Environmental Technology & Science Journal
Vol. 11 No. 1 June 2020

Strategies for Attaining Higher Risk Management Maturity by Highway Contractors in Nigeria

A. M. Bashir[1]* & A. D. Ibrahim[2]
[1]Department of Quantity Surveying, Bayero University, Kano
[2]Department of Quantity Surveying, Ahmadu Bello University, Zaria
ambashir.qs@buk.edu.ng

Received: 2/6/2020 **Reviewed: 26/6/2020** **Accepted: 29/6/2020**

Highway projects require amongst others, contractors' high risk management maturity (RMM) for effective management of project risks and certainty in project outcome. Though several RMM models have defined maturity levels with corresponding capability attributes for each maturity level, however, there is a lack of strategies for highway contractors to attain higher levels of RMM. This paper is part of a research aimed at developing strategies for attaining optimised RMM by highway contractors in Nigeria. The methodology involved review of existing literature, mixed method approach comprising questionnaire survey of one hundred and six (106) highway contractors and semi-structured interviews with project and risk managers in selected construction firms. Stratified and maximal variation sampling techniques were used to draw samples for the quantitative and qualitative data respectively. Conceptual content analysis technique was used to analyse the transcribed data. The low level of implementation of thirty-one (31) factors was found to be responsible for the 'novice' level, and a major barrier to attaining higher RMM. The study revealed that the barriers could be overcome by adoption of formal RM practices, implementation of organisation wide policy on RM and engagement of professional staff competent in technical/management aspect of highway construction amongst others. The results further showed that strong capital base, established reputation in quality delivery and relationship management are amongst the strongest enablers for higher RMM. The study ultimately developed strategies for highway contractors to attain higher RMM levels leading to better utilisation of resources, improved project control and competitive advantage in projects delivery.

Keywords: contractors, highway, maturity, risk, strategy

Introduction

The development of corporate strategy is paramount to the long-term survival and success of any organisation. Strategy has been defined as a desired company objective and the communication of how it will be achieved, by whom, for whom and why the output is valuable (Huff et al., 2009). In order to gain maximum benefits of profitability and efficient use of resources from construction projects, organisations need to strategise and attain high level of risk management maturity (Mu et al., 2014; Zhao et al., 2013). Zou et al. (2010) defined risk management maturity as the level of sophistication of an organisation in understanding its risk portfolio and the internal systems necessary to cope with risks when they eventuate. Kim and Hun (2016) regarded highway project as a basic service and social overhead capital without which primary, secondary and tertiary productive activities cannot operate.

The very risky nature of highway projects coupled with multiple stakeholder engagement at design and construction stages, strong dependency on local, human and natural resources makes the determination of the RMM of construction organisations essential if projects are to be

delivered with added value, improved efficiency and enhanced profitability (Liu et al., 2013; Loosemore et al., 2006; Zou et al., 2010). Several types of risks (macro and micro levels) are associated with highway construction projects and warrant special attention (Antoniou et al., 2012; Zayed et al., 2008). The unique features of highway projects characterized by long payback period, susceptibility to political and economic risks, complex contract mechanism with multiple stakeholders, huge capital outlay and intricate site conditions make the delivery and risk management processes delicate and challenging (Zayed et al., 2008). The attainment of a high RMM level enables the contractors to cope with the vagaries of risks inherent in highway projects and also provide clients with more certainty in selection of appropriate contractors for award of highway projects (Salawu & Abdullah, 2015; Zayed et al., 2008).

Studies have shown that the risk management capability and maturity of contractors in Australia, China, Singapore, Netherlands and Nigeria is at a relatively low (novice) level (Bashir, 2019; Mu et al., 2014; Hoseini et al., 2018; Salawu & Abdullah, 2015; Zhao et al., 2014; Zou et al., 2010). The low maturity level was partly attributed to lack of knowledge, lack of organisation-wide implementation of formal risk management processes and other organisational factors such as lack of top management support, technical training programmes, effective risk management policy and organisation structure (Adeleke et al., 2015; Bashir et al., 2011; El-Sayegh & Mansour, 2015; Hwang et al., 2014; Serpella et al., 2014; Yazid et al., 2018). In view of the importance of highway projects and their very high risk exposure, it is of utmost significance to determine the risk management capability of contractors prior to their selection for proposed new or rehabilitation projects (Le, Caldas, Gibson & Thole, 2009; Salawu & Abdullah, 2015). This is essentially to eliminate or mitigate the high incidences of project failure and attainment of the project performance objectives. This study is aimed at developing strategies for attaining higher risk management maturity for highway contractors based on the following objectives. The aim was achieved through articulation of the RMM models, identifying the various factors determining RMM and evaluating the factors responsible for the present 'novice' RMM level of highway Contractors. Means of overcoming present barriers were developed and finally identifying the enablers for higher RMM and ultimately developing strategies for progressing between the various RMM levels to the optimised level.

Literature Review

In the development of effective strategies for corporate organisations, Huff et al. (2009) emphasized five principal concepts that need to be considered. First, the organisation needs to communicate a compelling vision to all staff and external stakeholders for an understanding of what it stands for. Secondly, there's need to establish a strong nexus between the organisation's internal strengths and the external opportunities in the market place. Thirdly, the company must generate more resources than required. Fourthly, a sensible co-ordination of the organisation's activities and geared towards achievement of success. Finally, the organisation must be prepared and respond to changing conditions in the external business environment. McCabe (2010) opined that while there are no definite recipes for guaranteed success in corporate strategy, a number of tests can be used to determine the appropriateness and likelihood of success of proposed strategies to be formulated. From a practice-oriented perspective, Lynch (2006) identified value addition, consistency and competitive advantage as necessary tests that a proposed strategy must pass.

McCabe (2010) suggested that in developing corporate strategies, considerations need to be accorded to two main issues. First, the existing and likely future needs of customers and potential consumers of the organisation's products. Secondly, the optimal utilisation of existing resources or where necessary and possible

seek alternative resources. McCabe (2010) citing Ansoff (1987) identified four choices in developing strategic options as market penetration, product development, market development and diversification. Highway contractors desirous of attaining higher RMM capability and maturity must choose a multiple or all amongst these options in developing their strategic position for competitive advantage in the construction industry.

Hillson (1997) opined that 'maturity' in construction organisations connotes an organisation's clear view of its current RM processes; benchmark it against established frameworks for the purpose of setting clear measurable improvement mechanisms. Ongel (2009) described maturity as the level by which an organization regularly executes documented, managed and controlled processes that are continually improved for its business objectives. According to Cooke-Davies (2005), maturity is a state of perfection by organisation in carrying out its business processes. These views were further consolidated by Hopkinson (2011) who viewed mature risk management capability as an organisation's state of keeping updated with the latest technological processes and current thinking in the discharge of its business activities. Wendler (2012) further explained 'maturity' as a measure of determining the quality of organisational processes with a view to making improvements for better performance.

In essence, the maturity level of an organisation's risk management process determines the extent of effectiveness and efficiency by which its projects are delivered (Mu et al., 2014). Hence, organisations are keen on benchmarking their RM processes against established framework to determine their strengths and weaknesses for improvement in organisational processes that will enhance profitability and certain project outcomes.

The first risk management maturity model was developed by Hillson (1997) for organisations to assess their present level of maturity and formulate realistic targets for improvement in project performance. The model was based on four maturity levels; naïve, novice, normalized and natural. Maturity assessments are carried out through the attributes, application, process, culture and experience. The model's main objective was to determine the current risk management capability of the organisation. Hillson's model was criticized for being too generic in the definitions of levels and characteristics of the attributes to be measured (Serpell et al., 2015). Hence, the evolution of other models that seemingly addressed these shortcomings with varied attributes and levels (Ren & Yeo, 2004; Zou et al., 2010; Hopkinson, 2011; Mu et al., 2014; Zhao et al., 2014;).

In developing strategies for progressing along the risk management maturity continuum, this study adopted the maturity levels classified in the model of Mu et al. (2014) being the most recent that took account of some of the limitations of previous models. These levels are naïve, novice, managed and optimised. Mu et al. (2014) developed a model for assessing RMM of subway contractors based on similar attributes to Zou et al. (2010) but de-emphasizing people and leadership. The model's maturity levels are also four and classified as naïve, novice, managed and optimised. The model tested risk management capability based on twenty-one indices of risk management capability under six major attributes. The attributes are risk attitude, risk culture, risk identification capability, risk analysis capability, risk response capability and development and application of standardized risk management process. Zhao et al. (2014) outlined sixty-six indices of determining the RMM of construction organisations under sixteen major attributes. This study adopted the model of Mu et al. (2014) in evaluating the RMM level of the highway contractors with a synthesis of fifty-five RMM indices.

Methodology

This study adopted a combination of the classical and processual approaches of strategy formulation. The classical approach

believes in a top down approach of formulation and implementation of strategies while assuming that market, people and the external environment will remain largely constant (McCabe, 2010). The processual approach, on the other side, acknowledges the imperfections of these three (3) factors (market, people and environment) thereby proposing adoption of emergent processes based on multiplicity of possible outcomes from the environment and market place (McCabe, 2010). This is with due regard to the uniqueness of each project with different complexities, consultants, clients and other stakeholders. Rationalism is the ontological basis of the classical approach as it is simply lucid for strategic decisions formulated at the top level to be implemented by lower level managers and operational staff to achieve corporate objectives.

This paper was part of a broader study that adopted mixed methods methodology in data collection to achieve its objectives. It involved the adoption of explanatory sequential design that consisted of quantitative data strand using 5-point Likert scale questionnaires to determine the level of implementation of factors influencing RMM of highway contractors. Based on the identified risk management maturity criteria from literature, fifty-five RMM factors were synthesized and adopted as the basis for the questionnaire survey.

The population of the study comprised of all highway contractors involved in provision of road infrastructure in the seven North-western States and the FCT which stood at 1469 (Corporate Affairs Corporate, 2017). Stratified sampling was adopted in the questionnaire survey where each State was regarded as a stratum from which samples were drawn. Fellows and Liu (2015) described stratified sampling as establishing your population in strata and taking samples from each stratum based on purposive sampling. This is to provide adequate representation of the population by using proportions of the samples as prevalent in each State.

Using the formula from Kish (1995) in equations (1) and (2), the sample size was determined as 94. However, in view of the low response of questionnaire survey as opined by Creswell (2012), 240 questionnaires were administered using the house-hold drop off technique which provides opportunity for clarification on any aspect to the respondents. 132 questionnaires were retrieved and sorted with 106 found adequate for further analysis. The Statistical Product for Service Solution (IBM SPSS) version 21 software was used to analyse the quantitative data.

$$N_0 = (p * q)/v^2 \quad (1)$$

$$n = N_0/[1 + (N_0/N)] \quad (2)$$

Where:

$N_0 =$ First estimate of sample size

$p =$ The proportion of the characteristic being measured in the target population;

$p = 0.5$ Considering a confidence level of 95%;
$q =$ Complement of p, $q = (1 - p), 1 - 0.5 = 0.5$
$v =$The maximum standard of error allowed $= 0.05$
$N =$ The population size = 1468
$n =$ The sample size
$N_0 = (0.5 * 0.5)/(0.05)^2 = 100$
$n = 100/ [1+ (100/1468)] = 93.62$

Using the findings from the questionnaire survey as input and basis of selection of six contractors, a semi-structured interview was adopted for the qualitative strand with two groupings of three contractors each based on their established RMM levels from the questionnaire responses. The interview sessions were audio recorded after seeking the permission of the interviewees and on an average, it lasted for one hour, 15 minutes. A variant of purposive sampling, maximal variation sampling technique was used (Creswell, 2012) to select three project/risk managers from the 'novice' level and the other three from 'managed/optimised' level for interview. The maximal variation sampling was chosen to understand and present multiple perspectives of individuals to crucial issues in the attainment of higher risk management maturity. This is to determine the means of overcoming the barriers for the present maturity level and also the enablers for higher RMM.

Conceptual content analysis technique was used to analyse the transcribed interview data. Of the six firms, three were medium sized while the other three were large sized. Medium sized companies were classified with average project value of N200million – N500million (USD 550,000 – 1,300,000) and average annual turnover of N500million – N1billion (USD 1.3million – 2.6million). A large sized company has average project value of over N500million (USD 1.3million) and average annual turnover above N1billion (USD 2.6million) based on Federal Ministry of Works and Housing, Abuja classification. Codes and themes were developed from literature and used as basis for the conceptual content analysis as shown in Table 1.

Results

Respondents' Demograhics

The first section of the questionnaire requested for general information of the respondents which comprises name of organisation; position of respondent; years of experience; nature of the firm's ownership; number of permanent employees; average project value and average annual turnover. The highest category with seventy-six is senior staff whom are Engineers, Project Managers or Quantity Surveyors representing 71.7%. Principal staff are twenty in number representing 18.9%, and directors are eight representing 7.5%. Junior staff is the least category having two respondents representing 1.9%. Most of the respondents were at least from the senior staff level. The very high percentage of respondents at least at the senior level suggested that the level at which data was obtained is rich and meaningful for the study.

Factors Responsible for the 'Novice' RMM Level

Fifty-five factors influencing RMM identified from literature were subjected to questionnaire survey for determining their level of implementation by the contractors. Based on the adopted RMM model of Mu *et al*. (2014) and the mean scores of thirty-one (31) out of the fifty-five (55) factors influencing RMM (which represents 56.36%) found to be between 2.01 and 2.99 (low to medium level of implementation), the thirty-one (31) factors responsible for the novice level of risk management maturity of the highway contractors are listed in Table 2.

Table 1: Codes for conceptual content analysis of transcribed data

Codes	Concepts
Code 1	Project management plan.
Code 2	Risk management plan.
Code 3	Informal RM approach includes use of experience, intuition, judgment and contingencies.
Code 4	Formal PRM approach encompasses risk identification, risk analysis, risk response and risk monitoring & control.
Code 5	Policies by board or management for project risk management.
Code 6	Contractor's risk management attitude (initiative to partake in risk activities, RM policy, RM plan).
Code 7	Contractor's risk management culture.
Code 8	Contractor's risk identification capability (brainstorming, checklist, past experience).
Code 9	Contractor's risk analysis capability (risk breakdown matrix, cause & effect diagram, P/I matrix, expert judgment).
Code 10	Contractor's risk response capability (retention, reduction, control, sharing, transfer & avoidance).
Code 11	Development and application of standardized RM process (risk register, lessons learnt, and staff training programmes).
Code 12	Approaches for overcoming present limitations
Code 13	Enablers for risk management capability
Code 14	Means of better project risk management
Code 15	Tactics for continuous successful project delivery

Table 2: Factors responsible for 'novice' RMM level of Highway Contractors

S/No.	Factors	N	Min	Max	Mean	Std. Deviation
1	Consistent identification, analysis and response to risks throughout the project life cycle	104	1	5	2.98	0.935
2	Continuous monitoring, review and improvement of risk identification, analysis and response activities	104	1	5	2.98	0.870
3	Dedication of a senior executive, or a stand- alone department, or a board-level committee to take charge of risk oversight	104	1	5	2.98	1.052
4	Risk management process is woven into daily business processes of the organisation	104	1	5	2.96	0.965
5	Recording of the Risk Management process for convenience, review and improvement	104	1	4	2.94	0.748
6	Incorporation of risk awareness culture into the corporate strategy	104	1	5	2.94	1.032
7	A written risk management (RM) policy approved by the Board and made known to all staff	104	1	5	2.94	1.298
8	Technical staff comprehension of risk analysis skills	104	1	5	2.94	0.798
9	Consideration and assessment of the relationship between different risks	104	1	4	2.94	0.774
10	Consistent identification of new and emerging risks in a timely and proactive manner	104	1	5	2.92	1.021
11	Designing risk response to deal with all critical risks	104	1	5	2.92	1.002
12	Analysis of the likelihood of occurrence and impact magnitude of all the risks identified	100	1	4	2.92	0.8
13	Technical staff comprehension of effective risk response method	104	1	5	2.90	0.93
14	Periodic monitoring of the progress of RM implementation against its RM plan.	104	1	5	2.90	0.99
15	Assessment of the probability and severity of all risks	104	1	5	2.90	0.795
16	Periodic review of the RM framework, policy and plan based on results of monitoring and reviews.	102	1	5	2.90	1.02
17	Consistent usage of qualitative and quantitative risk management tools and techniques	104	1	5	2.88	1.109
18	Wide practice of risk management in every level of the organization	102	1	5	2.88	1.154
19	Standardisation of organisation's risk management process	104	1	5	2.87	0.837
20	Adoption of a formalized and standardized RM process both at project and company level	104	1	5	2.87	0.882
21	Usage of systematic analysis method for risk analysis	104	1	5	2.87	1.005
22	Usage of systematic analysis method for risk identification	104	1	5	2.83	1.038
23	Provision of regular training to staff to maintain high-level knowledge and skills relating to RM	104	1	5	2.79	1.236
24	Formal and clear definition of risk tolerance according to corporate strategy	104	1	4	2.77	0.753
25	Conducting formal training programs to understand the RM policy, process and potential benefits to the organisation.	104	1	5	2.75	1.164
26	Assessment and reiteration of residual risks that remain after response measures have been implemented	104	1	4	2.75	0.879
27	RM process is often reviewed to ensure its applicability	104	1	4	2.73	0.815
28	Usage of a systematic response method	104	1	4	2.71	1.03
29	Formal and clear definition of risk appetite according to corporate strategy	104	1	5	2.71	0.844
30	Risk information is collected from various sources and updated regularly	104	1	4	2.58	0.821
31	Intimating all staff on company's risk appetite	102	1	5	2.47	0.962
	Valid N (pair wise)	106				

Overcoming the Factors Responsible for the 'Novice' RMM Level

Content analysis of the interviews held with the medium sized contractors revealed that companies should adopt formal risk management practice with emphasis on risk identification and response strategies in place; the board of the company and management should have a policy on organisation wide risk management. A separate department or desk officer responsible for managing company and project risks should be created where there none exists at present. Engagement of professional staff competent in technical and management aspect of highway projects was further advocated. Details of lessons learnt from completed projects should be documented for use on future projects. Relevant staff should be trained in risk management knowledge areas and investment in plants and equipment should be intensified.

The large sized companies viewed the approaches to overcoming present low level of maturity of highway contractors as first, prior to commencement of any highway project, documents should be studied for accuracy and completeness of information. Then, there must be management support to the risk management process, involvement of all key staff through periodic technical meetings and review of progress against established programme of work must be observed. Staff must be competent and periodically trained in project and risk management knowledge areas. They further encouraged development and promotion of a RM culture and attitude within the organisation which would be spearheaded by the top management; consistent training of personnel and a functional and organized set-up; periodic key staff meetings on projects and establishment of risk management units with adequate resources to deal with projects and organisational level risks.

Enablers for Attaining Higher Risk Management Maturity

Though the large sized firms recorded more successes with proven track records, the medium sized companies have also recorded modest successes in their project execution pathways. In view of their varying levels of operation and capacity, it is apt to consider the suggestions of the medium sized companies as more relevant to contractors at the naïve level of risk management maturity. The enablers suggested by the big sized companies with higher risk management maturity level will be most beneficial to all at either the novice or naïve maturity levels.

The medium sized firms identified proper project planning comprising a detailed work program with procurement plan, method statement, milestones delivery dates, performance review meetings, payment and cash requirements schedule; strict compliance with the project execution plan by all team members; improvement in quality standards and relationship management with client and consultants as enablers to higher risk management maturity. The large sized companies identified as paramount enablers, technical capacity of personnel; quality delivery in project execution; established reputation for standardized products; sufficient human and machine resources; strategic contacts in client organisations; adherence to discrete programme of work by project team members; thorough project analysis and value engineering workshop prior to highway project commencement.

Strategies for Attaining Higher Risk Management Maturity

In developing strategies for attaining higher risk management maturity, findings from the field has provided basis for key and laudable strategies that highway contractors need to implement for attainment of higher risk management capability and maturity for continued delivery of more profitable, effective and successful projects. The strategies from one level to the next level are detailed below in ascending order of the four-level maturity continuum adopted for this study.

Strategies for Progressing from Naïve Level to Novice Level

Based on the four-stage maturity level developed by Mu *et al*. (2014) and adopted for this research, the lowest maturity level is naïve. The naïve maturity level is characterised by firms' unawareness of the need and benefits of risk management. The company does not identify any risk before commencement of projects and neither is there any proactive and structured means of dealing with risk issues when they occur. A company at the naïve risk management maturity does not have any formal or structured risk management process in place. Therefore, to progress from naïve to novice level of risk management maturity, the study identified that the following strategies need to be undertaken by the company.

i. The board shall clearly define the organisation's goals and vision which is effectively communicated to every staff so that everyone strives towards the attainment of that vision, goals and corporate objectives.
ii. The management shall embrace the need for risk management acquainting itself with the meaning and benefit of risk management through seminars and workshops to be organised for the top management level of the organisation.
iii. The management shall initiate and observe risk management practice at least informally through the documentation of lessons learnt and experiences from past projects. This shall be performed by engineering and project management personnel in liaison with other technical and administrative staff of the organisation.
iv. The senior management staff shall identify key technical personnel, evaluate their competencies and train them in project and risk management knowledge areas to fully comprehend the meaning, requirements and benefit of risk management consistent with the organisation's policy and vision.
v. The management shall invest in the procurement of project risk management resources such as risk literature, softwares, safety wears, tools and equipment that will enhance technical competence, knowledge and mitigation of site risks in projects delivery.
vi. The senior management staff shall initiate a process of determining its major areas of strengths and weaknesses in terms of human, mechanical and other resources internal to the organisation.

Strategies for Progressing from Novice Level to Managed Level

At the novice RMM level, the organisation is not only aware of risk management and its potential benefits it is practiced largely informally. Some aspects of formal risk management are practiced to some extent. This includes risk identification, analysis and response. Risks are managed generally on the basis of experiences and lessons learnt from past projects. This is usually limited to the project managers overseeing the construction projects. The risk management practice is not extended to other departments or units of the organisation. For an organisation striving to attain the managed level of risk management maturity, the study revealed that certain strategies as explained below need to be devised and implemented.

i. The management in collaboration with senior managers of engineering and management divisions shall develop a risk management policy tailored to the company's corporate vision, objectives and context for the board's approval.
ii. The board of the company shall vet and approve the risk management policy developed by the management for a standardised and organisation wide implementation.
iii. The senior management shall oversee the implementation of organisation wide communication

and co-ordinated practice of a standardised risk management plan to all the staff at various levels and departments within the organisation. This will enlighten all staff and mitigate unnecessary loss of company resources.

iv. The management shall employ professional staff competent in technical and management aspect of highway projects that shall be periodically trained to fully comprehend effective risk analysis and response methods thereby maintaining high-level knowledge and skills relating to risk management.

v. The heads of project teams shall document lessons learnt on executed projects and share the knowledge with senior management for the development and application of standardised risk management process of future projects.

vi. The heads of technical and project management teams shall prior to commencement of any highway project, study project documents and carry out site visits/investigations to ensure accuracy and completeness of information. Any issue of concern must be raised for resolution by the concerned stakeholder.

vii. The head of the project management team shall collaborate with other team members and prepare a project execution plan with detailed project planning comprising a work program, method statement, procurement plan, milestones delivery dates, review meetings, payment and cash flow schedule to govern the execution of the project.

viii. The project management team shall ensure a consistent and systematic identification, analysis and response to risks throughout the project lifecycle. New and emerging risks shall be dealt with timely and proactively. Residual risks that remain after response measures have been taken shall be reiterated through another risk management process.

Strategies for Progressing from Managed Level to Optimised Level

The ultimate level in the risk management maturity continuum is the optimised level. Beyond the organisation's formal risk management practice, risk management culture is embedded in each unit and sub-units of the organisation. The risk management culture and attitude of an organisation at the optimum level is so high that risk management knowledge is used essentially to gain competitive advantage over contemporaries within the same sector and market segment. Risk management processes are well documented, implemented and the results obtained used in planning the risks potentials and opportunities of future projects. At the optimised level, risks considerations are inherently contained in routine business activities of the organisation at all levels. Hence, organisations aiming to reach the optimised level must devolve strategies requisite to the attainment of the highest level. Based on the findings of this study, these strategies are suggested as follows.

i. The management shall generate more internal resources and establish a nexus between its strengths and the external market opportunities in the highway construction sector. Human and materials resources in various departments must be harnessed and aimed at opportunities to create business prosperity for the organisation.

ii. The senior management staff shall create awareness and promote risk management culture and attitude to all staff in various departments. This shall involve provision of risk management resources, consistent training and emphasis on decision making to be in conformity with the organisation's risk management policy.

iii. The board and management shall as a matter of policy periodically monitor the implementation of the risk management processes of all units against the risk management plan with a view to reviewing the risk management framework, policy and plans based on the results obtained from the monitoring and review process.

iv. Top management staff shall examine documented risk management knowledge of past projects, analyse and compare actual results against original plan for evaluation of accuracy and forecasting likely risk management plan of future projects. Where a significant discrepancy is realized, review of the risk management plan becomes inevitable.

v. The heads of project management teams shall extensively utilise project management techniques such as value engineering (VE), value analysis (VA), environmental and social impact assessment (ESIA) to further elucidate potential risks and opportunities in proposed projects for appropriate response mechanisms put in place.

vi. The management shall make a formal and clear definition of the firm's risk appetite and tolerance level in line with the corporate strategy so that senior managers will intimate staff and thresholds established for appropriate risks response strategies to be put in place.

vii. The management shall consider the establishment of either a separate risk management department, or a management committee or a dedicated senior executive that will take charge of risk oversight at both organisational and project level. This will provide effective internal feedback to the success or otherwise of risk management processes put in place so that appropriate decisions could be taken.

Discussion

Prime suggestions for overcoming the barriers to higher RMM are adoption of formal risk management process; organisation wide policy on RM by the board and management; engagement of professional staff competent in technical and management aspect of highway projects; lessons learnt from past projects should be documented for application on future projects; study of project documents prior to commencement; consistent training of personnel and functional/organised set-up; development and promotion of risk management culture and attitude within the organisation; and periodic meetings for project performance review meetings. There must be management support to the risk management process, involving all key staff through periodic technical meetings and review of progress against established programme of work must be observed. While some of the suggestions are consistent with previous requirements for effective risk management processes in organisations, others are products of experiences and real-life engagements with relevant stakeholders as affirmed by the respondents (Serpella *et al*., 2015; Zhao *et al*., 2014; Zhao *et al*., 2015; Zou *et al*., 2010).

Enablers for attaining higher RMM level are products of tactical strategies and consistent delivery of projects within the industry. Respondents from the two maturity levels categorisation offered suggestions based on their experiences, knowledge of the industry and the business environment. Proper project planning with all the discrete project management techniques such as project execution plan (PEP), procurement plan, programme of work, method statement, cash flow schedules, etcetera complimented with a strict compliance to the PEP by all team members; continuous improvement in quality standards; relationship management with all stakeholders; establishing a reputation for standardised products; sufficient human and machine resources;

and maintaining strategic contacts in client organisations. The enablers further included a thorough project analysis and value engineering workshop before commencement; compliance with project specifications and offering standards of quality beyond that specified where possible.

The identified enablers being products of experience and tactical approaches are adequately supported by McCabe (2010) as enshrined in the development and testing of a good strategy. Improvement in quality standards is akin to market penetration; establishing a reputation for quality products is product development; adherence to project management techniques and compliance with project specifications is a strategic position that shows consistency in services and customer satisfaction. In developing a strategy, three primary tests that must be passed from a practical viewpoint are value addition, consistency and competitive advantage. Continuous improvement in quality standards, compliance with all the requirements of a PEP and project specifications, offering quality beyond that specified and maintaining strategic contacts in client organisations will provide the three ingredients of strategy in attaining higher RMM.

Organisations at the naïve RMM level aspiring to attain the novice RMM level need to execute six distinct action plans as detailed above by different units of the organisation for the benefit of other complementing units. It starts with a clear definition of the goals and vision of the company by the board which is effectively communicated to all staff by the top management. This is one of five concepts of effective strategy as proffered by Huff *et al*. (2009). The top management will have to embrace the need for risk management through organising workshops/seminars for a full understanding of its benefit and further activate project and senior management to initiate and observe RM practice at least informally. This is in consonance with the requirements of RMRDPC (2002) and Mu *et al.* (2014). Execution of these action plans and achievement of the desired results will progress a firm to attain the novice RMM level.

The study found that the sampled highway contractors in Nigeria are generally at the novice RMM level. For these firms to progress to the higher managed level of RMM, actions must be taken. The actions are initiated by the top management's formulation of a risk management plan which is tailored towards the organisation's vision, objectives and context. This plan will require the board's approval after which organisation wide implementation commences. As part of the RM plan, risks will be consistently and systematically identified, analysed and response techniques put in place throughout the project life cycle. These actions are consistent with the positions of Mu *et al.* (2014) and Zhao *et al.* (2015) in their determination of RMM factors. In line with McCabe (2010)'s proposition of planning and communicating as essential steps in implementing strategy, the senior management will further implement an organisation wide communication and effective co-ordinated practice of the approved standardised RM plan of the organisation. The top management must ensure the employment of staff competent in technical and management aspect of highway construction who shall ensure the achievement of formal PRM practices at all departments of the company. The project management and technical levels of the organisation have the sole responsibilities of studying project documents, carry out site investigations, prepare detailed project execution plan (PEP). Lessons learnt on executed and on-going projects would be documented by the PM/technical team and share the knowledge with senior management for use in future projects. These primary actions of the PM/technical team will not only ensure that right and viable projects are done, project specific issues will be proactively dealt with and the RM plan of the firm will be more standardised in view of lessons learnt.

The topmost level in the maturity conundrum is the optimised level. Attaining this level by highway contractors have added benefits of competitive advantage amongst competitors, increased management accountability and improved control of an organisation on its projects. RMRDPC (2002) opined that at the optimised level risk management knowledge base is used for modelling risk and opportunity optimisation. Requisite strategies for highway firms to reach the optimised level starts with the top management's formal and clear definition of the firm's risk appetite and tolerance level in line with the corporate strategy. The implementation of risk management processes against the firm's RM plan of all the various units will be periodically monitored by the top management for a review of the RM framework, policy and plans based on actual results obtained (where necessary). The senior management will further create risk awareness and promote RM culture and attitude across all levels with the singular aim of embedding an organisation wide practice of RM in all staff. These three (3) principal actions of the top and senior management are supported by the suggestions of Zhao *et al.* (2013) and Zou *et al.* (2010). While the findings further suggest the establishment of a separate RM department, management committee or a senior executive to take charge of risk oversight, previous research also supported this action plan (Zhao *et al*., 2013). Consistent with the recommendation of Huff *et al*. (2009), the top management will need to generate more internal resources and establish a nexus between organisational strength and external market opportunities in the highway sector. This will bring about market penetration and creation of a niche for the organisation which is an important strategic option for corporate success (McCabe, 2010).

Conclusion and Recommendations

The study was aimed at developing strategies for attaining higher risk management maturity by/ highway contractors in Nigeria based on clearly defined objectives which have been achieved. The study is concluded as follows; the risk management maturity of highway contractors is at 'novice' level due to low implementation of thirty-one RMM factors. The means of overcoming present barriers include adoption of formal risk management approach, engagement of professional staff competent in technical/management aspect of highway projects and development and promotion of a risk management culture and attitude within the organisation. The enablers for higher RMM such as strict compliance with project execution plan (PEP), established reputation for standardised products and strategic contacts in client organisation were determined. Highway contractors must implement clearly defined strategies in order to progress along the risk management maturity continuum to attain higher RMM levels and also sustain the optimised level when attained. This shall further provide highway contractors with the strategies for sustaining the optimised risk management maturity level when attained.

The study recommends that, in the implementation of the strategies for attaining higher risk management maturity levels, appropriate concern must be given to the dynamics of the construction industry in terms of multiplicity of stakeholders, project complexity and clients' political expediency. Highway contractors also need to implement the means of overcoming present barriers coupled with the enablers for attainment of higher RMM ultimately leading to better utilisation of resources, project performance and competitive advantage. With the identification of means to overcome barriers to and enablers for attaining higher risk management maturity of highway contractors, further studies could be undertaken to assess the level of success or otherwise that could be achieved with the implementation of the thirteen means to overcome barriers and eleven enablers for higher RMM.

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