THE IMPACT OF EFFECTIVE RISK MANAGEMENT ON PROJECT SUCCESS

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Project success is the satisfaction of stakeholder needs and is measured by the so-called success criteria as identified at the start of the project. The conventional view of project success based on cost, time and quality is no longer sufficient. The main objective of the research work that underpins this paper was to investigate the impact of effective risk management processes on project success. In this paper, two case studies of already executed projects have been considered to analyse the impact of their risk management processes on the project outcome. Project 'A' had no visible risk management process implemented therefore all the risks identified at the definition stage occurred during the project execution. Project 'B' on the other hand, had some risk management process implemented but the project still overran schedule due to lack of continuity in the risk management. Both projects incurred huge amounts of lost earnings for the organisations due to their schedule overrun. It has been concluded that the cause of the projects failure can be directly related to the extent of risk management undertaken. Besides, the level of risk management process undertaken during a project impacts directly on the success or otherwise of the project. Furthermore, effective risk management should be continuously undertaken throughout the project lifecycle to enhance project success.

Keywords: project management, project success, risk management.

INTRODUCTION

Conservative estimates put the cost of project failure at £97bn across the European Union (Boddy, 2006). Many projects suffer overrun in cost, delayed schedule, failure and even abandonment. They may equally not meet the quality specifications or may not achieve the benefits for which they were embarked upon. The cost of failure makes it important to understand what makes a project successful.

Traditionally, successful project management is analysed on the criteria of performance/ quality, budget and time of completion. Two more criteria to determine the successful project management were added by Kerzner (2001). Firstly, the project would effectively and efficiently utilise the resources and, secondly, it should be accepted by the customer.

Projects surround us as can be testified with the growth of the Project Management discipline. Society desires that all projects should be successful and has become less tolerant of failure (Edwards and Bowen, 2005). Pressure is exerted on project managers to minimise the chance of project failure. This increasing pressure for

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successful project delivery suggest that it is prudent for anyone involved in a project to be concerned about the associated risks and how they can be effectively managed.

According to APM (2006), all projects are inherently risky because they are unique, constrained, complex, based on assumptions, and performed by people. As a result, project risk management must be built into the management of projects and should be used throughout the project lifecycle. Many projects fail because organisations assume that all the projects would succeed and they therefore do not identify, analyse, and provide mitigation or contingencies for the risk elements involved in the project. This is especially true with the rapid change and increased competition.

In this paper, the impact of effective Risk Management processes on project success is investigated within the context of two case studies. In the following section, the concept of project success and its relation to risk management is studied in some detail. Then, the data gathered from two case study projects is analysed. Finally, the research work is summarised, conclusions are drawn and recommendations for future research are introduced.

PROJECT SUCCESS

Success Factors

Based on the researches of various authors (APM, 2006; Turner, 2002; Turner & Simister, 2001; among others), it was determined that the conventional view of project success based on cost, time and quality objectives were not sufficient. The various stakeholders involved in a project may each have a different view of what determines the successful project. Kerzner (2001) added two more criteria to determine the successful project. First, the project would effectively and efficiently utilise the resources. Secondly, it should be accepted by the customer.

Turner (2002) discredits this conventional view of the project success based on time, cost and quality objectives as being a perspective from the point of view of the project team. He identified a wide range of success criteria, reflecting various stakeholders' interest and judged over different time scales. These views though differing need to be aligned in order to achieve a successful project (Turner & Simister, 2001).

Critical Success Factors

Critical Success Factors are elements within the project context/ environment which should be controlled to increase the probability of a successful project outcome. The presence of these factors in a project does not guarantee a success but their absence may contribute to failure. Many authors (e.g. Rozenes *et al.*, 2006; Dooley *et al.*, 2005; Maylor, 2003; Turner, 2002; Kerzner, 2001) have identified the following as critical factors to the success of a project:

- Definition of clear goals.
- Management support.
- Detailed project plan.
- A defined control mechanism.
- Communication- client consultation and acceptance throughout the project lifecycle.
- Competent and technically able project team.
- Flexibility of the Project Manager to deal with uncertainty.
- The project owner should take an interest in the performance.

Appropriate planning of the project determines a baseline which outlines a course to steer in the execution of the project. In project execution, actual progress usually deviates from the baseline plan. Rozenes *et al.* (2006) stated that the deviations can be due to the following:

- Owner Interference/ Scope creep.
- Inadequate constructor experience.
- Financing and payments.
- Labour Productivity due to learning curve, sickness, absenteeism.
- Slow decision-making.
- Improper planning.
- Subcontractor's late deliveries.

Project Benefits

Benefits management on the other hand is the identification of the benefits at an organisational level, monitoring and achievement of those benefits (APM, 2006). Project benefits can be measured either qualitatively, e.g. in terms of customer satisfaction, or quantitatively e.g. in terms of profit or increase in market share. The achievement of the project success criteria can be measured at the project closeout and handover phase of the life cycle while the benefits can only be derived after this phase. This therefore means that the ownership of the benefit realisation rests with the project sponsor rather than the project manager. Key Performance Indicators (KPIs) are quantitative measures of success criteria and tracking of the KPIs would ensure the project is aligned towards success.

Risk Management and Project Success

To increase the chances of a proposed project succeeding, it is necessary for the organisation to have an understanding of potential risks, to systematically and quantitatively assess these risks, anticipating possible causes and effects, and then choose appropriate methods of dealing with them (Mobey & Parker, 2002). To ensure that any potential risks are managed effectively, the risk process needs to be explicitly built into the decision-making process.

Risk management is thus an important tool to cope with such substantial risks in projects by: (a) assessing and ascertaining project viability; (b) analyzing and controlling the risks in order to minimize loss; (c) alleviating risks by proper planning; and (d) avoiding dissatisfactory projects and thus enhancing profit margins (Lam *et al.*, 2007).

Applying principles of risk management supports the quality improvement and improves cost estimation by identifying and mitigating potential risks before a project begins. Risk management puts processes in place to ensure management receives organised risk information early enough to apply corrective actions that will allow realistic schedule and cost estimates and assure successful completion of the project (Tinnirello, 2000). Risk management principles increase team involvement by providing a mechanism for the reporting of potential problems and increasing the team's stake in the overall success of the project. The embedding of risk is a long-term exercise to ensure that risk consideration is at the heart of the decision-making process (Hodge, 2002). Failure to appreciate risk issues may give rise to serious consequences (Fraser & Henry, 2007).

Elkington & Smallman (2002) have identified that there is a strong link between the amount of risk management undertaken in a project and the level of success of the project - more successful projects use more risk management. Also the earlier that risk management was used in a project, the more successful it was. It is essential that the risks of a project be assessed at the Project Brief stage. Risks identified here will not only help the production of the necessary project products, but will increase the chance of overall project success. A significant risk that is not identified and mitigated will become a real problem at some point during the project life cycle (Tinnirello, 2000).

The Project Manager should establish a control system that will comply with the project success factors as recommended by several researchers (Kerzner, 2001; Maylor, 2003; Rory, 2003; Rozenes *et al.*, 2006; among others).

CASE STUDIES

In this section, two case studies of the previously executed projects are analysed in detail based on their pre-determined and pre-agreed success criteria set by stakeholders. In line with the confidentiality agreement with the interviewee, the case study projects would be called Project 'A' and Project 'B'. Both projects were undertaken in the Oil and Gas Industry.

Analysis of Case Study Method

To ensure that the data obtained is a true representative of the case study projects, various documents related to the projects have been collected and analysed. An 'analytical' approach is adopted for the interpretation of the data. This data was obtained from structured interviews and review of the case studies documents. Besides, the Risk Management Consultant has been interviewed to gain an insight into what the risk elements involved in the projects were. Other key project management personnel involved in the case study projects have relocated outside UK and even Europe following the disband of the project teams. They therefore were not accessible for the interview as efforts made to contact them proved abortive.

The Risk Management Consultant available for the interview has been questioned in such a way as to get an objective response. He equally gives an objective opinion of the risk management errors made during the project implementation and how they affected the project outcome. 'Open questions' have been used to enable the interviewee expand on his answers. Additional information is obtained from the documentation on the case study projects. The qualitative data obtained from the structured interview are grouped under specific question headings for ease of analysis.

Case Study 'A'

Project Overview
Project 'A' was executed in West Shetland on the Atlantic Ocean. It was part of a $600 platform project for the development of a drilling module, production module and accommodation. The organisation hired a Risk Management Consultant to analyse the risks involved in an aspect of the platform project. This aspect of the project is what would hereafter be known as Project 'A'. It was a $200 project involving the supply of 11KV power to the Drilling Systems Module (DSM) and Derrick Equipment Set (DES) through the re-entry of the 10Z tie back well. The Drilling Modules would be mechanically completed and hooked-up to the platform. The 10Z tie back well is a raised module that carries the oil being drilled up to the

platform. The scope of this project was the hook-up and commission of the drilling systems commission and Integrated Assurance Test (IAT) only.

This project involved the drilling facility of a mechanised rig between the verification phases of the commissioning and Integrated Assurance Test (IAT). The commissioning phase is the verification of design and functionality of equipment and integrated systems. The IAT phase is the verification that the holistic nature of the drilling rig and crew meet the required operational standard. In effect, the commissioning phase of the project is as fundamental to the IAT as is the competence level of the crew. It confirms the drilling module is in a safe condition following construction (drops survey, lifting gear certification, etc).

The Risk Management Consultant reviewed the approach their Client was taking in managing the project so as to give a good analysis of what might happen. They identified key risks through brainstorming, interviewing the project team and review of similar projects. Using probability software, they predicted a less than 5% chance of achieving 'first oil' by 07/01/2005 and a 40% chance of achievement by 22/02/2005 if the risk mitigations were not implemented. Appendix 4a attached shows the Project 'A' Commissioning Schedule Risk in terms of the 'first oil' milestone. Appendix 4b shows the tasks likely to delay the 'first oil' milestone.

The consultant recommended ways to mitigate the risks and thereby increase the project success. This recommendation was not adhered to as the organisation did not mitigate any of the risks identified. All the identified risks occurred during the project lifecycle and the Project overran schedule which was the main success criteria. This schedule overrun therefore incurred a huge amount of lost earnings for the organisation. The actual date of 'first oil' was 22/02/2005 as predicted by the consultant.

Predetermined Success Criteria

The success criteria for this project were in line with the traditional project objectives of time, budget and quality. However, the emphasis was more on time and achieving the drilling of the 'first oil' by a pre-determined date of 07/01/2005. If the budgeted time for project completion was not met, the organisation stood to lose earnings on the barrels of oil they would have drilled daily. This was approximately 60,000 barrels/day at $50/barrel.

This emphasis on time as a success criterion was equally reflected in the type of contract the organisation had with its labour force. The contracts with workers were the 'reimbursable' type where workers were paid hourly based on their productivity and input.

Analysis of the Project Success

During the project implementation, everyone involved in the hook up, commissioning and IAT work was focused on completing the work within the shortest time frame possible. However, having not conducted a formal risk assessment prior to the implementation, the completions team found themselves reacting to situations which could have been identified, quantified and managed. They experienced schedule impacts to critical path activities which directly impacted on the date for 'first oil'.

When schedule durations were developed, the focus was purely on the time to complete every identifiable task and little conscious effort was put into building in time for disruption due to variables such as the risks identified above. Similarly the

tendency was to develop the schedule to meet expected targets and as such is often overly optimistic.

The emphasised success criterion for this project was completion on time and achieving the drilling of the 'first oil' by 07/01/2005. The date of first oil being a major pre-determined and pre-agreed success criterion was not achieved. In addition the schedule overran by 45 days as the project was completed by 22/02/2005. If the budgeted time for project completion was not met, the organisation stood to lose earnings on the barrels of oil they would have drilled daily. This was approximately 60,000 barrels/day at $50/barrel. The total estimated amount lost by the organisation as a result of the schedule overrun is $135,000,000. This project was therefore considered a failure.

The cause of failure in Project 'A' can be directly linked to the risk management attitude adopted by the Project Manager. The Risk Management Consultant outlined key risks involved in the project, identified the tasks that would mostly be affected by the risks and provided mitigations for them. Unfortunately, these mitigations valued at $3m were not implemented and all the predicted risks occurred during the project. It can safely be concluded that if the mitigations were implemented as recommended, the project would have been a success as the date of 'first oil' would have been achieved. The organisation equally could have earned approximately $135,000,000 which they lost due to the delay.

A review of available documentation from this project to identify lessons learnt revealed the following:

Throughout the hook-up, commissioning and start up phases of the work, the whole focus of the project team was on the tasks at hand and not necessarily on the next phase of the job. For instance, the drill crews got so involved in the commissioning process that key start up activities were overlooked. This ultimately resulted in delays to starting drilling operations.

The drilling crew were not confident with the new equipment and systems such that they relied heavily on the contractors even after the handover. This was because there was not adequate training on the start up of mechanised systems prior to the handover.

Insufficient time built into the schedule for hook up and commissioning of the drilling systems caused an overrun of the project schedule.

Case Study 'B'

Project Overview

Project 'B' was a $30m project for the upgrade of the Mobile Offshore Drilling Unit of an Oil and Gas company by Contractors. For ease of narration and also in line with the confidentiality agreement, the Organisation would be referred to as 'ABC' while the Contractors are 'XYZ'. 'XYZ' was to upgrade the rig and on completion, lease it out to 'ABC'. It was to undergo a pre mobilisation upgrading and modification program at a Brazilian Shipyard to meet ABC's contract requirements.

The drilling unit was to be transported from Brazil to Angola where it would be used. 'XYZ' was to carry out the upgrade before the rig is towed to Angola. The scope of Project 'B' was from the time 'XYZ' started the upgrade to the beginning of the transit period from Brazil to Angola. It also includes the sea trials

The Risk Consultant was commissioned by 'ABC' Project Team to provide independent project management assurance review, monitoring and validation of the

'XYZ' Upgrade Project's quality, technical integrity, progress measurement and milestone forecast completion 'The consultant also determined whether the proposed yard stay of 85 days was a realistic duration for all upgrading tasks 'XYZ' has planned to implement. As with Project 'A' above, the Risk Management Consultant reviewed the approach their Client was taking in managing the project so as to give a good analysis of what might happen. They identified key risks through brainstorming, interviewing the project team and review of similar projects. Using probability software they predicted a 10% probability of achieving the 85 days schedule on 27/04/2005 and a 50% probability of 6days duration overrun to 03/05/2005 based on un-mitigated schedule (Appendix 7a). They also identified the tasks mostly affected by the risks as shown in Appendix 7b attached. Based on mitigated schedule, the consultant predicted a 10% probability of an 82days duration under-run on 24/04/2005 and a 90% probability of an 84days duration under-run on 26/04/2005. Appendixes 8a and 8b attached show the risk assessment prediction and the tasks likely to delay the project completion.

The target of completing the dock stay within the scheduled completion date of 27/04/05 was achievable and possibly can be exceeded by completion before the date. This can only be possible if 'XYZ' fully implements its plans to mitigate and manage the identified project risks. The consultant recommended ways to mitigate the risks and thereby increase the project success. This recommendation was partly adhered to as 'XYZ' did mitigate some of the risks identified.

Predetermined Success Criteria

Rig upgrade projects normally have two main drivers/ success criteria. These are Cost and Schedule. The driver that takes precedence depends on the length of time the project can be planned and executed in. Usually, if the rig is being upgraded to go immediately onto a contract, the project can be described as a schedule driven project. Therefore, Project 'B' can be described as a schedule driven project as it was going to be leased to 'ABC' immediately after the upgrade.

Analysis of the Project Success

The Upgrade Risk Review commissioned by 'ABC' identified several areas of risk and included recommendations for 'XYZ' to complete an integrated schedule and formal Risk Review. The results of the Consultant's review were issued to 'XYZ'. In consideration of the value of the project, the magnitude of the work and its importance to 'XYZ', it is difficult to understand why 'XYZ' chose to ignore recommendations made by the Consultant's report and fail to complete a more thorough Risk Assessment.

By not conducting an overall project risk assessment, the project manager runs the risk of focusing only on risks associated with the SOW and overlooking the overall risks to the project and schedule. Also, the success of the project can be directly influenced by the level of ownership and understanding of the identified risks by the project stakeholders and the project team. This level of ownership directly affects the level of implementation of mitigation and management tasks in order to lower the probability of the risks actually occurring.

The main contracting strategy 'XYZ' had with shipyard for Project 'B' is Fixed Lump Sum pricing against the Scope of Work (SOW) with liquidated damages assigned for delays to the completion date. There are two main risks associated with this strategy. First is the risk that the SOW has not been adequately defined. Second is that the choice of strategy may be at odds with the project driver. This is because the control

of ‘when’ and ‘how’ the work happens is handed over to the shipyard. In this case, the liquidated damages agreed to in the contract are capped at a relatively small value ($450K). Therefore, if the yard stay experience difficulties, the risk is that they (shipyard) may try and protect their profit margin at the expense of the schedule. Thus, they will complete the work later than estimated.

Many of the risk areas identified above materialised during the course of the project and were either contributory factors towards extending the completion date, or inhibited the project’s ability to accelerate completion of elements of the work. Therefore the chances of early or on schedule completion were not delivered.

The Project overran schedule by 6 days totalling the overall project duration to 91days as earlier predicted. As the schedule was the main success criterion, ‘XYZ’ incurred a huge amount in lost revenue from the rig daily rental value ($350,000/day) for the 6days. If the risks were mitigated and the upgrade completed ahead of schedule (82days), ‘XYZ’ had a potential earnings up to $1,050,000 from the daily rental value. ‘XYZ’ would equally save on the labour cost, etc from the project if it was completed ahead of schedule.

‘ABC’ on the other hand, adhered to the advice of the Risk Consultant. They made a savings of about $3m from pulling mobilisation. They delayed the mobilisation of their staff to Angola based on the schedule by ‘XYZ’ stipulating the arrival of the rig. Instead, ‘ABC’ mobilised their staff based on the schedule stipulated by the Risk consultant after the risk assessment. In other words, Project ‘B’ was a success for ‘ABC’ and a failure for ‘XYZ’ in terms of money saved and lost respectively.

Although there was some form of risk management process undertaken during the course of executing Project ‘B’, it was not carried out continuously throughout the project lifecycle. This led to the failure to properly mitigate the risks. It is therefore important to undertake the risk management process from inception to completion in any given project because of the ‘fluid’ nature of projects.

Findings from Structured Interview

In his opinion, the Risk Management Consultant identified the causes of the project failure as “lack of a risk management process in Project ‘A’ and lack of a continuous risk management process in Project ‘B’.” He analysed that there was a direct relationship between effective risk management and project success. In his words, “Effective risk management enhances project success. It helps to identify the key risks, assess them and plan a mitigation or contingency for them. Without an effective risk management, the Project Manager would ‘react’ to the risks as they occur against the option of being ‘proactive’ and manage the risks before they occur.”

The Consultant recommended a continuous effective risk management in project management. In his words, “Effective continuous risk management helps to keep track of risk elements, what is being done about them and identifies new risks.”

From the responses by the interviewee, the failure or otherwise of Projects ‘A’ and ‘B’ were directly related to the risk management process undertaken during the project lifecycle. In Project ‘A’, there was no evident form of risk management undertaken during the project lifecycle. The project manager did not adhere to the risk report submitted nor did he have a visible risk management plan of his own. Project ‘B’ was different in that there was some risk management undertaken during the lifecycle. The cause of the schedule overrun was that the Project Manager did not continuously undertake the risk management process all through the project life cycle.

CONCLUSIONS AND RECOMMENDATIONS

A literature review of project success and risk management has been undertaken. It has been found that the conventional view of project success based on cost, time and quality objectives is not sufficient. Besides, project success has been seen to be relative based on the pre-determined and pre-agreed success criteria set by all the stakeholders.

A detailed analysis of the risk management processes implemented during two previously executed projects has been undertaken to establish the relationship between the level of risk management and the project outcome. It has been established that the there was a direct relationship between the effective risk management and project success based on the case studies. Besides, it can be argued that the more effective continuous risk management implemented in a project, the higher the chances of project success.

Whilst the findings point to general areas that could benefit from further analysis, there exist two limitations which may have a bearing on the outcome of the research. First, the small sample size of two case study projects would not give a reliable and valid data to make a definite conclusion, particularly with unavailability of most key project management personnel involved in the case study projects. This meant that a variety of opinion through structured interview was not got. Further study into all elements of the way in which projects were run would have to be undertaken to determine if one element improved the project success rate fundamentally.

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