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Procedia Engineering 182 (2017) 314 – 320

Procedia Engineering

www.elsevier.com/locate/procedia

7th International Conference on Engineering, Project, and Production Management

Major Participants in the Construction Industry and Their Approaches to Risks: a Theoretical Framework

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Abstract

The construction sector is an important engine for economic development in Australia. A variety of stakeholders is involved in any construction project. Major participants including design teams, clients, contractors and project managers are examples of stakeholders that have the ability to hinder or promote the progress of a construction undertaking. Each participant's approach towards the project is likely to be influenced by its characteristics such as power, interest, and influence as well as their actual role in the project, education, experience, etc. This research is aimed at comparing the major participants of the client, design team, contractor and project manager involved in construction projects based on their characteristics and the risk management approaches they implement. The research will ascertain if there is a correlation between the major participants based on their characteristics and their approach to risk management.

Peer-review under responsibility of the organizing committee of EPPM2016

Keywords: risk management; stakeholders; construction industry; literature review

1. Introduction

The construction industry is an important component of the Australian economy. The industry accounted for approximately 8% of the labour force and 5.5% of the GDP for 1999-2000. Its impacts upon the general economy extend far beyond the sole erection of buildings as it has linkages with many other sectors particularly due to the large

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Peer-review under responsibility of the organizing committee of EPPM2016
doi:10.1016/j.proeng.2017.03.100

number and variety of participants involved in it either directly or indirectly. The construction sector is considered to be an essential productive driver for economic development in Australia [1].

Given the nature of the construction industry, there is a high inherent risk factor of late or non-completion [2, 3], running over budget [4] and/or non-compliance with requirements among a majority of construction projects. More often than not a variety of stakeholders, including major participants of design teams, clients, contractors and project management, are involved in building projects. Each invests a substantial outlay of capital, in the form of time, resources or financial backing. As a result these major participants and stakeholders in general have a great deal of power which can influence and shape the progress of any project. The push and pull effects and interrelationships of characteristics within a stakeholder's organisation and between stakeholders themselves can have a significant impact upon the construction sector and in turn the entire value chain [5, 6].

The type and number of stakeholders involved, the size, uniqueness and complexity of the actual project itself combined with the current social, political and economic climate all contribute to the level of risk [7]. The sources of risk may arise from environmental, logistics, design, financial, legal/contractual, political, operational or technical areas. The risks cause cost and time overruns ultimately impacting on the overall success of the project. It is generally accepted that stakeholders within the construction sector aim to manage risks to create a sustainable outcome [8].

Many studies, to date, have been conducted on identifying the attributes of stakeholders involved in construction projects. Some have been in the form of case studies of specific projects and so provide a narrow perspective of the situation but do provide valuable data [9, 10]. Furthermore, a considerable amount of the research has been conducted overseas such as the United Kingdom [11, 12], Asia [2, 13, 14] and the Middle East [3] with little discussion of the Australian situation in comparison. While there is some research available on stakeholder attributes such as power, interest and role in construction projects [9, 10] there is less reference as to how particular stakeholders actually approach and manage risk themselves. In reference to risk in the construction industry, past research tends to focus on ways of identifying risk and the strategies and the benefits of particular risk management techniques during a construction project in relation to the project objectives [7, 8]. A number of studies of particular interest were conducted by Carr and Tah [15], Skitmore and Wilcock [16] and Tah et al. [11] which concluded that a formal risk management process was a rarity within many industries. Furthermore, Akintoye and MacLeod [12] in a UK study, found that there was some reliance on intuition or "good feeling" when conducting risk analysis. This also raised the question as to the real extent and implementation of formalised risk management amongst stakeholders within the construction industry in Australia.

The current economic climate in Australia is quite confronting and a number of well-known and reputable companies involved in major construction projects have recently had to enter into receivership. This research will focus on the major participants in a construction project being clients, design teams, contractors and project managers. There are many risks and uncertainties that must be considered by the major participants of design team, client, contractors and project management when involved in construction projects. This research focuses on how the characteristics including size, role, experience, education of clients, design team, contractors and project managers as major participants involved in construction projects, affect their approach to risk. These characteristics will then be aligned with their use of formal risk management tools or lack thereof.

Based on the research problem, the following research questions are developed:

- Is there a correlation between major participant characteristics including role, size, education, experience and their approach to risk management?
- Do major participants; clients, design team, contractors and project managers with different characteristics approach risk differently?
- How is intuition and experience used in risk management by clients, design team, contractors and project managers?

2. Literature Review

2.1. Stakeholders and major participants

Clients, design team, contractors and project managers are examples of stakeholders that are major participants in many construction projects. Olander [9] describes "stakeholders as any group or individual who can affect, or is affected by, the achievement of a corporation's purpose". This is quite a broad definition and can be refined by incorporating the aspect of contributing to or participating in decision making and activities as well as benefiting or being disadvantaged from the outcomes of decisions. There is a contribution to wealth creating activities and therefore being a potential beneficiary or risk bearer throughout the project. Consequently, a stakeholder may be defined as an individual or group that has a vested interest or share in an undertaking. This may include some aspect of rights or ownership. There is both a direct and indirect reciprocal relationship between a stakeholder and an organisation or project; as each has the ability to affect and in return be affected by the activities of the other. Stakeholder influence can be either beneficial in nature or conversely threaten the success of a venture [17, 18].

There are numerous stakeholders and participants involved in a construction undertaking. The list of possible stakeholders is extensive and can encompass owners, managers and users of facilities, project managers, designers, shareholders, legal authorities, employees, sub-contractors, suppliers, service providers, competitors, financial establishments, insurance companies, media organisations, neighbours and community representatives, the general public, government establishments, visitors, regional development agencies, the natural environment, pressure groups and civic institutions [17].

These stakeholders may be categorised as internal or external. Project owners or clients are an internal stakeholder and have overall managerial responsibility and power the project owner may be a consortium which may delegate management responsibility. They are often linked to a financial stake; and organisations or individuals who have a contractual relationship with the project owner. Local communities, government, potential users, regulators, environment groups and the media are external stakeholders. They may have varying attitudes towards a development and may also seek to influence a project through campaigning and political lobbying, regulation or direct action [5].

The importance of stakeholder engagement together with the correlation of stakeholder vision and goals has been well established in the literature [4, 18]. Stakeholder engagement refers to the formal process of relationship management through which projects and organisations interact with stakeholders in order to support and promote their mutual interests thereby reducing risk and advancing their current circumstances. This emphasizes the need for those involved in construction undertakings to have knowledge about the stakeholders or participants involved in a project, the risks that they face and how they approach risk management in order to develop a good working relationship with them.

A number of studies point to the acknowledgement that stakeholders and major participants often hold a position of some power in a project. Stakeholders are directed by a need to manage threats, opportunities and uncertainties about the performance of a development and to impose their will in the relationship to achieve a desired goal. Consequently, they have the ability to affect the progress and type of outcomes associated with any project [5, 9, 10]. It is imperative that any organisation and project is aware of their stakeholders and the influence that they can exert through their use of power. These stakeholders must be monitored and proactively managed to control their potential impact

Newcombe [10] found that stakeholder use of power depended largely on the stakeholder's attitude and motives which was in turn influenced by their role in a project. Power was used to 'maintain the status quo or to enforce fundamental change'. An Australian study conducted by Bourne and Walker [18] showed the project manager, while a major participant, is often neglected and overlooked as holding a key stakeholder role. Depending upon their role, a stakeholder also has a level of legitimacy. This is often associated with a moral obligation and the bearing of risk, either beneficial or harmful, in relation to the project [9]. The importance of a particular stakeholder or participant will depend upon the needs of the project and the extent to which the project is dependent on that stakeholder's attributes in meeting its needs. As the project moves through the project lifecycle, stakeholders and participants change as they enter, move or leave the project. Consequently some stakeholders will be more important to a given project at a particular time than others and their corresponding level of power and influence also alters [9, 18].

Due to the number and diversity of participants and stakeholders involved in a project, relationships between clients, contractors, design team and project managers can be adversarial leading to an increased risk of conflict, withdrawal of support and lessening the likelihood of the successful completion of a project [13]. A stakeholder engagement plan can be regarded as an important part of the overall risk management. An awareness of each stakeholder's risk tolerance and approach to risk including indicators that signal loss of interest or support for an undertaking need to be acknowledged and managed. The number, characteristics and diverse interests of stakeholders potentially have the ability to exacerbate the changeability and complexity of the risks associated with a construction project thereby requiring careful management themselves [18].

Acknowledging stakeholder power, influence and roles as well as understanding how their characteristics of size, experience, education and background impact on their approach to risk will allow their potential influences on a project to be better managed. Appropriate strategies can then be developed and implemented to maximize a stakeholder's positive influence and minimize any detrimental influences which influences their approach to risk [18]. Furthermore, knowledge of these characteristics can be utilised as part of a multi-criterion analysis when developing alternative courses of action for a project [9].

2.2. Risk and Risk Management in the Construction Industry

In the construction industry risk is often defined as an uncertain event, variable, or condition that, if it occurs, has an effect on at least one project objective, such as time, cost and/or quality. The risks can cause cost and time overruns in construction projects whose variation significantly results in uncertainty as to the final cost, duration and overall successful outcome of the project [4, 7]. A number of factors influence the perception of risk including educational background, experience, individual personality, cognitive abilities, information available and peer group [12].

An awareness of risk and defined risk management approaches have come to assume more significance in the construction industry as risk identification and risk allocation shape risk handling decisions [7]. A number of studies have been conducted to identify risks associated with a construction project. Kangari [8] listed areas for potential risk under the headings of construction related, contractual and legal, physical risks, managerial, public and political factors, managerial and economic. Akintoye & MacLeod [12] stated that the sources of risk may arise from environmental, logistics, design, financial, legal/contractual, political, operational or technical areas. While Zou's et al. [14] research on risks related to designers, clients, contractors, sub-contractors/suppliers and government agencies was quite comprehensive and emphasised stakeholders' roles in the management of project time, quality, cost, safety and environmental sustainability in the Chinese construction industry. These studies point out that there are numerous risks and the importance for risks to be actively managed to ensure project success.

Risks often cannot be eliminated. Successful projects are ones in which risk has been appropriately managed. Consequently, the manner in which risks are addressed will have a profound impact on project outcomes [8]. A variety of techniques and strategies have been developed to manage the influences associated with potential risks. Risk management is a cyclical process and the selection of the most appropriate tool depends upon the phase of risk identification, analysis or response [19]. Therefore using formalised and logical methods at tender development stage were seen as crucial in achieving cost success [4, 20]. The literature reviewed presents risk management as a form of best practice with its rationality being justified among many stakeholders within the construction industry [7] However, a number of studies have shown that this approach to risk is often disregarded. An Australian study by Uher and Toakley [21] found that the widespread adoption of risk management was hindered by a low knowledge and skill base due to a lack of commitment to training and professional development within the sector. Tah et al. [11] showed that in all cases the approach was "ad-hoc" and based upon "hunches" and past experience. Skitmore and Wilcock [16] concluded that a combination of both the subjective method of experience and the prescribed more formal methods is the most efficient and appropriate manner to achieve accurate tender prices for estimators in a time sensitive environment.

2.3. Identified Knowledge Gaps

From the literature reviewed a number of knowledge gaps have been identified as stated below:

- The literature often identifies the phenomenon of risk and its general acceptance as a part of the inherent character of the construction industry. It also presents discussion on risk management theory and strategies however, the actual risk management practices of clients, design teams, contractors and project managers in Australia particularly in regard to informal management approaches including intuition have not been explicitly explored in detail
- The influence of stakeholders on a construction project is addressed in the literature however, the specific characteristics of size, education and previous experience has not been comprehensively addressed in relation to their approach to risk management
- Many studies point to overseas issues and trends in the construction industry; with the Australian economy showing steady growth over the coming years, it is imperative that information is available in regard to Australian trends
- Further analysis of a variety of major participants with differing characteristics and their approach to risk management would contribute to a greater understanding for project management.

3. Theoretical Framework

The literature review points to the many variables that have to be considered during a construction project. Many of these are unknown, unexpected, possibly undesirable and often unpredictable, such is the nature of risk. Risk cannot be eliminated however it can be mitigated to some extent. The management of risk is relevant to all professionals and groups involved in any project; that is the major participants and stakeholders. The nature of the participants, their characteristics such as size, location, education, power, interest, experience and relationship to the project all impact upon a construction undertaking. However, the research available does not make direct comparisons between major participants, based on their characteristics and their approach to risk management in a construction project. This research will explore client, design team, contractor and project managers' response to risk, in particular the techniques employed for risk management based on their characteristics of size, location, role, education/training and experience of the organization.

Figure 1 below provides a visual representation of the relationship of the major participants; clients, design team, contractors, project managers and risk management in construction projects. There is an element of risk associated with any construction undertaking and that these risks must be managed in order for the project to be successful. Major participants are an integral component of the construction process and their characteristics of size, experience, education and role in the project will shape their approach to risk. Furthermore, the reciprocal relationships of stakeholder and risk management are illustrated as the major participants who influence and are influenced by the risk management process. The selection of particular risk management approaches, either formal or informal such as intuition or experience, are determined by participant characteristics.

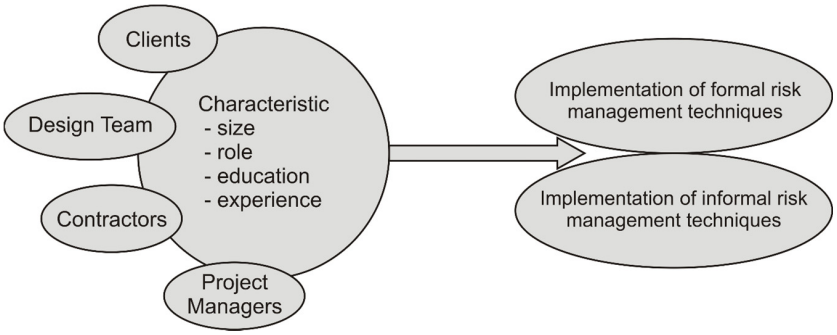

Fig. 1. Theoretical Framework.

The theoretical framework outlines the main areas considered in developing the research hypothesis. To meet the research aims and objectives and to resolve the research problem and question the following hypothesis will be tested: Clients, design teams, contractors and project managers will vary their approach to risk management because they have different characteristics including role, size, education and experience.

The theoretical framework provides a guide to show how the major participants; clients, design team, contractors and project managers; and risk management are interlinked in a construction project. Risk needs to be managed by all individuals and organisations involved in a project for it to be successful. The approach to risk management by the four identified major participants will be ascertained and correlated to their characteristics of size, role, education and experience. This research will focus on design teams, contractors, project managers and clients as the major participants in construction projects and how they manage risk.

4. Conclusion

The construction sector is an important engine for economic development in Australia. A variety of stakeholders are involved in any construction project. Major participants including design teams, clients, contractors and project managers are examples of stakeholders that have the ability to hinder or promote the progress of a construction undertaking. It has been found in the literature that each participant's approach towards the project is likely to be influenced by its characteristics such as power, interest and influence as well as their actual role in the project, size, education, experience and time it has been established and its ability to cope with risk. The major participants of clients, design team, contractors and project managers are diverse in their characteristics and each are exposed to different potential risks throughout the lifecycle of a construction project. The way that they approach this risk and how it is actually managed by the participant is shaped by their characteristics.

Meanwhile, there are many sources of risk that need to be managed. There are a variety of formal risk management techniques that can be used including checklists, brainstorming, flowcharts, questionnaires and scenario building for risk identification; Sensitivity analysis, probability analysis, decision and event trees for conducting risk analysis; Action plans, value methodology and contingency plans can assist risk response. However, the reality appears to be a substantial use of experience and intuition within the industry in relation to actual risk management approaches.

This research is built upon the existing knowledge base by focusing on the approaches to risk exhibited by major participants of clients, design team, contractors and project managers. An increased understanding about client, design team, contractor and project manager approaches and functionality in regard to risks during a construction project will allow their interests and relationships to be better managed and maximise positive inputs while minimising any negative or detrimental impacts thereby ensuring improved sustainability and increased likelihood of success in project delivery.

The purpose of this research is to compare the major participants of client, design team, contractor and project manager involved in construction projects based upon their characteristics and the risk management approaches they implement. The next stage involves the use of a questionnaire to gather primary data via the internet for this study. This is appropriate given the number of respondents that will be required and their geographic distribution. Also, the nature of a questionnaire as a research tool allows the gathering of a variety of data which can be statistically analysed. The research will ascertain if there is a correlation between the major participants based upon their characteristics and their approach to risk management. The concept of what constitutes acceptable approach to risk for the participants will be considered in relation to their characteristics. Furthermore, client, design team, contractor and project manager approaches to risk management including the phenomenon of utilizing intuition and experience as a form of risk management will be addressed as a reality or a myth. The results and findings will be reported in another paper.

Acknowledgements

7th International Conference on Engineering, Project, and Production Management (EPPM2016) was financed in the framework of the contract no. 712/P-DUN/2016 by the Ministry of Science and Higher Education from the funds earmarked for the public understanding of science initiatives.

7th International Conference on Engineering, Project, and Production Management (EPPM2016) finansowana w ramach umowy 712/P-DUN/2016 ze środków Ministra Nauki i Szkolnictwa Wyższego przeznaczonych na działalność upowszechniającą naukę.

7th International Conference on Engineering, Project, and Production Management (EPPM2016) was co-organised by the Agency for Restructuring and Modernisation of Agriculture (Poland).

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