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Assessment of Risk Management Maturity of Construction Organisations in Joint Venture Projects

R. S. Abdulrahman[1], A. D. Ibrahim[2], and P. G. Chindo[3]
[1]Assistant Lecturer, Department of Quantity Surveying, Ahmadu Bello University, Zaria, Kaduna State, Nigeria. Email: ridwanshuayb1@gmail.com (corresponding author).
[2]Professor, Department of Quantity Surveying, Ahmadu Bello University, Zaria, Kaduna State, Nigeria.
[3]Senior Lecturer, Department of Quantity Surveying, Ahmadu Bello University, Zaria, Kaduna State, Nigeria.

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Abstract: For organizations to be successful, they should be committed in managing risk proactively and consistently throughout the project and equally important is the determination of the Risk Management Maturity (RMM) of organizations because it is the commencing point in the review of the current RM systems, practices, and culture of construction organisations. It was reported that construction organisations lack the knowledge of their capability to manage risk and as a result, JV projects continue to fail. Studies have identified, categorised and assessed risk associated with JV projects in their local and international context but no study has assessed the RMM of construction organisations in JV projects. Therefore, this study assessed the RMM of construction organisations in JV projects. The attributes and dimensions used to assess the RMM of construction organisations were identified from literature and used in the survey to collect data from respondents and subsequently analysed using the Fuzzy synthetic evaluation technique. Findings revealed that construction organisations undertaking JV projects are at the "defined maturity level" which means that these organisations only practice informal risk management and uses only qualitative risk assessment technique. The study recommends that further studies should focus on how to improve and move from the current RMM level of construction organisations to the next maturity level (managed and optimised).

Keywords: Risk management maturity, Risk management capability, Fuzzy synthetic evaluation.

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1. Introduction

The Nigerian construction industry is beset with many problems such as uncompleted projects, poor quality work, time overrun, cost overrun and low level of productivity especially the projects handled by indigenous contractors (Aniekwu and Okpala, 2006; Idoro and Okun, 2009). The construction industry has a growing rate of delays in project delivery (Aibinu and Jagboro, 2002). Dada and Jagboro (2007) reported that, improper assessment of risk factors is a vital reason for the ineffective project delivery in the construction industry of Nigeria. Though recent studies in Nigeria showed that not only is the adoption of risk management process low, they also lack the understanding of risk management process (Ojo, 2010; Augustine et al., 2013). Studies outside Nigeria have also reported rarity in the use of formal risk management process and a heavy reliance on experience, personal skills, and comparing analysis of similar projects (Jin et al., 2017; Adeleke et al., 2018). This informal risk management practises have been reported to be ineffective particularly amongst the small and medium scale organisations (Algahtany et al., 2016; Oduoza and Tamparapoulos, 2017). Hence, the industry continues to perform poorly with many projects not meeting time and cost targets.

Furthermore, the characteristics and complexities of the construction industry often require special skills and techniques. To this effect organisations are drifting away from the traditional procurement routes to strategic alliances such as joint ventures which according to Famakin et al. (2012), is a procedure or system used to respond to specific business phenomena such as access to new markets, business capacity, specific government policy, technology transfer, or economies of scale. JV creates certain benefits such as integration of complementary skills between organisations cross culturally, satisfying technological gap and quicker market access. These benefits have made it a strategic alliance in the world economy. Despite the benefits of JVs, there still exist risk and uncertainties, which causes financial losses and even project failure among others (Hwang et al., 2017; Yu et al., 2017). Thus, it has become

very necessary to develop an effective mechanism for risk management, assessment and control in order to attain success in JV projects.

A number of studies have identified, categorised and assessed risk associated with JV projects in their local and international context (Bing et al., 1999; Shen et al., 2001; Zhang and Zou, 2007; Famakin et al., 2012; Hwang et al., 2017). However, no study has assessed the RMM of construction organisations in JV projects. Moreover, studies covering this subject matter (RMM) have been single organisations undertaking a project and not through JVs (Ren and Yeo, 2004; Zou et al., 2010; Mu et al., 2013; Salawu and Abdullah, 2015). Furthermore, Nwachukwu and Emoh (2011) and Mba and Agumba (2017) reported that, many construction JV projects in Nigeria and abroad have failed to achieve project success due to increased risk and uncertainties, despite the adoption of risk management process on the projects. Also, Nguyen and Chileshe (2015) revealed that construction organisations lack the knowledge of their capability to manage risk and as a result JV projects continue to fail. In addition, it has been reported that organisations with high RMM level tends to improve their project performance **(**Mafakheri et al., 2012). Hence, in light of the diverse potential risk associated with JV projects, it is of utmost importance for a potential joint venture partner to have adequate knowledge and understanding of the RMC of construction organisations before any contractual agreement. Hence, this study seeks to assess the risk management maturity of construction organisations in JV projects.

2. Literature Review

2.1. Risk Factors Affecting Construction JV Projects

The characteristics and complexities of the construction industry is what necessitated the introduction of JVs and other different forms of strategic alliances but despite this, there still exist risk and uncertainties which brings about project failure (Nwachukwu and Emoh, 2011). Shen et al. (2001) identified and assessed fifty-eight (58) risk factors associated with JVs of which the top three (3) risk factors are; cost increase due to changes in policies, improper project feasibility studies, and project delay.

Zhang and Zou (2007) identified and assessed thirty-nine (39) risk factors associated with international construction joint venture (ICJV) and found, partner's financial ability, distrust among partners and local partner's incompetence as the top three (3) most significant risk factor within the internal category. Cash flow problem of client, delay in project and incompetence of the subcontractors/suppliers were the most significant risk factors within project risk category while changes in policies, bureaucracy for late approvals and economy fluctuation were the top three (3) significant risk factors under the external category.

Adnan (2008) reported twenty-five (25) risk factors associated with JV projects in Malaysia and ranked their severity based on internal, external and project categorisation. He reported that, financial problems, lack of management competencies and resourcefulness and changes in policies as the most significant risk factor within the internal categorisation. In the project risk categorisation, cash flow problem, poor project performance and incompetence of suppliers and sub-contractors were ranked as the most significant risk factors. Economies fluctuation, inflation and policies, laws and regulations were the top three most significant risk factors in the external risk categorisation.

Jamil et al. (2008) reported, financial risk due to delay in payment, foreign currency fluctuation, incompatibility of local policies with international practices as the top three most significant risk factors in ICJV projects.

Zhao et al. (2013) identified disagreement on some conditions of contract as the most significant risk factor affecting ICJVs, followed by disagreement on some accounting of profit and loss and finally distrust between partner employees. Hwang et al. (2017) reported the most significant risk factors as political instability, corruption and changes in laws, regulations and policies within the country level risk category. Uncertain market demand, cost fluctuation of labour materials and equipment and difficulty in finding and keeping skilled workers were the top three most significant risk factors within the market level risk category. Budget overrun, termination of JV contract and insufficient cash flow were ranked the top three most significant risk factors affecting ICJVs within the project level risk category. Most of the studies on JVs consider either change in laws, regulations and policies or economy fluctuation or cash flow problems as one of their most significant risk factors affecting JV projects with the exception of the study by Zhao et al. (2013) and Hwang et al. (2017). These differences could be attributed to specific project type or location. However, Table 1 depicts the list of risk factors in JV projects identified from literature.

Table 1. Risk Factors in JV Projects

S/N	Risk Factors
1	Economy fluctuation
2	Exchange rate
3	Loss incurred due to bribery and corruption
4	Errors in design drawings
5	Excessive demands and variations by client.
6	Import restriction
7	Security problems
8	Poor relation with regulatory agencies
9	Incompetence of sub-contractors/ suppliers
10	Shortage in skillful workers
11	Cash flow problems
12	Poor relation and disputes with partner
13	Employees from each partner distrust each other
14	Disagreement on some conditions of contract
15	Breach of contract by other partner(s)
16	Partners lack of management competence and resourcefulness.
17	Partner's company in financial problem
18	Poor project relationship
19	Policy changes in partner's company towards the joint venture
20	Disagreement on allocation of work
21	Disagreement on accounting of profit and loss
22	Disagreement on allocation of work
23	Unforeseen site condition
24	Social and cultural differences between organizations
25	Knowledge and technology transfer disputes
26	Accident on site
27	Inconsistency in policies, laws and regulation
28	Force Majeure (flood, earthquake etc.)

2.2. Risk Management Maturity of Construction Organisations

According to Likhitruangsilp and Prasitsom (2008), JV project management is extremely challenging for all contractors due to several factors, which are usually more complicated than those of typical construction projects. The performance of JV projects depends highly on the parties' ability to communicate, understand each other, compatibility of objectives among others (Famakin et al., 2012). Hence, several researchers have stressed the importance of assessing the RMC of construction organisations, as it is the commencing point in comprehending the RMC of construction organisations (Ren and Yeo, 2004; Zou et al., 2010; Mu et al., 2013; Salawu and Abdullah, 2015). RMC is the ability of an organisation to manage risk. The RMC of organisations can be assessed through the attributes and dimensions using a risk management maturity (RMM) model that have been developed in previous studies. The model assesses the current RMM level of organisations by identifying areas for improvement and creating strategies for improving the risk management maturity level. Hopkin's model comprises of four (4) maturity levels (naive, novice, normalised and natural) that are used in measuring the key attributes (culture, process, experience and application) of an organisation. Each of these attributes in turn has dimensions as a sub-category which will further be assessed. Studies on RMM have adopted between 4-8 key attributes of organisational RMC (Salawu, 2016).

Studies have reported that, the RMM levels of construction organisations are not the same on different attributes (Loosemore et al., 2006). For example, an organisation could have a high RMM level in risk management process and practices but low RMM level in risk attitude and culture. This is an indication that, understanding the RMC of an organisation depends on the RMM level of the organisation in varying attributes, which reveals the strength and weakness of the organisation (Salawu, 2016). Studies have used similar maturity scale of five or four-point scale but with slightly different nomenclatures, though they are essentially the same. Table 1 shows the details of attributes adopted in the risk management maturity model in previous accessible studies.

From the review of the accessible literature on RMM models, this study adopted the following categories of attributes which include; management perspective, risk attitude and culture, risk management process and organisational risk management practices.

2.2.1. Risk management maturity levels for construction organisations

Different maturity levels have been used in previous studies and models developed. The existing risk management maturity model (RM3) has four (4) main levels namely; naïve, novice, managed and optimised. However, Table 3 below shows the different maturity level as reported in previous studies.

The characteristics of every maturity level differ from one another. These characteristics informs an organisation on the level at which it is operating with regards to risk management process and/or the level of adoption of risk management process. Though studies have used different maturity levels ranging between four and five, predominantly four has been used. However, both categories of studies with four and five maturity levels have the same characteristics though some have slightly different nomenclature. Studies with four maturity level tends to have collapsed two maturity levels in to one, particularly level 2 and 3 using maturity scale 4 and 5 respectively. However, they still mean the same thing.

3. Research Method

Literature review relating to the theme of the study was carried out. The review focused on the RMM of construction organisations. The approach used in this study to assess the risk management maturity of construction organisations in JV projects was adapted from the studies undertaken by Zou et al. (2010) and Mu et al. (2013) and Salawu and Abdullahi (2015). Questionnaires were developed and distributed to construction organisations undertaking JV projects in Abuja. Four (4) attributes and twenty-six (26) dimensions (questions) were identified from literature and included in the questionnaires. Data collected was analysed using Fuzzy Synthetic evaluation model to calculate the attribute index (AI) and the risk management maturity index (RMMI).

Table 2. Attributes used in different risk management maturity models (Salawu, 2016)

Hilson (1997)	RMRDPC (2002)	Ren and Yeo (2009)	Zou et al. (2010)	Hopkins (2011)	Mu et al. (2013)
Culture	Culture	Culture	Culture	Culture	Attitude & Culture
Experience	Experience	Experience	Management perspective	-	-
Process	Process	Process	Identification and Analysis	Identification and Analysis	Identification, Analysis and Response
Practice	Application	Application	Application and Practice	Project management	Application and Practice

Table 3. Risk management maturity levels used by different authors (Salawu, 2016)

Authors	Risk Management Maturity Levels				
	1	2	3	4	5
Hillson (1997)	Naïve	Novice	Managed	Optimized	
RMRDPC (2002)	Adhoc	Initial	Repeatable	Managed	
Yeo and Ren (2009)	Ad-hoc	Initial	Defined	Managed	Optimized
Zou et al. (2010)	Initial and Ad-hoc	Repeatable	Managed	Optimized	
Hopkins (2011)	Naïve	Novice	Normalized	Natural	
Mu et al. (2013)	Naïve	Novice	Normalized	Natural	

Fuzzy synthetic evaluation

Fuzzy synthetic evaluation is a subset of the fuzzy set theory, which can deal with the problems relating to ambiguous, subjective and imprecise judgements (Zhao et al., 2013b). It can quantify linguistic terms of available data for decision-making (Zhao et al., 2013b; Zimmermann, 2001). The Fuzzy synthetic evaluation is chosen because, it is a multi-attribute decision making (MADM) technique which according to Salawu (2016) can be used to attain a precise conclusion that is based on an unclear and imprecise data or information**.** Risk information on JV projects is many and is usually extracted through construction professional's subjective judgments. These kinds of information are ambiguous and imprecise. In addition, similar studies have used the Fuzzy synthetic evaluation in analyzing the RMC of organizations on different project typologies (Zou et al., 2010; Mu et al., 2013; Salawu and Abdullah, 2015). Hence, the suitability of fuzzy synthetic evaluation is used to assess the RMC of construction organisations in JV projects.

From the questionnaires, the ranked attributes and dimensions of RMC by the construction organizations undertaking JV projects were then analyzed using the Fuzzy synthetic evaluation with the aid of MATLAB software. The evaluation process includes:

Step 1: Mean scores and membership function computation for the RMC dimensions (questions).

The mean scores for each dimension is calculated from the ratings of the respondents using Eq. (1):

$$M_i = \sum_{i=1}^{w} wi\, fi \div \sum_{i=1}^{w} fi \quad (1)$$

Where:

w*i* = respondent's preferences;

i = response category of maturity levels and *fi* is the frequency

Step 2: Development of weightings for the dimensions and attributes.

The weightings of the attributes and dimensions of the RMC were computed from the mean scores of the ratings respondents using Eq. (2):

$$Wi = \frac{Mi}{\sum_{i=1}^{n} Mi} \quad (2)$$

Where:

Wi = relative weight of each attribute/dimension;

i = 1, 2, …, n dimensions;

Mi = mean score of an attribute/dimensions for the respondents;

$\sum Mi$ = Summation of the mean ratings for the dimensions of an attribute or attributes for RMC.

Step 3: Membership function calculation for the RMC dimensions.

The attributes and dimensions of RMC are the set of basic criteria for the fuzzy synthetic evaluation, therefore, Q = (q1, q2, q3 ……. q26). The rating scale is defined as N= (n1, n2, n3, n4, n5). Where n1 = 0.10= Ad-hoc, n2 = 0.31 = Initial, n3 = 0.51= Defined, n4=0.71 = managed, n5=0.91 optimized as shown in Table 4 below:

Table 4. Rating Scale of each maturity level of the RMC (Ren and Yeo, 2004; Zou et al., 2010; Mu et al., 2013; Salawu, 2016)

Linguistic variable: RMM Scale		
Linguistic values	**Rating Scales**	**Mid-Point**
Ad-Hoc	0.00 - 0.20	0.10
Initial	0.21 - 0.40	0.31
Defined	0.41 - 0.60	0.51
Managed	0.61 - 0.80	0.71
Optimized	0.81 - 1.00	0.91

The membership functions for each dimension were computed from the proportion of the respondents' scores using Eq. (3):

$$\text{MF} = \text{P1/Ad-hoc, P2/Initial, P3/Defined, P4/Managed, P5/Optimized} \quad (3)$$

$$\text{MF} = \underline{\text{P1}}\ \ \underline{\text{P2}}\ \ \underline{\text{P3}}\ \ \underline{\text{P4}}\ \ \underline{\text{P5}}$$
$$0.10\ \ 0.31\ \ 0.51\ \ 0.71\ \ 0.91$$

MF = membership function;

P = proportion of the total respondents that selected a specific RMM level.

Step 4: Calculating the trapezoidal membership function (TMF) for AI and RMMI.

To compute the TMF for AI and RMMI, the model 3 of the fuzzy synthetic evaluation was used, because it is fit for treating or manipulating multi-criteria problems and when the difference in the weighting of each criterion is not much. In addition, Xu et al. (2010); Mu et al. (2013) and Salawu (2016) used this same model in their studies with multi-criteria problems.

$$\text{bj}(1) = \sum_{i=1}^{n} (Wi \times (Pij)) \quad (4)$$

Where:

j(I) = trapezoidal membership functions (TMF) for 'AI' or TMF for 'RMC';

Wi = relative weight of a particular dimension or attribute i = 1, 2, …, n dimensions or attributes;

Pij = degree of membership of each dimension or attribute.

Eq. (4) above was used with the aid of MATLAB software to calculate the TMF for the attributes and the RMM level for organisation in JV projects.

Step5: Defuzzification of trapezoidal membership function.

The TMF obtained for the attributes and the RMMI in step 4 above were defuzzified to acquire the RMM level of these organisations in JV projects for the attributes and the overall RMMI. Eq. (5) was used for the defuzzification.

$$C = \sum^{n}_{i=1} (W \times R_K) \times L \quad (5)$$

Where:

C = crisp value (maturity level) of the TMF for the RMM or attributes;

W = relative weight of a dimension that forms part of an attribute;

R_k = membership degree for each of the RMC attributes;

L = is the mid-point for each maturity levels of the maturity rating scale (Ad-Hoc = 0.10, Initial = 0.31, Defined =0.51, managed = 0.71 and optimised = 0.91).

4. Results and Discussions

Risk Management Maturity Level

Twenty-six dimensions and four attributes were identified from literature and used in this research to assess the RMC of construction organisations in JV projects. These attributes are; management perspective, risk attitude and culture, risk management process and organisational risk management practices. The RMC of construction organisations was assessed by estimating the AI for each of the four attributes mentioned and then the overall RMMI. This was achieved through the use of Fuzzy Synthetic Evaluation technique to calculate the AI and the RMMI.

AI and RMMI for construction organisations in JV projects

Through a series of computations of the mean responses, weightings of each dimension and attributes, and trapezoidal membership functions for both dimensions and attributes, the RMMI for construction organisations in JV projects was computed as presented in Table 5.

The computed AI on management perspective, risk attitude and culture, risk management process and organisational risk management practices are 0.49, 0.47, 0.47 and 0.43 respectively and the overall RMMI is 0. 46. The indices are all greater than 0.40 but less than 0.60, which signifies that, each of the attributes fall within the same maturity level, revealing that construction organisations undertaking JV projects are at the defined level of maturity. The RMMI, shows that, construction organisations are aware of some of the benefits of risk management, generic risk management processes are applied to most projects, only qualitative risk analysis methods are used to assess risks, and informal channel of communicating risk information is used. The result also shows that construction organizations are inconsistent in the use of formal risk management process and mostly reacting to risk events rather than been proactive. The overall maturity level of these organizations is quite similar to the findings of Salawu & Abdullah (2015) which revealed that, construction organizations undertaken road construction projects in Nigeria are at the novice level (equivalent to the defined level), though the difference in the project typology will not make comparison to be adequate. However, similar studies on maturity level have been reported from different part of the world such as the work of Zou et al (2010) which was rather on understanding and improving the RMC of construction organizations in Australia and that of Mu et al. (2013) which was on subway projects in China. Both studies reported the RMM level of their construction organizations to be between low and medium. This shows that the Nigerian construction organizations are slightly behind in risk management when compared to organizations from other countries.

5. Conclusions

The presence of risk in a project has the potential of derailing the achievements of its objectives and so it is of utmost importance that all risk associated with a project are systematically identified, assessed and responded to carefully to achieve any said objectives. However, establishing the RMM of an organization is very important and should be the commencing point when reviewing the RM systems, practices, and culture of an organisation. This study has assessed the RMM of construction organisations in JV projects and found that, they are at the defined maturity level, which is to say that, construction organisations are aware of the benefits of risk management at all levels but they only apply generic risk management processes to projects, only qualitative risk analysis methods are used to assess risks, and also informal channel of communication of risk information are used. Based on the five scale maturity level used in this study, the defined maturity level attained by these organizations is merely the average maturity level, which is not satisfactory. There are two other maturity levels (managed and optimized) superior to the current level attained, meaning organizations needs to improve from their current maturity level to the managed and optimized maturity level. However, having used questionnaires to collect data, construction organizations could have misrepresented the actual practices of their organizations and as a result, the findings could be tainted. Also the study did not consider the perceptions of the JV as a team but the perceptions of individual organizations involved in the JV projects. Lastly, the study focused on JV projects, which means it cannot be generalized.

Table 5. Attributes Index and Risk Management Maturity Index for JVs

S/N	Risk Management Capability Dimensions & Attributes	Attributes Index
1	Risk management process is provided for in the Organisation's corporate philosophies and strategies	
2	Top management take part in risk activities, supports & encourages risk management	
3	Risk management tools and techniques are integrated & used in projects	
4	Top management allocate resources to projects based on the severity of risk events identified	
	Management Perspective	**0.49**
6	There is trust between the organization and the project teams in relation to risk management	
7	Team members are familiar with risk management concepts & methods	
8	Team members take risk ownership during project implementation	
9	Every team member is accountable for managing allocated risks	
10	Risk events are openly and frequently communicated in your organization	
11	Risk management is totally accepted and practiced at all levels of the organization	
	Risk Attitude and Culture	**0.47**
13	For every new project potential risks are identified	
14	Risks are identified using a systematic identification approach	
15	Information on risks identified are processed, grouped & communicated to all project participants	
16	The organization compares the actual risks found with the initially identified risks	
17	All project participants have basic risk analysis skills	
18	The probability of occurrence and magnitude of impact of risks are thoroughly assessed	
19	Qualitative and/or quantitative risk analysis techniques are used to assess the identified risks	
20	Systematic response method are used in risk mitigation	
21	All project participant understand risk response methods	
	Risk Management Process	**0.47**
23	Formal risk management process are used in your organization	
24	Risk are systematically identified, analysed, responded and continuously monitored throughout a project	
25	Risk management process are intertwined into the business processes of your organization	
26	Risk analysis result are used in your organization	
27	Risk information on previous JV projects are collected and kept in the organisation's database	
28	Risk management process is reviewed to ensure the process is effective	
29	Risk management capability of your organisation is frequently undertaken	
	Organizational Risk Management Practices	**0.43**
	Overall Risk Management Maturity Index	**0.46**

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Rilwan Shuaib Abdulrahman is a Lecturer in the Department of Quantity Surveying, Ahamdu Bello University, Zaria, Nigeria. He holds a B.Tech. (Hons) in Quantity Surveying and an MSc in Project Management. His research interest is in the general area of Quantity Surveying, Risk management, procurement and supply chain management. Mr. Abdulrahman is a member of the Nigerian Institute of Quantity Surveyors.

Ahmed Doko Ibrahim is a Professor of Quantity Surveying from the Department of Quantity Surveying, Ahmadu Bello University, Zaria, Nigeria. He holds a BSc (Hons) in Quantity Surveying, MSc in Construction Engineering & Management and PhD in Construction Project Management. He has research interest in the general areas of Quantity Surveying and Project Management with particular emphasis on Procurement, Cost Modelling, Public-Private Partnerships, Risk Management and Strategic Management of Construction firms. Prof. Ibrahim is a Fellow of the Nigerian Institute of Quantity Surveyors, a corporate member of the Association for Project Management (UK), Chartered Institute of Building (UK) and the Society for Construction Industry Arbitrators (Nigeria).

Peter Gangas Chindo is Senior Lecturer in the Department of Quantity Surveying, Ahmadu Bello University, Zaria, Nigeria. He holds a BSc (Hons) in Quantity Surveying, MSc in Construction Management and PhD in Quantity Surveying. He has research interest in Construction Manpower Training and Management, Project Monitoring and Control and Strategic Management of Construction Firms. Dr Chindo is a corporate member of the Nigerian Institute of Quantity Surveyor.

Appendix A. Fuzzy synthetic evaluation computation: Trapezoidal membership functions and attributes

S/N	Questions	Weightings	Trapezoidal Membership Functions For Dimensions					Trapezoidal Membership Function For Attributes				
1	MP1	0.23	0.16	0.28	0.28	0.26	0.02					
2	MP2	0.25	0.16	0.28	0.19	0.26	0.12					
3	MP3	0.26	0.16	0.23	0.21	0.19	0.21	0.14	0.25	0.24	0.26	0.11
4	MP4	0.26	0.09	0.21	0.28	0.35	0.07					
5	**Management Perspective**											
6	RAC1	0.17	0.09	0.30	0.35	0.23	0.02					
7	RAC2	0.16	0.09	0.28	0.28	0.23	0.12					
8	RAC3	0.15	0.09	0.56	0.19	0.16	0.00					
9	RAC4	0.17	0.12	0.35	0.21	0.19	0.14	0.13	0.29	0.29	0.23	0.07
10	RAC5	0.18	0.16	0.14	0.37	0.28	0.05					
11	RAC6	0.18	0.19	0.14	0.33	0.28	0.07					
12	**Risk Attitude and Culture**											
13	RMP1	0.11	0.14	0.40	0.19	0.21	0.05					
14	RMP2	0.10	0.33	0.23	0.19	0.21	0.05					
15	RMP3	0.11	0.19	0.21	0.33	0.23	0.05					
16	RMP4	0.11	0.09	0.40	0.33	0.19	0.00	0.11	0.32	0.28	0.23	0.06
17	RMP5	0.10	0.19	0.42	0.21	0.19	0.00					
18	RMP6	0.12	0.14	0.26	0.37	0.16	0.07					

Appendix A. Fuzzy synthetic evaluation computation: Trapezoidal membership functions and attributes (continued)

S/N	Questions	Weightings	Trapezoidal Membership Functions For Dimensions					Trapezoidal Membership Function For Attributes				
19	RMP7	0.11	0.07	0.40	0.33	0.14	0.07					
20	RMP8	0.12	0.14	0.30	0.26	0.26	0.05					
21	RMP9	0.12	0.05	0.40	0.23	0.28	0.05					
22	**Risk Management Process**											
23	ORMP1	0.13	0.16	0.44	0.21	0.19	0.00					
24	ORMP2	0.15	0.16	0.30	0.28	0.16	0.09					
25	ORMP3	0.14	0.14	0.37	0.28	0.12	0.09					
26	ORMP4	0.14	0.12	0.42	0.28	0.16	0.02	0.17	0.35	0.23	0.19	0.06
27	ORMP5	0.15	0.16	0.33	0.14	0.30	0.07					
28	ORMP6	0.14	0.26	0.28	0.23	0.16	0.07					
29	ORMP7	0.15	0.16	0.33	0.21	0.21	0.09					
30	**Organisational Risk Management Practices**											

Appendix B. Fuzzy synthetic evaluation computation: Trapezoidal membership function for attributes and RMMI

S/N	RMC attributes	Weightings	TMF for attributes					TMF for RMMI				
1	Management Perspective	**0.17**	0.14	0.25	0.24	0.26	0.11					
2	Risk Attitude & Culture	**0.23**	0.13	0.29	0.29	0.23	0.07					
3	Risk Management Process	**0.34**	0.11	0.32	0.28	0.23	0.06					
4	Organizational Risk Management Practices	**0.26**	0.17	0.35	0.23	0.19	0.06					
5	**RMMI**							**0.13**	**0.31**	**0.26**	**0.22**	**0.07**