

PROJECT MANAGEMENT SERVICE DELIVERY USING COMPETENCY ANALYSIS

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There are ongoing discussions on the competencies of construction professionals for project management service delivery in Nigeria. The current study therefore undertakes a competency analysis using related attributes of knowledge, skills and abilities as criteria for determining which of the construction professions has the greatest potential to offer project management services.

A questionnaire was structured to capture the opinions of project owners and constructors for the study. This provided data that were analysed using the mean item score (MIS) method.

The results reveal quantity surveyors as having the highest potential for project management service delivery while civil engineers, builders, estate surveyors and architects follow in this order respectively.

The study recommends the improvement of project management service delivery through the acquisition of the professional qualities of quantity surveyors; and other knowledge areas such as legal and contractual issues, risk analysis, quality control, safety and environmental issues. It suggests further collaboration between construction industry professional bodies and the Association of Project Managers to facilitate cross exchange of knowledge in project management practice in Nigeria.

Keywords: Project management, service delivery, competency analysis, construction professionals

INTRODUCTION

There has been an unprecedented growth and development in construction industry practice driven mainly by the need to adopt best practices for improved productivity and service delivery witnessed in the manufacturing industry. Current management practices need to be more customer-oriented focusing on providing the utmost value for monies committed into today's complex structures. The supply-chain needs to shift into an era that involves more integration and collaboration among project partners.

Project management services offer an innovative approach for the achievement of project objectives along these lines. Professional Project Managers are now more than ever, responsible for the overall success of delivering the owner's physical development within the constraints of cost, schedule, quality, time and safety requirements (Oberlender, 1993). It is more appropriate for project owners/promoters to appoint independent project managers to manage the design and construction of projects on their behalf in Nigeria (Odusami & Iyagba, 2001). There are a range of construction professionals that offer project management services that project owners can choose from. They include architects, builders, civil engineers, estate surveyors, quantity surveyors etc. But the question is who is the most capable of these construction professionals? This issue is topical in developing countries like Nigeria.

This study therefore undertakes the analyses of the competencies of construction professionals so that the profession with the greatest potential for project management service delivery is determined.

BRIEF LITERATURE REVIEW

The construction industry is a collection of loosely integrated sub-sections that collectively construct, alter and repair buildings, civil and industrial or process engineering works (Andawei & Nyenke, 2001). The industry is unique by the variety of physical products it produces, its demand pattern, novelty, and the variability of its production environment.

Unarguably, the construction industry in Nigeria, and in other countries, plays a vital role in its economic development. Its sector output is comparatively high in the total gross national product; whilst it employs a large proportion of the country's labour market (Mosaku, 1982). Its clientele and indeed the national economy will therefore gain from any healthy improvement scheme on offer.

Proper selection of the right caliber of construction professional to deliver project management services may contribute to project success especially as demand for project management services has outstripped supply (Birkhead, 2000).

Project Management - the goal post for project success

Kupakuwana and Vanderberg (2005) suggest that good project management techniques and principles may lead to effective service delivery and product success. Successful projects are those where performance meet desired project objectives of timely completion, within established budgets, and of high quality. Kupakuwana and Vanderberg reinforce these success criteria as a triangle of project objectives.

Construction Project Managers

Construction project managers are the project owners' expert representatives on construction projects. They coordinate the entire development process to ensure timely completion within budget and performance requirements (Moneke, 2001). Such responsibility demands a high level of technical training, experience and construction-related professional qualifications. Commercial prudence will suggest the appointment of a firm or persons for this service based on their abilities to deliver the triad of project objectives identified earlier (Bamisile, 2004;

Struckenbruck, 1981). Their capabilities are dependent on their innate qualities and on the knowledge gained during training.

Competency model for construction Project Managers

Birkhead (2000) outlines the generic knowledge areas of competent project managers in line with those developed by the project management institute and other educational accreditation bodies. These knowledge areas include integration, scope, time, cost, quality, human resources, communication, risk, procurement, safety, environmental, financial and claim management. These knowledge areas are laid out in chart form (Birkhead, 2000:2).

Similarly, Edum-Fotwe and McCaffer (2000; 113) pictorially present good competency models to include technical, administrative, contractual, team building, communication and legal skills. Thus if a project manager is well grounded and is able to deliver in these knowledge areas, success on a construction project is almost assured.

At this point, it is important to review the potentials of other construction industry professions for project management service delivery. These are described briefly from the perspective of several authors.

Architect's potentials for project management services

Oduami and Iyagba (2001) opine that architect's by virtue of their traditional roles as coordinating consultants and project administrators would have a greater potential to deliver project management services. Architects being the first point of contact by clients already enjoy clients' recognition as the master builder of necessity. Their traditional role gives them an edge in communication skills, contract management and project documentation.

Estate Surveyor's potential for project management service

Estate Surveyors have the capability for project management service delivery because of their resource management and estate administration backgrounds (Oduami and Iyagba, 2001). Surveyors would make good fund managers that can provide clients with the highest value for monies invested in their capital projects. Their training on feasibility and viability assessments, financial risk evaluations and cost management, economics in property, and time management are relevant in project management delivery.

Quantity Surveyor's potentials for project management service

Zack Jr. (2004) opines that construction professionals with quantity surveying educational backgrounds have the highest capabilities to provide project management service. This conclusion is based on professional quantity surveyor's competencies in cost engineering and project control, which is the bedrock of project management. Quantity surveyors are skilful in cash flow analysis and management, profitability analysis, property business planning, and scheduling. Oduami and Iyagba also suggest that the requirements for strict control in project budgets and control gives the quantity surveying profession good potentials to provide project management service.

Civil Engineer's potentials for project management service

Traditionally civil engineers have the right credentials to deliver project management service because of their knowledge of both the technical/technological and management requirements

of construction projects. Their active involvement in the physical realisation of projects provides them with in depth knowledge base and experience to manage complex structures as professional project managers (Oladipupo, 2004).

Builder's potentials for project management service

The professional builder is versatile in construction processes because of prior training and experience (Oduami and Iyagba, 2001). They would normally have a balanced knowledge of all disciplines and are central to construction performance. The professional builder translates the clients' requirements (concepts and heart desires), designed by the architect on paper into physical reality by virtue of their training. These skill sets are no doubt useful in project management service delivery.

RESEARCH METHODOLOGY

A questionnaire survey of project owners and constructors' opinions provided data for the analyses. The sample population (N = 50) were themselves contributors to construction project delivery and were chosen for their opinion on the subject matter. The survey spanned a period of one month.

Thirty two (32) responses were received however the real analysis is based on thirty (30). This represents 60% of the total number of questionnaires administered. The Mean Item Score method was used to analyze some of the Likert-scaled questions to determine the competency levels of the professionals. Comparison of the respective mean item scores enabled the determination of the professional with the highest potential to deliver project management service.

The Mean Item Score method is mathematically represented below:

$$MIS = \frac{\sum n_1 k_1}{\sum N} = \frac{5n_5 + 4n_4 + 3n_3 + 2n_2 + 1n_1 + 0n_0}{N_5 + N_4 + N_3 + N_2 + N_1 + N_0}$$

Where: MIS = Mean Item Score

$\sum N$ = Total number of respondents

N_5 = The number of respondents that chose 5, etc

0 – 5 = The various marks for the ranking of the factors as applicable in each case.

DATA ANALYSIS AND RESULTS

Descriptive Summary

Table 1 gives a summary of the main categories of respondents that questionnaires were administered to. These were project owners and contractors. 36.7% and 13.3% of the respondents were public and private sector project owners respectively. The remaining were

administered to building contractors of which 26.7% were indigenous and 23.3% non-indigenous contractors.

Table 2 indicates the different professionals that had provided project management services to the group of clients and contractors surveyed. Among the respondents, 30% of their project managers had been professionally qualified architects, 26.7%, 6.6%, 26.7% and 10% were quantity surveyors, builders, civil engineers and estate surveyors respectively.

Table 1: Summary of respondents

Characteristics	Frequency	Percentage
Public-sector owners	11	36.70
Private-sector owners	4	13.30
Indigenous contractors	8	26.70
Non-indigenous contractors	7	23.30
Total	30	100.00

Table 2: Profession of construction project managers

Profession of project managers	Frequency	Percentage
Architects	9	30.00
Quantity Surveyors	8	26.70
Builders	2	6.60
Civil Engineers	8	26.70
Estate Surveyors	3	10.00
Total	30	100.00

The nature of the construction projects which respondents had rendered project management services for, are presented in Table 3 below. A greater percentage (66.7%) of these was building construction projects, followed by civil works. Large industrial and heavy engineering projects are few and far between in recent times in Nigeria.

Table 3: Nature of projects handled

Nature of projects	Frequency	Percentage
Building Project	20	66.70

Civil Engineering Project	8	26.70
Industrial /Heavy Engineering Project	2	6.60
Total	30	100.00

Perceptive Views of Respondents

On the management aspects of construction professionals

Respondents' views were sought on the performance of construction professionals employed for project management services on their development projects. A seven point rating system was developed, so that respondents can rate performance levels on thirteen (13) management aspects. The survey result is presented in Table 4. The 13 management aspects are listed in the first column, while the respective indices of performance by each of the construction professionals are indicated in next five columns.

Comparatively, the highest indices were recorded for quantity surveyors in 11 aspects of management. Quantity surveyors were only rated low in safety and environmental management. The lowest set of ratings was observed in the estate management profession, with poor ratings in scope management, risk and safety management. Other listed professionals had a fairly even spread of rating across all their management aspects.

Overall average performance in these management aspects was determined using the formula for Mean Item Score (MIS) previously discussed. Quantity surveyors ranked highest with total MIS of 82.50; while civil engineers, estate surveyors, architects and builders with a total mean item score of 65.25, 58.35, 56.75 and 56.60 follow in that order respectively.

On essential skill sets of construction professionals

The survey goes further to determine performance indices of construction professionals on seven (7) essential skill sets (technical, administrative, contractual, team building, legal, communication and general). The clients and contractors rated these skills using a five-point ranking, from 1 – not effective to 5 – most effective.

The survey result is summarised in Table 5. A similar pattern of response is observed when compared with Table 4 results. Quantity surveyors were considered by respondents to exhibit comparatively high skills across all seven essential skill sets listed. For instance, respondents generally agreed that the quantity surveyors who rendered project management services on their development projects had the most effective technical skills.

The total MIS also indicate the highest value for quantity surveyors (32.90). Consequently civil engineers, estate surveyors, builders and architects were ranked below quantity surveyors, in this order.

Looking through the Table for the highest rating of skill sets exhibited by respective construction professionals; it is observed that architects had better contractual skills; quantity surveyors had better technical skills; builders' with contractual and team building skills; civil engineers had good technical and contractual skills; and estate surveyors had good administrative and communicating skills.

Table 4: Client and contractors' perception of project management services rendered by construction professionals

Management Aspects	Index of Managerial Performance				
	Architects	Quantity Surveyors	Builders	Civil Engineers	Estate Surveyors
Integration Management	4.50	6.10	4.10	4.50	4.00
Scope Management	4.11	6.50	5.00	4.86	3.67
Time Management	4.89	6.50	4.00	5.50	4.33
Cost Management	4.33	6.50	4.00	5.63	5.67
Quality Management	4.33	6.13	5.50	5.38	5.00
Human Resources Management	4.22	6.13	5.50	5.13	4.67
Communication Management	4.89	6.63	5.00	5.38	5.67
Risk Management	4.11	6.13	3.50	4.25	3.67
Procurement Management	4.33	6.75	4.00	5.50	4.00
Safety Management	3.89	5.75	4.50	4.13	3.00
Environmental Management	4.44	5.75	3.00	4.86	4.67
Financial Management	4.38	6.88	4.50	5.50	5.67
Claim Management	4.33	6.75	4.00	4.63	4.33
Total	56.75	82.50	56.60	65.25	58.35

1 – Extremely Low; 2 – Very Low; 3 – Low; 4 – Moderately High; 5 – High; 6 – Very High; and 7 – Extremely High

On meeting project objectives by construction professionals

The survey participants were required to rate (on a scale of 1 to 5) the performance of the construction professionals who had rendered project management services for them. The rating was based on their perception of the professionals' ability to meet three salient project objectives. These project objectives were timely completion, ability to meet cost targets, and their quality achievements.

The results obtained using the MIS is presented in Table 6 below. Respondents rated the professional quantity surveyors highly. The scores were comparatively high on all three project objectives. Architects were rated the highest in their ability to meet quality targets; builders in their ability to complete projects timely; civil engineers fared better in both time and quality targets; and estate surveyors were better at meeting quality targets.

Table 5: Clients and contractors perception of project managers' skill sets in project management

Essential Skill Sets	Index of Performance Skill Sets				
	Architects	Quantity Surveyors	Builders	Civil Engineers	Estate Surveyors
Technical Skill	3.56	5.00	3.50	4.13	3.33
Administrative Skill	3.44	4.88	3.50	3.75	4.33
Contractual Skill	3.78	4.75	4.50	4.13	3.67
Team Building Skill	3.44	4.63	4.50	3.75	4.00
Legal Skill	3.11	4.38	2.50	3.50	3.67
Communication Skill	3.33	4.63	3.50	3.87	4.33
General Skill	3.78	4.63	3.00	3.62	3.33
Total	24.44	32.90	25.00	26.75	26.66

1 – Not Effective; 2 – Negligible; 3 – Effective; 4 – More Effective; and 5 – Most Effective

Table 6: Clients and contractors' perception of project managers in meeting the project objectives

Project Objectives	Index of Performance Objectives				
	Architects	Quantity Surveyors	Builders	Civil Engineers	Estate Surveyors
Time Target	3.56	4.88	4.00	4.00	3.33
Cost Target	3.00	5.00	3.50	3.75	3.67
Quality Target	3.89	4.75	4.00	4.00	4.00
Total	10.45	14.63	11.50	11.75	11.00

1 – Negligible; 2 – Very Low; 3 – Low; 4 – High; 5 – Very High

The pattern of the overall result is similar to previous ones, for the fact that quantity surveyors' achieved the highest score. The total MIS determined was 14.63 while civil engineers, builders, estate surveyors and architects were scored lower in this order.

DISCUSSION OF FINDINGS

The results presented in the tables generally rate performance of the different construction professionals in Nigeria above average. The different scores generated for the different professionals are indicative of the fact that every professional have core areas of specialization in line with their training and previous traditional roles played in the

construction industry (Nkado and Meyer, 2001). Odusami *et al* (2001) suggest that training and up skilling of construction professionals irrespective of previous educational backgrounds could improve competency to levels needed to provide project management services. Present day project management services demand the best trained with a diversity of knowledge, not limited, to cost/cash flow management, construction technology, marketing, information technology, law, economics etc. Zack Jr. (2004) suggests that the probability of project success will be higher if construction professionals develop their knowledge base on every key area of project management.

The survey result on essential skill sets are in line with Edum-Fotwe and McCaffer (2000) which noted that the skills exhibited by construction professionals depend on their management capabilities, which are a function of the knowledge acquired through training in the relevant disciplines.

The pattern of scores on the ability of construction professionals to meet project objectives is encouraging. Considering that the essence of project management service delivery is to achieve project objectives with available resources (Onwusonye, 2005); this is a good capability profile of the various professionals.

On careful observation, comparatively low scores were recorded in risk, safety and environmental management across the professions. This confirms Zack Jr., (2004) assertion that risk, safety and environmental management are relatively new fields that construction professionals should strive to be competent in. Considering the complexity of modern day construction products and processes, virtually all of the professionals will need to address this weakness.

CONCLUSION

The study is an opinion survey of project owners and contractors on the performance of construction professionals who had rendered project management services on some construction projects in Nigeria. The survey's objective was to determine amongst the construction professions which one had the greatest potential for delivering project management services.

The results obtained give a good capability profile of all the construction professions. However quantity surveyors rated highest across all aspects of management, essential skill sets, and their ability to meet desired project objectives. It is thus concluded that quantity surveyors have the highest potential to offer project management service delivery in Nigeria.

Consequent upon this investigation, the paper recommends the following:

- That educational and vocational training should be improved across all construction professions to include the good qualities inherent in quantity surveying training. The training schemes could take the form of a post-qualification certificate.
- It is imperative for construction professions to improve their knowledge base in risk management, health and safety management and environmental management. These are essential skills needed to practice in today's complexities.

Finally as a national policy initiative the paper recommends greater collaboration between construction industry professional bodies and the Association of Project Managers in Nigeria. This is hoped will facilitate cross exchange of knowledge that will benefit project management practices in Nigeria.

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