

International Conference of Socio-economic Researchers ICSR 2016 SERBIA  
*Conference Proceedings*

# AN ASSESSMENT OF ENTERPRISE RISK MANAGEMENT PROCESS IN CONSTRUCTION FIRMS

**Berenger Y. Renault**

*University of Johannesburg, Johannesburg, South Africa*

**Justus N. Agumba**

*University of Johannesburg, Johannesburg, South Africa*

**N. Ansary**

*University of Johannesburg, Johannesburg, South Africa*

## Abstract

Though the construction industry is project-based, risk management should address risks at both projects, and enterprise levels as an overemphasis on project risk management would lead to some limitations. As a comprehensive and strategy-focused risk management discipline, enterprise risk management (ERM), which agrees with the modern portfolio theory, manages the whole risk portfolio of a firm and has been recommended in the construction industry. This study provides an understanding of ERM and investigates an ERM process for construction firms. The work methodology included a comprehensive literature search relating to ERM. The literature review was conducted through accredited academic and Professional journals, books, the internet, theses, and dissertations. Literature revealed environment and strategy, risk identification, risk assessment and prioritising, risk mitigation and control, information and communication and monitoring, reporting and continuous improvement as the essentials of ERM. The investigated process could be used as a guide for ERM process in construction firms. As few studies have attempted to investigate ERM in construction firms, it is believed that this study expands the existing literature relating to ERM.

**Keywords:** Construction Firms, Enterprise Risk Management (ERM), Enterprise Risk Management process (ERMP).

## 1. Introduction

Two decades ago risk management (RM) was not considered as a comprehensive and strategy-focused risk management discipline. It was essentially influenced by the managers' insight of risk (Thompson, 2003). Nowadays, managing risk is becoming a major concern and the aptitude to identify risks and familiarize to the changing business environment among the critical success factors for enterprises (Arena et al., 2010). None of the approaches namely; insurance, political RM and managerial discretion in management were incorrect. However, their focuses were restricted and fragmented. Thus, the necessity to efficiently identify and respond to risks resulted in the adoption of inclusive RM programs by several firms (Woon et al., 2011).

Enterprise Risk Management (ERM) is one of the disciplines that go far beyond the silo-based view of risk (Gordon et al., 2009). It is a holistic discipline in identifying possible risks that a firm would face and choose correct measures that match enterprise's risk appetite. Applying ERM may intensify risk consciousness in a firm and consequently improves decision-making aptitude leading to firm value maximisation (Razali et al., 2011). Regardless of the increasing number of studies on ERM, many organizations have yet to understand the concept of ERM and implement ERMP (Beasley et al., 2005). A survey conducted in 2011 in the US, established that of 1431 risk managers' firms found, only 17 percent had a complete integrated ERM program, 37 percent had partially integrated ERM program, and 23 percent had just embarked on investing in ERM programs. Three (3) percent had no plan for the year to come whereas 20 percent had no plan to implement ERM any soon (Society, 2011). The literature relating to ERM, calls for more research on the level of ERM implementation among firms (Daud et al., 2010; Razali et al., 2011).

An increased number of studies have looked at ERM implementation among construction firms in general; however, a limited number of them have endeavored to investigate the ERMP in the construction industry. Therefore, this study aims to investigate a process for ERM in construction firms. The elements in this proposed process represent the essentials of ERM. The proposed process could be used as a guide for ERM process in construction firms. As few studies have concentrated on ERM process in construction firms, it is believed that the proposed process can contribute to the existing body of knowledge relating to ERM.

## **2. Literature Review**

Dickinson (2001) defined ERM as: "... the extent to which the outcome from the corporate strategy of a company may differ from those specified in its corporate objectives or the extent to which they fail to meet these objectives". The corporate strategy resulting from the corporate objectives is tied to a certain risk profile, which is expressed by considering some factors that might influence the organization's activities and processes.

Valsamakis et al., (2000), embraced an RM definition that displays the managerial nature and integrated approach of RM. Implicit in the description, is management's involvement in strategic decision-making: "RM is a managerial function intended to protecting the organization, its employees, assets, and profits, against the physical and financial consequences of event risk. It includes planning, coordinating and directing the risk control and the risk financing activities in the organization" (Valsamakis et al., 2000).

The Federation of European Risk Management Associations (FERMA, 2003), also mentions the strategic nature of risk management. According to FERMA (2003), RM is a systematic process of addressing risks that are attached to a company's strategic objectives, by ensuring that sustained benefit is reached within all activities and processes.

According to Schröder (2006), ERM is: "a holistic systematic and integrated approach to the management of all key risks and opportunities with the intent of maximizing shareholder value for the enterprise as a whole". Miccolis et al. (S.a.: xxii) attached a definition to ERM, as: "A rigorous and coordinated approach to assessing and responding to all risks that affect the achievement of an organization's strategic and financial objectives. Briers (2000), formulated the following definition of RM: "RM is the process of intervention in economic and behavioral risk dynamics so that the value of the organization is improved".

According to Abrams et al., (2007), an evaluation of the various ERM definitions indicates that they share three important characteristics, in that ERM should be:

- **Integrated:** ERM must span all the lines of business.
- **Comprehensive/inclusive:** ERM must comprise all types of risk.
- **Strategic:** ERM must Concorde with the overall business strategy and objectives of the organization.

The Committee of Sponsoring Organizations of the Treadway Commission (COSO) (2004) attached a definition to ERM as “a process, effected by an entity’s board of directors, management and other personnel, applied in strategy setting and across the enterprise, designed to identify potential events that may affect the entity, and manage risk to be within its risk appetite, to provide reasonable assurance regarding the achievement of entity objectives”. The definition is adopted in this study as it applies to various industries, including the construction industry (CI). Moreover, it reflects that ERM should be implemented at all levels across an enterprise and applied in strategy setting to assure the achievement of corporate objectives.

As enterprises begin to manage risk, they become aware that they cannot manage it in a remote way by activity, process, but rather in a comprehensive, integrated manner all through the organization. Such an integrated RM practice requires defining risk, the establishment of risk tolerances, the formulation of policies and processes dealing with risk, the presence of risk in all decision-making processes, considering the interconnectedness of risks, and the reporting of risk in a consistent way, all within the borders of a single business strategy of the organization (Abrams et al., 2007).

## 2.1 ERM in Construction Firms

In construction firms, ERM and Project Risk Management (PRM) are disciplines to managing risks at a different level, with different goals (Liu et al., 2011). ERM manages risks at the firm level and focuses on the operations, strategic, reporting, and compliance objectives of a firm (COSO, 2004); whereas PRM manages risks at the project level and focus on project objectives (Liu et al., 2011). In fact, project objectives are within the corporate objectives, serving as the key components of operational objectives of a construction firm as the operation of a construction firm mostly depends on the construction projects that it is engaged in (Zhao et al., 2013a).

PRM is still indispensable and should not be regarded as a limitation to adopting ERM in a construction firm. PRM has been viewed as one of the nine areas of project management knowledge (PMI, 2008), and is crucial to the success of projects and the survival of construction firms. Therefore, ERM cannot substitute the role of PRM. In fact, PRM is an essential part of ERM since project risks are within the whole risk profile of a construction firm and ERM should be executed at all levels of a firm, counting the project level (Zhao et al., 2013a). Effective PRM practices, which properly handle project risks, can contribute to ERM efficiency throughout a firm. In turn, ERM implementation requires improved communication of project risk information, so it can assist the management in making better-informed decisions and handle project risks more efficiently (Liu et al., 2013), and increase the performance of construction firms (Low et al., 2013).

## 2.2 ERM Practices

Survey results from the 2007 Towers Perrin Risk/Opportunity Study (Towers Perrin, 2008), conducted on medium and large enterprises in Western European, Asian/Pacific, North American and other regions, indicated that executive management recognises the value-adding benefits of risk management, and does not perceive it merely as applying to threats to operations and assets. Although

top managements identify workforce skills and experience as the primary opportunity for their organizations, it is ranked with the lowest amount of management confidence in managements' ability to effectively manage workforce risks and opportunities.

It is evident from this study that there is not only one best approach to risk management. Organizations' perception of business risks and their risk management approach will vary amongst organizations and organizational management. Event management should be aligned to the organization's business strategy and its risk tolerance. However, the primary differentiating factor in successful risk management is organizational culture. The risk management process is important, but a participative workforce and an organizational culture that embraces enterprise-wide integrated risk and opportunity management contribute toward organizational success (Towers Perrin, 2008).

Likewise, in a Survey conducted on more than 100 different enterprises in the United Arab Emirates, executive management identified numerous obstacles to ERM (Rao & Marie, 2007). Although executive managers of these organizations realize ERM's value-adding capabilities, they encountered significant frustration and dissatisfaction with the current ERM practices in their organizations. The most important ERM obstacles encountered by executives in the construction sector were processes, tools, skills, organizational culture, ERM costs and organizational structure. This is followed by the secondary obstacles identified by construction enterprises as time availability, intellectual capital and technology. In other categories namely; Banks, oil and Non-banking finance companies (NBFC) identified culture, time availability, costs, processes, organizational structure and risk tools as the largest hurdle to ERM compared to skills, intellectual capital and technology as less important obstacles. Furthermore, manufacturing and trading companies identified culture, time, and costs as the major obstacles to ERM. From the survey results it is evident that businesses experience several obstacles to ERM implementation, with the type and degree of obstacles encountered varying according to the types of organization (Rao & Marie, 2007).

A United Kingdom study was conducted on over 100 companies in the oil, gas and construction industry regarding risk analysis methods used, the organization's policy on responding to risk, and risks encountered during operations. The survey results showed that the majority of organizations are of the opinion that their organization uses a mixture of qualitative and quantitative risk analysis techniques, with personal and corporate experience, engineering judgement, and brainstorming the best qualitative techniques, while break-even analysis and decision trees are some of the techniques best suited for quantitative use. Organizations' most frequent risk response was risk reduction by training and educating staff and improving their work conditions; then risk transfer followed by risk retention as the least used method. One of the main survey results is that current risk management practices should be further refined by allocating more resources and time to the risk management process (Baker *et al.*, 1999).

### **2.3 Enterprise-Wide Risk Management Frameworks**

Henriksen and Uhlenfeldt (2006) summarized the enterprise risk frameworks proclaiming a link to strategy:

- DeLoach's Enterprise-Wide Risk Management (EWRM)-Strategies for Linking Risk and Opportunity (DeLoach, 2000). The focus of this document is directed at definitions, specific guidelines on risk identification, risk assessment and various methods of risk control.

- The Committee of Sponsoring Organizations of the Treadway Commission (COSO)- Enterprise Risk Management Integrated Framework (COSO, 2004). This document represents a framework structure, recommendations for key risk management activities and guidelines for internal support.
- The Institute of Risk Management (IRM), the Association of Insurance and Risk Managers (AIRMIC) and the National Forum for Risk Management in the Public Sector (ALARM) combined efforts in the formulation of a risk document labelled FERMA (2003), which provides a framework as a generic guideline for ERM.
- The Australian/New Zealand Risk Management Standard 4360 (AS/NZS 4360, 2004) comprise in-depth commentaries and various application techniques regarding ERM.

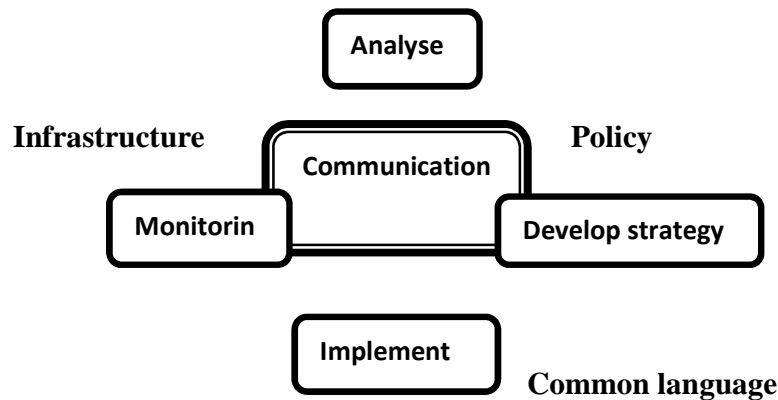
The four frameworks claim to address the tangent planes between risk management processes and organizational strategy. DeLoach's EWRM framework (DeLoach, 2000), recognizes that risk management should be incorporated into strategic activities at an early stage and also link risks to strategy formation. Although the importance of the tangent planes between risk management and strategic management are recognized by the other three frameworks, these limit risk activities to risk identification, evaluation, and management of risks, that impact predetermined organizational objectives and strategies. As a result, the focus is limited to strategy execution.

In all four frameworks, the focus of risk management activities can be mapped to the accomplishment of predefined objectives and strategies within operational-tactical areas. Nonetheless, the frameworks make limited reference to the process of risk consolidation, which includes the identification, quantification, incorporation of risks in a risk framework, the risk prioritizing process and risk communication process to key decision-makers. An effective risk consolidation process forms the underpinning foundation in the formulation of good strategic decisions and guides the organization in efficient resource allocation (Smit, 2012).

## **2.4 The ERM Process**

Every ERM activities start with the availability of an effective and efficient organization to support the process, followed by the risk analysis steps, which consist of risk identifying, sourcing and measurement. The process entails management devising an RM strategy as well as the implementation of the formulated strategy. To ensure the efficient and effective working of the processes, the risks, the risk strategies, and the implementation activities should be monitored on a continuous basis. All these steps should be performed keeping the key objectives of the ERM process in mind as graphically depicted in Figure 1 (Bowling et al., 2003).

**Figure 1: Key objectives of the ERM process (Adapted from Bowling et al., 2003)**



- **Infrastructure:** 1) Aligned risk policies, processes, charters; 2) Resources that support a value adding ERM process; 3) Ability to communicate across organization about risks.
- **Develop Strategy:** 1) Strategy is linked to risk management processes; 2) Roles and responsibilities of all employees are understood.
- **Implement:** 1) Risk management is understood in the organization; 2) Risks are managed across processes in an efficient and integrated fashion; 3) Monitoring activities are well respected.
- **Monitoring:** 1) Common ERM approach is used across all monitoring processes; 2) Activities add value through communication and follow-up on key issues.

According to COSO (2004), there are four groups within which an organization should achieve its objectives. These groups should be cascaded through the organization and aligned to the organization’s mission, strategic objectives, and strategy. These groups are expanded as follows (COSO, 2004):

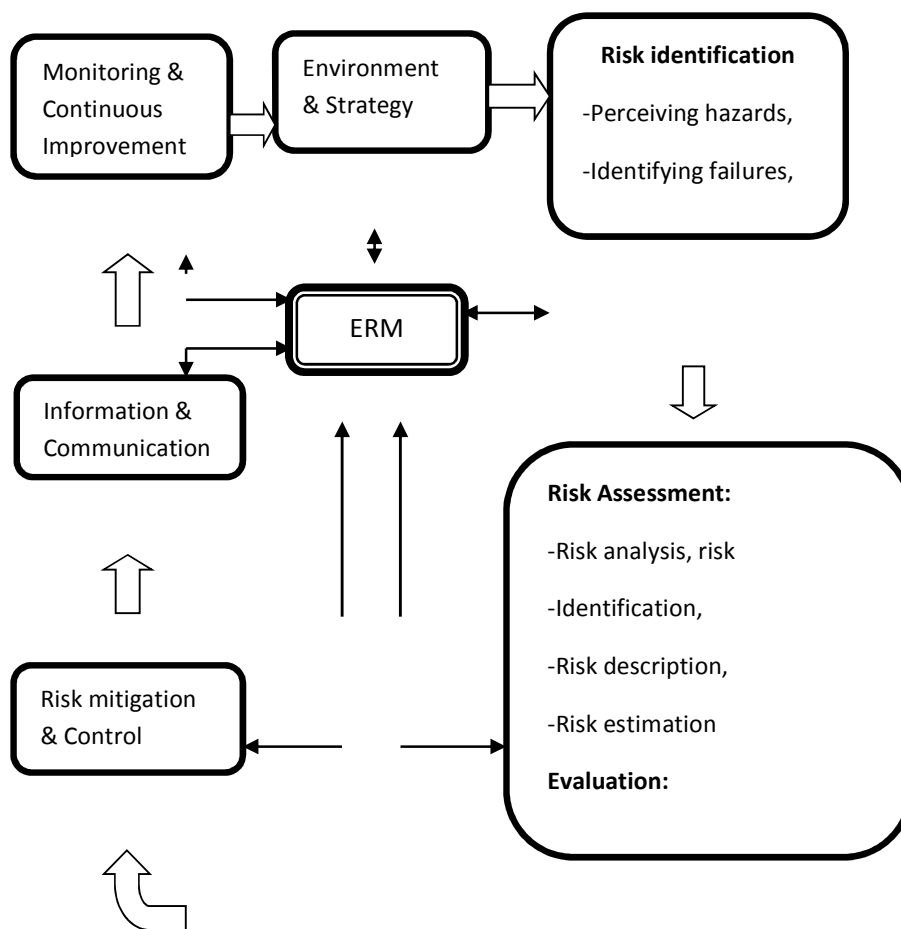
- **Strategic:** High-level objectives, linked with and supporting the organization’s mission.
- **Operational:** Effective and efficient use of firm resources, addressing the firm’s objectives.
- **Reporting:** Reliability of reporting, i.e. accuracy, timeliness, appropriateness, etc.
- **Compliance:** Organizational compliance with applicable laws and regulations.

By categorizing the objectives, an organization’s focus is directed at the different ERM aspects. ERM will assist in the accomplishment of internal objectives within the organization’s control such as reliability of reporting, and compliance with laws and regulations. As far as external objectives such as operational and strategic activities are concerned (which are not always within the organization’s

control), ERM can provide sensible assurance that management is informed of the organization’s level of accomplishment of these goals (COSO, 2004).

Based on the above discussion and evidence of risk management in practice, an ERM process can be grouped into six main activities, which comprises of further sub-processes as depicted in Figure 2. ERM is not strictly a ‘serial process’; it is a ‘multidirectional process’, in which activities influence each other (COSO, 2004).

**Figure 2: The Enterprise Risk Management Process**



The six stages illustrative of the ERM process are expanded in detail below.

### **2.4.1 Environment and Strategy**

Environment and strategy are the critical first stage in the ERM process. It consists of evaluating the external and internal environment within which the firm operates, with the internal environment comprising of the firm's strategy for attaining its set objectives, the organizational culture comprising internal controls, and the risk appetite of the firm (Funston, 2003).

An essential component of the ERM process is the internal control environment as insufficiencies in this environment are often the cause of risk and control breakdowns (Funston, 2003). The internal control environment involves an organization's and the employees' ethical values; management is operating style, and philosophy and the assignment of authority and responsibility (COSO, 2004).

### **2.4.2 Risk Identification**

The following stage in the ERM process is the development of a risk identification framework (Funston, 2003), where the firm's exposure to uncertainty is identified (FERMA, 2003). This stage necessitates a comprehensive knowledge of the firm, together with various factors such as the organization's market, the environment (legal, social, political and cultural), an in-depth understanding of the firm's strategic and operational objectives, the firm's critical success factors and the threats and opportunities that may prevent the firm from achieving of these objectives. An important tool in the identification process is a SWOT analysis, a matrix conducted by the firm by which **S**trengths, **W**eaknesses, **O**pportunities and **T**hreats are identified. Risk identification is a meticulous process, and an organization should ensure that all significant organizational processes are identified and that all the risks emanating from these processes are well-defined. Additionally, any volatility linked to these processes should be identified and grouped (FERMA, 2003)

In the risk identification stage, both internal and external events that may impact an organization's objectives should be identified, along with the risk or opportunity it represents. Value creating opportunities are channeled back to management's strategy or objective-setting process (COSO, 2004). Top management's attention should not be concentrated only on risks that result in organizational failure, but also at events that influence the effectiveness and efficiency of the organization's activities, and have a significant impact on the organization's performance or risk profile. Moreover, management should be aware of the nature of risk, i.e. its interconnectedness. Potentially all activities in a firm are exposed to risk, although the impact of the risk may be influenced by actions taken by other parties in the firm (Ritchie & Brindley, 2007).

The development of a risk framework and a generic risk language to foster better risk understanding is a main characteristic of the ERM approach (Selim & McNamee, 1999). In helping to identify key risks to the organization, workshops may be facilitated, where unrestricted information sharing and debate are encouraged. This can provide valuable information in the identification, assessment and management of risks (Hodge, 2002).



### **2.4.3 Risk Assessment and Prioritizing**

The third stage, risk evaluation typically involves the determination of risk impact and the probability of risks occurring. A weighting should be allocated to risk impact and risk probability (Funston, 2003). Though risk probability and risk impact are two significant factors to take into consideration, it is usually not sufficient. It is argued that estimates of probability are only relevant for risks that have already occurred, in other words, risks which have a history. Basing reliance on such risk analysis may give a firm an incorrect sense of security as these firms rarely prepare themselves for relevant high impact, low likelihood risks which may have the most damaging consequences. For high impact, low probability risks, the firm's state of risk preparedness are very important. The firm should allocate its resources based on the potential risk impact and its ability to manage such risks. The focus is thus not to address all possible sources of risk. For example, it is impossible to forestall all sources of risk to a firm's computer network, but it is possible to address the degree of disruption caused by the risk of say a network failure and the firm's preparedness to address it (Funston, 2003). The next step is risk prioritization, which implicates a risk matrix of risk probability and risk impact, with the results categorized as high, low or medium risks (Page & Spira, 2004).

During the risk description process, the identified risks should be depicted in a structured format such as a table. An adequately designed table can facilitate the description and evaluation of risks, and furthermore, help to ensure comprehensive risk identification, description and assessment process. By assessing each risk according to probability and impact, key risks can be prioritized for management action. Risk management should be incorporated in the initial start-up phases of projects, and continued throughout the project (FERMA, 2003). Most organizations recognize the importance of incorporating an ERM process in their organization, as it helps in the analysis of information, and translates the information into value-adding activities (Chapman, 2001). Quantitative, semi-quantitative or qualitative risk estimation methods may be used regarding risk likelihood and impact. After the completion of a risk analysis, the estimated risks should be compared against the organization's risk criteria regarding socio-economic and environmental factors, stakeholders' expectations, legal requirements, etc. Risk evaluation, therefore, considers the impact of risk on the organization, and the manner in which it should be treated (FERMA, 2003).

After the risk evaluation and prioritization process, an enterprise-wide risk register should be developed to ensure that ERM is applied consistently throughout the organization, and a uniform understanding is achieved by all (Fraser & Henry, 2007).

### **2.4.4 Risk Mitigation and Control**

In ERM is risk mitigation and control stage, the firm should apply risk tolerances for each situation that affects the firm according to its 'risk appetite'. Awareness should be taken off the interrelationships of risks when risk treatment situations are considered (Funston, 2003). Table 1 reflects the various definitions of risk control. Even though different terms are used, the meanings are the same.

**Table 1:** Risk control terms used (DEAT, 2006)

<b>Terms used in Risk Control</b>		<b>Meaning</b>
<b>Finance</b>	<b>Risk Management</b>	
Decline	Elimination	Some risks can be avoided by not entering into or stopping the activity, or refraining from performing specific hazardous activities
Accept	Acceptance	Where the risk-return properties are acceptable or low-risk outcomes can be expected, the risk exposure is accepted
Mitigate	Reduction/Mitigation	Where action can be taken to reduce the impact of the risk(s) to an acceptable exposure level
Manage	Transfer	Where specific control activities are applied to minimize risk exposure, through transferring or outsourcing, the risky activity to another party

#### **2.4.5 Information and Communication**

Firms have become aware of the importance of constantly gathering risk information within the organization as well as the significant amount of effort needed for the maintenance of a risk information system. ERM allows firms to use this risk information to identify possible risks resulting from an organization's decisions, and to address proactively such risks. A risk information system involves effective processes, an appropriate infrastructure, accurate information, and timely reporting for management to make informed decisions (Funston, 2003).

#### **2.4.6 Monitoring, Reporting and Continuous Improvement**

In order to successfully manage risk, continuous risk tolerance and risk threshold monitoring are required. By continuously monitoring situations, problem areas can be identified timeously before they escalate into a crisis. ERM can facilitate improved governance through the use of key metrics and a reporting system to gauge the effectiveness of risk management processes (Funston, 2003; and DEAT, 2006). Executive and senior management should drive the ERM process.

They should ensure that an organization's structure, along with ERM implementation policies, is in place to support the ERM process. A two-way risk information flow should be established between those closest to the risk and senior management. Risk information will assist senior managers in formulating the organization's risk policy and those closest to the risks should be empowered to take action to prevent a small risk from increasing (Dickinson, 2001).

### **3. Research Methodology**

The work methodology included a comprehensive literature search. Various sources were consulted including accredited academic and Professional journals, books, the internet, theses, and dissertations. This research is mainly a literature review and looks at the literature relating to enterprise risk management in the construction industry. This is because the concept of ERM appears to be receiving much attention over the recent years from various businesses and industries including the construction industry. The current methodology falls within the qualitative research methodology.

### **4. Lesson learnt from Literature Review**

Based on the review of ERM literature, experience and evidence of risk management in practice, six activities were identified as the essentials of ERM process. It is believed that if the organizations follow these activities, and also senior management understand the importance of ERM and engage with the implementation, and utilize best practices and expertise within the system, they will make quick progress in the successful implementation of ERM.

The activities of the ERMP laid out in the report should be adopted and implemented as a package by each executive head to ensure successful ERM implementation in their respective organizations.

## 5. Conclusion

While most studies have focused on some aspects of enterprise risk management in other sectors, this paper has examined literature relating to enterprise risk management in construction firms. The main objective of the study was to provide an in-depth understanding of enterprise risk management and to investigate an enterprise risk management process for construction firms. To achieve the objective of this study, we started by discussing the definitions of ERM and the concept of ERM in the context of construction. Furthermore, the study investigated the ERM process which comprised of six (6) main stages namely; environment and strategy, risk identification, risk assessment and prioritisation, risk mitigation and control, information and communication, Monitoring, reporting and continuous improvement. The six activities identified in this report form a solid framework to be followed by the organizations. It is believed that if organizations were to follow the activities as best practices and tenets for the effective implementation of ERM, in addition to reflecting the best practices available, and sharing information, management could improve the quality of its strategic, tactical and operational decisions. Construction firms should adopt the activities set out in this report, with a view to ensuring that the ERM approach is accepted and implemented in line with best practices. Furthermore, governing bodies should exercise their oversight role regarding the adoption of ERM activities, the effectiveness of implementation and the management of critical risks in their respective organizations.

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