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Project Risk Management in Oman: A Survey of Risk Practices in the Construction Industry

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ABSTRACT

Risk management in a project context is a formal process that enables the identification, assessment, planning and management of risks throughout the project lifecycle. This paper reviews risk management practices within project environments in Oman. A survey of construction organizations reveals that the majority of these companies relies on intuition, subjective judgment, and experience in assessing project risks. Furthermore, it has been revealed that their risk management practices are based on ad hoc fire-fighting basis rather than formal and systematic risk management processes. The focus of such organizations is on the avoidance of risk as a process and not mitigating the circumstances which give rise to the occurrence of risk. The reasons behind these common practices are: (a) lack of familiarity with formal risk management concepts and methods; (b)

lack of expertise; and (c) lack of incentives to carry out risk analysis exercises.

KEYWORDS: Risk, Risk Management, Construction Industry.

1. INTRODUCTION

The increasing failure of many construction projects in meeting deadlines, cost and quality targets and the competitive threat posed by globalisation all put risk management high in the agenda for forward thinking organisations. This concept has been a subject for serious academic study because of inherent time and cost overruns associated with construction projects.

Risk management is a formal process that systematically enables the identification, analyses, and management of risks throughout a project lifecycle (PMBOK, 1996). The management of risk is one of the most important issues facing the majority of construction firms in Oman's construction industry today. The concept of risk management is relatively new and has not yet been practiced by most contractors with the exception of subjective judgement and practical experience; this resulted in poor definition of the project objectives, inadequate cost estimates and adversarial relationships between these companies and their clients.

Risk refers to factors affecting project outcomes and the probability of occurrence of each outcome. Risk Management is about minimising disturbance to the project, and ensuring every thing goes according to plan to meet project objectives. It provides a disciplined environment for proactive decision making to assess continuously what could go wrong, determine which risks are important to deal with and implement strategies to deal with those risks. Therefore, managing risk is actually managing the organisation's activities and resources to mitigate the impacts to the achievement of a project's goals and objectives.

Recent events in the Sultanate of Oman of opening doors to foreign investments especially in the gas and tourism sectors and joining regional and global free trade organisations is expected to yield an unprecedented growth in construction activities. Oman is in desperate need for development projects in many areas, especially in the fields of petrochemical and gas industries, water, wastewater collection and distribution, roads and highways infrastructure, tourism and residential projects. As a result, an unprecedented number of large-scale projects are currently under construction and in the planning and contract award stage.

The construction industry is one of the major sectors in Oman and has played a significant and distinct role in Oman's economic and social development. Its contribution to the Gross Domestic Product (GDP) was 3% in 2004 and is projected to increase to 10% by 2020 (Oman Chamber of Commerce and Industry, 2005). In order for this industry to sustain a

positive performance and achieve a continuous improvement for the coming years and to meet the demands of the comprehensive development, it is required to adopt Project Management tools and techniques such as Risk Management. With this, the construction industry will hopefully, be able to play an important role in contributing to the betterment of the Gross Domestic Product and the growth of investment made in the tourism and other economic sectors in addition to its contribution in employing the national cadre for generating income and raising the living standards of the individuals and ultimately achieving economic wellbeing for the Omani society. The construction industry is key to Oman's development.

This paper reviews risk practices within project environments in Oman. It presents the results of a questionnaire survey of the largest contractors involved in the Omani construction industry, concerning the usage of risk management technique. It aims to identify and assess the construction risks and to understand how these risks are currently being managed, particularly those related of time and cost.

2. RISK AND RISK MANAGEMENT

Risks are present and inherent in all businesses and transactions; we live with it and learn to manage its influence on our lives. Construction activities are not an exemption to this influence. According to Chapman and Ward (1997):

"All projects involve risk – the zero-risk project is not worth pursuing. Organisations which better understand the nature of these risks and can manage them more effectively cannot only avoid unforeseen disasters but can work with tighter margins and less contingency, freeing resources for other endeavours, and seizing opportunities for advantageous investment which might otherwise be rejected as too risky".

Risk refers to factors affecting project outcomes, is related to a range of outcomes and the probability of occurrence of each outcome. A number of researchers have attempted to define risk from various perspectives. Although Healy (1982) and Smith (1999) expressed risk as an exposure to economic loss or gain from being involved in the construction process, other researchers (Flanagan and Norman, 1993) regarded risk as a potential for unwanted negative consequences of an event or activity. Furthermore, Bufaied (1987) and Boothroyd and Emmett (1998) described risk in relation to construction as a variable in the process of a construction project whose variation results in uncertainty as to the final cost, duration and quality of a project.

Risk Management is concerned with minimizing disturbances to projects and ensuring everything goes according to plan to meet project objectives. It provides a disciplined environment for proactive decision making to assess continuously what could go wrong, determine which risks are important to deal with and implement strategies to deal with those risks. Therefore, managing risk is actually managing the organisation's activities and resources to mitigate the impacts to the achievement of a project's goals.

A growing number of construction organisations especially in the developed world have recognized the increasing importance of risk management. Many of these have established risk committees which are often chaired by a board member or a risk facilitator who is responsible for providing strategies, techniques and specific approaches to recognize and confront any threat faced by an organisation in fulfilling its objectives. According to Smith (2003), competent contractors, in addition to their professional competence, must demonstrate high competence in managing risks to avoid potential disastrous outcomes. He argues that risk management can be considered as an essential part of a continuous and structured project planning cycle which:

- Requires acceptance that uncertainty exists;
- Generates a structured response to risk in terms of alternative plans, solutions and contingencies;
- Is a thinking process requiring imagination and ingenuity; and
- Generates a realistic (and sometimes different) attitude in project staff by preparing them for risk events rather than letting them be taken by surprise when they arise.

Simon et. al. (1997) suggest that, at its most fundemantal level, risk management involves identifying risks, predicting how probable they are and how serious they might become, deciding what to do about them and implementing these decisions. This is further endorsed by Smith (1999) who presents a process involving four steps for managing risks: 1. identification of risks; 2. analysis of implications; 3. response to minimize risk effects; and 4. allocation of appropriate contingencies.

Of course, the objective of risk management is not to create a totally risk free business or project, as no such risk-free environment exist, but to raise the awareness of all the stakeholders of a project or business of both negative and positive risks associated with their activities. This will help then to better calculate risks and to manage these effectively and efficiently throughout the life of a project.

3. THE STUDY

This study is based on an intensive research of the Omani construction industry to understand current methods used for managing risk and identify the most common risk factors particularly those contributing to time and cost overruns. To realize these objectives a questionnaire survey was personally distributed to 60 contractors representing the largest construction contractors listed in the Omani Government Tender Board (Oman Tender Board, 2005). The personal delivery approach was deliberate to ensure that respondents fully understood the aim of the study and that no part of the questionnaire was ambiguous to any of the respondents. In the following sections, the results of this survey are discussed in more details.

4. THE QUESTIONNAIRE SURVEY

A total of 43 responses were received resulting in a 72% response rate to the questionnaire survey. This is much higher than the average acceptable response rate of 20-30% (Akintoye and Fitzgerald, 2000). The reasons for such a high response rate are believed to be the distribution method and also the nature of the investigation with Omani construction professionals realizing the importance of this study to their practices. The respondents to the questionnaire were executive directors, qualified project managers or chief engineers with at least 10 years of experience.

The survey included 32 risk factors, Table 1. Respondents were asked to indicate the significance of each of these factors on a 3-point Likert scale as follows:

1 = not significant
2= moderately significant
3= highly significant

The data collected from the questionnaire was used to compute a Severity Index for each of the risk factors. Severity Index computations were used to rank the factors according to their significance in affecting time and cost overruns. The results from this computation will be discussed in the analysis and discussion section.

Severity Index analysis is a technique used for measuring the relative importance of a group factors. The index is calculated using the equation illustrated below (Elhag *et. al.*, 2005):

$$\textbf{S.I.} = \left(\sum_{i=1}^{3} wi \times \boldsymbol{fi}\right) / \boldsymbol{n} \times 100\%$$

Where *i* represents the rating of each point on the scale: 1-3, *fi* the frequency of responses, *n* the total number of responses and *wi* the weight for each rating.

Table 1: Significance of Risk Factors on time and cost overruns

Type of Risk	Severity Index	Ranking
Financial Capability / failure	82.95	1
Management team (Suitability, experience, performance)	81.4	2
Variation orders & Additional works (magnitude, timing, interference level)	80.62	3
Accuracy of project programme	79.84	4
Material prices / availability / supply / quality	79.84	4
Delayed Permits issuance	79.07	5
Inspection, testing & approval of completed works (toughness / quality requirements)	79.07	5
Quality of design & specification	78.29	6
Subcontractors performance	78.29	6
Level of communication within the contractor organisation	77.52	7
Project Risk Management in Oman Delayed payment by client	77.52	7 *7*
Level of uncertainty of soil / underground condition	77.52	7
Labour cost / availability / supply / performance / productivity	77.52	7
Accident / safety	75.97	8
Quality of finishing	74.42	9
Completeness & timeliness of project information (design, drawings, specification)	74.42	9
Contractor Current Work Load	72.87	10
Delayed payment to subcontractors	72.87	10
Plant costs / availability / supply / condition / performance	72.1	11
Site access / Work space	69	12
Third party delays	68.99	13
Stability of Market Conditions	68.22	14
Delayed claims & dispute resolutions	66.67	15

Disasters i.e. fire, flood, .etc	65.9	16
site conditions / site topography	65.9	17
Exchange rate fluctuations	65.12	18
Adverse weather conditions	63.57	19
Client access and working hours restriction	59.69	20
Government regulations / policy (health & Safety, fire etc)	58.91	21
Inflation	58.14	22
Labour disputes	55.04	23
New technology	53.49	24

5. THE ANALYSIS

The survey reveals that financial capability of contractors, suitability and experience of the management team and the magnitude and timing of additional works and variation orders are the top 3 most significant risk factors affecting time and cost overruns. The least significant factors in order of importance are inflation, labour disputes and new technology. The survey of Omani construction organizations also reveals that there is a need to engage construction organizations in a systematic process of risk management which would foster intuitive judgement and experience. Despite the existence of risk management guides such as PRAM (Simon et. al., 1997) and RAMP (1998), there is no evidence that these have had any impact in the Omani construction industry. One reason for this is believed to be the onerous nature of implementing such programmes.

PRAM (Simon et. al., 1997) is a comprehensive risk management guide that through experience has shown that the level and kind of communication it generates can lead to significant cultural changes within an organization that are complex and difficult to predict. This by all means is very beneficiary indeed but could be why construction organizations are reluctant to adopt. Cultural change is often perceived as a threatening exercise to existing practices.

On the other hand, RAMP (1998) has been developed to aid in decision making and risk management at strategic rather than project level. Furthermore, it places particular emphasis on financial implications and therefore the framework targets sponsors, lenders and investors rather than project managers.

There is clearly a need to develop a framework for Omani construction organization that would serve as a practical first-step guide to promoting the concept of risk management at project level which could be used in the short term by construction organizations with a view of implementing a full-scale onerous risk management programme such as

PRAM in the long term. This framework would provide a pragmatic bird's eye view of all the stages essential in a risk management exercise together with guidance on quantitative and qualitative tools and techniques that could be used at each stage. The authors are in the final stages of developing such a framework that would enable the construction industry in Oman to further contribute towards development of the economy and social systems.

6. CONCLUSIONS

This paper reviews risk practices within project environments in Oman. It presents the results of a questionnaire survey of the largest contractors involved in the Omani construction industry, concerning the usage of risk management technique. It has been revealed that the majority of construction organisations in Oman have no formal risk management procedures in place. It has been suggested that such procedures are based on an ad-hoc fire-fighting basis rather than formal and systematic risk management processes. The focus of such organizations is on the avoidance of risk as a process and not mitigating the circumstances which give rise to the occurrence of risk. The survey shows that the most significant risk factors found are (a) *Contractor Financial Capability*; (b) *Management team (Suitability, experience, performance)*; (c) *Variation orders and Additional works*; and (d) *Accuracy of project programme*. The risk category *Inflation, Labour disputes* and *new technology* received the lowest ranks due to low inflation rate and the industry is not influenced by any power group such as labour unions and minor labour disputes are handled by the Ministry of Work Force.

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