OPTIMISED SELECTION AND USE OF PROJECT PROCUREMENT STRATEGY IN NIGERIA: A PRACTICAL CASE STUDY

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Abstract

Decision based selection process is one of the methods developed to assist procuring clients globally in overcoming the difficulty associated with procurement strategy selection due to competing advantages. While it is increasingly being used in other parts of the world for optimal result, it is not very popular in Nigeria. There is an increasing recourse to the use of one or two procurement strategy based on familiarity for all project circumstances and the outcome is poor performance witnessed in most public and private sector projects. This paper demonstrate the use of decision matrix in appraising a private sector client's procurement need with a view to select most appropriate procurement strategies to deliver its development needs. It is a report of an action research involving a focus group discussion of key stakeholders in the project selected using convenience sampling. The study was conducted in Akwa Ibom State, south-south Nigeria. Like every other procurement selection exercise, the process adopt in-depth construction industry tested parameters for appraising and advising on the most suitable procurement strategy based on eight project success criteria. The project organisation accepted both the innovation to adopt the process for change and the product of change. The study provides a structured decision based model for improving procurement selection process and eliminating the problems associated with poor project performance in the construction industry in the country.

Key words: *Decision matrix, Nigeria, procurement strategy, partnering, selection, success criteria*

Introduction

Poor performance of construction projects in Nigeria has been attributed to the wrong procurement selection decisions and continuous use of the traditional framework notably in the public sector (Oyedele, 2012). Each project is unique with its own characteristics and requirements; for a project to be successful therefore, the procurement strategy must be carefully selected to satisfy the technical needs or objectives of the project (Alhazmi and MaCaffer, 2000). Numerous studies have demonstrated the impact of procurement and procurement related factors on project outcomes (Ogunsanmi, 2013 and Eriksson and Westerberg, 2012). While the various industry reports (Latham and Egan) advocates a move away from adversarial practice, there are also concern that existing delivery option have not been appropriately utilized (Alhazmi and McCaffer, 2000). The choice of an appropriate successful project. Due to the proliferation of procurement approaches, project clients now have the responsibility to select appropriate strategy for their projects (Okunola, 2012). Many factors impede the selection and use of an appropriate procurement strategy in Nigeria and globally. Adherence to the use of public procurement law contributes immensely to the selection difficulties (Olayiwola and Oyegoke, 2010). Risk of failure in implementing new approach and the lack of experience also restrained the selection processes in developing countries (Shiyamini, 2006).

Also, while the use of scientific approach or decision based selection is widely applied outside Nigeria, it is not very popular in the local construction industry context. Different approaches have been developed and applied to the selection of procurement strategy. The priority rating of National Economic Development Office- NEDO (1985) is fundamental and the most simplified approach. In this approach, clients' success criteria are

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weighted against different procurement options on the merits of their capability to satisfy these criteria. A critique of the approach, Masterman (2002), alleged lack of sophistication but however agree, it eliminates inappropriate options from the lists of choices. This critique view is rather weak in the context of developing countries where this method is not known and not widely used. Luu *et al.,* (2003) attempted an expanded review of NEDO's criteria and were disapproved of by clients (Love *et al.,* 2008).

Knowledge-based selection approach has also been proposed. This method adopts computer expert system to recommend most appropriate option for adoption. Critique of the approach, Love *et al.* (1998) have found the method inadequate in satisfying time and quality criteria and does not address the peculiar needs of different projects. Further modification to the expert based system was attempted by Moshini and Botros (1990) in Okunola (2012). Their refinement was able to satisfy project specific internal and external needs. Despite this improvement, its potential for a wide spread uptake in the local construction industry is minimal. This is because, it is computer based and involves the use of application software. Despite the increasing level of awareness and the benefits of the use of ICT, construction professionals in Nigeria have exhibited reluctance to apply information technology in their practices (Ibironke *et al.,* 2011). More so, cost has been identified as a critical disincentive to the use of ICT in the Nigerian construction industry (Oyediran & Odusami, 2005).

Further improvement on the traditional NEDO model was carried out by Cheung *et al.* (2001) using the analytical hierarchy process (AHP). This approach developed a 'pairwise' comparison matrix using importance scale. It states in clear terms that the choice of an option is better than another based on the expected utility values. This method although, useful further extend the boundaries of complexity due computation time. Closely related to this approach is the multi-attribute utility approach developed from the games theory (Chang *et al.,* 2002).

In the local construction industry, Okunola and Olugbenga (2010); Okunola (2012) and Okunola and Ikpo (2013) develop decision support systems for procurement strategy selection. These models also lean towards the approaches discussed earlier and are all computers based. Based on the extant barriers to the wide spread needs for computer demonstrated in the foregoing approaches; the present study which seeks to enhance significant application of decision support systems, emphasis the need to promote the fundamental utility ranking approach. This is anchored on the ease of use, simplicity, little or no dependent on the use of computer and zero cost of purchase and flexibility. This method is suitable for all procurement approaches and has been used with non-traditional approaches (Ekung, 2012). These premises have been identified as barriers to the use scientific approach in the selection of an appropriate procurement strategy. Previous studies in Nigeria have also stopped short at demonstrating the use of these models in practical project scenario. The study aims to demonstrate the use of decision matrix in the selection and use of procurement strategy using practical case study.

Decision Matrix

Procurement decisions generally are not easy as often being perceived and practice notably in the Nigerian public sector (Ojo and Gbadebo, 2012). Stakeholders in the Nigerian Construction industry had thought may be with the enactment of Public Procurement Act (PPA) 2007, super performing construction projects will be obtained naturally. But these expectations are not met because the act is plagued with numerous institutional inefficiencies notably typecasting single procurement strategy for every project circumstances.

The use of selection model is potentially beneficial as it points a direct route through the procurement debacle. It also analyse the procurement problem to be solve by the procurement strategy. From empirical evidence Ratnabapathy and Rameezdeen (2007) and Love *et al.* (2010a), the use of selection models and matrices has continued to flourish and the impacts in project delivery have been

impressive. It may be argued that the selection of an appropriate procurement strategy does not guarantees successful delivery of projects (Okunola and Olugbenga, 2010). It has however, facilitated the improvement of selection practice weaknesses identified above in different parts of the world.

Decision matrix removes the clogs super impose by competitive advantages; one strategy has over the other. By so doing, a clear bench marked advantage is defined for the selected strategy. Furtherance to benchmarking, it provides statistical basis for the decision making process. Decision matrix also allows procurement managers to analyse, and then solve their problems by: identifying and prioritising their needs with a list of identified criteria; evaluating, rating and comparing the different solutions, and selecting the best matching solution (http://web2.concordia.ca/Quality/tools/10decision.pdf, 2013).

Research Methodology

This study is an action research involving focus group discussions. Using convenience sampling, a focus group of 12 participants was instituted. The participants comprised of stakeholders selected from architectural, engineering, quantity surveying contractors and project management organisations appointed for the case study. The aim of the focus group was to validate both the project criteria that defined the procurement strategy selection and the suitability of the selected strategy. Kumar (2011) affirmed the suitability of focus group for validating results and to collect preliminary data that can be further tested in a study. Again, since construction is a group process that requires team input to succeed; team response in various ways has significant value and reliability than individual view notably at the planning stage (Love *et al.,* 2010a). Persistent use of individual perception in measuring project and organisation performance largely adopted in most construction industry research is heavily criticised (e.g. Patton, 2002). Based on these considerations, the use of focus group was found appropriate.

After the appraisal of potential procurement method, each method were given weightings 1 - 25; 0-5: No impact, 5-10: essential, 10-15: important, 15-20: critical and 20-25: prioritised. The procurement methods were also appraised and performance match against criteria using ranks on scale 1 -5; 1= okay; 2=suitable; 3=very suitable; 4=highly suitable and 5=best. The ranking enables a subjective assessment to be made against pre-defined procurement appraisal criteria. Each criterion for the client objective is weighted depending upon their relative importance, and the most is awarded the highest weighting (Love *et al.,* 2010a). The choice of appropriate method is clearly define by the weighting of the procurement strategy with the highest utility score.

The Case Study

The practical example presented in this paper involves private sector highbrow estate development. The project involves the construction of 1,000 units of housing within 5years in 3 phases. The first phase consists of the construction of 300 units of detached and semi-detached four and three bedrooms maisonettes. Phase 2 and 3 is similar to 1 with 300 units each of 2 and 3 bedrooms detached and semidetached bungalows. Phase one is about 90% completed awaiting road and external electrical infrastructure and the installation of renewable energy equipment.

Identification of Project Success Criteria

After the brainstorming and extensive interaction eschewing from the analysis of the project brief, the following were the agreed success criteria:

Time Certainty: the criticality of time is necessitated by two factors: payment tied to early completion and the fact it is a commercial development. Moreover, the idea of phasing the project means time is critical and each milestone must be met.

Cost Certainty: the job was won in contest hence budget plays an important role in the tender selection process and it is therefore not expected to vary significantly with final price.

Quality: quality is a critical issue attracting immense attention both in research and practise in the construction industry. Opinion varies as per what it means and how to define criteria for its measurement. It has been variously considered. Abdul-Raman *et al.* (2011) sees quality in terms of ‘’*product that meets client*

requirement'' in line with specification. Ikediashi *et al., (*2012) opines it is an *''amalgamation of client satisfaction, architecture excellence, standard of finishes, standard of materials used for construction process and utility value''*. The subjective view is appropriate in this context and it is seen as integrating three things: advanced technology, prestigious architecture design, sustainable durable material and workmanship. The end users of the facilities reinforced the need to be guided by through life consideration in the selection and use of quality material and components. This criterion is highly critical to the client needs in the project.

Flexibility: flexibility is sine qua non to innovative project development and good construction (Ofori *et al.,* 2008). It is the ability of an organisation to satisfy expanding array of ''client'' objectives with limited impact on cost, schedule imbalance or functional failure (Zhang *et al.,* in Ofori, *et al.,* 2008). Flexibility here means designs adaptability to alternated uses in the future. This criterion is prioritised based on the emphasis on sustainability.

Risks and Responsibility: the term risk is associated with the totality of the chances of an events happening and their effects on project objectives (Eaton, 2013). Possible envisaged risks include: price fluctuation and other economic risks; programme delay and variation of requirements due to imposing emerging market expectation and poor management competency; availability of construction resources (mainly imported materials); imposing emphasis on innovative design; incompetent project team; with the emphasis place on sustainability and whole life cycle consideration; and multiple stakeholders. However, all risks are to be shared in the project.

Sustainability: sustainable construction deals with the social, economic, and environmental implications of creating usable facilities (Barrett, 2012). Social sustainability focused on people using the building and emphasises flexibility in design that will facilitate future change in use. Environmental sustainability seeks to safeguard the natural environment from activity associated with the construction of and use of constructed facility. Economic sustainability targets cost saving for the client in the long and short term basis. Sustainable construction therefore is one of the key success parameter to achieve the attractiveness desired; it is highly prioritised in the project.

Collaboration: significant benefits can be maximised from collaborative working relationship with teams in the supply chain such as improved cost savings and better time performance, sharing in risks and reward and elimination of disputes. Moreover, because of the restriction imposed by the upfront budget, setting up a high performance target post a serious risk to delivering the project within budget. To safeguard against this risk, the client is dispose to set up incentives within the contract to share reward in cost savings; run a design contest to win the design and contract with a single team responsibility to agree ways of minimising or eliminating cost increases. Non- collaborating or split responsibility is known to reinforce the risk of not achieving set targets in sustainable construction (Clement, 2012).

Whole Life Cycle Cost: the proposed scheme is centred on sustainable construction, whole life costing is critical to obtaining best solution in design optimization, component specification and future maintenance minimization.

Appraisal of Potential Procurement Systems

Traditional Approach:-This approach set-up a two stage tendering in which major reports have considered unhealthy for the quest for integrated design and construction. The two stage practice does not only increase project time but also affect the project in terms of buildability. The over ridding irritation with respect to current practice is that the professionals are told what to do hence, they are not allow to think or solve problems proactively. The stereotyping instinct therefore means less value as value management is not encouraged. The approach is known to have high level of price certainty attributed to known scope before construction (Ashworth and Hog, 2007). Risks are one sided with the contractor bearing most risks. The system is susceptible to buildability problems because the contractor is not engage in the preliminary stage (Masterman, 2002). The approach sequenced design and construction and it is therefore

grossly not time efficient. The contractor and suppliers join the supply chain very late in the project life cycle hence; the approach does not enhance collaborative working. Whole life or through life consideration can now be achieved using this approach as it was never relevant when the traditional contracting was more prevalent.

Design and Build:-The system assigns the total work package to an organisation and incidentally leads to a single point responsibility for the entire project completion. The inherent advantages of the design-build system are certainty of price and time and full transfer of risks to the contractor. On comparative performance, most writers argue the system is limited by project size (Ashworth and Hogg, 2007). Quality in design and construction of design build projects remain a subject of controversy in research and practice. Balson *et al.,* (2012) alleged poor quality in design build projects, low quality of materials (Abi-Karan, 2005) and poor design quality (Anumba and Evbuonwan, 1997). To address the quality problems and difficulties encountered in the use of design build, the concept of novation and develop and construct were developed.

Partnering**:** Partnering facilitates collaborative relationships either for a one-off project (1st generation partnering or project partnering) or in a long term commitment (2nd generation partnering or strategic partnering). Clients and supply chain organisations that seek to eliminate risks and disputes; improved project performance and long term cooperation often adopt partnering (Cartlidge, 2011). Although, there are implementation challenges of recourse to cost based criteria in practice rather than value for money (Wood, 2005); partnering remain most suitable for the realisation of integrated project objectives. Many researchers have explored the success factors in effective partnering (Awodele and Ogunsemi, 2010); but the findings of Bennett and Hayes (1998) that ‘’partnering strives on the fundamentals of cooperation and teamwork, openness and honesty, trust, equity and equality’’ remain the leading premise. Partnering stand unequivocally unchallenged in terms of cost and time certainty, better risk allocation, flexibility, quality design and construction.

Results and Discussions

The focus group discussions identified eight criteria relevant to the needs of the client. These criteria were weighted using the scale indicated Table 1. The criteria evolve from the refinements of the traditional NEDO criteria to address sustainable needs of the present project. Based on the client’s need appraisal, assessment of potential procurement methods and the outcome of the decision matrix (Table 2), strategic partnering is recommended for the execution of the project. The partnering option offers all inclusive advantage to deliver all the project criteria and evidence abound from practice and literature on the success pedigree of the strategy to deliver envisaged outcomes (Ogunsemi & Awodele, 2010 and Wood, 2005). Cost, time and quality criteria are fundamentally recognize as the iron triangle (Jha and Devaya, 2008). Collaboration in project delivery has also emerged very strongly as prioritised objective of clients in most project delivery across the globe (Ross, 2009). The approach is also widely adopted in search of solution to the imminent problems plaguing the traditional delivery methods (Rahman & Kamaraswamy, 2005). It is also the best establish approach for extenuating contractual conflicts that plagues extant practice (Ross, 2009). Joint risk management is also possible with this approach (Osipova and Erikkson, 2011). Since the project is to be developed in phases over a five year period, it is optimal for the client to build a relationship with a single supply chain so as to maximised the benefits of partnering such as minimised risk of slippages in cost and time, improved quality facilities, opportunities for time and cost reduction, effective problem solving, reduced fees charges, enhanced opportunity for originality (value management), and greater opportunity for financial success in the present and future engagement(Bennett & Hayes, 1998). Strategic Partnering involves the integrated supply team and the client organization working together on a series of construction projects to promote continuous improvement. With this kind of arrangement a contract or framework

agreement is awarded to an integrated supply team for a specified period of time; the team prices individual projects within the contractual agreement (Wood, 2005).

Table 1: The Weighting/Importance Procurement Needs Criteria

Procurement Assessment Criteria	Weighting(W)
Time Certainty:	
The severity of completion dateline	25
Cost Certainty	
Is project completion on time important?	25
Quality	
Is prestige, technological advancement and high functional performance?	25
Collaboration	
Is there a need to build relationship based on trust and co-operative working important?	25
Flexibility	
Are variation anticipated after works has commenced on site	20
Whole Life Cycle Cost	
Is the thorough life of the project important?	20
Sustainability	
Is social, economic and environmental sustainability important?	25
Risk	
Is the transfer of the risk of the cost and time slippages from the client important? Or to be shared	15

Similarly, sustainability is one of the leading requirements of clients in contemporary projects (Clement, 2012 and Cartlidge, 2011). Flexibility is desirous in most projects to allow for the incorporation of emerging ideas that could improve the business objective of most projects (Othman *et al.,* 2005). The weighted rank approaches as a decision support system have been widely used in the construction project procurement strategy selection (Luu *et al*., 2003 and Love *et al.,* 2010). In all project circumstances, there is wide spread acknowledgement of success in delivering project objectives. It is therefore seen as a panacea for the local construction based on continuous use of traditional form.

Conclusion

This study demonstrates optimised selection and use of procurement strategy from decision matrix in Nigeria through a practical case study. Using an action research involving focus group discussions, structured decision matrix procurement selection process was tested on the development needs of a commercial private client with a view to providing strategy that will realise its business needs. Participants in the focus group brainstormed and agreed on success criteria relevance to the client's needs. Weighting of each criteria procurement method strategies were jointly agreed and utility value computed. Strategic partnering was selected and used.. The study provides a structured decision based model for improving procurement selection process thereby eliminating widely reported problems associated with poor project performance in the construction industry in Nigeria. The research is conclusive in its objective since all the criteria earlier identified were judiciously incorporated in selection process; stakeholders also validate and approved the outcome. Although not entirely new, there is need however test the model on a public sector projects as largest client in the Nigerian construction industry.

Table 2 Procurement Decision Matrix for the Proposed Estate Development

Client Criteria/Questions	Criteria Weightings	Procurement System													
	0-5; Not Important	Fragmented		Integrated						Management System				Collaborative	
	5-10; Essential	Design Bid Build		Pure Design & Build		Develop & Construct		Novated D & B		Management Contract		Construction Mgt		Partnering	
	10- 15; Important	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score
	15-20; Prioritised														
	20-25: Critical														
Time Certainty:															
The Severity of Completion dateline	25	1	25	5	125	5	125	5	125	5	125	5	125	5	125
Cost Certainty:															
Is project completion on time important?	25	3	75		125	5	125	5	125	2	50	2	50	5	125
Quality:															
Is presstige, technological advancement and high functional performance	25	2	50	5	100	2	50	4	100	2	50	4	100	5	125
Collaboration															
Is there a need to build relationship based on truth and co-opertaive working important	25	3	75	1	25	1	25	1	25	5	125	5	125	5	125
Flexibility:															
Are variation anticipated after works has commenced on site	20	4	80	1	20	3	60	3	60	5	100	4	80	5	100
Whole Life Cycle Cost															
Is the thorough life of the project important? in terms of materials and workmanship and functional performance	20	4	80	2	40	5	100	4	80	5	100	5	100	5	100
Sustainability															
Is social, economic and environmental sustainability important?	25	5	125	1	25	5	125	1	25	4	100	4	100	5	125
Risk															
Is transfer of the risk on cost and time slippages from the client important?	15	1	15	5	75	5	75	5	75	5	75	5	75	5	75
Total			525				685		615		725		755		900
Rank															
	Scales upon which Procurement Systems are Ranked: 1= Satisafactory; 2= Suitable, 3= Vey Suitable, 4 = Highly Suitable; 5 = Best														

References

Abdul-Rahman, H., Wang, C. andJackson, C., (2011), CTM[4] Model Using Ishikawri Diagram for Quality Management in Design- Build Projects, *Scientific Research and Essays*, 6(25): 5442-5456, available online at http/www.academicjournals.org/SRE, accessed 2/11/13.

Abi-Karam, T. (2005), Design/Build Selection Process-Art or Science? *Cost Engineering,* 47(5), 4-9

Accessed 22/1/2013 from<http://eprints.utm.my/790/1/procurement performance Rosli.pdf.

Alhazmi, T. and McCaffer, R. (2000), Project Management System Selection Model, *ASCE Journal of Construction Engineering and Management,* 126(3), 176 – 184

Ashworth, A. and Hogg, K. (2007), *Willis's Practice and Procedure for Quantity Surveyors*, 12th Edition, London: Blackwell Publishing

Awodele, O. A. and Ogunsemi, D. R.(2010), An assessment of Success Factors and Benefits of Project Partnering in the Nigerian Construction Industry, In Barrett, H.P., Amaratunga, D. Haigh, R., Keraminiyage, K. and Chaminda, P. (Eds.). Proceeding W092-Procurement Special Track, 18th CIB World Building Congress, May, Salford.

Balson, D., Gray, J. and Xia, B. (2012), Why the Construction Quality of Design-build Projects is not Satisfactory: a Queensland study. In Engineering, Project and Production Management 2012 Conference, The University of Brighton, Brighton. (In Press)

Barrett, P. (2012), The Value of the built Environment to the Society, Guest Lecture Series, School of Built Environment, University of Salford, Greater Manchester: 5/12/2012

Bennett, J. and Hayes, S. (1998), The Seven Pillars of Partnering. London: ThomasTelford.

Cartlidge, D. (2011). *New Aspect of Quantity Surveying Practice,* 3rd Edition, London: Routledge Spon Press

Chang, C. and Ive, G. (2002), Rethinking the Multi-attribute Utility Approach Based Procurement Route Selection Technique, *Construction Management Economics*, 20, 275-284.

Cheung, S., T. Lam, M., Leung and Y. Wan, (2001), An Analytical Hierarchy Process based Procurement, *Construction Management & Economics*, 19, 427-437.

Clement, S. (2012), Procuring Innovative Sustainable Construction: A Guide for European Public Activities, Freiburg: Sci-Network Decision Matrix/Selection Matrix, available online @ http://web2.concordia.ca/Quality/tools/10decision.pdf, accessed 23/3/13

Eaton, D. (2013), Risk and Financial Management in Construction, Post Graduate Research Module School of Built Environment, University of Salford, Greater Manchester

Ibironke, O. I., Ekundayo, D. and Awodele, O. A. (2011), A survey on the Use and Impact of Information Technology in Quantity Surveying Service Delivery in Nigeria *In:* Egbu, C. and Lou, E.C.W. (Eds.) *Procs 27th Annual ARCOM Conference,* 5-7 September 2011, Bristol, UK, Association of Researchers in Construction Management, 433-442.

Ikediashi, D., Mendie, A., Achuenu, A. and Oladokun, M. (2012), Key Performance Indicators of Design and Build projects in Nigeria, *Journal of Humanities and Ecology,* 37(1): 37-6

Jha, K.N. and Devaya, M.N. (2008), The Hierarchy and Relationship of Project Performance Criteria in Indian Construction Projects, Proceeding of the 24th Annual Conference of *ARCOM*,

Love, P. Smith, J. and Regan, M. (2010), Comparative Procurement Methodology Analysis in Australia: A New Approach, *In* Barrett, H.P., Amaratunga, D. Haigh, R., Keraminiyage, K., Chaminda, P. (eds.). Proceeding W092- Procurement Special Track, 18th CIB World Building Congress, May 2010, Salford, UK

Luu, D.T., Ng, S.T., and Chan, S.E. (2003), A Case-based Procurement Advisory System for Construction, *Advances in Software Engineering*, 34, 429 – 438

Masterman, J. (2002), *Introduction to Building Procurement* (2nd Edition), Oxford: Taylor and Francis

NEDO (1985), Thinking about Building, National Economic Development Office, HMSO, London

Ofori, G. Ling, F. and Lim, B. (2008), Flexibility Management in the Changing Competitive Environment, Proceeding of the 21st Annual Conference of *ARCOM*, SOAS, London, September 3-4

Ogunsanmi, O.E. (2013), Effects of Procurement Related Factors on construction Project Performance in Nigeria, *Ethiopian Journal of Environmental Studies and Management*, 6(2), 215 – 222

Ojo, A. E. and Gbadebo, A. M. (2012), Critical Selection Criteria for Appropriate Procurement Strategy for Project Delivery in Nigeria, *Journal of Emerging Trends in Economics and Management Science,* 3(5), 442 -428

Okunlola, O.S. and Ikpo, I.J. (2013), Determining the Performance of Procurement Methods against Selection Criteria Using Outranking – Satisfying Methodology, *Journal of Engineering, Project, and Production Management*, 3(2): 74 -84.

Okunlola, S.O. (2012), PROMA- A Decision Support System to Determine Appropriate Procurement Method, *Research Journal of Applied Sciences, Engineering and Technology*, 4(4), 316-321

Okunola, O. S. and Olugbenga, A.O. (2010), Developing a Decision Support System for the Selection of Appropriate Procurement Method for a Building project in Nigeria, *Global Journal of Researches in Engineering,* 10(2), 18 -30

Olayiwola, M.K.A., and Oyegoke, S.A. (2010), The Effect of Budget Appropriation on Project Delivery in Nigeria and its Subsequent Effects on the Supply Chain, In Barrett, H.P., Amaratunga, D. Haigh, R., Keraminiyage, K., Chaminda, P. (eds) Proceeding W092-Procurement Special Track, 18th CIB World Building Congress, May, Salford,

Osipova, E. and Eriksson, E. (2011), How Construction Options Influence Risk Management in Construction Projects, *Construction Management & Economics* 29(11), 1149-58

Othman, A.A.E., Hassan, T.M. and Pasquire, C.L. (2005b), Analysis of Factors that drives brief development in Construction, Construction, *Engineering, Construction & Architectural Management*, 11(4), 69 – 87

Performance, available online @ http://www.pure.itas/portal/files/3477530/, accessed 4/7/13

Rahman, M. and Kumaraswamy, M. (2005), Assembling Integrated Project Teams for Joint Risk Management, *Construction Management and Economics*, 23:4, 365-375, DOI: 10.1080/01446190500040083

Ratnasabapathy, S. and Rammeezderen, R. (2007), A Decision Support System for the Selection of Best Procurement System in Construction, *Built Environment*- Sri-Lanka, 7(2), 42-53

Ross, D. (2009), The Use of Partnering as a Conflict Prevention Method in Large-Scale Urban projects in Canada, *International Journal of Managing Projects in Business*, 2(3), 401-408.

Shiyamini, R. (2006), Study of Factors Affecting the Selection of Procurement Systems in Construction Industry: A Multi-Criteria Decision Support Model, Thesis submitted to the University of Moratuwa

Wood, G. (2005), Partnering Practice in the Relationship between Clients and Main Contractors, RICS, Research Paper series, 5(2).

Kumar, R. (2011), Research Methodology, a Step-by-Step Guide for Beginners, London: SAGE.