

Are Quantity Surveyors Competent to Value for Civil Engineering Works? Evaluating QSs' Competencies and Militating Factors

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Abstract

The role of the quantity surveyor is one that is often unclear amongst the general public. This study discussed the competencies of the quantity surveyor in measuring and managing civil engineering works and also carrying out the financial management for civil engineering construction projects; also outlined the various competencies and skills required of quantity surveyors in discharging and managing their professional duties. The core activities of quantity surveyors include determining project budgets, measuring project quantities, preparing contract documentation (such as Bills of Quantities and cost control documents), administering contracts, and preparing final accounts. The study also examines recent developments in the profession, which have led to the quantity surveyor delivering a number of management related consultancy services, in response to rising client expectations and demands. The militating factors to QS participation in the Nigeria AEC industry were identified as skills and knowledge, competencies, identity or branding issues, fewer QS in public service among others. The study advocated a change in culture and the inclusion of quantity surveyors on civil engineering projects in order for the industry to leverage on the dynamism of the quantity surveying profession.

Keywords: Quantity Surveyors, Civil engineering works, Skills, Competencies, Nigeria

1.0 Introduction

The construction industry comprises of many stakeholders such as clients, design professional, construction professionals, and operational teams. The major professionals in the industry in terms of their initial contact with the client and involvement with the design and construction stages of the construction projects includes engineers (notably civil, electrical and mechanical), building engineers, quantity surveyors or cost estimators and architects. The construction industry also comprises of various activities such as new construction, maintenance, refurbishment, rehabilitation, conversion, extension, and renovation. The construction industry generally contributes between 3% and 10% of the Gross Domestic Product of most countries (Olanrewaju and Anahwe, 2015). For instance, in 2012, the construction industry contributed N2, 188,718.59 million, 3.05% to the Nigerian GDP and employed 6,913,536 persons (National Bureau of Statistics [NBS], 2015). The Nigerian construction industry is largely British with some incursion from Europe and America, as such quantity surveying is offered in most reputable universities and polytechnics.

The architects are a specialist in the development of building concepts and design. During the construction phase, the architects continuously revise plans, drawings, and specifications to meet the requirements of the clients and statutory regulations. While the civil engineers are most concerned with public constructions (i.e. roads, dams, quays, shipyards, and bridges); building engineers are involved in calculating the strength and forces of the proposed construction (Olanrewaju and Anahwe, 2015). They also prepare structural drawings and specifications from architectural drawings and other relevant contract documents. They work to ensure that the buildings can carry and withstand the loads they will encounter while in operation. The mechanical and electrical engineering are often termed together as services engineering and are an important aspect of modern constructions contributing up to 30% of the total contract sum for a standard building. Modern buildings require complex and sophisticated services to make the building more convenient and comfortable. Engineering services are executed by the nominated or domestic subcontractors (Olanrewaju and Anahwe, 2015).

The RICS (1971) emphasized that the distinctive competencies or skills of the quantity surveyor (QS) are associated with measurement and valuation which provide the basis for the proper cost management of the construction project in the context of forecasting, analyzing, planning, controlling and accounting

2.0 The Quantity Surveyor and the Built Environment

Said, Shafiel and Omran (2014) traced the history and origins of quantity surveyors back to the ancient Egyptian civilization that used dedicated personnel to carry out estimates and costing for their magnificent structures and buildings. It developed into an occupation during the 17th-century restoration of London after the Great Fire. In 1836, the profession entered its new age when the new Houses of Parliament of Great Britain, designed by Sir Charles Barry, became the first major public contract to be fully measured and tendered using detailed bills of quantities for financial accountability (Royal Institution of Chartered Surveyors, RICS, 1998). A quantity surveyor is a professional in the construction industry who has the ability to analyze both cost components and

practical physical construction works of a project in a successful way so as to be able to apply the results of his analysis in solving problems peculiar to each project (Nkado, 2000). The built environment is global and extends across all real estate and infrastructure markets; and in order to appreciate the dynamics of the quantity surveying profession along these segments, it necessary to define the scope of work of the Quantity Surveyor.

Quantity surveyors work in all sectors of the built environment (sometimes refer to as the construction industry) worldwide. In real estate, QS scope of work covers residential, commercial, industrial, leisure, agricultural and retail. In infrastructure, QS work sectors include roads, railways, airports, waterways, seaports, coastal defenses, power generation, and utilities. Also, QS needs understand all aspects of construction over the whole life of a building or facility and must have the ability to manage cost effectively, equating quality and value with individual client needs. Quantity surveyors are initially involved with the capital expenditure phase of a building or facility, which involves the feasibility, design and construction phases. However, we are also involved with the extension, refurbishment, maintenance and demolition of a facility not excluding other professional services like cost planning, contract administration, procurement advice, preparation of bill of quantities (BOQ) among others.

The quantity surveying profession largely developed over the 19th century (Opawole, Awodele, Babatunde, & Awodele, 2012). Quantity surveyors are involved in various types of construction including civil, building, mining, petrochemical plants and refineries construction and installations (Olanrewaju and Anahwe, 2015). Quantity surveying involves cost management, procurement, and contractual issues in the supply chain and marketplace for constructions. They monitor and update initial estimates and contractual obligations as the construction progresses based on additional works and variations. While some practices still provide services that are focused on buildings (the architectural elements), others now provide services that include heavy engineering, oil and gas, and engineering services (Ashworth, Hogg, and Higgs, 2013).

Quantity surveying is concerned with cost and financial management of construction projects (Ekung & Okonkwo, 2015). Its expertise enhances the design process through the logical use of cost parameter to sustain viable links relating price, utility, and forms which assists in attaining the employer's objectives within the predetermined budget (Maarouf & Habib, 2011). The responsibility of the Quantity Surveyor includes cost assessment, evaluation of economic and contractual arrangement of the project which is often significantly prejudiced by factors in the environment, and changes that are exclusive to the individual project (Senaratne & Sabesan, 2008). Experience over the years underpinned the significance growth in practices and procedures of the quantity surveying since establishment (Moore, 2011), many decades ago. Basically, the expertise of the quantity surveying profession is anchored on key knowledge including construction technology, quantification convention, construction economics, financial management, business administration and construction law (Ashworth & Hogg, 2007).

Quantity surveyors add value primarily to the financial and contractual management of construction projects at the pre-construction, construction and post-construction stages (Dada & Jagboro, 2012). They contribute to overall construction project performance by acquiring, developing and deploying appropriate competencies (Nkado and Meyer, 2001). The profession of quantity surveying is practiced in Nigeria along the same pattern as in the United Kingdom and other commonwealth countries. The Regulated and Other Professions (Miscellaneous Provisions) Act 1978 of Nigeria recognized Quantity Surveying profession as one of the scheduled Professions while Decree No. 31 of 1986 gave legal backing to the profession and also set up the Quantity Surveying Registration Board of Nigeria (QSRBN) to regulate it.

Quantity surveying is global and provides services across various industries. Quantity surveyors are involved in all phases of a facility's lifecycle such as feasibility, design, construction, extension, refurbishment, maintenance, and demolition. The competencies of the quantity surveyors are aimed at producing constructions that meet the client's value system (Olanrewaju and Anahwe, 2015). Quantity surveying as a discipline concerned with detailed calculation and measurement of materials and labor required for construction activities including building, and engineering project, reveals a multi-disciplinary nature (Opawole et al., 2012). Olusoga (2006) observed that Nigerian quantity surveyors of the older generation were more of experts in the costing, cost monitoring and control as it relates to building projects which they were respected for by their sisters' professionals. Although it is true that today's quantity surveyors want to expand the horizon of their practice as observed by Seppanen (2002), it is to be noted that most of this expansion in Nigeria as the case may be is into costing of engineering projects which are still within the traditional role of the older generation of quantity surveyors especially in the developed world.

The RICS (1998) set out the requirements and competencies for assessment of professional competence by listing the competencies required of quantity surveyors in three categories: basic competence, core competency and optional competencies (Dada & Jagboro, 2012). The basic skills are common to all construction professionals under RICS structure; the core skills are uniquely required of quantity surveyors while the optional competencies reflect areas of specialization or future career diversification (Nkado and Meyer, 2001).

The quantity surveyor according to Aje and Awodele (2006) is "a professional trained, qualified and

experienced in dealing with problems relating to construction cost, management, and communication in the construction industry". The problem lies neither in the cost nor communication but in the management of construction projects since proper and effective overall management entails every other function i.e. cost and communication. This should be an area of concern to Nigerian quantity surveyors in discharging their duties since a well-managed project is always a well-delivered project. Royal Institute of Chartered Surveyors (RICS) noted that "*quantity surveying is very much a client led profession in that the professional quantity surveyors respond to client needs and must continue to develop more on their own initiatives and that concerns in the coming decade will be dominated by the need to anticipate and satisfy changing client requirements*". This called for a need to examine the present performance of Nigerian quantity surveyors in their quest for better service delivery.

3.0 Quantity Surveyors and Civil Engineering Works

The Curriculum and Course Specification for Nigerian University system defined civil engineering as discipline involved in the planning, design, construction and operation of physical facilities essential to modern life and community living. Opawole et al. (2012) noted that whereas quantity surveyors are adequately engaged in engineering projects in Great Britain from where quantity surveying education in Nigeria derived its source and model, their involvement seems sub-optimum in Nigeria, attributable to the perception of the correlation of quantity surveyors' education to engineering projects' requirements. They further emphasized that there is an increasing evolution of the profession into new fields including engineering and that for this evolution to be worthwhile in Nigeria, there is the need to understand the major aspects under which engineering constructions are administered, and the scope of quantity surveyors' education and training in Nigeria.

Seleey (1993) identified nine major aspects around which engineering contract administration revolved. These are a contractual arrangement, contract documentation, tendering procedure, site organization, site supervision, communication, measurement and valuation of works, instruction and variations, settlement of claims, and certificate while Bello (2003) summarizes these as 'design and construction' and 'cost appraisal and construction'.

Quantity surveying profession is constantly confronted with challenges and opportunities in new markets. These are often passed over, predominantly because of the lack of relevant skills and competencies (Dada & Jagboro, 2012). These challenges and opportunities will not be fully leveraged if these skills are not addressed. Ajanlekoko (2012) emphasized the need for quantity surveyors to move away from being a 'thermometer' (reader of temperature) to being a 'thermostat' (controller of the event) in the 21st century. If this is going to be, he called for a culture change and attitudinal development of quantity surveyors.

Here, O'Kelly and Scully (2009) list typical quantity surveying functions as:

1. Preparing approximate estimates of cost in the very early stages of the formulation of a building project, giving advice on alternative materials, components and types of construction and assisting with feasibility studies.
2. Cost planning and value analysis during the design stage of a project to ensure that the client obtains the best possible value for money, including adding value to property assets, preferably having regard to total costs using life cycle costing techniques. Costs should be distributed in the most realistic way throughout the various sections or elements of the building and tender figures should be kept within the client's budget.
3. Advising on the most appropriate form of building procurement, having regard to the type of project, quality, the speed of construction, apportionment of risk and price certainty.
4. Preparation of bills of quantities and other contract documents relating to the project.
5. Examining tenders and priced bills of quantities and reporting the findings.
6. Negotiating rates with contractors on negotiated contracts and dealing with cost reimbursement contracts, design and build, management and other forms of contract.
7. Valuing work in progress and making recommendations as to payments to be made to the contractor, including advising on the financial effect of variations.
8. Preparing the final account on completion of the contract works.
9. Advising on the financial and contractual aspects of contractors' claims.
10. Giving cost advice and information at all stages of the contract and preparing cost analyses and cost reports to clients.
11. Specialist advice, such as technical auditing, valuations for fire insurance, giving advice on funding, grants, capital allowances and taxation, risk analysis and management, bank monitoring, project management, building services cost advice and other related matters including health and safety and quality control.'

Cost advise and cost planning functions enable the QS to advise building owners, architects and the other members of the design team of the probable costs of construction schemes and on the costs of alternative

designs before and during the design development phase of the project. This assists the design team to arrive jointly at practical designs for projects while staying within the client's budget. This advice enables design and construction to be controlled within predetermined expenditure limits at all stages of the project.

The relationship between the quantity surveyors and the construction industry vis-à-vis their ability to comprehend and manage civil engineering projects effectively will be discussed under the following headings:

3.1 Skills and Knowledge of Quantity Surveyors

In almost all the British colony, quantity surveyors services are fully appreciated for all forms of engineering projects. The situation is different in Nigeria where their involvement is fully appreciated for building engineering constructions but at a seemingly low level in engineering projects (Opawole et al., 2012). They further stressed that some previous works attributed this lacuna to professional rivalries while some are of the opinion that the present education/training of quantity surveyors in Nigeria has not led to the adequate qualitative competence of the quantity surveyors due to the embryonic state of the discipline.

Collaboratively, Olanrewaju and Anahwe (2015) argued that it would be out of place to claim that all quantity surveyors have the required skills and knowledge to provide expert advice on the engineering services as they do for other aspects of the construction processes. They argued further that clients are increasingly becoming uncomfortable with the inability of quantity surveyors to provide conclusive and accurate estimates for their buildings arising from using lump sums to price engineering services.

Meanwhile, several researchers (Ashworth, 2010; Ashworth, Hogg and Higgs, 2013; Marsh, 2003) opined that some quantity surveyors have specialized their job in such a way that they preferred been called '*M&E Quantity Surveyors*', ostensibly to mean quantity surveyors that are 'qualified' to offer advice on the building and civil engineering services.

In addition, some universities in Nigeria (such as the Federal University of Technology Akure, FUTA) offer courses in building services and civil engineering works (*as course work*) in quantity surveying undergraduate programs thereby preparing such graduates for real life experiences in the industry and making them capable of measuring, evaluating and offering advice to both clients and contractors on building and civil engineering projects. Mogbo (1998) identified quantity surveyors' education as an applied science which is in effect a construction economics and management oriented that covers various areas of construction sciences (engineering: civil, electrical, product and chemical, among others), pure and applied economics, finance, accounting, politics, sociology, government administration and law.

However, the opinion of Jagboro (1991) that the training of quantity surveyors in Nigeria has not led to adequate quantitative competence of the professionals because of the embryonic state of the discipline is also supported by Mogbo (1998) who advocated for an overhauling to the quantity surveyors syllabi in the Nigerian tertiary institutions to respond to all engineering projects.

Based on these viewpoints, it can be accepted that quite a few of quantity surveyors have distinguished themselves and have the requisite skill and ability to adequately procure and manage civil engineering projects. This submission is supported by Opawole et al. (2012) where they reported that in a recent survey that the "education and training of quantity surveyors in Nigeria provides adequate skill requirement for providing services requiring measurement of civil engineering works as well as services requiring evaluation of civil engineering works and financial management with about 51.2% and 52.2% of the curriculum and course content of University and Polytechnic respectively satisfying directly the requirement of cost appraisal and administration of the financial aspects of civil engineering and other engineering projects". Meanwhile, they suggested a continuous overhauling of the curriculum and course content of quantity surveying in the Nigerian higher education system in order for the discipline to meet the ever dynamic international standard required for engineering projects growing challenges.

3.2 Quantity Surveyors' Competencies

For a quantity surveyor to be graded as being competent, such QS must have enough skill or knowledge to do something to a satisfactory standard. The PMI (2002) defined competence as 'a cluster of related knowledge, attitudes, skills, and other personal characteristics that affect a major part of one's job, correlates with performance on the job, can be measured against well-accepted standards, can be improved via training and development and can be broken down into dimensions of competencies'. Babalola (2009) while relating this to quantity surveying profession viewed a competent quantity surveyor as a person who is expected to possess a range of skills, knowledge and understanding and be able to apply these skills and knowledge in a range of context and organization.

QS's basic competencies include- personal & interpersonal skills, business skills, information technology, professional practice, law, measurement, mapping (RICS, 1998). QS's core competencies include- construction contract practice, construction technology & environmental services, the economics of construction, procurement and financial management (RICS, 1998). QS's optional competencies include- arbitration & other

dispute resolution procedures, development appraisal, facilities management, insolvency, insurance, project management, property investment funding, research methodologies & techniques, taxation allowances & grants, Valuation (RICS, 1998). Opawole, Awodele, Babatunde and Awodele (2012) also corroborated this competency required of quantity surveyors in managing civil engineering works reiterated further that quantity surveyors are not expected to design and construct civil engineering infrastructure but to show adequate understanding of the design and construction with the aim of being able to communicate and interpret for the purpose of the cost management services.

A research study carried out recently by Dada and Jagboro (2012) indicated that Nigerian quantity surveyors have over the years gained significant competencies in Cost Planning and Control, Estimating, Construction Procurement System, Contract Documentation, Contract Administration, Project Management, Feasibility/Viability Studies, Valuation, Financial Management, Development Economics, Risk Management, Life Cycle Costing, Facility Management, Arbitration and Dispute Resolution, Economic Mgmt. of Urban Infrastructure (in decreasing order).

In addition, it was also reported by Dada and Jagboro (2012) that a high percentage (75%) of Nigerian quantity surveyors competencies falls under the core competencies band of the Royal Institute of Chartered Surveyor's competency scheme; this shows that the quantity surveying practice in Nigeria is responding in a positive and dynamic way to ensure the needs of the built environment including accurate assessment and evaluation of civil engineering works.

3.3 Branding the Quantity Surveyors

Quantity surveying has identity problem! Quantity surveyors are called by so many names all over the world such as cost engineers, building economists, cost managers, construction accountants, etc. and different authors have adopted these different names in different studies (Kelly, 1999) and in Nigeria such as (Ajanlekoko, 2004; Ogunsemi, 2004; Babalola, 2006; Oke, 2006). Quantity surveyor according to Wikipedia (2008) is "a professional trained, qualified, and experienced in handling construction cost, construction management, and construction communication on behalf of the client".

In the USA, quantity surveying is related to cost engineering, while they are also referred to as cost economists or cost consultants in other places (Olanrewaju and Anahwe, 2015); in Nigeria like most other commonwealth nations such as United Kingdom, Australia, South Africa among others, they are referred to as quantity surveyors. This situation has been attributed by some quantity surveyors why civil engineers (in civil engineering projects) and architects (in building projects) tends to ignore or give little significance to the skill and input made by the quantity surveyor because to them, the scope of a quantity surveyor's job is not well-defined.

Furthermore, the increasing awareness on accountability and transparency had made clients be more demanding than they used to be. In light of this, for quantity surveyors to remain competitive, there is a need to embrace value-added tools, skills, and expertise (Cartlidge, 2011). However, for Nigerian quantity surveyors to be part of the transformation agenda of the current Nigerian government, they need to provide cutting edge services.

The modern quantity surveyors perform various types of services that extend beyond the services that the traditional quantity surveyors provide and higher institutions offering quantity surveying program respond accordingly by modifying and upgrading their course contents. Quantity surveyors provide advice on the strategic planning of a project (Ashworth, Hogg, and Higgs, 2013). For a construction work, this advice affect clients' decisions on whether to construct or not, and if the client decides to construct what effect does cost have on other criteria within the clients/users value systems including time and quality, function, satisfactions, comfort, and aesthetics (Olanrewaju and Anahwe, 2015).

In the foregoing, it is advised that quantity surveyors, cost economists, cost accountants or cost engineers and whatsoever name they may bear, based on location or region should come together and adopt a singular brand name for the quantity surveying profession like those of architecture (architects), civil engineering and other construction industry professionals, if so possibly it can improve and shore up the image of the profession in developing countries like Nigeria.

3.4 Civil Engineering Services and Quantity Surveying

Deployment of appropriate skills and competencies is crucial and germane to the development and continuous relevance of any profession. In the built environment, the art of selecting the required skills and competencies expected of quantity surveyors and understanding the inherent dependencies between them remains a research issue (Dada & Jagboro, 2012). However, they noted that formal measures of skills and competencies require definitions and classification of skill and competence, type and extent. Meanwhile, the extant literature on quantity surveying skill and competence illustrates a multiplicity of perspectives (Nkado and Meyer, 2001; Crafford and Smallwood, 2007; Babalola, 2009).

The skills and knowledge of the quantity surveyors in this aspect of engineering is critical. Those (quantity surveyors) who do not possess the required competencies would not be able to provide the total value added service expected of them. In fact, specialists' quantity surveyors in engineering projects are invited for large facilities distinct from the standard quantity surveyors. Sealey (1993) is of the opinion that sound knowledge and expertise of project design and cost solution to physical and geological problems are the required proficiency for administering civil engineering projects.

However, most quantity surveyors still considered engineering services as unknown territory (Ashworth, 2010; Marsh, 2003). This is largely explained by the very complex nature of some engineering services. However, for the quantity surveyors to provide value added services, they must have a detailed knowledge and skills of the construction works, a failure of which will inhibit the delivery of the value added services to the clients and to other members of the design and construction teams (Marsh, 2003).

However, methods of procurement also fragment the supply chain (Olanrewaju and Anahwe, 2015). This fragmentation is making it difficult for quantity surveyors to provide expert advice at the upstream in the procurement of building services. For instance, under most current procurement methods, quantity surveyors are only involved when strategic decision are taking, when architects and engineers have been an appointment, briefing conducted and drawings reaching completion if not completed (Olanrewaju and Anahwe, 2015). However, as noted by Ahuja and Walsh (1983) 75% of construction cost is already committed when the design is only 25% complete.

A research project recently carried out by Aje, Adedokun and Ibronke (2015) revealed that for civil engineering works, about half of the firms that responded to the research survey handled about 5 projects since inception, 17.2% of the firms had never handled civil engineering projects at all, while only 10.3% handled more than 20 civil engineering works since the establishment of the firm. Furthermore, when it comes to industrial engineering works, more than half never handled such work at all, 25.9% handled about 5 projects in this category while only 5.2% handled 11-20 and above 20 industrial engineering works respectively.

This is closely related to the work of Said *et al* (2010) that argued quantity surveying educators and practices alike, are still deeply entrenched in the 'traditional' core competencies rather than the newer and more novel services and skills.

3.5 Quantity Surveying Profession Dynamism

Quantity Surveying is a dynamic and sensitive profession. The profession feels impulses from all sectors of the economy which dovetail into affecting various operations. The built environment has evolved over the years and the recently backed technological innovations in the construction industry have revolutionized how construction activities have been initiated, planned, executed and terminated. The rate of advancement of technological advancement which was around 35years in the early 1900s has reduced drastically to around 5-7 years in the 21st century and could further decline to between 2-3 years from 2025 onwards.

It is also noted that construction industry constitutes about 6-9% of the gross domestic product (GDP) and also constitutes more than half of the fixed capital formation as infrastructure and public utilities capital works required for economic development (Chitkara, 1998); this fact and figures calls for the need for the sustainability of the gains of the built environment.

Quantity surveying profession has always been considered as a dynamic profession has undergone various changes during its evolution over the past centuries. The QS who is regarded as cost and procurement manager of the built environment has also undergone significant changes over the past decade. Although it was initially considered as the main profession for quantifying construction works in projects, quantity surveyors today undertake a spectrum of work ranging from providing investment appraisals to construction project management.

In addition, changes in the market, construction industry, client needs and profession posed threats and opportunities to the profession. Quantity surveyors have, therefore, subsequently begun to explore new potential roles. Apart from the traditional roles, quantity surveyors are expected to perform evolving roles in the profession with increased importance and emphasis on meeting clients' needs. The constant change in the roles they perform in the industry pose a challenge for the quantity surveying professionals to be competitive in the construction labor market.

Githaiga (2004) grouped the experience of the services that quantity surveyors render into budgeting and estimating. He postulated a new role in the light of better financial management role, minimizing of risk and major savings for the client and the better yield on investment. Furthermore, he highlighted new areas of diversification where we have opportunity and challenges as development appraisal, pre-contract cost control, taxation planning, contract administration, disputes, litigation and arbitration, technical auditing, valuation for fire insurance, fire loss adjustment, maintenance management schedule of condition and dilapidation, project management, research and development and overseas works. Therefore, it is recommended to the stakeholders in the Nigeria AEC industry most importantly clients, engineers, and government agencies tap into the dynamism

of the quantity surveying and give them more free hands to work on civil engineering and not to no longer relegate them to the background.

Table 1: Chronology of QS' skill Developments

DATE	PRACTICE / SKILLS
Pre-1960s	Approximate estimating; Bills of quantities; Final accounts
1960s	Elemental bills; Operational bills; Cut and shuffle; Cost planning; Cost limits and allowances; Value for money in building
1970s	Computer bills; Formula methods of price adjustment; Cash flow forecasting; Engineering and construction; Cost-in-use; Cost modeling; Contractor's estimating; Cost control
1980s	Project management; Post-contract cost control; Contractual procedures; Contractual claims; Design and build; Life-cycle costing; Accuracy in forecasting; Value engineering
1990s	Diversification; Development appraisal; Facilities management; Commercial revolution; Building sustainability; Value management; Risk analysis
2000s	Rethinking construction; Lean construction; Facilities management; IT in construction; Knowledge management; Whole-life costing

Source: *Thayaparan et al. (2011, p.5)*

3.6 *Lacuna of QS places in public service compared to other professions*

The early introduction of professional bodies in Nigeria such as Nigerian Society of Engineers (NSE) which comprises all categories of engineers (be it civil, structural, mechanical, electrical engineers) in the country and the Nigerian Institute of Surveyors (NIS) had helped the recognition of this professions in the country and the larger numbers have helped them to influence government policies and guidelines as regards the construction sector of the economy; thereby, giving little or no room for the quantity surveying professional members under the umbrella of the Nigerian Institute of Quantity Surveyors (NIQS). It is instructional to note that before the formation of NIQS in 1969, the Nigerian Quantity Surveyors attempted joining the NIS but they were refused recognition because according to the NIS executives of those days, quantity surveyors aren't really surveyors. This is against the practice in the UK were both the NIS members and the Nigerian quantity surveyors had their education, in which the Royal Institution of Chartered Surveyors is an amalgamation of several professions including land surveyors, quantity surveyors among others.

In addition, it should be noted that most Nigerian quantity surveyors prefer working in the private sector, some even set up their firms or partner with colleagues in a consortium than working in the public sector, this affecting the voting strength of quantity surveyors in the public sector as compared to other professions. Thus, they could only have a little or no influence on government decisions regarding the construction sector and making it difficult for them to advocate their needed presence on civil engineering projects.

3.7 *Pervading Use of Provisional Sum*

It is instructional to note that the new Standard Method of Measurement (SMM) of the Nigerian Institute of Quantity Surveyors (NIQS), that is, BESMM4 has totally eliminated the need or use of provisional sum for both building and civil engineering projects and it has in its place promoted risk management in construction scheme. In the place of the use of provisional sum, the risk involved in pricing a unit of work with incomplete details or drawings is a factor in and price separately. The risk is categorized as Residual risk, Retained risk, Transfer risk or Combination of any of the three; also the risk involved is considered in terms of programming, planning and ways of managing it in order to determine the Risk Premium to be included in the Bill of Quantities (BoQs).

Every building, engineering, and industrial projects involve risk. Proper management of risks saves money and time. Risks must be identified, assessed, monitored and controlled as appropriate and effectively. The risk could be- transferred to the contractor (though, it must be expressly stated), shared by both the contractor and client, retained by the client or otherwise avoided- if it could be designed out and dealt with. BESMM4 provides for risk response strategy to manage Employer's residual risks. Risk management strategy of the document enhances project price/cost certainty thereby promoting overall cost reduction which could be of advantage to civil engineering projects which had been faced with issues such as abandonment, litigation, disruption of works due to factors such as unrealistic assessment of project cost, insertion of provisional sums, non-involvement of the right professional to manage project cost (i.e. quantity surveyors) among others.

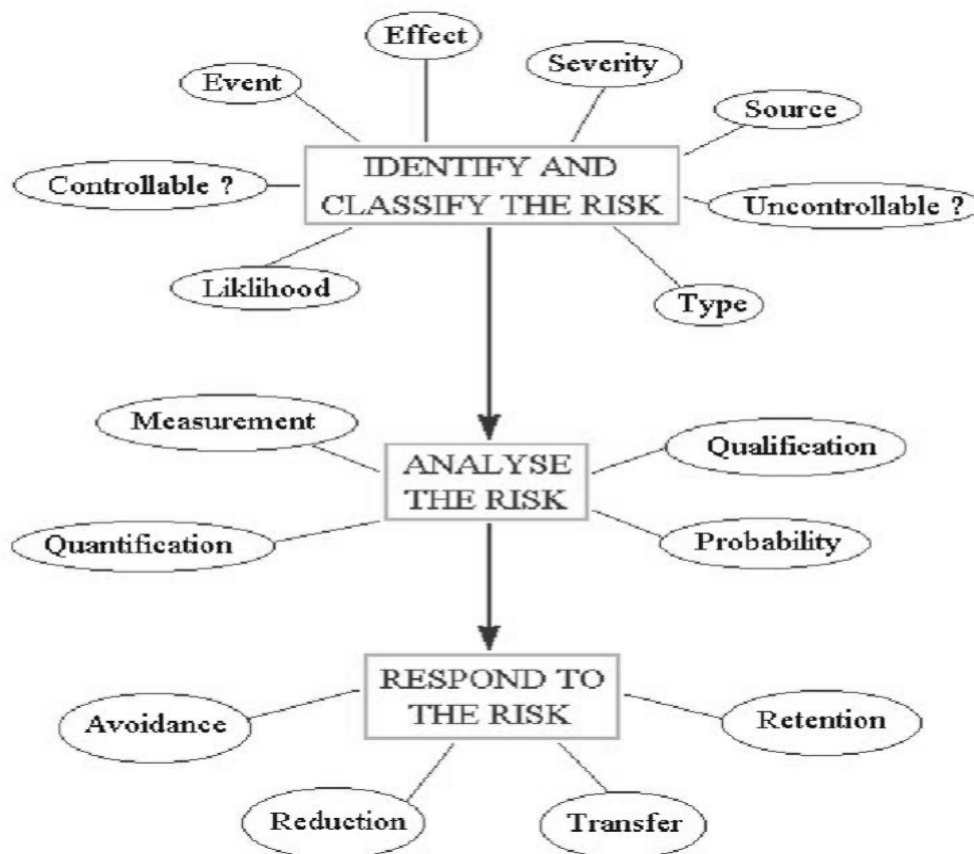


Figure 1: Structure of Identifying and Estimating the Risk

4.0 Conclusion

This study concluded that the education and training of quantity surveyors in Nigeria provides adequate skill requirement for providing services requiring measurement of civil engineering works as well as services requiring an evaluation of civil engineering works and financial management. The role of the quantity surveyor continues to evolve in response to the ever-changing business environment and rising client expectations. Cartlidge (2006) portrayal of the profession of the 1980s as a mainly technical back office operation offering a limited range of services has largely disappeared, particularly among the larger practices. He notes however that there will always be a demand for measure and value type services from traditional quantity surveying practices. However as long as clients need construction work to be done, there will be a need for its financial management; this is the service that quantity surveyors currently, and will, no doubt, continue to provide in the future.

It is proposed to have the role of quantity surveyors (QS) firstly, to be clearly defined in the engineering contracts. This means to classify the work that QS has to do in the project and the duties that “quantity surveyor” have to handle. Such role details can be made to the work duties, included in the contract clauses, or added in a sub-consultancy agreement. It is also recommended to publicize successful cases and best practices of QS services for civil engineering and infrastructure projects to promote QS input in engineering projects. In order to do this, the following are suggested: Organize a series of seminars and training sessions for QS who intend to work for engineering projects; Liaises with universities for enhancing existing education programmes with new programmes, new courses or electives; Encourage more QS to take up the role of QS in dispute resolution so as QS can work as Dispute Resolution Advisor (DRA), Adjudicator and Mediator for civil engineering and infrastructure projects; Publicize success cases of independent audit, independent assessment, and particular project arrangements.

Meanwhile, estimating rules and cost databank should be established so that rates can be derived from the first principle with pre-fixed labor constants for engineering works. In addition, a clear career path or qualifying route for engineering QS would be meaningful for those who are involved in engineering projects or are interested in joining the workforce. Furthermore, the knowledge and work experiences of individual members are invaluable and would be lost if they leave the industry. Therefore, the knowledge should be captured and organized into reference materials to maintain sustainability. Also, continuous monitoring and control are nowadays necessary to upkeep cost and contractual matters; it is worthwhile to devise project

governance structures to suit individual civil engineering and infrastructure projects, and within that structure, a clear role of QS can be defined.

Conclusively, the important skills and competencies identified in this paper should be given prominence, in the training and continuous development of the quantity surveying profession. Also, the academic institutions and the National University Commission in collaboration with the NIQS should critically address this during accreditation and in running quantity surveying programs in Nigerian higher institutions. The NIQS and the Quantity Surveyors Registration Board of Nigerians (QSRBN) should also endeavor to make strong representation in the review of quantity surveying academic program to reflect the important skills and competencies which may be lacking in the current program and also advocate the inclusion of quantity surveyors on civil engineering projects. This will not only enrich quantity surveying curriculum and make it meet the current need of the industry but will make Nigerian quantity surveyors marketable in the global market and ensure Nigerian AEC sector benefits immensely from the skills and competencies of the Nigerian quantity surveyors.

References

- Ahuja, H.N., & Walsh, M. A., (1983). *Successful methods in cost engineering*, John Wiley, and Sons, New York
- Ajanlekoko, J. O. (2004). Branding the quantity surveying profession to meet the challenges of built environment. *The Quantity Surveyor*. 49, 3-7
- Ajanlekoko, J.O. (2012) 'From Thermometer to Thermostat: The challenging role for the Quantity Surveyors in the 21st Century', *The Quantity Surveyor: Journal of the Nigerian Institute of Quantity Surveyors*, 1 (1), 40-41
- Aje, I. O., & Awodele, O. A. (2006). A study of the ethical values of quantity surveyors in Nigeria. Paper presented at a 2-day national seminar on Ethical issues and the challenges in construction professionals' service delivery. Nigerian Institute of Quantity Surveyors, Ondo state chapter.
- Aje, I.O., Adedokun, O.A., & Ibronke, O.T. (2015). Analysis of projects undertaken by Quantity Surveyors in Lagos State, Nigeria. *Organization, technology, and management in Construction*. 7(1) pp. 1209-1216
- Ashworth, A. & Hogg, K. (2007). *Willis's Practice and Procedure for the Quantity Surveyor*, 12th Ed., Oxford: Blackwell Publishing
- Ashworth, A., (2010). *Cost studies of buildings*, 4 Ed., Pearson Education Limited, Harlow
- Ashworth, A., Hogg, K., & Higgs C., (2013). *Will's practice and procedure for the quantity surveyors*, 13th Edition. UK: John Wiley and Sons Ltd
- Babalola, O. (2009) 'A study of the core competencies of quantity surveyors in managing electrical and engineering services sub-contract', *Journal of Environmental Design and Management*, 2 (1), 55-64
- Bello, A. (2003). 'Engineer Misconstrue other Professional Roles. An official Newsletter of the Nigerian Institute of Quantity Surveyor, Lagos, (5) 4-5
- Cartlidge, D. (2006) *New Aspects of Quantity Surveying Practice*, Butterworth-Heinemann, Oxford.
- Cartlidge, D., (2011) *New Aspect of Quantity Surveying Practice*, Butterworth – Heinemann, UK
- Chitkara, K.K. (1998), *Construction Project Management*, New Delhi: Tata McGraw-Hill Education, p.4, ISBN 9780074620625 retrieved September 28, 2015, from https://books.google.co.in/books/about/Construction_Project_Management.html?id=nmiMyNhKQooC.
- Crafford, G.J. & Smallwood, J.J. (2007) 'Clients' views on quantity surveying competencies', *Acta structilia: Journal for the physical and development sciences*, 14 (1), 33-55
- Dada, J. O., & Jagboro, G. O. (2012). Core Skills Requirement and Competencies Expected of Quantity Surveyors: Perspectives from Quantity Surveyors, Allied Professionals and Clients in Nigeria. *Australasian Journal of Construction Economics and Building*, 12(4), 78–90.
- Ekung, S., & Okonkwo, E. (2015). TREND IN INFLUENCES ON CAREER CHOICE IN QUANTITY SURVEYING AND ITS IMPLICATIONS. *International Journal of Education (IJE)*, 3(1), 1–9.
- Githaiga, F.M. (2004) 'Challenges facing the Quantity Surveying Profession in a Globalized Economy', *Proceedings of the 21st Biennial Conference of Nigerian Institute of Quantity Surveyors (NIQS): Adding Value to Reforming Challenges for the Quantity Surveying Profession in Nigeria*, Premier Hotel, Ibadan, Nigeria, 24-27 November, 32-48
- Hore, A.V. O'Kelly, M. and Scully, R. (2009) *Seeley and Winfield's Building Quantities. Explained Irish Edition*. Palgrave Macmillan, Houndsmills, Basingstoke, Hampshire.
- Jagboro, G.O. (1991), *Education for Quantity Surveyors*. *Proceedings of the International Conference on Quantity surveying and developing world*, 16-20 October 1991; Ahmadu Bello University, Zaira, Nigeria
- Lau, E.H.L., (2013). *An investigation of the Role of QS in Infrastructure Projects*. Quantity Surveying Division, Hong Kong Institute of Surveyors. Research Report 2011-2012.
- Maarouf, R. & Habib, R. (2011). *Quantity Surveying Role in Construction Projects – a Comparison of Roles in*

- Sweden and the UK, Malmo University: Anders Peterson
- Male, S. (1999). Professional authority, power and emerging forms of the profession in quantity surveying. *Construction management and economics*, 8, 191-204
- Marsh, C., (2003) *Building Services Procurement*, Spon Press, London
- Mogbo, T. C. (1998), *Quantity Surveying in the Nigerian University System: A Pragmatic Approach for the New Millennium. The Quantity Surveyors* (27): 17-25.
- Moore, J.D. (2011). *Entering Construction Professionals: Survey of Work Values and Career Expectations*, Thesis submitted to the Department of Construction Management, Colorado State University.
- National Bureau of Statistics [NBS], (2015) *Nigerian Construction Sector: Summary Report; 2010-2012*.
- Nkado, R. and Meyer, T. (2001) 'Competencies of professional quantity surveyors: South African perspective', *Construction Management and Economics*, 19, 481-491
- Nkado, R.N. (2000), "Competencies of Professional Quantity Surveyors in a Developing Economy", available at <http://citeserx.ist.psu.edu/viewdoc/download?doi=10.1.1.199.1152&rep=rep1&type=pdf>, accessed 4th April, 2016
- Ogunsemi, D. R. (2004). Meeting the challenges of national development – A case for review of quantity surveying curriculum. Paper presented at the 21st biennial conference/general meeting on Adding Value to a Reforming Economy – Challenge for the Quantity Surveying Profession in Nigeria. Nigeria Institute of Quantity Surveyors
- Oke, A. E. (2006). Effect of quality of materials and workmanship on building collapse in Nigeria. An unpublished B.Tech thesis submitted to Department of Quantity Surveying, Federal University of Technology, Akure.
- Olanrewaju, A. & Anahwe, P.J. (2015). Duties and responsibilities of quantity surveyors in the procurement of building services engineering. *Creative Construction Conference*.
- Olusoga, J. R. (2006). Keynote address of a 2-day national seminar on Ethical issues and the challenges in construction professionals' service delivery. Nigerian Institute of Quantity Surveyors, Ondo state chapter.
- Opawole A., Awodele O.A., Babatunde S.O. & Awodele O.O. (2012), *Review of Correlation of Quantity Surveyors' Education in Nigeria to Skill Requirements for Administration of Civil Engineering Projects*. 109-111
- Opawole, A., Awodele, O. A., Babatunde, S. O., & Awodele, O. O. P. (2012). Review of Correlation of Quantity Surveyors' Education in Nigeria to Skill Requirements for Administration of Civil Engineering Projects. *Journal of Education and Practice*, 3(16), 109–118.
- PMI (2002). *Project Manager Competency Development Framework*, Pennsylvania, Newton Square: Project Management Institute.
- RICS (1971) *The future role of Quantity Surveyors*, London: Royal Institution of Chartered Surveyors
- RICS (1998) *The APC Requirement and Competencies*, London: Royal Institution of Chartered Surveyors
- Said, I., Shafiel., M.W.M., & Omran, A. (2010). "The competency requirements for Quantity Surveyors: Enhancing Continous Professional Development", available at <http://acta.fih.upt.ro/pdf/2010-3/ACTA-2010-3-16.pdf>, 2010, accessed 9th May 2014.
- Said, I., Shafiel., M.W.M., and Omran, A. (2010), "The competency requirements for Quantity Surveyors: Enhancing Continous Professional Development", available at <http://acta.fih.upt.ro/pdf/2010-3/ACTA-2010-3-16.pdf>, 2010, accessed 9th May, 2014
- Seeley, I. H.. (1993). *Civil Engineering Contract Administration and Control*. Second Edition, Macmillan, London.
- Senaratne, S. & Sabesan, S. (2008). Managing Knowledge as Quantity Surveyors: an Exploratory Case Study in Sri Lanka, *Built Environment-Sri Lanka* 8(2): 41-7
- Seppanen, V. (2002). Evolution of competence in software subcontracting projects. *International Journal of Project Management*, 20(2002), 155-164.
- Thayaparan M., Siriwardena M., Amaratunga D., Malalgoda C., & Keraminiyage K., (2011). Lifelong Learning and the Changing role of Quantity Surveyor Profession. 15th Pacific Association of Quantity Surveyors Congress.
- Wikipedia (2008). Quantity surveyor. Retrieved May 12, 2008, from <http://en.wikipedia.org/>