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Abstract

The objectives of risk management in a project are to increase the probability and impact of positive events and decrease the probability and impact of negative events (PMBOK Guide fourth edition). However, construction projects have been faced with a challenge of not practicing risk management which has resulted in projects delaying and taking longer than anticipated increasing the budget of the project. This challenge can be found in most countries and is more pronounced in Africa. The main aim of this paper was to investigate risk management practices and performance of building construction projects. Risk management practice was the independent variable and performance on building construction projects was the dependent variable. This study sought to investigate the relationship between the risk management practices and performance on building construction projects. The study was premised on the hypothesis that if a building construction project is practicing risk management then its performance is positive and if a building construction project is not practicing risk management its performance is negative. This study sought to undertake desktop literature review on empirical journal articles in which the authors gathered primary data about the impact of risk management and performance of construction projects. The articles gave insights about the various methodologies, theories that informed the research, ethical considerations and findings by different authors around the world and was able to compare and contrast various research components which were used. This study believed that practicing risk management in the construction industry increased the probability of positive project performance. The researchers in this study were able to look at the background to the problem, justification of the problem and individual journal analysis. Further, this study presented the convergence and divergence issues observed during individual journal analysis in addition to the summary of the gaps and the findings. The key finding of the study was that Risk Management Practices influence the Performance of Building Construction Projects. Finally, the authors presented the conclusion and recommendations. The recommendations were made to researchers and policy makers.

Keywords: *Risk Management, Project Performance*

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1.0 Introduction

1.1 Background to the problem

Projects take place in uncertain environments that are prone to risks. With the increased number of construction projects across the World, it is crucial for project managers to ensure projects are well managed from initiation to the closure stage to ensure adherence to the triple constraints of time, cost and scope. This is important in the current economies due to scarce resources that need to be utilized effectively and efficiently during implementation of projects.

Risk management is considered as an integral part in project planning and management as it influences project performance. Due to lack of structured risk management practices in the field of construction, a number of construction projects have experienced cost overruns, poor quality and delay in time hence poor performance. In line with this gap, the authors of this seminar paper chose to examine the influence of risk management on project performance in order to improve projects performance.

1.2 Justification of the problem

Projects are designed to achieve a specific outcome intended to yield benefits to the beneficiaries. During project initiation, a benefits review case is usually designed to identify the projects expected benefits. The achievement of the outcome and impact of the project might not be successful if risks are not managed. Risks pose a great challenge to projects accomplishment within the constraints of time, cost and quality. It is therefore important that construction projects design a clear strategy on how a number of risks will be managed during the implementation and control of the projects. Most projects have not achieved the intended purpose because the project designers failed to identify a strategy on how the risks will be managed. The analysis of risk management practices in construction projects is therefore important as it will help in adopting a strategy on how to thwart uncertainties that might hinder the project from achieving the intended purpose. The recommendations of this paper would be useful to project managers and contractors by equipping them with skills and knowledge necessary in management of risks in a project.

1.3 Introduction of the Journal Articles

This paper is a desktop review of six journal articles in the broad area of Risk Management. The authors chose to study risk management practices and performance on building construction projects as the area of interest and managed to access research based journal articles as conducted by various scholars from a number of countries from different regions of the world. The selected journals were from; Ethiopia, Nigeria, Nepal, Jordan, Brazil and lastly from United Kingdom and Pakistan. The review majored on journals containing primary data. The journal articles were accessed through various websites and selected the ones that contained appropriate information as per their area of interest.

2.1.0 Journal Article Analysis

2.1.1 Journal Article One

Mariusz Urbanski, Adnan Ul Haque, & Isaiah Oino. (2019).*The Moderating Role of Risk Management in Project Planning and Project Success: Evidence from Construction Businesses of Pakistan and the UK*, Engineering Management in Production and Services, Vol. 11, Issue 1, DOI: 10.2478/emj-2019-0002

Abstract

The authors examined the role of risk management as a moderating variable in project planning and relating it to project success. The authors examined risk management as a function in project planning. The study was undertaken in the UK and Pakistan which are two distinct economies. It compared findings from these two economies in the construction industry through a survey questionnaire. The study found a relationship between project planning and project success in the construction industry in both economies. Risk management moderated the relationship between project planning and project success. Despite having two distinct economies, the findings were similar. The abstract recommended further action to be taken by stakeholders in both economies.

Introduction

The authors emphasized the significant role played by the construction industry in development of both economies. The industry has equipped people with skills of building, repair and maintenance of buildings such as hospitals, schools, airports among others has offered employment and backed this information with statistics which show the magnitude of benefits in both economies. The authors felt it was important to do this research because of the benefits which can be realized in this industry. This section would have been more comprehensive if the authors included the study objectives, research questions, and study hypothesis.

Literature review

The authors argue that project success and performance depend on planning and risk management is an important function during planning. Therefore, planning is an important determinant of project success. The authors supported this argument with similar empirical studies which indicate that indeed planning is a determinant factor of project success. The authors adopted a definition of planning as being a thorough continuous process for delivering a project. Project success is the satisfaction of customers in terms of time, cost, and quality. The study would have been more objective if the authors had used project performance instead of project success as the dependent variable. Risk management is a process that accompanies the project from its definition through its planning, execution, and control phases up to its completion and closure. The study examined three variables, risk management, project planning and project success.

1. Relationship between Project Planning and Success
2. Relationship between Risk Management and Project Success
3. Relationship between Risk Management as a moderating variable between Project Planning and Project Success

The authors supported these variables with related empirical studies that have given similar findings. The study formulated three hypotheses on the three variables. Despite there being a

number of studies in project planning and project success the author found a gap in studies that focused on risk management as a moderating variable in project planning and project success especially in the construction sector. Despite having a comprehensive literature review the study ought to have been guided by a theory which is a very crucial component of research.

Research Methods

The authors conducted a survey using a questionnaire through a purposive sampling technique. This is because the authors wanted to give a fair representation of all important groups to be included in the study. The study interviewed 152 project managers from Pakistan and the UK. The questionnaire contained four sections, demographic information, project success, project planning, and project risk management. Each of the three variables was assessed differently. The study used a five point Likert scale. Four items in project success were assessed, risk management three items, and project planning three items. The authors ought to have given reasons why project success had four items and the others had three items. Ethical considerations were adhered in the study. The study only used questionnaires and was not able to triangulate the results. The study used Cronbach's alpha, Composite reliability and Average Variance Extracted to measure reliability of the questionnaire and Fornell-larcker criterion to measure validity. The study tested the three hypotheses using the T-test and P value.

Data analysis/findings

The study found a significant relationship between the three variables.

1. Significant relationship between Project Planning and Success
2. Significant relationship between Risk Management and Project Success
3. Significant relationship between Risk Management as a moderating variable, Project Planning and Project Success

Discussion

The study confirmed that;

1. Better planning results to project success
2. Practicing risk management results to project success
3. Risk management affects both project planning and project success.

The authors supported these findings with similar studies which yielded the same results.

Conclusions

Risk management has a moderating effect between project planning and project success. Despite the variations of economies, policies, regulations, management styles, between the UK and Pakistan the results were similar.

Recommendations

The study recommended strategic measures to be adopted in the construction industry in both economies in terms of financial, human resource and technical to improve the outcomes of project success. The government should reduce tariffs to enable the industry improve on risk management and the industry to adopt simulations in risk management practices.

2.1.2 Journal Article Two

Luka Goji Tipili & Prof. Ibrahim Yakubu. (2016). *Identification and Assessment of Key Risk Factors Affecting Public Construction Projects in Nigeria: Stakeholders Perspectives*, International Journal of Engineering and Advanced Technology Studies, Published by European Centre for Research Training and Development, Vol. 4, No.2, pp20-32, ISSN 20535783/20535791

Abstract

The risk management technique revolves around the aspects of cost, time, quality, safety and environmental sustainability so risk management involves mitigation around these key variables. The paper explored aspects of risk management from stakeholders' perspective.

The researcher employed a mixed method approach in collection of data. The qualitative data was collected by the use of interviews while quantitative data was collected by use of a questionnaire survey, which was self-administered on 40 randomly selected participants who were clients and contractors. The main findings revealed that construction phase had the highest number of risk factors and that financial risk factors accounted for the highest number of risk factors with the biggest impact to a construction project. The research recommended that there is a need for clients, builders and government bodies to work cooperatively from the feasibility stage onwards to address potential risk in time, and contractors and subcontractors with robust construction and management knowledge must be employed early to make sound preparation for delivery out efficient and quality construction program.

Introduction

In a study on risks management in Nigeria the researcher noted that risks in project management fall into the categories of design, finance, political, and external factors which may be predictable or unpredictable. He asserts that these risks are however not considered during bidding, the risks factors lie within the triple constraints of cost, time and quality. The authors mention that risk management is a tool that aims at identifying sources of risk and uncertainty, determining their likelihood of occurrence, their impact, and developing appropriate management responses. A systematic process of risk management has been divided into risk classification, risk identification, risk analysis and risk response, where risk response has been further divided into four actions, i.e. retention, reduction, transfer and avoidance. Some researchers investigated risk management for construction projects in the context of a particular project phase, such as conceptual/feasibility phase construction phase rather than from the perspective of a project life cycle. The construction industry is subject to more risks due to the unique features of construction activities, such as long period, complicated processes, abominable environment, financial intensity and dynamic organization structures.

Literature review

Risk management is the systematic process of identifying, analyzing and responding to project risk. It includes maximizing the likelihood and the impact of positive events and minimizing the likelihood and the impact adverse events to meet the project objectives should be carried out at the planning stage. Risk assessment concentrates on quantifying identified risks by using statistical analysis, since the identified risk in most cases can be either quantitatively or

subjectively assessed factors and identified the key stages of risk management which are: risk identification, risk analysis and risk response. Risk identification involves uncovering any risks that could potentially affect a process. This step is of considerable importance as other processes such as risk analysis and response can only be undertaken on the potential risks that have been identified, Managers often rely heavily on their experience and on the insight of other key personnel involved in the process. One of the effective tools for identifying potential risks is the work breakdown structure (WBS) which reduces the chance of missing risk event. It enables analysis of; what could go wrong? How likely is it? (Probability), and how it will affect the project?(impact). Project manager and the team could use the experience and lessons learnt from the past, use a simulation model to present possible risks in addition to brainstorming in order to recognize the potential risk factors. Risk analysis techniques are mainly grouped into qualitative and quantitative methods. The potential risks are analyzed using a qualitative or quantitative method to evaluate their potential impacts. Another way of defining risk analysis is estimating what could happen if an alternative action or response were selected. The final stage of risk response then follows which could be mitigation, avoid, transfer, retain, and share.

The author has clearly outlined the stages involved in risk management which include risk identification, analysis and response which he argues that should begin at the planning stage, stakeholders should be involved from this point in the construction work a move that is all inclusive. The idea of managers relying on past experience is also seen as a good initiative because it helps in predicting the likelihood of risk occurring thus preparing in advance to mitigate the risk in case it arises. The author has identified a tool that could be of help in identifying the risks and help mitigate them known as the work breakdown structure. The study however would have been of greater significance if it could have been guided by a theory.

Methodology

The researcher employed literature review method, face to face interview with construction stakeholders, interview as well as the use of historical project data which was used to give insight into current problem of risk in the construction projects through the examination of what has happened in the past. The researcher administered 40 structured close- ended questionnaires on randomly selected construction practitioners involved in Abuja, Kaduna, Kano and Plateau state. The selection of these places is attributed to the frequent construction activities in these areas. The researcher covered stakeholders in construction projects, and primarily Contractors/Builders, Clients, and Consultants in the mentioned states. The research sought to collect information from the stakeholders relating to their academic qualification, years in service, the likely number of projects they have handled with the value of the project, their awareness of risk factors and its impact on performance of the projects.

A simple random sampling method was chosen so as to give equal chances to all the listed professionals and contractors in the study areas. The method of data collection which included interviews, questionnaires and analysis of past documents were appropriate for this study since the analysis of past documents would give more insight into the risk management technique since construction projects have lasted for ages. The target group was also appropriate since it entailed those who were involved or directly associated with the construction projects who were contractors, clients and stakeholders. The choice of questions was also appropriate in the researcher wanting to know the level of education and how long they had been in the construction industry, the number of projects they had undertaken and if they were aware of the

risk factors and ways of mitigating them. The simple random sampling technique was giving a fair chance to everyone thus it was appropriate since it was unbiased.

Data Analysis

A survey questionnaire was designed to collect required data about the two attributes of likelihood of occurrence and the impacts of risk factors on project performance. In order to assess the importance of each factor, a risk significance index was established by calculating a significance score for each factor. An alternative for calculating a significance score was to multiply the likelihood of occurrence by the degree of impact,

Abbreviated as RS= $f(\alpha,)$

$$S_j^i = \alpha_j^i \beta_j^i$$

Where

S_j^i is the significance score for risk i, as acknowledge by respondent j

is the likelihood of occurrence for risk i, as acknowledge by respondent j

β_j^i is the level of degree of impact for risk i as acknowledge by respondent j

Thus the RSIS can be calculated through the following model

$$RSIS_i = \frac{(\Sigma^{N}_{j=1})}{N}$$

RSS is the relative significance index score for risk i

S_j^i is the significance score for risk i, as acknowledge by respondent j

N is the number of the respondent

41 risk factors were identified from discussion with other researchers in the field of risk management in construction projects as well as discussion with construction practitioner the risk factors were perceived to have potential impact on construction project performance in terms of cost, time, and quality as well as project success The questionnaire was then administered on projects stakeholders mainly, the clients, contractors and consultants who also scored on a likert scale.

Findings

From the categorization of the risk factors into categories of; construction risk, design risks, political risks, environmental risks, financial and economic risk, the financial and economic factors was ranked first considering the attributes of inadequate cash flow, underestimation of direct costs, inflation and availability of foreign currency and exchange rate. The construction risk ranked second considering the factors of; quality problems, failure of on completion test, different site conditions, poor site condition, poor productivity, and equipment breakdown. Political factors came third considering the factors of problems of licenses, changes in law and regulations and war and civil disorder. Design factors ranked fourth considering the factors of insufficient detailing. Default by subcontractor and design changes. Environmental risk factors

ranked lowest considering the factors of inadequate program schedule, variation of construction program, serious noise pollution and low management competency.

Conclusion

The primary aim of every construction project usually is to achieve project goals within available cost, with the best possible quality and within a specified period of time. Client, contractor and consultant should work cooperatively from feasibility phase onwards to address potential risks effectively and in time; contractors and subcontractors with robust construction and management knowledge must be employed early to make sound preparation for carrying out safe, efficient and quality construction activities.

Research findings show that cash flow has been the major problem of construction activities in Nigeria and improvement in cash flow problems will reduce disputes, cost overrun, time overrun, claims etc. Many of the construction stakeholders in the country are not familiar with risk management in relation to project objectives rather they think it has to do with safety hazards. Risk management workshops will help many of the project stakeholders to understand what risk management is all about and how to apply it in construction projects.

2.1.3 Journal Article Three

Mervat Mohammed Al Mhirat, & Hani.Jazz'a Irtemeh. (2017) *Impact of Risk Management on Project Success:* An Empirical Investigation in Jordanian Ministry of Environment, European Journal of Business and Management ,ISSN 2222-1905 (Paper) ISS22222839 (Online),Vol.9, No.19.

Abstract

The abstract contained the main purpose of the study which captured the main variables, the scope, the population, research design, data collection tool and the findings of the study. To enhance it, it ought to have information on the specific objectives, the type of data analysis, the data presentation and the recommendations. It however served its purpose of providing a summary of what was contained in the journal

Introduction

The introduction focused on risk management as the independent variable and project performance as the dependent variable. A relationship was drawn between the main variables. Further, the introduction had research questions and the objectives which were all in line with the title of the study. The introduction could be improved by having additional information on the definitions of the key terms and the statement of the problem. Lastly, according to the research title the dependent variable was Project Success but in the introduction, project performance was used as the dependent variable. The introduction was therefore to have an explanation to link between project success and project performance.

Literature Review

The literature review for the independent and dependent variable were relevant. However, it should be noted that the literature used was on Project Performance as a dependent variable instead of Project success as it was in the title. The literature cited was from year 2001 to 2015 with most citations being around 2008. This study having been conducted in 2017, it ought to have used most recent literature which could have been sourced from researches conducted in 2010 and above bearing in mind that risk management and project performance are old concepts and researches have been continuously conducted on them. Generally the findings from most of the previous studies had shown a positive relationship between the risk management and project performance.

Apart from the above, the section had a conceptual framework in which the hypotheses presented the relationship between the independent variable and dependent variable. It could be vital if the journal had the theoretical framework section which could have provided the basis of argument in the study.

Research Methodology

Research methodology is important as it prepares and takes the researcher into the field to collect data for analysis. The authors in this research adopted survey research design with census as sampling technique in which 62 projects all within the Jordanian Ministry of Environment were targeted. The study used a sample size of 500 workers all working in the 62 projects. Validity test was carried out by using a panel of experts while the reliability test was through use of Cronbach's Alpha. Data collection was by use of questionnaire. Multiple regressions were used to analyze the data by testing null hypotheses. Although the methodology had all these information, it didn't have information on the specific type of questionnaire, construction of research tool, ethical considerations and how data was presented during the study which could have given more insight about the study.

Data Analysis and Findings

Multiple regressions were used during data analysis in which four hypotheses were tested. The findings from the four hypotheses indicated a significant relationship between the two variables. This meant that risk management practices affect project success. These findings were however general and therefore use of Alternative directional hypothesis could have provided the strengths of the significance of the impact of risk management on project success.

Conclusion

It was concluded that risk management practices affect project performance. Each conclusion was supported by the findings from previous researches. Although the findings were supported by literature review, there was no confirmation if there had been any other study that had contrary results.

Recommendation

All Project Managers should embrace risk management during project development and management. This will make sure that risks are identified and measures to mitigate them are put in place earlier in order to enhance project success.

2.1.4 Journal Article Four

Bahiru Bewket Mitikie, Jaeho Lee, & Tai Sik Lee. (2017).*The Impact of risk in Ethiopian Construction project performance.* Open Access Library Journal, 4 4: e4233. https://doi.org/10.4236/oalib.1104233. ISSN Online: 2333-9721, ISSN Print: 2333-9705

Abstract

The main aim of this journal was to increase the understanding of risk's impact on civil work construction project performance. The section incorporated the purpose of the study, data collection tools, data analysis tool and findings. The study would have been more comprehensive if the authors included methodology used which is important in any research work, objectives of the study, target population, and recommendations. The study mentioned (SPSS) which was used to analyze the data.

Introduction

The introduction section of the journal focused on background and research problem only. On background**,** the authors introduced the issue under study well by linking risk management with project performance and highlighted that no construction project is risk free. In addition to this, risk was said to affect project performance in terms of cost, quality and time, however the background would have been comprehensive it was presented in a funnel approach which dictates that introduction has to be done from a global, regional to national (local) perspective.

Furthermore, in research problem the authors argue that risk factors that contribute towards cost overrun and time delay had not been identified in evaluated projects**.** The research gap between what ought to be and the current situation was that there were 15.33% cost overruns and 80% time delay and thus necessitated the study. The section however did not show what has been done in the past in regard to the issue under study. The authors should have indicated from past literature what has been done in relation to the subject in the past. This would bring out the research gap strongly.

Research methodology

The authors employed use of triangulation in data collection through the use of questionnaire, focus group discussion and literature review to improve on the quality of data collected. Also, a sample size of 22 projects was selected through a disproportionate stratified random sampling technique from a target population of 29 that consisted of contractors and consultants.

The research design used in this study was not indicated in this section, however under background, the authors have only indicated that a qualitative approach was used to tackle the problems related to construction risk in Ethiopia. Based on the tools used in data collection, a mixed research method would have yielded more credible and valid results. Data collected was analyzed by use of SPSS and presented in pie charts, tables to show the probability of risk occurrence and its impact of risk factors. Radar charts are selected to present the risk level.

Results and discussion

The results and discussion of this paper indicated that no risk management practice or method in Ethiopian construction projects took place, however the discussions should have been presented

in line with the study objectives that were not highlighted. This would have brought out the results clearer and compared them with what other researchers found out in their studies.

Conclusion

The authors of the journal concluded that risk management was not practiced in Ethiopian construction projects. Risk management practices are therefore important in enhancing project performance. This will ensure that a project conforms to the triple constraint of time; quality and cost (budget) hence improve project performance.

2.1.5 Journal Article Five

Andrey Pimentel Aleluia Freitas, Joao Alberto Neves dos Santos, Joaquim Teixeira Netto, & Nylvandir Liberato Fernandes de Oliveira. (2019). *Delays in Construction Projects: Analysis of Critical Risk Factors in Small Brazilian Companies* International Journal of Scientific Research and Engineering Development-– Volume 2 Issue 3, May –June 2019 ISSN: 2581-7175

Abstract

The paper starts by underscoring the importance of risk in construction projects as it affects the project schedule and deliverables. The aim of the study was to identify and prioritize the main risk factors that had an impact on the delays recorded on the construction projects of the small construction companies in Brazil. The paper identified 43 risk factors associated with the construction industry; however, the study narrowed down to 26 which have a direct impact on the small construction companies in Brazil. The authors applied a survey method to 133 professionals working in small construction companies in Brazil. It adopted exploratory factor analysis to identify and rank six risk factors. The abstract of the paper provided a good summary of the study; however, it would have been complete with the inclusion of the conclusions and recommendations of the paper besides the research design.

Introduction

The authors mentioned that there are a number of factors that cause delays in construction projects and this is a usual occurrence. The delay can affect construction projects in two ways; compromising the sequencing of the projects and impacting the projects delivery. The impact is usually higher in construction projects and therefore the need to adopt robust risk management processes. The two main questions that the authors asked were;

Q1: What are the main operational risks factors affecting the schedules of the small construction projects of the national construction industry?

Q2: What is the order of relevance of the main risk factors that impact the delays of small companies in the national construction sector?

Therefore the main objective of the study was to identify and prioritize the main risk factors that caused delays in the construction projects of the small construction companies in Brazil. The benefit of the study was to assist Brazilian small-scale construction companies to direct their focus on actions of specific risk factors that can impact on schedule and comprise

their delivery. The study would have been more elaborate if the authors stated the statement of the problem, limitations and study assumptions.

Literature Review

The authors highlighted that the issues are higher in developing countries as a result of a number of unwanted factors, making it difficult to address some of the delays. They underscored the fact that most delays are as a result of the inconsistencies that occur during the preliminary phases of the project planning. The authors provided a clear explanation on the understanding of the key concepts and variables. There is the presentation of relevant empirical literature that helped in understanding the risk of delays in construction projects. There is the clear presentation of a secondary data from the sources that helped in the understanding of the classification of small construction companies in Brazil. The portion however did not mention relevant theory that can help understand the work further. The conceptual framework is also missing in the study.

Methodology

This research adopted a non-probabilistic sampling, characterized by 133 professionals with experience in small construction companies operating in the Brazilian market. The non-probabilistic sampling technique was adopted because the researchers were clear on the characteristics and information that define the elements of the population needs. The researcher however did not specify the type of non-probabilistic sampling that was adopted in the study. From the discussion, it looked like they adopted purposive sampling since they had knowledge on the specific people with the competencies they were looking for.

The study adopted a survey method through the use of a questionnaire which was presented to professionals who work in small Brazilian construction companies. The collected data was analyzed by a multivariate statistical approach which verifies the level of consistency and reliability to guarantee the application of the exploratory factorial analysis. The questions in the questionnaire were measured using the Likert scale. The study did not clearly show the research design adopted. This paper noted that descriptive research design was adopted even though it is not clearly mentioned. The design helps in stating the affairs of the problem. It did not as well provide the advantages and disadvantages of the mentioned sampling type.

Results

The study started by verifying the distribution and validity of the data. The authors tested the data and confirmed normal distribution resulting in the rejection of the null hypothesis that the data did not present a normal distribution. The study used Kaiser-Meyer-Olklin test, the Cronbach's alpha coefficient and the Bartlett sphericity test to check for content reliability and objectivity of the research instrument. Cronbach's alpha exceeded the minimum acceptable value of 0.70, characterizing a high internal consistency in the evaluation scale. At the end of the factorial analysis, six variables namely; Project errors, Reduced Term, Little experience in similar projects, High complexity of the project, Incomplete Project Information and successive changes in projects presented a high correlation value. The result of the factorial analysis presents six variables that are grouped in a single construct, corresponding to 73.46% of the total variance.

Conclusion

The results obtained through the use of the exploratory factorial analysis identified six risk factors that presented high correlation, basically the highlights of the professionals who participated in the study. The study identified technical project errors as the one with the highest potential for impacts of delays in small construction projects in Brazil. The authors suggested that there should be future studies that address the risk management in small-scale construction companies, leading to the identification and analysis of "elements of risk" that increase the appearance of critical factors in the construction sector.

2.1.6 Journal Article Six

Anjay Kumar Mishra & Kamalendra Mallik (2017) *Factors and Impact of Risk Management Practice on Success of Construction Projects of Housing Developers, Kathmandu, Nepal,* International Journal of Sciences: Basic and Applied Research, Published by Research Gate, Volume 36, No 7, pp206-232ISSN 2307-4531

Abstract

The authors examined the risk factors and the impact of risk management Practice on success of construction projects in Kathmandu Valley, Nepal. The authors emphasized that risk factors and the risk management practices are essential elements for the success of Construction Projects of Housing Developers, in Kathmandu. The study employed a questionnaire survey method for data collection carried out among the project employees. Questionnaire consisted of several statements meant to help to understand the practices prevailing in their projects regarding the various steps of risk management. The study revealed that the housing developers of Kathmandu valley being quite aware regarding Risk Management and are practicing it in their projects, a small percentage are practicing using formal techniques.

The abstract concluded by emphasizing that significant impact exists between risk management practice and success of projects for the housing projects in Kathmandu valley. The study findings/ results were also highlighted as expected.

Introduction

The authors emphasized that there is great increase in construction projects in the construction sector and that risk management has emerged, as the main function of project management. Projects are becoming larger and more complex, encountering changing economic and financial situation, face unpredictable political environmental changes, thereby constantly subjected to certain sensitive and volatile, external and internal environments. The researchers sought to introduce the impact of risk management on construction projects success from the perspective of employees of the housing developers of Kathmandu city. The authors provided the aims of the study as;

1. To analyze the status of risk management practices of shared-residence construction projects of Kathmandu.
2. To identify the significant factors of risk.
3. To analyze the impact of risk management practice on construction projects' success.

The study main objective is to assess the risk factors and impact of risk management practices on the success of construction projects. The authors felt it was important to undertake this research to be able to assist the people of Kathmandu achieve project success. The background of the study mentioned the statement of the problem and study objectives. The study would have been completed if the authors included limitations and study assumptions.

Literature review

In this section, the authors' highlighted risk in three different forms; being various events, factors of risks and risk management process. An event can be classified into uncertainty or risk depending on the probability of occurrence and the only way to deal with uncertainty is to convert it into risk. On the other hand risk can be categorized into Opportunity and Threat depending on their outcome. Favorable outcomes the opportunities whereas unfavorable one for Threat. Therefore different approaches are employed for these risks. Those dealing with Opportunities being exploitation, enhancement, sharing and acceptance and those dealing with Threat are avoidance, transfer, reduction and acceptance. Factors of risk are those risks that are tactfully deal by developer, consultant and contractor when particularly in the implementation phase. The risk management process has four steps toward risk resolving, Preliminary Activities, Risk Identification and Categorization, Risk Assessment and Analysis and Risk Response Planning. The authors supported these variables with other related empirical studies that had given similar findings.

Despite a number of studies on impact of risk management on construction projects success, the author found a gap in the studies which focused on factors and impact of risk management practice on success of construction projects. The study would have been more elaborate if the authors would have included study theory to guide the research. The variables of the study were mentioned by the researchers.

Research Methods

This study used a questionnaire survey design method where respondents rated each statement on Likert Scale. The study interviewed a population of 34 housing developers in Kathmandu.

A purposive sampling on the study population was done and a schedule questionnaire conducted on the various employees of the sample developers companies. Data collected were analyzed by use of MS Excel and SPSS software. The results were presented in graphical form for ease of achieving the objectives. Being a descriptive type of study simple frequency distributors was used as an analytical tool in form of charts and tables. In measuring validity and reliability of collected data, Cronbach's alpha was used.

Data Analysis/Findings

The findings revealed that an impact exists between the risk management practices followed by the housing developers on their success criteria of their projects. The respondents perceive that risk management is highly practiced either formally or informally in housing projects with the mean score of 3.83 on the Likert Scale.

Discussions

The study confirmed the following;-

i. Risk management i.e. risk identification, Risk Assessment and Risk Response was found to lay an impact on project success, achieving success in compliance of Technical Specification, Adherence to Schedule, Financial and Economic risk bared in a project.

ii. Findings also revealed that risk management play a significant role in defining the Scope of Project, overcoming Health, Safety and Environmental Risks, overcoming Leadership Risks.

iii. Risk management was not found to lay an impact on overcoming Contractual Risks, or to play any role in overcoming organizational risk.

Conclusions

The study revealed a high impact of risk management practice in the project success.

Recommendation

The study recommended strategic measures of training of the senior management on practicing risk management using formal techniques to be adopted. The organizations to ensure that contractors understand the risk responsibilities, risk event conditions, risk preference and risk management capabilities.

2.2.0 Convergence Analysis

The researchers in this section looked at issues that exhibited similarity in the six journal articles that were analyzed. This section contains conceptualization of the problem, methodology and findings.

2.2.1 Conceptualization of the problem

The problem of risk management in building construction projects were observed by Tipili & Yakubu (2016) in Nigeria, Mitikie, Lee, & Lee (2017) in Ethiopia, Freitas, Santos, Netto, & Oliveira. (2019) in Brazil and Mishra & Mallik (2017) , in Nepal who observed that risk factors are the main causes of delays and cost overruns in building construction projects. According to Tipili & Yakubu (2016), risk factors were not considered during the bidding process in Nigeria. Mitikie *et al* (2017) mentions that in Ethiopia, risk management is not being practiced in the building construction industry. In the building construction industry in Nepal there were projects which practiced risk management and others were not (Mishra & Malik, 2017).

According to the three highlighted journals, construction projects operate under uncertain external environments, therefore it is important to practice risk management to control uncertainties and ensure that high quality projects are being delivered. According to Urbanski, Ul Haque, & Oino. (2019), it is important to conduct studies about risk management in the building construction industry because of its benefits. The industry is able to provide employment, enhance skills, produce buildings which are being utilized as schools, hospitals, airports etc. Freitas *et al* (2019) on the other hand feels that it is important to conduct studies in this sector because of the negative impact which is caused by not practicing risk management. The negative impact is higher in the building construction industry compared to other sectors of the economy.

2.2.2 Methodology

The study observed similarities in methodology which was used by Urbanski *et al* (2019) in UK and Pakistan, Tipili & Yakubu (2016) in Nigeria, Al Mhirat, & Irtemeh (2017) in Jordan, Mitikie *et al* (2017) in Ethiopia, Freitas *et al* (2019) in Brazil and Mishra & Mallik (2017) in Nepal who conducted surveys using questionnaires. Urbanski *et al* (2019), Freitas *et al* (2019) and Mishra & Mallik (2017) used a non-probability, purposive sampling technique. The limitation of this technique is that the findings cannot be generalized in the building construction industry in the UK, Pakistan, Brazil and Nepal. On the other hand Tipili & Yakubu (2016), Al Mhirat, & Irtemeh (2017), and Mitikie *et al* (2017) used a probability sampling technique. Tipili & Yakubu (2016) used a simple random sampling technique, Al Mhirat, & Irtemeh (2017), used a census and Mitikie *et al* (2017) a disproportionate stratified random sampling technique. The advantage of using probability sampling technique is that the findings can be generalized in the building construction industry in Nigeria, Jordan and Ethiopia. Urbanski *et al* (2019), Al Mhirat, & Irtemeh (2017), and Mishra & Malik (2017) mentioned how their questionnaires were tested for reliability and validity.

2.2.3 Findings

All the reviewed empirical journal articles highlighted the fact that practicing risk management results in the project success. A study by Urbanski *et al* (2019) showed a significant relationship between Risk Management and Project Success. It also showed that there is a significant relationship between risk Management as a moderating variable, Project Planning and project Success. The findings are consistent with the results of the study conducted by Al Mhirat, & Irtemeh (2017) and Mishra &Malik (2017), which presents a significant relationship between risk management practices and project success. Despite the fact that a study by Mitikie *et al* (2017) does not clearly provide a clear relationship between the variables, it noted that most projects do not practice risk management which results in a failure by most of them. A study by Tipili & Yakubu (2016) and Freitas *et al* (2019) did not directly look at the relationship between the two main variables. However, both papers listed and ranked through Shen formula and exploratory factorial analysis, some of the top risks that affect projects in the construction industry. In a nutshell, all the authors agreed that risk management practices has a direct correlation with success of the project.

2.3.0 Divergence Analysis

This section presents the differences identified in all of six journal articles. The differences were in terms of problem conceptualization, methodology and the findings of the research.

2.3.1 Conceptualization of the problem

Risk management practices are important to the performance of projects. From the literature, projects that practice risk management are likely to report high performance rates compared to projects that do not practice risk management. Despite the fact that all the authors were of the same opinion that risk management is key in the performance of projects, Tipili & Yakubu (2016) and Freitas *et al* (2019) hold that before an analysis is undertaken on the relationship between project performance and risk management practices, construction companies should first identify some of the top risk factors in the construction projects. Al Mhirat, & Irtemeh (2017) and Mishra & Mallik (2017), Mitikie *et al* (2017) work is more inclined towards creating

an awareness of risk management amongst practitioners as opposed to analyzing the direct relationship between risk management practices and project performance.

2.3.2 Methodology

The study observed differences in methodology used by different authors. Urbanski *et al* (2019), Freitas *et al* (2019) and Mishra & Mallik (2017) used purposive sampling which is different from Tipili & Yakubu (2016) and Mitikie *et al* (2017) who used random sampling while Al Mhirat,& Irtemeh (2017) used census technique. The use of Likert scale was adopted in studies of Urbanski *et al* (2019), Tipili & Yakubu (2016), Mitikie *et al* (2017), Freitas *et al* (2019) and Mishra & Mallik (2017) which is different from Al Mhirat, & Irtemeh (2017). In data analysis, Mitikie *et al* (2017) used SPSS as a tool of data analysis while Mishra & Mallik (2017) who used Excel. In addition to the use of Excel, Mishra & Mallik (2017) also used SPSS for complementary purposes.

2.3.3 Findings

According to Tipili & Yakubu, (2016) in Nigeria -risk management should be conducted from the planning phase. The research recommended that there is a need for clients, builders, contractors and government bodies to work cooperatively from the feasibility stage onwards to address potential risk in time, and contractors and subcontractors with robust construction and management knowledge must be employed early to make sound preparation for delivery out efficient and quality construction program.

Project manager and the team could use the experience and lessons learnt from the past, use a simulation model to present possible risks in addition to brainstorming in order to recognize the potential risk factors. The researcher felt that a WBS –work breakdown structure was essential in identifying the risk factors during work to mitigate the effects. He felt a simple random sampling was the most appropriate means of reaching the respondents. His ideal method of ranking was to apply the shen (2002) formula of ranking RS= f (α,beta) where the frequency multiply by impact would be ideal in quantifying the risk. According to Urbanski *et al* (2019), risk management is moderating issue that come between project management and success as opposed to Tipili & Yakubu (2016) study in Nigeria who felt that government intervention through lowering of tariffs in construction would be greater help in mitigating the risk compared to workshops in Santo in his study in Brazil in 2019 on critical risk factors affecting construction project through a survey research method, employed an exploratory factor analysis to identifying and ranking risk factors based on the level of occurrences as opposed to the shen 2002 ranking formula ranking employed in by Tipili & Yakubu (2016) in Nigeria, his conclusion was that risk occur due inconsistencies and failure to follow the preliminary design thus making technical risk factors the highest in ranking as opposed to Tipili & Yakubu (2016) in Nigeria who had finance factors rank first.

In a study in Nepal Mishra & Mallik (2017, Concluded that risk management mainly involves risk control since risks are unavoidable, he brings in the element of uncertainty and argues that risk comes from uncertainty in project undertaking. Contrary to all other authors he argues that risk can be both positive and negative in construction the issue lies in how it is handled, favorable outcomes can be opportunities to reinvent better approaches while the unfavorable are the threats and should be dealt with. He alleges that risk management was only practiced informally and that formal control was necessary, external factors had effect on risk management.

In a study project in Ethiopia on construction projects in 2017, Mitikie *et al* (2017) notes that no risk management was practiced and the effects were more severe in developing countries than developed countries. Risk management was practiced in Ethiopia, though many people were not aware of it. The construction sector operations are not integrated but rather fragmented with unrelated and often conflicting components. In understanding risk management,Mitikie *et al* (2017) sampled twenty-two projects and investigated the same by using frequency analysis and relative importance index R=I*P (where I stood for impact of magnitude against the likelihood of occurrence P). The approach is similar to the Shen formula of ranking employed by Tipili & Yakubu (2016) in Nigeria. Lack of training, communication is a high risk level in a project. The quality of the project affected by labour poor productivity is very high. The others like equipment/ material failure, managerial inadequacy, and lack of training, lack of communication and departures of qualified staff are high risk levels in terms of quality management.

2.4 Summary of the Gaps

This study has identified risk management gaps in complex building construction projects. These are projects with a main contractor and sub-contractor. The main reason for the main contractor to engage subcontractors is to transfer risks. The biggest risk faced by the sub-contractors is delay of payments by the main contractor. This leads to delays in the schedule of the whole project. The sub-contractors would charge penalties to the main contractor which would increase the whole budget of the project. This study found a gap on studies that focus on risk management practices in complex projects that have the main contractor and subcontractors. These studies would reveal the kind of risks that are being faced with the main contractors and the sub-contractors. These revelations would assist the industry in reducing schedule delays and budget overruns.

3.0 Conclusions

Projects are implemented under uncertainties. The probability of the project failing if the risks are not considered is therefore high. During project initiation, implementation and control, the project management team should closely engage with the stakeholders to monitor and track all possible risks that might impact on the project. The seminar paper looked at the relationship between risk management practices and project performance. The paper summarized empirical journal articles from different regions.

The reviewed journal articles showed that Risk Management Practices in any project management are important as they lead to good project performance. It is therefore concluded that Risk Management is vital in the performance of projects. The authors of this seminar paper concluded that risk management practices are a key factor in determining performance of a project. It is therefore critical for project managers to employ the use of risk management practices in project planning and management to ensure projects adhere to the triple constraints of cost, time and quality.

4.0 Recommendations

Based on the six reviewed journals in this seminar paper, the following recommendations were made to the policy makers and researchers;-

The study recommended that policy makers should make it mandatory for projects to practice risk management. Based on the journals, there are some projects that practice risk management

while others do not. It is important that practicing risk management is made mandatory to enhance project performance.

The study also recommended that policy makers should make it mandatory for all the projects to be insured against potential risks. Insurance should cover some of the risks identified during the project planning and any other identified during the implementation.

The study recommended training of project staff on risk management practices. This will help in sharpening skills and knowledge that would assist in risk assessment and coming up with strategies to avert them.

The paper recommended that future researchers should adopt the use of Shen (2002) formula in identifying risks in the construction industry.

Risk Management should be undertaken in all projects and the government should develop policies that would ensure that Risk Management is incorporated in all projects. However, more research should be conducted to establish the level of awareness and types of Risk Management that can be effective in project management.

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