

© 2010 IEEE. Personal use of this material is permitted. Permission from IEEE must be obtained for all other uses, in any current or future media, including reprinting/republishing this material for advertising or promotional purposes, creating new collective works, for resale or redistribution to servers or lists, or reuse of any copyrighted component of this work in other works.

Theoretical Framework: Factors for Project Success in Oil & Gas Companies & Contractors in Miri, Sarawak, Malaysia

Dicky Cassily Sylvester
MSc. Project Management (student)
School of Business, Curtin University
Miri, Malaysia
e-mail: dickycassily@yahoo.com

Nazatul Shima Abdul Rani
Marketing and Management Department
School of Business, Curtin University
Miri, Malaysia
e-mail: shimarani@curtin.edu.my

Abstract— The Oil and Gas Industry is a multimillion-dollar industry. The companies which are involved in the Oil and Gas industry are well aware of the cost factor which plays a very critical part in every industry. The aim of the research is to critically identify and evaluate the depth of the Project Management Triangle concept applied in the execution of projects tendered by the Oil and Gas Companies to relevant contractors. A theoretical framework is proposed for the purpose of this research.

Keywords- project success, project management triangle, oil and gas companies

I. INTRODUCTION

Traditionally, project success was assessed on the triple measure set of cost, time, and performance. A project is considered successful if it was completed within its budget estimate, within its initial scheduled time frame, and performed as it was designed to function. The recognition that project success is multi-dimensional raises the question of whether different input factors may have different effects on different project outcomes [7].

[9] explained the importance of having a proper project management plan, which not only works efficiently but also accurately. A proper project management plan greatly helps in the construction process of a project and a significant number of international high-profile projects fail to be delivered on time and on budget. This is due to a number of undesirable characteristics that are associated with the failure of the projects: budget overruns, compromised project specifications, and missed milestones. One example is the construction of the Channel Tunnel that did not work out as anticipated.

In other words, the three basic dimensions of project success, namely time, cost and quality, are often overlooked by both client and contractor. Hence, to avoid these problems, proper project planning must be practiced and put in order: a description of the objectives and general approach of the project, its resources and personnel, evaluation methods, and also a project schedule as well as a description of potential problems that may be encountered.

With this, [9] have come up with a strategy known as the hierarchical framework which assists in the project management frame work. After the project management plan is formed, the client and the contractors will proceed to the next level of project management; The Project Management Triangle and the critical factors contributing to decision

making by both Oil and Gas Company and contractors. Hence a literature review, theoretical framework, the gap between oil and gas companies and contractors, and the significance of the research are forwarded in this paper to illustrate this study.

II. LITERATURE REVIEW

A. Project Management Triangle

Quality improvement is crucial for the contractors. [6] defined quality as meeting established requirements, and it is achieved if the completed project conforms to the stated requirements of the owner, the designer, and the contractor. Here it is clearly defined that quality is the end product of the Project Management Triangle. The dimension of scope, time, and cost equals quality product.

Quality product leads to the attaining of trust and confidence of the Oil and Gas Company (client) for long term success in the construction business. [15] stated that as the Oil and Gas Companies became more commercially demanding, they forced the engineering contractors into tough, competitive bidding. The Oil and Gas Companies have increased their own resources to oversee the contractors' performance and insisted on arduous conditions of contracts. Therefore, contractors are screened before they are selected to bid for the contracts opened by the Oil and Gas Companies. It is imperative to get the right contractor for the task.

[3] stated that continuous process improvement is an ongoing systematic effort to improve day-to-day operations to remain competitive and sustain profitability. This statement proves that contractors in their bid to profit from a project, quality of operation is crucial in gaining the trust of the clients. This is achieved through actively improving the scope work and integrating technology to achieve quality and client satisfaction.

Edward Deming in [3] described quality improvement as a never-ending cycle Plan-Do-Check-Action. It is a continuous interaction between functional departments that is important to provide product and services that satisfy customers. This is further supported by Foreman in [3] which had listed the following major principles:

- The customer must be satisfied
- Everything can be improved

An on-going effort is needed in which everyone is allowed to help to achieve the primary business goal of improved quality, cost and delivery

A systematic approach to evaluating processes better results than the systematic approach

It can be summarized that the above insist that a contractor company must improve the system and policies of the company as failure to comply would result in the ability of the company to reflect competitive needs. Hence, the contractor company would not be able to compete with other companies that are able to meet with clients' expectations.

3. Priorities in a Project

[5] argued that the balance of the Project Management Triangle is highly dependent on the priorities in a project. He also stated that the stakeholder or the client, in this case the Oil and Gas Company must decide, in regards to a particular deliverable, which of the three constraints of scope, time and cost is most flexible, medium flexible, and least flexible. This statement supports the concept that if one dimension is altered, it would affect the other side of the Project Management Triangle [8]. At the same time, this will affect the Oil and Gas Company should any of the project schemes of work changes while the project is still on-going. This factor also increases the overall production cost.

As pointed out by [10] this is known as the scope-creep - an almost unstoppable tendency by project to accumulate new functionality. Some scope-creep is inevitable since, during the early stage, the project will be poorly defined and as a result will need to evolve. This statement shows that every project will have to undergo changes in the middle of a progressing project. This may be affected by the client's request or the contractor's inability to deliver based on the expectations of the client. Among the reasons for this would be monetary - either the client or contractor, unavailability of manpower to complete the project, or the political stability of the country abide by both contractor and client.

[5] added that a large amount of scope creep however can be disastrous. When the scope starts to creep, new functionality must be added to cover the increased scope. Due to this factor, the scope of work will be affected, hence affecting or breaching the entire agreement reached by both the contractor and client during the initial phase of the project. This is represented by the quality arm of the triangle, representing the ability of the 'product' to fulfill the clients' requirements. It is understood that more requirements fulfilled equals a better quality product.

[5] illustrated the scope-creep into the following:

- Add time - to delay the project to give the contractor or the client more time to add the functionality
- Add cost - to recruit, hire or acquire more people to do the extra work
- Cut quality - to trade off/scrape/let-off some non-essential requirements to compensate for the new requirements

Another priority in a project is the stakeholders' or owners' expectations. [6] wrote that project owner has three common goals: 1. completion of the project at the lower reasonable price, 2. within a stated time, and 3. to a specified

quality. [6] added, based on the owner's viewpoint, quality is as follows:

- Function and aesthetic
- Completion on time and within budget
- Lifecycle cost
- Operability and maintainability
- Environmental, health and safety requirement

C. The Gap between Oil and Gas Company and Contractor

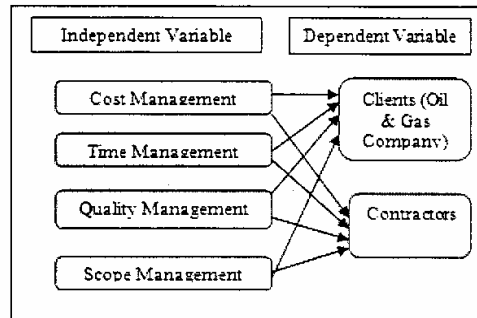
After analyzing the literature review, it has been concluded that there is a gap in the interest of the Oil and Gas Company and the contractor. The most predominant is the focus in which The Project Management Triangle they fall in either its cost and time, or quality and time. All these fall in to the scope management of the two panels. The gaps exist through the scope of work. In the scope, both contractors and oil and gas company can decide and reach and understanding and decision on the specification of materials used, time of completion and the budget that should be produced by the oil and gas company. The Oil and Gas Company will be willing to spend more to have a product or service completed at the estimated time and it functions well (quality). This is because the need to have operation working as the cost for rig rental is extremely costly. [15] describe the oil and gas company as being over ambitious and irresponsible in spending. Huge cost overruns resulted from this inefficient way of working and the contractors made money at the oil companies' expenses. This is because construction begins before the overall design is completed. This leads to major changes over time and the oil and Gas Company ended up paying double the original price. Contractors are more likely to be more concern on profit and keeping business running. [21] stated that in the process of giving projects has not change since the 1940s. It involves the system of bid evaluation dominated by the principle of acceptance of the lowest price. [21] explained that there are some contractors offer the lowest bid in order to stay in the business. This proves that contractors are more concerned in cost and time rather than quality and cost. Securing many projects, and to stay in the business is the objective of contractors. This contradicts with the client needs, hence voiding The Project Management Triangle (refer Fig. 2).

Figure 2: The dimension in Project Management Triangle which proves balance



III. THEORETICAL FRAMEWORK

Figure 1: Proposed Theoretical Framework for Factors that contribute for oil and Gas Company



D. Cost Management

Cost refers to the amount of spending the clients (Oil and Gas Company) and contractors will have to produce in the duration course of the project [1][4][8][12]. Cost effects the overall production as the client and contractors will have a different aim in cost-management. The client's aim is to have the product at the end of the project, fully functional and within the scope of work. The client's role in cost is to comply with the needs of the company and to meet up with the expectation of the stakeholders [10][17]. Whereas, the contractors aims to profit from the project by carefully managing the purchase of materials, workmanship wage and company's income [17]. This is important if the company aims to be in the business and competitive with other engineering contractors in the market [2][5][20]. Cost includes the financial ability of both contractors and clients [4][19]. Hence, this hypothesis is forwarded:

H1: Cost more important for contractors rather than the clients.

E. Time Management

Time constraint reflects the time allocated by the clients to the contractors to complete the project. Time is crucial to both sides as it is related to time and quality. The clients need the end product to be fully functioning to meet with demands worldwide. The contractors have to be punctual to secure more projects and earn the trust of the clients. Time must be managed efficiently to avoid delays and unnecessary spending [2][5][10]. This is because more time equals to higher cost of production. A significant number of international high-profile projects fail to be delivered on time and on budget. A number of undesirable characteristics are associated with failing projects: budget overruns, compromised project specifications, and missed mile-stones [1][10][12][14]. In other words, the three basic dimensions of project success, namely time, cost and quality, are often in jeopardy [9]. Thus, this hypothesis is forwarded:

H2: Time is more important for the clients rather than the contractors

F. Quality Management

Quality Management is the output of time, cost and scope. Quality of the product defines the workmanship and the credibility of the Contractors. It boosts the contractors' image and prospect, making them irresistible to the clients. This is because client's filters contractors with the most value for money service besides being reputable in the construction industry [6][10][14][15][16]. Reputable image creates confidence in clients and quality product means less maintenance over a long period of time. Quality is measured through client satisfaction and the longevity of the product, quality workmanship and efficient management of the contractors. Quality products and services, on the down side, cost more and take longer to complete. The scope of work is also more elaborate and critical by providing time is not critical, the delivery criteria are only one set against which success can be measured [3][5][8][10][19]. Hence, this means the overall end products tells of the success of the overall project [2]. Thus, this hypothesis is forwarded:

H3: Quality is more important for clients rather than the contractors.

G. Scope Management

The discipline of project management is about providing the tools and techniques that enable the project team to forecast, anticipate and organize their work to meet these constraints [8]. Scope of work is the job specification in which is defined and produced by the client. The contractors execute the project based on the scope of work given. The contractors also have their own scope of work based on the client's expectations and needs. This scope of work weighs the time and costing as to not exceed the intended profit by the contractors [15][18][19]. This is usually the reason, as to stay competitive with other contractors by having the funds, specialized tools and machineries, skilled and professional workers and it boosts the image of the company. The scope of work must be balanced in terms of time, cost and quality as to meet with the Project Management Triangle. The scope of work also gives problem solving answers to upcoming problems in the course of the project. The discipline of project management is about providing the tools and techniques that enable the project team to forecast, anticipate and organize their work to meet these constraints [8] [16]. Hence, this hypothesis is forwarded:

H4: The scope of work is more important to the contractors rather than the clients

IV. SIGNIFICANCE OF THE RESEARCH

A. Anticipated uses of the research

This research aims to contribute in the identification of the important factor of a project based on the Project Management Triangle, the procurement procedures as well as the strategic management of the client and contractors to achieve their aims. This project will be based on companies in Miri, Sarawak and predicted to be the first in the region. It

is also expected this research can give researcher and the oil and gas companies a better insight on the important variables of the Project Management Triangle most preferred by contractors and vice versa.

B. Relevance of the research for project management

The research is important as to evaluate the important factors of the Project Management Triangle (PMT) to the clients and the contractors. PMT is a branch of the Project Management.

REFERENCES

- [1] Adekalu K.O, L. A. O. O. January 2003. Cost recovery strategy for large-scale irrigation projects in Nigeria. *Technovation* 23 (1): 77 - 83.
- [2] Atkinson, R. December 1999. Project management: cost, time and quality, two best guesses and a phenomenon, its time to accept other success criteria. *International Journal of Project Management* 17 (6): 337 - 342.
- [3] Badiru, S. S. a. A. B. May 1992. Project management for successful implementation of continuous quality improvement. *International Journal of Project Management* 10 (2): 89 - 101.
- [4] Berends, K. August 2007. Engineering and construction projects for oil and gas processing facilities: Contracting, uncertainty and the economics of information. *Energy Policy* 35 (8): 4260 - 4270.
- [5] Browser, F. July 31, 2008. The Triple Constraint. 1 of 5. <http://systems-overload.blogspot.com/2008/08/triple-constraint.html> (accessed 10/3/2010).
- [6] Bubshait, A. A. May 1994. Owner involvement in project quality. *International Journal of Project Management* 12 (2): 115 - 117.
- [7] Christina Scott-Young, D. S. November 2008. Project success and project team management: Evidence from capital projects in the process industries. *Journal of Operations Management* 26 (6): 749 - 766.
- [8] Demarco, A. August 27, 2008. Estimating is not just about cost, it is about respecting the Project Management Triangle.: 1 - 2. <http://blog.pricystems.com/blog/tony-demarco-on-accurate-estimating/0/0/estimating-is-not-just-about-cost-it-is-about-respecting-the-project-management-triangle> (accessed 20/3/2010).
- [9] Hans E.W, Leusb, W. H., R., Wullinka, G. October 2007. A hierarchical approach to multi-project planning under uncertainty. *Omega* 35 (5): 563 - 577.
- [10] Jenkins, N. February 5, 2008. A Project Management Primer - Basic Principles - Scope Triangle. <http://www.pmhut.com/a-project-management-primer-basic-principles-scope-triangle> (accessed 9/3/2010).
- [11] Jha K.N, K. C. I. 5 July 2007. Commitment, coordination, competence and the iron triangle. *International Journal of Project Management* 25 (5): 527 - 540.
- [12] Kaiser, M. J. September 2009. Modeling the time and cost to drill an offshore well. *Energy* 34 (9): 1097 - 1112.
- [13] Kiess, E. 28 January 2007. The Triangle of Truth. http://www.verasage.com/index.php/community/comments/the_triangle_of_truth/ (accessed 9/3/2010).
- [14] Lambropoulos, S. January 2007. The use of time and cost utility for construction contract award under European Union Legislation. *Building and Environment* 42 (1): 452 - 463.
- [15] Lang, M. J. August 1990. Project management in the oil industry. *International Journal of Project Management* 8 (3): 159 - 162.
- [16] Parast, M. M. 20 February 2010. The effect of Six Sigma projects on innovation and firm performance. *International Journal of Project Management* In Press, Corrected Proof.
- [17] Trond Jürgensen, S. W. W. 1 December 2000. Improving project cost estimation by taking into account managerial flexibility. *European Journal of Operational Research* 127 (2): 239 - 251.
- [18] Wakefield, L. C. P. Nov - Dec 2008. Project Management Principles for Unit Logisticians. 40 (6): 1 - 5. http://www.almc.army.mil/aalog/issues/NovDec08/projmanag_principles.html (accessed 10/3/2010).
- [19] Turner, E. K. February 1988. Scope definition for bidding project-control services. *International Journal of Project Management* 6 (1): 39 - 44.
- [20] Wit, A. d. May 1986. Cost-effective owner project management. *International Journal of Project Management* 4 (2): 77 - 81.
- [21] Zedan Hatush, M. S. March - May 1998. Contractor Selection Using Multicriteria Utility Theory An Addictive Model. *Building and Environment* 33 (2 - 3): 105 - 115.