

No	Internal Factors	Onshore Drilling Division	
		Weight	Normalized Weight
1	MANAGEMENT FACTORS	0.15	
1.1	Management Know How	0.61	0.09
1.2	Capability to adopt New Technology	0.13	0.02
1.3	Corporate Governance	0.26	0.04
2	RESOURCES FACTORS	0.14	
2.1	Quality of Personnel	0.29	0.04
2.2	World Class Certification	0.19	0.03
2.3	Human Resources Development	0.52	0.07
3	FINANCE FACTORS	0.17	
3.1	Financial Cash Flow	0.52	0.09
3.2	Access to Capital Market	0.30	0.05
3.3	Long Contracts with Multinationals	0.18	0.03
4	MARKETING FACTORS	0.26	
4.1	International Market Experiences	0.10	0.03
4.2	Pricing Strategy	0.59	0.15
4.3	Operational Achievement	0.31	0.08
5	OPERATIONS FACTORS	0.28	
5.1	Excellent Performance	0.59	0.17
5.2	Good Customers Service	0.21	0.06
5.3	Numbers of Drilling Units	0.20	0.06
	Total	5.00	

From Table 10, for onshore drilling division the highest weights are sub factor Excellent Performance (0.17) followed by Pricing Strategy (0.15) and equally by Financial Cash Flow (0.09) and Management Know How (0.09).

4.3 Strategy Formulation

Strategy Formulation according to Fred R David (David, 2013) consists of three stages, the input stage, the matching stage and the decision stage. The three different stages and the strategy involved in each stage will be explained one by one in the next section

4.3.1. The Input Stage

There are three steps to be conducted in the Input Stage, the construction of matrix EFE, matrix IFE and Competitive Profile Matrix (CPM).

4.3.1.1 External Factor Evaluation Matrix (EFE)

The EFE matrix will evaluate and summarize the information related to the external environment of drilling business like the economic situation, the socio-cultural situation, the political situation, the technology situation and also the competitive situation. By evaluating the external factors, it can be identified the factor which could become the opportunity for the company as well as the factor that could become threat.

From the discussion with the management of PT. APX and several experts in the field, the sub factors under the external factors will be grouped under the two part i.e the Opportunity Group and the Threat Group as described in the Table 11 and Table 12 below. In order to finalize the EFE matrix, a rating is assigned to each of the sub factor of opportunities and threat. The rating is given by the selected respondents (mainly from PT.APX and its main client) based on the questionnaire. The final form of the matrix is described in the Table 11 and Table 12 below.

Table 11. Matrix EFE - Offshore Drilling Division

No	External Factors - Offshore	Normalized Weight	Rating	Score
	OPPORTUNITIES			
1	Exploration Trends in Indonesia	0.165	4	0.66
2	Offshore Technological Progress	0.102	3	0.31
3	Oil & Gas Applicable Laws	0.088	3	0.26
4	National Economic Growth	0.053	3	0.16
5	Local Content Requirement	0.056	3	0.17
6	Energy Demand	0.046	3	0.14
7	Operation Know How	0.071	4	0.28
	THREATS			-
1	Oil & Gas Prices	0.136	2	0.27
2	Low Cost Competitors	0.063	2	0.13
3	Drilling Rig Capacity	0.063	2	0.13
4	Interest Rate	0.031	2	0.06
5	Environment Régulations	0.012	2	0.02
6	Natural Resources Conservation	0.012	2	0.02
7	Local Government (Province) Regulation	0.026	2	0.05
8	Financial Strength	0.076	2	0.15
	TOTAL	1.00		2.82

Table 12. Matrix EFE - Onshore Drilling Division

No	External Factors - Onshore	Normalized Weight	Rating	Score
	OPPORTUNITIES			
1	Local Content Requirement	0.092	4	0.37
2	Operation Know How	0.084	4	0.34
3	Oil & Gas Applicable Laws	0.076	4	0.30
4	Drilling Rig Capacity	0.063	4	0.25

5	National Economic Growth	0.046	4	0.18
6	Energy Demand	0.036	4	0.14
7	Onshore Technological Progress	0.023	3	0.07
8	Exploration Trends in Indonesia	0.024	4	0.10
	THREATS			-
1	Low Cost Competitors	0.186	2	0.37
2	Oil & Gas Prices	0.125	2	0.25
3	Financial Condition	0.081	2	0.16
4	Interest Rate	0.048	2	0.10
5	Local Government (Province) Regulation	0.042	2	0.08
6	Environnement Régulations	0.039	2	0.08
7	Natural Resources Conservation	0.035	2	0.07
	TOTAL	1.000		2.87

From the EFE matrix, the score for offshore drilling and Onshore Drilling division is 2.82 and 2.87 respectively. These scores are well above the average scores of 2.5 and they explained that PT. APX is responding well enough to the existing opportunities and to avoiding threats in the drilling industry. PT. APX could take advantages on almost all available opportunities in the drilling industry as the company is responding very well on each different factor.

Exploration trend in Indonesia has the highest score for Offshore Business Division as PT. APX could optimize its fleet optimally. The exploration trend is also providing future direction for PT. APX in getting more market share as the exploration trend is clearly will go further to the eastern part of Indonesia which will be the deep sea. Here the offshore drilling fleet will require a longer leg to reach the deeper part of the ocean and PT. APX has just recently build two new jack-up rig with 400ft leg in China to take advantage of the exploration trend. With this additional two jack-up rigs, PT PAX will be able to get a larger share of the drilling market in Indonesia.

For Onshore Business Division, PT APX could take advantages of the opportunities due to the local content requirement. One of the mandatory requirements in the drilling industry in Indonesia set by SKKMIGAS is the local content requirement. SKKMIGAS as the authority set a high percentage of local content requirement to any company who will perform drilling operation in Indonesia. Being a national company, PT. APX could take the most advantages of the situation in any call for tender in the region as this will help to protect the domestic player from the invasion of foreign company from the low cost country or company who will bring a “cheap” land rig (made in LCC) to Indonesia.

The Oil and Gas Prices is the common threat for both business division of PT. APX. The Oil and Gas Prices are not very easy to predict as it depends on many global factors, either economic or political or others. Low oil prices will certainly hit the drilling industry as many operators will tend to postpone their drilling campaign or worse to terminate their contracts. In the contrary, high Oil & Gas Prices will boost the demand for both Offshore and Onshore Rigs and drilling company could gain significant profit from the high daily rate. The unpredictability of Oil & Gas Price remains a common threat for the both Offshore and Onshore business Division of PT. APX.

The other common threats for both business divisions are the Low Cost Competitors which could become serious if not anticipated accordingly. The extend of these threats are somehow balanced by the opportunity from Oil & Gas Applicable Laws and Local Content Requirement. Oil & Gas Laws provide advantages for national company to be the main player in Indonesia, among others are the requirement for any vessel operating in Indonesia to have Indonesia Flag (Cabotage Law), in this case offshore drilling rigs are considered as vessel. The appreciation of domestic product is also another advantage that national company could have to be in better position than the foreign company where a certain local content must be met if foreign company wants to work in Indonesia.

4.3.1.2 Internal Factor Evaluation Matrix (IFE)

The IFE matrix will evaluate and summarize the information related to the internal environment of drilling business like the management situation, the

resources situation, the financial situation, the marketing situation and also the operations situation. By evaluating the internal factors, it can be identified the factor which could become the strength for the company as well as the factor that could become the weaknesses.

From the discussion with the management of PT. APX and several experts in the field, the sub factors under the external factors will be grouped under the two part i.e the strength Group and the weaknesses Group as described in the Table 13 and Table 14 below. In order to finalize the IFE matrix, a rating is assigned to each of the sub factor of strength and weaknesses. The rating is given by the selected respondents based on the questionnaire given in the beginning. The final form of the matrix is described in the Table 13 and Table14 below.

Table 13. Matrix IFE - Offshore Drilling Division

No	Internal Factors - Offshore	Normalized Weight	Rating	Score
	STRENGTH			
1	Excellent Performance	0.17	4	0.68
2	Operational Achievement	0.10	4	0.4
5	Long Contracts with Multinationals	0.09	4	0.36
3	Management Know How	0.07	4	0.28
4	Human Resources Development	0.06	4	0.24
5	Quality of Personnel	0.05	4	0.2
6	Corporate Governance	0.04	3	0.12
7	Pricing Strategy	0.04	3	0.12
8	Good Customers Service	0.04	3	0.12
9	World Class Certification	0.03	3	0.09
	WEAKNESS			
1	Capability to adopt New Technology	0.08	2	0.16
2	Access to Capital Market	0.07	2	0.14
3	Financial Cash Flow	0.06	2	0.12
4	Numbers of Drilling Units	0.06	2	0.12

5	International Market Experiences	0.05	2	0.1
	Total	1.00		3.25

Table 14. Matrix IFE - Onshore Drilling Division

No	Internal Factors - Onshore	Normalized Weight	Rating	Score
	STRENGTH			
1	Excellent Performance	0.17	4	0.68
2	Pricing Strategy	0.15	4	0.6
3	Management Know How	0.09	4	0.36
4	Operational Achievement	0.08	4	0.32
5	Human Resources Development	0.07	4	0.28
6	Good Customers Service	0.06	3	0.18
7	Quality of Personnel	0.04	4	0.16
8	Corporate Governance	0.04	3	0.12
9	World Class Certification	0.03	3	0.09
10	Long Contracts with Multinationals	0.03	4	0.12
	WEAKNESS			0
1	Financial Cash Flow	0.09	2	0.18
2	Numbers of Drilling Units	0.06	2	0.12
3	Access to Capital Market	0.05	2	0.1
4	International Market Experiences	0.03	2	0.06
5	Capability to adopt New Technology	0.02	2	0.04
	Total	1.00		3.41

From the IFE matrix, the score for offshore drilling and Onshore Drilling division is 3.25 and 3.41 respectively. These scores are high above the average scores of 2.5 and they explained that PT. APX has a very strong internal position

in the drilling industry. It could be said that the strengths of PT. APX outweighs its weaknesses.

The main strengths of PT. APX are its excellent performance, operational achievements and management knowhow. These factors gave PT. APX confidence and good reputation towards its clients as it build the platform for PT. APX to be considered as one of the most reliable drilling contractor in Indonesia. Specific for Offshore Drilling Division, the internal strengths also lies in the fact the PT. APX has succeeded to secure long contracts with one of the major Oil & Gas Operator in Indonesia, i.e Total E&P Indonesie for almost all of his offshore fleet

The weaknesses for both divisions are mainly on the capability to adopt new technology as this capability will require significant capital investment (to build new higher HP land rigs or longer leg JackUp or drill ship/semi sub). Others are access to capital market, maintaining a healthy cash flow to secure operations and also the limited number of fleets which will further limit the participation of PT. APX in the new drilling campaign.

4.3.1.3 Competitive Profile Matrix (CPM)

The CPM matrix identifies PT. APX's major competitors and its particular strength and weaknesses in relation to PT.APX strategic position. This matrix is constructed by doing a comparison between PT.APX and its main competitors. For Offshore Drilling Division, the competitors selected are those who are actively operating in the Asia Pacific region including in Indonesia and compete face to face with PT.APX in most of the tenders for drilling rig in the region. For Onshore Drilling Division, the competitors selected are those companies who actively operating in Indonesia only and compete with PT.APX in most of the tenders for Land Rig in Indonesia.

The critical success factors were identified based on the discussion with respondents who know the market very well and have good experiences in the business. The weight assigned to each of the critical success factors are calculated using AHP based on the questionnaires received from respondents. The critical success factors were selected from the EFE matrix based on the discussion with

key personnel of PT. APX, and then the weight is assigned using the AHP method by comparing each factor to the other to find the relative importance of each critical success factor.

For Offshore Business Division, the most important factors to being successful in the industry are the Technical Experiences and the Number of Fleet as indicated by the high weight factor of 0.34 and 0.25 for each factor respectively. On this CPM matrix, the position of PT. APX is relatively weak compare to its main competitors which are mainly international player which have higher technical capability, better international reputation, better resources and also larger drilling fleet. PT. APX score for the CPM profile is 3.34 which is the lowest score compare to its foreign competitors.

For Onshore Business Division, the position of PT. APX is stronger compare to its main competitors which are mainly local player. This is clearly reflected in the CPM score of 3.75, the highest score compare to its main local competitor. PT. APX is stronger mainly in the Technical Experiences factor, Number of Fleet, followed by National Reputations.

Table 15. CPM Matrix - Offshore Drilling Business

		PT APX		Japan Drilling		Ensco		Transocean	
Critical Success Factor	Weight	Rating	Score	Rating	Score	Rating	Score	Rating	Score
Number of Fleet	0.25	3	0.75	3	0.75	4	1	4	1
Technical Experiences	0.34	4	1.36	4	1.36	4	1.36	4	1.36
International Reputations	0.19	3	0.57	4	0.76	4	0.76	4	0.76
Resources	0.22	3	0.66	3	0.66	3	0.66	4	0.88
Total	1.00		3.34		3.53		3.78		4.00

Table 16. CPM Matrix - Onshore Drilling Business

		PT APX		Elnusa		Bormindo		PDSI	
Critical Success Factor	Weight	Rating	Score	Rating	Score	Rating	Score	Rating	Score
Number of Fleet	0.25	4	1	3	0.75	3	0.75	4	1
Technical Experiences	0.34	4	1.36	3	1.02	3	1.02	4	1.36
National Reputations	0.19	4	0.76	3	0.57	3	0.57	3	0.57

Resources	0.22	3	0.66	3	0.66	3	0.66	3	0.66
Total	1.00		3.78		3.00		3.00		3.59

4.3.2. The Matching Stage

The Matching Stage will be the stage where the process of matching between the internal and the external critical success factors will be done. The matching stage will consist of five techniques: the SWOT Matrix, the SPACE matrix, the BCG matrix, the IE matrix and the Grand Strategy matrix.

4.3.2.1 SWOT Matrix

In this matrix, we will be able to develop four types of strategies: SO (strength-opportunities) strategies, WO (weakness-opportunities) strategies, ST (strength-threat) strategies and WT (weakness - threat) strategies. To develop the SWOT matrix, matching key external and internal factors will have to be done. The below tables will show the matching and the proposed four types of strategy to develop the SWOT Matrix for Offshore Drilling Business and Onshore Drilling Business.

Table 17. SWOT Matrix - Offshore Drilling Unit

	STRENGTH 1. Excellent Performance 2. Operational Achievement 3. Long Contracts with Multinationals 4. Management Know How 5. Human Resources Development	WEAKNESS 1. Capability to adopt New Technology 2. Access to Capital Market 3. Financial Cash Flow 4. Numbers of Drilling Units 5. International Market Experiences
OPPORTUNITIES 1. Exploration Trends in Indonesia 2. Offshore Technological Progress 3. Oil & Gas Applicable Laws 4. Nat. Economic Growth 5. Local Content Requirement	SO Strategies - to build competence on new technology to benefit from future trends - to build stronger relationship with authority to benefit from the applicable law - to develop robust personel	WO Strategies - to follow technological trend development - to develop know how in new technology. - to develop new network in the emerging market - to find partners - to increase number of fleets

	development system	
THREATS 1. Oil & Gas Prices 2. Low Cost Competitors 3. Drilling Rig Capacity 4. Interest Rate 5. Environment Rég.	ST Strategies - to develop risk mgt system to cope with fluctuating OG prices - to develop market intelligence section to follow LCC competitors -to develop global strategy	WT Strategies - to build cooperation with local universities for technology development - to improve financial management system

Table 18. SWOT Matrix - Onshore Drilling Unit

	STRENGTH 1. Excellent Performance 2. Pricing Strategy 3. Management Know How 4. Operational Achievement 5. HR Development 6. Good Customers Service	WEAKNESS 1. Financial Cash Flow 2. Numbers of Drilling Units 3. Access to Capital Market
OPPORTUNITIES 1. Local Content Requirement 2. Operation Know How 3. Oil & Gas Applicable Laws 4. Drilling Rig Capacity	SO Strategies - to build strong relationship with clients - to build stronger relationship with authority to benefit from the applicable law - to develop robust personel development system	WO Strategies - to develop new network in the emerging market - to find partners - to increase number of fleets
THREATS 1. Low Cost Competitors 2. Oil & Gas Prices 3. Financial Condition 4. Interest Rate	ST Strategies - to develop risk mgt system to cope with fluctuating OG prices - to develop market intelligence section to follow LCC competitors	WT Strategies - to improve financial control

The SWOT analysis for Offshore Drilling Division resulted in the construction of SO strategies as follow:

1. to build competencies in new technology to benefit from future trends (S1, S2, S4, O1).
2. to build stronger relationship with authority to benefit from the applicable Oil and Gas Law (S1, S2, S4, O3)
3. to develop robust personnel development system (S4, S5, O4)

The WO strategies are:

1. to follow technological development and to develop know how in new technology (W1, O1, O2).
2. to develop network in the emerging market or to find partners (W2, W3, O4)
3. to increase number of fleets (W4, W5, O4, O5)

The ST strategies are:

1. to develop risk management system to cope with fluctuating Oil and Gas Prices (S1, S2, S4, T1).
2. to develop market intelligence section to follow Low Cost Country competitors (S1, S2, S4, T2).
3. to develop global strategy (S1, S2, S4, T1, T4, T5).

The WT strategies are:

1. to build cooperation with local universities for technology development (W1, T2)
2. to improve financial management system (W2, W3, T1, T4)

The SWOT analysis for Onshore Drilling Division resulted in the construction of the SO strategies as follow:

1. to build strong relationship with clients (S1, S3, S4, S6, O2, O3).
2. to build stronger relationship with authority to benefit from the applicable law (S1, S3, S4, O2, O3).
3. to develop robust personnel development system (S5, O2).

The WO strategies are:

1. to develop new network in the emerging market (W1, W3, O2)

2. to find partners (W1, W3, O2, O3)
3. to increase number of fleets (W2, O2)

The ST strategies are:

1. to develop risk management system to cope with fluctuating Oil and Gas Prices (S1, S3, S4, T2, T4)
2. to develop market intelligence section to follow competitors from Low Cost Country (S1, S3, S4, S5, T1)

The WT strategies are:

1. to improve financial management system (W1, T3, T4)

4.3.2.2 SPACE Matrix

The second step in the matching stage is to develop the Strategic Position & Action Evaluation (SPACE) Matrix. This matrix will consists of four quadrants that will indicate whether aggressive, conservative, defensive or competitive strategies will be the most suitable for PT.APX.

Based on the factors that are required to build the SPACE matrix (Table 19. SPACE Matrix Factors- Offshore Business Unit and Table 20. SPACE Matrix Factors - Onshore Business Unit), the Space matrix diagram can be constructed as in the Figure .

Table 19. SPACE Matrix Factors- Offshore Business Unit

<i>Internal Analysis</i>		<i>External Analysis</i>	
Financial Position (FP)	score	Stability Position (SP)	score
Return on Investment	3	Technological Changes	-1
Leverage	4	Rate of Inflation	-2
Liquidity	3	Demand Variability	-3
Working Capital	5	Barriers to entry into market	-1
Cash Flow	7	Risk involve in Business	-2
Financial Position average	4.4	Stability Position average	-1.8
Competitive Position (CP)	score	Industry Position (IP)	score
Market Share	-2	Growth Potential	3
Capacity Utilization	-1	Profit Potential	5
Quality of Personnel	-1	Financial Stability	3
Technological KnowHow	-3		

Competitive Position average	-1.3	Industry Position average	3.7
y-axis	2.6	x-axis	1.9
coordinate = 1.9 ; 2.6		Vector lies in Aggressive Quadrant	

Table 20. SPACE Matrix Factors - Onshore Business Unit

<i>Internal Analysis</i>		<i>External Analysis</i>	
Financial Position (FP)	score	Stability Position (SP)	score
Return on Investment	3	Technological Changes	-1
Leverage	4	Rate of Inflation	-2
Liquidity	3	Demand Variability	-3
Working Capital	5	Barriers to entry into market	-5
Cash Flow	5	Risk involve in Business	-3
Financial Position average	4	Stability Position average	-2.8
Competitive Position (CP)	score	Industry Position (IP)	score
Market Share	-2	Growth Potential	3
Quality of Personnel	-1	Profit Potential	4
Capacity Utilization	-1	Financial Stability	4
Technological KnowHow	-1		
Competitive Position average	-1.3	Industry Position average	3.7
y-axis	1.2	x-axis	2.4
coordinate = 2.4 ; 1.2		Vector lies in Aggressive Quadrant	

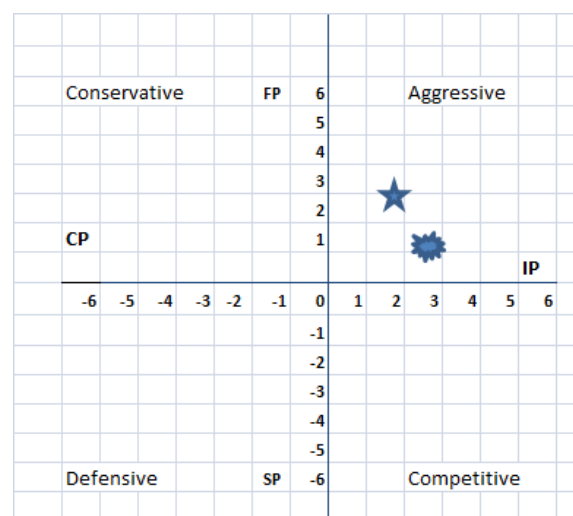


Figure 4. SPACE Matrix Diagram

Legend : ★ = Offshore Drilling Division ; ⚙ = Onshore Drilling Division

The SPACE matrix show in which quadrants each of the drilling business divisions are located in order to identify what kind of strategies are appropriate in accordance with two internal dimensions (financial position and competitive position) and two external dimensions (stability position and industry position).

From Figure 4. SPACE Matrix Diagram, both drilling business division are located in the aggressive quadrant, which means that PT. APX is in excellent position to optimize its internal strength (excellent performance, knowhow, operational achievement, quality personnel, HR development) to take advantage of external opportunities available locally or regionally, to overcome internal weaknesses and to avoid external threats (Fluctuated Oil and Gas Prices, LCC Competitors, interest rate etc). Here the best strategy to select will be among others are market penetration, market development and product development.

4.3.2.3 IE Matrix

The IE matrix is used to know the position of PT. APX's different business division in a format of nine cell display. This matrix is based on two key dimensions: the IFE total weighted scores on the x axis and the EFE total weighted scores on the y axis. Information related to percentage of profit for each different business division is also required to construct the matrix, see Table 21. Estimated Revenues and Profit of PT.APX (2013).

The final IE matrix is described in Figure5. Both drilling division lies in the high IFE and medium EFE quadrant.

Table 21. Estimated Revenues and Profit of PT.APX (2013)

Business Division	Net Income	Profit Pct	EFE score	IFE score
Offshore Drilling Division	USD 8,514,452	76%	2.82	3.25
Onshore Drilling Division	USD 2,966,814	24%	2.87	3.41

Source: Summarized from various sources

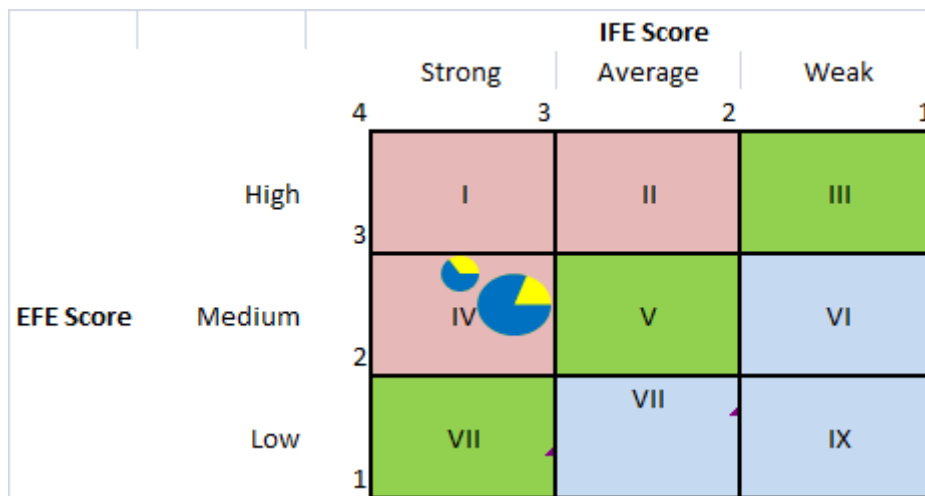


Figure5. IE Matrix – Offshore & Onshore Drilling Division

Note : Bigger Pie is Offshore Drilling Unit, Smaller Pie is Onshore Drilling Unit

From Figure5. IE Matrix – Offshore & Onshore Drilling, both drilling business division are located in the cell IV of the IE matrix which are considered as the Grow and Build cell. Here according to David (David, 2013), the best strategy to be implemented in the division are the intensive strategies (market penetration, market development, and product development) or the integrative strategies (backward integration, forward integration, and horizontal integration). For the case of PT. APX with its two business unit, the intensive strategies will be the most appropriate considering its high score in IFE where PT. APX could use its strength to penetrate more the existing domestic market or develop new market in the region.

4.3.2.4 BCG Matrix

The BCG matrix is required to enhance a multidivisional firm's effort in formulating strategies. The BCG matrix allows a multidivisional organization to manage its portfolio of business by examining the relative market share position and the industry growth rate of each division relative to other division in the organization. Relative market share position is defined as the ratio of a division's own market share (or revenues) in a particular industry to the market share (or revenues) held by the largest rival firm in the industry.

The information related to market share and industry growth rate for PT.APX is explained in the Table 22. Market Share & Industry Growth Rate.

Table 22. Market Share & Industry Growth Rate

Business Division	EBITDA	Profit Pct	Relative Market Share	Industry Growth rate
Offshore Drilling Division	USD 8,514,452	76%	62%	10%
Onshore Drilling Division	USD 2,966,814	24%	40%	8%

Source: Summarized from various sources

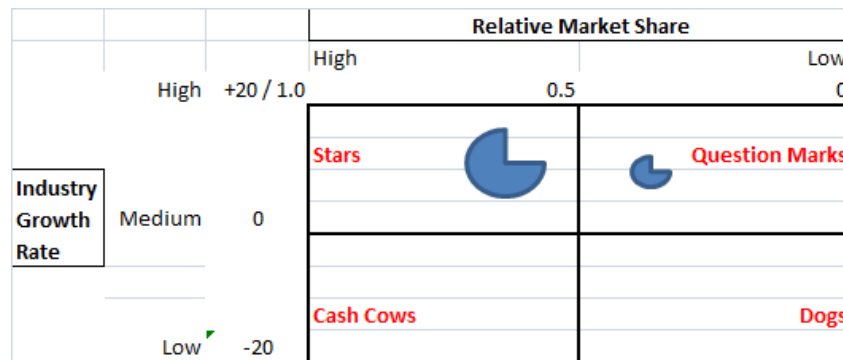


Figure 6. BCG Matrix – Offshore & Onshore Drilling Division

Note : Bigger Pie is Offshore Drilling Unit, Smaller Pie is Onshore Drilling Unit

From Figure 6. BCG Matrix – Offshore & Onshore Drilling Division, the Offshore Business Division lies in the Star position (quadrant II) which means that this division has a good opportunity in the long term to grow and to gain more profit. In this position making additional or new investment to maintain position or to strengthen position will be best the strategy to take. For the offshore business division the strategy to be taken following this analysis will be to get additional fleet in the offshore unit to penetrate market and to strengthen the existence of PT APX in the market.

The Onshore Business Division on the other hand is in the Question Marks position (quadrant I) which means that this division has a relatively low market share

but compete in a high growth industry. The Onshore Business Division would require substantial cash flow as their cash flow generation capability is quite low.

4.3.2.5 GS Matrix

The GS matrix is developed based on two evaluative dimensions, the competitive position and the market (industry) growth. The competitive position of both divisions of PT. APX based on the IE matrix is considered as in the strong competitive position and based on the BCG matrix the growth rate is above 5 percent and thus could be considered as rapid growth (David, 2013). Putting this information on the GS matrix (Figure 7), both divisions of PT. APX lie on the first quadrant of the GS matrix.

The appropriate strategy for the business division located in Quadrant I is to continue concentration on current markets through market penetration and market development, It is not wise for a business division located in Quadrant I to shift from its established competitive position. In Quadrant I, a business division can afford to take advantage of external opportunity in several areas and can take risks aggressively when necessary.



Figure 7. GS Matrix – Offshore & Onshore Drilling Division

Note : Bigger Star is Offshore Drilling Unit, Smaller Star is Onshore Drilling Unit

From Figure 7. GS Matrix – Offshore & Onshore Drilling Division, both Offshore and Onshore Business Division are located in the quadrant I and here both division could continue to concentrate on current markets by employing market development, market penetration and product development strategy. Both Offshore and Onshore Business Division could take advantages from the external opportunities available and could assume risks aggressively when necessary.

4.3.3. The Decision Stage

In this stage, the process of selecting several alternatives of strategy will be done based on the results from SWOT matrix, SPACE matrix, IE matrix, BCG matrix and GS matrix.

Table 23 below show the results from the input and matching stage for two business division of PT APX.

Table 23. Input Stage Result

Input Stage	Offshore Drilling Division	Onshore Drilling Division
	Score	Score
EFE Matrix	2.82	2.87
IFE Matrix	3.25	3.41
CP Matrix	3.25	3.75

Table 24 and Table 25 below show the results from the input and matching stage for two business division of PT APX.

Table 24. Matching Stage Results – Offshore Drilling Unit

Matching Stage – Offshore Drilling Unit				
SWOT Matrix	SPACE Matrix	IE Matrix	BCG Matrix	GS Matrix
<i>Position in different matrix</i>				
SO, WO, ST, WT	Aggressive Quadrant	Quadrant IV	STARS	Quadrant I
<i>Alternative Strategies</i>				
Market Development	Market Development	Market Development	Market Development	Market Development
Market Penetration	Market Penetration	Market Penetration	Market Penetration	Market Penetration
Product Development	Product Development	Product Development	Product Development	Product Development
	Forward Integration	Forward Integration	Forward Integration	Forward Integration
	Backward Integration	Backward Integration	Backward Integration	Backward Integration
	Horizontal Integration	Horizontal Integration	Horizontal Integration	Horizontal Integration
	Diversification			Diversification

Table 25. Matching Stage Results – Onshore Drilling Unit

Matching Stage – Onshore Drilling Unit				
SWOT Matrix	SPACE Matrix	IE Matrix	BCG Matrix	GS Matrix
<i>Position in different matrix</i>				
SO, WO, ST, WT	Aggressive Quadrant	Quadrant IV	Question Marks	Quadrant I
<i>Alternative Generic Strategies</i>				
Market Development	Market Development	Market Development	Market Development	Market Development

Market Penetration	Market Penetration	Market Penetration	Market Penetration	Market Penetration
Product Development	Product Development	Product Development	Product Development	Product Development
	Forward Integration	Forward Integration	Divestiture	Forward Integration
	Backward Integration	Backward Integration		Backward Integration
	Horizontal Integration	Horizontal Integration		Horizontal Integration
	Diversification			Diversification

The results summarized in Table 24 and Table 25 will be used to determine the right strategies of PT.APX to be implemented in the future in order to be competitive in the market. Based on the discussion with PT.APX management, the following strategies have been selected for both the offshore business division and the onshore business division.

Table 26. Decision Stage Table – Offshore Drilling Division

Decision Stage for Offshore Drilling Division		
Selected Generic Strategies		Selected strategies to be implemented
Market Development		1. To finding new partner to extend market coverage
Market Penetration		2. To increase the number of drilling fleet
Product Development		3. To build competence on new technology to benefit from future trends

Table 27. Decision Stage Table – Onshore Drilling Division

Decision Stage for Onshore Drilling Division		
Selected Generic Strategies		Selected strategies to be implemented
Market Penetration		1. To build stronger relationship with authority and clients 2. To increase the number of drilling fleet with high capacity (≥ 1000 HP)

Product Development	3. to build competence on new technology to benefit from future trends
---------------------	--

4.3.3.1. QSP Matrix

To determine the relative attractiveness of the selected strategies above, the technique of Quantitative Strategic Planning Matrix (QSPM) is constructed. This matrix will show which alternatives are best based on the information acquired from the input stage and matching stage. The external and internal factors from the previous analysis will be used to evaluate the attractiveness of each strategy.

From the calculation using the QSP Matrix (Table 28, Table 29) for offshore drilling division, the market development strategies appears to be the most attractive with TAS value of 5.94 followed by market penetration with TAS 3.77 and product development with TAS 3.44. For the onshore drilling division, the market penetration strategies appears to be the most attractive with TAS value of 7.13 and 5.40 respectively and product development with TAS 3.99.

Table 28. QSP Matrix for External Factors – Offshore Drilling Unit

			Finding New Partners		Increase Number of Fleet		Build Competence on new Tech	
		Weight	AS	TAS	AS	TAS	AS	TAS
	OPPORTUNITIES							
1	Exploration Trends in Indonesia	0.17	4	0.68	3	0.51	2	0.34
2	Offshore Technological Progress	0.1	4	0.4	2	0.2	3	0.3
3	Oil & Gas Applicable Laws	0.09	4	0.36	3	0.27	1	0.09
4	National Economic	0.05	4	0.2	3	0.15	2	0.1

	Growth							
5	Local Content Requirement	0.06	3	0.18	2	0.12	1	0.06
6	Energy Demand	0.05	3	0.15	4	0.2	2	0.1
7	Operation Know How	0.07	4	0.28	2	0.12	3	0.21
	THREATS							
1	Oil & Gas Prices	0.14	3	0.42	4	0.56	1	0.14
2	Low Cost Competitors	0.06	-	-	-	-	-	-
3	Drilling Rig Capacity	0.06	-	-	-	-	-	-
4	Interest Rate	0.03	2	0.06	4	0.12	1	0.03
5	Environnement Régulations	0.01	-	-	-	-	-	-
6	Natural Resources Conservation	0.01	-	-	-	-	-	-
7	Local Government (Province) Regulation	0.02	-	-	-	-	-	-
8	Financial Strength	0.07	3	0.21	4	0.28	2	0.14
	Sub Total External	1		2.94		2.53		1.51

Table 29. QSP Matrix for Internal Factors – Offshore Drilling Unit

			Finding New Partners		Increase Number of Fleet		Build Competence on new Tech	
		Weight	AS	TAS	AS	TAS	AS	TAS
	STRENGTH							
1	Excellent Performance	0.17	4	0.68	1	0.17	3	0.51
2	Operational Achievement	0.10	4	0.40	1	0.10	3	0.30
3	Long Contracts with	0.09	4	0.36	2	0.18	3	0.27

	Multinationals							
4	Management Know How	0.07	4	0.28	2	0.14	3	0.21
5	Human Resources Development	0.06	4	0.24	2	0.12	3	0.18
6	Quality of Personnel	0.05	4	0.20	1	0.05	3	0.15
7	Corporate Governance	0.04	3	0.12	1	0.04	2	0.08
8	Pricing Strategy	0.04	-	-	-	-	-	-
9	Good Customers Service	0.04	-	-	-	-	-	-
	WEAKNESS							
1	Capability to adopt New Technology	0.08	-	-	-	-	-	-
2	Access to Capital Market	0.07	4	0.28	3	0.21	1	0.07
3	Financial Cash Flow	0.06	4	0.24	3	0.18	1	0.06
4	Numbers of Drilling Units	0.06	-	-	-	-	-	-
5	International Market Experiences	0.05	4	0.20	1	0.05	2	0.10
	Sub Total Internal	1.00		3.00		1.24		1.93
	Grand Total – Offshore Drilling			5.94		3.77		3.44

Table 30. QSP Matrix for External Factors – Onshore Drilling Unit

			Build Relationship w/ Clients & Authority		Increase Number of Fleet		Build Competence on new Tech	
		Weight	AS	TAS	AS	TAS	AS	TAS
	OPPORTUNITIES							

1	Local Content Requirement	0.09	4	0.36	3	0.27	2	0.18
2	Operation Know How	0.08	4	0.32	1	0.08	3	0.24
3	Oil & Gas Applicable Laws	0.08	4	0.32	3	0.24	1	0.08
4	Drilling Rig Capacity	0.06	4	0.24	3	0.18	2	0.12
5	National Economic Growth	0.05	4	0.20	3	0.15	2	0.1
6	Energy Demand	0.04	3	0.12	4	0.16	2	0.08
7	Onshore Technological Progress	0.02	2	0.04	3	0.06	4	0.08
8	Exploration Trends in Indonesia	0.02	4	0.08	3	0.06	2	0.04
	THREAT							
1	Low Cost Competitors	0.19	4	0.76	3	0.57	2	0.38
2	Oil & Gas Prices	0.13	4	0.52	3	0.39	2	0.26
3	Financial Condition	0.08	3	0.24	4	0.32	1	0.08
4	Interest Rate	0.05	2	0.10	4	0.20	1	0.05
5	Local Government (Province) Regulation	0.04	4	0.16	1	0.04	2	0.08
6	Environnent Régulations	0.04	-	-	-	-	-	-
7	Natural Resources Conservation	0.04	-	-	-	-	-	-
	Sub Total External	1.000		3.46		2.72		1.77

Table 31. QSP Matrix for Internal Factors – Onshore Drilling Unit

			Build Relationship w/ Clients & Authority		Increase Number of Fleet		Build Competence on new Tech	
		Weight	AS	TAS	AS	TAS	AS	TAS
	STRENGTH							
1	Excellent Performance	0.17	4	0.68	3	0.51	2	0.34
2	Pricing Strategy	0.15	4	0.6	2	0.3	1	0.15
3	Management Know How	0.09	4	0.36	2	0.18	3	0.27
4	Operational Achievement	0.08	4	0.32	2	0.16	3	0.24
5	Human Resources Development	0.07	4	0.28	2	0.14	3	0.21
6	Good Customers Service	0.06	4	0.24	2	0.12	3	0.18
7	Quality of Personnel	0.04	3	0.12	2	0.08	4	0.16
8	Corporate Governance	0.04	4	0.16	2	0.08	3	0.12
9	World Class Certification	0.03	4	0.12	3	0.09	2	0.06
10	Long Contracts with Multinationals	0.03	4	0.12	2	0.06	3	0.09
	WEAKNESS							
1	Financial Cash Flow	0.09	4	0.36	3	0.27	1	0.09
2	Numbers of Drilling Units	0.06	2	0.12	4	0.24	3	0.18

3	Access to Capital Market	0.05	2	0.10	4	0.20	2	0.1
4	International Market Experiences	0.03	3	0.09	2	0.06	1	0.03
5	Capability to adopt New Technology	0.02	-	-	-	-	-	-
	Sub Total Internal	1.00		3.67		2.49		2.22
	Grand Total – Onshore Drilling			7.13		5.21		3.99

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CHAPTER 5

RESULTS AND DISCUSSION

Based on the matching stage where the results are presented in Table 24. Matching Stage Results – Offshore Drilling Unit and Table 25. Matching Stage Results – Onshore Drilling Unit, the selected strategy for Offshore Business Division and Onshore Business Division are quite similar which are related to Market Development, Market Penetration and Product Development.

The corporate strategies for implementation is selected by considering the IFE, EFE, CPM matrices coupled with the other five matrices (SWOT, BCG, IE, SPACE and GS) constructed in the matching stages. Several strategies, based on the discussion with PT. APX key personnel, have been selected and evaluated further with the Quantitative Strategic Planning Matrix (QSPM).

From this matrix, as described in detail in Table 28, Table 29, Table 30 and Table 31, the best strategy for Offshore Drilling Division, as reflected by the high TA score 5.94, will be to develop market by finding new partners who has the capability to join forces (technically and financially) with PT. APX to extend the market coverage in Indonesia and other region/area. The new partnership could be formalized in the form of consortium where PT. APX could be the leader during the call-for-tender in the local market or become the participants (or the leader) in case of international call-for-tender.

The strength of PT. APX as a good drilling contractor with good performance, good personnel, supported by strong management are quite well known in the industry. With this strength PT. APX should be confident in marketing itself to potential partner.

The second strategy proposed for Offshore Drilling Unit, with TA score of 3.77, is to increase the number drilling fleet for offshore operation. This strategy is to market development where existing products is brought to new area. Compare to its foreign competitors operating in Indonesia, PT. APX has the least number of offshore drilling rigs. Its capability to get larger market share, locally or regionally, is therefore limited only to the number of rigs it owns. Other foreign

competitors has more offshore rigs operating in Asia Pacific which give them more advantages to participate in any new drilling campaign in Indonesia or in the region compare to PT. APX.

On the other hand, PT. APX is very much depending on its main client Total E&P Indonesia where almost all of its offshore fleet are used to produce from the Mahakam Block. The four swamp barge rigs are operating in a very niche market of swamp area in East Kalimantan and very few areas in Indonesia would require the swamp barge rigs for drilling operation, only in West Papua. Other places in the world where swamp barge rigs could be used are only in Gulf of Mexico and West Africa (Nigeria).

Even though the market share of PT. APX is quite large in this area; the number of offshore drilling rigs, especially jack-up rigs, are still less than needed. This condition could be seen in the fact that the realization of number of wells drilled in Indonesia in 2013 is less than planned (SKKMIGAS, 2014) and this is in greater part is due to the limited number of drilling rigs.

The third strategy which is quite important even though it received the lowest TA score is to build competence on new technology. This strategy is very important if PT. APX wants to take benefit of future trend in the exploration and production activities and also to take advantages of the new frontiers of drilling operation that will go deeper to the sea and to the most difficult places.

For Onshore Drilling Division, the strategy proposed is similar to that for Offshore Drilling Division, to increase the number of its drilling fleet for onshore operation (TA score is 5.21). There is high demand for high capacity (Horse Power above 1000) land rigs owned by PT. APX especially for geothermal operation which started to be the next 'favorite' energy resources in the near future, especially as Indonesia is well known to be lying in the 'ring of fire' area with many potential geothermal sources

The other strategy which received the highest TA score is to build close relationship with the authority and the clients. This strategy is considered very important for PT. APX especially considering the facts that the entry barrier to the local market of land rigs is quite low. The land rigs are not a sophisticated piece of equipments and it also does not require high capital investment to build compare

to the offshore rigs. This situation make the market is quite open for the intervention of low cost land rigs made in China, either brought by foreign competitor or by local competitor. The drawback of this low cost land rigs, as normally the case with many cheap made Chinese products, is the quality and the robustness of the rigs as steel structure. When Safety is put as priority by almost all oil and gas operator, the quality problem will become the barrier for the Chinese made land rigs to rule the market.

Building close relationship with client (especially main clients) will be very important as it will increase trust and dependency of clients to PT. APX to get the quality in terms of operational excellence, HSE and customer satisfaction through a qualified crew and safety of drilling operation. On all this aspects, PT APX has a very strong position compare to its competitors. Situations might change if clients become more cost sensitive due to global situation (low oil and gas prices or low profit due to decreased production).

Relationship with the authority is also important to be developed and improved to ensure that the facility of local content requirement is well addressed in the regulation and fully implemented during local call-for-tender. This will put a significant barrier to foreign competitor from low cost country that will bring cheap and low quality land rigs.

The other strategy, similar to the strategy for Offshore Drilling Business, is to build competence on new technology to take benefit of future trend in the exploration and production activities. This strategy is less important for onshore drilling unit compare to offshore drilling unit,

The strategies selected above are intensive strategies where PT. APX will put more effort on its strategic plan for market development, market penetration and product development. These intensive strategies are all based on the external situation where the oil prices is at a sustainably high and stable level (the price of USD 110 a barrel has been around for the last four years) and also high drilling activities in Indonesia and in the region. However, the global oil price at the end of 2014 (the time the thesis is finalized) has suddenly decreased by more than 50%, from USD 115 a barrel in June 2014 to less than USD 50 a barrel by the end of 2014. This global economic situation where the oil price is decreasing rapidly

will certainly put PT. APX in a situation where it has to re-evaluate again its corporate strategy. With the low oil price, the demand for drilling rigs will be slowing down and decreased as oil & gas operators will have to re-visit and re-evaluate its drilling planning with the possibility to reduce activities or even to stop activities as the economics of the project disappear.

The national issue that PT. APX has to also consider in its strategic planning is the extension of the license of Block Mahakam in East Kalimantan which is currently operated by Total E&P Indonesia (TEPI) and will due in 2017. In this Mahakam Block, two jack-up rigs and three swamp rig of PT. APX is performing the drilling operations, which means that PT. APX's offshore business division is heavily depended on the long term contracts with TEPI. The recent situation related to the license extension has put TEPI in a difficult situation as there is no clarity of when the decision will be given; and with the short time remains before 2017 TEPI will definitely be very careful (not aggressive) in its drilling plan in case the Government of Indonesia decides not to grant the license extension. In these perspectives there will be high risk that some of the rigs will be released and have no contracts until the new operator is appointed and launch the call-for-tender. This situation will be especially difficult for swamp-rigs where the rigs only served a very niche market in East Kalimantan; the other regions where swamp rigs normally operate are Nigeria and the Gulf of Mexico.

CHAPTER 6

CONCLUSION AND RECOMMENDATION

6.1 CONCLUSION

1. David's models for strategy formulation could be used to develop and to formulate the corporate strategy of PT.APX, both for the offshore business division and onshore business division.
2. For Offshore Drilling Division, the most important internal factors are Excellent Performance, Operational Achievement, Long Contracts with Multinational followed by Management Knowhow and HR Development.
The most important external factors are the exploration trend in Indonesia, the rapid development of offshore technology; and the existing oil and gas laws.
3. For Onshore Drilling Division, the most important internal factors are Excellent Performance, Pricing Strategy, Management Know How followed by Operational Achievement and HR Development.
The most important external factors are local content requirement and oil and gas applicable laws.
4. The selected strategy for Offshore Drilling Division is market development (TAS 5.94) with the strategy to find partners and to form cooperation to open and explore new market.
5. For Onshore Drilling Division the selected strategy is market penetration (TAS 7.13 and 5.21) with the main strategy are to build strong relationship with clients and authority and to increase the number of land rigs fleet to strengthen its presence in the market and to gain more market share.

6.2 RECOMMENDATION

1. The identification of strategic internal and external factors could be enhanced further by applying other statistical method like Factor Analysis.

2. For company, David's model of strategy formulation could become one alternative in formulating corporate strategy in the oil and gas industry despite its limited application in the field.
3. For academia, more research on the application of David's model in the oil and gas related company should be promoted to see how effective the model works in the industry.

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K. D. Goepel Version 09.05.2013

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Objective 10. Calculating Weight of EXTERNAL Factors influencing OFFSHORE Drilling

Author Sanggam LG

Date 19-Dec-14

Thresh:

Iterations: 5

EVM check: 1.5E-08

Table	Criterion	Comment	Weights	Rk
1	Economic		22.0%	2
2	Soc, Cult, Enviro		6.8%	5
3	Politic, Legal, Gov		16.9%	4
4	Technological		33.2%	1
5	Competitive		21.0%	3
6				
7				
8				
9				
10		for 9&10 unprotect the input sheets and expand the question section ("+" in row 66)		

Result Eigenvalue lambda:

Consistency Ratio GCI: CR:

Matrix	Economic	Soc, Cult, Enviro	Politic, Legal, Gov	Technological	Competitive	0	0	0	0	0	10	normalized principal Eigenvector
Economic	1	-	4	1 1/3	1/2	1	-	-	-	-	-	21.99%
Soc, Cult, Enviro	2	1/4	-	1/3	1/4	2/5	-	-	-	-	-	6.84%
Politic, Legal, Gov	3	3/4	2 5/6	-	1/2	5/7	-	-	-	-	-	16.91%
Technological	4	2	4 2/9	2	-	1 2/5	-	-	-	-	-	33.23%
Competitive	5	1	2 1/2	1 3/8	5/7	-	-	-	-	-	-	21.03%
0	6	-	-	-	-	-	-	-	-	-	-	0.00%
0	7	-	-	-	-	-	-	-	-	-	-	0.00%
0	8	-	-	-	-	-	-	-	-	-	-	0.00%
0	9	-	-	-	-	-	-	-	-	-	-	0.00%
0	10	-	-	-	-	-	-	-	-	-	-	0.00%

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p= selected Participant (0=consol.) 2 7

Objective 19. Calculating Weight of Sub Factors Competitive, EXTERNAL for Offshore Drilling

Author

Date

Thresh:

Iterations: 8

EVM check: 2.6E-08

Table	Criterion	Comment	Weights	Rk
1	Low Cost Competit		29.8%	3
2	Operations KnowH		34.3%	2
3	Financial Strength		35.9%	1
4				
5				
6				
7				
8				
9				
10		for 9&10 unprotect the input sheets and expand the question section ("+" in row 66)		

Result **Eigenvalue** lambda:

Consistency Ratio GCI: CR:

Matrix	Low Cost Competitors	Operations KnowHow	Financial Strength	0	0	0	0	0	0	0	normalized principal Eigenvector
	1	2	3	4	5	6	7	8	9	10	
Low Cost Competitors	1	-	1	4/5	-	-	-	-	-	-	29.79%
Operations KnowHow	2	1	-	1	-	-	-	-	-	-	34.27%
Financial Strength	3	1 1/4	1	-	-	-	-	-	-	-	35.94%
0	4	-	-	-	-	-	-	-	-	-	0.00%
0	5	-	-	-	-	-	-	-	-	-	0.00%
0	6	-	-	-	-	-	-	-	-	-	0.00%
0	7	-	-	-	-	-	-	-	-	-	0.00%
0	8	-	-	-	-	-	-	-	-	-	0.00%
0	9	-	-	-	-	-	-	-	-	-	0.00%
0	10	-	-	-	-	-	-	-	-	-	0.00%

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p= selected Participant (0=consol.) 2 7

Objective 17. Calculating Weight of Sub Factors Technological, EXTERNAL for Offshore Drilling

Author

Date

Thresh:

Iterations: 8

EVM check: 2.2E-08

Table	Criterion	Comment	Weights	Rk
1	Offshore Tech Prog		31.4%	2
2	Drilling Rig Cap		18.9%	3
3	Exploration Trends		49.8%	1
4				
5				
6				
7				
8				
9		for 9&10 unprotect the input sheets and expand the		
10		question section ("+" in row 66)		

Result **Eigenvalue** lambda:

Consistency Ratio GCI: CR:

Matrix												normalized principal Eigenvector	
		Offshore Tech Progress	Drilling Rig Cap	Exploration Trends	0	0	0	0	0	0	0		
Offshore Tech	1	1	2/3	5/8	-	-	-	-	-	-	-	31.38%	
Drilling Rig Cap	2	3/5	1	3/8	-	-	-	-	-	-	-	18.85%	
Exploration Trends	3	1 3/5	2 5/8	1	-	-	-	-	-	-	-	49.77%	
0	4	-	-	-	1	-	-	-	-	-	-	0.00%	
0	5	-	-	-	-	1	-	-	-	-	-	0.00%	
0	6	-	-	-	-	-	1	-	-	-	-	0.00%	
0	7	-	-	-	-	-	-	1	-	-	-	0.00%	
0	8	-	-	-	-	-	-	-	1	-	-	0.00%	
0	9	-	-	-	-	-	-	-	-	1	-	0.00%	
0	10	-	-	-	-	-	-	-	-	-	1	0.00%	

AHP Analytic Hierarchy Process(EVM multiple inputs)

K. D. Goepel Version 09.05.2013

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N= Number of Participants (1 to 20) α : Consensus:

p= selected Participant (0=consol.) 2 7

Objective 15. Calculating Weight of Sub Factors Political, Legal, Government, EXTERNAL for Offshore Drilling

Author

Date

Thresh:

Iterations: 8

EVM check: 1.8E-08

Table	Criterion	Comment	Weights	Rk
1	Oil & Gas Law		52.1%	1
2	Local Gov (Prov) L		14.5%	3
3	Local Content Req		33.4%	2
4				
5				
6				
7				
8				
9		for 9&10 unprotect the input sheets and expand the		
10		question section ("+" in row 66)		

Result **Eigenvalue** lambda:

Consistency Ratio GCI: CR:

Matrix	Oil & Gas Law	Local Gov (Prov) Law	Local Content Req	0	0	0	0	0	0	0	0
Oil & Gas Law	1	3 1/2	1 3/5	-	-	-	-	-	-	-	-
Local Gov (Prov) Law	2/7	1	3/7	-	-	-	-	-	-	-	-
Local Content Req	5/8	2 2/5	1	-	-	-	-	-	-	-	-
0	-	-	-	1	-	-	-	-	-	-	-
0	-	-	-	-	1	-	-	-	-	-	-
0	-	-	-	-	-	1	-	-	-	-	-
0	-	-	-	-	-	-	1	-	-	-	-
0	-	-	-	-	-	-	-	1	-	-	-
0	-	-	-	-	-	-	-	-	1	-	-
0	-	-	-	-	-	-	-	-	-	1	-
0	-	-	-	-	-	-	-	-	-	-	1

normalized
principal
Eigenvector

(52.11%)
 (14.46%)
 (33.43%)
 (0.00%)
 (0.00%)
 (0.00%)
 (0.00%)
 (0.00%)
 (0.00%)
 (0.00%)
 (0.00%)

AHP Analytic Hierarchy Process(EVM multiple inputs)

K. D. Goepel Version 09.05.2013

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N= Number of Participants (1 to 20) α : Consensus:

p= selected Participant (0=consol.) 2 7

Objective 14. Calculating Weight of Sub Factors Social, Cultural, Environment, EXTERNAL for Offshore Drilling

Author

Date

Thresh:

Iterations: 8

EVM check: 1.6E-08

Table	Criterion	Comment	Weights	Rk
1	Transportation		66.4%	1
2	Environment Regu		16.9%	2
3	Nat Resources Co	Natural Resources Conservation	16.6%	3
4				
5				
6				
7				
8				
9				
10		for 9&10 unprotect the input sheets and expand the question section ("+" in row 66)		

Result **Eigenvalue** lambda:

Consistency Ratio GCI: CR:

Matrix	Transportation	Environment Regulation	Nat Resources Cons	0	0	0	0	0	0	0	0
Transportation	1	4 1/5	3 5/7	-	-	-	-	-	-	-	-
Environment Regulation	1/4	1	1	-	-	-	-	-	-	-	-
Nat Resources	1/4	1	1	-	-	-	-	-	-	-	-
0	-	-	-	1	-	-	-	-	-	-	-
0	-	-	-	-	1	-	-	-	-	-	-
0	-	-	-	-	-	1	-	-	-	-	-
0	-	-	-	-	-	-	1	-	-	-	-
0	-	-	-	-	-	-	-	1	-	-	-
0	-	-	-	-	-	-	-	-	1	-	-
0	-	-	-	-	-	-	-	-	-	1	-
0	-	-	-	-	-	-	-	-	-	-	1

normalized principal Eigenvector

(66.44%
 16.92%
 16.64%
 0.00%
 0.00%
 0.00%
 0.00%
 0.00%
 0.00%
 0.00%
 0.00%)

AHP Analytic Hierarchy Process(EVM multiple inputs)

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n= Number of criteria (3 to 10) Scale:

N= Number of Participants (1 to 20) α : Consensus:

p= selected Participant (0=consol.) 2 7

Objective 20. Calculating Weight of INTERNAL Factors influencing Offshore Drilling Business

Author Sanggam LG

Date 19-Dec-14

Thresh:

Iterations: 5

EVM check: 2.3E-08

Table	Criterion	Comment	Weights	Rk
1	Management		19.0%	4
2	Resources		13.5%	5
3	Finance		21.4%	2
4	Marketing		19.3%	3
5	Operation (Tech.)		26.9%	1
6				
7				
8				
9				
10		for 9&10 unprotect the input sheets and expand the question section ("+" in row 66)		

Result **Eigenvalue** lambda:

Consistency Ratio GCI: CR:

Matrix	Management	Resources	Finance	Marketing	Operation (Tech.)	0	0	0	0	0	10	normalized principal Eigenvector
Management	1	1/7	1	7/8	3/4	-	-	-	-	-	-	18.95%
Resources	7/8	1	1/2	3/4	1/2	-	-	-	-	-	-	13.50%
Finance	1	2	1	5/6	-	-	-	-	-	-	-	21.35%
Marketing	1 1/7	1 1/3	1	1	2/3	-	-	-	-	-	-	19.32%
Operation (Tech.)	1 1/3	2 1/6	1 2/9	1 4/9	1	-	-	-	-	-	-	26.88%
0	6	-	-	-	-	1	-	-	-	-	-	0.00%
0	7	-	-	-	-	-	1	-	-	-	-	0.00%
0	8	-	-	-	-	-	-	1	-	-	-	0.00%
0	9	-	-	-	-	-	-	-	1	-	-	0.00%
0	10	-	-	-	-	-	-	-	-	1	-	0.00%

AHP Analytic Hierarchy Process(EVM multiple inputs)

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n= Number of criteria (3 to 10) Scale:

N= Number of Participants (1 to 20) α : Consensus:

p= selected Participant (0=consol.) 2 7

Objective 25. Calculating Weight of Sub Factors Finance, INTERNAL - Offshore Drilling

Author Sanggam LG

Date 19-Dec-14

Thresh:

Iterations: 8

EVM check: 2.6E-08

Table	Criterion	Comment	Weights	Rk
1	Finance Cash Flow		28.1%	3
2	Access to Cap Mar		30.7%	2
3	Long Contracts w/		41.2%	1
4				
5				
6				
7				
8				
9				
10		for 9&10 unprotect the input sheets and expand the question section ("+" in row 66)		

Result **Eigenvalue** lambda:

Consistency Ratio GCI: CR:

Matrix	Finance Cash Flow	Access to Cap Market	Long Contracts w/ MNC	0	0	0	0	0	0	0	normalized principal Eigenvector
	1	2	3	4	5	6	7	8	9	10	
Finance Cash Flow	1	1	2/3	-	-	-	-	-	-	-	28.09%
Access to Cap Market	1 1/9	-	3/4	-	-	-	-	-	-	-	30.70%
Long Contracts w/	1 4/9	1 3/8	-	-	-	-	-	-	-	-	41.21%
0	4	-	-	-	-	-	-	-	-	-	0.00%
0	5	-	-	-	-	-	-	-	-	-	0.00%
0	6	-	-	-	-	-	-	-	-	-	0.00%
0	7	-	-	-	-	-	-	-	-	-	0.00%
0	8	-	-	-	-	-	-	-	-	-	0.00%
0	9	-	-	-	-	-	-	-	-	-	0.00%
0	10	-	-	-	-	-	-	-	-	-	0.00%

AHP Analytic Hierarchy Process(EVM multiple inputs)

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n= Number of criteria (3 to 10) Scale:

N= Number of Participants (1 to 20) α : Consensus:

p= selected Participant (0=consol.) 2 7

Objective 24. Calculating Weight of Sub Factors Resources, INTERNAL - Offshore Drilling

Author

Date

Thresh:

Iterations: 8

EVM check: 2.4E-08

Table	Criterion	Comment	Weights	Rk
1	Quality Personnel		33.7%	2
2	World Class Cert.		22.0%	3
3	HR Development		44.3%	1
4				
5				
6				
7				
8				
9		for 9&10 unprotect the input sheets and expand the		
10		question section ("+" in row 66)		

Result **Eigenvalue** lambda:

Consistency Ratio GCI: CR:

Matrix	Quality Personnel	World Class Cert.	HR Development	0	0	0	0	0	0	0	0
Quality Personnel	1	1 1/2	7/9	-	-	-	-	-	-	-	-
World Class Cert.	2/3	1	1/2	-	-	-	-	-	-	-	-
HR Development	1 2/7	2	1	-	-	-	-	-	-	-	-
0	-	-	-	1	-	-	-	-	-	-	-
0	-	-	-	-	1	-	-	-	-	-	-
0	-	-	-	-	-	1	-	-	-	-	-
0	-	-	-	-	-	-	1	-	-	-	-
0	-	-	-	-	-	-	-	1	-	-	-
0	-	-	-	-	-	-	-	-	1	-	-
0	-	-	-	-	-	-	-	-	-	1	-
0	-	-	-	-	-	-	-	-	-	-	1

normalized
principal
Eigenvector

(33.69%
 22.03%
 44.28%
 0.00%
 0.00%
 0.00%
 0.00%
 0.00%
 0.00%
 0.00%
 0.00%)

AHP Analytic Hierarchy Process(EVM multiple inputs)

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n= Number of criteria (3 to 10) Scale:

N= Number of Participants (1 to 20) α : Consensus:

p= selected Participant (0=consol.) 2 7

Objective 22. Calculating Weight of Sub Factors Management, INETRNL - Offshore Drilling Business

Author

Date

Thresh:

Iterations: 8

EVM check: 2.3E-08

Table	Criterion	Comment	Weights	Rk
1	Management Know		37.1%	2
2	Cap to adopt new t		42.7%	1
3	Corp. Governance		20.2%	3
4				
5				
6				
7				
8				
9				
10		for 9&10 unprotect the input sheets and expand the question section ("+" in row 66)		

Result **Eigenvalue** lambda:

Consistency Ratio GCI: CR:

Matrix	Management KnowHow	Cap to adopt new tech	Corp. Governance	0	0	0	0	0	0	0	normalized principal Eigenvector
	1	2	3	4	5	6	7	8	9	10	
Management KnowHow	1	-	2	-	-	-	-	-	-	-	37.14%
Cap to adopt new tech	2	1 2/9	-	-	-	-	-	-	-	-	42.69%
Corp. Governance	3	1/2	1/2	-	-	-	-	-	-	-	20.18%
0	4	-	-	-	-	-	-	-	-	-	0.00%
0	5	-	-	-	-	-	-	-	-	-	0.00%
0	6	-	-	-	-	-	-	-	-	-	0.00%
0	7	-	-	-	-	-	-	-	-	-	0.00%
0	8	-	-	-	-	-	-	-	-	-	0.00%
0	9	-	-	-	-	-	-	-	-	-	0.00%
0	10	-	-	-	-	-	-	-	-	-	0.00%

AHP Analytic Hierarchy Process(EVM multiple inputs)

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n= Number of criteria (3 to 10) Scale:

N= Number of Participants (1 to 20) α : Consensus:

p= selected Participant (0=consol.) 2 7

Objective 30. Calculating Weight of EXTERNAL Factors influencing ONSHORE Drilling Business

Author Sanggam LG

Date 19-Dec-14

Thresh:

Iterations: 5

EVM check: 1.7E-08

Table	Criterion	Comment	Weights	Rk
1	Economic		21.9%	2
2	Soc, Cult, Enviro		10.7%	5
3	Politic, Legal, Gov		20.9%	3
4	Technological		11.3%	4
5	Competitive		35.1%	1
6				
7				
8				
9				
10		for 9&10 unprotect the input sheets and expand the question section ("+" in row 66)		

Result Eigenvalue lambda:

Consistency Ratio GCI: CR:

Matrix	Economic	Soc, Cult, Enviro	Politic, Legal, Gov	Technological	Competitive	0	0	0	0	0	10	normalized principal Eigenvector
Economic	1	2 4/7	1 1/5	1 1/3	3/5	-	-	-	-	-	-	21.91%
Soc, Cult, Enviro	2	2/5	3/7	1 1/7	3/8	-	-	-	-	-	-	10.70%
Politic, Legal, Gov	3	5/6	2 1/3	2 1/8	1/2	-	-	-	-	-	-	20.95%
Technological	4	3/4	7/8	1/2	1/3	-	-	-	-	-	-	11.34%
Competitive	5	1 2/3	2 2/3	3 1/3	-	-	-	-	-	-	-	35.11%
0	6	-	-	-	-	-	-	-	-	-	-	0.00%
0	7	-	-	-	-	-	-	-	-	-	-	0.00%
0	8	-	-	-	-	-	-	-	-	-	-	0.00%
0	9	-	-	-	-	-	-	-	-	-	-	0.00%
0	10	-	-	-	-	-	-	-	-	-	-	0.00%

AHP Analytic Hierarchy Process(EVM multiple inputs)

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n= Number of criteria (3 to 10) Scale:

N= Number of Participants (1 to 20) α : Consensus:

p= selected Participant (0=consol.) 2 7

Objective 39. Calculating Weight of Sub Factors Competitive, EXTERNAL for Onshore Drilling

Author Sanggam LG

Date 12/19

Thresh:

Iterations: 8

EVM check: 2.2E-08

Table	Criterion	Comment	Weights	Rk
1	Low Cost Competit		53.2%	1
2	Operations KnowH		23.9%	2
3	Financial Strength		22.9%	3
4				
5				
6				
7				
8				
9				
10		for 9&10 unprotect the input sheets and expand the question section ("+" in row 66)		

Result **Eigenvalue** lambda:

Consistency Ratio GCI: CR:

Matrix	Low Cost Competitors	Operations KnowHow	Financial Strength	0	0	0	0	0	0	0	0	normalized principal Eigenvector
	1	2	3	4	5	6	7	8	9	10		
Low Cost Competitors	1	2 2/7	2 1/4	-	-	-	-	-	-	-	53.18%	
Operations KnowHow	3/7	1	-	-	-	-	-	-	-	-	23.93%	
Financial Strength	4/9	1	-	-	-	-	-	-	-	-	22.89%	
0	4	-	-	-	-	-	-	-	-	-	0.00%	
0	5	-	-	-	-	-	-	-	-	-	0.00%	
0	6	-	-	-	-	-	-	-	-	-	0.00%	
0	7	-	-	-	-	-	-	-	-	-	0.00%	
0	8	-	-	-	-	-	-	-	-	-	0.00%	
0	9	-	-	-	-	-	-	-	-	-	0.00%	
0	10	-	-	-	-	-	-	-	-	-	0.00%	

AHP Analytic Hierarchy Process(EVM multiple inputs)

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n= Number of criteria (3 to 10) Scale:

N= Number of Participants (1 to 20) α : Consensus:

p= selected Participant (0=consol.) 2 7

Objective 37. Calculating Weight of Sub Factors Technological, EXTERNAL for ONSHORE Drilling

Author Sanggam LG

Date 19-Dec-14

Thresh:

Iterations: 8

EVM check: 2.1E-08

Table	Criterion	Comment	Weights	Rk
1	Offshore Tech Prog		20.8%	3
2	Drilling Rig Cap		56.7%	1
3	Exploration Trends		22.5%	2
4				
5				
6				
7				
8				
9		for 9&10 unprotect the input sheets and expand the		
10		question section ("+" in row 66)		

Result **Eigenvalue** lambda:

Consistency Ratio GCI: CR:

Matrix	Offshore Tech Progress	Drilling Rig Cap	Exploration Trends	0	0	0	0	0	0	0	0	normalized principal Eigenvector
Offshore Tech	1	1/3	1	-	-	-	-	-	-	-	-	20.84%
Drilling Rig Cap	2 4/5	-	2 1/2	-	-	-	-	-	-	-	-	56.68%
Exploration Trends	1	2/5	-	-	-	-	-	-	-	-	-	22.48%
0	4	-	-	-	-	-	-	-	-	-	-	0.00%
0	5	-	-	-	-	-	-	-	-	-	-	0.00%
0	6	-	-	-	-	-	-	-	-	-	-	0.00%
0	7	-	-	-	-	-	-	-	-	-	-	0.00%
0	8	-	-	-	-	-	-	-	-	-	-	0.00%
0	9	-	-	-	-	-	-	-	-	-	-	0.00%
0	10	-	-	-	-	-	-	-	-	-	-	0.00%

AHP Analytic Hierarchy Process(EVM multiple inputs)

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n= Number of criteria (3 to 10) Scale:

N= Number of Participants (1 to 20) α : Consensus:

p= selected Participant (0=consol.) 2 7

Objective 34. Calculating Weight of Sub Factors Social, Cultural, Environment, EXTERNAL for ONSHORE Drilling

Author Sanggam LG

Date 19-Dec-14

Thresh:

Iterations: 8

EVM check: 2.7E-08

Table	Criterion	Comment	Weights	Rk
1	Transportation Demand	Energy Demand	33.0%	2
2	Environment Regulation		35.4%	1
3	Nat Resources Conservation	Natural Resources Conservation	31.6%	3
4				
5				
6				
7				
8				
9				
10		for 9&10 unprotect the input sheets and expand the question section ("+" in row 66)		

Result **Eigenvalue** lambda:

Consistency Ratio GCI: CR:

Matrix	Transportation Demand	Environment Regulation	Nat Resources Conservation	0	0	0	0	0	0	0	0
Transportation Demand	1	1	1	-	-	-	-	-	-	-	-
Environment Regulation	1	1	1 1/7	-	-	-	-	-	-	-	-
Nat Resources Conservation	1	7/8	1	-	-	-	-	-	-	-	-
0	4	-	-	-	-	-	-	-	-	-	-
0	5	-	-	-	-	-	-	-	-	-	-
0	6	-	-	-	-	-	-	-	-	-	-
0	7	-	-	-	-	-	-	-	-	-	-
0	8	-	-	-	-	-	-	-	-	-	-
0	9	-	-	-	-	-	-	-	-	-	-
0	10	-	-	-	-	-	-	-	-	-	-

normalized principal Eigenvector

(33.00%
 35.44%
 31.56%
 0.00%
 0.00%
 0.00%
 0.00%
 0.00%
 0.00%
 0.00%
 0.00%)

AHP Analytic Hierarchy Process(EVM multiple inputs)

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n= Number of criteria (3 to 10) Scale:

N= Number of Participants (1 to 20) α : Consensus:

p= selected Participant (0=consol.) 2 7

Objective 32. Calculating Weight of Sub Factors Economic, EXTERNAL for ONSHORE Drilling

Author Sanggam LG

Date 19-Dec-14

Thresh:

Iterations: 8

EVM check: 2.1E-08

Table	Criterion	Comment	Weights	Rk
1	Oil & Gas Price		57.4%	1
2	Nat. Econ. Growth		20.6%	3
3	Interest Rate		22.0%	2
4				
5				
6				
7				
8				
9				
10		for 9&10 unprotect the input sheets and expand the question section ("+" in row 66)		

Result **Eigenvalue** lambda:

Consistency Ratio GCI: CR:

Matrix		Oil & Gas Price	Nat. Econ. Growth	Interest Rate	0	0	0	0	0	0	0	normalized principal Eigenvector
		1	2	3	4	5	6	7	8	9	10	
Oil & Gas Price	1	-	2 3/4	2 2/3	-	-	-	-	-	-	-	(57.35% 20.61% 22.04% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00%
Nat. Econ. Growth	2	3/8	-	1	-	-	-	-	-	-	-	
Interest Rate	3	3/8	1	-	-	-	-	-	-	-	-	
0	4	-	-	-	-	-	-	-	-	-	-	
0	5	-	-	-	-	-	-	-	-	-	-	
0	6	-	-	-	-	-	-	-	-	-	-	
0	7	-	-	-	-	-	-	-	-	-	-	
0	8	-	-	-	-	-	-	-	-	-	-	
0	9	-	-	-	-	-	-	-	-	-	-	
0	10	-	-	-	-	-	-	-	-	-	-	

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n= Number of criteria (3 to 10) Scale:

N= Number of Participants (1 to 20) α : Consensus:

p= selected Participant (0=consol.) 2 7

Objective 40. Calculating Weight of INTERNAL Factors influencing ONSHORE Drilling Business

Author Sanggam LG

Date 19-Dec-14

Thresh:

Iterations: 5

EVM check: 2.2E-08

Table	Criterion	Comment	Weights	Rk
1	Management		14.6%	4
2	Resources		14.6%	5
3	Finance		17.2%	3
4	Marketing		25.6%	2
5	Operation (Tech.)		28.0%	1
6				
7				
8				
9				
10		for 9&10 unprotect the input sheets and expand the question section ("+" in row 66)		

Result **Eigenvalue** lambda:

Consistency Ratio GCI: CR:

Matrix											normalized principal Eigenvector	
	Management 1	Resources 2	Finance 3	Marketing 4	Operation (Tech.) 5	0 6	0 7	0 8	0 9	0 10		
Management	1	-	1 1/7	7/9	5/9	1/2	-	-	-	-	-	14.63%
Resources	2	7/8	-	4/5	3/4	1/2	-	-	-	-	-	14.57%
Finance	3	1 2/7	1 1/4	-	1/2	2/3	-	-	-	-	-	17.21%
Marketing	4	1 5/6	1 1/3	2	-	6/7	-	-	-	-	-	25.57%
Operation (Tech.)	5	1 6/7	2	1 1/2	1 1/6	-	-	-	-	-	-	28.02%
0	6	-	-	-	-	-	-	-	-	-	-	0.00%
0	7	-	-	-	-	-	-	-	-	-	-	0.00%
0	8	-	-	-	-	-	-	-	-	-	-	0.00%
0	9	-	-	-	-	-	-	-	-	-	-	0.00%
0	10	-	-	-	-	-	-	-	-	-	-	0.00%

AHP Analytic Hierarchy Process(EVM multiple inputs)

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Only input data in the light green fields and worksheets!

n= Number of criteria (3 to 10) Scale:

N= Number of Participants (1 to 20) α : Consensus:

p= selected Participant (0=consol.) 2 7

Objective 49. Calculating Weight of Sub Factors Operations INTERNAL - Onshore Drilling

Author Sanggam LG

Date 19-Dec-14

Thresh:

Iterations: 8

EVM check: 2.0E-08

Table	Criterion	Comment	Weights	Rk
1	Excellent Performance		58.9%	1
2	Good Customer Service		21.5%	2
3	Nbr of Drilling Units		19.6%	3
4				
5				
6				
7				
8				
9				
10		for 9&10 unprotect the input sheets and expand the question section ("+" in row 66)		

Result **Eigenvalue** lambda:

Consistency Ratio GCI: CR:

Matrix	Excellent Performance	Good Customer Service	Nbr of Drilling Units	0	0	0	0	0	0	0	0
Excellent Performance	1	2 3/4	3	-	-	-	-	-	-	-	-
Good Customer Service	3/8	1	1	-	-	-	-	-	-	-	-
Nbr of Drilling Units	1/3	1	1	-	-	-	-	-	-	-	-
0	4	-	-	-	-	-	-	-	-	-	-
0	5	-	-	-	-	-	-	-	-	-	-
0	6	-	-	-	-	-	-	-	-	-	-
0	7	-	-	-	-	-	-	-	-	-	-
0	8	-	-	-	-	-	-	-	-	-	-
0	9	-	-	-	-	-	-	-	-	-	-
0	10	-	-	-	-	-	-	-	-	-	-

normalized principal Eigenvector

(58.91%
 21.46%
 19.62%
 0.00%
 0.00%
 0.00%
 0.00%
 0.00%
 0.00%
 0.00%
 0.00%)

AHP Analytic Hierarchy Process(EVM multiple inputs)

K. D. Goepel Version 09.05.2013

Free web based AHP software on:

<http://bpmsg.com>

Only input data in the light green fields and worksheets!

n= Number of criteria (3 to 10) Scale:

N= Number of Participants (1 to 20) α : Consensus:

p= selected Participant (0=consol.) 2 7

Objective 45. Calculating Weight of Sub Factors Finance, INTERNAL - Onshore Drilling

Author Sanggam LG

Date 19-Dec-14

Thresh:

Iterations: 8

EVM check: 2.1E-08

Table	Criterion	Comment	Weights	Rk
1	Finance Cash Flow		51.7%	1
2	Access to Cap Mar		30.1%	2
3	Long Contracts w/		18.2%	3
4				
5				
6				
7				
8				
9				
10		for 9&10 unprotect the input sheets and expand the question section ("+" in row 66)		

Result **Eigenvalue** lambda:

Consistency Ratio GCI: CR:

Matrix	Finance Cash Flow	Access to Cap Market	Long Contracts w/ MNC	0	0	0	0	0	0	0	0	normalized principal Eigenvector
1	1	1 2/3	3	-	-	-	-	-	-	-	-	51.73%
2	3/5	1	1 3/5	-	-	-	-	-	-	-	-	30.10%
3	1/3	5/8	1	-	-	-	-	-	-	-	-	18.17%
0	4	-	-	1	-	-	-	-	-	-	-	0.00%
0	5	-	-	-	1	-	-	-	-	-	-	0.00%
0	6	-	-	-	-	1	-	-	-	-	-	0.00%
0	7	-	-	-	-	-	1	-	-	-	-	0.00%
0	8	-	-	-	-	-	-	1	-	-	-	0.00%
0	9	-	-	-	-	-	-	-	1	-	-	0.00%
0	10	-	-	-	-	-	-	-	-	1	-	0.00%

AHP Analytic Hierarchy Process(EVM multiple inputs)

K. D. Goepel Version 09.05.2013

Free web based AHP software on:

<http://bpmsg.com>

Only input data in the light green fields and worksheets!

n= Number of criteria (3 to 10) Scale:

N= Number of Participants (1 to 20) α : Consensus:

p= selected Participant (0=consol.) 2 7

Objective 44. Calculating Weight of Sub Factors Resources, INTERNAL - Onshore Drilling

Author Sanggam LG

Date 19-Dec-14

Thresh:

Iterations: 8

EVM check: 2.1E-08

Table	Criterion	Comment	Weights	Rk
1	Quality Personnel		28.9%	2
2	World Class Cert.		18.7%	3
3	HR Development		52.4%	1
4				
5				
6				
7				
8				
9		for 9&10 unprotect the input sheets and expand the		
10		question section ("+" in row 66)		

Result **Eigenvalue** lambda:

Consistency Ratio GCI: CR:

Matrix	Quality Personnel	World Class Cert.	HR Development	0	0	0	0	0	0	0	0
Quality Personnel	1	1 4/7	1/2	-	-	-	-	-	-	-	-
World Class Cert.	5/8	1	1/3	-	-	-	-	-	-	-	-
HR Development	1 6/7	2 3/4	1	-	-	-	-	-	-	-	-
0	-	-	-	1	-	-	-	-	-	-	-
0	-	-	-	-	1	-	-	-	-	-	-
0	-	-	-	-	-	1	-	-	-	-	-
0	-	-	-	-	-	-	1	-	-	-	-
0	-	-	-	-	-	-	-	1	-	-	-
0	-	-	-	-	-	-	-	-	1	-	-
0	-	-	-	-	-	-	-	-	-	1	-
0	-	-	-	-	-	-	-	-	-	-	1

normalized
principal
Eigenvector

(28.89%)
 (18.66%)
 (52.45%)
 (0.00%)
 (0.00%)
 (0.00%)
 (0.00%)
 (0.00%)
 (0.00%)
 (0.00%)
 (0.00%)

AHP Analytic Hierarchy Process(EVM multiple inputs)

K. D. Goepel Version 09.05.2013

Free web based AHP software on:

<http://bpmsg.com>

Only input data in the light green fields and worksheets!

n= Number of criteria (3 to 10) Scale:

N= Number of Participants (1 to 20) α : Consensus:

p= selected Participant (0=consol.) 2 7

Objective Critical Success Factor - CPM

Author Sanggam L

Date

Thresh:

Iterations: 6

EVM check: 2.9E-08

Table	Criterion	Comment	Weights	Rk
1	Number of Fleet		24.4%	2
2	Technical Experien		34.0%	1
3	International Reput		19.2%	4
4	Resources		22.3%	3
5				
6				
7				
8				
9		for 9&10 unprotect the input sheets and expand the		
10		question section ("+" in row 66)		

Result **Eigenvalue** lambda:

Consistency Ratio GCI: CR:

Matrix	Number of Fleet	Technical Experiences	International Reputations	Resources	0	0	0	0	0	0	10	normalized principal Eigenvector
Number of Fleet	1	2/3	1 4/9	1	0	0	0	0	0	0	0	24.44%
Technical Experiences	1 4/9	1	1 4/5	1 4/9	0	0	0	0	0	0	0	33.99%
International Reputations	2/3	5/9	1	1	0	0	0	0	0	0	0	19.24%
Resources	1	2/3	1	1	0	0	0	0	0	0	0	22.32%
0	5	-	-	-	0	0	0	0	0	0	0	0.00%
0	6	-	-	-	0	0	0	0	0	0	0	0.00%
0	7	-	-	-	0	0	0	0	0	0	0	0.00%
0	8	-	-	-	0	0	0	0	0	0	0	0.00%
0	9	-	-	-	0	0	0	0	0	0	0	0.00%
0	10	-	-	-	0	0	0	0	0	0	0	0.00%

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