CHAPTER I. INTRODUCTION

This chapter will describe about the basic study of this thesis, Section 1.1 of this introduction describes the background research of this thesis. establishes the need for organizations to examine their organizational change capabilities and processes as we enter the era of over the next 10 years for preparing the expected Upstream staffing trends. It examines corporate inertia and how this is changing business rules, how its creating new value streams, and how these changes are impacting company.s relationships with human resources, and how people work within the company, particularly in Geoscience and Petroleum Engineering disciplines. It also establishes the important role of Geoscientists and Petroleum Engineers and their value in the organisation. Section 1.2 of this introduction examines research objectives and developed high level research questions to guide a preliminary study. Section 1.3 introduces research purposes and explaining the aims of research. Section 1.4 of this introduction examines the research advantages concerning global recruiting strategy and global training and development strategy changes in the Company.

1.1. Research Background

The research is concerned with the investigation of the impact of managing change processes which create the innovative strategy of the oil and gas company to the recruitment and development of Geoscientists and Petroleum Engineers, which are described in section 2.2.2. These investigations are conducting as the proposed tools for use within an organisation's strategic change process. The methods chosen for this study have been the focus of recent human resources research, and being used by large multinational organizations particularly in multinational oil and gas companies worldwide. Fluctuating oil prices, the demise of communism combined with the emergence of global economy have created increased competition for the numerous investment opportunities now available to the hydrocarbon industry. These and other events have forced oil companies to restructure and develop new business strategies. While some skills became redundant the need for new skill mixes emerged. Employees lacking the technical and nontechnical skills required in the new business environment were released. This has severely tightened the job market. Although their recruitment

requirements are now modest, some companies have continued to recruit from a small pool of top quality graduates having the appropriate mix of technical and non-technical skills. To achieve this, the search has become increasingly global: particularly for the larger international companies. This phenomena was researched by Geoscience Canada in 2004.

During 1999-2002, a lot of big oil companies merged each other and some of them were takenover by the bigger one. American embassy, Jakarta, 2003 at www.usembassyjakarta.org/petro2003/chapter2-2003.pdf reported that in Indonesia several oil companies were being mergers, acquisitions and takeover as seen in Table 1 below.

YEAR	MERGER	TAKEOVER
1999	BP and Amoco --- *BP Amoco Plc*	-
1999	Kerr McGee and Oryx -- *Kerr McGee Corp*	-
1999	Nisseki and Mitsubishi Oil Co *Nisseki Mitsubishi Abushild*	-
1999	Santa Fe and Snyder --- *Santa Fe Snyder Corp*	-
1999	Lasmo an Monument --- *Lasmo Plc*	-
1999	Total and Fina --- *TotalFina*	-
1999	ElPaso and Sonat --- *El Paso Energy Corp*	-
1999	Ekon and Auto --- *EkonAuto Corp.*	-
2000	TotalFina and Elf --- *TotalFinaElf Sam*	Maple/Matrix – GFB Resources (langsa)
2000	BP Amoco and Arco --- *BP*	Singapore Petroleum Company Ltd – LL&E Indonesia
2000	Santa Fe Snyder and Devon *Devon Energy Corp*	Agip – British Borneo
2000	-	Fortune (Indo Pacific) – GFB Resources (Jav
2000	-	Canadian Natural Resources – Ranger Oil
2000	-	Husky Oil Ltd – Renaissance Energy
2001	Chevron and Texaco --- *ChevronTexaco*	-
2002	-	PetroChina – Devon Energy
2002	-	CNOOC – YPF Maxus
2002	MultiKo and Piliko --- *Multikopil*	MultiKo – Gulagula Indonesia Resources

Table 1. Merger and Takeovers Oil and Gas Company During 1997 - 2002
(Source: Petroleum Report Indonesia, 2003, American Embassy, Jakarta)

1.1.1. Change Management in the Company

In US, after completed the acquisition of all the ordinary shares of Gulagula Canada Resources Limited (Gulagula Canada) on July 16, 2001 MultiKo Inc is then known as MultiKo Canada Resources Limited (MultiKo Canada). For ease of reference, it will be referred to MultiKo Canada as Gulagula Canada. On November 18, 2001, MultiKo and Piliko Petroleum Company (Piliko) announced that their boards of directors unanimously approved the merger of the two companies. The new company has been named Multikopil. Both companies held special meetings

of shareholders on Tuesday, March 12, 2002, and the shareholders of both companies approved the proposed merger. Completion of the transaction was signed in the second half of 2002. (www.usembassyjakarta.org).

Multikopil, a major, integrated, global energy company, has three operating segments: upstream, downstream and emerging businesses (www.scripophily.net).
Upstream is focused on maintaining consistent, profitable growth, and is aggressively pursuing high-potential opportunities worldwide. A top priority since 2002 are to maintain the focus on operational excellence during the integration process for the Multikopil merger.
Downstream is focused on maintaining a balanced suite of assets capable of generating strong returns even in cyclical markets. The company will continue to pursue innovative growth opportunities that require limited capital investment and continue to upgrade the business in sustainable ways.
The emerging business - carbon fibers, natural gas refining and international power businesses are focused on developing commercial capability and building our customer base. All three of these emerging businesses complement our core businesses and have the potential to contribute substantially to long-term growth.

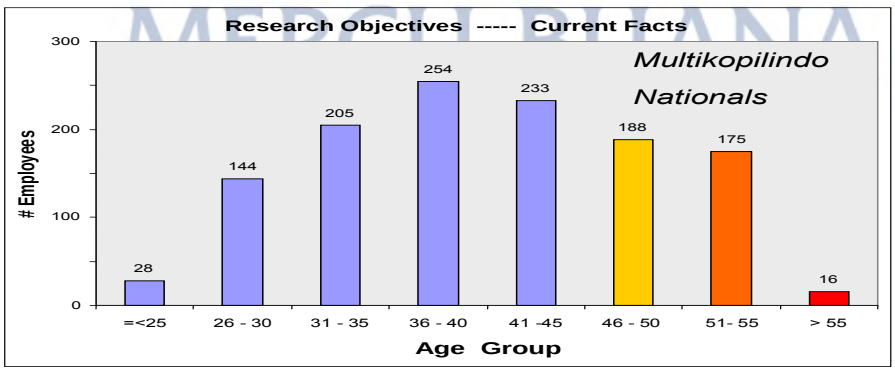
The combination of MultiKo Inc. and Piliko Petroleum Co, to be called Multikopil, becomes the third-largest integrated U.S. oil company and the largest U.S refiner. Worldwide, it becomes the sixth-largest energy company, based on hydrocarbon reserves, and the fifth-largest global refiner. By merging of these two companies in to new name Multikopil, there are management change happened in Multikopil. Multikopil is headquartered in Houston, MultiKo's current headquarters, with a "significant and continuing presence" in Bartlesville, Oklahoma. There are eight directors elected from each company. The deal was closed in the second half of 2002, (www.scripophily.net).

Multikopil operates in more than 40 countries. Multikopil will continue to pursue profitable production growth through successful exploration, a steady stream of high-value development projects, and securing new opportunities by providing innovative commercial solutions to host governments around the globe. As a results of this merger and management change, there are also some sifting

strategic planning in recruiting and developing of the employee from this company, particularly in continuing projecting to grow the company at least ten years ahead. The company has approximately 35,800 employees worldwide and assets of $93 billion (www.scripophily.net). Over the next 10 years, expected upstream staffing trends need the strategy to create the competing in the future for the human resources in this company. GRAD (Global Recruitment and Development) Strategy recommends a strategic shift in Multikopil's recruiting and development strategy to address business needs associated with projected staffing trends. This innovative strategy as a result of management changes aimed to create and develop the competency of human resources forward, especially Geoscientists and Petroleum Engineers.

1.1.2. Management Change In Multikopil

MultiKo's acquisition of Gulagula Canada in 2001 led to a change of Gulagula Indonesia Resources' president, but until September 2002 MultiKo Indonesia and Gulagula Indonesia Resources continued to exist as separate enterprises in Indonesia even as the MultiKo parent company assumed 72% ownership of Gulagula Indonesia Resources. MultiKo purchased the remaining shares of Gulagula Indonesia Resources in July 2002. The two units were merged in September 2002 to form Multikopilindo (www.scripophily.net) and at www.usembassyjakarta.org/petro2003/chapter2-2003.pdf).



Graph 1. Current Facts of Multikopil's Employees

Figure 1 above highlights the situation of the National human resources in the Multikopilindo. Clearly shown in this figure that the national staff employees with the average age of greater than 46 years old is about 31% from the total staff employees. These employees will be retired within ten more years ahead. To

educate the staff employees in order to become globally and fully experienced at least need 15 years. By this current facts as a business unit of Multikopil, Multikopilindo also follows the recommendation of a strategic shift in recruitment and development strategy to address business needs associated with this projected staffing trends by applying GRAD project strategy.

1.1.3. Geoscientists and Petroleum Engineers Employees

As Multikopilindo activity in Indonesia has been focusing mainly on the upstream business, The amount of Geoscientists and Petroleum Engineers employees (staff) are approximately 7% of the total national staff employees. The Geoscientists and Petroleum Engineers are vary in their professionalities and play the main role in exploration and production activities at Multikopilindo. This thesis, then, tries to examine the advantages and disadvantages of the Innovative Strategy (GRAD project) passthrough the research on the Geoscientists and Petroleum Engineers's staff. (www.scripophily.net).

The world is changing rapidly, technology is accelerating the use of new tools for acquiring, integrating, processing, analyzing and distributing geoscience data. Demands of users are increasing. Suppliers of geoscience and petroleum engineering knowledge have had to become lean and mean in response to economic pressures. Multikopil is proud of its international reputation for excellence in the field of geosciences and petroleum engineering. Active in the areas of petroleum exploration, development and production and with a strong heritage in Research and Development, Multikopil is committed to innovation and to pushing back technical boundaries. Through their geoscience and petroleum engineering research activities Multikopil aim to keep the company ahead of the competition in developing emerging technologies. Geosciences and Petroleum Engineering play a central role in delivering their ambitious business strategy and the resulting sustainable growth. Geosciences and Petroleum Engineersing add value in two key areas within the organization (www.scripophily.net)

- *Within the Operations group, geoscience and petroleum engineering activities form an integrated strategy designed to maximise value from exploration/development projects across an operated and non-operated asset portfolio.*
- *In addition, R&D activities are the focus of the Upstream Technology where*

professionals in Geology, Reservoir and Geophysics work hand in hand with other Multikopil Group research centres, academia, professional institutions and with their partners to develop and advance new technologies.

Both groups work together to ensure that Multikopil's business objectives are achieved and exceeded. Multikopil intention is to generate greater interaction with operational activities and Multikopil's business partners and to create opportunities for the sharing of knowledge and skills across the geosciences spectrum. A number of vacancies have been identified within the upstream technology and the operations geosciences group creating tremendous opportunities for geosciences professionals to join a progressive and innovative organisation at an exciting stage of its evolution. All posts demand highly talented professionals whose calibre can be demonstrated by academic excellence and professional success. Furthermore, because Multikopil is typically big companies with virtually complete administrative staff, the Geoscientists and Petroleum Engineers had more opportunity to develop standardized craft categories.

1.2. Research Objectives

Having defined the background of the research, a preliminary phase was conducted to help the researcher better understand the context of the research and to develop clear research objectives to focus the research. It is often traditional to develop the research objectives based on the gap within the literature. In this case it was difficult for the researcher to do this as there was very little previous research on the managing changes and innovative strategy methods under investigation. As an alternative, the researcher developed high level research questions to guide a preliminary study that used theory to help develop a conceptual model of the research area and focused the remainder of the research. The main research questions to guide the preliminary study are: "what organizational change actions are most likely to help companies make successful organizational change as they attempt to create a global project strategy to the human resources within the company?", and "how does it impact to the human resources?", which then creates subquestions as follows:

1.2.1. Management Change happened in Multikopil as the results of the integrated two Oil and Gas Companies, what organizational change actions are most likely gives the impact to the strategy of Recruitment and Development? Do

the whole managing change processes contribute direct impact to the strategy of Recruitment and Development of Geoscientists and Petroleum Engineers in Multikopilindo?

1.2.2. Does the innovative strategy (GRAD Project) applied after Management Change happened in Multikopil Corporate contribute impact to the Geoscientists and Petroleum Engineers workers in Multikopilindo?

1.2.3. Does the innovative strategy (GRAD Project) applied in Multikopilindo addressed to Geoscientists and Petroleum Engineers solve the problems of their competencies and development?

1.2.4. How is the best way in implementing the innovative strategy (GRAD Project) to the Geoscientists and Petroleum Engineers to address business needs in Multikopilindo?

These questions have been used as a basis for the preliminary study. From the data gathered and results generated in the preliminary study, a conceptual model was developed.

The topic of this thesis has been chosen because recently a lot of oil and gas companies were being merger, acquisitions and takeover. There are very interesting to know what are the oil and gas company's actions in their managing change processes in order to remain competitive and profitable in the era of globalization and highly competitive market. Multikopil company has been chosen as the research object because the process of change management in this company has passed through the complete processes of changes such as merger, acquisition and takeover from several big oil and gas companies. There are also interesting to know what key business processes that enable this company to compete effectively in the current global environment through the nature of their workforce.

1.3. Research Purposes

The aims of Research are to examine:

1.3.1. Impact of Management Change processes and the actions to the Recruitment & Development of Geoscientists and Petroleum Engineers in Multikopilindo

1.3.2. The shifting strategy of GRAD Project application and its impact to the

Recruitment & Development of Geoscientists and Petroleum Engineers

1.3.3. The implementing of the strategy to obtain the desired GRAD Outcome

Based on the above research questions and purposes, it is then, possible to develop more fixed research objectives to focus the literature review and the next stage of the research is the focused study. The research objectives are:

1. To critically review the impact of managing change processes in Multikopil as the whole and to identify what organizational change actions are most likely contribute impact to the strategy to the Recruitment and Development of Geoscientists and Petroleum Engineers in Multikopilindo.
2. To explore the impact of innovative strategy (GRAD Project) applied during managing change processes in Multikopil Corporate to the Geoscientists and Petroleum Engineers workers in Multikopilindo
3. To explore whether this innovative strategy (GRAD strategy Project) addressed to the Geoscientists and Petroleum Engineers can solve the problems of their competencies and development
4. To identify the best ways in implementing this innovative strategy (GRAD Project) to the Geoscientists and Petroleum Engineers to address business needs in Multikopilindo

1.4. Research Advantages

The advantages of this research are to see

1.4.1. Science Development Benefit

1.4.2. Company's Practical Benefit / The important of GRAD Project Research is to see the advantages of:

- Global Recruiting Strategy Changes (For the new Geoscientists and Petroleum Engineers Employee)
- Global Training & Development Strategy Changes (For the present Geoscientists and Petroleum Engineers Employee)

1.4.3. Company's Human Resources Benefit. The contents of Geoscientist and Petroleum Engineers in this thesis can make HRD awares of understanding their specific employees function and the way in how to trait them.

CHAPTER II. LIBRARY RESEARCH, RESEARCH FRAMEWORK AND HYPOTHESIS

The purpose of the library research is to describe the context of the research in relation to the relevant fields of literature and to identify the novelty of the work through its contribution to this existing body of knowledge. Section 2.1 of this chapter explains about the previous research on change management, innovation and strategy in the oil and gas company. From the preliminary study and initial literature review, a conceptual model was developed that illustrated the key themes to have emerged from the research as explain in section 2.2 of this chapter. It was identified through the preliminary study that the methods have been developed for use within an organisation's strategic change process (Chalik M, 2005). It was therefore necessary to gain an understanding of the theories relating to the business areas of strategy and change management. From the understanding of the theory it was then possible to identify where, in an organisation's strategic change process, the methods become relevant and how they might contribute to an improved process. Emerging from the preliminary study was also an understanding that the methods are predominantly used for communication purposes, for the organisation's strategy.

Section 2.3 of this chapter describes about the next stage in the research design is to select an appropriate research strategy as a framework to guide the researcher in carrying out the research and in its relation to the library research in section 2.2. Section 2.4 explains about the hypothesis of this thesis based on the explanations in section 2.2 and 2.3.

2.1. Previous Research On Change Management, Innovation and Strategy In the Oil and Gas Business

Typically, the concept of organizational change is in regard to organization-wide change, as opposed to smaller changes, such as adding a new person or modifying a program. (Bahe, 2004). Examples of organization-wide change might include a change in mission, restructuring operations, new technologies, mergers, major collaborations, "rightsizing", and new programs, such as Total Quality Management and re-engineering. There are forces, in the business world today, that require

organizations to make changes to their strategies and processes in order to remain competitive and profitable. Once an organization has identified the forces for change that will affect their business environment, they must determine how they will best manage any planned changes. There are four very important goals successful change management must meet :

- to minimize the impact on productivity;
- to avoid unnecessary turnover or loss of valued employees;
- to eliminate any adverse impact on your customers; and
- to achieve the desired business outcomes as soon as possible.

To begin managing a change process, managers need to understand that changes are viewed from two different perspectives, they are:

a. From management's standpoint, or organizational change management, which focuses on "broad change management practices and skills that will help the organization understand, accept and support the needed business change" (Prosci, 2004, n.p.).
b. From the employees' view and is called individual change management. Since the employees are typically tasked with implementing any organizational changes, the focus of individual change management is on the tools and techniques needed to help them with the change process.

The successful implementation of change requires:

a. A well-planned strategy that utilizes the company's key players and follows the organization's culture. What will contribute to a greater change success rate is "careful planning, detailed design, and thorough implementation" (DeWitt, 2004, n.p.).
b. Innovation is a very important part of the change process. One way to stimulate innovation is by empowering employees to develop ideas and new concepts that will help the organization transition through changes.
c. Managing data and knowledge. Oil and gas companies continue making strides in better managing both data and knowledge (Poruban and Clark, 2001). Gains in managing and retaining institutional knowledge are evident amid a backdrop of some formidable challenges. These include:

- A workforce fast approaching retirement age. With the loss of these workers over the next decade, many industry sources fear the loss of vital institutional knowledge.
- Competition for workers from outside industries.
  Oil and gas companies are finding themselves with a new challenge: to remain technologically competitive with other high-tech jobs.
- Dispersing knowledge.
  Companies are taking it upon themselves to train and develop employees.

As for the example and analog, below is the previous study of the management change in the oil and gas business through merger between Ekon and Auto, and their implementation of change in managing change process through strategy.

2.1.1. Merger as management Change in EkonAuto Corp.

In 1999, as stated in the American Embassy report, Ekon and Auto merged to become *EkonAuto Corp* (table 1). The top management hoped to combine their businesses into the largest U.S.-based company of any type and the largest non-government oil company in the world. The merged company expects that the scale of the worldwide near-term cost savings and the long-term strategic benefits will most probably exceed those announced in previous years. Also, the merger will allow EkonAuto to compete more effectively with the recently combined multinational oil companies and the large state-owned oil companies that are rapidly expanding outside their home areas (editor@leadingtoday.org).

Mergers often fail because (1) companies experience difficulties when trying to integrate divergent corporate cultures, (2) companies overestimate the potential economic benefits from an acquisition, (3) acquisitions tend to be very expensive and (4) companies often do not adequately screen their acquisition targets. In the case of EkonAuto, none of these factors proved to be a problem. These companies knew exactly how they would benefit from each other's technologies and resources and did not go into the merger with high expectations but little fact (editor@leadingtoday.org). The EkonAuto combination is an archetype of a successful merger. Fundamentally, the reasons, structures, and implementation of the transaction reflected the characteristics of the oil and gas industry. The industry

increasingly utilizes advanced technology in exploration, production, refining, and in the logistics of its operations. It is international in scope. World demand is sensitive to economic conditions. The merger was expensive and took a long time to gain approval from the authority due to its large size and cost but so far, the cost has been in large part justified. Divergent corporate cultures never seemed to be an issue and both companies spent a long time to size the environment, themselves and the other company before succumbing to the necessity of this merger (Andrade, Mitchell, and Stafford, 2001).

2.1.2. Managing Change Process in EkonAuto Corp through strategy

EkonAuto's merger of 1999 as a classic example of a strategic change. Strategic change is one of the types of organizational change and is different from others in its outlook, goals and method of initiation and implementation (editor@leadingtoday.org). This was a strategic change because the company had its business strategy at the root of the change – it wanted to enter new markets and expand the size of its operations. These are the very basic characteristics of a strategic change. The management had conducted a thorough analysis of the competitive forces in the industry. In fact, sources at Ekon and Auto said that changes in the oil industry and the need to reduce costs in the face of low prices were two important factors in the merger. In addition to the growth of state-owned oil companies, the changes include the emergence of low-cost independent refiners and marketers in U.S. markets *(Cibin & Grant, 1996; Davies, 2000).*

Another trademark of strategic change, EkonAuto has continued the expansion of business operations and theses acquired a broader portfolio of opportunities in the followings:

- In attractive upstream areas and high-growth markets and businesses worldwide. It became able to optimize its choices to further improve returns. Each of its businesses began executing their plans to capture these opportunities.
- Marked by exhaustive long-term projections. EkonAuto had a very extensive inventory of upstream development projects even before the merger but based on the development plans put forward with the merger, liquids and natural gas production was expected to grow by about three percent per year through 2005. new geographical markets were also expected to be covered and key growth

areas included the deepwater Gulf of Mexico, offshore eastern Canada, West Africa, the Caspian, South America and the Middle East. Beyond 2005, growth is expected to increase based on the numerous development projects currently in the design and planning stages (U.S. Energy Information Administration).

- As for the downstream, the strategy was to improve returns through self-help initiatives and profitable growth. Focused marketing programs and customer-focused strategies were to be implemented for EkonAuto Corporation to make it truly the leader in its industry.

- This company were distinguished in their own right and both joined hands to become a strong force in this highly competitive industry. Technology had always been a long-standing core strength of EkonAuto and differentiated them from competition. It was unanticipated but a much appreciated result of the merger when it was discovered that the technology programs of the two companies were far more complementary than had been assumed. Consequently, cross application benefits exceeding $1 billion were projected for the five years after 1999 (U.S. Energy Information Administration). The increased application of technological advances in exploration, production, refining methods, and transportation logistics created new competitive opportunities and threats.

2.1.3. The Goal of Strategy Implementation in EkonAuto Corp.

The goal of strategy implementation in EkonAuto Corp. is the execution of a strategic plan that produces a better fit between the firm, its internal processes, and its external environment. Strategy implementation is defined as those actions taken by a firm to put their strategic plans into place by either changing their mission, changing their environment, or changing their resources, capabilities and internal operations. For EkonAuto, the strategy implementation process which has perfect fit to the above strategic plan can be achieved by the firm's leadership are:

a. *learning* about the organization's situation
b. preparing the firm for *change* by sharing this information and *educating* employees and key stakeholders
c. *empowering* employees and key stakeholders thereby *overcoming resistance* by developing strategic plans with employee and key stakeholder input One way to

stimulate innovation is by empowering employees to develop ideas and new concepts that will help the organization transition through changes.

d. using the strategic plan to *intervene* in the firm's current operation and *change* its direction (if needed)
e. *educating* and *empowering* employees to *change* themselves, their groups, subsystems, the organization as a whole, and their relationships with key stakeholders. Trust is a key factor in the empowerment process. Not only does the supervisor have to trust that the employees will fulfill their responsibilities, but the employees must find the supervisor to be credible and trustworthy. According to Allen (2002), research has found that employees who believe that their supervisor is highly credible are more positive about their work and are more loyal to the company).
f. providing *feedback* to employees, groups, and stakeholders as to the progress being made in executing the plan.

The success of implementing a firm's strategy in EkonAuto is embedded in how well the firm first formulates the strategic plan as well as how the firm monitors and reacts to the plan. The strategic management process then, although depicted as a linear, rational, step-wise model, has many overlapping functions and activities.

From the example above, change and innovation are key business processes that enable organisations to compete effectively in the global environment. Irrespective of sector, innovative organisations recognise that to maintain their competitive advantage, they must continually seek to identify, develop and make the best use of all their available resources. leadership, an enabling organisational culture, and a structured process for managing innovation are some of the key success factors required to achieve that objective. At present, EkonAuto's upstream business spans nearly 40 countries and is the world's largest and most profitable nongovernmental producer of oil and gas. The upstream business is managed by five functionally organized global companies. These companies are responsible for the corporation's exploration, development, production, gas and power marketing, and upstream-research activities. This organization successfully leverages the worldwide experience of their people, industry-leading technology, exceptional financial resources and disciplined investment approach.(EkonAuto Homepage, 2006)

2.1.4. Impact To Recruitment and Development

EkonAuto has drawn on many strengths and assets to achieve these results. Among the most important are technology and the talent, creativity and determination demonstrated by the people of EkonAuto. Technological advances help EkonAuto do their job better, more safely and more profitably. For nearly 120 years, this company has held the unshakable conviction that business success is achieved by people of intelligence, drive and high personal standards.

2.1.4.1. EkonAuto Graduate Recruitment Programme

EkonAuto recruit graduates who show high management potential. Numerical and analytical skills are essential for all vacancies, as is the ability to display sound judgement. All graduates can expect the prospect of real responsibility and accountability from day one and should expect domestic or international relocation throughout their career. Graduates progress through specific operational roles, rather than joining a trainee scheme. The employees will receive technical and personal skills training via internal and external courses as well as on-the-job. Obtaining chartership status is encouraged, where appropriate to the job role.

2.1.4.2. EkonAuto Graduate Development Programme

EkonAuto's graduate development programme at the London Business School has a two-year, modular structure designed to cover business awareness, interpersonal skills and people management. Lecturers from the LBS deliver the course, aided by EkonAuto speakers. Graduates become equipped with a broad portfolio of skills to help them manage workplace issues, analyse problems and take appropriate action. Those who successfully complete the programme are awarded alumni status with the LBS (EkonAuto Homepage, 2005).

EkonAuto's on-the-job experience has given the employee some fantastic opportunities to learn about the industry and develop the skills who need to build a successful career. By providing business training courses in establishments that include London Business School and the Thunderbird campus in Phoenix, USA, they have invested a great deal in developing my core commercial skills.

These courses have complemented my day to day work, building on skills in areas such as negotiations and commercial analysis.

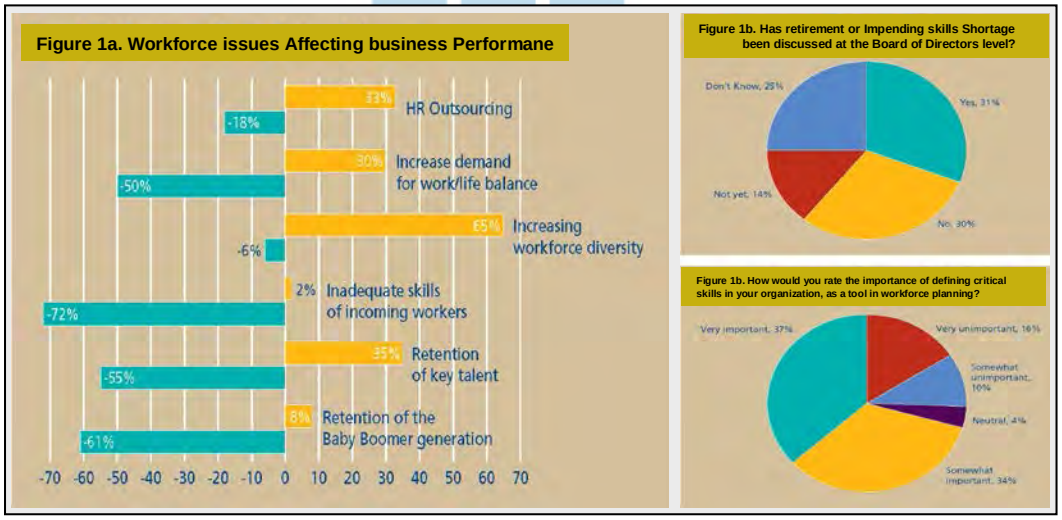
Being a global company, the employees of a diverse workforce and work alongside people with wide-ranging experiences from many different markets and commercial scenarios. The employees have learnt a great deal from their colleagues and in the process have made many great friends from all around the world. There are so many opportunities on offer at EkonAuto; From the optimisation of their European gas supply portfolio, to marketing new supplies in London to working as a business development analyst in their LNG group in Qatar, the opportunities seem almost boundless.

2.1.5. Previous Workforce's Survey in the Industry.

Deloitte, 2005, conducted a Talent Management Strategies Survey related to today's workforce issues which have the potential to impact business performance in the coming years. The electronic survey of 123 human resources executives in the United States was conducted between late December 2004 and early January 2005. The report examines two emerging trends that are rapidly changing the talent landscape: the retirement of Baby Boomers and a growing critical skills shortages. The report further challenges organizations to shift their mindset beyond traditional talent management approaches (acquisition and retention) and explains why companies must employ a "Develop-Deploy-Connect" model to generate superior performance. According to Deloitte Consulting LLP's recent survey on talent management strategies, almost three-quarters (72 percent) of companies surveyed said they are concerned that the inadequate skills of incoming workers will negatively affect their bottom line. As seen in graph 2a, among the issues likely to have a negative affect, the retirement of the baby boomers and the difficulty of retaining key talent were cited by more than half of the participants. Almost three-quarters were concerned about the skills of the future workforce. The impending talent crisis is a global, cross-industry threat that is about to become much worse as the first wave of Baby Boomers turn 62 in 2008 and skills gaps widen, Most companies do not have the necessary processes in place to know where in their organization the critical talent lies and how to manage, so the companies that respond quickly

and plan effectively will take the high ground and achieve a competitive advantage.

According to the survey, fully one-third (33 percent) of participating companies state that 11 percent or more of their workforce is scheduled to retire in the next two to three years. This presents a significant "changing of the guard" as companies bring new employees on board and attempt to give them the skills and organizational knowledge needed to perform their jobs as effectively as those who came before them. This issue is beginning to "trickle up." Nearly one-third of companies (31 percent) have discussed retirement or the impending skills shortage at the board of directors level. (See Graph 2b.) Yet only one-half of survey respondents have defined a list of critical skills needed for future growth. They find this surprising as over 70 percent of respondents indicate that defining critical skills is important. (See Graph 2c.)



Graph 2. Workforce issues on workforces and survey of Talent.
(Deloitte, 2005 Talent Management Strategies Survey)

According to the survey, organizations must employ a more comprehensive talent management solution that not only will secure critical talent, but also will use their critical workforce as a competitive advantage by focusing on what matters most to employees – their personal **development** or growth, their need to be **deployed** in engaging work, and their desire to be **connected** to others in the organization. Many of the companies surveyed also plan to increase their investment for formal training and development programs in 2005, such as

classroom training (49 percent), e-learning (64 percent), and mentoring and coaching (70 percent).

It is clearly important from the survey for the competitive advantages, the global and multinational companies need to find the new strategy in recruiting and developing their employees to meet their business needs and to make their business stay in sustainable development as well as identification of talent. In the natural resources sector industry, Geoscientists and Petroleum Engineers find and exploit the commercially viable oil and gas reserves by assessing the characteristics of the earth's subsurface. They are involved not only in the exploration and appraisal of new areas, feasibility studies and field development planning of the discovered fields, but also in optimising recovery of the producing field to make the sustainable development of the oil and gas industry. The competitiveness of entry into the oil and gas sector can vary according to the world oil market and the international situation, although this does not mean that entry standards are likely to be reduced. The pattern tends to be that jobs are either available through the graduate recruitment process or they are advertised as and when they arise. Advertised jobs are often for more senior positions and can require a minimum of ten years' experience. The major oil companies operate graduate training programmes, which generally deliver on-the-job training through a series of projects or assignments alongside structured modules aimed at giving an overview of the business and developing expertise in general and specialist areas. The projects may be based in different geoscience and petroleum engineering disciplines and some may be in the form of overseas placements.

2.2. Library Research On The Theory Relates To This Thesis

This research wiil be focusing on the previous research and the theory of Management Change, the strategy and strategic planning, the detailed definition of the terms related to the thesis's topic, such as innovation and the innovative strategy, the research framework as well as hypothesis.

The research was an exploratory study using a qualitative approach, which proved to be a highly effective strategy for guiding the research There are a growing

number of academics that are advocating the use of longitudinal qualitative research in developing a contextualist approach to change management. In general, qualitative studies can be defined as any kind of research that produces findings that has not been arrived at by statistical procedures or other means of quantification (Strauss and Corbin, 1998). The research often deals with human issues, and is conducted through contact with field or life situations. Strauss and Corbin (1990, p. 50 – 53) suggest that existing literature can be used for five purposes in qualitative research:

1. *To stimulate theoretical sensitivity – by providing concepts and relationships that can be compared to the actual data collected.*
2. *To provide secondary sources of data –- to be used perhaps as initial hypotheses testing of the researchers' concepts and ideas.*
3. *To stimulate questions during data gathering and data analysis.*
4. *To direct theoretical sampling – to guide the researcher as to where to go to uncover phenomena that are important for theory development.*
5. *To be used as supplementary validation – to explain why the findings support or differ from the existing literature*.

2.2.1. Definitions and Terms Used in this Thesis

Based on the title of this thesis : "Managing Change Processes and Their impact: The Innovative Strategy of a Major Oil and Gas Company to Recruit and Develop Geoscientists and Petroleum Engineers", the writer wish to define clearly first the terms that have been used in this thesis to understand better in complete meaning of the terms below:

1. **Management Change and Change Management Process**
2. **Strategy, Planning Strategy and Innovative Strategy**
3. **Recruitment and Recruitment Strategy**
4. **Development and Professional Development**
5. **Geoscientists & Petroleum Engineers and their Works**
6. **Major Oil and Gas Company**

2.2.1.1. Management Change and Change Manajement Process

A lot of published papers gave several understanding in the complete definitions of the terms of Change and Management Change. As written below they gave several different definition applied to the definition of this terms. Georgetown University has given the definition of management change by defining first the

definition of Change and two steps of change management's definitions as shown below:

1). Change
Change is a deviation from a currently established baseline. (Georgetown University)

2). Change Management - (Georgetown University)
a. *The complete set of processes employed on a project to ensure that changes are implemented in a visible, controlled and orderly fashion.*
b. *The activity, or set of activities, undertaken to govern systematically the effects of organizational change.*

Lamarsh and Associate, Inc, gave a slight different meaning for the definition of change management in its application to the knowledge, tools and resources.

Change Management - (Lamarsh and Associate, Inc)

Change Management is an organized, systematic application of the knowledge, tools, and resources of change that provides organizations with a key process to achieve their business strategy

Change Management Process.

A Change Management Process is a method by which changes to the project (e.g. to the scope, deliverables, timescales or resources) are formally defined, evaluated and approved prior to implementation. The process entails completing a variety of control procedures to ensure that, if implemented, the change will cause minimal impact to the objectives of the project.

In this thesis, the definition proposed by Lamarsh above has been used to understand the relationship of change management and change management process.

2.2.1.2. Strategy, Strategic Planning and Innovative Strategy.

There are many types of definition applied on the term of strategy and Planning Strategy from the expert in accordance with the company needs.

1). Strategy (EASTERN LEADERSHIP CENTRE)

Strategy is defined as the way an organization meets the challenges and opportunities presented by its environment. It consists of a set of conscious choices about how it will deliver value to its customers and distinguish itself from its competitors.

2). Strategy (NEIL DOWN ASSOCIATES)

Strategy is a word that has become overused and is relatively little understood within the management context. It is often overused by managers trying to make something sound grand or important (Peter Franklin 1997, page1).

3). Strategy (M. Porter 1996. P 68)

Strategy is the creation of a unique and valuable position, involving a different set of activities.

4). Strategy (H Mintzberg 1994, p25)

Strategy is a plan or guide, a direction or course of action in the future. It is also a pattern that is consistent over time i.e. High-Risk strategy. Strategy is a position in particular markets or products and strategy is perspective, it is our way of doing things.

5). Strategy (Eccles & Nohria 1992, p 87)

Strategy is the extent to which the organisation creates competitive advantage over its competition.

6). Strategy (Business Process Trends, 2003)

Business Process Trends, 2003 give another definition for the strategy. A good strategy defines how a company can position itself to maintain a long term competitive advantage. They defined strategy as:

"A general statement of the goals and policies of an organization developed by the executives of an organization to guide everyone in the organization".

7). Strategy Planning (From Wikipedia, the free encyclopedia)

Strategic planning is a way to identify and move toward desired future states. It is the process of developing and implementing plans to reach goals and objectives.

8). Innovative Strategy (Mazengwa, 2004, apply to HR).

Innovative (HR) strategy is a critical aspect of success in the competitive globalised economy, where service, productivity, efficiency, commitment and stability of workers have to be maximized. (Mazengwa, 2004).

The definitions of strategy proposed by Mintzberg 1994 and innovative strategy from Mazengwa, 2004 have been applied in this thesis as they relate to human resources.

9). System (Business Process Trends, 2003).

Business Process Trends, 2003 give a simple definition on the meaning of system. They defined system as:

"A group of elements, parts, people or organizations that operate together for a common purpose".

2.2.1.3. Recruitment and Recruitment Strategy

Anthony Robbins,2005, in "Developing a Recruitment Plan" gave a preferred and simple definition for Recruitment and defined as:

"a set of planned activities designed to positively influence the perceptions and choices of individuals and organizations".

2.2.1.4. Development and Professional Development

There are a lot of definition about the development and professional development defined by several authors. Geoscientists and Petroleum Engineers are professional human who need to develop in order to expand their careers working in the oil and gas industry. Continuing Professional Development in www.pd-how2.org/6_5.htm gave the definition of Professional development is ***:***

"the systematic maintenance, improvement and broadening of knowledge and skills, and the development of personal qualities necessary for the execution of professional duties throughout working life".

The Michigan State Board of Education special in Professional Development Definition and Standards mention that Professional development is defined by the State Board in www.remc11.k12.mi.us/bcisd/pdcatalog/standards.html as :

"a continuous process of improvement to promote high standards of academic achievement and responsible citizenship for all employee. Professional development increases the capacity of all members of the learning community to pursue life-long learning."

In Oil and Gas Industry all Geoscientists and Petroleum Engineers are staff employees and they need to be develop to enhance their careers, the knowledge, skill and attitude to perform a certain task at a given level. Omaha Public Schools, Staff Development Services in www.ops.org/staff-dev/defined.dhtml gave a definition that:

"*Staff development is the provision of activities designed to advance participants thinking in knowledge, understanding and skills. Staff development is a comprehensive and continuous process of professional growth and self-actualization that benefits staff, the organization, students, and ultimately the community".*

2.2.1.5. Geoscientists and Petroleum Engineers

2.2.1.5.1. Geoscientists

The definition of Geoscientists according to Australian Institute of Geoscientists, 2004, has been used in this thesis, *A Geoscientists is defined as:*

"a person who has acceptable tertiary qualifications in geological science from a university or tertiary institution recognised by the Council of the Institute for the time being or who has received adequate industrial training equivalent, in the Council's opinion, to such tertiary qualifications" and may be taken to mean "one who practises one or more of the geological sciences".

Another definition for the works of professional Geoscience can be found in the web site of www.qp.gov.bc.ca/statreg/stat/E/96116_01.htm from the artikel of Queen's Printer, Canada, 2004 as follows:

Practice of professional geoscience *means reporting, advising, acquiring, processing, evaluating, interpreting, surveying, sampling or examining related to any activity that*

(a) is directed towards the discovery or development of oil, natural gas, coal, metallic or non-metallic minerals, precious stones, other natural resources or water, or the investigation of surface or sub-surface geological conditions, and

(b) requires the professional application of the principles of geology, geophysics or geochemistry;

Minnesota Statuetes, 2004 gives a definition of this in their articles at : www.revisor.leg.state.mn.us/stix/G/GE/Geoscientists andPetroleum Engineers.html as follows :

"Practice of professional geoscience. *A person is considered to be practicing professional geoscience who holds out as being able to perform or who does perform any technical professional services, the adequate performance of which requires professional geoscience education, training, and experience in the application of special knowledge of the mathematical, physical, chemical, biological, and earth sciences to such services or creative work as consultation, investigation, evaluation, planning, mapping, and inspection of geoscientific work and its responsible supervision".*

2.2.1.5.2. Petroleum Engineers

Petroleum Engineer is the person who works in the Oil and Gas Industry based on their petroleum engineering discipline and defined their field works for oil and gas and has been used in this thesis and defined as follows: (National occupational Classification, 2001, www.23.hrdc drhc.gc.ca/2001/e/groups/ 2145.shtml)

"Petroleum engineer is a person who conduct studies for the exploration, development and extraction of oil and gas deposits; and plan, design, develop and supervise projects for the drilling, completion, testing and reworking of oil and gas wells. Petroleum engineers are employed by petroleum producing companies, consulting companies, well logging or testing companies and in government and research and educational institutions".

In relation to their work. according to Encyclopædia Britannica. 2006 in Encyclopædia Britannica Premium Service. 15 Jan. 2006, (www.britannica.com/eb/article-9059508) petroleum engineering is defined as:

"the branch of engineering that involves the development and exploitation of crude oil and natural gas fields as well as the technical analysis and forecasting of their future performance. Its origins lie in both mining engineering and geology. The petroleum engineer, whose aim is to extract gaseous and liquid hydrocarbon products from the earth, is concerned".

Wikipedia give more complete information about petroleum engineering in www.answer.com, 2006, as follows:

"Petroleum Engineering is involved in the exploration and production activities of petroleum at the upstream end of the energy sector. Upstream, refers to the source of the petroleum, the petroleum deposit, usually buried deep beneath the earth's surface supplying flow to consumers as a river supplies the ocean. The diverse topics covered by petroleum engineering are closely related to the earth sciences. Petroleum engineering topics include geology, geochemistry, geomechanics,geophysics, oil drilling, geopolitics, knowledge management, seismology, team building, team work, tectonics, thermodynamics, well logging, well completion, oil and gas production, reservoir development, and pipelining".

All of the above definition concerning geoscientist and Petroleum Engineers are applied in this thesis.

2.2.1.6. Major Oil and Gas Company

As mentioned in Chapter 1 the research for this thesis has been conducted in Multikopilindo as part of Multikopil business unit in the world. At present Multikopil is the third largest Oil and Gas Company in the world as a major, integrated, global energy company, has three operating segments: upstream, downstream and emerging businesses (Multikopil homepage, 2005)

2.2.1.6.1. Multikopil Company.

Information for Multikopil company can be found in their website homepage at: Multikopil homepage, 2005 , as follows:

- *is an international, integrated energy company. It is the third largest integrated energy company in the United States, based on market capitalization, oil and gas proved reserves and production; and the largest refiner in the United States. Worldwide, of non-government controlled companies,*
- *has the eighth largest total of proved reserves and is the fifth largest refiner in the world.*

* *Is the new name of integrated two oil industry, MultiKo Inc. and Piliko Petroleum Company leaders in the global energy industry and combined their complementary strengths and shared values to create Multikopil*

2.2.1.6.2. Multikopilindo. Ltd.

Multikopilindo is one of the branch of Multikopil which has operated their business in petroleum industry in Indonesia both in offshore and onshore area. This company was originally known as MultiKo Inc. The company has then tookover Gulagula Resources Indonesia Ltd. and then announced a new name as Multikopilindo (www.usembassyjakarta.org/petro2003/chapter2-2003.pdf).

2.2.2. Change Management and Strategic Theory

2.2.2.1. Change Management

Change Management examines human behavior in organizational settings, the structures and actions of organizations, and relationships between organizations and their environments. Key topics in change management include: (a) approaches to motivating, directing, and coordinating people's efforts; (b) political processes in both public and private-sector organizations, including analyses of power, decision making, and managing conflict; (c) processes facilitating organizational change and adaptation such as planning, innovation and strategy formulation; (d) designing organizational structures and processes; (e) designing and implementing strategies; (f) analyzing how environments affect organizations and how organizations shape their environments. Human resource management has an important role in any change process. Change always needs people: for developing objectives, for identifying the need for change, for developing solutions and for implementing these solutions. Technology can support and influence change, but it can never replace people.

2.2.2.1.1. Reality Of Change

There is no progress without change. The nature of the change itself keeps on changing. Linear change no longer serves the objectives of a progressive organization (Maquis, 1992). The notion of slow incremental change is typically in conflict with the overriding challenges. Today, the change is fierce and ferocious. The impact of change these days is much broader and deeper than ever before in history.

"There is nothing more difficult to carry out, nor more doubtful of success, nor more dangerous to handle, than to initiate a new order of things."
Nicolo Machiavelli

Mergers and acquisitions, growth, competition, deregulation, globalization, changing market conditions, new technologies-whatever the drivers of change in a particular situation may be, the leaders are constantly faced with managing change successfully. Prosperity and sometimes even survival of their organizations depends on their success at change management.

Winardi, 2005, stated that there is a planning force to create the change's condition and the internal and external dynamic strengths in organization cause the must-do to create the change. Organization has an open system, therefore it will face the pressures or prosecutions from its environment to create the change. Kasali, 2005, describes that there are some characteristic of changes, ie: (1) change is a mysterious; (2) change need change makers; (3) not all people can be asked to change; (4) change can happen any time; (5) there are hard and soft model of the change; (6) change needs long time, cost and strength; (7) needs specific efforts to touch the organization's values (corporate culture); (8) changes affected by mythos; (9) changes create expectations; (10) changes always scary and create panics.

2.2.2.1.2. Change Theory From Literatures

Change Theory was developed in the mid 1900s by Kurt Lewin (Maquis, 1992). Lewin (1958), identified 3 phases through which the change agent must proceed before the planned change becomes a part of the system. These stages include: Unfreezing, Movement, and Refreezing.

Unfreezing: The change agent unfreezes forces that maintain the status quo. People often become discontented and aware of a need to change. Before change can occur, they must believe change is needed.

Movement: The change agent identifies, plans, and implements appropriate strategies. One must be sure that driving forces for change exceed restraining forces.

Refreezing: The change agent assists in stabilizing the change in the system so that it becomes integrated into the status quo.

Beckhard and Harris, 1977, referred to them as the current state, the transition state, and the future state. Generically, these phases might be termed before-during-after. The comparison terms of these is shown in table 2.

Stage	1	2	3
Lewis, 1958	Unfreezing	Movement	Re-Freezing
Beckhard & Harris, 1977	Current State	Transition State	Future State
Generic phases	Before	During	After

Table 2. Three phases of Change (Matthew W. Ford, 2000)

The phase applied in this thesis is currently in the transition state or movement stage during the managing change process. Detailed processes of this stage is explained below.

2.2.2.1.3. Types of changes and Managing Change

Change management comprises both, revolutionary one-off projects and evolutionary transformations (Recklies, 2003).

a. Organizational Development.

This is the more gradual and evolutionary approach to change. It bases on the assumption that it is possible to align corporate objectives with the individual employees objectives. In practice, however, this will rarely be possible.

b. Reengineering.

This is known as corporate transformation or business transformation. It is the more radical form of change management, since it challenges all elements of processes or structures that have evolved over time. In order to successfully manage change processes, it is necessary to analyze the phases of this process.

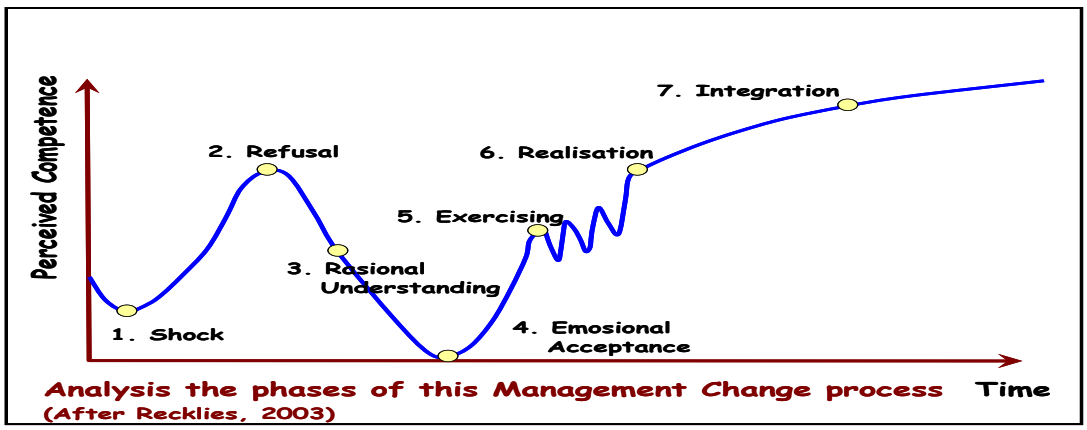


Figure 1. Analysis the phases of Management Change process (Oliver Recklies, 2003)

Most successful organizations are those that are able to adjust themselves to new conditions quickly. This requires planned learning processes that lead to improved organizational effectiveness. Ideally, employees are able to reflect their own behavior in relation to the organizational context (e.g. processes, products, resources, customers). Normally, people perceive change processes in seven typical stages as shown in the figure 1 above : In detail, the above seven phases of change can be described as follows:

Phase	Description
Shock and Surprise	Confrontation with unexpected situations. This can happen 'by accident' (e.g. losses in particu business units) or planned events (e.g. workshops for personal development and team perfor mance improvement). These situations make people realize that their own patterns of doing things are not suitable for new conditions any more. Thus, their perceived own competence decreases.
Denial and Refusal	People activate values as support for their conviction that change is not necessary. Hence, th believe there is no need for change; their perceived competency increases again.
Rational Understanding	People realize the need for change. According to this insight, their perceived competence decreases again. People focus on finding short term solutions, thus they only cure symptoms. There is no willingness to change own patterns of behavior.
Emotional Acce	This phase, which is also called 'crisis' is the most important one. Only if management succee to create a willingness for changing values, beliefs, and behaviors, the organization will be ab to exploit their real potentials. In the worst case, however, change processes will be stopped slowed down here.
Exercising and Learning	The new acceptance of change creates a new willingness for learning. People start to try new behaviors and processes. They will experience success and failure during this phase. It is the change managers task to create some early wins (e.g. by starting with easier projects). This w lead to an increase in peoples perceived own competence.
Realization.	People gather more information by learning and exercising. This knowledge has a feedback- effect. People understand which behavior is effective in which situation. This, in turn, opens u their minds for new experiences. These extended patterns of behavior increase organizationa flexibility. Perceived competency has reached a higher level than prior to change.
Integration	People totally integrate their newly acquired patterns of thinking and acting. The new behavio become routine.

Table 3. Detailed Information on the phases of Management Change process (Reclies, 2002)

The above description of the seven phases of change is adapted from: Colin Carnall: Managing Change in Organizations **(Recklies, 2002).**

2.2.2.1.4. Managing Change Processes

A Change Management Process is a method by which changes to the project (e.g. to the scope, deliverables, timescales or resources) are formally defined, evaluated and approved prior to implementation. The process entails completing a variety of control procedures to ensure that, if implemented, the change will cause minimal impact to the objectives of the project. Strategis Help Desk, 2004, Ottawa, Ontario, Canada at their website : www.Strategis.ic.gc.ca/epic/internet/inee-

ef.nsf/en/h_ee00317e.html defined that the change management process comprises four major steps or phases:

1. Preparation: The preparation phase helps you develop a foundation upon which to build employee commitment to the change effort.
2. Acceptance: The acceptance phase guides you in gaining support for a specific course of action.
3. Implementation: The implementation phase deals with the actual changes to business processes and technology.
4. Commitment: The commitment phase helps you understand how to sustain support for the changes in which you've invested.

A Change Management Process is used to ensure that every change identified is formally: a). Communicated; b).Documented; c). Reviewed; d). Approved; and e). Implemented. The Change Management Process is undertaken during the 'Execution' phase of the project (i.e. the phase within which the deliverables are produced), once the project has been formally defined and planned. In theory, any change to the project during the Execution phase will need to be formally managed as part of the Change Management Process. Without a formal Change Management Process in place, the objective of delivering a solution within 'time, cost and quality' may be compromised. The Change Management Process is terminated only when the Execution phase of the project is completed (i.e. just prior to Project Closure).

There are many types of managing change process propose by some authors. According to RCG University, 1999, Managing change means co-ordinating a number of activities and inter-relationships so that the organization can survive, and benefit from, the process of change. A major challenge is to achieve the right balance between the short-term pressure for change and longer-term corporate goals. Knowledge of the change process is determined by a person's understanding of three key processes: planning change, managing change (both the "people" side and the "organization" side) and evaluating change. It should be noted that each dimension builds on those below it; in other words, knowledge of the fundamental aspects of change is critical to the process of planning, managing and evaluating change (RCG University, 1999)

The change management process is the sequence of steps or activities that a change management team or project leader would follow to apply change management to a project or change. Based on Prosci's research of the most effective and commonly applied change, most change management processes contain the following three phases (Prosci, 2006)

Phase 1 - Preparation, assessment and strategy development
Phase 2 - Detailed planning and change management implementation
Phase 3 - Data gathering, corrective action and recognition

Team working and inter-personal relationship are fundamental if the change management process is to be successful. For unity to be maintained throughout the change management process people need a clearly defined role and a shared vision of the change aim. Managing change is more effective when people are empowered and given the time needed to implement quality into the change process. Managing change needs individual behaviour and attitude change. To achieve individual behaviour and attitude change first the managing change of culture and systems. The change management process must inspire and motivate people if it does then managing change will enhance productivity how to manage organisational change, generic managing change processes or packaged systems

In the implementation of changes as proposed by Strategis Help Desk, 2004, the detailed types of action needed during managing change process proposed by Ruth Tearle, 2002, has been used in this thesis and is shown in the table below:

Step	Action Needs in Change Process	Reasons For the action	Appropriate intervention include
1	**Team bonding**.	**You need to bond people into a team due to one of the following** • a merger. • a change in structure. • new members coming into the team. • a new leader joining an existing team. • a change of ownership. • a desire to resolve interpersonal conflict. • a need to get people working across functional boundaries or with people from other organizations in the network. • low morale as a result of retrenchments.	• basic team building • building common values for the team building a vision for the team. (strategic planning).
2	**Creating new paradigms**	**In the change process the managers needs to inject strategic thinking into the organization. In this situation the company want people to:** • understand new strategic trends. • generate opportunities from these trends.	• providing research about changing trends. (see Our Changing World, and SA Strategic Trends.) • providing a form of brainstorming session to apply these trends to

		• develop new ways of delighting their customers. • develop new distribution channels, markets, products and value added services. • imagine the future. • get creative. • produce paradigm busting ideas.	your organisation.
3	**Strategic planning**	*In strategic planning, the managers need to develop a new strategic plan or vision for the following reasons:* • a merger/takeover. • a change in ownership. • new stakeholders with new expectations of the organization. • a need for transformation. • a loss of profitability or market share. • new competitors entering your industry. • you're concerned about the impact of e-commerce on your business. • there is a need for a change in your company culture.	• team based strategic planning. • innovative strategy. • brainstorming sessions based on solid macro environmental research.
4	**Communicating your vision. Getting buy in and action.**	**After managers have already developed a strategic plan. Further action need to do is to:** • communicate it to all employees • get them motivated and excited about contributing to the vision. • get them committed to taking action to making the vision a reality.	• non participative communication (presentations, briefings, newsletters, emails, websites...) • participative communications (workshops and competitions). • using your performance management system to link individual/divisional goals to your new vision.
5	**Planning the changes**	**In the process of change, the managers difficult to manage because of some factors:** • your organization is involved in too many changes at once. • you feel your organization has lost its focus. • you are facing resistance to change. • you don't know how to plan a change process. • there are lots of political agendas to deal with. • previous change processes haven't worked. • you find it difficult to sustain the excitement and energy needed to implement your changes.	**Training leaders and change agents at all levels to** • use systems thinking to identify the few core changes that your organization needs to focus on. i.e. the 20% of changes that will yield 80% benefit to your organization. • Selecting the tools you need to achieve your change. • Develop an integrated change process for your organization. • Understand the roles that need to be played to ensure the changes are sustained.
6	**Energy**	**Managers and manager team lack the energy needed for change. You:** • feel bogged down at the thought of having to implement your company's vision. • are often tired, depressed and worn out. • seem to complain a lot • find that the fun and excitement has gone out of work • are continually having to deal with negativity at work. • Seem to have lost control over your lives • want to leave the company, but are concerned whether this is the right thing to do.	• a vacation! • stress reduction workshops/techniques • identifying your own personal values • creating your own personal vision/mission. experimenting with different belief systems.

Table 4. Type of change process and action need (Ruth Tearle, 2002)

As for comparison, Heller, 1988, proposed five actions and detailed implementation in managing change processes in an organization. The five actions covering: (1) to introduce the change; (2) to distribute responsibility; (3) to grow the commitments; (4) to change the culture; and (5) to restrict the resistance. Detailed implementation of each action is seen in table 5 below:

No	Action	Implementation
1	**To introduce the change**	a. To inform soon. b. To give the whole picture. c. To obtain participation. d. To choose the method. e. To avoid the problem. f. To inform the bad news.
2	**to distribute responsibility**	a. To define the change agent. b. To hire the change agent. c. To delegate the change. d. To keep the information safely.
3	**to grow the commitments**	a. To lead the process of commitment. b. To accept the recommendation. c. To build the dialog.
4	**to change the culture;**	a. To change the environment. b. To accept the success. c. To link the wage and age.
5	**to restrict the resistance**	a. To detect the resistance. b. Avtive refusal. c. Passive refusal d. To perceive arguments. e. To push the openness. f. To use the meeting. g. To eliminate the anxiety.

Table 5. Implementation of managing change process in Organizations (Heller, 1998)

DiGeorgio, 1998, employs a variety of models to help clients understand and address change. It describes a way to analyze a company or organization and it encourages systems thinking. Their model in managing change process can be seen in the figure 2 below.

Widjaya, 2005 proposed that there are four stages in managing change. The four stages are: (1) identifying what is needed to change; (2) to consider the contexts of organization/corporate (3) to plan and apply the change and (4) to evaluate the results. In this thesis, however, the managing change process applied looks better to use the model from Strategis Help Desk, 2004 and comined with the model from Tearle, 2002, as can be seen in table 4. Clearly shown that according to Tearle, 2002, that the strategic planning as the action needs in managing change process includes the innovative strategy as the appropriate intervention.

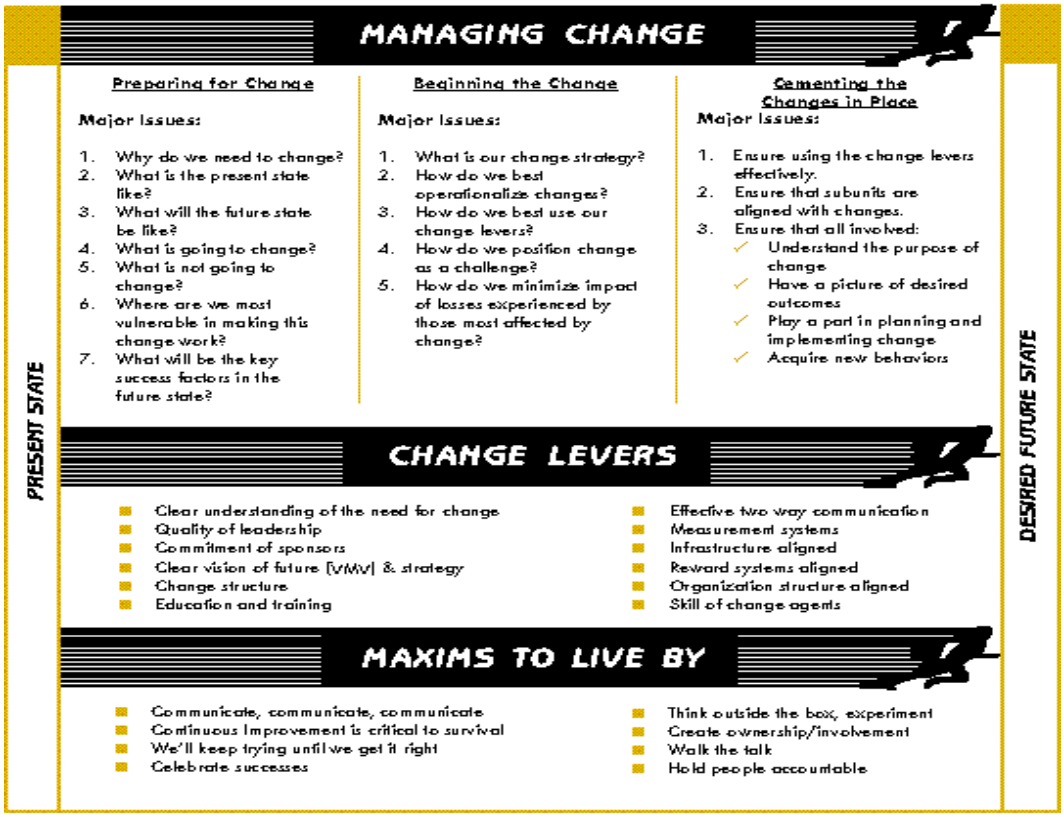


Figure 2. Overview of the Change Process (Richard M. DiGeorgio & Associates,1998)

2.2.2.2. Strategy, Innovation and Innovative Strategy Theory

2.2.2.2.1. Strategy Theory

According to Hamel & Prahalad 1994, p 24-25, to think of strategy in a different way requires four things:

- *An understanding of how competition for the future is different.*
- *A process for finding and gaining insight into tomorrow's opportunities.*
- *An ability to energise the organisation from top to bottom for what may be a long and arduous journey toward the future.*
- *The capacity and stamina to outrun competitors and get to the future first.*

1). A good strategy will be:

- Capable of obtaining the desired objective
- A good fit between the external environment and an organizations resources and core competency - It must be feasible and appropriate
- Capable of providing the organization with a sustainable competitive advantage – It should be unique and sustainable

- Dynamic, flexible, and able to adapt to changing situations
- Sufficient on its own - ie.: valuable without cross-subsidization

2). Factors in Selecting A Change Strategy

Which of the preceding strategies to use in your mix of strategies is a decision affected by a number of factors (Fred Nickols 2004). Some of the more important ones follow.

- ***Degree of Resistance***. *Strong resistance argues for a coupling of power-coercive and environmental-adaptive strategies. Weak resistance or concurrence argues for a combination of Empircal-Rational and normative-reeducative strategies.*
- ***Target Population***. *Large populations argue for a mix of all four strategies, something for everyone so to speak.*
- ***The Stakes***. *High stakes argue for a mix of all four strategies. When the stakes are high, nothing can be left to chance.*
- ***The Time Frame***. *Short time frames argue for a power-coercive strategy. Longer time frames argue for a mix of empirical-rational, normative-reeducative, and environmental- adaptive strategies.*
- ***Expertise***. *Having available adequate expertise at making change argues for some mix of the strategies outlined above. Not having it available argues for reliance on the power-coercive strategy.*
- ***Dependency***. *This is a classic double-edged sword. If the organization is dependent on its people, management's ability to command or demand is limited. Conversely, if people are dependent upon the organization, their ability to oppose or resist is limited. (Mutual dependency almost always signals a requirement for some level of negotiation.)*

Strategic planning for managing change ensures that an organisation is doing the right things. In the context of a change management programme, a strategic plan explains what managing change is needed. Once it has determined what are the right things to do, managing change devolves accountability to change management for doing them right. Corporate managing change planning is the highest form of strategic planning.

2.2.2.2.2. Innovation and Innovative Strategy Theory

Global competition, heightened customer expectations and the pursuit of best practice mean that the need for organisations to be innovative is no longer a wish list but a **must do** to ensure the continued growth and long term survival.

Innovation and creativity are much sought after skills and in particular it is assumed that such skills are often natural and cannot be learned or taught.

Innovative organisations embrace innovation by constantly introducing change. Not change for the sake of change, and not change simply to follow the pack, but reinventing the way work gets done (Terziovski, 2001). Such innovations include new work structures – teams, networks, outsourcing and creating value webs; new work procedures – advanced technology, new manufacturing methods, information technology, quality management and process cycle time; human resource management strategies to ensure strategic fit with the business goals and inject flexibility – constant training, recruiting the best talent and rewarding employees; and creating a work environment to spur innovation – encourage risk-taking behaviours and valuing experimentation.

Hampton, 2002, describes that innovation is about people and ideas. It is a concept, a perception, a skill, a way of operating together with new products or services. It includes the generation of new concepts or ideas or the development of old ideas to fit new customers, settings or opportunities. Most innovation builds on repurposing, improving or renewing existing ideas or practices.

> *Innovation is the key to the creation of new wealth in our economy. Innovation drives employment growth, technological development, business rejuvenation and our global competitiveness. (Douglas 2001).*

The underlying principle of innovation is improved outcomes and added value for the customer; all innovation therefore must add value and target a particular audience. The capacity to be innovative takes time and experimentation and can be learned. There are many tools that can support people and ideas to generate innovation just as there are organisational structures and cultures that can inhibit it.

To be innovative an organisation requires flexibility and nimbleness, fast decision making, excellent communication and requires an *egological* environment that promotes enthusiasm, motivation and passion within staff (Lin 2001). These qualities are frequently associated with small companies while large and public sector organisations frequently have difficulty creating the right environment and

culture to optimise on these qualities and act on initiatives from staff (Glor 2001, MacKenzie 2001).

To be innovative all those within an organisation must think innovatively, whether this is at the strategic, tactical or operational level. Innovative thinking comes more easily to some than others but is a skill that can be learned, practiced and refined (Wheeler, 1995 in Hampton, 2002). An intentional approach to innovation will also ensure that the resources required to underpin these competencies will be made available and they include money, time, people, equipment and skills (Wheeler 1995 in Hampton, 2002).

The application of these resources to enhance the vision to be innovative is critical and must be built on the innovation building blocks of the new global economy, namely new information, new knowledge networks, new mental perspectives and new futures mindset (Lin 2001). It requires an investment in the building of the competencies across a workplace.

The *Innovation Study Commission of the Business Council of Australia* concluded that:
… innovation in Australia in the 1990s is about people and enterprises, not about science and technology. For the vast majority of enterprises, science and technology are vital tools that need to be applied effectively and developed selectively. But for these enterprises, innovation is more a matter of flexible, productive and focused employee relations in the workplace than it is a result of technological resources or the impact of science and science policies (Carnegie, 1993).

The report defines innovation as
… something that is new or improved done by an enterprise to create significantly added value either directly for the enterprise or indirectly for its customers. …The Study Commission saw examples of innovation that covered the two dimensions of bringing value to enterprises and of newness (Carnegie, 1993).

Innovation needs to be part of the culture of any viable business, not just an add-on; *innovation is corporate reproduction, and in today's competitive environment innovation is no longer optional* (MacKenzie, 2001). Innovation is therefore seen as an investment for the future, a vital element in organisational development and a competency to be developed in all staff. The risks associated with innovation are high in many cases, the cost of no innovation is considerable in business terms, and increasingly fatal. Australian innovation, 2006 at www.innovation.gov.au gives

another definition of innovation. According to their definition Innovation is ***the process that transfers ideas through business activity into saleable goods, processes and services.***

Innovation is the key to future business prosperity and can take place in all areas of the business process. Innovation has been linked to increased market shares, higher growth rates and greater profitability for businesses. According to Australian innovation, 2006 There are a number of different types of innovation (table 6). These include:

Product Innovation	The development of new products, technologies and services. This may be a high risk undertaking which requires substantial investment in people, time and funds.
Product improvement	Refers to improvements made to existing products or services, such as new packaging methods for food. Improving current systems may need minimal investment but may result in substantial profit increases.
Process improvements	This includes improvements in business processes such as internet banking, manufacturing processes such as changes to production facilities, or organisational processes such as more efficient ways of undertaking work or advanced management techniques.

Table 6, Different types of innovation (Australian innovation, 2006)

In the context of strategic management, Industry Canada, 2002 have recognized the strategy programming and strategy innovation. The difference of these two model strategic management in terms of their conditions such as environment, organization, change and innovation can be seen in figure 3 below.

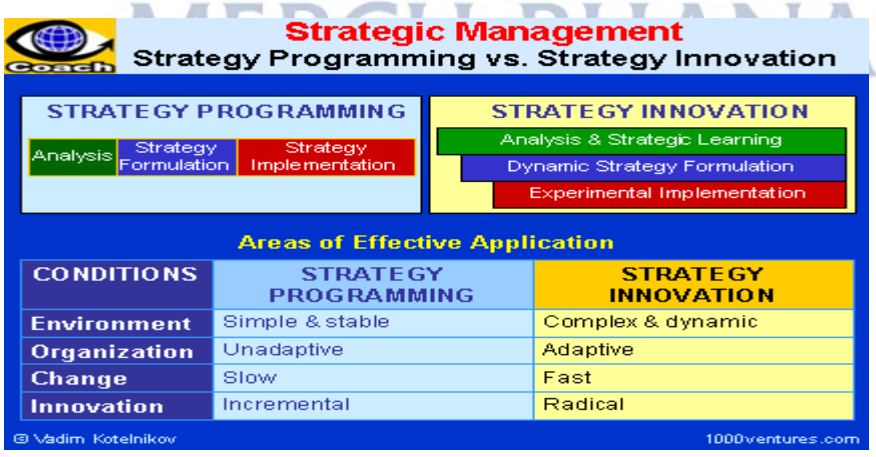


Figure 3. strategy programming and strategy innovation (Industry Canada, 2002).

Industry Sector, Industry Canada, 2002, defined that strategy innovation is about challenging existing industry methods of creating customer value in order to meet

newly emerging customer needs, add additional value, and create new markets and new customer groups for the sponsoring company.

Strategy Innovation vs. Strategy Programming

- In **strategic programming**, you can realistically separate planning and doing, strat formulation and implementation.
- In **strategy innovation**, you assume that you cannot realistically tell in advance ho future will unfold or what will work, and therefore intertwine formulations and implementation, continually adjusting your strategy as you gain new insights through experimental trial-and-error process of learning by doing.[9]

Figure 4. Strategy Innovation vs. Strategy Programming

The basic differences between the strategy innovation versus strategy programming is shown in figure 4 above.

Innovative Strategy known also as best practice are not new concepts to most of organizations. Major oil and gas organizations worldwide are engaged in best practice activities on a daily basis, which are resulting in dramatic improvements in the area of recruitment and retention of employees. What constitutes innovative strategy has been the focus of numerous discussions in the literature. According to Florida Center for Nusing, 2006, at www.flcenterfornursing.org/rr. in the context of this initiative, ***best practice and/or innovative strategy is defined as strategies, activities, or approaches which have been shown to be effective.***

Lundquist, 2005, describes that in relation the innovation to the strategic business, one pre-planning approach designs businesses around four clusters of questions answered through brainstorming, prioritizing, and wordsmithing by an empowered team.

***Strategic Identity**: Who are we and who do we want to become?*
***Strategic Directions**: Where do we want to go?*
***Strategic Decisions**: How do we intend to get there?*
***Strategic Culture**: How do we intend to behave?*

Identity asks about focus, value, and image. Inquiry includes at least business focus, technical focus, key products, markets to serve, customers to satisfy, needs to meet, benefits to deliver, competition to address, uniqueness to develop, current image, desired image, image gaps to close, mission, name, slogan, and brand.
Direction asks about goals and objectives. Goals are more strategic; objectives more tactical. Goals may last for years. Objectives change with plan period.

Goals are more general and visionary. Objectives are precise, numerical, measurable, time-able, achievable, and assignable.

Decision asks about strategies as methods for achieving objectives. Normal businesses organize around strategies such as product development, finance, and sales. Each box in their org charts identifies a strategy, either directly or by the title of its senior manager.

Culture asks about values and principles. Values are more personal; principles more corporate. "Driving factors" represent underlying motivations and expectations. "Sales-driven" companies look and feel different to their customers than do "customer-driven" companies. "Value-driven" businesses are structured, led, and managed to consistently increase the win-win value of *relationships* with customers and stakeholders.

In The Colorado Innovation Newsletter, Lundquist, 2005 makes a synthesis and delivered seven core roles played by *innovation*, innovators, and innovation managers, they are: Change Agent; Value Creator; Customer Satisfier; Leader; Strategy/Strategist, Opportunity Generator and Wealth Creator. They describes that in organizations, the impacts of innovation to the leaders will make the following:

- *Innovation* influences decisions, including corporate strategic directions and areas of investment.
- *Innovation* develops options that empower other business decisions. Effective *innovation* leads businesses, companies, and whole industries.
- *Innovation* creates new knowledge that defines what is possible technically, competitively, and globally. Innovative technologies enable new products, features, components, and manufacturing methods.
- *Innovation* leads markets with new capabilities for consistently improving cost and price.
- *Innovation* opens doors to entirely new ways of doing things, changing society at large. The sum of *innovation* worldwide leads civilization along the path of progress.

He also defined that the impacts of the innovation to the strategy Strategy/Strategist will makes:

- *Innovation* is a method (a strategy) for achieving corporate goals.
- *Innovation* is, quite literally, the only way to initiate and manage fundamental change in technology, products, and processes.
- *Innovation* is the very best way to respond to changes in markets, competition, globalization, and regulation.

- Effective *innovation* management and staff are also strategists. They envision potential results and develop ways (strategies and tactics) to realize their visions.
- In the squeeze between costs and inability to increase prices, better thinking up front always leads to better use of strengths.
- The *flow* of new products and processes is the life blood of every company and *the* core strategy for turning internal investment into revenues.

Kathryn A. Baker, 2004, describes that there are three main types of innovation (*process*, *product/service*, and *strategy)*, each of which can vary in the degree of newness (*incremental* to *radical*) and impact (*sustaining* versus *discontinuous*). Process Innovation relates to the rise of the quality and continuous improvement movements and with the more recent attention directed at change management, organizational learning and knowledge management. Corporations today, at least in the developed world, are reaching the limits of incremental process improvement. Discontinuous process innovation can originate outside the industry and/or may be more or less serendipitous. Thus, in addition to intentional process improvement and reengineering, companies must take care to monitor and have the ability to quickly adapt to potential innovations that could affect how they currently operate. Incremental product/service innovation is oriented toward improving the features and functionality of existing products and services. Radical product/service innovation is oriented toward creating wholly new products and/or services. Although product/service innovation and process innovation are not the same thing, they are often interconnected. For example, process innovation may be required to support product or service innovations. Also, it has been argued that organizational processes and structures oriented to incremental product innovation are not the same as those needed to foster and facilitate new product development.

It is possible to incrementally improve one's business strategy or Business Concept Innovation**,** but Hamel (1996, 2000) contends that radical business concept innovation is now paramount and claims that the current environment is hostile to industry incumbents and hospitable to industry revolutionaries. The fortifications that protected the industrial oligarchy have crumbled under the weight of deregulation, technological upheaval, globalization, and social change. Requirement to ensure organizational success is to continually revolutionize the

basic organizational strategy, which progressively typically requires:

- *Radically reconceiving products and services, not just developing new products and services*
- *Redefining market space*
- *Redrawing industry boundaries.*

If radical business concept innovation is successful in accomplishing these objectives, it is by definition discontinuous. Figure 5 below provides a general framework for understanding organizational innovation.

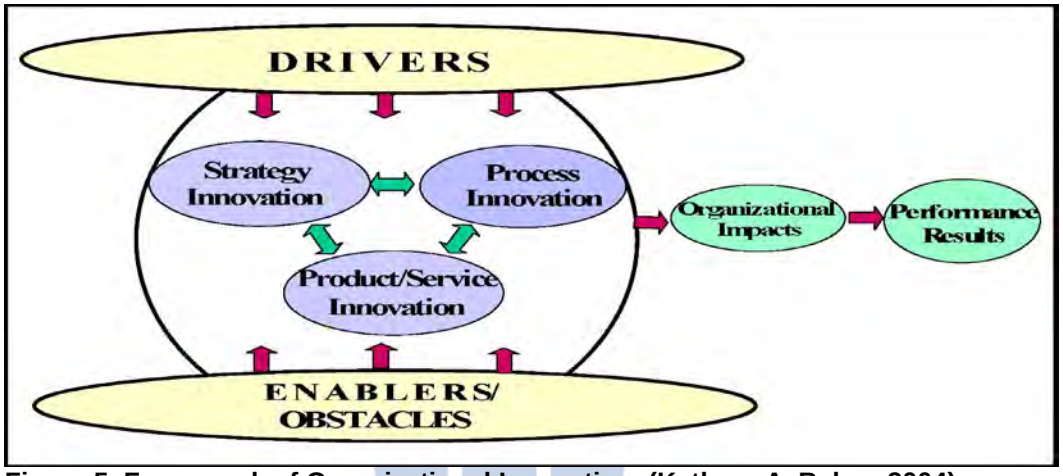


Figure 5. Framework of Organizational Innovation. (Kathryn A. Baker, 2004)

Baker, 2004, defined that the primary drivers of innovation include:

(1) Financial pressures to decrease costs, increase efficiency, do more with less, (2) Increased competition, (3) Shorter product life cycles, (4) Value migration, (5) Stricter regulations, (6) Industry and community needs for sustainable development, (7) Increased demand for accountability, (8) Community and social expectations and pressures (giving back to the community, doing good, etc.), (9) Demographic, social, and market changes, (10) Rising customer expectations regarding service and quality, (11) Greater availability of potentially useful new technologies coupled with the need to keep up or exceed the competition in applying these new technologies and (12) The changing economy.

Hamel and Prahalad argues that organizations must develop an innovation competency if they are to survive: radical business concept innovation must become a core component of this competency. The increase competition, industry and community needs for sustainable development and greater availability of potentially useful new technologies coupled with the need to keep up or exceed the competition in applying these new technologies are the topics relates to the human resources in this thesis.

According to Baker, 2004, to recognize the Enablers and Obstacles to Innovation, some factors need to identify.

The capacity to innovate, especially to produce radical and discontinuous innovations, is seen by an increasing number of scholars and practitioners as the new competitive competency of organizations. As innovation has become a more pressing concern for companies in almost every sector of the economy, the literature has increasingly explored the factors that enable or hinder an organization's capacity to innovate. Factors have been identified at each of the following levels, they are: (1) Individual; (2) Project; (3) Organization; and (4) Environment.

The impact of innovations has become an empirical question. Innovations are likely to cause various organizational impacts (organizational changes, challenges, and issues) but they may or may not bring about the desired performance results, such as effectiveness, efficiency, cost savings, customer value, or a transformation of the market place. What is needed to determine the overall pay-off for being innovative are systematic data on the costs and benefits of innovation for organizations in different industrial sectors.

Khan and Al-Ansari, 2004, proposed that in Innovation process, to be effective, must be sustainable. The organization must provide an environment to "incubate" ideas which mature and translate through implementation into products or services. These elements were lacking in the innovation programs of most of the failed organizations. The sustainable innovative organization foster creativity by following a variation of the model discussed below (Khan and Al-Ansari) :.

- *Organizational mission is defined and aligned to incorporate widespread trust and respect for individuals.*
- *The Corporate mission is communicated throughout the organization.*
- *A successful creating organization is a constantly changing dynamic organization to create new practices, processes, services and products of value to itself and its customers.*

Khan and Al-Ansari, 2004, also defined that successful companies add value by fostering sustainable innovation and creativity, They developed the model of the sustainable versus old model of innovation as shown below (table 7):

To create and add value, there should be a value system in the organization to begin with. High trust, people development, and commitment to learning and respect for individuals enable the organization to insist on high-performance.

Types of program	Old Paradigm	Innovative organizations
Core values	Physical innovation center, no core value defined. Success at any cost	Innovation as part of business policy and core value of the company; Dedication to truth and honesty
Leadership	Passive leadership	Leaders actively participate
Focus	Employee oriented	Customer oriented
Process	Stagnant, process oriented	Dynamic, fluid or organic In nature. Evolutionary.
Measure or source	Numbers of ideas are counted "Out-of-the- box" thinking absent	Focus on creating value. "Not-inven-ted-here" syndrome not present. Does not matter where the ideas come from.
Training	Number of sessions/people counted Counts quantity, not quality	Coaching and feedback. Competency -based development.
Context/Culture	Individual oriented	Group oriented
Environment	Internally competing	Collaborative
Implementation	Lacks focus	Value oriented
Motivation	Extrinsic or none	Intrinsic
Corporate Citizenship	Narrow and shallow	Focused on big picture

Table 7. Sustainable versus Old Model of Innovation (Khan and Al-Ansori, 2004).

When individuals seethat they are respected and valued, they will dedicate themselves to create true value to the organization. There are at least four most frequently general actions that would better position Company's labour force for the future, they are::

- *Refocussing university, college and vocational training on existing and future labour force requirements..*
- *Providing focused incentives for companies and individuals.*
- *Collecting and disseminating information on future skills requirements.*
- *Coordinating government action in terms of vision, leadership and efficiency.*

Globalisation and growing economic integration in the world require companies to adjust to the new competitive conditions on the world market. Contemporary day economy is no longer based on raw materials or labour, but on knowledge. Innovations are the most important tool to build competitive advantage, thus, forming the basis for not only the prosperity of the companies but also of the entire region. Innovativeness is to a large extent determined by external factors, such as market requirements, access to capital, supply of technology and services necessary in order to implement it. However, the fundamental factor is the internal ability of companies to implement innovations which depends on the technological

and material resources, motivation of management, a company's development strategy, organisational skills and intellectual capital understood as education and skills of employees and their involvement in the company's growth.

Innovative Wielkopolska, 2004, proposed that to increase of the ability of companies to introduce innovation, the strategic goal will be achieved through the following operating objectives (see table 8 for explanantion):

- *Overcoming mental stumbling blocks for innovation and cooperation*
- *Improving the skills of personnel in companies*
- *The development of technical resources of companies*
- *The development of inter-regional cooperation of companies*

Increase of the ability of companies to introduce innovation	
1. Overcoming mental stumbling blocks for innovation and cooperation	
Activities	**Recommended forms of implementation**
1.1. Promoting good examples and successful innovations in companies in the region to raise innovation awareness.	Identifying companies -innovation leaders-through periodically organised competition and thorough usual activities of support institutions. Innovation leaders should be asked to share their experience during training and seminars, also organised on their premises. Promotion of innovation leaders should be additionally supported by local media and by the information platform that is proposed in another activity.
1.2. Promotion of training and consulting services for companies related to: identify-cation of company's innovation needs, -iden-tification of company's innovation potential -improving skills in defining company's development strategies.	The activity should involve training and information, dissemination, as well as direct subsidies to such services.
1.3. Encouraging companies to establish cooperation networks and supporting branch clusters.	Training and promotion of good examples that focus on benefits from cooperation and on specific forms and issues of cooperation. Identification of the existing and creating new business clusters. Support institutions providing clusters with speci-alised consulting and promotion services. Utilisation of potential financing for implementation of joint pilot projects by company clusters, such as those involving: promotion, common purchases, extend-ing distribution network, as well as consulting ser-vices for building strategies of business clusters activities.
1.4. Enhancing cooperation between companies, support institutions and the R&D sector.	Utilisation of subsidies for basic services (e.g. certifi-cation, training) and preparing of technologic al and organisational analyses ordered by compa-nies from the institutions of the R&D sector. Results of such activities should be promoted in the media and in training organised for companies.
1.4. Promotion of a good image of Wielkopolska companies among their domestic and foreign customers.	Identification and promotion of reliable business partners, e.g. through introduction of a special certi-ficate.

1.5. Promotion of creation networks bet0 ween large foreign companies and regional SMEs.	Identification of good examples of such cooperation and promotion; grants for joint projects of large companies and SMEs for modernisation of technologies and management techniques (including quality systems) in SMEs.
2.. Improving the skills of personnel in companies	
Activities	**Recommended forms of implementation**
2.1. Improving access to specialised training and courses developing managerial skills and strategic thinking among company management and owners.	Supporting and promotion of training of personnel in: utilisation of technologies, quality assurance, creativeness and cooperation, e.g. specialised, interactive training conducted by managers of most successful companies.
2.2. Stimulating companies to use advanced innovation management techniques.	Information seminars and training sessions focused on utilisation and demonstrating effects of implement tation of such techniques.
2.3. Stimulating companies to introduce quality control systems in organisation and human resources management.	Information seminars and training sessions as well as utilisation of subsidies for implementation of most up-to-date organisation quality systems.
3. The development of technical resources of companies	
Activities	**Recommended forms of implementation**
3.1. Supporting advanced technologies and modernisation of production methods.	3.1. Supporting advanced technologies and modernisation of production methods.
3.2. Improving availability of financial instruments that support innovation investments.	3.2. Improving availability of financial instruments that support innovation investments.
3.3. Improving availability of consulting services related to transfer of technologies.	3.3. Improving availability of consulting services related to transfer of technologies.

Table 8. Increase of the ability of companies to introduce innovation (Innovative Wielkopolska, 2004)

2.2.2.2.3. Innovative Strategy To Geoscientists and Petroleum Engineers

One of the purpose of this thesis is to analyze the Innovative strategy framework in Multikopil through an integrated vision of a functional innovation system, aimed at enhancing economic competitiveness through developing human resources. The proposed framework is based on the most recent theoretical background underpinning the innovative strategy and its further developments and describes both the role of innovation in the economic structure of a country, and the functionality parameters of the innovation system defined.

In some model, the innovation process involves five elements (Romania, 2005):

1. *the research system (which is the center of knowledge production)*
2. *the innovation drivers (enterprises, which transform knowledge into market products)*
3. *the innovation infrastructure*
4. *the capital and financing channels*
5. *the labor resources and education services (human capital)*

In reality the five elements are often overlapping, as for instance a research unit

can also function as an innovation driver, companies might have their own research units, etc. but theoretical simplification may be more useful in order to grasp better the different functions of an research and development system. The important thing to be describes here is human capital and education The following explanations are some factors to how the human capital and education can be part of the innovation strategy:

1. *The Innovation Strategy should invest in the commercialization of development products, services and technologies. This would include new money for environmental technology, through funding mechanisms such as the Sustainable Development Technology Fund, national infrastructure funding, and new programs to promote climate change reduction technologies.*
2. *The Innovation Strategy should help develop the human resources needed for business to integrate strategic planning into economic decision-making. This can be promoted by grants to, and Chairs at, universities where strategic issues are stressed within existing business and engineering programs.*
3. *To promote the spread of "best practices" within various industrial sectors, the Innovation Strategy should include seed money to create associations be formed in each relevant sector and should feed into a national association.*
4. *To help the company occupy a leading position in the coming century of oil and gas based industry, the Innovation Strategy should establish to play a role analogous to that of the Geological Survey and would undertake the study, classification and preservation.*
5. *To facilitate a more integrated approach to decision-making and to help people deal with progress and change, the Innovation Strategy should establish multistakeholder working groups for confronting controversial action items.*

Most business strategies have acknowledged the centrality of human resources in the formulation of strategy. Scholars in this field have explicity acknowledged that a motivated employee is a great asset to an organization operating in a business environment characterized by intense competition. Mazengwa, 2004, stated that Innovative motivational human resource strategies are *a critical aspect of success in the competitive globalised economy, where service, productivity, efficiency, commitment and stability of workers have to be maximized.*

Geoscience and petroleum engineering are pursued with varying vigour in oil and gas Industrial's areas, and it is a relevant component of several of the business sectors identified in the Industry consultation process - particularly in ocean technology, environment, mining/metals/minerals, energy (especially hydrocarbons), geomatics, and academia. Because of the distribution of geoscience and petroleum engineering effort among the sectors and its dilution, in

each sector, by other worthy 'disciplinary' components, then to reinforce the impact that smart geoscience and petroleum engineering should have in helping meet the goals of the Innovation Strategy.

The focus on information technology is appropriate. However, information technology needs populating with knowledge in order for it to have a use: geoscience and petroleum knowledge can generate wealth and, in decision making, can reduce economic, environmental and health and safety risk.

Geoscience and Petroleum Engineering provides the explorative underpinning of the non-renewable resource industries - minerals and hydrocarbons - and, we now understand, of the habitat for many renewable resources, whether they be in fisheries, forestry, agriculture, or water. Geoscience and Petroleum Engineering provide tools for discovery and efficient production of resources, and helps protect the company from a diversity of contrary circumstances, from earthquakes and landslides, to environmental pollution and the effects of global change. Thus geoscience and Petroleum Engineering provides the fundamental underpinnings of sustainable development: it is about understanding Earth's surface and what lies just below. This is the surface on which we live, build extraordinarily complex edifices; it is the surface that provides all our resources, and receives all our wastes.

Below are several themes stem from the discussion of geoscience and petroleum engineering component in innovation strategy.

1. Recruitment, to recruit the selected Geoscientists and Petroleum Engineers that meet the company's criteria which easy to develop in accordance with the business's needs.
2. Training and developing, in these new multi-faceted geoscience and petroleum engineering approaches, of the employees that will become tomorrow's explorers is growing in importance as impending retirements from industry, geological surveys, and academia loom.
3. The contribution of public funds to facilitate, and undertake, new geoscience and petroleum engineering research will accelerate innovation.

4. The competitiveness of Multikopil industry in geoscience and petroleum engineering fields depends on their use and, where appropriate, development of smart new tools that give them competitive advantage. The tools may be field hardware, interpretative software, or anything in between.

These themes can be pursued in various ways, so the following suggestions are merely illustrative of what government, corporate and research funding agencies might do to facilitate the contribution of geoscience and petroleum engineering to enhancing R&D in Multikopil.

Sustainable development of resources. Encourage the development of partnerships among government, universities and the private sector directed to collaborative research that addresses sustainable development of resources in a holistic manner, involving geoscience and petroleum engineering in a multi-tiered network of inter-related issues of exploration, production, refining and reclamation and, on a wider base, economics, sociology and politics.

a. Provide additional support for collaborative undergraduate and postgraduate training in modern geoscience exploration and petroleum engineering, by co-operative programs that are a formal part of university programs or by new or enhanced funding programs of scholarships for collaborative projects of academia with geological surveys or industry or both. This would enhance the opportunities for exposure of students to modern geoscience technology used by government and industry.
b. Increase funding for research studentships, especially for those pursuing collaborative studies with industry, geological surveys or both, in order to attract the brightest students into geoscience and petroleum engineering.
c. Introduce scholarships for course-based Master's degree programs. Vocational courses in geoscience and petroleum engineering are relatively rare in Indonesia, yet fundamental training in geoscience exploration and petroleum engineering applied to specific target industries, resource-based, environmental or geotechnical is essential to the operational science and engineering activities of those industries. The essential broadening of undergraduate curricula to embrace Earth systems makes it more difficult at that level to provide adequate vocational training.

The results of these programs would be an enhanced supply of geoscience and petroleum engineering graduates, with a range of capabilities matched to the levels of opportunities offered by Multikopilindo,

2.2.2.2.4. GRAD Project As Innovative Strategy

Based on the aforementioned descriptions, the impacts of radical management changes create shifting in the strategic planning of Multikopil. This shifting strategic planning occurs in the adaptive organization with complex and dynamic environmentst creating the innovative strategy to the human resources. The innovative strategy recommends a strategic shift in Multikopil's recruiting and development strategy to address business needs associated with projected staffing trends especially Geoscientists and Petroleum Engineers. GRAD (Global Recruitment and Development) is an innovative strategy and process to recruit a new employee and develop the present employee globally in the whole branches of Multikopil Company (a process strategy of recruitment for new employee and development of Multikopil employees globally through the whole branches of Multikopil). Below is the strategy to create the competing in the future for the human resources in this company. Based on the current fact, over the next 10 years, expected upstream staffing trends are:

- *Growth in Asia-Pacific, Middle East and Russia/Caspian, while mature.*
- *US/ North Sea operations forecasted to decline*
- *Pressure for increased national content in the workforce*
- *Skilled national staffs for sustainable operations in mature and emerging businesses*
- *Development of a high quality, globally mobile expat workforce to support growth areas.*
- *Development of future leaders that reflect our asset base*
- *Strong competition for top global talent with strong technical skills;*
- *Significant numbers of staff retiring from the workforce in coming Years.*

To anticipate the above upstream trends and to sustain the global talent with strong technical skill a shifting strategy is necessary in global recruiting and global training and development of the human resources in the company, especially for the Geoscientists and petroleum Engineers. The strategy changes are as follows:

a. Global Recruiting Strategy Changes

1. *Recruit in all locations to the same quality standards*

2. *Increase overall hiring to address age demographics gap. Hire 70 globally in 2005, a 17% increase over 2004. Ramp up hiring as the GRAD program develops to meet business needs.*
3. *Increase proportion of non-US/NS new hires to reflect locations with growing businesses – from 35% to 45%*
4. *Some international hiring in US/NS/Canada universities*
5. *Hire experienced hires (already trained by other companies) to help close the global demographic and skills gap.*
6. *Seek top talent worldwide to include selective hiring of PhD's and diversity of engineering disciplines*

b. Global Training & Development Strategy Changes

1. *Consistent development program for first 5 years for all new hires. 2 Phases with defined entry/exit gates and includes job rotations, evaluations, classroom training and mentors.*
2. *Leverage successful mentorship programs globally and ensure mentoring is a key job expectation*
3. *Global TMT's will establish and continually improve standards of technical excellence (career maps)*
4. *Engineering new hires will have training rotation in project management, to build more capacity in this function*
5. *In years 3-5, selected GRAD participants will have an international assignment. This development assignment is designed to encourage global mobility early in one's career.*

2.2.3. Recruitment & Development Theory

The success of any organization is related to how it attracts, retains and develops its human resources. The company's culture is one of cooperation, teamwork, shared values and ethics, and empowered action. To ensure that culture is, and is seen to be, an employer of choice, the sector is committed to creating and maintaining a knowledgeable, diverse, innovative and representative work force by the effective development, recruitment and retention of its human resources. The framework for Human Resource (HR) Planning was developed to guide the sector in the implementation of its HR strategic plan.

2.2.3.1. Recruitment Theory

Definition: The recruitment and selection process is the mechanism by which supervisors/managers are provided with qualified candidates for vacancies in the classified service.

Developing a recruitment plan should be a team effort. Board members, executive team members and co-workers need to be invited to share their insights and ideas

in the development of a recruitment plan. A recruitment plan should be developed for every aspect of a volunteer program – from growing the program to special events. A recruitment plan is one of the most important tools managers of volunteer programs can develop. A recruitment plan will help divert that river of service to benefit the program and organization.

2.2.3.1.1. Recruitment Strategy

The goal of the recruitment strategy is to attract as many and as diverse a number of qualified applicants as possible and do so in accordance with the The Oil and Gas Company Equal Opportunity Policy and Affirmative Action Plan, as well as the country's laws. The purpose of effective recruiting is to attract strong applicants prepared to perform successfully on the job. Recruiting is an on-going process. It is not a phase, nor is it something you do only when you need applicants.

2.2.3.1.1.1. Preparing The Recruitment Strategy

Effective recruitment depends on how well you market your product and organization. The marketing approach should include (Maine)
at www.umaine.edu/eo/search/Strategy.htm:

- ***Planning:*** *Know your audience and prepare realistic strategies to reach them.*
- ***Collaboration:*** *Identify the community groups and agencies that have direct contacts with the job seekers you are trying to reach.*
- ***Message:*** *Be accurate, brief and clear. Use terms that will encourage and persuade customers to try your product.*
- ***Best Practices:*** *Research what has worked locally, regionally and nationally.*
- ***Evaluation and feedback:*** *Conduct focus groups of community residents to determine the effectiveness of your proposed strategies.*

2.2.3.1.1.2. Developing a recruitment strategy

Efficient recruitment requires development and delivery of customized messages. It also requires a good understanding of how effective different recruitment strategies are in terms of producing a high quality, diverse applicant pool. Choosing the wrong strategy may produce too many or too few applications. Efficient recruitment strategies produce the required results in the shortest time.

The five (5) steps in developing a recruitment strategy are:

Step	***Action***
1	Become a strategic partner with your agency's managers to identify recruitment needs.

2	Analyze the future demands of your agency's workforce and identify appropriate occupations, competency requirements, and hiring strategies.
3	Research the labor market and design your message and corporate image.
4	Identify and train recruiters.
5	Establish and maintain relationships with the best sources of applicants for your workforce (e.g., colleges/universities, technical and trade schools, professional associations).

Table 9. The five (5) steps in developing a recruitment strategy

2.2.3.1.1.3. A recruitment strategy section can include:

1. Mission Statement
2. Recruitment Objectives
3. Financial Objectives
4. Target Markets
5. Marketing Mix
6. Research

Recruitment efforts need to be focused, specific and targeted. The Marketing Mix refers to mediums (presentations, Internet...) that will support the plan. Research methodology will also need to be clearly defined.

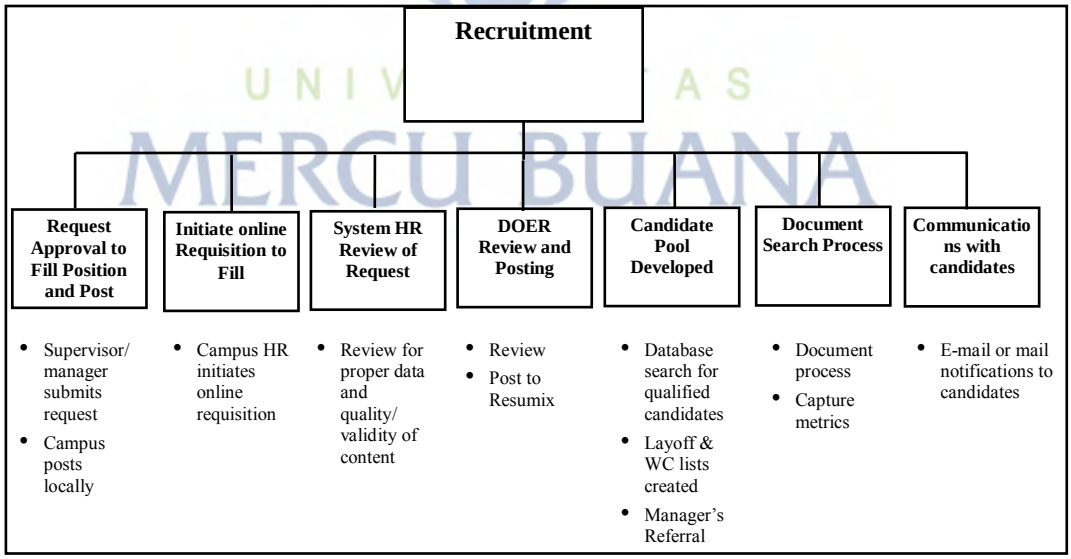


Figure 6. Recruitment - Mega and Major Process Model (In-Sight-2004)

In-Sight, 2004, developed a mega-major process recruitment model as shown in figure 6 above. They also developed the process of this assessement, starting

from source and input, then passthrough the recruitment process and with the results of output and customers. Detailed of this process Assessment of the recruitment is shown in figure 7 below.

Recruitment - Process Assessment

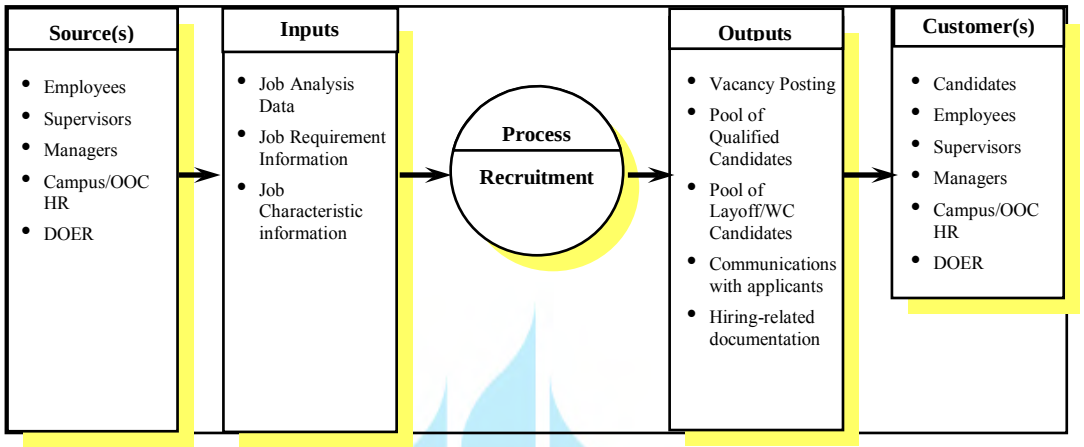


Figure 7. Recruitment - Process Assessment (In-Sight-2004)

A complete model of recruitment for Geoscientists and Petroleum Engineers can be seen in the appendix 4.

2.2.3.1.2. Building Strategy in recruiting Geoscientist and Petroleum Engineers

A number of vacancies have been normally identified within the operations Geosciences and Petroleum Engineering in creating tremendous opportunities for Geosciences and Petroleum Engineering professionals to join a progressive and innovative organisation at an exciting stage of its evolution. All posts demand highly talented professionals whose calibre can be demonstrated by academic excellence and professional success. The typical profile sought for these type posts of Geosciences and Petroleum Engineering professionals is normally as follows:

- *First degree in physical or earth sciences at 1st or 2.1 Hons level with related MSc and ideally a PhD, especially for the R&D positions. Candidates considering undertaking a PhD may be considered for sponsorship by TOTAL*
- *Relevant experience of at least 2-6 years in developing and applying innovative approaches to chosen discipline(s)*
- *Strong understanding of geophysics, exploration/development geology, operations geology or petrophysics*
- *Applied knowledge of principles relating to oil exploration across Reservoir Engineering, Geology or Geophysics*

- *Highly developed skills in computer programming, data processing or interpretation*
- *Creative thinker with the ability to identify opportunities and see the business potential*
- *Excellent report writing and presentation skills*
- *Self reliant and able to engage effectively with others*
- *Capable of building and utilising a network of contacts*
- *Able to work to tight deadlines without compromising the quality of work produced*
- *Energy, enthusiasm and desire to learn and progress*
- *Strong team working skills*
- *Experience of mentoring or coaching would be desirable*
- *Working in multi-cultural teams with leading professionals in their fields, the successful applicants will be given the opportunity for further development and will be considered for international assignments. In return, the company can offer an unrivalled environment in which to further develop technical and professional skills, underpinned by a genuine commitment to training and development.*

Hobbs, 1999 proposed that Exploration and Production (E&P) companies which have a consistent track record of exploration success share a common denominator. This is: a) outstanding people; b) a focused strategy leveraged by a competitive advantage; and c) an aggressive commitment to the exploration process.

Everyone understands the terms "people", "strategy" and "competitive advantage", but before delving further into the qualities which lead to exploration success, let's first define what is meant by the term "exploration process". The "exploration process" is defined as *"a dedicated, long term intellectual and capital commitment to the assumption of risk and reduction of uncertainty in looking for commercial hydrocarbons where they have previously not been found".*

Below is the descriptions of qualities and policies of which a company must possess to be successful in the exploration business. Here also analyze those qualities which lead to failure. Representative companies of the "winner" and "loser" categories are cited to illustrate the points made in this study.

2.2.3.1.3. Recruitment Strategy To Geoscientists and Petroleum Engineers

According to Hobbs, 1999, the most important factor is "people". The success of a company's endeavors is the direct result of the quality and dedication of its

employees, in petroleum as in any other business. Management and technical staff have very specific personalities (Geoscientists and Petroleum Engineers) and traits in the most successful E&P companies. The optimal qualities of management and staff are as follows.

- Management in exploration-production

1). Experienced explorationists with a minimum of 15-20 years broad experience in a number of different basins with diverse stratigraphic and structural play types.
2). Proven and successful "oil finders" in own right.
3). Proven management and leadership experience.
3). Have a thorough understanding of risk management and economics.
4). Not risk adverse; must understand that dry holes are an integral part of the exploration process.
5). Think positively. Oil is not found by nay sayers!
6). Able to prioritize and stay focused.
7). Must have an open mind without a bias against particular regions or plays.
8). Able to nurture creativity of exploration staff.
9). Able to identify and hire successful oil finders.
10). Able to delegate.
11). Excellent communicators.
12). Patient.

- Geoscience & Petroleum Engineering Staffs

1). Must be the very best you can identify for their particular area of expertise.
2). Only employ proven oil finders for key staff positions. 10 to 20 years experience in diverse structural and stratigraphic play types with the last five years in primary play area.
3). Must be creative and have good visualization skills.
4). All geoscience employees must be computer literate.
5). Staff must appreciate the economics of their play concepts.
6). Must be good communicators.
7). Supplement staff with expert contractors and consultants on an "as needed basis"

2.2.3.2. Development Theory

The standards for professional development are organized into three categories:

1). Context, which addresses the organization or culture in which the new learning will be implemented;

2). Content, which refers to the skills and knowledge, both pedagogical and disciplinary, that effective educators need to possess or acquire through participation in professional development activities;

3). Process, which describes the means for the acquisition of the new knowledge and skills.

Professional staff development is effective when it is embedded in the school or training improvement process and aligned with curricular, instructional, and assessment decisions that result in improved achievement for all employee. A complete model of training, development and mentoring for Geoscientists and Petroleum Engineers can be seen in the appendix 5.

2.2.3.2.1. Developing Strategy for Geoscientists and Petroleum Engineers

Hobbs, 1999, proposed that to make the best explorationists having good intelligence naturally helps. More important, however, is the ability to visualize; to be creative; to be an unconventional thinker - one who can recognize opportunities where others see nothing, by pulling together seemingly unrelated facts into a coherent and rational model; to not give up the quest until they have figured "it" out; to have tireless energy and anticipation; to be a dreamer.

The following is developing strategy he proposed for the developing of Geoscientists and Petroleum Engineers in exploration and production oil and gas company (Hobbs, 1999).

1). *Staff involvement in the engineering, geological and geophysical societies is important.*
2). *Participation at professional society meetings, particularly presentation of technical papers, keeps staff current with the latest exploration plays and technologies, demonstrates to others that the company is progressive and technically competent, thereby suitable as a potential joint venture partner, and facilitates the networking process in identifying opportunities and expert consultants. Presentation of technical papers also sharpens communication skills.*
3). *Continuing education through professional society short courses is also important to help keep staff on the leading edge of exploration techniques and technologies.*
4). *Establish an "Exploration and Production Committee" to coordinate the exploration and development/production activity. Geologists, geophysicists, engineers and landmen should understand and appreciate each others skills, responsibilities and limitations.*
5). *Establish a regular procedure for peer review of play concepts and matured prospects; weekly technical staff meetings are one way to do this; include geologists, geophysicists, and reservoir engineers in the process.*

6). Keep on top of technological developments. Send staff to continuing education courses.
7). The lesson to be learned from the drilling fund companies is that success is not just a function of money, size of the staff, and holes drilled in the ground. The quality of the people, a strategic focus, and the thoroughness of the creative and evaluation processes are critical to success
8). One must evaluate the quality of the technical staff and management, their exploration strategies and tools, and the thoroughness of their approach to, and execution of, the exploration process.

2.2.3.2.2. Developing The Petroleum Engineering

The method of Developing Engineering must create the experienced team of multi-disciplined engineers capable of analysing and troubleshooting oil and gas projects from reservoir to export facilities and pipelines. The team is experienced in both offshore and onshore projects and is structured to provide a broad spectrum of skills from high level views and conceptual evaluations to longer-term projects. When feasible, methods of development are identified to achieve maximum economics. Studies are frequently made at short notice to accommodate Client schedules.

Methods in developing Engineering must specialises in developing an energy asset into a profitable venture through the major areas of:

- *Field Development Planning*
- *Field Life Extension*
- *Support Services Externally and In-house*
- *Troubleshooting*
- *Abandonment*

The objective is to produce a high return technical solution and development strategy to achieve early payback and high life cycle NPV. Ideally, this work is commenced early in project life to have maximum effect and to compensate for reservoir and other uncertainties. In developing Engineering, the outcome must have in-depth experience and knowledge over a wide spectrum of geo-technical, facilities and process engineering disciplines.

- *Facilities Engineering*
- *Process Engineering*
- *Production Facilities*
- *Topsides and Sub-sea*
- *Pipeline*
- *Power Generation*
- *Reservoir Engineering*

Developing Engineering must direct their works together as a close-knit team to integrate reservoir recovery processes with drilling, process and equipment opportunities.

2.2.3.2.3. Field Development Planning

A "whole system" design approach is taken to maximise reservoir extraction and optimise facilities design to fit the expected range of reservoir performance for new field developments. All stages of evaluation are covered from reservoir evaluation to facilities design to economics:

- *Interface between reservoir engineering and facilities design*
- *Concept design and costing using in-house evaluation software*
- *Optimum placement of development wells for maximum recovery*
- *Cost estimation, economics and risk analysis*
- *Strategic impact of the development locally and regionally*

For any field development evaluation, there is continual interface with reservoir engineering and the facilities design specialists from initial screening to final selection of the development concept. This insures optimum placement of development wells to minimise drilling and completion costs and maximise hydrocarbon recovery. In-house evaluation softwares are used to refine the development options to provide the least cost for the highest economic returns and is also used for probalistic economic evaluations.

Use of the field development planning tools permits rapid ranking of issues and leading concepts.

2.2.3.2.4. Field Life Extension

For previously developed, producing fields, the experienced personnel within as a result of developing Engineering can evaluate the possibilities and capabilities for increasing recoverable reserves from fields at their middle or mature stage of reserves recovery. The major options are -

- *Extending the production plateau*
- *Increasing the productive life of the field, or "Field Life Extension"*

Many fields have a short period of plateau production before production declines for the remaining life of the field. The Developed Engineering can evaluate the

options for extending this plateau period or extending the life of a mature, producing field after the plateau period such as -

- *Reservoir evaluation for potentially increasing reserves*
- *Additional wells to produce non-exploited reserves*
- *Increasing deliverabilities of wells*
- *Facility de-bottlenecking*
- *Reducing energy consumption and OPEX toward improving profit margins*
- *Improved screening methods*
- *New or modified recovery methods*
- *Improved dehydration methods*
- *Reduction of operating constraints*
- *Improved gas utilisation*
- *New gas disposal methods and reduction of greenhouse gas emissions*

2.2.3.2.5. Technology Development

The Developed Engineering must continually developing new and innovative ideas to improve offshore and onshore operations. New and less expensive methods of gas disposal are being developed, including for carbon dioxide, sour gas and non-marketable natural gas. Environmental constraints throughout the world plus unstable oil prices have created a stimulus for innovative solutions in such areas as -

- *Reduction / elimination of gas flaring and greenhouse gas emissions*
- *Improved gas management*
- *Improved well productivity*
- *Heavy oil production*
- *Improved facilities design*
- *Alternative / Sustainable energy*
- *Reduction in operating costs*
- *Well and field abandonment*

The intention is to generate greater interaction with operational activities and the business partners and to create opportunities for the sharing of knowledge and skills across the geosciences and petroleum engineering spectrum.

2.2.4. Geoscientists and Petroleum Engineers, Their Works and Careers

According to **AGI** (The American Geological Institute), there are many definitions and types of Geoscientists and Petroleum Engineers as can be found in their website at : http://www.earthscienceworld.org/careers/brochure.html. A strong interest in science and a good education are the most important elements in becoming a Geoscientists and Petroleum Engineers. The geosciences draw on

biology, chemistry, mathematics, physics, and engineering. High school courses related to these subjects plus a geology or earth-science course, or an integrated science curriculum, will help prepare you for college. Also, get a solid grounding in English, because Geoscientists and Petroleum Engineers need to be able to write and speak clearly.

They often divide their time among work in the field, the laboratory, and the office. Field work usually consists of making observations, exploring the subsurface by drilling or using geophysical tools, collecting samples, and making measurements that will be analyzed in the laboratory. For example, rock samples may be X-rayed, studied under an electron microscope, and analyzed to determine physical and chemical properties. Geoscientists and Petroleum Engineers may also conduct experiments or design computer models to test theories about geologic phenomena and processes. In the office, they integrate field and laboratory data and prepare reports and presentations that include maps and diagrams that illustrate the results of their studies. Such maps may pinpoint the possible occurrence of ores, coal, oil, natural gas, water resources, or indicate subsurface conditions or hazards that might affect construction sites or land use.

Geoscientists and Petroleum Engineers are stewards or caretakers of Earth's resources and environment. They work to understand natural processes on Earth and other planets. Investigating the Earth, its soils, oceans, and atmosphere; forecasting the weather; developing land-use plans; exploring other planets and the solar system; determining environmental impacts; and finding new sources of useful Earth materials are just a few of the ways Geoscientists and Petroleum Engineers contribute to our understanding of Earth processes and history. Geoscientists and Petroleum Engineers provide essential information for solving problems and establishing governmental policies for resource management; environmental protection; and public health, safety, and welfare.

Geoscientists are curious about the Earth and the solar system. Is there life on other planets? How are they changing? What effects will shrinking glaciers have on the oceans and climate? What makes a continent move, a mountain form, a volcano erupt? Why did the dinosaurs become extinct?

Geoscientists and Petroleum Engineers are concerned about the Earth. How is the global climate changing? How do Earth systems work? How and where should we dispose of industrial wastes? How can society's growing demands for energy and water be satisfied while conserving natural resources for future generations? As global populations increase, can we grow enough food and fiber to sustain them? The Earth is an outdoor laboratory filled with opportunities to observe Earth processes in action. By applying their knowledge of forces and factors that shape the Earth, Geoscientists and Petroleum Engineers seek to reconstruct the past and anticipate the future.

2.2.4.1. Geoscientists and Petroleum Engineers Careers

In describing about the Geoscientist and Petroleum Engineer careers, first need to see their level of education prior to develop them. The levels of education for Geologist and their benefit to the employer is described in detail in the general information below (University of Tennessee, Knoxville, 2000):

- *Bachelor's degree is sufficient for entry-level industry positions. Majoring in two subject areas can increase employability, for example, geology and physics for geophysics or geology and foreign language for overseas assignments.*
- *Master's degree is preferred for state survey work and advancement in industry and government.*
- *Ph.D. is required for college/university teaching and advanced research positions.*
- *Obtain volunteer, part-time, summer, internship, and/or co-op experience in different geological fields.*
- *Employment prospects are best for those with master's degrees, familiarity with advanced technologies e.g. computer modeling, and a willingness to relocate.*
- *Plan on taking a state exam to become a registered geologist.*
- *Obtain experience in mapping and surveying. Develop skills with measuring equipment as well as laboratory equipment and processes.*
- *Obtain a business background to help in managing projects and assessing economic costs and benefits.*
- *Have a love of the outdoors, an interest in nature, and a desire to travel. Develop physical stamina to work/research in remote areas under various conditions.*
- *Join groups directed toward improvement of natural resources, environment, and pollution control.*
- *Join the student branch of the professional organization(s) related to interest area(s).*
- *Develop excellent computer skills.*
- *Strong verbal and written communication skills are essential. The ability to market your skills and write proposals is necessary to maintain steady work. The ability to obtain grants may be necessary to continue a project.*

2.2.4.1.1. Geoscientists Career

Geoscientists follow paths of exploration and discovery in quest of solutions to some of society's most challenging problems.(**AGI** -The American Geological Institute) at: http://www.earthscienceworld.org/careers/brochure.html,

- *Predicting the behavior of Earth systems and the universe.*
- *Finding adequate supplies of natural resources, such as ground water, petroleum, and metals.*
- *Conserving soils and maintaining agricultural productivity.*
- *Developing natural resources in ways that safeguard the environment.*
- *Maintaining quality of water supplies.*
- *Reducing human suffering and property loss from natural hazards, such as volcanic eruptions, earthquakes, floods, landslides, hurricanes, and tsunamis.*
- *Determining geological controls on natural environments and habitats and predicting the impact of human activities on them.*
- *Defining the balance between society's demand for natural resources and the need to sustain healthy ecosystems.*
- *Understanding global climate patterns.*

The Career Planning staff of Career Services at The University of Tennessee, Knoxville. (1995, Revised 2000) prepared the model of areas, employers and career strategies for geologist as can be seen in table 10 below.

AREAS	EMPLOYERS	DESCRIPTIONS/STRATEGIES
PETROLEUM GEOLOGY Stratigraphy Sedimentology Structural Geology Geophysics Geomorphology Paleontology	Petroleum industry including oil and gas exploration, production, storage and waste disposal facilities Independent drilling companies Federal government agencies such as Department of Energy State government Private entrepreneurial companies Universities and colleges Consulting firms Equipment suppliers	Petroleum geologists use aerial photographs, fieldwork, and other data to understand and determine where oil or gas is accumulated. Most petroleum geologists work where oil and gas are found: Texas, Oklahoma, Louisiana, California, offshore sites, or overseas in oil-producing countries. Because geologists often work closely with engineers,obtain some knowledge in engineering to aid communication Gain knowledge of computer modeling and the Global Positioning System (GPS). Both are used to locate oil and gas deposits. This industry is subject to fluctuations, so be prepared to work on a contract basis.
MINING GEOLOGY Mineralogy Geochemistry	Federal government agencies such as: - Bureau of Mines	Mining geologists locate accumulations of minerals or metals, called ore deposits, and determine the best ways to develop

Paleontology Stratigraphy Sedimentology Petrology Crystallography	- Office of Surface Mining State government Oil and gas industry Coal companies Mining companies Well services and drilling companies Construction firms Quarries Railroad companies Universities and colleges Museums	the ore. Mining geologists rely heavily on the computerized Geological Block Model to learn about a mineral deposit, so computer literacy is essential. Become familiar with environmental regulations and government permit issues.
ENVIRONMENTAL GEOLOGY Sedimentology Stratigraphy Hydrogeology Geochemistry	Large and small consulting or engineering firms providing services for: -high tech, oil, gas, mining and other industries -federal, state and local government -utility companies -law firms -developers Federal government agencies such as: Environmental Protection Agency Bureau of Outdoor Recreation State government Construction companies Trucking firms Universities and colleges	Environmental geologists focus on studying, protecting, and reclaiming the environment. For example, they may locate safe sites for hazardous waste facilities, try to preserve water supplies, or work in risk assessment to predict natural disasters. Get a great deal of lab experience. Develop public speaking skills in order to present findings. Develop excellent writing skills in order to prepare reports and proposals. Develop leadership and organizational skills in order to manage projects. Gain a thorough understanding of federal and state
ECONOMIC GEOLOGY Petrology	Mining companies Consulting firms Federal governement agencies such as: - Bureau of Land Management - Bureau of Reclamation State government Universities and colleges	Economic geologists focus on the study of mineral deposits, exploration for new resources, development and mining of all non-hydrocarbon oredeposits, and environmentally-safe disposal ofwaste materials from mining activities. Learn about policy issues at both the federal and state government levels. Obtain management and leadership experience in order to head up projects. Develop excellent writing skills to publish reports and to solicit grants from government, industry, and private foundations.
EDUCATION Teaching Research Administration	Elementary/secondary public or private schools Colleges and universities Private research companies National laboratories	Obtain certification/licensing for public school teaching. Obtain Ph.D. for higher education teaching and/or advanced research and administrative positions. Develop grant writing skills.

		Become familiar with Geographic InformationSystems (GIS).
GEOPHYSICS Oceanography Meteorology Space Sciences Solid Earth Exploration Seismology Geodesy Hydrology Geomagnetism Paleomagnetism Petrology Tectonophysics	Petroleum and natural gas companies Mining, exploration and consulting firms Research institutes Consulting firms Federal government agencies including: - U.S. Geological Survey - National Oceanic and Atmospheric Administration - Department of Defense State government Private industry Universities and colleges	Geophysicists use the Earth's electric, magnetic, and gravitational fields to explore the molten core, study the planet's shape, and map past movements of continents. Obtain double major in physics. Take advanced courses in mathematics, chemistry and engineering. Obtain graduate degree for advancement and research. Learn special techniques through fieldwork. Check on state licensing requirements.

Table 10. Areas, employesr and career strategies of Geologist (model from: University of Tennessee, 2000)

2.2.4.1.2. Petroleum Engineers Career

A petroleum engineer usually works for a petroleum company in various capacities. The typical petroleum engineer works in the field. First, he scouts prospective sites that have a strong likelihood of containing oil or gas below. Then, he takes samples from the site and determines the amount and quality of oil, the depth at which these resources lie, and the equipment that will be needed to properly extract them. The PE then supervises construction and operations at the site and adjusts plans accordingly. Finally, when the well or pocket is exhausted, he supervises the removal of the drilling equipment and the safe return of the land to structural stability, and he oversees the removal of any waste (hazardous or otherwise) left at the site. These stages of work can be quick three-month stints or can be extended to as long as two years. Patience, sound judgment, and maturity are all required features for the successful Petroleum Engineer (The Princeton Review, 2005)

Some petroleum engineers do work in offices, however, analyzing the reports and recommendations of field engineers and advising corporate decision-makers on whether to proceed. These positions are usually held by veteran personnel with experience as field engineers, drilling engineers, and reservoir estimators. While these people are crucial to the success of the industry as a whole, their levels of satisfaction were slightly lower than those of field engineers; the gambling lifestyle,

it seems, is less exciting from behind a desk. Petroleum engineers develop extensive knowledge about the world of oil production, and many become industry analysts. A number use their economics skills—all oil production is a cost-benefit analysis—to enter companies as in-house economists. The largest number of refugees from this profession, however, enter environmental companies, are hired by the EPA, or become consultants to professional oil and gas organizations.

According to descriptions of National Occupational Classification, 2001 at: http://www.23..hrdc.gc.ca./2001/e/groups/2145.shtml, Petroleum engineers perform some or all of the following duties:

- *Conduct feasibility assessment studies for developing new oil and gas fields*
- *Direct and monitor oil and gas drilling operations*
- *Develop drilling programs, select sites and specify drilling fluids, bit selection, drill stem testing procedures and equipment*
- *Direct and monitor the completion and evaluation of wells, well testing and well surveys*
- *Design and select artificial lift machinery, and well and surface production equipment and systems and specify programs for corrosion control and oil or gas treatment*
- *Develop specifications for and monitor and supervise well modification and stimulation programs to maximize oil and gas recovery*
- *Analyze reservoir rock and fluid data to design optimum recovery methods and to predict reservoir performance and reserves*
- *Monitor and forecast oil and gas reservoir performance and recommend oil recovery techniques which extend the economic life of wells*
- *Design, develop and co-ordinate the installation, maintenance and operation of subsea well-head and production equipment.*
- *Petroleum engineers may specialize in drilling, production, reservoir analysis or subsea operations.*

2.2.4.2. Types of Geoscientists and Petroleum Engineers

The followings are types of Geoscientists and Petroleum Engineers:

2.2.4.2.1. Geoscientists

Geoscientists gather and interpret data about the Earth and other planets. They use their knowledge to increase our understanding of Earth processes and to improve the quality of human life. Their work and career paths vary widely because the geosciences are so broad and diverse. The National Science Foundation considers geology, geophysics, hydrology, oceanography, marine science, atmospheric science, planetary science, meteorology, environmental science, and soil science as the major geoscience disciplines. Most Geoscientists are employed

by industries related to oil and gas, mining and minerals and water resources. Many Geoscientists are self-employed as geological consultants or work with consulting firms. Most consulting geologists have had extensive professional experience in industry, teaching, or research.

The following list gives a glimpse of what Geoscientists do in these disciplines and a variety of subdisciplines.

1. **Atmospheric scientists**
2. **Economic geologists**
3. **Engineering geologists**
4. **Environmental geologists**
5. **Geochemists**
6. **Geochronologists**
7. **Geologists**
8. **Geomorphologists**
9. **Geophysicists**
10. **Glacial geologists**
11. **Hydrogeologists**
12. **Hydrologists**
13. **Marine geologists**
14. **Meteorologists**
15. **Mineralogists**.
16. **Oceanographers**
17. **Paleoecologists**
18. **Paleontologists**.
19. **Petroleum geologists**
20. **Petrologists**
21. **Planetary geologists**
22. **Sedimentologists**
23. **Seismologists**.
24. **Soil scientists**
25. **Stratigraphers**
26. **Structural geologists**
27. **Volcanologists**

2.2.4.2.2. Petroleum Engineers.

The petroleum engineer evaluates potential oil and gas reservoirs, oversees drilling activities, selects and implements recovery schemes, and designs surface collection and treatment facilities. The petroleum engineer increasingly uses advanced computers in this work, not only in analysis of exploration data and simulation of reservoir behavior, but also in automation of oil field production and drilling operations. Petroleum companies own many of the world's supercomputers. Petroleum engineers have historically been one of the highest paid engineering disciplines; this is offset by a tendency for mass layoffs when oil prices decline. Petroleum engineering offers a challenging blend of earth sciences, geology, operations, politics, advanced mathematics and the opportunity to risk massive amounts of money. The rewards for successful engineers range from high paying jobs to the opportunities to start oil and gas companies

Not all of the terms above are applicable to expand their careers in Petroleum Industry.. APEG (Association of Professional Engineers and Geoscientists and

Petroleum Engineers of B.C.) has defined more applicable term in relation to their work in Petroleum Industry as the Professional Engineers and Geoscientists. In Multikopil, the term stress on Geoscientists and Petroleum Engineers is focusing on their works in the Petroleum Industry and their background study, known as:

1. *Petroleum Geologists. They are divided into several job function related to their work in the Petroleum Industry such as:*
   a. *Wellsite Geologists*
   b. *Petrophysicists*
   c. *Structural Geologists*
   d. *Operation Geologist*
   e. *Reservoir Geologists*
   f. *Geoscientists in IT Technology*

2. *Geophysicists. No matter their background from Physiscs or Geologists*

3. *Petroleum Engineers*
   a. *Reservoir Engineers*
   b. *Drilling Engineers*
   c. *Project/Process Engineers*
   d. *Production Engineers*

These three type terms of Geoscientists and Petroleum Engineers are used for defining the Geoscientists and Petroleum Engineers's term used in this thesis.

2.2.4.3. Competency of Geoscientists and Petroleum Engineers

Recruitment and Development in Oil and Gas Companies should follows the competency's table of Geoscientists (Myers, G, A., et all., 2005) . Each company has their own competency's table but the proposed table (Appendix 3A) is very good guides to follow. Myers, G, A., et all., 2005 proposed that :

"Competency is defined as having the requisites or adequate ability and quality to function in a particular way. In our demanding work environment, competence is a professional necessity".

According to SPE, 2006, a set of tools used in determining the minimum aptitude levels for petroleum engineers is the competency matrices. This system is structured to assess the minimal competency levels required at various stages of an engineer's career. It also is used to establish future industry standards. The following terms are necessary to the definition of competency for engineering professionals (appendix 3B):

Breadth: the basic knowledge common to all areas of petroleum engineering needed by each and every engineer to demonstrate minimum competency after four to six years of practical experience.

Depth: the knowledge needed by petroleum engineers to demonstrate minimum competency within their primary area of practice after four to six years of practical experience.

To be successful, it musts strive to reduce the time lag between the development of an emerging technology and its implementation in the field. The competent professionals are those who develop the right skills and leverage them to add value by transforming analysis and interpretation into results. Based on a review of the available literature, the report finds that nearly all industries in the sector are now facing - or are expecting to face - shortages of highly qualified personnel, in addition to skilled and general labour. Reasons for the recruitment and development strategy include demographic changes in society, an erosion of traditional labour pools, and competition from other sectors and industries. Geoscience Canada in 2004, place the specific issues that need to be addressed include:

1. *Awareness and public image of natural resource jobs*
2. *Recruitment of new entrants and retention of existing personnel*
3. *Education and training in universities, colleges, and on-the-job*
4. *Professional development and certification.*

Individual firms and industry associations have developed innovative HR recruitment, development and training approaches that can act as models for other sectors to follow. Multikopil in this case has developed an innovative strategy through GRAD project strategy for the model of recruitment and development its human resources. However, many industries are not yet organized to address common issues.

2.2.4.4. Relationship's Model of Training and Competencies Adressed To Geoscientist and PetroleumEngineers

According to Scott, et al,1994, Geoscientists and Petroleum Engineers are human resources and all resources must be used wisely and the human resource should be given special treatment it rightly deserves. The company must develop the human resources in a well planned and efficient manner in order to maximize their

potential, but must never fail to make the distinction between physical resources and human resources. Scott, e al, 1994, also defined that training is a particular aspect of the overall process of human resource development. In the most basic form training is the act of transferring knowledge or “know-how” from one person that already has expertise to someone who wants that same expertise. Training can be found in many forms; the teacher-student-classroom format, one-on-one mentoring between the experienced professional, the casual transfer of knowledge that occurs from just working closely with someone more experienced or within the framework of team dynamics.

Like normally continuing education or training program for technical disciplines, hydrocarbon exploration training requires specific training in addition to that obtained at the university. It requires knowledge of the state-of-the-art concepts being used to successfully explore for and discover economic deposits of hydrocarbon.

As shown in figure 8, Scott, et al, 1994, proposed the steps and types of continuing education to prepare Geoscientist and Petroleum Engineer to become competent or competitive explorationist in order to gain the main aim of exploration success. To achieve that, Scott et al, has identified four types of continuing education, ie; university advanced degree, public industry short course, in-house industry short course and self study. The important of continuing education can not be overemphasized. They suggested that the training and development program for these types of employees must address both short terms and long term goals as well as methods to achieve them. According to them training and development program is the sum total of experiences that creates a successful exploration geoscientist and petroleum engineer, it includes:

- *Initial and ongoing assignment.*
- *Increasing complexity of assignment*
- *Increasing responsibility*
- *Relationship with supervisors/mentors*
- *Cross-discipline interfacing and training*
- *Access to resources and evolving technology*
- *Access to continuing education*
- *Drilling wells.*

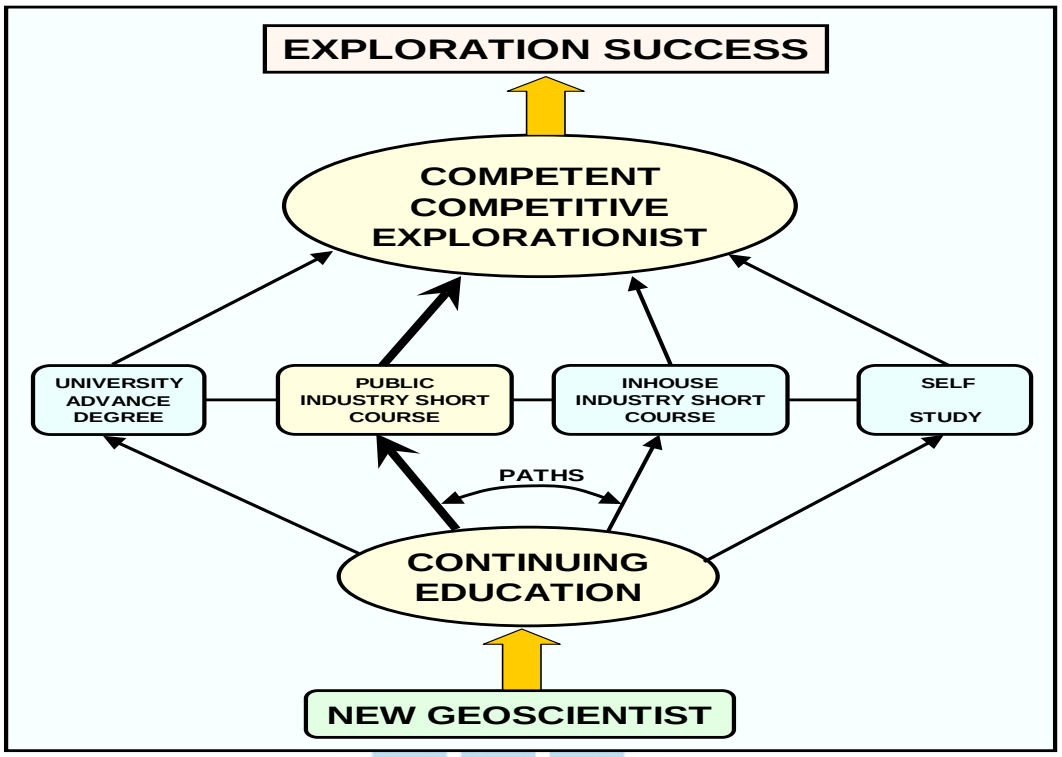


Figure 8. Many Geoscientists rely on the publicly offered industry short cources as a primary means of continuing education. No doubt in-house cources play a critical role as does self study (after Scott, e al, 1994, with author's permission).

They also proposed that for many companies the geoscience industry short course as a continuing education is an important and necessary training option. The employee should have, in place, a realistic plan of professional and scientific development, a training plan, that target training which should be taken at the appropriate time and as a function of previous education, experience level and current need to know. According to Scott, 1994, the public geoscience short course as an important vehicle for knowledge transfer. Figure 9 shows the fundamental considerations that will help assure successful geoscience knowledge transfer via the industry short course. They categorize the fundamental consideration which can influence the efficiency in utilizing of industry short courses may come from some key components below:

- realistic longterm employee training olans
- fundamental course in Indonesian language
- employee accountability
- closer supervisor involvement
- training at appropriate time

- realistic and functional access guidelines.

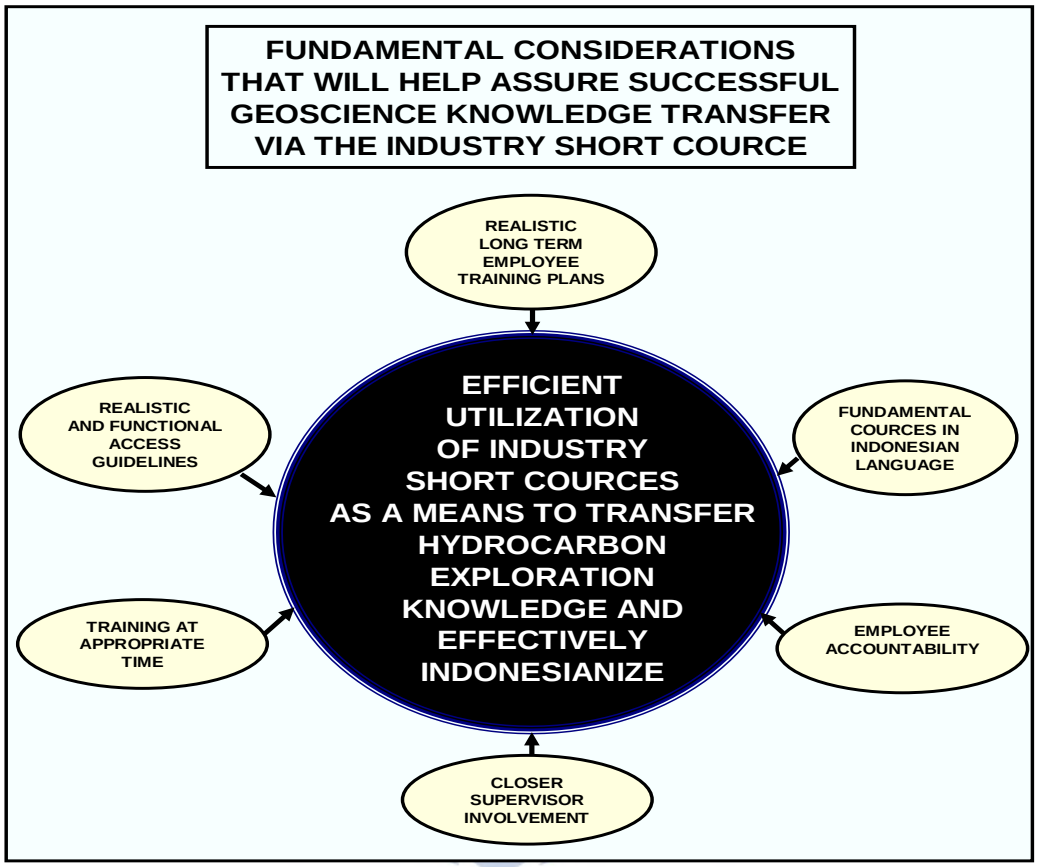


Figure 9. By focusing one key components that contribute to successful knowledge transfer we can help assure an overall efficient use of continuing education program does (after Scott, et al, 1994, with author's permission).

If the company wants to develop competent geoscientists and/or petroleum engineers who are competitive on a worldwide basis they must be allowed to access training when the time for that training is appropriate.

2.3. Research Framework

Change Management is an organized, systematic application of the knowledge, tools, and resources of change that provides organizations with a key process to achieve their business strategy (Lamarsh and Associate, Inc). To approach these results, it is necessary to manage this changes properly and then designed to bring the organizational and people sides of change together - for results and benefits. Addressing the human elements of change by way of this disciplined approach will

increase the speed of implementation of your change project and thereby decrease the cost.

Change management also means to plan, initiate, realize, control, and finally stabilize change processes on both, corporate and personal level (Wikipedia - 2003). Change may cover such diverse problems as for example strategic direction or personal development programs for staff. In many cases, first effects of change on employees, leaders, and on performance levels are negative. These effects include fears, stress, frustration and denial of change. Most employees tend to react with resistance to change rather than seeing change as a chance to initiate improvements. They are afraid of losing something, because they have incomplete information on how the change processes will effect their personal situation in terms of tasks, workload, or responsibilities. Managers need to keep in mind those negative side-effects of change initiatives in order to achieve the expected positive results. The success of change projects depends on the organization's ability to make all their employees participate in the change process in one way or the other. Only if change managers understand these phases of change, and only if they act accordingly, they will be able to successfully manage change processes without destroying peoples motivation and commitment.

Geoscientists and Petroleum Engineers as human resources in an oil and gas company play an important role in the administration process and management. It means that the change to the positive ways in an organization will happen if supported by the sufficient human resources management (Siagian, 1999:7). Phylosofically, there is a dependant relationship between human and organization, that means human can not achieve their objectives and purposes without using organization. On the other hand, every organization will achieve its purposes and aims through the cooperatively efforts of a group of human in it (Siagian, 1999: 19).

In the implementation of change employees as human resources need to know the complete information on how the change processes will effect their personal situation in terms of tasks, workload, or responsibilities. In the implementation of change and during managing change processes creates the strategic planning as the action needs in the change process (Tearle, 2002). This action includes the

creation of “Innovative Strategy”. Besides derive from strategic planning caused by the change process, the innovative strategy can also derive from “other drivers” such as those introduce by Kathryn A. Baker, 2004. These other drivers will create the increase of ability of companies to introduce the innovation to the human resources, such as improving the skills of personnel in companies, the development of technical resources of companies, etc.

Another fact, globalization can influence the companies during their managing change process through this innovative strategy to introduce a new model to recruit and develop their human resources, while in this thesis focusing on Geoscientists and Petroleum Engineers. Figure 10 highlights the schematic paradigmn of Innovative strategy in change management and other drivers

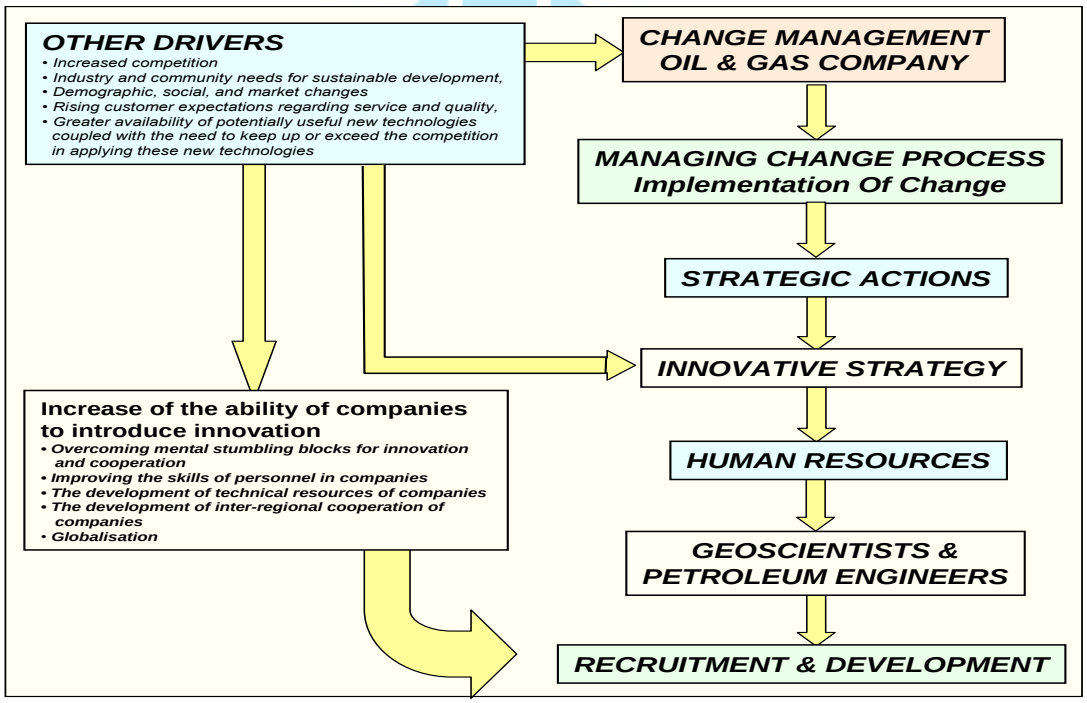


Figure 10. Paradigmn of Innovative Strategy in Change Management and Other Drivers

The goal of the recruitment and development strategy in Multikopil is to attract as many and as diverse a number of qualified applicants as possible and do so in relation to the business’s needs and the way in developing their employee in accordance with the Multikopil’s GRAD strategy project. Efficient recruitment requires development and delivery of customized messages. It also requires a

good understanding of how effective different recruitment and development strategies are in terms of producing a high quality, diverse applicant pool.

Choosing the wrong strategy may produce too many or too few applications and also minimize results of the employee's development. Efficient recruitment and development strategies produce the required results in the shortest time and high quality results of desired GRAD's outcome especially in the area of Geoscientists and Petroleum Engineers.

This research has been focused on the management change happened in Multikopil company and the impact of that change to strategic planning to the workers, particularly the Geoscientists and Petroleum Engineers workers in the company.

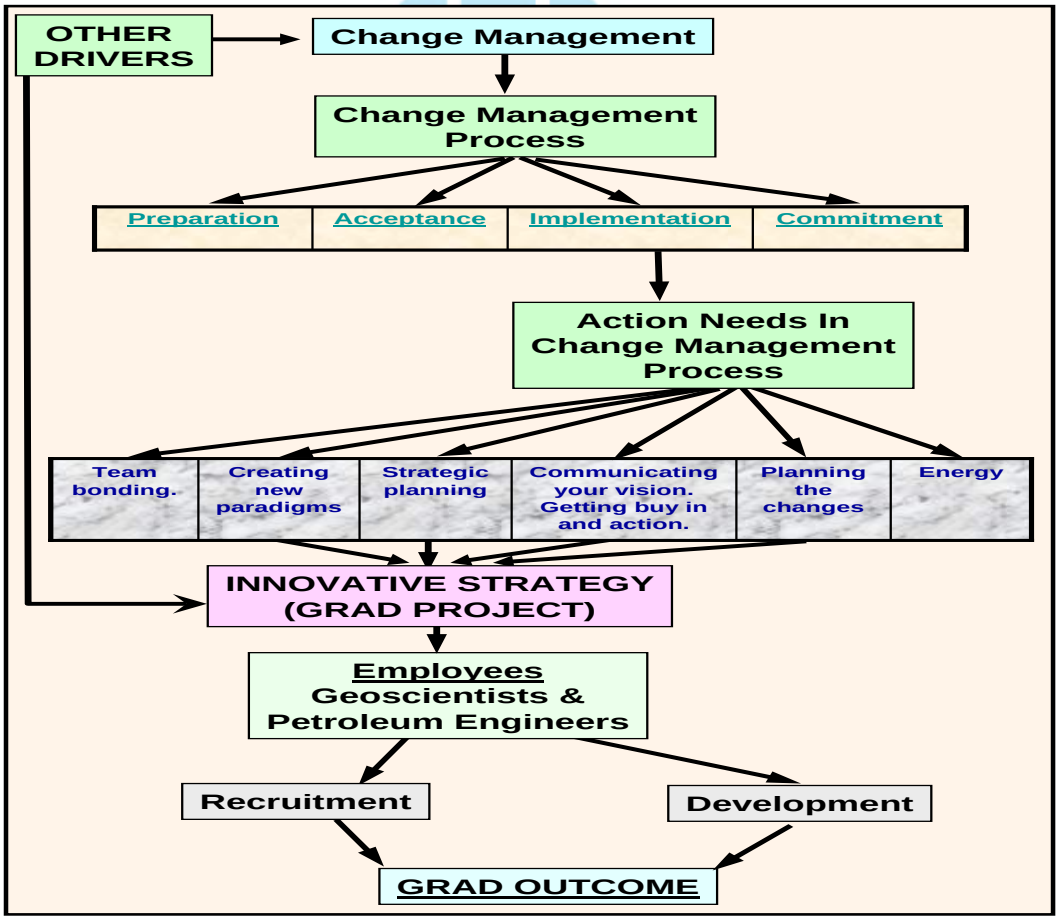


Figure 11a. Applying Theory to generate thesis framework of Managing Change Processes and the Strategic Shift in recruitment and development.

These Geoscientists and Petroleum Engineers are the main business needs of human resources in the upstream sector of oil and gas company. Good strategy in recruiting and developing the Geoscientists and Petroleum Engineers gives the good competency of main human resources for the future oil and gas company. The successful of recruiting and developing Geoscientists and Petroleum Engineers means the successful of the company in preparing their human resources for their business needs in the future. Based on the above descriptions on the theory of process of change management from Strategis Help Desk, 2004 and its implementation to Tearle's model, the applying of those theories to generate research framework resulted from change management process in creating the shifting in Multikopil's recruiting and development strategies aims to create and develop the competency of human resources forward and is highlighted in figure 11a. Based on the above applying theory and combined with the theory of recruitment and development strategy from In-Sight, 2004, then the research framework showing the relationship of independent and dependent variables is summarized in figure 11b below.

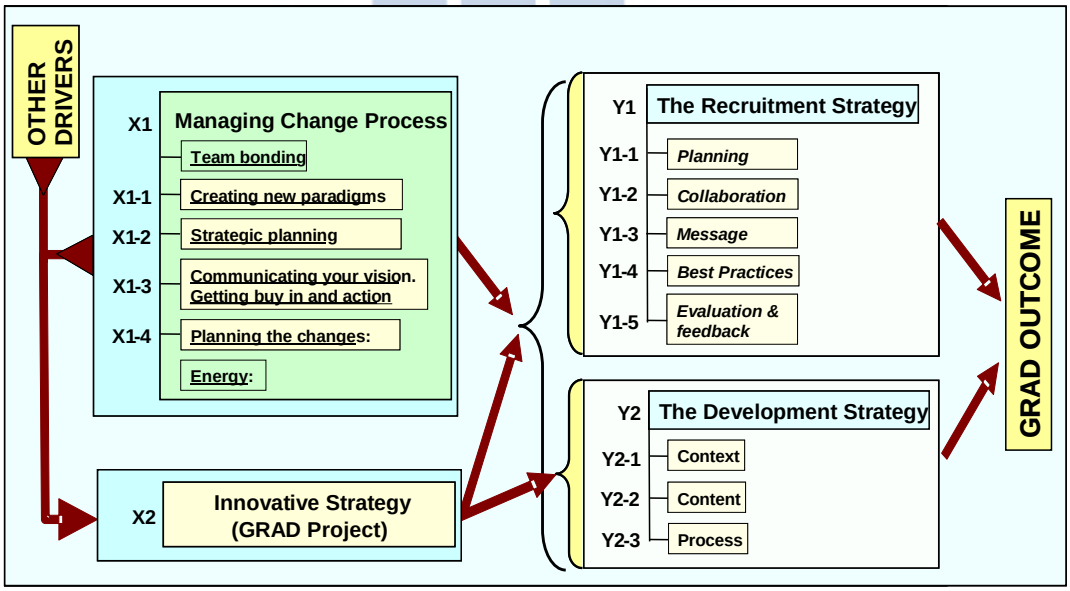


Figure 11b. Summary of Thesis Framework showing independent and dependent variables.

2.4. Hypothesis

The process of management change in Multikopil as a results of two merger of big oil and gas companies resulted in integrated of two different organization cultures

and affects the process of recruiting and development strategy of the Geoscientists and Petroleum Engineers in this new company and its branches worldwide.

Theoritically, there is a closed relationship between the managing change processes and the strategic shift in recruiting and development strategy to address business needs associated with projected Geoscientists and Petroleum Engineers staffing trends. The relationships are:

- Management change and managing change processes resulted in Innovative strategic change applied to the workers.
- Geoscientists and Petroleum Engineers are the company workers who are the main business needs in the oil and gas company.
- Good strategy in recruiting the Geoscientists and Petroleum Engineers gives the good competency of main human resources for the future oil and gas company and/or vise versa.
- Keeping the present Geoscientists and Petroleum Engineers workers sustainable development will resulted in sustainable development of oil and gas Business in the future.
- Developing of Geoscientists and Petroleum Engineers workers in global manner will give the global competency of human resources for oil and gas business needs

Based on the above frameworks, then the main hypothesis which will be proved is:

"Managing Change Processes and Their impact: The Innovative Strategy of a Major Oil and Gas Company to Recruit and Develop Geoscientists and Petroleum Engineers"

Based on the facts that were described above and in the previous chapter and by considering the literature reviews, and the analytical results of questionnaires' survey, then the hypothesis can be concluded as follows:

1. There are significant impacts of organizational capabilitiy actions in managing change processes such as creating new paradigmn, communication about vision getting buy in action, strategic planning and planning the change to the

shifting strategy of Recruitment and Development of Geoscientists and Petroleum Engineers in Multikopilindo.

2. The innovative strategy (GRAD Project) applied contributes the positive impacts to the Geoscientists and Petroleum Engineers workers in Multikopilindo.
3. The innovative strategy (GRAD Project) applied in Multikopilindo addressed to Geoscientists and Petroleum Engineers can solve the problems of their competencies and development.
4. The best way in implementing the innovative strategy (GRAD Project) to the Geoscientists and Petroleum Engineers to address business needs in Multikopilindo is by attaching them to the oil and gas company's home office, company's business units or the tertiary universities abroad.

CHAPTER III. OBJECT RESEARCH'S METHODS

This Chapter outlines some of the research strategies available to researchers involved in a social inquiry and the discussions surrounding the various options. The particular research strategy chosen for this study will then be presented and the rationale behind the choice explained. The research strategy chosen for the focused study was a case study approach. This encompassed the application of multiple methods of data gathering in the investigation of the conceptual model. Section 3.1 explains about the research objects. Section 3,2 describes about the sources of data collections and methods and instruments of data collections. Section 3.3 describes about the desired GRAD outcomes resulted from the innovative strategy (GRAD Project) which need to be proved in this thesis. The obstacles and implementation phase of this innovative strategy is described in section 3.4 which is continued by the menthoring program as explained in section 3,5. Section 3,6 describes the global recruiting and development challenges in adapting the innovative strategy, then the section 3.7 describes the research time table which has been planned in doing this thesis's research and completion.

3.1. Research Object

Explains the objects for this research and the methodology in acquiring, collecting and analyzing of the data for obtaining conclusion. The research's objectives will be focusing on three area, they are:

3.1.1. Company as Research Subject.

Multikopil Corporate and stress to Multikopilindo (Structure, System and Culture), and their innovative strategy to the employees (see Figure 12).

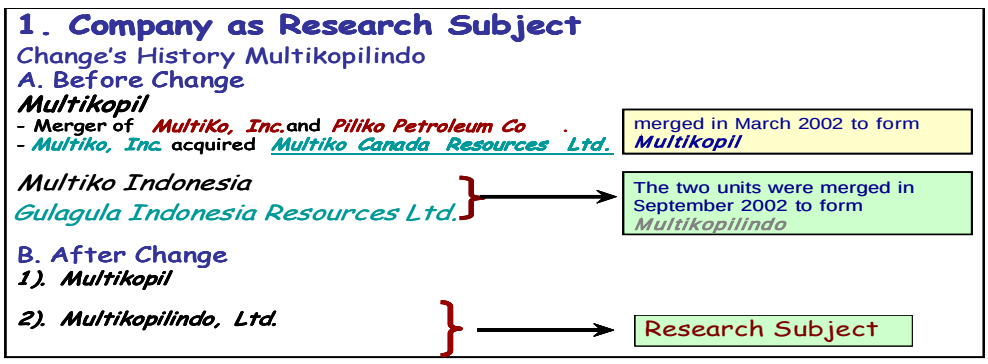


Figure 12. Company as Research Subject.

3.1.2. Geoscientists and Petroleum Engineers Workers

All Geoscientists and Petroleum Engineers workers In Multikopilindo (People and Culture) as shown in Figure 13.

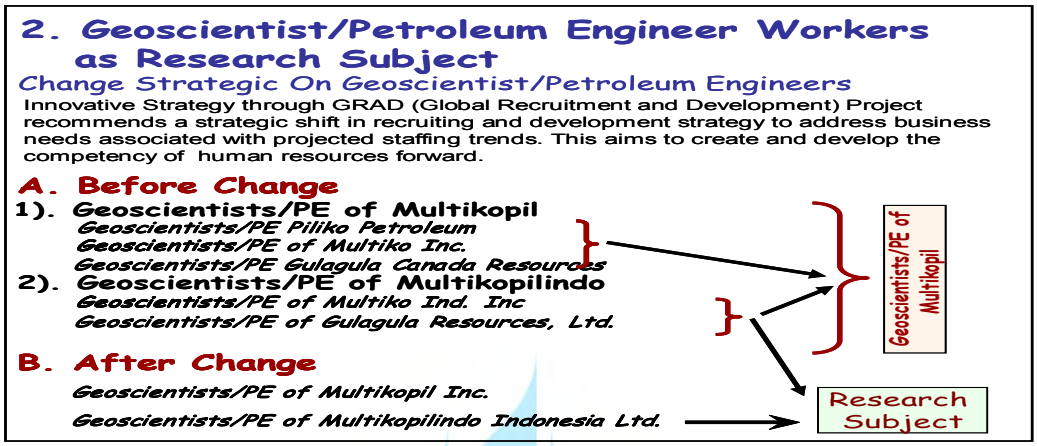


Figure 13. Geoscientists and Petroleum Engineers as Research Subject.

3.1.3. Program GRAD

The company's mission is to maximize performance by investing in people. (Strategy and System). GRAD (Global Recruitment and Development) Strategy recommends a strategic shift in Multikopil recruiting and development strategy to address business needs associated with projected staffing trends.

3.2. Sources, Methods and Instruments of Data Collection

3.2.1. Sources

To obtain the data for this research the following manners are applied:

3.2.1.1. Library Research.

Applied to obtain the secondary data about the information on the Managemenet Theory such as Management Change, Strategy, Recruitment and Development as well as information on the background of the study. Library Research covering **Management Text Books** and **Internet Websites.**

3.2.1.2. Field Study

Applied to obtain the Primary Data using :

- Direct Interview to the Geoscientists and Petroleum Engineers Workers.
- Observation, by direct watching the works condition of the Geoscientist and Petroleum Engineers in Multikopilindo as the research's location.

- Distribute the Questionnaires directly to the Geoscientists and Petroleum Engineers to obtain their response on the available questions and informations concerning Management Change and its impact to the recruitment and development strategies and application of GRAD Project to the Geoscientists and Petroleum Engineers Workers in Multikopil. A complete set of questionnaire's survey for Geoscientists and Petroleum Engineers can be seen in the attachment 2.

3.2.2. Research Design

This research designs to acquire and collecting data to indicate the figures of the managing change processes through: the Innovative strategy of a major Oil and Gas Company and their impact to the recruitment and development of Geoscientists and Petroleum Engineers. The research will be conducted in Multikopilindo's office in Jakarta. The research's design uses the survey approach by applying explanatory survey, by acquiring the samples from one population and using questionnaire as a tool for collecting data and then explain the relationship among the variables through the hypothesis examination **(Singarimbun** dan **Efendi, 1999: 3-5).**

3.2.2.1. Population and Samples gathering technics

Population in this research is the whole Geoscientists and Petroleum Engineers employed in Multikopilindo. The amount of them based on the latest data is about 122 employees (national and expat). As there may be not all of these employee will be participate in the survey, therefore the method will apply the available sample data gathered by assumptions that they can be regarded as representative of the population **(Arikunto, Suharsimi, 1998: 117).** The total questionnaires distributed are **80** and were returned **78** questionnaires. The sampling technics in collecting data have used the quantitative and qualitative methods. The quantitative method covering the survey using questionnaires data statictic content analysis. The qualitative method covers the field research in the Multikopilindo office. The sampling method has been based on ***"non probability sampling"*** where there are not all of the samples have been selected for the research' object.

3.2.2.2. Variable Operasional

In this research the research's variables are the managing change proceses in Multikopilindo as independant variable (X1) and recruitment and developemnt of Geoscientists and Petroleum Engineers by applying innovative strategy (GRAD

Project) as dependant variable (Y1 and Y2). Methodologically GRAD project as innovative strategy is part of product during managing change processes (X2) which gives impact to the strategy of the recruitment and development of Geoscientists and Petroleum Engineers are the research's variables, which can become a symbol with value.

Topics	Implementations	Descriptions	Variable
Managing Change Process	----------	----------	**X1**
	1. Team Bonding		
	2. Strategic Planning ----------	----------	**X1-1**
	3. Creating New Paradigm------	----------	**X1-2**
	4. Communication About vision	----------	**X1-3**
	5. Planning The Change	----------	**X1-4**
	6. Energy		
Innovative Strategy GRAD Project	----------		**X2**
1. **Recruitment Strategy**	----------	----------	**Y1**
	a. Planning		**Y1-1**
	b. Collaborations		**Y1-2**
	c. Message		**Y1-3**
	d. Best Practice		**Y1-4**
	e. Evaluation and Feedback		**Y1-5**
2. **Development Strategy** --------	----------	----------	**Y2**
	a. Context ---------- *Organisation/facilitator*		**Y2-1**
	b. Content ---------- *Skills and knowledge of Educators, competency*		**Y2-2**
	c. Process ---------- *Acquisition of New learnin g/technology*		**Y2-3**
	d. Menthoring Strategy		**Y2-4**
The Desired GRAD Outcome	High Competency of Geoscientists and Petroleum Engineers	---------- 1. Strong, talented national workforces 2. Globally mobile Upstreamers 3. Improvement in our demographic profile 4. High quality and globally consistent training & development program	**RESULTS**

Table 11. Independent and Dependent Variable Determinations in this thesis.

Based on the research framework the definition of operational variable is:

"Change management is an organized, systematic application of the knowledge, tools, and resources of change that provides organizations with a key process to achieve their business strategy"

"A Change Management Process is a method by which changes to the project (e.g. to the scope, deliverables, timescales or resources) are formally defined, evaluated and approved prior to implementation. The process entails completing a variety of control procedures to ensure that, if implemented, the change will cause minimal impact to the objectives of the project. In implementation of the change process

contains some actions needed to activate including: Team building, Creating new paradigms, Strategic planning, Communicating your vision. Getting buy in and action., Planning the changes, and Energy.

"The strategic actions create the innovative strategy gives shifting in GRAD strategy containing implementing recruitment and development of human resources, especially Geoscientists and Petroleum Engineers".

Detailed of the relationship between independent and dependant variables from the above statement and the literature reviews as described in chapter II is summarized in table 11 above. In detail, the relationship between independent and dependant variables from the above statement can also be seen in figure 14 below

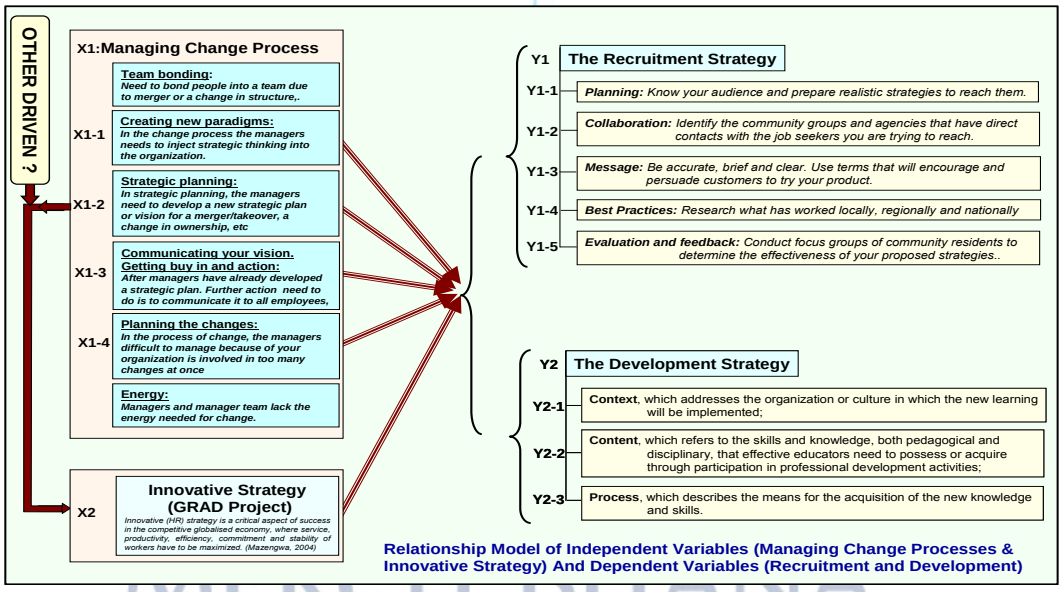


Figure 14. Relationship of Independent and dependent variables in this Thesis

Indicators in this research apply ordinal scale which measured based on "Likert Scale". Likert scale is a method of measuring acceptance for agreement and disagreement (Nur Indriantoro dan Bambang Supomo -1999: 104). For quantitative analysis, each response has the scores as follows:

a. Strongly Disagree---------- score's value : 1
b. Disagree---------- score's value : 2
c. Neither Agree nor Disagree---- score's value : 3
d. Agree ---------- score's value : 4
e. Strongly Agree---------- score's value : 5

These likert's scales is very useful to mesure the opinion of the response directed to the respondents by giving the score's value for each item of response. The

answer for each response uses Likert's scale has gradational scale from very positive to very negatip (Sugiono (2001: 86 - 87).

3.2.3. Validity and Reliability Tests of Research's Instrument

The validity of research's results is determined by the tools that implemented. The valid tools can figure the real research's object. In this situation, the honesty of respondent in choosing the response in the queationnaires is very important. The reliable instrument is the type of instrument if used several times to measure the same object will yield the same data (Sugiono dan Wibowo Eri, 2002 : 220). To solve the observed aspects of the research, it is required the needs of the reliable and valid instrument's tool. This is important to avoid the deviations of the conclusions and to avoid the big different's features from the real phenomena. If the research's variables measured by the tool that has no proven in its reliability and validity, then the conclusions of the research will be failed. To approach the best solution for that, prior to deriving the questionnaires, the variables measured have been categorized properly based on the research's framework in to subvariables from where the questionnaires come from. Table 12 below tabulates the summary of variables and subvariables in order to make better approachment in testing the validity and reliability of the data gathered..

Variables	Var. Symbol	Subvariables	Subvar. Symbol	Remark
MCP	X1	CNP	X1-1	Managing Change Processes
		ISG	X1-2	
		RST	X1-3	
		DST	X1-4	
ISG	X2	IS	X2	Innovative Strategy
RST	Y1	PL	Y1-1	Recruitment Strategy
		C	Y1-2	
		M	Y1-3	
		BP	Y1-4	
		EF	Y1-5	
DST	Y2	CX	Y2-1	Development Strategy
		CT	Y2-2	
		P	Y2-3	

Table 12. Summary of Variables and Subvariables Terminology

3.2.3.1. Validity Test

Masri Singarimbun dan Sofyan Effendi (1995:124) have determined that validity shows how far an instrument mesured what will be measured. This validity test

used to define the accuracy of the tools in its function then can define its validity's scale. The colleting data in a research are reliable whenever the tools used have high validity and have low range of invalidity. A research's instrument will be valid if it can measure dan gives expression to data from the researched variables constantly. The valid results of research is accepted if there is similarity between the collected data and the real data happened at the research's object. An instrument is valid if correlation coefficient between score of the items and the total score is greater than r table. On the other hand, if correlation between items score and total scores is less than r table then, the items in that instruments regarded as invalid. The Validity shows how far a research instrument measures what are needed to be measured (Singarimbun and Effendi, 1995). A valid instrument is the measurement's tool which can be used to gather valid data and can be used for measuring what are needed to be measured. The steps in measuring the validity of the data are:

1. To calculate correlation of each total score of questionnaires' item *(corrected item-total correlation)* using the correlation technics of '*product moment*' as shown in the equation below:

$$r_{xy} = \frac{N\left(\sum XY\right) - \left(\sum X \sum Y\right)}{\sqrt{\left[N\sum X^2 - \left(\sum X\right)^2\right]}\sqrt{\left[N\sum Y^2 - \left(\sum Y\right)^2\right]}}$$

2. To compare the correlation value using the critical number from product moment with the significancy level α and free level n-2 (n = amount of respondent).
3. To make the conclusions
   - $r_{hitung} > r_{tabel}$, item is valid,
   - $r_{hitung} < r_{tabel}$ or r value negative, then the item is invalid,
4. In the application of SPSS, the invalid items are not used for data processing and the test will be conducted for the valid item only. If there are still find the invalid item in the subsequent test then the process of eliminating invalid item must be continued until all of the items are valid. The more the repeating of test processes then the more the decreasing amount of the data.

Hypothesis.

H_0 = the questionnaire items which has positive correlation to the total score.

H_1 = the questionnaire items which has no positive correlation to the total score

The obtained correlation number is compared to the critical number from table of product moment. The valid questionnaire's items mean that those questionnaires have the construction of validity or in statistical language there are internal consistency available. On the other hand, the invalid questionnaires indicate that those statement are different from the other statement (Singarimbun dan Effendi, 1995).

3.2.3.2. Reliability Test

Reliability is the index which shows how far a measurement's tool is reliable or can be rely on. The reliable instrument means that whenever that instrument is used several times to measure the same objects will yield similar data (Sugiyono dan Wibowo, 2001). Meanwhile, a measurement's tool is regarded as reliable whenever this tool is capable to give the reliability measurement in accordance with what have been measured and how far the tool always similar and in its consistency. There are several technics that has been used to calculate the reliability index, ie: *Test Retest, Split Half,* dan *Alpha Cronbach* (Umar, 2005). Masri singarinambun and Sofyan Effendi (1995:144) have defined that : reliability is an index which shows how high a measurement tool is reliable and capable. If it is used twice to measure the same response and yield the relatively consistent results then this tool is reliable. On the other word, realibilty shows the consistency of a tool in measuring the same phenomena.

In this research, the method for calculating reliability index uses *Alpha Cronbach.* (α). The equation used is as follow:

$$\alpha = \left[\frac{k}{k-1}\right]\left[1 - \frac{\sum \sigma_b^2}{\sigma_t^2}\right]$$

Where:

α : realiability instrument (*Cronbach Alpha*)
k : amount of questionnaire's items
$\sum \sigma_b^2$: amount of variance' items.
σ_t^2 : total variance.

Research's variable can be regarded as reliable whenever the value of *"alpha's coefficient"* is greater than 0,6. Arikunto, 1998, defined that an instrument is

regarded as reliable if its validity coefficient of *Alpha Cronbach* or reliability as big as 0.60 or more. According to Rarasanti (2003), the value of reliability coefficient of *Cronbach's Alpha* is defined and can be relied on (reliable) if its correlation value is ≥ 0.70 and is defined as can not be relied on if its correlation value is < 0.70.

3.2.4. Research Hypothetics Test. Using questionnaire Data

To solve the relationship among the research's variables, the approahment applying descriptively statistics and interference statistics. The determination of highest scores (maximum), the lowest score (minimum), median, quarter I and quarter III uses the following methods:

- Maximum Score = Highest Score (5) x amounts of items x amount of respondent.
- Minimum Score = Lowest Score (1) x amounts of items x amount of respondent.
- Median = Minimum Score + Makximum Score : 2.
- Quarter I = Minimum Score + Median : 2.
- Quarter III = Median + Maximum Score : 2.

If converted into a figure, then the interval value from minimum score to the maximum score can be seen in figure 15.

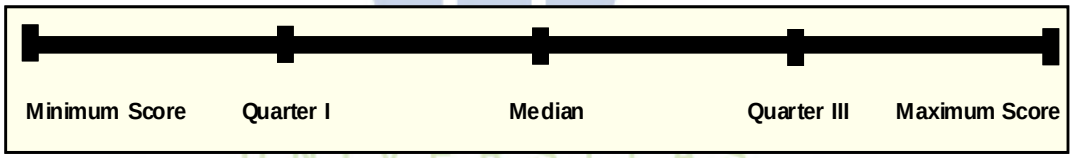


Figure 15. Position of interval value from the lowest to the highest's value.

:

3.2.5. Assumptions Used For Data Analysis

Gujarati (1995: 314). defines that conducting the assumption tests in applying model can pply the assumption models of normality, homoskedastisity, multicolinierity and linearity. The explanation below summarizes the types of assumption that are used in testing the hypothesis.

3.2.5.1. Assumption Normality.

The aims of assumption normality is to test whether in the regression model, the dirturbance variable or residual have the normal distribution. As it is understand that t and F assume that the residual value follows the normal distribution. If this assumption is ignored then the statistic test become invalid for the small amount of samples. Therefore, it is necessary to detect whether the residual has normal

distribution or not. The statistic test which can be used to test the residual normality is non-parametric statistic from Kosmogorov-Smirnov (K-S). Kosmogorov-Smirnov's test can be done by creating hypothesis.

H_0 = Residual data has normal distribution

H_1 = Residual data has no normal distribution

The basis for taking conclusion is from the probability If probability > 0.05, Ho is accepted, while if probability < 0.05, the Ho is rejected.

According to Guilford (Al rasyid, 1997:164), to examine the degree of relation between the variable using criteria as follows:

Less than 0,20	=	***Slight correlation***.
Between 0,20 s.d. 0,40	=	***Low correlation***.
Between 0,41 s.d. 0,70	=	***Moderate correlation***.
Between 0,71 s.d. 0,90	=	***High correlation***.
Between 0,90 s.d. 1,00	=	***Very high correlation.***

3.2.5.2. Assumption Linearity.

By using the linearity test will obtain the information whether the emphirical model is linear, quadran or cube. This test model can use *Ramsey Test.* To conduct this test we have to make assumption or judgement that the right function is linear function. The hypothesis's form from *Ramsey Test is:*

H_0 = Model specification is in the form of linear function.
H_1 = Model specification is not in the form of linear function.

The aims of this test is to yield the F_{calc} by:

1. Obtain *fitted value* from dependent variables.
2. Then, the variable of fitted value be regressed simultaneously with the initial model as independent variable. Obtain the R^2 value to calculate the F statistic using the equation of: $$F = \frac{\left(R^2 new - R^2 old\right)/m}{\left(1 - R^2 new\right)/\left(n - k\right)}$$

Where : m = The amount of the new entrance of independent variable
n = The amount of observation data
k = The amount of parameters in the new equation
R^2new = value of R^2 from new equation
R^2old = value of R^2 from initial equation.

The result of calculating $F_{calc,}$ is then, compared with the value of F_{table} If $F_{calc} > F_{table,}$ then Ho that define the model specification is in the form of linear function is rejected. Independent variable will have linear relationship if the level of linearity significance is ***less than 0.1***.

3.2.5.3. Assumption Multicolinearity

The way that is used in knowing the presence of multicolinearity is by using the concept of *Variance Inflation Factors* = VIF which has equation as follow:

$$VIF = \frac{1}{TOLERANCE} = \frac{1}{1 - R_i^2}$$

Neter, et al (1989) defined that the VIF which has value greater than 10 often use as indicator for recognizing the presence of multicolinearity that may be influence in interpreting *least squares*.

3.2.5.4. Assumption Homoskedastisity *(Glejser test)*

The aims of homoskedastisity is to test whether there is similarity of variance in the regression model of residual from one observation to the other observation. If variance of residual from one observation to the other observation is constant, then it is called homoskedastisity, If different then called heteroskedastisity. The good regression model is homoskedastisity or there is no heteroskedastisity. The way in detecting the presence of homoskedastisity is using the (Glejser test). This test is used by regressing the absolute value of residual to the independent variable (Gujarati, 2003) by using regression's equation $|U_i| = \alpha + \beta X_i + \varepsilon_{i..}$ If the independent variable significantly affect the dependent variable statistically, means there is an indication of heteroskedastisity. The Glejser test will regress the absolute values of residual to the independent variables which normally used for a regression model. If the independent variable, in fact significant (***sig < 0,05***), it will affect the absolute residual. It means that there are heteroskedastisity in the data. If it is not significant (***sig>0.05***), then it will fulfil the heteroskedastisity assumption The good model is the model which fulfil the homoskedastisity assumption (Umar, 2005). According to Sudrajat; (1988; 196), to detect heteroskedastisity in this type of research can also use the rank correlation from Spearman model from the SPSS software.

3.2.5.5. Assumption AutoCorrelation *(Durbin Watson test)*

The aims of autocorrelation is to test whether in the regression linear model there is correlation between disturban mistake at the periode t and the disturban mistake at periode t-1 (the previous periode). If there is correlation, then it is called autocorrelation problem. The good regression model is the regression free from autocorrelation. The way to detect the presence or absence of autocorrelation is using *Durbin-Watson test*. The hypothesis which will be test is:

H_0 = no autocorrelation(r = 0)
H_1 = with autocorrelation (r ≠ 0)

Hypothesis null	Decision	Condition
No positive autocorrelation	Reject	0 < d < dl
No positive autocorrelation	*No decision*	dl ≤ d ≤ du
No negative autocorrelation	Reject	4-dl < d < 4
No negative autocorrelation	*No decision*	4-du ≤ d ≤ 4-dl
No positive or negative autocorrelation	Accept	du < d < 4-du

Table 13. Hypothesis Null for Decision and Condition.

If the obtained values of Durbin Watson (dw) situated at between ***du and 4-du*** (du=value in the table), then it will fulfil the assumption for no autocorrelation.

3.2.6. The Test of Parameter's Model

3.2.6.1. Significancy Test of the whole Regression line *(Fisher test)*

The F statistic's test is used to test whether the independent variable gives wholly impact to the the dependent variable with the following hypothesis:

$H_0 : \beta_1 = \beta_2 = ... = \beta_k = 0$

Means that there is no simultaneously imoact of independent variable to the dependent variable

H_a : Minimum one $\beta_i \neq 0$ i = 1, 2, …, k

Means that there is minimum one independent variable contributes impact to the dependent variable.

The decision is taken by comparing the statistic value F_{obs} to the F_{table}, reject Ho if $F_{obs} > F_{table}$ by using the level of reliability of (1-α). It means that minimize there is one independent variable gives significantly impact to the dependent variable. The decision can also be taken based on the level of its significancy where if significancy is lower than α, then Ho is rejected.

3.2.6.2. Significancy Test of the partially Regression line *(t test)*

Statistic t-test is used to test whether each independent variable entered in the model gives significant impact partially to the dependent variable, with the following hypothesis: $H_0 : \beta_i = 0$ $\quad i = 1, 2, \ldots, k$

means: no significant impact between independent variable and dependent variable.

$H_a : \beta_i \neq 0$ $\quad i = 1, 2, \ldots, k$

means: with significant impact between independent variable and dependent variable..

The decision taken is to reject Ho if $|t_{obs}| > t_{table,}$ by using the level of confidence $(1-\alpha)$ that means there is any significant impact between each independent variable to the dependent variable. On the contrary, accept Ho if $|t_{obs}| < t_{table}$ means that the impact of each independent variable to the dependent variable is not significant. Refusal of Ho can also based on its level of significant, ie. If significancy is smaller than α then Ho is rejected.

3.2.6.3. Goodness of Fit Test

To know how far the precision and fitness of a sample of regression line in fitting a group of data, requires a common measurement called coefficient determination *(R^2)*. Gujarati (1991), defined that coefficient determination *(R^2)* is *a measure of the goodness of fit***.** Verbally, the coefficient determination measures proportion or total variation percentages in the dependent variable which explained by independent variable simultaneously in the regression model.

In comparing the two regression models or more using R^2, it is necessary to define how many of available independent variables in the model. The increment of the amount of independent variables to the regression equation will cause the increment of R^2, and will never decrease due to SSE will never increase with the increasing of independent variables. Meanwhile SST is always similar, therefore, it is suggested to use the modificated measurement to fit with the amount of independent variables entered in to regression equation. This can be done by considering the alternative coefficient determination, called *R^2Adjusted.* The term :adjusted means adjusted to its degree of freedom.

According to Neter et all (1990) R^2 *Adjusted* can become smaller while other variables are entered in to the model due to decreasing of SSE is greater than the declining the degree of freedom n-p as the equalization.

3.3. The desired GRAD Outcome

Based on the research data, the desired GRAD outcome from this project are:

3.3.1. Strong, talented national workforces in all business units- both mature assets and growth areas
3.3.2. A larger pool of globally mobile upstreamers to provide business flexibility.
3.3.3. Improvement in our demographic profile (age and geography) that is aligned with our business portfolio.
3.3..4. A high quality and globally consistent early year training and development program
3.3.5. Best practices in recruiting and development will be leveraged globally

3.4. Obstacles and Implimentation Phase

- The recommended funding mechanism, based on the most globally cost effective method, is for each BU to pay their own hiring and development costs.
- GRAD hiring target will be set annually with BU input and approved by ULT, based on the upstream business growth plans and BU capability to recruit and train.
- 2005 implementation will add these costs: spending for additional new hires, for additional training, and for additional expat assignments.
- Costs will be partially offset by increased efficiency in leveraged recruiting and training programs and higher productivity due to a better developed workforce.

3.5. Mentoring Program

The GRAD mentoring program provides a globally consistent approach for mentoring within Phase 1 and Phase 2 of the GRAD development model. The detailed model of the mentoring program can be seen in appendix 5. Based on the research data The GRAD mentoring program will:

- *facilitate new hire's learning of technical and business skills*
- *provide orientation in business procedures and corp culture*
- *support growth in the new hire's personal leadership skills*
- *assist in career planning and professional development.*

3.6. Global Recruiting and Development Strategy Challenges.

Based on the research data, the global recruiting and development strategy facing both internal and external challenges which can enhance in defining better strategy in the future.

3.6.1. Internal Challenges

- *Mentors –resources, time, tools, cost*
- *Establishing a globally coordinated training program*
- *BU's hiring for global in addition to local needs*
- *Avoid surplus people- balance global vs. local needs*
- *Create a new global payroll*
- *Retention after development program*
- *Recruiting foreign students in US/NS universities*
- *T&D Expat policy*

3.6.2. External Challenges

This study will also try to relate the 4 categories of challenges facing the Geoscientists and Petroleum Engineers and oil and gas industry in particular, but with implications for other natural resource sectors:

- *Awareness and public image*
- *Recruitment and retention*
- *Education and training*
- *Professional development and certification*

3.7. Research's timetable.

For the smoothness of this thesis's research, the research's timetable were started in March, 2006 with the maximum schedule and location as follows (figure 16). Detailed research' and thesis's actual timeframe is shown in appendix 1.

Activities/Months	I	II	III	IV	V	VI
Research Preparation						
- Initial Research						
- Research Proposal						
- Proposal Consultation						
Proposal Seminar						
Data Collection & Analysis						
Thesis Writing						
Draft Thesis Consultation						
Thesis Colloqium						
Thesis Exam						

Figure 16. Thesis Time Frame For 6 Month Periods (6 Credit hours).

CHAPTER IV. RESULTS AND DISCUSSIONS

This chapter describes about the results of the process management change in the company and the results of the analysis data acquired from questionnaires, Section 4.1 describes in general about the oil and gas company feature as the object of the study, the company's history in its development either before change or after change, and then the current situation of the company, its feature on the organization culture and its human resources condition especially covering Geoscientists and Petroleum Engineers. Section 4.2 describes about the results of the questionnaires and analytical data of the respondents's expressions based on questionnaires and the transformation of the analytical data to hypothesis test. In summary, the final discussion about the results is described in detail in section 4.3. The strategy for the geoscience and petroleum engineering group is discussed in section 4.4. Section 4.5 summarizes about the role of human resources functions.

4.1. Oil and Gas Company Feature

The company object of this research is Multikopilindo as one of Business Unit of MultiKopil Inc. This company is a result of merger of two major oil and gas companies in United States in November, 2001. Before merger, MultiKo Inc acquired Gulagula Resources Canada in July, 2001. The result of this merger, makes this company become the third largest oil and gas company in United States in exploration, production and refinery.(Multikopil Homepage, 2005).

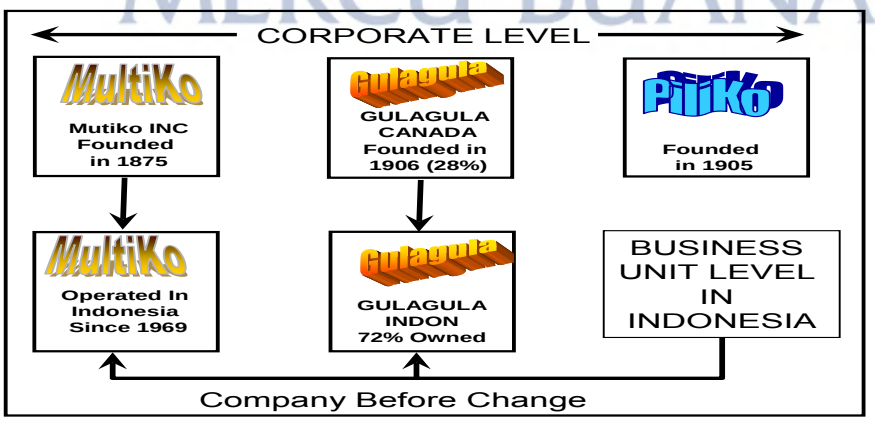
The acquisition of MultiKo to Gulagula Resources Canada, made Gulagula Resources Indonesia as a business unit became a separate company from MultiKo Inc for about one year.until September, 2002. In July, 2002, MultiKo Inc bought all of Gulagula Resources Indonesia;s shares, then in September, 2002 MultiKo Inc and Gulagula Resources Indonesia became Multikopilindo.

4.1.1. Before Change

Historically, as shown in table 12, MultiKo Inc. was founded in 1875 as Multi Oil and Transportation Co based in Oglen, Utah, USA. Piliko Petroleum Company was founded in 1905 based in Bartlesville, Oklahoma, USA. Both are different oil and gas company with different operational area with the latest merger as MultiKopil .(Multikopil Homepage, 2005).

Gulagula Canada Limited was a Canadian-based independent exploration and production company, with primary operations in western Canada, Indonesia, the Netherlands and Ecuador www.thecanadianencyclopedia.com, Gulagula Canada Resources Limited was incorporated in 1906 as the British American Oil Company Limited (Table 14).

MultiKo	**MultiKo Inc.** MultiKo Inc. began in 1875 as the Multi Oil and Transportation Co. Based in Ogden, Utah, the company distributed coal, oil, kerosene, grease and candles to the West.
Piliko	**Piliko Petroleum Company** Piliko Petroleum Company traced its roots to rugged Bartlesville, Oklahoma, in the middle of Indian Territory. In 1905, Frank Piliko and brother, L.E., hit their first gusher - the first of 81 wells in a row without a single dry hole
Gulagula	



4.1.1.1. MultiKo In Indonesia

MultiKo has a 33-year operating history in Indonesia where it operates the Block B, Tobong and Northwest Natuna Sea Block II Production Sharing Contracts (PSCs) and holds an interest in the south Sokang PSC. During 2001, MultiKo significantly grew its business in southeast Asia with the acquisition of a majority stake in Gulagula Indonesia and as a result declared southeast Asia its fourth core area. In November 2001, the Government of Indonesia formally awarded the Nila Block PSC to MultiKo and its partner Inpex. MultiKo will serve as operator and hold a 65 percent majority interest in the 5,300 square kilometer block. Extensive seismic and exploration drilling will be conducted under a three-year work program. The Nila block is located adjacent to the MultiKo-operated south Natuna Sea Block B PSC (Multikopil Homepage,2005)

MultiKo is committed to four core values: operating safely, protecting the environment, behaving ethically, and valuing all people. Each year, MultiKo President's Awards honor individuals and teams of employees for advancing these core values. MultiKo's core values provide the foundation for the company's commitment to sustainable growth and support the basic tenets of sustainability -- financial excellence, environmental responsibility, and social progress. MultiKo issued its first sustainable growth report to show how the company creates value for shareholders while maintaining respect for environmental and social considerations. The report takes a look at areas in need of improvement, and outlines the company's commitment to sustainable growth. The document is a major step in MultiKo's journey toward transparency and includes a record of the company's global environmental and safety performance and sustainable development goals for 2006. The report received worldwide recognition, including coverage on CNN (Multikopil Homepage,2005)

In 2001, MultiKo maintained its record level of employee safety performance. MultiKo is the safest integrated global energy company in the United States, according to data published in the American Petroleum Institute (API) annual survey of Occupational Injuries and Illnesses in the Petroleum Industry for performance in 2001. This was the fifth consecutive year, as well as the 17th time in the past 23 years, that MultiKo topped the safety list among its industry peers.

As an international energy company, MultiKo has an extremely diverse global workforce. By drawing on the different perspectives and cultures of their 20,000 employees, along with their combined knowledge and creativity, MultiKo has a powerful business advantage around the world. At MultiKo, they strive to create an inclusive work environment that treats all people with dignity and respect, and encourages employees to express their ideas and develop to their maximum ability. This helps employees reach their personal career goals, while increasing their contributions toward achieving the company's objectives. MultiKo in 2001 awarded employees globally a "Learning is Timeless" gift. Employees were able to select from several choices of high-tech learning tools for their personal use. Such investments in their employees contribute to their personal development and motivation and results in a highly motivated, innovative work force. It was believe that these core values result in a motivated workforce with values and goals firmly aligned with the strategic aims of the business. This belief is reinforced through their 2001 Employee Opinion Survey results, which reached an eight-year high, indicating employees were quite pleased with the company and their jobs. Core values guide employees in working to meet the expectations of customers, partners and host governments, and in respecting the communities in which they do business. In addition, they believe their commitment to core values reduces liabilities, helps to manage risks and improves business performance.

4.1.1.2. Gulagula Indonesia Resources

Gulagula Indonesia, was headquartered in Jakarta, is a 72 percent owned, indirect subsidiary of MultiKo as a result of MultiKo's acquisition of Gulagula Canada. Since 1997, Gulagula Indonesia common shares have been traded publicly on the New York Stock Exchange under the symbol, "GRL". In 2001, Gulagula Indonesia celebrated its 40th anniversary of operations in Indonesia. At December 31, 2001, Gulagula Indonesia had interests in 13 contract areas in Indonesia, covering a total gross acreage of nearly 10 million acres (6 million net acres). Five of the contract areas have commercial production. One of the contract areas is in the development phase, and the remaining seven areas are in the pre-development or exploration phase. Gulagula Indonesia is a party to four substantial long-term U.S. dollar gas sales contracts. Three of these contracts are being supplied or will be supplied from onshore fields in South Sumatra and the gas supply for the fourth is

from the Kakap Block in the Natuna Sea. All reserve numbers for the Gulagula Indonesia gas contracts are stated net to Gulagula Indonesia before royalty. Gulagula Indonesia has agreed to deliver approximately 0.6 tcf of natural gas over a 15-year period, which commenced in October 1998, from the Corridor Block PSC area to the Duri Steamflood in central Sumatra. Further,

Gulagula Indonesia signed agreements for the delivery of an additional 0.6 tcf of natural gas over a 19-year period with first gas deliveries targeted for late 2002. Gulagula Indonesia is also a participant in the West Natuna Group consortium, as a participant in the Kakap Block PSC in the Natuna Sea. Gulagula Indonesia's share of the Kakap Block PSC will be a part of the total 2.5 tcf to be supplied under the Sembgas contract. In February 2001, Gulagula Indonesia signed agreements for the supply of approximately 0.7 tcf of natural gas from Sumatra to Singapore over a 20-year period. First gas deliveries for this contract are targeted for late 2003.

4.1.1.3. Gulagula Canada Acquisition

On July 16, 2001, MultiKo, through a wholly owned subsidiary, completed the acquisition of all the ordinary shares of Gulagula Canada, now known as MultiKo Canada Resources Limited (MultiKo Canada) for approximately $4,571 in cash plus assumed liabilities and minority interests. For ease of reference, we will refer to MultiKo Canada as Gulagula Canada. Prior to the acquisition, Gulagula Canada was a Canadian-based independent exploration and production company, with primary operations in western Canada, Indonesia, the Netherlands and Ecuador. Subsequent to the acquisition, operational responsibilities for Gulagula Canada's interests in Indonesia, the Netherlands and Ecuador were realigned within MultiKo's regional organizational structure, and operationally MultiKo's existing Canadian operations were merged with those of Gulagula Canada.

4.1.1.4. Subsequent And Other Events.

On November 18, 2001, MultiKo and Piliko Petroleum Company (Piliko) announced that their boards of directors unanimously approved the merger of the two companies. The new company would be named MultiKopil. Under the terms of the agreement, Piliko shareholders will receive one share of new MultiKopil common

stock for each share of Piliko stock they own, and MultiKo shareholders will receive .4677 shares of new MultiKopil common stock for each share they own. The merger is conditioned upon, among other things, the approvals of the shareholders of each company and customary regulatory approvals.

4.1.2. During and After Change

From their beginnings in the early days of the oil industry, MultiKo Inc. and Piliko Petroleum Company grew and prospered, becoming leaders in the global energy industry. On August 30, 2002, they combined their complementary strengths and shared values to create MultiKopil. As a multinational company, MultiKopil has operated in more than 40 countries which their main office is based in Houston, USA. This company continues their profit production through the successful of exploration and through high technology projects and safely opportunity by

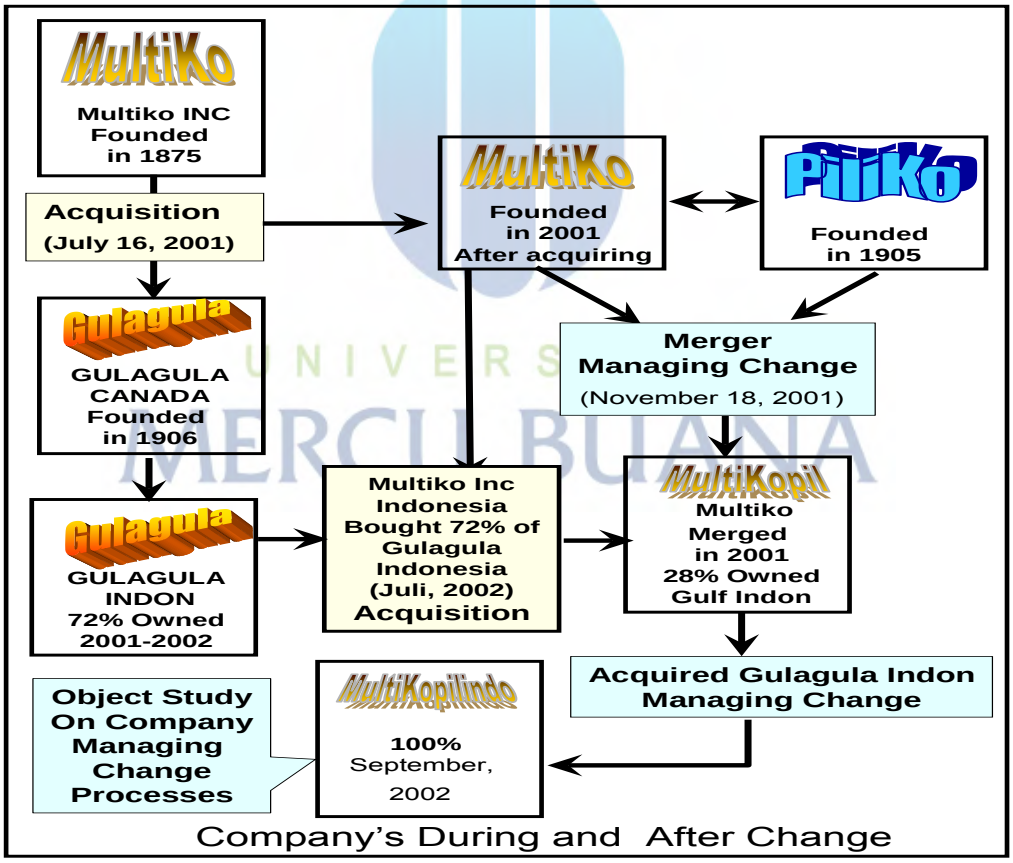


Figure 18, Situation of MultiKo Inc and Piliko Petroleum Company after Change

completing the commerciality innovative solutions at every business unit worldwide. As a result, in developing of human resources, there is a strategic shift

in recruitment and development in this company, particularly in the sustainable projection for the qrowth of this company within the next 10 years. This company employs about 35,800 employees worldwide with the assets about 93 million dollars .(www.scripophily.net). Figure 18 displays the flow process of this company during and after changes.

There are a lot of different cultures among their employees as a result of character of their multinational business, where in every business unit their employees must have globally standard. For that reason, the company creates a new strategy in recruiting and developing their employees globally to answer the business needs associated with the projection and direction of staff employees. This strategy aimed to create and develop the competency of their future human resources. Therefore, for the business unit in Indonesia, based on the above facts, there are necessary to have shifting strategy in recruiting and developing their staff levels. So, the culture in Multikopil is a type of global culture. Therefore the managements of this merged companies create a global corporate's vision and mission (www.scripophily.net).

4.1.3. Current Status (Culture, Commitments, Activities)

This section describes about the current status of the company covering descriptions of it culture, commitments and activities as results of manegement change in the company .(www.scripophily.net). As a merger, multinational and global company, they have to create the organizational culture which can make adaptation to the environment wherever they conduct exploration and other operation and development of oil and gas. The organizational culture must also as a whole employees's property, which each part of that may be inherit from the previous company. This change will give impact to the available components including the symbols and attributes of the company. Based on their multinational and global characteristics, the board of directors has formulated and owned the clear vision to this organization. In this company the organizational/corporate culture has contrived to the "SPIRIT of Performance" which contains the purpose and values of the organization and then has been translated to the ethical business of the company (Multikopil Homepage,2005).

4.1.3.1. The Company's Culture,

The company's culture of Multikopilindo is adopted from Multikopil home page at: www.scripophily.net . As a business unit in Indonesia, the company's culture followed the multinational and global corporate's culture. Multikopil is committed to setting the standard of excellence in everything they do. The "Purpose and Values" are essential building blocks in the continued success of the company. Together, these ideas represent ***"The SPIRIT of Performance"*** and are an integral part of our search for greatness. The description of this business unit culture about the purpose and values is explained in the following section.

4.1.3.1.1. Sustainable Development Position

For Multikopil, sustainable development is about conducting their business to promote economic growth, a healthy environment and vibrant communities, now and into the future. Multikopil believe that this approach to business will enable us to deliver long-term value and satisfaction to our shareholders and our stakeholders. Sustainable development is fully aligned with our purpose "to use our pioneering spirit to responsibly deliver energy to the world," and helps translate our core values - Safety, People, Integrity, Responsibility, Innovation and Teamwork (SPIRIT) - into action (Multikopil Homepage,2005)

4.1.3.1.2. The Spirit of Performance

As shown in table 13 the culture of this company follows the spirit of performance which consists of purpose and value.: As stated in their public homepage the culture of the company is shown below (Multikopil Homepage,2005):

The SPIRIT of the Company is embodied in the purpose and values we espouse and share. It's what makes us unique, special, successful and poised for capturing future opportunities.

Building momentum takes talented, passionate people capable of recognizing and capturing opportunities that help the company succeed.

Purpose:

Use our pioneering spirit to responsibly deliver energy to the world. Multikopil is committed to setting the standard of excellence in everything we do.

Values:

Safety	We operate safely.
People	We respect one another, recognizing that our success depends upon the commitment, capabilities and diversity of our employees.
Integrity	We are ethical and trustworthy in our relationships with all stakeholders.
Responsibility	We are accountable for our actions. We are a good neighbor and citizen in the community
Innovation	We anticipate change and respond with creative solutions. We are agile and responsive to the changing needs of stakeholders and embrace learning opportunities from our experiences around the world.
Teamwork	Our "can do" spirit delivers top performance. We encourage collaboration, celebrate success and build and nurture long-standing, mutually beneficial relationships.

Table 15. Spirit Performance of Multikopil (Multikopil Homepage, 2005)

From the above data it can be concluded that the organisation's culture in Multikopil characterizes the multinational and global culture.

4.1.3.2. The Company's Commitments

The commitments of Multikopil is adopted from www.scripophily.net, as follows:

- *Increase the availability of ever-cleaner energy*
- *Be transparent and accountable by measuring and reporting both our financial and non-financial performance*
- *Operate to the highest safety standard*
- *Positively impact communities wherever we operate*
- *Minimize the environmental impact of our operations*
- *Invest in the well-being and development of our employees*
- *Constantly improve the energy and material efficiency of our operations*
- *Practice and uphold the highest ethical standard*
- *Ensure the long-term financial viability of the company*

4.1.3.3. The Approach

To deliver on these commitments, Multikopil will prioritize issues, establish plans for action with clear goals, and monitor our performance. In addition, Multikopil will develop the following company-wide competencies to successfully promote sustainable development (Multikopil Homepage,2005)

- *Integration - Clearly and completely integrate economic, social and environmental considerations into strategic planning, decision-making and operating processes.*
- *Stakeholder Engagement - Engage our stakeholders to understand their diverse and evolving expectations and incorporate that understanding into our strategies.*

- *Life-Cycle Management - Manage the full life-cycle impacts of our operations, assets, and products, utilizing such processes as front-end loading, staged decision analysis, and product stewardship.*
- *Knowledge Management - Share our successes and failures to learn from our experiences.*
- *Innovation - Create a culture that brings new, innovative thinking to the challenges of our evolving business environment.*

4.1.3.4. The Expectations

Through delivering on the company's commitments to sustainable development Multikopil will be the best company to invest in, to work for, to partner with, to have as a supplier, and to have as a neighbor (www.scripophily.net).

4.1.3.5. The Position.

Multikopil recognizes that human activity, including the burning of fossil fuels, is contributing to increased concentrations of greenhouse gases in the atmosphere that can lead to adverse changes in global climate. While the debate continues over the extent of human contributions and the timing and magnitude of future impacts, Multikopil is committed to taking action to expand the company business planning processes to address greenhouse gas emissions and to develop greenhouse gas targets for the company operations. The company's commitment to sustainable development will provide the foundation for the company actions. Furthermore, the company support public actions that take a flexible approach to managing this issue. Multikopil support market-based approaches that reward voluntary actions, include reduction targets that allow for economic growth, foster technological solutions, and support products that are increasingly friendly to the environment (Multikopil Homepage,2005)

4.1.3.6. The company four core activities worldwide:

The company's core activities below is adopted from Multikopil home page as follows (Multikopil Homepage,2005):

- *Petroleum exploration and production.*
- *Petroleum refining, marketing, supply and transportation.*
- *Natural gas gathering, processing and marketing, including a 30.3 percent interest in Duke Energy Field Services, LLC.*
- *Chemicals and plastics production and distribution through a 50 percent interest in Chevron Piliko Chemical Company LLC.*

In addition, the company is investing in several emerging businesses — fuels technology, gas-to-liquids, power generation and emerging technologies — that provide current and potential future growth opportunities.

4.1.3.7. The Business

Multikopil is a global competitor with operations on nearly every continent An integrated petroleum company, Multikopil is engaged in:

- *Petroleum exploration and production on a worldwide scale.*
- *Petroleum refining, marketing, supply and transportation,*
- *Natural gas gathering, processing and marketing*
- *Chemicals and plastics production and distribution worldwide.*
- *Developing emerging businesses for its own use, as well as for licensing worldwide.*

In Indonesia their activity covering the Petroleum exploration and production on a worldwide scale, Petroleum marketing, supply and transportation, Natural gas gathering, processing and marketing, and developing emerging businesses for its own use, as well as for licensing worldwide (Multikopil Homepage,2005).

4.1.4. The Company's Human Resources

Before merger, MultiKo had about 20,000 corporate employees at December 31, 2001, approximately 2,400 more employees than the previous year. After merger, In their business unit in Indonesia (Multikopilindo) there are more than 2000 employees, which geoscientists and petroleum engineers are about 7% of the total. All of these employees are treated in similar manners. Together with the business units, Human Resources (HR) produces programs that tap bright, highly motivated individuals, develop skills, and provide challenging and diverse careers around the world — all to ensure that Multikopil has the right people with the right skills to create the right business results. HR helps the company attract top talent — both experienced and new — with recruiting strategies geared toward people who want not just a job, but a career. Across Australia, Asia, Africa, Europe and the Americas, Multikopil looks for people who will make the most of opportunities in established and emerging arenas. Performance management and early-year development programs help people plan and build compelling careers, preparing them for evermore challenging assignments. As consultants, HR guides the business units in planning and maximizing the capability of people with highly

technical or specialized operational and business skills who are needed for the company to thrive. Underpinning Multikopil' value for people are competitive health and welfare benefits and compensation programs that attract and reward employees to ensure a healthy and productive work force.

The company aligns individual performance with company results and rewards performance so that employees share in the company's success. Looking to the future, HR serves the company by heightening awareness of shifting demographics and the new competencies required of tomorrow's work force. Already, Multikopil is reshaping programs to attract, develop, reward and retain employees into the next decade". Securing the future now means identifying and preparing leaders well in advance of their upcoming roles through succession planning and leadership development. Multikopil does not stand still and neither does HR. Recognizing that it takes people to create business results, HR anticipates the needs of the company, standing shoulder-to-shoulder with the operating organizations to deliver the future. streamline and refocus its Indonesian operations following the August 2002 merger of MultiKo Inc. and Piliko Petroleum (Multikopil Homepage,2005).

4.1.5. Managing Change Process of Human Resources Status

As a new company from merger of two major oil company, in this case is still at the stage of "managing change processes". Therefore this company is still continuing efforts to form a new organization culture represents the available groups from different original company both internally covering the management and staffs and externally from their partners and the customer and also in adaptation to the government where their business present (Prabu, 2005). An overview of the company's corporate governance and methods for accountability in its sustainability performance. Multikopil' approach toward ensuring ethical behavior, and an overview of its relationship with its employees, local communities and global society. As stated in their homepage, an overview of the company's health, safety and environmental policies, programs and performance.t he project's objective is the completion of a report which demonstrates the employees's ability to conduct research independently and will require their employees to:

a. *Identify an existing or potential Human Resources Development problem/ challenge.*

b. Conduct appropriate literature reviews.
c. Determine a research methodology to be followed.
d. Specify the findings from the research.
e. Develop possible solutions to the identified problem.
f. Recommend realistic actions available for implementation.

The descriptions below explains how the implementation of managing change processes in the company apply to the sectors of human resources and systems covering the advantages for: Organization & Expense Improvement; Succession Planning; Management Support: Training and Development; Graduate Program and menthoring: Performance Management System; Job Rotations; Technical Focus and Special focus on Geoscientists and Petroleum Engineering Diciplines and Strategy,

4.1.5.1. Organization & Expense Improvement

From the observation, the managing change processes in this company have focusing the implementation to the change in the organization and expense improvement to the human resources strategy in this company is explained below:

4.1.5.1.1. Organization

- Evaluating staffing structure and skill levels and recommending upgrades; staff counseling
- Identifying good-fit suppliers and strategic partners
- Negotiating employment terms with senior hires
- Supporting key staff as they ramp up
- Providing interim support when accounts are won or lost
- Coordinating and supporting agency management during downsizings and terminations
- Complementing/supplementing CEO, CFO and executive managers' existing skill sets and experiences

4.1.5.1.2. Expense Improvement

- Streamlining agency workflows
- Reviewing procedures and internal controls and recommending improvements
- Analyzing cost structures and recommending improvements

- Analyzing and vetting supplier lists and arrangements
- Evaluating and upgrading expense controls

4.1.5.2. Succession Planning and Management Support

4.1.5.2.1. Succession Planning

- Developing succession plans for managers and owners
- Mediating deal terms when partners and owners are either being added or leaving
- Introductions/mergers/acquisitions

4.1.5.2.2. Management Support

- Identifying interim managers
- Providing critical interim support
- Protecting agencies from financially distressed clients
- Litigation Support
- Overall go-to person, facilitator, confidant, and general problem solver

4.1.5.3. Training and Development

There are some issues that need further describes on the training and development issues in the company, covering:

a. Review the trends in expenditure on training and development in the Company over recent years;
b. Review the methods used to identify training needs in the Company
c. The methods used to evaluate training and development provided in the Company
d. The extent of accredited/articulated training offered in the Company
e. The processes used in the Company to evaluate training providers and training courses;
f. The adequacy of training and career development opportunities available to the Company's employees in regional areas;
g. The efficiency and effectiveness of the devolved arrangements for training in the Company
h. The value for money represented by the training and development dollars spent in the Company

i. The ways training and development offered to the Company's employees could be improved in order to enhance the skills of their employees

4.1.5.4. Graduate Program and Mentoring

The Graduate Program is an integral part of oil and gas company's capability development strategy. Its goal is to ensure that the company attract and retain the best graduates and provide them with career path planning and opportunities for growth and development through planned training strategies implemented with the assistance, support and coordination of human resources professionals.

4.1.5.4.1. Graduate Program and Key Feature

The key features of good program are:

- Targeting to attract high quality graduates who best fit the Company's graduate profile and are results-orientated with attributes that include demonstrated initiative, effective communication skills and a commitment to achieving commercial outcomes through technical excellence.
- A structured interview and selection process, where all candidates are given the same opportunity to demonstrate the required attributes. This is achieved by utilising a consistent candidate evaluation process.
- Offering excellent training and development opportunities and providing challenging career prospects.
- A beneficial Support Mentor Program to assist first year graduates with career advice and counselling. This provides the opportunity for graduates to understand the company culture, assists them in settling into their new surrounds and develops them for their professional careers.
- A structured Job Rotations Program that facilitates the graduate's accelerated development, underpinning their advancement during the first three years of joining the Company.

4.1.5.4.2. Graduate Development Program

The Graduate Development Program is an important strategic objective aimed at developing the graduate to effectively contribute to the achievement of company goals and at the same time provide exciting challenges in developing their careers.

4.1.5.4.3. Graduate Induction Program

This program is designed to assist our first year graduates to feel comfortable in their new environment and quickly find their feet within the company. It is also designed to facilitate network building that provides further support and cohesiveness at the peer group level.

4.1.5.4.4. Graduate Group

This Group is formed by graduate volunteers and represents all graduates within the Graduate Program. The purpose of the Group is to develop a social atmosphere for existing graduates by organising regular social functions, assisting new graduates in networking, being actively involved in graduate recruitment and contributing to ongoing improvements within the Graduate Program.

4.1.5.4.5. Mentors

At the commencement of the graduate's employment, each graduate will automatically be assigned a Technical Mentor, who will provide ongoing technical support. In addition, a senior staff member will be assigned to each first year graduate as a Support Mentor to provide informal advice, support and guidance in the graduate's early development.

4.1.5.5. Performance Management System

On commencement, the graduate enters the company's Performance Management System which contains the following elements:

- Setting of performance/behavioural objectives on commencement of employment *Plant*
- Review of performance on an ongoing basis, and formally during December to February as part of our company-wide annual review process. There is a direct linkage between performance and remuneration.
- Participation in the Individual Development Review process, which is designed to identify required training and development needs through feedback surveys. This process results in a tailored Individual Development Plan which maximises progress of the graduate's early career development.

4.1.5.6. Job Rotations

The three-year program provides extensive on-the-job training as well as

structured business and development courses tailored for new industry entrants. Built into the program is the ability for graduates to rotate through various teams, departments, business units or across business locations. A forum of senior managers monitors the graduates' rotations through various

4.1.5.7. Technical Focus

The Company offers wide-ranging technical opportunities that are exciting and challenging for a new ambitious graduate. Within the company's diverse portfolio, graduates can explore the very real career opportunities that span across onshore and/or offshore operations within the oil and gas industry. We use the latest industry software applications and our training and development philosophy ensures the highest level of technical competence.

4.1.6. Geoscientists and Petroleum Engineering Diciplines

4.1.6.1. Geoscience Disciplines.

Multikopil employs graduates with degrees in Geology and Geophysics. They are looking for graduates who have a strong work ethic, are diligent and committed and bring a strong technical base as demonstrated by their academic record and previous work experience. Initially, the employee will be assigned to one of these specific roles as a graduate geoscientist:

4.1.6.2. Engineering Disciplines.

Multikopil employs graduates from a number of engineering disciplines including petroleum, chemical, environmental, electrical and mechanical, as well as students with maths and physics degrees. They are looking for graduates who have a strong work ethic, are diligent and committed and bring a strong technical base as demonstrated by their academic record and previous work experience. Initially, you will be assigned to specific roles as a graduate engineer:

4.2. Analytical Data of Questionnaires

This section describes about analytical data acquired from the questionnaires distributed to the respondents as well as about the general view about the respondents. Statistical analysis is also explained here in its relationship to the hypothesis test.

4.2.1. General View of Respondents

After conducting the validity and reliability examinations to about 10 respondents to examine the questionnaire items, the questionnaires were then distributed to 80 respondents to be filled by hoping that all of those can be completed within one week. However, after passing one week, only 78 respondents returned the filled questionnaires or 97.5%, where 2 respondents or 2.5% did not return the questionnaires with many reasons.

Based on the returned questionnaires, this research also obtain the specific characteristic informations from the respondents covering the sex, age, education, year services, background major study as well as their job.positions. Table 16 shows the summary of respondent's characteristics based on the questionnaires relates to the questions number 1 through 4.

Question Number	The Variables	1 (=<25 Years)	2 (26-30 Years)	3 (31-35 Years)	4 (36-40 Years)	5 (41-45 Years)	6 (46-50 Years)	7 (51-55 Years)	Total
1	AVERAGE AGE	3	16	11	8	21	6	13	78
Question Number	The Variables	1 (=<5 Years)	2 (6-10 Years)	3 (11-15 Years)	4 (16-20 Years)	5 (21-25 Years)	6 (26-30 Years)	7 (31-40 Years)	Total
2	WORK EXPERIENCE	33	17	11	9	5	3	0	78
Question Number	The Variables	1 Geologist	2 Geophysicist	3 Petrophysycist	4 Petroleum Engineer	5 Drilling Engineer	6 IT Geoscientist	7 Project/Process Engineer	Total
3	PROFESSIONALITY	21	19	1	25	5	5	2	78
Question Number	The Variables	1 Geology	2 Geophysics	3 Petrophysics	4 Geography /Geodesy	5 Drilling Engineering	6 Computer Science	7 Petroleum Engineering	Total
4	BACKGROUND STUDY	33	13	3	0	0	0	29	78

Table 16. Respondent's characteristic based on question no 1 through 4.

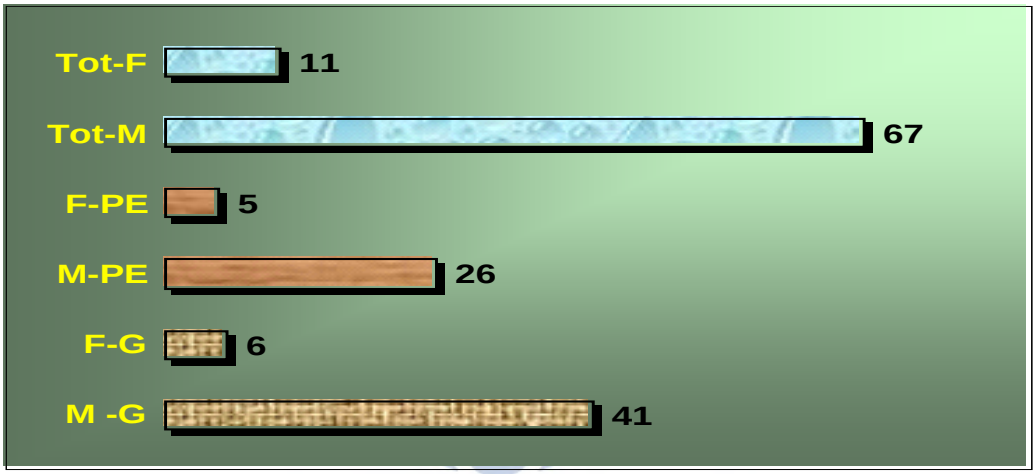
All of those valuable informations are described in the following section.

4.2.1.1. Characteristics of Respondents Based On Sexs

Characteristics of respondents based on sex as a subject within this research is shown in table 17. Clearly seen in table 14 that "male" is the highest respondents amounting to 67 or 85.9% of total 78 respondents. Female respondents noted only amounting to 11 or 14.1% of the population. A separate sex percentages for Geoscientists and Petroleum Engineers is tabulated in table 17 above. Graph 3 displays the distribution of the respondent's sex in this research.

Sex	Frequency	Percentages
Geoscientists		
Male	41	52.56
Female	6	7.69
Petroleum Engineers		
Male	26	33.33
Female	5	6.41
Total (Geoscientists and Petroleum Engineers)		
Male	**67**	**85.90**
Female	**11**	**14.10**

Table 17. Sex of Respondents (Geoscientists and Petroleum Engineers)



Graph 3. Sex of Respondents (Geoscientists and Petroleum Engineers)

4.2.1.2. Characteristics of Respondents Based On Educations

Complete characteristics of respondents based on their education is tabulated in table 18. In total there are 48 (61.54%) of respondents are Baccalaurate, 29 (37.18%) hold master degree and only 1 (1.28%) holds doctoral degree.

Education	Amount	% from Total	Education	Amount	% from Total
Geoscientists			**Petroleum Engineers**		
Baccalaurate	26	33.33	Baccalaurate	22	28.21
Master Degree	19	24.36	Master Degree	10	12.82
Doctor	1	1.28	Doctor	0	0.00

Total (Geoscientists and Petroleum Engineers)		
Education	**Amount**	**Percentages (%)**
Baccalaurate	48	61.54
Master Degree	29	37.18
Doctor	1	1.28

Table 18 Education Levels of Respondents (Geoscientists and Petroleum Engineers)

4.2.1.3. Characteristics of Respondents Based On Technical Cources Certificates

Complete characteristics of respondents based on their technical cources's certficate is tabulated in table 19. In total there are 19 (24.36%) of respondents have 1-5 technical course's certificates, 14 (17.95%) have 6 – 10 technical course's certificates, 21 (26.92%) have 11 – 20 technical course's certificates, 21 (26.92%) have 21 – 30 technical course's certificates, and only 8 (10.20%) have greater than 31 technical course's certificates. It means that Geoscientists and

Technical Cources Certificates	Amount	% from Total	Technical Cources Certificates	Amount	% from Total
Geoscientists			Petroleum Engineers		
1 - 5	8	10.26	1 - 5	11	14.10
6 - 10	8	10.26	6 - 10	6	7.69
11 - 20	13	16.67	11 - 20	8	10.26
21 - 30	10	12.82	21 - 30	6	7.69
> 31	8	10.26	> 31	0	0.00

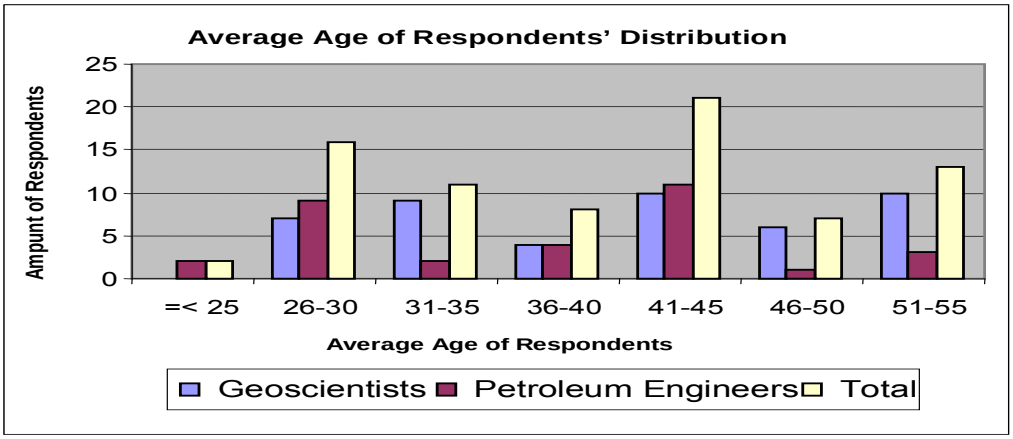
Total (Geoscientists and Petroleum Engineers)		
Technical Cources Certificates	Amount	Percentages (%)
1 - 5	19	24.36
6 - 10	14	17.95
11 - 20	21	26.92
21 - 30	16	20.51
> 31	8	10.26

Table 19 Technical Cource's Certificates of Respondents (Geoscientists and Petroleum Engineers)

Petroleum Engineers need to attend more technical cources to become more expert in their fields.

4.2.1.4. Characteristics of Respondents Based On Ages and Year Services

Characteristic of respondents based on their ages and work Year Services is tabulated in table 20 and 21. In total, based on the ages distribution, the Geoscientists and Petroleum Engineers at the level 41 to 45 years old are the highest percentages amounting to 21 (26.92%) of the total respondents's ages. Based on the year services of Geoscientists and Petroleum Engineers which have work experiences at less than 5 years have the highest percentages amounting to 33 or (42.31%) from the total respondents.



Graph 4. Ages of Respondents (Geoscientists and Petroleum Engineers)

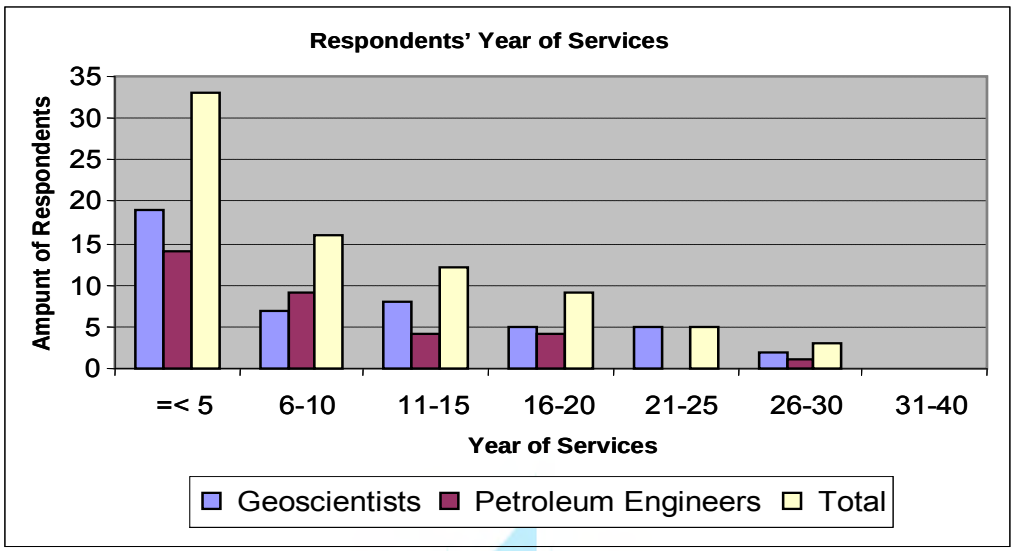
Table 20 and 21 as well as Graph 4 and 5 display the detailed phenomenas of ages and year services of Geoscientists and Petroleum Engineers consecutively in this research.

Ages	Amount	%
Geoscientists		
<= 25 years	0	0.00
26 - 30 years	7	8.97
31 - 35 years	9	11.54
36 - 40 years	4	5.13
41 - 45 years	10	12.82
46 - 50 years	6	7.69
>= 51 years	10	12.82
Petroleum Engineers		
<= 25 years	2	2.56
26 - 30 years	9	11.54
31 - 35 years	2	2.56
36 - 40 years	4	5.13
41 - 45 years	11	14.10
46 - 50 years	1	1.28
>= 51 years	3	3.85
Total		
<= 25 years	2	2.56
26 - 30 years	16	20.51
31 - 35 years	11	14.10
36 - 40 years	8	10.26
41 - 45 years	21	26.92
46 - 50 years	7	8.97
>= 51 years	13	16.67

Table 20. Ages Distribution of Respondents

Experiences	Amount	%
Geoscientists		
<= 5 years	19	24.36
6 - 10 years	7	8.97
11 - 15 years	8	10.26
16 - 20 years	5	6.41
21 - 25 years	5	6.41
26 - 30 years	2	2.56
>= 31 years	0	0.00
Petroleum Engineers		
<= 5 years	14	17.95
6 - 10 years	9	11.54
11 - 15 years	4	5.13
16 - 20 years	4	5.13
21 - 25 years	0	0.00
26 - 30 years	1	1.28
>= 31 years	0	0.00
Total		
<= 5 years	33	42.31
6 - 10 years	16	20.51
11 - 15 years	12	15.38
16 - 20 years	9	11.54
21 - 25 years	5	6.41
26 - 30 years	3	3.85
>= 31 years	0	0.00

Table 21. Work experiences of Respondents



Graph 5. Experiences of Respondents (Geoscientists and Petroleum Engineers).

4.2.1.5. Characteristics of Respondents Based On Education Background and Professionality

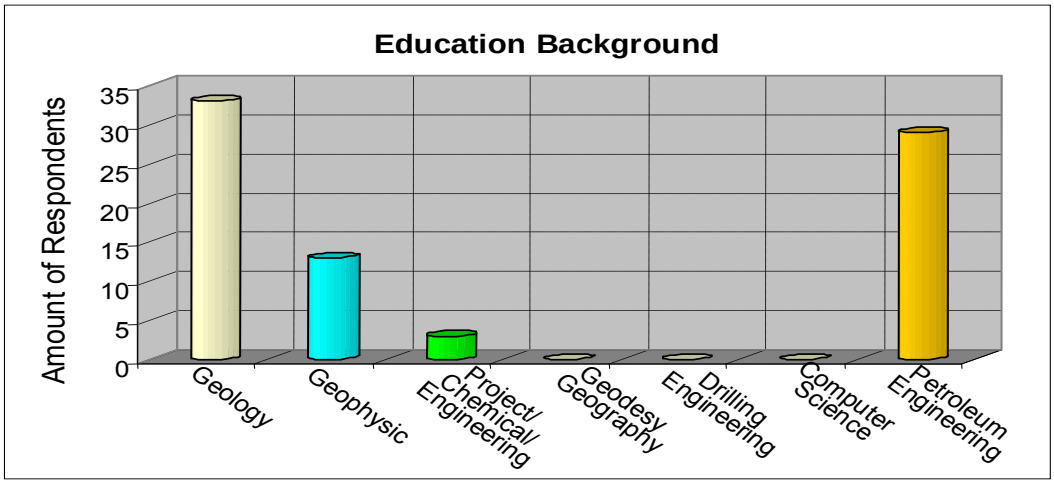
Characteristics of respondents based on education's background within this research is shown in table 22. Clearly seen in table 22 that the respondents have education's background of Geology is the highest points amounting to 33 or 42.31% of total 78 respondents. Education's background of Petroleum Engineering noted as the second population amounting to 29 or 37.19% of the population. Detailed population of education's background for Geoscientists and Petroleum Engineers is tabulated in table 22 below. Graph 6 displays the distribution of the respondent's education background in this research.

Background	Frequency	%
Geology	33	42.31
Geophysics	13	16.67
Project/Chemical/ Process Engineer	3	3.85
Geography/ Geodesy	0	0.00
Drilling Engineering	0	0.00
Computer Science	0	0.00
Petroleum Engineer	29	37.18

Table 22. Education's Background of Respondents

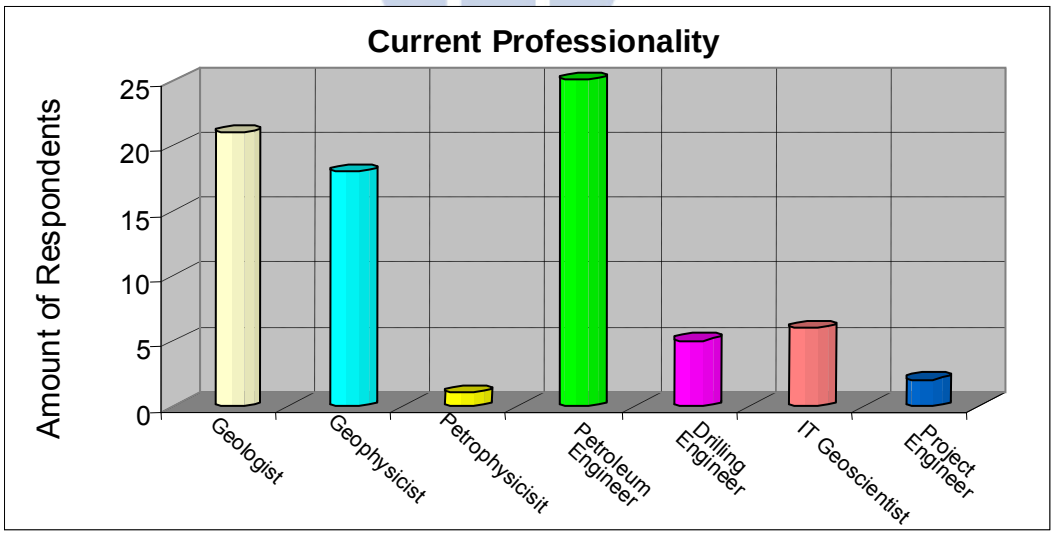
Professionality	Frequency	%
Geologist	21	26.92
Geophysicist	18	23.08
Petrophysicisit	1	1.28
Petroleum Engineer	25	32.05
Drilling Engineer	5	6.41
IT Geoscientist	6	7.69
Project Engineer	2	2.57

Table 23. Professionality of Respondents



Graph 6. Education's Background of Respondents

Table 23 above displays the amount of Geoscientists and Petroleum Engineers population according to their job's position in the company. Employees work as Petroleum Engineers are the highest population amounting to 25 (32.05%) and followed by Geologist amounting to 21 (26.92%). Detailed distribution of job position of Geoscientists and Petroleum Engineers is tabulated in table 16 and graphically displays in graph 7.



Graph 7. Current Professionality of Respondents

4.2.2. Descriptions of Research Questionnaires Items

Descriptions of instruments' items can be seen from frequency distribution of the answers of each questionnaire which in fact, to see the amount of respondents answered each of alternative answer. The results of this each frequency for each

answer will be used to analyze the expressions of respondents to the research's variables. The matrix questions related to the variables and subvariables based on the questionnaires numbers 5 through 50 are shown in table 24 below:

No	The Variables Abbreviation	Sub variables	Abbreviation	Questionnaire's Number	The Variables
1	MCP	Creating New Paradigmn	CNP	5, 6, 7	Managing Change Processes
2	MCP	Strategic Planning	SP	8, 9	
3	MCP	Communication Your Vision Getting Buy In Action	CB	10, 11	
4	MCP	Planning The Change	PC	12, 13	
5	ISG	Innovative Strategy	IS	14, 15, 16, 17, 18, 19, 20	Innovative Strategy
6	RST	Planning	PL	21, 22, 23	Recruitment Strategy
7	RST	Collaboration	C	24, 25, 26	
8	RST	Message	M	27, 28	
9	RST	Best Practice	BP	29, 30	
10	RST	Evaluation and Feedback	EF	31, 32	
11	DST	Context	CX	33, 34, 35, 36, 46, 47	Development Strategy
12	DST	Content	CT	37, 38, 39, 40, 48, 49	
13	DST	Process	P	41, 42, 43, 44, 45, 50	

Table 24. Matrix Questions based on the questionnaires numbers 5 through 50.

4.2.2.1. Analysis of Respondent's expressions to the Managing Change Process (X1).

Table 25 below describes the respondent expression to the analysis of managing change processes as the independent variable X1 Independent variable of managing change processes only measured by 4 subvariables and only operated by 9 questionnaire items with 9 indicators.

The results of frequency respond in table 25 indicate that the average highest respond from 78 respondents fall in the "agree" category (scale 4). In summary, the total of respond on scale 1 is only 17 (2.42%), total respond on scale 2 is only 95 (13.5%), total respond on scale 3 only 253 (36.04%), total respond on scale 4 is 307 (43.7%) and total respond on scale 5 is 30 (4.27%).

Frequency Distribution of Respondent's Feedback To The Variables of Questionnaires											
Quest. No	Strongly Disagree		Disagree		Neither Agree/ Nor Disagree		Agree		Strongly Agree		Total respond
	f	%	f	%	f	%	f	%	f	%	
About Management Change											
5	1	1.28	7	8.97	22	28.21	46	58.97	2	2.56	78
6	1	1.28	6	7.69	18	23.08	45	57.69	8	10.26	78
7	1	1.28	4	5.13	19	24.36	47	60.26	7	8.97	78
8	4	5.13	11	14.10	32	41.03	28	35.90	3	3.85	78
9	3	3.85	14	17.95	30	38.46	29	37.18	2	2.56	78
10	1	1.28	14	17.95	29	37.18	34	43.59	0	0.00	78
11	2	2.56	7	8.97	36	46.15	30	38.46	3	3.85	78
12	1	1.28	17	21.79	35	44.87	23	29.49	2	2.56	78
13	3	3.85	15	19.23	32	41.03	25	32.05	3	3.85	78
Total	***17***	**2.42**	***95***	**13.53**	***253***	**36.04**	***307***	**43.73**	***30***	**4.27**	***702***

Table 25. Analysis of Respondent's expressions to the Managing Change Process (X1).

Those responds indicate that the managing change process in the company give positive implication to the Geoscientists and Petroleum Engineers

4.2.2.2. Analisis of Respondent's expressions to the GRAD Innovative Strategy (X2)

The respondent expression to the analysis of GRAD Innovative Strategy as the independent variable X2 is tabulated in table 26. Independent variable of GRAD Innovative Strategy measured by several subvariables and operated by 7 questionnaire items with 7 indicators. The responds of these questionnaires from 78 respondents are described below as shown in table 26 below

The results of frequency respond in table 26 indicate that the average highest respond from 78 respondents fall in the "agree" category (scale 4). In summary,the average of respond on scale 1 is only 4 (0.73%), total respond on scale 2 is only 37 (6.78%), total respond on scale 3 only 116 (21.25%), total respond on scale 4 is 297 (54.4%) and total respond on scale 5 is 92 (16.85%).

Those responds indicate that the GRAD Innovative Strategy in the company gives positive implication to the Geoscientists and Petroleum Engineers

About Innovative Strategy											
Quest. No	Strongly Disagree		Disagree		Neither Agree/ Nor Disagree		Agree		Strongly Agree		Total respond
	f	%	f	%	f	%	f	%	f	%	
14	3	3.85	2	2.56	7	8.97	48	61.54	18	23.08	78
15	0	0.00	5	6.41	13	16.67	47	60.26	13	16.67	78
16	0	0.00	6	7.69	9	11.54	49	62.82	14	17.95	78
17	0	0.00	8	10.26	13	16.67	44	56.41	13	16.67	78
18	0	0.00	4	5.13	28	35.90	38	48.72	8	10.26	78
19	0	0.00	7	8.97	15	19.23	38	48.72	18	23.08	78
20	1	1.28	5	6.41	31	39.74	33	42.31	8	10.26	78
Total	***4***	**0.73**	***37***	**6.78**	***116***	**21.25**	***297***	**54.40**	***92***	**16.85**	***546***

Table 26. Analysis of Respondent's expressions to the GRAD Innovative Strategy (X2)

4.2.2.3. Analisis of Respondent's expressions to the Recruitment Strategy (Y1).

Table 27 below describes the respondent expression to the analysis of Recruitment Strategy as the dependent variable Y1.

About Recruitment Strategy											
Quest. No	Strongly Disagree		Disagree		Neither Agree/ Nor Disagree		Agree		Strongly Agree		Total respond
	f	%	f	%	f	%	f	%	f	%	
21	1	1.28	4	5.13	12	15.38	39	50.00	22	28.21	78
22	2	2.56	3	3.85	3	3.85	38	48.72	32	41.03	78
23	3	3.85	2	2.56	15	19.23	28	35.90	30	38.46	78
24	1	1.28	6	7.69	41	52.56	25	32.05	5	6.41	78
25	2	2.56	5	6.41	9	11.54	43	55.13	19	24.36	78
26	1	1.28	4	5.13	9	11.54	48	61.54	16	20.51	78
27	1	1.28	6	7.69	22	28.21	38	48.72	11	14.10	78
28	1	1.28	12	15.38	27	34.62	30	38.46	8	10.26	78
29	2	2.56	5	6.41	12	15.38	47	60.26	12	15.38	78
30	1	1.28	11	14.10	35	44.87	29	37.18	2	2.56	78
31	1	1.28	5	6.41	11	14.10	54	69.23	7	8.97	78
32	1	1.28	4	5.13	12	15.38	38	48.72	23	29.49	78
Total	***17***	**1.82**	***67***	**7.16**	***208***	**22.22**	***457***	**48.82**	***187***	**19.98**	**936**

Table 27. Analysis of Respondent's expressions to the Recruitment Strategy (Y1)

Dependent variable of Recruitment Strategy measured by 4 subvariables and operated by 12 questionnaire items with 12 indicators. The results of frequency respond in table 25 indicate that the average highest respond from 78 respondents fall in the "agree" category (scale 4). In summary, the total of respond on scale 1 is

only 17 (1.82%), total respond on scale 2 is only 67 (7.16%), total respond on scale 3 only 208 (22.22%), total respond on scale 4 is 457 (48.82%) and total respond on scale 5 is 187 (19.98%). Those responds indicate that the Recruitment Strategy in the company gives positive implications to the Geoscientists and Petroleum Engineers.

4.2.2.4. Analysis of Respondent's expressions to the Development and Menthoring Strategy (Y2).

The respondent expression to the analysis of development and menthoring strategy as the dependent variable Y2 is tabulated in table 28. Dependent variable of development and menthoring strategy measured by several subvariables and operated by 18 questionnaire items with 18 indicators. The responds of these questionnaires from 78 respondents are described below as shown in table 28.

About Development & Menthoring Strategy											
Quest. No	Strongly Disagree		Disagree		Neither Agree/ Nor Disagree		Agree		Strongly Agree		Total Respon
	f	%	f	%	f	%	f	%	f	%	
33	5	6.41	18	23.08	27	34.62	26	33.33	2	2.56	78
34	2	2.56	2	2.56	6	7.69	46	58.97	22	28.21	78
35	1	1.28	5	6.41	12	15.38	44	56.41	16	20.51	78
36	0	0.00	5	6.41	4	5.13	35	44.87	34	43.59	78
37	2	2.56	4	5.13	4	5.13	53	67.95	15	19.23	78
38	0	0.00	4	5.13	4	5.13	49	62.82	21	26.92	78
39	0	0.00	3	3.85	7	8.97	48	61.54	20	25.64	78
40	1	1.28	3	3.85	0	0.00	42	53.85	32	41.03	78
41	1	1.28	3	3.85	1	1.28	41	52.56	32	41.03	78
42	0	0.00	5	6.41	6	7.69	52	66.67	15	19.23	78
43	0	0.00	4	5.13	6	7.69	41	52.56	27	34.62	78
44	0	0.00	4	5.13	21	26.92	46	58.97	7	8.97	78
45	0	0.00	5	6.41	11	14.10	53	67.95	9	11.54	78
46	2	2.56	7	8.97	29	37.18	22	28.21	18	23.08	78
47	3	3.85	1	1.28	6	7.69	50	64.10	18	23.08	78
48	2	2.56	2	2.56	2	2.56	51	65.38	21	26.92	78
49	0	0.00	7	8.97	8	10.26	41	52.56	22	28.21	78
50	2	2.56	3	3.85	15	19.23	41	52.56	17	21.79	78
Total	***21***	**1.50**	***85***	**6.05**	***169***	**12.04**	***781***	**55.63**	***348***	**24.79**	**1404**

Table 28. Analysis of Respondent's expressions to the Development and Menthoring Strategy (Y2)

The results of frequency respond in table 28 indicate that the average highest respond from 78 respondents fall in the “agree” category (scale 4). In summary, the total of respond on scale 1 is only 21 (1.5%), total respond on scale 2 is only 85 (6.05%), total respond on scale 3 only 169 (12.04%), total respond on scale 4 is 781 (55.63%) and total respond on scale 5 is 348 (24.79%). Those responds indicate that the development and mentoring strategy in the company gives positive implication to the Geoscientists and Petroleum Engineers.

4.2.3. Validity and Reliability Test of Analytical Data

The validity and reliability tests follow those described in chapter III, section 3.2.3. The results of testing the data are described below:

4.2.3.1. Validity Test

Validity test conducted to the results of questionnaire surveys from 78 respondents has indicated that 44 questionnaire items are valid because of the correlation value between each questionnaire item to their score total is significant. Two other items, the Question 30 (BP2) from variable RST and Question 33 (CX1) from variable DST are invalid because of the correlation value between each questionnaire item to their score total is not significant. Table 29 below shows the distribution of initial, valid and invalid questionnaires and their variables after conducting the validity test.

Variables	Initial Questionnaire’s items	Invalid questionnaire’s items	Valid questionnaire’s items
MCP	9	0	9
ISG	7	0	7
RST	12	1	11
DST	18	1	17

Table 29. The distribution of initial, valid and invalid questionnaires and their variables after conducting the validity test.

This phenomena can be seen in the appendix 6 from the value of *corrected item-total correlation* where the correlation’s value for 44 questionnaire items is greater than r table (correlation) or 0.188 (Sutrisno Hadi, 1991). while two other items (BP2 and CX1) is smaller than 0.188. Based on the obtained correlation value, the questionnaire items which have significant value are 44 from the total

of 46 initial questionnaire items. These valid questionnaire items then, has been used for subsequent phases of statistical analysis.

Validity Test of Variable MCP (X1)	Question Code	*r*	Status	Validity Test of Variable ISG (X2)	*Question Code*	*r*	Status
Questionnaire Number	Item			Questionnaire Number	Item		
5	**CNP1**	0.457	Valid	14	**IS1**	0.741	Valid
6	**CNP2**	0.677	Valid	15	**IS2**	0.669	Valid
7	**CNP3**	0.608	Valid	16	**IS3**	0.779	Valid
8	**SP1**	0.600	Valid	17	**IS4**	0.753	Valid
9	**SP2**	0.557	Valid	18	**IS5**	0.511	Valid
10	**CB1**	0.452	Valid	19	**IS6**	0.286	Valid
11	**CB2**	0.523	Valid	20	**IS7**	0.692	Valid
12	**PC1**	0.716	Valid				
13	**PC2**	0.463	Valid				

Table 30. Validity Test of Research's Instrument of Managing Change Processes (X1) and Innovative Strategy (X2)

Table 30 and table 31 tabulate the validity and invalidity of the questionnaire items of MCP, ISG, RST and DST. The results of validity test to the points of questionnaires received from respondents about managing change processes and innovative strategy are tabulated in table 30 above. Based on the above table, it strongly indicates that all of 9 questions regarding the managing change process are valid. Therefore, those questions for the variables of managing change processes can be used for further analysis.

Validity Test of Variable of RST (Y1)	Question Code	*r*	Status	Validity Test of Variable DST (Y2)	*Question Code*	*r*	Status
Questionnaire Number	Item			Questionnaire Number	Item		
21	**P1**	0.572	Valid	33	**CX1**	**0.143**	Invalid
22	**P2**	0.773	Valid	34	**CX2**	0.697	Valid
23	**P3**	0.750	Valid	35	**CX3**	0.686	Valid
24	**C1**	0.293	Valid	36	**CX4**	0.695	Valid
25	**C2**	0.709	Valid	37	**CT1**	0.651	Valid
26	**C3**	0.707	Valid	38	**CT2**	0.692	Valid
27	**M1**	0.563	Valid	39	**CT3**	0.649	Valid
28	**M2**	0.332	Valid	40	**CT4**	0.754	Valid
29	**BP1**	0.786	Valid	41	**P4**	0.764	Valid
30	**BP2**	**0.077**	Invalid	42	**P5**	0.609	Invalid
31	**EF1**	0.657	Valid	43	**P6**	0.757	Valid
32	**EF2**	0.682	Valid	44	**P7**	0.440	Valid
				45	**P8**	0.684	Valid
				46	**CT5**	0.235	Valid
				47	**CT6**	0.616	Valid
				48	**CT7**	0.845	Valid
				49	**P9**	0.524	Valid
				50	**P10**	0.657	Valid

Table 31. Validity Test of Research's Instrument of Recruitment Strategy (Y1) and Development Strategy (Y2).

In the mean time, as seen in table 31, almost all of questionnaires from 21 to 32 about the recruitment strategy indicate as valid items as the correlation coefficient are greater than 0.188 and can be used for further analysis except the questionnaire of BP2 (Question 30) which is defined as invalid item. Based on the above table, the questionnaires from 34 to 40 about the development strategy and menthoring strategy are also indicate as valid items, therefore those questions can also be used for further analysis. The question 30 (CX1) is defined as invalid item and will not be used for further analysis.

4.2.3.2. Reliability Test and analytical data

The realibility examination applied in this research uses *Alpha Cronbach,* as explained in detail in chapter III section 3.2.3..Table 32 below tabulates the value of *Alpha Cronbach.* (α). based on the calculation results of valid's items from the variables of MCP, ISG, RST and DST. As shown in table 32, all of the alpha's value are greater than 0.7. It means that the status of all of the variables from reliability's tests are "reliable"

Test of Reliability Variables	*Symbol*	*Alpha Cronbach*	Status
MCP	X1	0.8446	Reliable
ISG	X2	0.8578	Reliable
RST	Y1	0.8949	Reliable
DST	Y2	0.9293	Reliable

Table 32. Reliability Tests of all variables in this Thesis.

After conducting the validity test for the variable of RST and DST for two times, 44 questionnaire items have been defined as valid from the total of 46 initial questionnaire's items. Therefore the value of reliability coefficient of *Cronbach's Alpha* have been derived from these 44 questionnaire items as follow:

1. The value of reliability coefficient *Cronbach's Alpha* for variable MCP is 0.8446 (≥ 0.70). It means that the instrument applied can be relied on because of that instrument has been used for many times and giving similar, stable and consistent data in measuring what needed to measure and can be relied on its reliability.
2. Reliability coefficient *Cronbach's Alpha* for variable ISG is 0.8578 (≥ 0.70).
3. Reliability coefficient *Cronbach's Alpha* for variable RST is 0.8949 (≥ 0.70).

4. Reliability coefficient *Cronbach's Alpha* for variable DST is 0.9295 (≥ 0.70).

4.2.4. Test of Hypothesis

The aims of this research is to analyze and to prove the hypothesis based on the research frameworks entitled: ***"Managing Change Processes and Their impact: The Innovative Strategy of a Major Oil and Gas Company to Recruit and Develop Geoscientists and Petroleum Engineers".***

This hypothesis have been done to clearly understand the impact of managing change processes (MCP) with its innovative strategy (ISG) of a major oil company to the recruitment (RST) and development (DST) of Geoscientists and Petroleum Engineers. However, prior to doing the hypothesis's test, to find the impact of independent variables (MCP, ISG) to the dependent variables (RST, DST) can be done by calculating the indicator's value for each variable by using the following equation:

$$\text{Indicator's value} = \frac{\sum \mathrm{N_j}}{\mathrm{a}}$$

Where:
Indicator's value = the value of respondent perspective to the indicator (variables)
Nj = amount of respondent's respond from each questionnaire's items.
a = amount of questionnaire's items which form an indicator

4.2.4.1. Recapitulation of Parameter's Model to Prove The Hypothesis

Based on the method as explained in chapter III, section 3.2.5, to prove the available hypothesis, then 4 models have been formed, they are:

1. $Y_{1i} = \beta_0 + \beta_1 X_{1i} + \beta_2 X_{2i} + \varepsilon_i$ **i = 1,2,3,…,78**

2. $Y_{2i} = \beta_0 + \beta_1 X_{1i} + \beta_2 X_{2i} + \varepsilon_i$ **i = 1,2,3,…,78**

3. $Y_{1i} = \beta_0 + \beta_1 CNP_i + \beta_2 SP_i + \beta_3 CB_i + \beta_4 PC_i + \varepsilon_i$ **i = 1,2,3,…,78**

4. $Y_{2i} = \beta_0 + \beta_1 CNP_i + \beta_2 SP_i + \beta_3 CB_i + \beta_4 PC_i + \varepsilon_i$ **i = 1,2,3,…,78**

All of those 4 models apply the ***"partial regression lines (t-Test)"*** analysis. It is necessary to conduct the classic assumption tests covering normality test, linearity test, multicolinearity test, heteroskedasticity test and autocorrelation test. (Umar, 2005). Figure 19 below highlights the summary of the partial regression analysis based on the above 4 models applied in this thesis.

Model	Linear Regression	Remark
1.	*Y1 = 0.894 + 0.100X1 + 0.683ISG* *RST = 0.894 + 0.100MCP + 0.683ISG*	MCP ISG
2.	*Y2 = 1.673 – 0.143X1 + 0.743X2* *DST = 1.673 – 0.143MCP + 0.743ISG*	MCP ISG
3.	*Y1 = 2.315 + 0.373(X1-1) – 0.007(X1-2) – 0.071(X1-3) + 0.117(X1-4)* *RST = 2.315 + 0.373CNP – 0.007SP – 0.071CB + 0.117PC*	MCP - CNP - SP - CB - PC
4.	*Y2 = 3.162 + 0.404(X1-1) – 0.084(X1-2) – 0.159(X1-3) + 0.056(X1-4)* *DST = 3.162 + 0.404CNP – 0.084SP – 0.159CB + 0.056PC*	MCP - CNP - SP - CB - PC

Figure 19. Four Models applied using Regression analysis

Detailed of calculation based on the SPSS data output by applying the above regression models for the independent variables of MCP and ISG with their cumulative frequency graphs can be seen in figure 20 below.

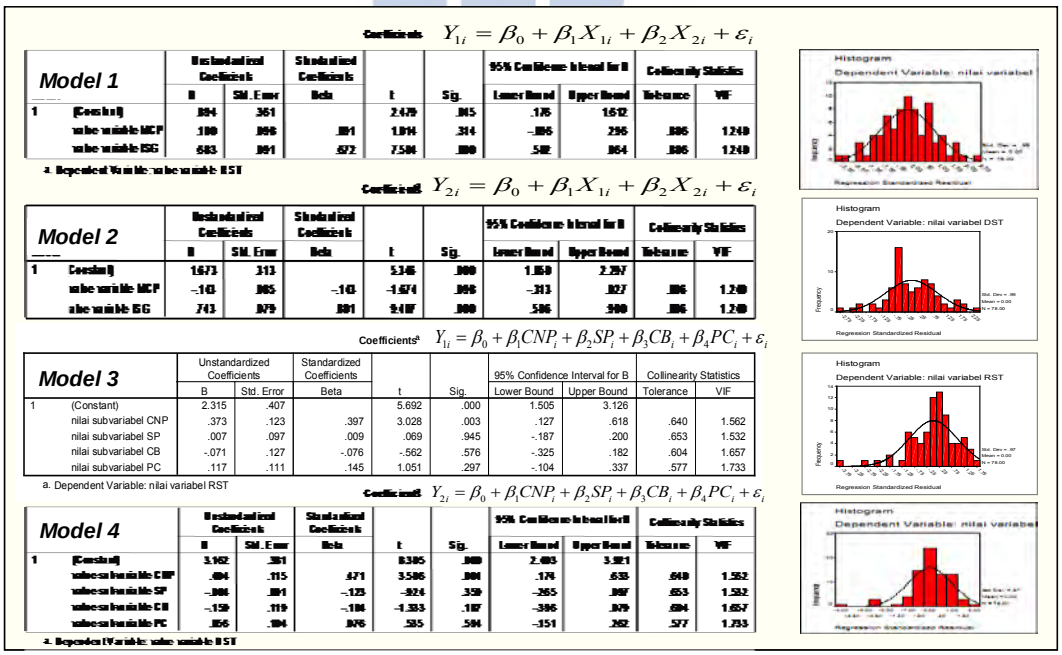
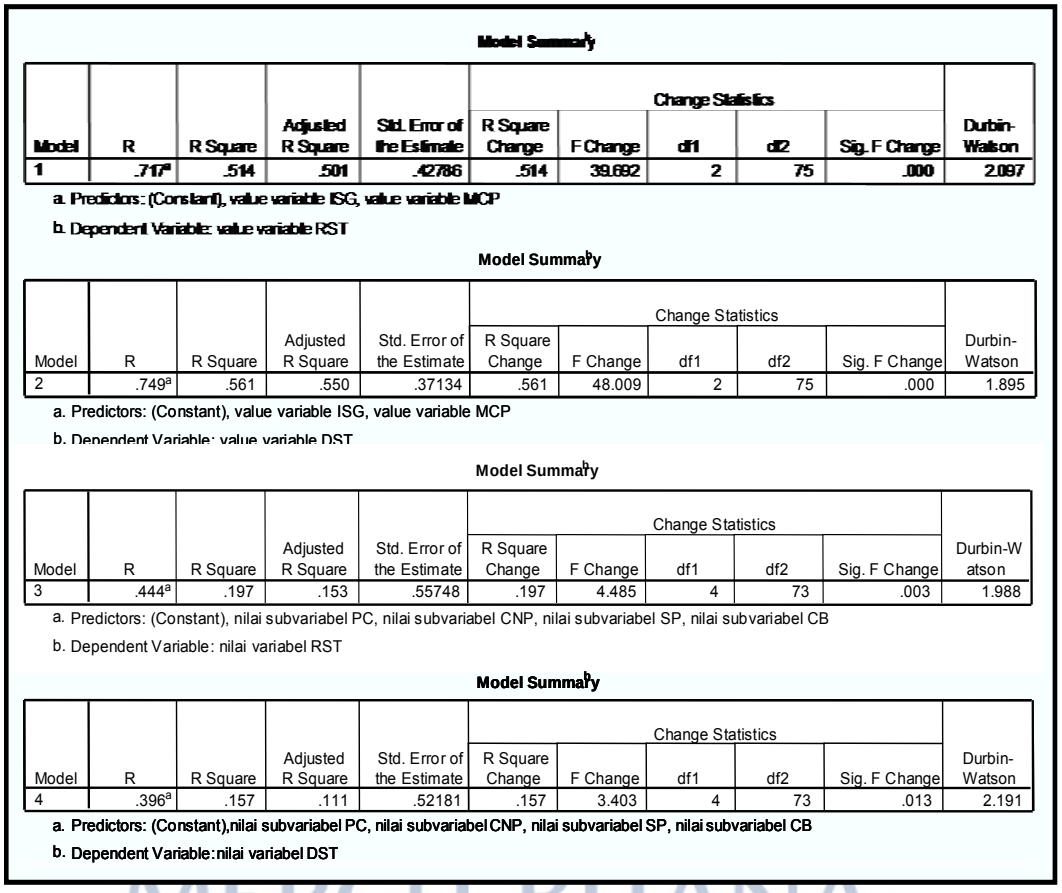


Figure 20. Summary of Detailed Partial Regression analysis and Frequency Graphs.

The model's summary for the regression using two or more independent variables R^2 (adjusted R^2) has been applied as the ***coefficient determination***. From the

SPSS's output (appendix 6) the summary values of adjusted R^2 for the above four models are displayed in figure 21. The more the value of adjusted R^2 the better for the regression model where the independent variables can explain more to the dependent variables..



Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.717[a]	.514	.501	.42786	.514	39.692	2	75	.000	2.097

a. Predictors: (Constant), value variable ISG, value variable MCP

b. Dependent Variable: value variable RST

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
2	.749[a]	.561	.550	.37134	.561	48.009	2	75	.000	1.895

a. Predictors: (Constant), value variable ISG, value variable MCP

b. Dependent Variable: value variable DST

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
3	.444[a]	.197	.153	.55748	.197	4.485	4	73	.003	1.988

a. Predictors: (Constant), nilai subvariabel PC, nilai subvariabel CNP, nilai subvariabel SP, nilai subvariabel CB

b. Dependent Variable: nilai variabel RST

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
4	.396[a]	.157	.111	.52181	.157	3.403	4	73	.013	2.191

a. Predictors: (Constant),nilai subvariabel PC, nilai subvariabel CNP, nilai subvariabel SP, nilai subvariabel CB

b. Dependent Variable:nilai variabel DST

Figure 21. Summary of Detailed coefficient determination using two or more independent variables R^2 (adjusted R^2)

The scores of significancy using wholly regression Test (Fisher Test) with the level confidence of 95% for these four models by applying Anova tables to see their significancies to the F value can be seen in figure 21. This Anova model means that if all independent tested simultaneously, then at least there is one of the two independent variables (MCP and ISG) contributes significantly impact to the either RST or DST variables.

$$Y_{1i} = \beta_0 + \beta_1 X_{1i} + \beta_2 X_{2i} + \varepsilon_i$$

Model	RST to MCP & ISG	Sum of Squares	df	Mean Square	F	Sig.
1	Regression	14.533	2	7.266	39.692	.000(a)
	Residual	13.730	75	.183		
		28.263	77			

a Predictors: (Constant), value variable ISG, value variable MCP
b Dependent Variable: value variable RST

ANOVA(b)

$$Y_{2i} = \beta_0 + \beta_1 X_{1i} + \beta_2 X_{2i} + \varepsilon_i$$

Model	DST to MCP & ISG	Sum of Squares	df	Mean Square	F	Sig.
2	Regression	13.240	2	6.620	48.009	.000 a
	Residual	10.342	75	.138		
	Total	23.582	77			

a. Predictors: (Constant), value variable ISG, value variable MCP
b. Dependent Variable: value variable DST

ANOVA(b)

$$Y_{1i} = \beta_0 + \beta_1 CNP_i + \beta_2 SP_i + \beta_3 CB_i + \beta_4 PC_i + \varepsilon_i$$

Model	RST to MCP (CNP, SP,CB,PC)	Sum of Squares	df	Mean Square	F	Sig.
3	Regression	5.575	4	1.394	4.485	.003(a)
	Residual	22.688	73	.311		
	Total	28.263	77			

a Predictors: (Constant), nilai subvariabel PC, nilai subvariabel CNP, nilai subvariabel SP, nilai subvariabel CB
b Dependent Variable: nilai variabel RST

ANOVA (b)

$$Y_{2i} = \beta_0 + \beta_1 CNP_i + \beta_2 SP_i + \beta_3 CB_i + \beta_4 PC_i + \varepsilon_i$$

Model	DST to MCP (CNP, SP,CB,PC)	Sum of Squares	df	Mean Square	F	Sig.
4	Regression	3.706	4	.926	3.403	.013 (a)
	Residual	19.877	73	.272		
	Total	23.582	77			

a. Predictors: (Constant), value subvariable PC, value subvariable CNP, value subvariable SP, value subvariable CB
b. Dependent Variable: value variable DST

Figure 22. Summary of Detailed significancy analysis using Anova Tables.

In detail, the processes of the above tests for each model are described below:

4.2.4.2. Application of Parameter's Model to The Hypothesis

This section describes the application of parameter's model as explained in the chapter III section 3.2.5 in order to answer the hypothesis. All of the determined 4 models apply the assumption tests (normality, linearity, multicolinearity, homoskedastisity and autocorrelation), and the parameter's model tests (Fisher test, t-Test and goodness of fit test).

4.2.4.2.1. Model 1. $Y_{1i} = \beta_0 + \beta_1 X_{1i} + \beta_2 X_{2i} + \varepsilon_i$ i = 1,2,3,…,78

A. Assumption Tests

Assumption tests for this model have applied normality, linearity, multicolinearity, homoskedastisity and autocorrelation.

a. Assumption normality Test (Kolmogorov – Smirnov)

From the SPSS output data as shown in appendix 6 the value of Kolmogorov-Smirnov dan *asymptotic significance (2-tailed*) for the variable of RST is ***0.352*** and ***1.000*** or probability above 0.05. Therefore, Ho is accepted means that the residual

data at this model has normal distribution. Table 33 below shows the significant value of variable RST and the status.

Variable	*Sign.*	Status
RST	1.000	Normal Distribution

Table 33. Model 1: Assumption Normality Test For Variable Y1 (RST).

b. Assumption linearity Test (Ramsey Test)

Output SPSS in the appendix 6 shows that R^2new = ***0.785*** while R^2old = ***0.514***, the amount of independent variable entered is 1 dffit and n amount of observation is ***78***, the amount of new parameter k is ***4***. From this data then the F value can be calculated based on the mentioned formula:

F calc = $\frac{(0.785-0.514)/1}{(1-0.785)/(78-4)}=93.274$

Meanwhile the F table with the degree of freedom (db) = ***74*** (n-k) and the amount of parameter 3 is ***2.70***. So $F_{calc} > F_{table}$, then it is concluded that Ho is rejected, means that the regression model is not in the linear form.

c. Assumption multicolinearity (Variance Inflation Factor)

Output SPSS in the appendix 6 shows that the value of *Variance Inflation factor* for all of independent variables (VIF) is smaller than 10. It can be concluded that there is no multikolinearity between independent variable in the regression model. Table 34 shows the results of Assumption multicolinearity Test for Variables MCP and ISG.

Variable	*VIF*	Status
MCP	1.240	No multikolinearity
ISP	1.240	No multikolinearity

Table 34. Model 1 - Assumption multicolinearity Test for Variables MCP and ISG

d. Assumption homoskedastisity (Glejser Test)

Output SPSS in the appendix 6 clearly shows that statistically there is none of the independent variables affecting the value of absolute residual of the dependent variable. This can be seen from the sgnificancy probability more than 0.05. It can be concluded that the regression model doesnot contain any of heteroskedastisity.

Table 35 below shows the value of signifancy of the independent variables of MCP and ISG.

Variable	*Sign.*	Status
MCP	1.000	Homokedastisity
ISG	1.000	Homokedastisity

Table 35. Model 1 -Assumption homoskedastisity Test for the Variables MCP and ISG

e. Autocorrelation (Durbin – Watson Test)

From the output data at appendix 6, it is known that the value of Durbin Watson adalah ***2.097*****.** Since this value is greater than the upper boundary's value of ***du*** at ***1.685*** and less than lower boundary of ***du*** at ***2.315*** than it can be concluded that there is ***no autocorrelation***.

B. Parameter's model Tests

Parameter's model tests for model 1 have applied significancy wholly regression test (Fisher Test), significancy partially regression test (t - Test) and goodness of fit test.

a. Significancy wholly regression Test (Fisher Test)

As shown in the ANOVA table at appendix 6 of the SPSS's output, it can be concluded that by the level confidence of 95%, this model is significant with the F value of ***30.692*** with the degree of freedom at 2 and ***75***, and the signicant level at ***0.000*** which is less than 0.05. This means that if all independent tested simultaneously, then at least there is one of the two independent variables (MCP and ISG) contributes significantly impact to the RST variable. On the other word, MCP and ISG contributes significantly impact to RST.

b. Significancy partially regression Test (t - Test)

From the result of t-test with the level confidence of 95%, only ISG variable significantly and positively contributes impact to the variable RST, while variable MCP is not significant to the variable of RST. This can be seen from the significant probability for MCP at ***0.314*** which is above 0.05 value, while ISG is significant at 0.05 which concludes that variable RST is affected by variable ISG. Table 36 below shows the partial regression line test for variables of MCP and ISG.

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.894	.361		2.479	.015
	nilai variabel MCP	.100	.098	.091	1.014	.314
	nilai variabel ISG	.683	.091	.672	7.504	.000

Table 36. Model 1 - Partial Regression Line Test for MCP and ISG Variables

c. Goodness of Fit Test

By using the level confidence of 95%, the obtained model can be used to predict the score's value of RST variable. Based on the results of SPSS's output as shown in appendix 6, the obtained value of R^2 is **0.514.** It means that the proportion of score variance for RST can be explained by the two independent variables (MCP and ISG) on the amount of ***51.4%*** dan the rest is explined by other factors which is not entered in this research. For the regression using two or more independent variables R^2 (adjusted R^2) has been applied as the coefficient determination. From the SPSS's output (appendix 6) the value of adjusted R^2 is ***0.501***. The more the value of adjusted R^2 the better for the regression model where the independent variables can explain more to the dependent variable.

Equation Model of Linear Regression

Based on the SPSS's output as shown in appendix 6, then the equation of linear regression has been obtained as follow:

Y1 = 0.894 + 0.100X1 + 0.683ISG

RST = 0.894 + 0.100MCP + 0.683ISG

The above equation defines that:

1. The constant number ***0.894*** defines that if independent variable is regarded as constant then the RST score is ***0.894***.
2. ISG variable has positive correlation to the RST. Regression coefficient ISG of ***0.683*** defines that the significantly increasing score of ISG for each number will increase RST's score as big as ***0.683*** by assuming that other variables are constant.

4.2.4.2.2. Model 2. $Y_{2i} = \beta_0 + \beta_1 X_{1i} + \beta_2 X_{2i} + \varepsilon_i$ **i = 1,2,3,…,78**

A. Assumption Tests

Assumption tests for this model have applied normality, linearity, multicolinearity, homoskedastisity and autocorrelation

a. Assumption normality Test (Kolmogorov – Smirnov)

From the SPSS's output (appendix 6) the value of Kolmogorov-Smirnov and *asymptotic significance (2-tailed)* for the DST variable are ***0.849*** and ***0.467*** consecutively or probability above 0.05. *Therefore, H_0 is accepted, means that the residual data in this model is* ***in Normal Distribution***. Table 37 below shows the significant value of variable DST and the status.

Variable	*Sign.*	Status
DST	0.467	Normal Distribution

Table 37. Model 2 - Assumption Normality Test for Variable Y2 (DST)

b. Assumption linearity Test (Ramsey Test)

The SPSS's output in appendix 6 shows that R^2new = ***0.785*** while R^2old = ***0,514*** (see: the result of initial regression model), the amount of new independent variable is I dffit and n observation amount is 78, and the amount of the new k parameter is 4. From this data the F_{Calc} value can be calculated as follow:

$$F_{Calc} = \frac{(0.800 - 0.561)/1}{(1 - 0.800)/(78 - 4)} = 88.43$$

Meanwhile the F_{Table} with the degree of freedom (db) = 74 (n-k) and the amount of parameter 3 is 2.70. So $F_{Calc} > F_{Table}$, then it can be concluded that H_0 is rejected means the regression model is ***not in linear form***.

c. Assumption multikolinearity (Variance Inflation Factor)

The SPSS's output in appendix 6 shows that the value of *Variance Inflation factor* (VIF) for the whole of independent variables is less than 10, so it can be concluded that there is no multicolinearity among the independent variable in the regression model. Table 38 shows the results of Assumption multicolinearity Test for Variables MCP and ISG.

Variable	*VIF*	Status
MCP	1.240	No multicolinearity
ISG	1.240	No multicolinearity

Table 38. Model 2 - Assumption Multicolinearity Test for Variables MCP and ISG

d. Assumption homoskedastisity (Glejser Test)

The results of SPSS's output in appendix 6 clearly shows that there are no significant independent variables statistically affect the residual absolute value of dependent variables. This phenomena can be seen from the value of significant probability above 0.05. So, it can be concluded that the regression model ***does not contain any heteroskedastisity.*** Table 39 below shows the value of signifancy of the independent variables of MCP and ISG.

Variable	*Sign.*	Status
MCP	1.000	Homokedastisity
ISG	1.000	Homokedastisity

Table 39. Model 2 -Assumption homoskedastisity Test for the Variables MCP and ISG

e. Autocorrelation (Durbin – Watson Test)

From the SPSS's output (appendix 6) the value of Durbin Watson adalah ***1.895.*** Since this value is greater than the upper boundary (du) at ***1.685*** but less than ***2.315*** (4-du), therefore it can be concluded that there is ***no autocorrelation***.

B. Parameter's model Tests

Parameter's model tests for model 2 have applied significancy wholly regression test (Fisher Test), significancy partially regression test (t - Test) and goodness of fit test.

a. Significancy wholly regression Test (Fisher Test)

The data of the Annova table as can be seen from the SPSS's output in the appendix 6 by using the level of confidence at 95% concludes that this model is significant to the value of F at ***48.009*** with the degree of freedom of ***2*** and ***75*** and the significancy level of 0.000 which is much lower than ***0.05***. This means that if both independent variables are tested simultaneously minimize there is one variable of MCP and ISG which has significantly contribute impact to the DST. In the other word, MCP and ISG variables have simultaneously contributed significant impact to the DST.

b. Significancy partially regression Test (t - Test)

From the result of test with the level of confidence at 95%, only ISG variable which has significantly and positively influenced the variable of DST. While the MCP variable has not significantly affected the DST variable. This phenomena can be seen from the value of significancy probability for MCP as big as 0.098 which is above 0.05. Meanwhile the ISG variable has significantly contributes impact at 0.05. From these data it can be concluded that the DST variable is influenced by the ISG variable. Table 40 below shows the partial regression line test for variables of MCP and ISG

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
2	(Constant)	1.673	.313		5.346	.000
	nilai variabel MCP	-.143	.085	-.143	-1.674	.098
	nilai variabel ISG	.743	.079	.801	9.407	.000

Table 40. Model 2 - Partial Regression Line Test for Variable MCP and ISG

c. Goodness of Fit Test

By using the level of confidence at 95%, the obtained model can be used to predict the value of DST score. Based on the SPSS's output in appendix 6, the value of R^2 is ***0.561***. This means that the variance proportion score of the DST can be explained by both of the independent variables (MCP and ISG) as big as 56.1% and the rest of 43.9% is explained by other variables which are not involved in this research. For the regression with two or more independent variables, the *Adjusted* R^2 will be used as coefficient determination. Based on the SPSS's output in appendix 6, the calculated value of *Adjusted* R^2 is ***0.550***. The greater the value of *adjusted* R^2 the better for the regression model, where the independent variables can explain more about the dependent variables.

Model of Linear Regression Equation

Based on the SPSS's output in appendix 6 then the linear regression equation model can be defined as follow:

Y2 = 1.673 – 0.143X1 + 0.743X2

DST = 1.673 – 0.143MCP + 0.743ISG

The above equation shows that:

1. The constant number of 0.673 defines that if the values of independent variables are regarded as constant then the DST score is 0.673.
2. The ISG variable has positive correlation to the DST. Regression coefficient ISG at 0.743 defines that significantly increase of ISG score as big as one point will increase the DST score as big as 0.743 by assuming that the other variables are constant.

4.2.4.2.3. Model 3. $RST(Y_{1i}) = \beta_0 + \beta_1 CNP_i + \beta_2 SP_i + \beta_3 CB_i + \beta_4 PC_i + \varepsilon_i$ **= 1,2,3,…,78**

a. Assumption normality Test (Kolmogorov – Smirnov)

From the SPSS's output (appendix 6) the value of Kolmogorov-Smirnov and *asymptotic significance (2-tailed)* for the RST variable are ***1.040*** and ***0.230*** consecutively or probability above 0.05. *Therefore, H_0 is accepted, means that the residual data in this model is* ***in Normal Distribution****.* Table 41 below shows the significant value of variable RST and the status.

Variable	*Sign.*	Status
RST	0.230	Normal Distribution

Table 41. Model 3 - Assumption Normality Test for Variable Y1 (RST)

b. Assumption linearity Test (Ramsey Test)

The SPSS's output in appendix 6 shows that R^2new = ***0.759*** while R^2old = ***0,153*** (see: the result of initial regression model), the amount of new independent variable is 1 dffit and n observation amount is ***78***, and the amount of the new k parameter is 6. From this data the F_{Calc} value can be calculated as follow:

$$F_{Calc} = \frac{(0.759 - 0.153)/1}{(1 - 0.759)/(78 - 6)} = 181.046$$

Meanwhile the F_{Table} with the degree of freedom (db) = ***72*** (n-k) and the amount of parameter 5 is ***2.32***. So ***$F_{Calc} > F_{Table}$*** , then it can be concluded that *H_0* is rejected means the regression model is ***not in linear form***.

c. Assumption multicolinearity (Variance Inflation Factor)

The SPSS's output in appendix 6 shows that the value of *Variance Inflation factor* (VIF) for the whole of independent variables is less than 10, so it can be concluded

that there is no multicolinearity among the independent variable in the regression model. Table 42 shows the results of Assumption multicolinearity Test for subvariables MCP (CNP, SP, CB and PC).

Variable	*VIF*	Status
CNP	1.562	No multicolinearity
SP	1.532	No multicolinearity
CB	1.657	No multicolinearity
PC	1.733	No multicolinearity

Table 42. Model 3 - Assumption Multikolinearity Test for all Subvariables MCP (CNP, SP, CB and PC)

d. Assumption homoskedastisity (Glejser Test)

The results of SPSS's output in appendix 6 clearly shows that there are one significant independent variable statistically affects the residual absolute value of dependent variables. This phenomena can be seen from the value of significant probability below ***0.05***. So, it can be concluded that the regression model ***contains no phenomenon of heteroskedastisity.***

Variable	*Sign.*	Status
CNP	0.006	Homokedastisity
SP	0.357	Homokedastisity
CB	0.650	Homokedastisity
PC	0.321	Homokedastisity

Table 43. Model 3 - Assumption Homoskedastisity Test for all Subvariables CNP, SP, CB and PC of MCP to the Variable RST

Table 43 above shows the value of signifancy of the independent subvariables of CNP, SP, CB and PC.

e. Autocorrelation (Durbin – Watson Test)

The SPSS's output (appendix 6) shows that the value of Durbin Watson adalah **1.988.** Since this value is greater than the upper boundary (du) at ***1.741*** but less than ***2.259*** (4-du), therefore it can be concluded that there is ***no autocorrelation***.

B. Parameter's model Tests

Parameter's model tests for model 3 have applied significancy wholly regression test (Fisher Test), significancy partially regression test (t - Test) and goodness of fit test.

a. Significancy wholly regression Test (Fisher Test)

The data of the Annova table as can be seen from the SPSS's output in the appendix 6 by using the level of confidence at 95% concludes that this model is significant to the value of F at ***4.485*** with the degree of freedom of ***4*** and ***73*** and the significancy level of ***0.003*** which is lower than ***0.05***. This means that if both independent subvariables are tested simultaneously minimize there is one of independent subvariables of CNP, SP, CB dan PC which has significantly contribute impact to the RST. In the other word, ***CNP, SP, CB dan PC subvariables have simultaneously contributed significant impact to the RST.***

b. Significancy partially regression Test (t - Test)

From the result of test with the level of confidence at 95%, from independent variable MCP, only CNP subvariable which has significantly and positively influenced the variable of RST. While the other subvariables (SP, CB and PC) does not significantly affect the RST variable. This phenomena can be seen from the value of significancy probability for subvariables SP, CB and PC as big as ***0.945, 0.576*** and ***0.297*** consecutively which are above ***0.05***. Meanwhile the ISG variable has signicantly contributes impact at 0.05. Meanwhile the subvariable CNP is significant at ***0.05***. From these data it can be concluded that from the whole subvariables of MCP (CNP, SP, CB and PC), the RST variable is influenced by the CNP subvariable only. Table 44 below shows the partial regression line test for subvariables of CNP, SP, CP and PC.

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
3	(Constant)	2.315	.407		5.692	.000
	Value of subvariabel CNP	.373	.123	.397	3.028	.003
	Value of subvariabel SP	.007	.097	.009	.069	.945
	Value of subvariabel CB	-.071	.127	-.076	-.562	.-576
	Value of subvariabel PC	.117	.111	.145	1.051	.297

Table 44. Model 3 - Partial Regression Line Test for all Subvariables CNP, SP, CB and PC of MCP to the Dependent Variable RST.

By using the level of confidence at 95%, the obtained model can be used to predict the value of RST score. Based on the SPSS's output in appendix 6, the value of R^2 is ***0.197***. This means that the variance proportion score of the RST can be

explained by both of the independent variables (MCP and ISG) as big as 19.7% and the rest of 80.3% is explained by other variables which are not involved in this research.

For the regression with two or more independent variables, the *Adjusted* R^2 will be used as coefficient determination. Based on the SPSS's output in appendix 6, the calculated value of *Adjusted* R^2 is ***0.153***. The greater the value of *adjusted* R^2 the better for the regression model, where the independent variables can explain more about the dependent variables.In determining of the interpretation of *adjusted* R^2 values, the logic relevance or teoritical values of subvariables of the independent variable which explain the dependent variable. If in this processes the values of *adjusted* R^2 obtained are high means showing good data, however, the low vales of *adjusted* R^2 do not mean that the model is bad (Gujarati, 1995: 102)

Model of Linear Regression Equation

Based on the SPSS's output in appendix 6 then the linear regression equation model can be defined as follow:

Y1 = 2.315 + 0.373(X1-1))+ 0.007(X1-2) – 0.071(X1-3) + 0.117(X1-4)

RST = 2.315 + 0.373CNP + 0.007SP – 0.071CB + 0.117PC

The above equation shows that:

1. The constant number of ***2.315*** defines that if there are no X1 and X2, then, the value of Y1 is 0.035 while the values of independent subvariables are regarded as constant then the RST score is ***2.315***
2. The CNP subvariable has positive correlation to the RST. Regression coefficient CNP of ***0.373*** defines that the significantly increase of CNP score as big as one point will increase the RST score as big as ***0.373*** by assuming that the other subvariables are constant.
3. Regression coefficient of PC of ***0.007*** has defined that every increasing of PC will increase the RST as big as ***0.007***.
4. Regression coefficient of PC of ***0.117*** has defined that every increasing of PC will increase the RST as big as ***0.117***.

4.2.4.2.4. Model 4. $Y_{2i} = \beta_0 + \beta_1 CNP_i + \beta_2 SP_i + \beta_3 CB_i + \beta_4 PC_i + \varepsilon_i$

i = 1,2,3,…,78

A. Assumption Tests

Assumption tests for this model have applied normality, linearity, multicolinearity, homoskedastisity and autocorrelation.

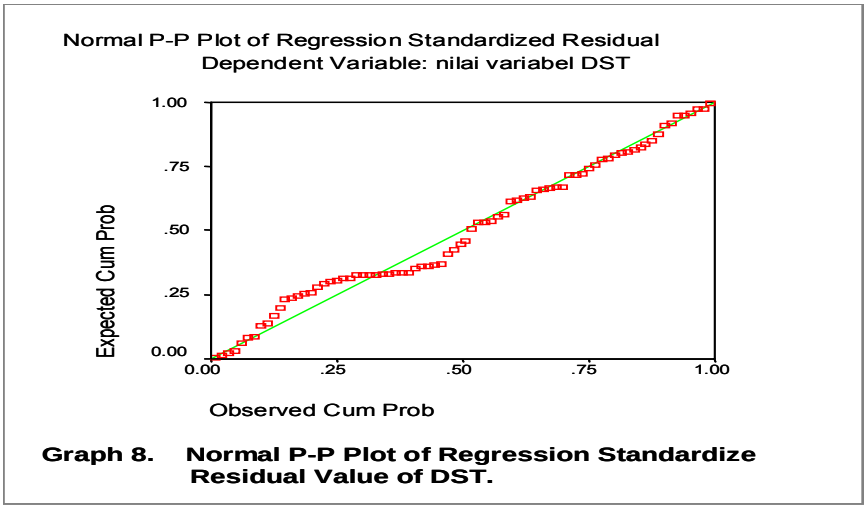
a. Assumption normality Test (Kolmogorov – Smirnov)

From the SPSS's output (appendix 6) the value of Kolmogorov-Smirnov and *asymptotic significance (2-tailed)* for the DST variable are ***1.368*** and ***0.047*** consecutively or probability below 0.05. *Therefore, H_0 is rejected, means that the residual data in this model is* ***not in Normal Distribution***. Table 45 below shows the significant value of variable DST and the status.

Variable	*Sign.*	Status
DST	0.047	Not Normal Distribution

Table 45. Model 4 - Assumption Normality Test for Variable Y2 (DST)

Assumption Normality can also be tested by using *P-P plot of regression standardised* between *expected cumulative probability* and *observed cumulative probability.* If the value identics with the straight line at normal plot then assumption normal has been fulfilled. From the SPSS's output (appendix 6), the residual values are present around the straight line and follow the direction of the line. This typical values can be interpreted that the rest values distribute as normal as shown in graph 8.



Graph 8. Normal P-P Plot of Regression Standardize Residual Value of DST.

b. Assumption linearity Test (Ramsey Test)

The SPSS's output in appendix 6 shows that R^2new = ***0.697*** while R^2old = ***0,157*** (see: the result of initial regression model), the amount of new independent variable is 1 dffit and n observation amount is ***78***, and the amount of the new k parameter is 6. From this data the F_{Calc} value can be calculated as follow:

$$F_{Calc} = \frac{(0.697-0.157)/1}{(1-0.697)/(78-6)} = 128.32$$

Meanwhile the F_{Table} with the degree of freedom (db) = ***72*** (n-k) and the amount of parameter 5 is ***2.32***. So $F_{Calc} > F_{Table}$, then it can be concluded that H_0 is rejected means the regression model is ***not in linear form***.

c. Assumption multicolinearity (Variance Inflation Factor)

The SPSS's output in appendix 6 shows that the value of *Variance Inflation factor* (VIF) for the whole of independent variables is less than 10, so it can be concluded that there is no multicolinearity among the independent variable in the regression model. Table 40 shows the results of Assumption multicolinearity Test for subvariables MCP (CNP, SP, CB and PC).

d. Assumption homoskedastisity (Glejser Test)

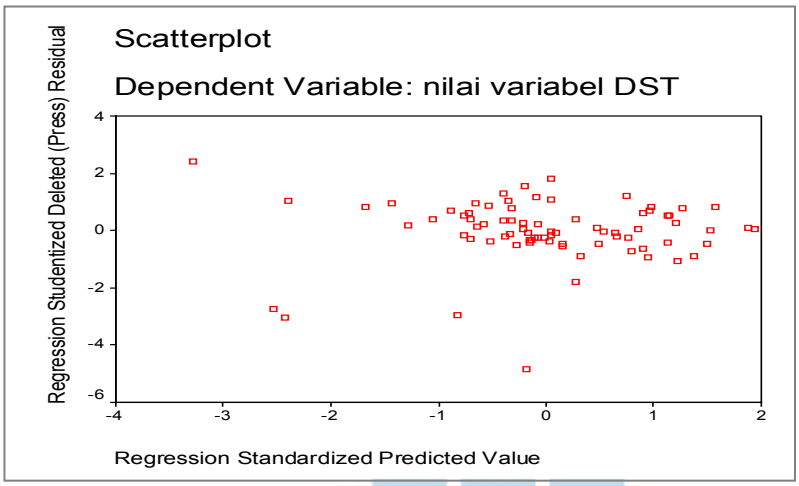
The results of SPSS's output in appendix 6 clearly shows that there are one significant independent variable statistically affects the residual absolute value of dependent variables. This phenomena can be seen from the value of significant probability below ***0.05***. So, it can be concluded that the regression model ***contains phenomenon of heteroskedastisity.*** Table 46 below shows the value of signifancy of the independent subvariables of CNP, SP, CB and PC.

Variable	*Sign.*	Status
CNP	0.087	Homokedastisity
SP	0.048	Heteroskedastisity
CB	0.201	Homokedastisity
PC	0.182	Homokedastisity

Table 46. Model 4 - Assumption Homoskedastisity Test for all Subvariables CNP, SP, CB and PC of MCP to Variable DST

To detect whether there is any phenomenon of heteroskedastisity can also be done by looking at the plot between residual quadran (ε_i^2) and the prediction value from Y. If the plot does not show any certain design then it can be concluded that

there is no heteroskedastisity. From the results of SPSS's output in appendix 6 can be seen that the plot between residual quadran (ε_i^2) and the prediction value of dependent variable does not form any certain design, means that the residual of freedom assumption and assumption homoskedastisity are fulfilled. The scatter plot of the dependent variable DST is shown below in graph 9.



Graph 9. Scatter Plot Dependent Variable DST

e. Autocorrelation (Durbin – Watson Test)

The SPSS's output (appendix 6) shows that the value of Durbin Watson adalah **2.191.** Since this value is greater than the upper boundary (du) at ***1.741*** but less than ***2.259*** (4-du), therefore it can be concluded that there is ***no autocorrelation***.

B. Parameter's model Tests

Parameter's model tests for model 3 have applied significancy wholly regression test (Fisher Test), significancy partially regression test (t - Test) and goodness of fit test.

a. Significancy wholly regression Test (Fisher Test)

The data of the Annova table as can be seen from the SPSS's output in the appendix 6 by using the level of confidence at 95% concludes that this model is significant to the value of F at ***3.403*** with the degree of freedom of ***4*** and ***73*** and the significancy level of *0.013* which is lower than ***0.05***. This means that if both independent subvariables are tested simultaneously minimize there is one of independent subvariables of CNP, SP, CB dan PC which has significantly

contribute impact to the DST. In the other word, ***CNP, SP, CB dan PC subvariables have simultaneously contributed significant impact to the DST.***

b. Significancy partially regression Test (t - Test)

From the result of test with the level of confidence at 95%, from independent variable MCP, only CNP subvariable which has significantly and positively influenced the variable of DST. While the other subvariables (SP, CB and PC) does not significantly affect the DST variable. This phenomena can be seen from the value of significancy probability for subvariables SP, CB and PC as big as ***0.359, 0.187*** and ***0.594*** consecutively which are above ***0.05***. Meanwhile the ISG variable has signicantly contributes impact at 0.05.

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
4	(Constant)	3.162	.381		8.305	.000
	Value of subvariabel CNP	.404	.115	.471	3.506	.001
	Value of subvariabel SP	-.084	.091	-.123	-.924	.359
	Value of subvariabel CB	-.159	.119	-.184	-1.333	.187
	Value of subvariabel PC	.056	.104	.076	.535	.594

Table 47. Model 4 - Partial Regression Line Test for all Subvariables CNP, SP, CB and PC of MCP to the Variable DST

The subvariable CNP is also significant at ***0.05***. From these data it can be concluded that from the whole subvariables of MCP (CNP, SP, CB and PC), the DST variable is influenced by the CNP subvariable only. Table 47 above shows the partial regression line test for subvariables of CNP, SP, CP and PC.

c. Goodness of Fit Test

By using the level of confidence at 95%, the obtained model can be used to predict the value of DST score. Based on the SPSS's output in appendix 6, the value of R^2 is ***0.157***. This means that the variance proportion score of the DST can be explained by both of the independent variables (MCP and ISG) as big as 15.7% and the rest of 84.3% is explained by other variables which are not involved in this research. For the regression with two or more independent variables, the *Adjusted* R^2 will be used as coefficient determination. Based on the SPSS's output in appendix 6, the calculated value of *Adjusted* R^2 is ***0.111***. The greater the value of

adjusted R^2 the better for the regression model, where the independent variables can explain more about the dependent variables.

Model of Linear Regression Equation

Based on the SPSS's output in appendix 6 then the linear regression equation model can be defined as follow:

Y2 = 3.162 + 0.404(X1-1) – 0.084(X1-2) – 0.159(X1-3) + 0.056(X1-4)

DST = 3.162 + 0.404CNP – 0.084SP – 0.159CB + 0.056PC

The above equation shows that:

1. The constant number of ***3.162*** defines that if there are no X1 and X2, then, the value of Y1 is 0.035 while the values of independent subvariables are regarded as constant then the DST score is ***3.162***
2. The CNP subvariable has positive correlation to the DST. Regression coefficient CNP of ***0.404*** defines that the significantly increase of CNP score as big as one point will increase the DST score as big as ***0.404*** by assuming that the other subvariables are constant.
3. Regression coefficient of PC of ***0.056*** has defined that every increasing of PC will increase the DST as big as ***0.056***.

4.2.5. Data Transformation to Hypothesis Test

4.2.5.1. Impact of X1 Variable to Y1 Variable

Based on the previous test conducted in the section 4.2.4.2.1, it can be concluded that the X1 variable (MCP) has no significantly impact to the variable Y1 (RST). This conclusion can be seen from the SPSS's output in the appendix 6 which shows that the value of significancy probability for MCP at ***0.314*** which fall far above 0.05.

4.2.5.2. Impact of X1 Variable to Y2 Variable

Based on the previous test conducted in the section 4.2.4.2.2, it can be concluded that the X1 variable (MCP) has also not contributed significantly impact to the variable Y2 (DST). This conclusion can be seen from the SPSS's output in the appendix 6 which shows that the value of significancy probability for MCP at ***0.098*** which fall far above 0.05.

4.2.5.3. Impact of subvariables X1 (X1-1, X1-2, X1-3, X1-4) to the variable Y1

Based on the previous test conducted in the section 4.2.4.2.3, it can be concluded that the subvariable CNP has significantly contributed impact to the Y1 (RST). This conclusion can be seen from the SPSS's output in the appendix 6 which shows that the value of significancy probability for MCP at ***0.003*** which is far below 0.05. While other subvariables (SP, CB and PC) has no significantly contributed impact to the Y2 (DST). This conclusion can be seen from the SPSS's output in the appendix 6 which shows that the value of significancy probability for the subvariables SP, CB and PC at ***0.945, 0.576*** and ***0.297*** consecutively which fall far above 0.05.

4.2.5.4. Impact of subvariables X1 (X1-1, X1-2, X1-3, X1-4) to the variable Y2

Based on the previous test conducted in the section 4.2.4.2.4, it can be concluded that the subvariable CNP has significantly contributed impact to the Y2 (DST). This conclusion can be seen from the SPSS's output in the appendix 6 which shows that the value of significancy probability for MCP at ***0.001*** which is far below 0.05. While other subvariables (SP, CB and PC) has no significantly contributed impact to the Y2 (DST). This conclusion can be seen from the SPSS's output in the appendix 6 which shows that the value of significancy probability for the subvariables SP, CB and PC at ***0.359, 0.187*** and ***0.594*** consecutively which fall far above 0.05.

4.2.5.5. Simultaneously impact of variables X1 & X2 to the variable Y1 & Y2

Based on the previous test conducted in the section 4.2.4.2.2, it can be concluded that the variable X1 (MCP) and X2 (ISG) has simultaneously contributed significant impact to both the Y1 (RST) and the Y2 (DST). This conclusion can be seen from the Annova table from the SPSS's output in the appendix 6 which shows that the value of significancy probability for MCP at ***0.000*** which is far below 0.05.

4.2.5.6. Impact of X2 variable to Y1 and Y2 Variables

Based on the previous test conducted in the section 4.2.4.2.2, it can be concluded that X2 variable (ISG) has significantly contributed impact to both variable Y1

(RST) and variable Y2 (DST). This conclusion can be seen from the SPSS's output in the appendix 6 which shows that the value of significancy probability for X2 (ISG) to Y1 (RST) and Y2 (DST) at ***0.000*** and ***0.000*** which fall far below 0.05.

4.2.5.7. Impact of X2 Variable to Y2 Variable

Based on the previous test conducted in the section 4.2.4.2.2, it can be concluded that X2 variable (ISG) has significantly contributed impact to the variable Y2 (DST). This conclusion can be seen from the SPSS's output in the appendix 6 which shows that the value of significancy probability for ISG at ***0.000*** which fall far below 0.05.

4.3. Discussions of Analytical Data to Hypothesis

In this research, to test the main hypothesis whether the managing change processes and innovative strategies have contributed impact to the recruitment and development strategy or have simultaneously contributed impact of the independent variables (X1 and X2) to the dependent variables (Y1 and Y2) has been based using Fisher's test. By appllying decision if $F_{calc} > F_{table}$, then Ho is rejected, means that there is simultaneously contribute impact of independent variables to the dependent variables. Detailed analysis of managing change processes variables (CNP, SP, CB and PC) has been done using the model 3 to analyze which part of this managing change actions have greater impact to the recruitment and development strategy. The analysis has also concluded about the relation of innovative strategy to the recruitment and development strategies. The descriptions below explain in detail about the results of the statistical analysis to the hypothesis answers.

4.3.1. General Hypothetical Tests

Based on the whole coefficient tests, the obtained value of $F_{calc} = 93.274$ which is greater than $F_{table} = 2.70$. This shows that there is simultaneously positive and significant impact of variables of managing change processes (X1) and innovative strategy (X2) to the variable of recruitment strategy (Y1). The same phenomena can be seen for the variable of development strategy (Y2), where $F_{calc} = 88.43$ is greater than $F_{table} = 2.70$ as also can be seen from the analysis reslted from the

Annova table. This means that there is simultaneously positive and significant impact of variable of managing change processes (X1) and innovative strategy (X2) to the variable of recruitment strategy (Y1), The same phenomena can be seen for the variable of development strategy (Y2),

From the data analysis, the discriminat analyses has indicated the determinative value of 51.4% to the RST (Y1). This shows that the value of correlation coefficient between variables of managing change processes (X1) and innovative strategy (X2) significantly and simultaneously contributed impact to the variable of recruitment strategy (Y1). It indicates that the contribution of managing change processes and innovative strategy give around 51.4% while the rest of 48.6% is affected by other factors.

The discriminat analyses to the factors of managing change processes and innovative strategy to the development strategy indicates the determinative value of 56.1%. This shows that the value of correlation coefficient between variables of managing change processes (X1) and innovative strategy (X2) significantly and simultaneously contributed impact to the variable of development strategy (Y2). It indicates that the contribution of managing change processes and innovative strategy give 56.1% while the rest of 43.9% is affected by other factors The above analysis shows that the managing change processes and innovative strategy has simultaneously and significantly contributed posiitve impact to the recruitment and development strategies.

4.3.2. Individual Hypothetical Tests

For the test of hypothesis in subhypothesis 1, 2, 3 and 4 or each individual test of dependent variables to the independent variables, the results of statistical analysis as desribed in the previous section using model 1, model 2 and model 3 have been applied based on the t calc model, then the following relationship can be drawn.

Subhypothesis 1

Critically review the impact of Managing Change processes happened in Multikopilindo and to identify what organizational change actions are most likely gives the impact to the strategy of the Recruitment and Development of Geoscientists and Petroleum Engineers in Multikopilindo.

Subhypothesis 1 contains two subquestions which relates to the contribution of managing change processes to the organizational change capabilities and its impact to the recruitment and development strategies as explains below:

a. ***Identification of what managing change processes actions which has significantly contributed to the shift of recruitment and development strategies.***

From the questionnaires survey, it can be seen that all of 4 subvariables of managing change processes using Tearle model (strategic planning, creating new paradigm, communication about vision and planning the change) have significantly contributed impacts to the recruitment and development strategies in Multikopilindo. Regression model 3 has interpreted that variable MCP and ISG has simultaneously contributed significant impact to both the RST and the DST. This conclusion can be seen from the Annova table which shows that the value of significancy probability for both MCP and ISG at ***0.000*** which is far below 0.05. As shown in the analysis in model 3, for the MCP variable, the creating new paradigmn (CNP subvariable) has strongly contributed impact more than others to the recruitment and development strategies.

b. ***Identification of direct Impact of Managing Change processes to the recruitment and development of Geoscientists and Petroleum Engineers in Multikopilindo.***

Relationship of managing change processes to the recruitment strategy is shown by $t_{calc} = 0.314 > t_{table,}$ then the decision is H_o is accepcted, and H_1 is rejected.. The same phenomena can be seen for the relationship of managing change processes to the development strategy which shows that $t_{calc} = 0.098 > t_{table,}$ then the decision is H_o is accepted, and H_1 is rejected. both means that there is no direct significant impact of managing change processes to the recruitment development strategies. Direct analysis for of MCP to Y1 and Y2 in model 3 and 4 indicates that some subvariabes of MCP has **t_{calc}** value less than 0.05. Application of model 1 and model 2 using Fisher test indicates that together with ISG, the MCP has significantly contributed impact to the RST and DST. It can be concluded that there are some subvariables.in managing change processes have significantly contributed impact more than other subvariables to the recruitment and development strategies.

Subhypothesis 2

Explore the impact of innovative strategy (GRAD Project) applied after Management Change happened in Multikopilindo Corporate to the Geoscientists and Petroleum Engineers workers in Multikopilindo

Relationship of innovative strategy to the recruitment strategy is shown by t_{calc} = 0.00 < $t_{table,}$ then the decision is H_o is rejected, and H_1 is accepted. The same phenomena can be seen for the relationship of innovative strategy to the development strategy which shows that t_{calc} = 0.00 < $t_{table,}$ then the decision is H_o is rejected, and H_1 is accepted. Based on the above relationship, It can be concluded that the innovative strategy has significantly contributed positive impact to the recruitment and development strategies.

Subhypothesis 3

Explore whether the innovative strategy (GRAD strategy Project) applied in Multikopilindo addressed to Geoscientists and Petroleum Engineers can solve the problems of their competencies and development.

Selected variables of questionnaires which have relationship to the competencies from development and mentoring strategies indicate that the value shown by level of significancy of 0.00 fall in to the decision of H_o is rejected, and H_1 is accepted. It means that there is significant impact of innovative strategy applied to the competencies and development of Geoscientists and Petroleum Engineers. Based on the above relationship, It can be concluded that the innovative strategy has significantly contributed positive solving problems to the competencies and development of Geoscientists and Petroleum Engineers.

Subhypothesis 4

Identify the best ways in implementing this innovative strategy (GRAD Project) to the Geoscientists and Petroleum Engineers to address business needs in Multikopilindo

In identifying the best way in implementing this type of innovative strategy, the description in this thesis has been based on the following criteria:

- Respondent's Opinion Based on the Survey Results.
- Current Model in Implementing Strategy
- Curricula Design and Framework to make it better

A. Respondent's Opinion Based on the Survey Results.

Based on the survey results concerning innovative strategy of the GRAD Project, 61.5% of respondents believe that this project has created greater opportunities for their training and development, 60.3% agreed that the program can create the ability to present results of their work in a skilled fashion in both oral and written forms. 62.8% of respondents agreed that this program can identify and train skilled manpower developments. 56% of respondents agreed that this project can provide better training for them and can increase the yield of performance level and the status of higher education. 48.7% of respondents agreed that this project need larger overall budget in providing strategic appointments, however, they like that the project curricula should be revised and repackaging the program to make it suitable for the countries from where the Geoscientists and Petroleum Engineers come from. In term of whether the program can act to identify successful and sustainable reasons for success, 39.7% of respondents have given the opinion of neither disagree nor agree.

B. Current Model in Implementing Strategy.

Detailed strategic shift for recruiting, training and development have been discussed in Chapter II section 2.2.2.2.4, which consists of two main strategies, they are:

a. Global Recruiting Strategy Changes
b. Global Training & Development Strategy Changes

The shifting in the strategy:aimed to obtain the desired GRAD outcomes and the challenges in implementing the program have been discussed in Chapter III section 3.3 to section 3.6. By identifying the desired outcomes and challenges at present, the ways in implementing the program are as follows:

1. Coordination and implementation

a. Plan globally, coordinate centrally, implement locally
b. GRAD Global Steering Committee will insure global coordination, local implementation, and program evaluation/improvement.

2. Model of consistent development Program

Model of consistent development program consists of two phases, they are:

a. Year 1 and 2 Development Program --- Phase 1

- Dependent contributors
- Job Rotation/exposure with “real” work in home country if possible
- Consistent training
- Mentoring support

b. Year 3, 4 and 5 Global Assignments Program ---Phase 2

- Independent contributors
- Top talent will go on an international assignment of 6-18 months on T&D Expat policy
- Identify a preferred TMT
- Consistent training
- Mentoring support

3. Mentoring Support

Mentoring support is very important as part of continuing education and directing employees to doing right. The GRAD mentoring program provides a globally consistent approach for mentoring within Phase 1 and Phase 2 of the GRAD development model. The GRAD mentoring program advantages have been discussed in Chapter III, section 3.5. A complete mentoring model is provided in appendix 5. The implementation of this mentoring program covers:

- Home BU pays salary and benefits
- Centrally coordinated, locally implemented
- GRADS Steering Committee has program oversight

C. Curricula’s Design and Framework to make it better

Based on the above description relates to this innovative strategy project, the best way in implementing of the program for Geoscientists and Petroleum Engineers, then, can be added by a systematic manner by considering the following actions:

1. Entry Requirements for Geoscientists and Petroleum Engineers.
2. Training and Developments Model
3. Workforce Framework.

1. Entry Requirements for Geoscientists and Petroleum Engineers.

Since geoscience and petroleum engineering are specialised career, it usually

requires more than a good education degree. Pre-entry experience is desirable although there may be occasional opportunities for graduates with a first degree only. Entry without previous experience is possible, but vacation work or placements are likely to improve the chances.

Potential candidates will need to show evidence of the following:

- the capacity to work in multidisciplinary teams, especially with engineers in production, where it is helpful to have some basic knowledge about specialities outside geoscience;
- a strong basic technical grounding and an understanding or knowledge of industry-specific techniques (more often learnt on the job);
- a good understanding of earth science concepts and the ability to apply them to new situations;
- a deeper understanding of several specific fields, such as stratigraphy or seismic interpretation;
- a wider appreciation of general science, such as physics or engineering;
- the ability to learn quickly;
- good IT skills; excellent communication and interpersonal skills.

2. Training and Developments Model

The major oil companies operate graduate training programmes, which generally deliver on-the-job training through a series of projects or assignments alongside structured modules aimed at giving an overview of the business and developing expertise in general and specialist areas.

The training and development's modul covering:

- The projects may be based in different geoscience and petroleum engineering disciplines and some may be in the form of overseas placements.
- The major oil companies often plan their training carefully so that it meets the professional requirements for employees.
- Professional development continues with tailored training in various locations, allowing networking with colleagues from around the world. Subsequent training tends to be based on supervised experience through a combination of in-service courses, relating to topics such as new software, and on-the-job training alongside experienced staff.
- Relatively early positions of responsibility would be as team leader for an asset,

such as an individual oil field or development prospect, co-ordinating the work of geoscientists and petroleum engineers.

- It is fairly easy to broaden their knowledge by moving between exploration and production -the role of the geoscientist and petroleum engineers is similar in both contexts.
- Depending on the company, career progression can lead to managerial or technical specialist positions. Geoscientists or petroleum engineers in oil companies may move into senior positions involving professional and technical management. It is also possible to move into consultancy.
- International mobility will be required throughout your career -the larger companies offer chances to take overseas assignments at an early stage.

The exceptional quality the workforce is a valuable competitive edge. To build on this advantage, the company will strive to hire and retain the most qualified people available and maximize their opportunities for success through training and development. Oil and Gas Companies are committed to maintaining a safe work environment enriched by diversity and characterized by open communication, trust and fair treatment. As Geoscientists and Petroleum Engineers involve in Exploration and Production operations then the company offer a diverse array of career development opportunities in a global petroleum exploration and production effort. A wide array of opportunities exist in both generalist and specialist positions cover the following:

a. Formal Education.

Oil and Gas Companies need to follow the continuing education for their geoscientists and petroleum engineers by putting them into formal education, at least covering the following:

- In the first two years of employment, Geoscientists and Petroleum Engineers need receive over 2 months of technical education designed to expose them to a variety of disciplines within the Geoscience and Petroleum Engineering arena.
- Depending on the field of specialty, the training may be conducted in a classroom environment with instructors and students from all parts of the company.

- In years 3 through 5, over 68 days of technical training are designed to provide advanced training on a variety of concepts and applications in several areas.
- Develop peer networks, interact with the company's subject experts, and be immersed in a collaborative learning environment.

b. Mentoring

A complete mentoring definition and model can be seen in appendix 5 within this thesis. Normally the advantages of mentoring process are as follow:

- Technical training is specific to employee's job assignment and is paced to coincide with the employees's individual skill development.
- Give the specific work responsibilities from day one to get the employee's up and running.
- Provide a specific mentor to help "show employee the ropes" and provide technical guidance and support.

c. On-Site Education

Provide the trainee out of the classroom and on-site at some of the facilities, where projects will be or are being developed so they can see first-hand the equipment and processes with which you'll be working.

d. Technical Training, Short Courses and Self Study

Technical training conducted either during the two phases of development program or the time prior to or after phases of development is very important to consider. As proposed by Scott, 1994, and Hobbs, 1999, the continuing education such as technical short courses through the industry, institution or government are very important to attend by considering the appropriate time and recognizing of what types of current project the geoscientists and petroleum engineers do to find the fast way in solving the problem in completing their project. However, several fundamental considerations related to the efficient utilization of this type of components are also important to consider. From the survey data, it clearly show that only 8 geologist and petroleum engineers which have technical certificates greater than 31. Most of them only have technical certificates atmounting to 11-20 only. Self study as also proposed by Scott, 1994, plays the main role in determining the successful of the individual developments. A good talent is normally derived from this type of employee. How long the employee be trained

with how many trainings the employee attended will be meaningless without his own desire in self implementing his hard-skill or soft-skill developmensts.

e. Non-Technical Training

- Non-technical training aimed at increasing your personal effectiveness.
- Guidance in essentials like business practices, safety, ethics, profitability analysis, petroleum law, joint venture agreements, communication skills, teamwork, presentation skills, leadership and general business understanding. diversity and career stages.

f. Early Career Development

- Focus on developing core technical competencies and proficiencies (breadth and depth) with their initial job assignment.
- Once the trainee able to undertake routine tasks with limited supervision, their assignments may broaden into other technical areas -- often within the first 5 years of your career.
- After that, start to focus on developing more technical depth in a particular area.

g. Job Rotations

Built into the program is the ability for graduates to rotate through various teams, departments, business units or across business locations. A forum of senior managers monitors the graduates' rotations through various

h. Onward and Upward

- To continue to grow professionally, then to continue to develop technical depth and apply the skills in a variety of settings and in more challenging situations.
- The impact will extend beyond just doing the trainee's own work as they leverage theirr expertise through others.
- At the highest level of technical competency, the trainee will provide strategic direction to the organization and lead the company through a vision of where it needs to go.
- Opportunities to develop the supervisory and management skills..

- Ultimately, the skills they need to become a senior professional or senior manager require the highest levels of technical competence, business judgement, leadership and personal effectiveness.

h. Staff Involvement in Societies and Teamwork

As proposed by Hobbs, 1999, staff involvement and participation in societies, particularly presentation of technical papers can keep staff current with the latest exploration plays and technology concepts as this can sharpen the communication skills and keep on top of technological developments. Establishing regular procedures for peer review of play concepts is a kind of sharpening skills in teamwork.

3. Workforce Framework.

The work involved looking at the workforce, workload and culture, developing the information that need to be asking to gather key data about the future, gathering the requisite data, and creating a plan for using the data to aid the decision-making. Some oil and gas companies developed the completed testing of the framework, and is available for implementation widely in their internal organization.

The framework involves:

- assessing workload five years out using a tool they provide, or any other tool that the employee may be using in their countries or business unit;
- assessing workplace culture to identify gaps in “soft” skill capabilities;
- using the registry of Skills;
- completing a workforce matrix which integrates “soft” skills and “hard” skills, in view of workload predictions, to determine capability needs for their future;
- developing actions to fill the gaps
- carrying out the actions for ensuring a capable workforce for their future.

The intended use of the framework is for the company’s workforce action planning on a continuing basis are as follow:

a. Workforce planning includes recruiting, deciding how work will be done, creating the workplace environment they need to maintain and sustain the technical workforce, succession planning, strategic planning, and facilitating

decisions about the best use of capabilities in their business units as a corporate whole.

b. Using a consistent and common framework will serve to support the concept of the Regional Business Center by assisting regional decision-making regarding workplace environment, workload, outreach, staffing, and other aspects of human resource planning.
c. The capable workforce framework is an isolated pieces and brings together information about workload, culture, and workforce into an integrated whole.
d. It emphasizes the need for meaningful dialogue, judgement and instuition, as well as data, in making effective decisions related to the workforce.

Additionally, the framework contributes to creating the workplace environment key to sustaining the workforce capability. It supports both the project management business process and the regional business center concept - designed to facilitate best use of the resources available in the company to meet their customers' needs. The company are faced with challenges associated with changes in the nature of their workforce from a high number of retirements and from changes in workforce demands as they shift from industrial age workers to knowledge workers. These challenges require that they place new emphasis on creating a workplace environment that sustains their capability.

Results from the above research shows that there are positively impact of managing change processes and innovative strategy to the recruitment and development strategies and also has contributed solving problems to the competencies and development of Geoscientists and Petroleum Engineers. By following the structured model as described above, this innovative strategy will create in better model of recruitment and development strategies and will create successful GRAD outcome.

4.3.3. Interview Results.

From the notes of interview, 10 respondents gave the information that the innovative strategy applied to the new models of recruitment and development strategy in the oil and gas industry is very useful and enhance the best recruited employees and carees of Geoscientists and Petroleum Engineers. They also feel

that those strategies are a kind of program in increasing the quality of human resources.in the company. However, by developing and increasing of their competencies they need to become more open in figuring their ideas in simply, technically and systimatic manners.

Obstacles that they have felt are derived from some other factors which applied the rigid regulation without considering the advantages and disadvantages what for the regulation has been raised. Therefore, once they have developed and become competitive, they try to look for the market outside the company to where they can openly develop more ideas in simple ways. If this happened than the good programs in developing the employees will create the lost of company's return of investment because of loosing talents. Walker, 1980, stated that the talent's pool is present in the type of professional. technical and managerial employments management. This division is about 20% of the salaried employees (figure 23).

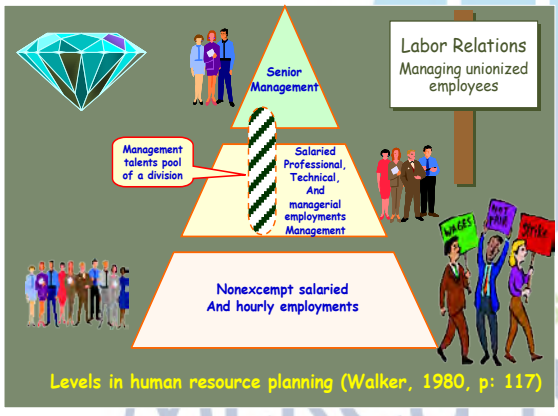


Figure 23. Levels in HRP (Walker, 1980).

Figure 24. Maslow's Hierarchy of Needs.

These typical of employees should be treated in accordance with Maslow's hierarchy of need, where figuring their challenging job and job title relates to achievement and status are more important than others (figure 24). Typical of these employees are always obey the company regulation. However, In their achievement they don't like the rigid and complicated translated system which they feel is not the way the management should do and critisize the management if doing wrong things in the implementation of regulation to them.

Based on the interview in treating the Geoscientist and Petroleum Engineers there are some important things need to consider:

1. Young Grad tends to look for the company which has good strategy in training and development, particularly using the global model and opportunity to have internationally work experiences.
2. Experienced and developed Geoscientists and Petroleum Engineers are typical of employees which always doing their work in technically and systematically manner, follow the company regulation, business ethics or other corporate's code of conduct,.
3. Experienced and developed Geoscientists and Petroleum Engineers do not like complicated interpretation and implementation of the rules from other departement beyond the regulation's advantages which they feel it can be done in systimatic and easy manner without against the company regulation.
4. In the achievement of the work, career development is very important for them and criticise the wrong interpreted company regulation which try to block their career and development, and need to be treated in accordance to Maslow's hierarchy.
5. In the current competitive market, experienced and developed Geoscientists and Petroleum Engineers are easy to look for the market whenever they feel competitive and are not treated proper.

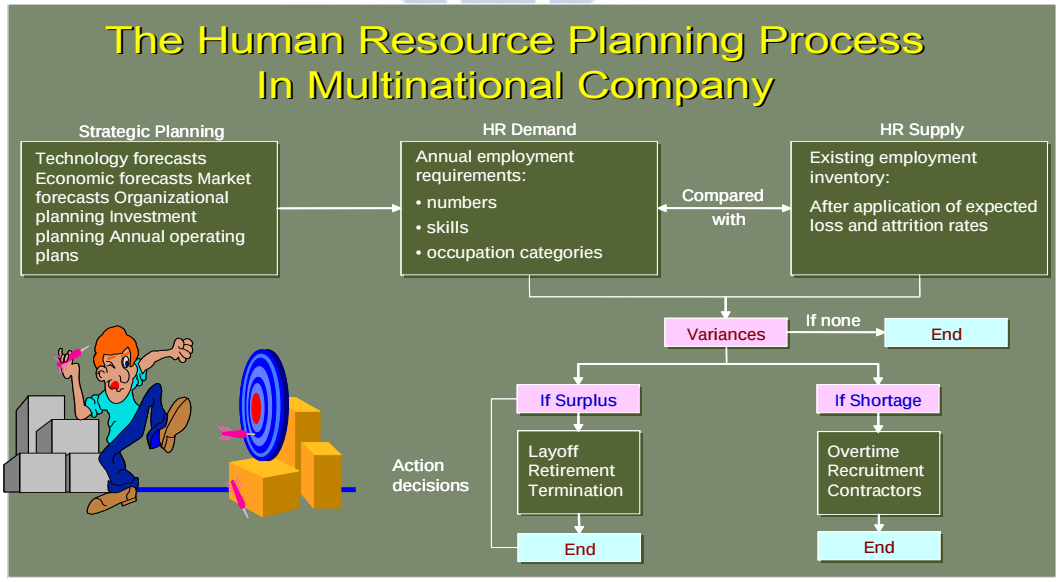


Figure 25. The Human Resource Planning Process In Multinational Company. (Ivancovich, 2004)

If the above points are not perceptived by the management, it will create the problem in the human resources planning process in multinational company due

to loss of existing employment inventory of talent as shown in figure 25. According to Ivancevich, 2004, to solve this problem there are some important things that need to consider by HRD in the strategic and human resource planning, they are:

a. ***Strategic Planning*** *–an organization's decision about:*
   - *What it wants to accomplish (its mission)*
   - *How it wants to go about accomplishing it*
b. *HR planning is important for developing a strategic plan*
c. *HR planning is critical to the implementation of the strategic plan*
d. *The acknowledgement that HR policies and practices have critical linkages with an organization's overall strategy*
e. *Central premise is that HR policies will have direct effects on an organization's profitability*
f. *HR must "fit" strategically with the mission of the organization*

4.4. Strategy for The Geoscience and Petroleum Engineering Groups.

Based on the review of discussion in section 4.3, the strategic objectives that have emerged from the review exercise and the formulation of the 'vision' for the Geoscience and Petroleum Engineering Group are most conveniently expressed under the following headings:

* Identity and leadership
* Professionalism
* External relations (with other professionals and the public)
* Internal relations (with the Geological and Engineering Society)
* Research and training
* Meetings and conferences
* Publications
* Funding

4.4.1. Identity and leadership

The geoscience and petroleum engineering group needs to establish a stronger sense of identity, and to determine how geoscientists & petroleum engineers are different from, and/or complementary to, other ground-related disciplines, notably geotechnical engineering. Based on the definition set out in the vision statement above, the geoscience and petroleum engineering group needs to work towards establishing geoscience and petroleum engineering as a term that has a clear meaning to fellow professionals and clients. Having a stronger sense of identity will enable the group to be more confident in promoting engineering geology and engineering in all areas, notably in relation to university teaching and research and the status of engineering geologists working in industry.

The geoscience and petroleum engineering group should continue to take the lead in pushing forward engineering geology and in ensuring that the facilities and services exist to meet the professional and scientific needs of engineering geologists. It should do this more confidently and obviously through closer contact with its membership, making best use of opportunities to publicise itself, especially through geoscience and petroleum engineering, on the Geological or Engineering Society website, and through direct contact with the membership by e-mail and conventional mailings. It should also promote itself and the Geological or Engineering Society through presentations to and participation with other groups in a range of professions.

4.4.2. Professionalism, continuing education and development and career structure

The geoscience and petroleum engineering group, through its meetings, publicity and membership should actively promote the benefits of career development for engineering geologists at all levels of their careers: young graduates; mid career individuals and those with late career needs The Group should promote career development and 'whole career' support as an important element of the benefit to the profession of joining the Geological or Engineering Society and becoming a Chartered Geologist - Engineer particularly for career progression purposes and the development of personal and management skills. It should also work with the Professional Committee of the Geological or Engineering Society to improve and develop this aspect of the Society's work. The Group should work with the other members of the Ground Forum, the Construction Industry Council and through the Geological or Engineering Society to influence and persuade government of the imperative of a legal framework requiring proper attention to site investigation and the employment of suitably qualified (licensed) individuals.

In addition to courses and workshops on technical subjects, the Group should work with the Geological or Engineering Society, and the other members of the Ground Forum to organise, promote or facilitate courses on professional skills such as communication skills (verbal and written), report writing, conditions of contract, project management, team management etc.

4.4.3. External relations (with other professionals and the public)

The geoscience and petroleum engineering group must participate fully, and visibly, within the broader geotechnical community. The members of Ground Forum are in agreement that future strength in ground engineering will come from co-operation between the member bodies, with each body retaining a clear identity and sense of its own aims and objectives. The Group should work with the Geological or Engineering Society and its Regional Groups to provide information about engineering geology for dissemination to politicians, school teachers and pupils, and undergraduates in geology and civil engineering departments. A register of those prepared to give talks or to write articles about engineering geology in local or national newspapers or magazines could be maintained.

4.4.4. Internal relations (within the Geological Society)

The geoscience and petroleum engineering group should continue to be actively and constructively engaged with the Geological or Engineering Society at all levels in its structure and activities. In particular, the policy of retiring officers and committee members seeking election to Council should be continued.

The Group should strongly encourage the Geological or Engineering Society to make career development mandatory for this to be policed as rigorously as that undertaken by Engineers Assistance should be offered to the Society in policing career development in engineering geology. Participation with the Society in creating and maintaining a portfolio of career development training courses endorsed by the Society should be continued and stronger links should be developed with the Professional Committee to facilitate this.

4.4.5. Training, teaching and research

The geoscience and petroleum engineering group must become more involved in influencing the content of training, teaching and research at all levels in influencing the level of expectation of employers for properly trained individuals. It should seek vigorously to ensure that provision is enhanced and extended rather than contracted through withdrawal of support by career consultant and other bodies. The quality and availability of research, training and development in engineering geology impact directly on the quality of engineering geologists and the benefits

that they will provide to a project. This has a direct relationship to the status of engineering geologists.

4.4.6. Undergraduate courses

Some undergraduate geology courses include no or little engineering geological content, and appropriately qualified staff may not teach that which is offered. There are graduate geologists who have never heard of engineering geology. The geoscience and petroleum engineering group should persuade the Geological and Engineering Society that the validation of undergraduate courses must ensure that they include appropriate engineering geological content delivered by competent people. This means tuition by engineering geologists and not by soils engineers or structural geologists. Geology is poorly taught in some civil engineering departments and this is where the 'rot' can set in as far as perception of the relative importance and worth of Chartered Engineers and Chartered Geologists in the workplace.

4.4.7. MSc courses

MSc courses in engineering geology are perceived to be under serious threat from withdrawal or severe curtailment of funding by career consultant and other body. The geoscience and petroleum engineering group is wholly committed to doing everything it can to prevent these courses from disappearing or contracting. There are two main short term objectives:

* To present a united front of influential interested parties (the members of the Ground Forum, course providers) to career consultant and other body. to argue the case for the retention of these courses and to persuade them that alternative funding arrangements cannot be put in place in the short term;
* To persuade all those who employ geoscientist and petroleum engineer that a reduction in the supply of suitably qualified graduates in geoscience and petroleum engineering at MSc level will impact directly on their businesses. In this light, to develop with them a strategy for supporting these courses in the future.

It may be that there is continuing pressure to regard MSci and MEng courses as replacements for MSc courses in engineering geology and geotechnics, and that this will present a further threat to their future viability. It should also work to ensure

the future of the specialist MSc courses in engineering geology and their differentiation from MSci and MEng qualifications in the perception of employers.

4.4.8. Research

The geoscience and petroleum engineering group should promote and encourage the formulation of a national strategic research plan for guiding geoscience and petroleum engineering research and encouraging the establishment of centres of excellence. The application of established science and techniques to solving engineering problems is not being perceived by higher education departments and research councils as contributing to the advancement of science or as a contribution to knowledge and therefore bids for support to geoscience and petroleum engineering activities are failing. This approach has been followed to good effect by the hydrogeologists. Research also ensures debate, development and vitality and is closely linked to postgraduate training.

The project's objective is the completion of a report which demonstrates the employee's ability to conduct research independently and will require him/her to:

a. Identify an existing or potential Human Resources Development problem/challenge.
b. Conduct appropriate literature reviews.
c. Determine a research methodology to be followed.
d. Specify the findings from the research.
e. Develop possible solutions to the identified problem.
f. Recommend realistic actions available for implementation.

4.4.9. Training

The primary role of the geoscience and petroleum engineering group (GGRE) in relation to training should be the identification of training needs amongst members and employers. Based on this, the group should determine a national training strategy for engineering geologists at all stages of their careers and work to implement it. The group may continue to organise courses using its own resources (and with the opportunity of a source of income) and it is committed to working more closely with the Geological Society's Regional Groups to develop and deliver courses. In addition, and through the training consultant, it will continue to identify

suitable courses, especially in universities, and where there are gaps seek to procure development of suitable courses.

4.4.10. Meetings and conferences

Meetings and conferences have always been at the heart of the geoscience and petroleum engineering group's activities.

a. Meetings

Meetings provide, and will continue to provide:

* opportunities to disseminate knowledge and to discuss current research topics;
* opportunities for continuing professional development and both specific and non-specific learning;
* a 'shop window' for the geoscience and petroleum engineering and engineering geology
* a networking and social dimension giving a sense of community and common purpose.

The geoscience and petroleum engineering group will develop and enhance its meetings programme and the accessibility of meetings to geoscienc and petroleum engineering in the regions by:

* restricting meetings in the BU's office to joint meetings with other Specialist Groups and Societies and 'crowd pullers' (e.g. meetings on current construction projects or geohazards),
* holding all other meetings out of Jakarta as joint meetings with the Regional Groups of the Geological and Engineering Society (and regional groups of other institutions and societies);
* considering running the same meeting in more than one regional location;
* creating and maintaining a list of speakers on geoscience and petroleum engineering topics prepared to speak at meetings of the Regional Groups;
* inviting the Regional Groups to participate in developing the annual meeting programme and encouraging them to keep the geoscience and petroleum engineering group informed of their programmes;

* including flexibility in the meetings programme so that urgent meetings on current topics can be convened at short notice, and 'generic' meetings (e.g. on a natural disaster occurred) could be included;
* including meetings in the programme that seek to communicate important issues to other bodies

b. Conferences

Over recent years, it has become more and more difficult to break even on conferences organised by the geoscience and petroleum engineering proup. This is due to two main influences:

* Pressure of work on potential delegates and reduction in company budgets for attendance at such conferences, leading to problems attracting sufficient delegates to meet costs at a reasonable registration rate;
* Increasing costs at suitable venues driven by universities insisting on conference organisers using their administrative facilities and reduced possibilities for voluntary effort amongst the academic and student community.

Rather than attempting to run conferences independently, the geoscience and petroleum engineering group might consider seeking to participate with others in related disciplines to put on conferences no more frequently than every alternate year. One idea being actively considered is that all Specialist Groups would be encouraged to hold their annual conferences or prestigious meetings during one week and at the same venue. The GGRE coference in Houston USA, would convene some larger, cross disciplinary meetings and events and would provide the administrative support for all such meetings. This might be an attractive model for the geoscience and petroleum engineering group as it could allow the company to run their own conference, offer reasonable registration fees taking advantage of economies of scale, and reduce the financial risks that we have previously run with stand-alone conferences.

4.5. The Role of Human Resources Development

In the multinasional oil and gas company, the role of human resources departement (HRD) is very important. This is because of the character of the company which has globalization type, therefore the company should consider the

development of change conditions in the market even for ten years before and ten years ahead. Figure 26 shows the types of globally change conditions in the market that must be considered by the human resources department.. From the above data then very important for HRD to design man power planning linked to the developments in the company concerned with economic or non economic of the productions and services, the technology that need to achieve, human resource and source of talent for the sustainable development of the company.

Figure 26. Organization Demand For Human Resources Function in Multinational Company Deloitte, 2005).

The importants of the human resources of man power planning are corcerned with three aspects, ie:individual requirement, organization requirement and national requirement (Prabu, 2005). Therefore the role of human resources department in forecasting, developing, implementing and controlling and to ensure that the organization has the right number of people and the right place at the economically is useful. Detailed of the human resources departement's roles in developing, controlling and implementing their employees can be seen in section 5.2.

CHAPTER V. CONCLUSIONS AND RECOMMENDATIONS

This chapter provides the answers of the research's questions as included in the chapter I. The answers have been based on the analytical data of the questionnaires' survey conducted and adressed to the Geoscientists and Petroleum Engineers as described in section 5.1. Section 5.2. facilitates the recommendations based on the answers of those hypothesis and questionnaires survey. The contribution to knowledge made by this study is shown and areas for future research are identified as well as the implication of the research's results.

5.1. Results and Conclusions.

This section states the hyphotetical answers concern with the managing change processes and innovative strategy and their impacts to the recruitment and development of Geoscientists and Petroleum Engineers. The followings are results and conclusions of the thesis's research :

5.1.1. *Critically review the impact of Managing Change processes happened in Multikopilindo and to identify what organizational change actions are most likely gives the impact to the strategy of the Recruitment and Development of Geoscientists and Petroleum Engineers in Multikopilindo.*

Subhypothesis 1 contains two subquestions which relates to the contribution of managing change processes to the organizational change actions and its impact to the recruitment and development strategies as explains below:

5.1.1.1. Identification of what managing change processes actions which has significantly contributed to the shift of recruitment and development strategies.

From the questionnaires survey, it can be seen that not all of 4 subvariables of managing change processes using Tearle model (strategic planning, creating new paradigm, communication about vision and planning the change) have significantly contributed impacts to the recruitment and development strategies in Multikopilindo. The creating new paradigmn have strongly contributed more than others to the shiftment of recruitment and development strategies.

5.1.1.2. Impact of Managing Change processes to the recruitment and development of Geoscientists and Petroleum Engineers in Multikopilindo.

Direct relationship of managing change processes to the recruitment and development strategie is shown by level of significancy which is greater than 0.05. It means that there is no direct significant impact of managing change processes to the recruitment and development strategies. Running together with Innovative strategy, the managing change processes have indicated significantly contributed impact to the recruitment and development strategies. Detailed analysis of its subvariables has indicated that some of subvariable of managing change proseses have given direct impact to the recruitment and development strategies. It can be concluded that some actions in the managing change processes have significantly contributed impact to the recruitment and development strategies.

5.1.2. Impacts of Innovative Strategy (GRAD) project to the recruitment and development strategies addressed to Geoscientists and Petroleum Engineers

Relationship of innovative strategy to the recruitment strategy is shown by the level of significancies to recruitment and development strategies which are lower than 0.05 It means that there is significant impact of innovative strategy to the development strategy. Based on the above relationship. It can be concluded that the innovative strategy has significantly contributed positive impact to the recruitment and development strategies addressed to Geoscientists and Petroleum Engineers

5.1.3. Impacts of Innovative Strategy (GRAD) project to the competency and development of Geoscientists and Petroleum Engineers

Statistical analysis on the variables of questionnaires which have relationship to the competencies in the development and mentoring strategies indicate that the value of level of significancy falls much lower than 0.05. It means that the GRAD project as part of the innovative strategy applied to the Geoscientists and

Petroleum Engineers are believed can solve the problem in increasing their competency and development. Based on the above relationship, It can be concluded that the innovative strategy has significantly contributed positive solving problems to the competencies and development of Geoscientists and Petroleum Engineers. This means that this innovative strategy can create a successful GRAD's outcome if the implementation of that follows the structured model as criticised by the respondents and follows the proposed implementation model.

5.1.4. The best way in applying Innovative Strategy to Geoscientists and Petroleum Engineers

In identifying the best way in implementing this type of innovative strategy, the description in this thesis has been based on the following criteria:

a. Respondent's Opinion Based on the Survey Results.

Most of the respondents agreed that innovative strategy GRAD Project can create greater opportunities to them toward the career development. However, they criticise about the implementation

b. Current Model in Implementing Strategy

- To recruit in all locations to the same quality standards and increasing the amount of nationality employees in each BU.
- Plan globally, coordinate centrally, implement locally
- Consistent development program for first 5 years for all new hires. 2 phases with defined entry/exit gates and includes job rotations, evaluations, classroom training and mentors. Leverage successful mentorship programs globally and ensure mentoring is a key job expectation
- Opportunity to have an international assignment and is designed to encourage global mobility early in one's career.

c. Curricula Design and Framework to make it better

Review the curricula of the program and design detail framework covering::

- Entry Requirements for Geoscientists and Petroleum Engineers.
- Training and Developments Model
- Workforce Framework.

5.2. Recommendations

Following are some recommendations in handling the strategic issues to the HR Departement in its relationship to the training and development of the employees.

5.2.1. Review The GRAD Curricula, designing framework and strategy.

- Review the curricula of GRAD by considering entry requirements for Geoscientists and Petroleum Engineers and training and developments model by considering the formal education, mentoring, on-site education, technical training, short courses and self study, non-technical training, early career development, job rotations, onward and upward, staff involvement in societies and teamwork, as well as considering the workforce framework
- Build the strategy for Geoscientists and Petroleum Engineers such as those described in chapter IV, section 4.4.

5.2.2. The primary purposes of the HR Department To Training & Development

5.2.2.1. Provide high quality pre-service and in-service staff employees for career and technical employeess at the baccalaureate and graduate levels.

5.2.2.2. Provide individuals with the opportunity to improve their leadership and management skills and increase their chances for advancement in the manufacturing and technology work place setting.

5.2.2.3. Provide a theoretical and application foundation for organizational, group, and individual learning and development for individuals wishing to pursue a career in the HRD field.

5.2.2.4. Develop leaders in the field of human resource at the state, national, and international level through articulation with business and industry.

5.2.2.5. Provide for the expansion and improvement of career and technical employee organizations as an integral part of the total technical education program.

5.2.3. Provide support services to other company departments and area business and industry.

These types consists of 2 objectives that need to consider, they are :

Objective1. Develop soft skills areas of materials for presentation capabilities for workshops, seminars, course assistance, and other areas of

specialization to assist other departments, community business and industry, in workforce preparation skill development.

Objective2. Develop materials for presentation capabilities for workshops, seminars, course assistance, and other areas of specialization to assist other departments, community business and industry, and related professional associations in human resources.

5.2.4. Issues On Training and Development

There are some issues that need further describes on the training and development issues in the company, covering:

5.2.4.1. Review the trends in expenditure on training and development in the Company over recent years;

This expenditure on training and development does not include any allowance for the salaries of those employees participating in training and nor does it include the salaries of those staff involved in administering and managing Departmental learning and development initiatives.

5.2.4.2. Review the methods used to identify training needs in the Company

Company utilises a wide variety of methods designed to identify training needs. These include:

- identification and direction by Secretary and/or senior executive management;
- training needs analysis at local and corporate levels by conducting staff and management focus groups and surveys;
- collation of data from individual's learning and development plans (as part of the department's performance management cycle);
- general feedback from staff; and
- skills gap analysis (in some Divisions).

5.2.4.3. The methods used to evaluate training and development provided in the Company

Company utilises the following methods to evaluate training and development programs:

- Following the Kirkpatrick Model, reaction surveys, post course evaluation forms, follow-up activities designed to extrapolate the degree of change that may have been brought about by the training experience. For example, the Learning Integration Strategy designed for the department's pathways program allowed for each individual to be followed up 1-3 months after the training intervention in order to assess how and to what degree it had changed behaviours;
- Organisational survey data to map and analyse trends throughout the organisation (eg. attrition rates across classifications, divisions and gender);
- general feedback from managing bodies, participants and managers;
- feedback from departmental networks such as the company's Learning & development Network;
- evaluation of some divisional Learning and development strategies through local staff attitude surveys.

5.2.4.4. The extent of accredited/articulated training offered in the Company

The Management (Industry Strategy) is a two-year, part-time program fully funded by the department and developed in close collaboration with the accredited University. The company has to investigate relevant financial training courses with the accredited tertiary university or from the institution which has accredited by BAN or BPMIGAS. Of three programs identified as priority areas of training for divisional staff, The Department also supports staff who are undertaking courses of study that will contribute to the improvement of their professional skills and knowledge.

5.2.4.5. The processes used in the Company to evaluate training providers and training courses;

Providers and courses are evaluated in a number of ways:

- open or restricted tender processes for major, usually expensive and corporately provided programs;

- consulting the Trainer Consultant to draw upon those providers who have been accredited to sit on the company oProviders - for usually small or finite training needs;
- having different divisions sponsor a training need and opening it to other divisions once it has been trialed in the initiating division;
- employing external consultants to evaluate programs before they are completed as part of our continuous improvement philosophy
- ensuring that considerable resources are put into developing a learning integration and evaluation strategy for every major training program the agency sponsors. It also provides for the initial piloting of a program and an evaluative 'pause' at various milestones to take stock and ensure the program is still achieving its objectives and remaining relevant to our needs;
- consulting professional bodies such as the Institute of Management, Institute of Training and Development, other consultant of Human Resources Institute, etc, for advice;
- consulting other agencies either directly or when attending different network meetings and/or seminars; and
- internally sharing information via the company's Learning and Development Network.

5.2.4.6. The adequacy of training and career development opportunities available to the Company's employees in regional areas;

Business Unit were appointed to provide program management services in various regional areas. Videoconferencing and eLearning options are also being considered for training purposes, though they have not been used extensively to date. All staff can access accredited training via generous distance education provisions (paid work time + reimbursement of some or all costs - depending upon degree of relevance of the study to the department).

5.2.4.7. The efficiency and effectiveness of the devolved arrangements for training in the Company

The Department has been able to use the devolved arrangements for training to develop programs that meet its particular needs such as the Master of

Management (Industry Strategy) program In this sense the devolved arrangements have been effective.

5.2.4.8. The value for money represented by the training and development dollars spent in the Company

This question is hard to quantify. There is no doubt that money spent on training and development within BU has produced a dividend including:

- better skilled staff;
- better motivated staff;
- the remedying of identified skill deficiencies;
- the meeting of identified skills required to undertake certain tasks;
- a Department better able to serve the needs of the Government; and
- a Department better able to serve the needs of the public.

Extensive evaluations (rather than specific ROI exercises) are routinely conducted for all programs.

5.2.4.9. The ways training and development offered to the Company's employees could be improved in order to enhance the skills of their employees

Strategies for improvement of training and development within the company include:

- greater use and access to Individual development plans in relation to planning learning and development activities;
- a Learning and Development Strategy (already in place) which is located on the Intranet and is accessible to all employees. The L&D strategy describes learning programs sponsored or supported at the organisational level. It also provides options and advice on training and development that divisions, teams or individuals can explore; and
- implementation of an internal Learning and Development Network, which has proven to be beneficial in terms of divisions sharing information and knowledge about learning and development issues, as well as economising on costs.

5.2.5. Recommendation For Further Research

In many respects it is felt that the research has provided a starting point for future research on these managing change actions and innovative strategy methods addressed to Geoscientists and Petroleum Engineers. The research has provided understanding and deeper insights into the methods from which a conceptual model was developed. This section makes some recommendations for further work that have emerged out of this research study.

5.2.5.1. Test Theory in More Cases

The development of the theory was based on a limited number of cases, therefore further research could include taking the findings from this study and applying them to a wider sample of client companies, to validate and strengthen the theory developed.

5.2.5.2. Qualitative vs. Quantitative

The research was an exploratory study using Quantitative and qualitative approach, which proved to be a highly effective strategy for guiding the research. It allowed for the collection of explorative data in a valid and transparent method for the development of concepts and theory. As little was known or written about the research subject, it was felt that adopting an inductive approach to the study would be more beneficial as it allowed for the development of theory based on rich understanding and qualitative data from a phenomenological perspective. The phenomenological approach used to investigate the managing change actions and innovative strategy methods within the strategic change process means that the findings of this research cannot be fully assessed in terms of the more traditional measures of reliability and could therefore be criticised as not being objective. Future research could include the collection of more measurable data; including more survey data for example, to enhance the view of reliability and objective reasoning.

5.2.5.3. Case Study for Change

The writer believes that an interesting future research project would be to take a longitudinal view of the strategic change process, which has used the methods of rootLearning and the grove, within its strategy implementation phase. In particular to try and establish what occurs after the implementation phase of the process and

what measurable changes take place linked to the use of the methods.

5.2.5.4. Application of Other Methods

Since the beginning of the research other methods, such as Prosci (2006), DiGeorgio and Associate (1998) and Reclies (2003), have come to light that could contribute to future research. These could be used for a comparison study or as further data collection cases.

5.2.5.5. Learning Preferences

One of the themes that emerged from the preliminary study showed that the methods were adept at appealing to a wide range of learning preferences. This theme was not taken for further investigation in the focused study but it is felt that further work could focus on the benefits of applying the methods for learning intensive situations, for example educational environments.

5.2.5.6. Development Phase

It was noted in the research that several practitioners and theorists felt that the development phase of the strategic change process was crucial to the overall success of the implementation of the strategy. Further work could include focussing on the effectiveness of using these methods at this phase of the process and researching the effectiveness of these methods in enabling bottom-up and emergent processes for strategic change. Furthermore a theoretical outcome of the research was the significance of developing organic, emergent and bottom up strategies in current organisations. It has been argued, within this piece of research, that these methods offer practical solutions to help bridge the gap between directive strategies and more bottom-up processes through involvement in the development phase of the strategic change process.

5.2.6. Implications of This Research

There are several issues that may be necessary to consider as the implications of the research's results within this thesis.

- The impact of all of these factors, is the incumbents are seriously at risk when there are a lot of old Geoscientists and Petroleum Engineers who about 52.56% of their ages are more than than 45 years old. Examining the change in

the business sustainable development, these phenomenons need to consider by the company since in the next 5-10 years most of the experienced Geoscientists and Petroleum Engineers will be in the ages of retirement. The company needs more attention to focus on the recruitment and development strategies to these types of employees.

- The models for recruiting, training & development as well as mentoring as attached in the appendices 4 and 5 are valuable methods in building the recruitment and development strategy for Geoscientists and Petroleum Engineers.
- Most of the respondents agreed that innovative strategy GRAD Project can create greater opportunities to them toward the career development as part of the competitive project to why they are interested in joining the company.
- The regulation relates to training and development is much better handled by the HR departement without much involving from other departments to avoid complicated policies and misleading interpretations.
- HR planning is critical to the implementation of the strategic plan and the acknowledgement that HR policies and practices have critical linkages with a company's overall strategy as long as it "fit" strategically with the mission of the company.
- Based on the interview data, typical of Geoscientists and Petroleum Engineers are eager to obey the company policies concerning with the sustainable development but do not accept the rigid policies in the company which apply without concern the advantages and disadvantages why the policies have been created.
- The strategic objectives that have emerged from the review exercise and the formulation of the 'vision' for the Geoscience and Petroleum Engineering Group are most conveniently expressed under the Identity and leadership, professionalism, external relations (with other professionals and the public), internal relations (with the Geological and Engineering Society), research and training, meetings and conferences, publications and funding.