The Potentials of Life Cycle Management for Project Performance in the Building Industry: A Case of Public and Private Projects in Abuja, Nigeria

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Abstract

The building industry (BI) has been a persistent key player in the socio-economic development of countries. It provides employment and shelter to millions as well as operational infrastructure such as offices, schools and hospitals. The expansion of the Federal Capital Territory (FCT) Abuja as a new capital has attracted increased private and public investments in the BI. Issues of quality, costs, reliability and human and environmental safety have posed a challenge to the growth of the BI. These issues are linked to the processes in building production. Studies express concerns over issues of poor quality, high cost of buildings and longer duration before project completion that prevents the BI from successful project delivery. This study focused on the assessment of the potentials of Life Cycle Management (LCM) on project performance in the building industry in Abuja, Nigeria using a case study approach. The objectives of the study were to: examine policies/procedural framework within the BI; investigate how adoption of initial phase principles may affect project performance within the BI; examine how planning phase principles influence project performance within the BI; determine how implementation phase principles may influence project performance within the BI; and ascertain whether completion phase principles can improve project performance within the industry in Abuja, Nigeria. Data for this study was obtained from the archives of both private and the public sectors. Proportional Stratified Random and Purposive Sampling using questionnaires and interviews was employed to select six projects from project files for qualitative data analysis. Results show that policy and procedural frameworks are not fully adhered to as stated in the National Building Code. From the initial to completion phases, LCM principles have not been adequately applied leading to projects being delivered at high cost, while time and quality standards being compromised. The study recommends that LCM principles be adopted to improve project delivery according to time, cost and quality standards in the BI in Abuja, Nigeria.

Keywords: Building Industry, Life Cycle Management, Project Performance, Potential

INTRODUCTION

The Building Industry (BI) contributes to socio-economic development through the creation of employment, provision of shelter to millions, as well as provision of basic infrastructure. However, it is faced by many challenges especially in project delivery (Ofori, 2014). The Building Industry (BI) as a key employer in the global economy is saddled with challenges of project management due to its adaptation of traditional project management systems, which lead to its failure to deliver projects efficiently and effectively (Okereke, 2008; Idoro, 2014; Usman, 2015).

According to Daft (2010), project management is the attainment of organizational goals in an effective and efficient manner through planning, organizing, leading and controlling organizational resources. Kalu (1990) added that the growing complexity of the building industry calls for increased effectiveness in the planning and control of projects. However, construction methods use a range of traditional to modern techniques to meet client's needs based on global economic development. As a result of population explosion and continued demand for new types of buildings, there is the need for

professional practitioners who are versed in project management systems (Kamang, 1992 in Usman, 2006; Ofori, 2007) to display their ability and improve BI performance.

The success of any project depends on how effective the project management cycle is from start to finish. A major bottleneck facing the building industry is why projects are not being completed on time, at the budgeted cost and within specified standards. Chandra (2010) noted that building projects especially in the public sector compromise on quality, are not completed on time, and have cost overruns.

Project management is very important in the building industry - a sector which ranks very high among other sectors in terms of inter-sector linkages. The importance of this sector as an agent of development is enhanced by its ability to provide gainful employment for an increasing global population. According to Chandra (2010), "noticeable development and the aesthetic transformation of the environment is bound up with and predicated on the building industry". This industry is pivotal to the social and political integration of society and ranks high on development budgets (Nwachukwu, 2008; Kamau, Mireri & Usman, 2013). The building industry has proven to be the cornerstone of rapid economic growth for any nation (Usman, 2015).

A building project's success depends on the strategy adopted by the organization responsible for its implementation and execution (Gilbert & Jones, 2000; Cole & Lassorn, 2000). How a project is implemented and managed with respect to time, cost and quality, using the LCM principles, determines whether the project will ultimately succeed. In most cases, public and private building projects are hardly completed on time, within cost, or according to quality and material specifications. The Life Cycle Management concept was developed in the 1960s and early 70s for space programs, and was used during the construction of the Pyramids in Egypt and the Great Wall of China (Roberts & Wallace, 2004). The algorithm process of LCM was first introduced in Europe (Ofori, 1994) and from 1990 the LCM concept became popular in the building industry (Chih-Chiang *et al.,* 2006) across the globe and was used to enhance project delivery (Usman *et al*, 2014). LCM is a management process used in the building industry to enhance project delivery. Patel & Morris (1999) in Usman (2015) opined that LCM has four phases: initiation, planning, implementation and completion. Proper initiation is central to the overall construction process because it is the foundation of LCM and once it is not done correctly will affect the other processes. LCM has four phases: initiation, planning, implementation and completion. Proper initiation is central to the overall construction process because it is the foundation of LCM and once it is not done correctly will affect the other processes.

The initial phase include: identifying need, defining project size, and conducting the survey and approving funding plans. At the initial stage, clients need has to be made clear to contractors to enable them plan for the project very well. For example, carry out survey and environmental impact assessment to enable proper cost analysis. Once this is done, the planning phase would be easier. The planning phase is to enable contractors identify project activities, establish project objectives, design and specify building activities, choose a strategy, break the project to sub-units, determine performance standard, determine a proper sequence for building production, design cost estimates, determine personnel and material resources, and design the time/schedule. This is to improve on the issues of high cost and longer project duration before completion. The implementation phase is to properly execute project activities according to plan. The contractor mobilizes, commission project, procure, determine cash flow, and the determination of consultants/government agencies. Project decommissioning, auditing, preparation of a final report, handover of the facility to the client, reassignment of the project team, and project closure, is the final stage of project completion. The issues of quality, high cost and longer project duration will be minimized once the initiation, planning, implementation and completion stages are carefully followed.

Studies express concerns over issues of poor quality and the high cost of buildings as well as longer duration before project completion which prevent the building industry from successful project

delivery. Hence the gap of this study is to assess the potentials of life cycle management system on project performance in the building industry in Abuja, Nigeria.

METHODOLOGY

A case study can purposely be used to study a situation when the cases are systematically chosen (Guthrie, 2010). Guthrie (2010) revealed a high probability for the results of the case study to represent cases being studied. Similarly, the same size of the case study was obtained through purposive sampling from 24 project files of both private and public projects respectively. Three projects each were selected from both the private and the public sectors. Purposive sampling was used for the case study because the selected files have records that give quality information. The project files that have been well documented were selected. This means that these files have all the details of the contract and duly signed by the contractor and the client. Out of the 24 files, only 6 have all the information needed, while other files don't have all the document required that is why purposive sampling was applied.

Document analysis technique was used to obtain data on policy and procedural framework within the building industry. This is because the performances of the industry can only be found from records of projects executed. Semi-structured instruments in form of interview guide were also utilized.

The completed projects from the public and the private sectors were sampled from project files for comparison and analysis. To address the issue of performance using LCM requires the administration of questionnaires, conducting interviews and project case studies (McNabb, 2009). The number of registered professionals was retrieved from their respective registration offices.

Documentary analysis on three completed projects from both public and private sectors were carried out to establish the influence of LCM principles on quality, time and cost overruns. Purposive sampling was used to pick those files that contain complete documents for the purpose of quality analysis. The aim was to find out how these projects were carried out and whether LCM principles were used in the process of building construction. For the public sector, the Federal Ministry of Housing and Environment were relied upon, and for the private sector, private construction firms were the focus.

Case Study

Case study method is one of the popular approaches used in getting information for a particular study (McNabb, 2009; Usman, 2015). It is a narrative event that constitute or leads to a decision (Stein, 1952 in McNabb, 2009). However, Guthrei (2010) observed that project evaluations have case study characteristics. He added, they usually analyze the entire activity of a project especially documents records and interviews. Yeaser (1989) defined case study as a description of a management situation based on interview, archival, naturalistic observation and other data deemed sensitive to the context in which management behaviour takes place. Case studies are often intensive studies of events or processes in making a decision (Lang and Heiss, 1990; McNabb, 2009).

According to McNabb (2009), an appropriate research method when some noteworthy success or failure in a case is contemporaneous. He added that a qualitative case study usually address programs directed towards individualized results. McNabb (2009) buttressed that a subject selected as a case study is chosen for study because it exposes some fundamental truths.

RESULTS AND ANALYSIS

Policies and Procedural Framework

Table 1 shows the effect and influence of project performance with regards to time and cost from analysis obtained from six project files. The analysis indicated that little delay has serious implications

on time and cost overruns. The analysis indicates that most projects were completed at a sum and period higher than planned. For instance, public projects CS2, CS5 and CS6 (Table 2) were completed at ₦425.41 million, ₦234.72 million and ₦150.15 million as against the initial cost ₦413.82 million, ₦221.44 million and ₦129.49 million respectively. The three projects (CS2, CS5 and CS6) were completed 40, 46 and 36 months higher than scheduled. One could wonder why these variations exist and may ask how well the policies are implemented and strictly followed.

Table 1: Case Study Projects

Project	Sector	Type
CS1	Private	Classroom Block
CS2	Public	Housing Estate
CS3	Private	Commercial Building
CS4	Private	Housing Estate
CS5	Public	Four Storey Office Block
CS6	Public	Secondary School Laboratory

Field Survey, 2013

According to Gupta (2010), policy is a basic precept, which guides project team actions and defines the authority and the respective relationships required to accomplish the objectives of the BI. Procedural framework is a series of logical steps by which all respective building processes are initiated, performed, controlled and finalized and it establishes the required action, who acts, and when the action is to take place (Gupta, 2010). This scenario was completely absent in the BI in Abuja. The issues of quality, cost, and time overruns are evidenced by the incessant collapses and failures of buildings (Jambol, 2012).

Table 2: Case Study Analysis of some Completed Projects

Project	**Initial Period (Months)**	**Final Period (Months)**	**Period Variation (Months)**	**Initial Cost (million ₦)**	**Final Cost (million ₦)**	**Cost Variation (million ₦)**	**Sector**
CS1	**28**	**60**	**32**	**333.79**	**334.41**	**0.62**	**Private**
CS2	**24**	**64**	**40**	**413.82**	**425.41**	**11.59**	**Public**
CS3	**26**	**47**	**21**	**179.82**	**180.35**	**0.53**	**Private**
CS4	**24**	**56**	**32**	**163.22**	**165.60**	**2.38**	**Private**
CS5	**30**	**76**	**46**	**221.44**	**234.72**	**13.28**	**Public**
CS6	**28**	**64**	**36**	**129.49**	**150.15**	**20.66**	**Public**

Source: Field Survey, 2013

i) Environmental Impact Assessment

The study revealed that projects CS1, CS2 and CS4 carried out Environmental Impact Assessment (EIA), while in projects CS3, CS5 and CS6 EIA were not conducted. According to National Building Code (NBC), EIA is mandatory at the beginning of any project in the building industry (FRN, 2006). From the findings, projects that did not conduct EIA were found to engage in unethical practices at expense of the project policy procedures to make money. The unethical practices constitutes compromising standards to make more gains as a result of bribery and corruption. This is a form of corruption in the BI. EIA help in the cost analysis of a project, but in practice it is hardly done and this affect project delivery.

ii) Approvals

According to the National Building Code, projects approvals should not take more than three months (FRN, 2006). In spite of this, projects CS1, CS2, CS3, CS4, CS5 and CS6 were approved after 10, 12, 14, 8, 15 and 18 months respectively. The delays were caused by lack of design compliance and other statutory requirements like recommendations from ward and village heads. These delays cause time and cost overruns. The prices of materials have also increased due to the petroleum crisis in the last ten decade and the cost of labour is also high. Delays also increase the rate of corruption, especially with public projects.

It is a policy that once a project is approved, contractors should mobilize to site within three months (FRN, 2006). However, only project CS1 met this standard; whereas, projects CS2 took seven, CS3 six months, CS4 four months, CS5 eight months, and CS6 nine months respectively. The implication is that projects have longer duration and this affect the cost of project.

iii) Project Commissioning and Decommissioning

In the same vein, projects CS2, CS3 and CS5 were commissioned, while, projects CS1, CS4 and CS6 were not. The statutory requirement demands that all projects must be commissioned at the takeoff (FRN, 2006). It was discovered that projects CS1 applied direct labour and CS4 and CS6 contracts were not awarded based on merit. This scenario creates unethical professional practice, which affects time, cost and quality standards of the project.

Besides, projects are supposed to be decommissioned after completion; but from the findings, no singled project was decommissioned. Since the projects were not commissioned in the first place, they could not be decommissioned. This affect the supervision of the projects and the contractors abuse the opportunity by compromising standard. Thus, the non- compliance results in delay, high cost and time overruns. It is therefore, a clear indication under such conditions that projects cannot be delivered. The BI is engulfing with corruption (Idoro, 2014), bureaucracy, and unethical professional practice (Usman *et al*, 2012), non- adherence to regulations and policies, and ineffective monitoring and supervision (Gollenbeck, 2008; Aniekwu & Audu, 2010).

From the above discussion, it implies that the more the delay, the higher the duration of the project, and the higher the cost, which is an impediment to project performance. However, the analysis shows that private projects are better managed than public projects. This is because the private firms fear been outhouse from practice and tries to maintain standard. Ofori (1994b) opined that the BI could not perform due to wrong policy adoption, inappropriate policies and non-compliance to correct policy/procedural frameworks. He suggests that a long-term strategy for the BI should be developed, continuously synchronized, coordinated and monitored. This will ensure project delivery.

The study therefore established that project performance depends on how well the policy measures and procedural framework are adhered to. Though policy measures and procedural frameworks exist within the building industry, they are minimally complied with. This could be accounted for incessant collapse of buildings, project abandonment and lack of timely delivery (Idoro, 2014; Ofori, 2014). Perhaps that is why projects are rarely completed within quality standards, cost and on time.

Initial Phase Principles

The initial phase is the beginning of the project execution. Once the initial phase is carried out correctly, it enhances project performance.

i) Scope

The scope is a project's span of work. Time, cost and quality are the characteristics of work. These are used to control variations within a specific limit. Since work has to be controlled and directed towards completion, no lapse at this end is acceptable (Gupta, 2010). However, the scope of projects CS3, CS4 and CS5 were found to have increased due to project variations and design alterations. Invariably this affected time, cost and quality of the building projects.

ii) Project Brief

The project brief is a mechanism of the project initiation phase in the form of either a standard document, or a specific document. It contains a set of instructions, information and a letter authorizing the use of internal and external resources to a certain limit. From the case study analysis, only project CS2 meets the requirements. This shows the non-compliance of the BI, which inevitably leads to its underperformance.

iii) Goal and Objectives

The BI is expected to set a goal and objectives for every project so as to guide the industry towards achieving results. Though projects CS1 to CS6 have goals and objectives, the level of performance was below expectations, and the outcome was not effective. This is why all the projects were not delivered according to time, cost and quality standards; and this could be accountable by cheap labour whereby the contractors were trying to make more gains (Ike, 2012; Ekundayo *et al*, 2013).This cause delay in the feasibility and vitality of the projects. According to Daft (2010) and Gupta (2010), these objectives should be identified where performance and results are expected because it directly affects the survival of the building processes.

iv) Environmental Impact Assessment (EIA)

The EIA is the conduct of feasibly and viability of a project to be carried in the BI. EIA is mandatory for every building project within the BI. For instance, projects CS1, CS2 and CS4 carried out Environmental Impact Assessment, while projects CS3, CS5 and CS6 were not conducted. According to National Building Code (NBC), EIA is mandatory for any project in the building industry (FRN, 2006).

Planning Phase Principles

The planning phase principle is the second stage of the activities of a project. It is used in improving project delivery as enumerated:

i) Design and Drawings

For instance, National Building Code specifies that drawings and specifications, which are prepared by architects in the Urban Development Planning Unit, be approved within three months once the required standards are met. Consider the following projects CS2 (Housing Estate), CS3 (Commercial), CS5 (Four Storey office Block) and CS6 (Secondary School Laboratory blocks) respectively. For example, project CS2 took nine months to be approved, project CS3 five months, project CS5 six months and project CS6 seven months as against three months respectively.

ii) Budget and Schedule

Table 1 shows the influence of planning on project performance of time, cost and quality standard. The analysis indicated that little delay has serious implications on time and cost overruns. The results revealed that most projects were completed at a sum of money, and period higher than planned. For instance, public projects CS2, CS5 and CS6 (Table 2) were completed at ₦425.41 million, ₦234.72 million and ₦150.15 million as against the initial budget of ₦413.82 million, ₦221.44 million and ₦129.49 million respectively. These projects were completed at a period of 40, 46 and 36 months higher than scheduled.

iii) Planning

A project involves a large number of activities. Constraints and resources cannot be visualized easily hence, the projects demands for formal planning and scheduling (Gupta, 2010). Gupta added that for planning, the question is what is to be done? And who is to do it? However, for scheduling, when is to be done? And how is to be done? These are planning principles that were lacking in the BI as per the results of case study projects. For instance, project activities were not listed at the planning phase, there was no clear sequence of activities to be taken up, as well as date and time for the finish of each activity were not clear. The study revealed that the planning phase principles were not followed.

iv) Determination and Appointment of Personnel

This is a process of identifying prospective personnel, stimulating and encouraging human resources in a building firm. In determining the personnel selection, the objectives provide a framework of implementation of programme in the form of procedures (Gupta, 2010). This functional related issue was only practiced with projects CS2 and CS4.

The BI in Abuja is blamed for its inefficiency in recruiting the right personnel to execute projects (Usman *et al*, 2012). Gupta identified remuneration and expenses of trainees and trainers; preparing and maintaining training programs, materials, equipment and premises; and lower efficiency of trainees until fully trained. Lack of proper appointment of personnel, however, affect cost and time overruns of projects.

v) Health and Safety

Health and safety is an important aspect of any building project. The concept of health and safety is necessary because of its importance in saving lives and property. This study revealed that in projects CS1 to CS6, none prepare health and safety documents. Yet according to the National Building Code 2006, health and safety provisions are mandatory for every building project. Studies have shown that the ratio of health and safety in UK have estimated to be 15:1 by local authority, while in New Zealand it was estimated to be 20:1 and in Denmark the ratio is an average of 25:1 (Osita, 2013).

Considering the cost of the loss of lives and properties during and after construction of buildings; it is necessary that health and safety provision be made at all the stages of building construction. Bubshait and Almohawis (1994) in Alzahrani and Emsley (2013) define health and safety as the degree to which the general conditions promote the completion of a project without major accidents or injuries. The issue of safety is mostly associated with building processes as most accidents occur during this stage. In the same way, Attala *et al* (2003) identified quality and safety as crucial aspects of successful project delivery. Similar studies show that the BI has long been known to lag behind industries in terms of health and safety (Alzahrani & Emsley, 2012; Choudhry *et al*, 2008).

Implementation Phase Principle

The implementation principle is the third segment of the LCM.

i) Mobilization to Site

Implementation phase is crucial in project delivery. Mobilization to site is a part in the implementation process. The NBC stipulates that within three months of approval, contractors should mobilize to site. However, in the case study, only project CS1 was mobilized to site within three months after approval. Whereas, projects CS2, CS3, CS4, CS5, and CS6 were mobilized after 7, 6, 4, 8 and 9 months respectively (Table 2). This delay impacted on time by extending the duration of the project schedule. The costs of these projects were found to be higher than planned. The factors that were associated with the poor implementation process include lack of release of mobilization fee on time, lack of cash flow, inadequate manpower, inadequate materials, and non-adherence to construction plan, non-compliance to budgetary provisions, inadequate allocation of resources to project activities, poor monitoring and supervision among other things.

ii) Project Commissioning

Project commissioning is another issue in the implementation phase principles. For instance, projects CS1, CS3 and CS5 were commissioned while; projects CS2, CS4 and CS6 were not. Yet the NBC states clearly that all projects must be commissioned before takeoff (Federal Republic of Nigeria, 2006). It was also discovered that projects CS2, CS4 and CS6 were not commissioned because of lack of approval due to major contract variations and non-compliance to building regulations.

iii) Allocation of Resources

In order to carry out building processes, it is necessary to determine the activities required and allocate the resources logically into specific project activities. Allocation of resources involves scheduling, budgeting, assigning tasks to subordinates and giving authorization. From the findings, projects CS1 and CS2 were found to have more gravel than cement and sand, while CS3 and CS5 had wet concrete left over during the concreting processes. However, CS4 and CS5 had redundant laborers at the concreting process due to the delay in formwork preparation. This misallocation of resources has led

to delays, which in turn affect cost, time and quality of the project. Therefore, the right resources should be allocated to the right activity at the right time in building processes for project delivery.

iv) Coordination

Project coordination is required to achieve project delivery. This can be achieved through effective communication; regular site meetings and clear span of control in the building processes. For instance, the issues of wastages of gravels by CS1 and CS2; wet concrete by CS3 and CS5; and redundant personnel as revealed by CS4 and CS5 were purely as result of poor coordination.

v) Organizing

Organization involves those activities of the building processes performed according to task, authority and responsibility. This is a framework that includes personnel, task, material resources and performance according to the BI project goals. Gupta (2010), asserts that organizing include defining the nature and content of each job in the building industry; setting the base for grouping the project activities together; deciding the size of the project team and delegating authority to assigned supervisors. This is lacking in the Nigerian BI. Studies by Ekundayo *et al.* (2013) revealed that the BI in Nigeria face challenges of project organization and supervision at the implementation phase.

Completion Phase Principles

Completion phase principles comprise the last stage of the LCM process. It is the closure of project activities.

i) Project auditing

Project auditing is a combination of building analysis and systems survey to determine the effectiveness of project operating functions. Proper auditing was not carried out due to bureaucracy and politics in government. There is political interest so due process was not observed. The factors that could account for the poor completion process include lack of proper monitoring and control, lack of cash flow, inadequate manpower, inadequate materials, and non-adherence to construction plan, non-compliance to budgetary provisions, and poor allocation of resources to project activities, poor implementation and lack of skilled labour among others. Another challenge is project decommissioning. For instance in Table 2, projects CS1, CS3 and CS5 were commissioned while; projects CS2, CS4 and CS6 were not. Yet the NBC states clearly that all projects must be commissioned before takeoff (Federal Republic of Nigeria, 2006).

It was also discovered that projects CS2, CS4 and CS6 were not commissioned because of lack of approval due to major contract variations. So these projects cannot be decommissioned because they was not commissioned in the first place and lacked statutory requirements. This is an example of the corruption and unethical practices in the building industry.

ii) Project Handover

Project handover marks the end of a project. At the completion phase, machines and equipment are handed over to the operation management by the project management department. However, the operation personnel begin working with the project management personnel as soon as plants get closer to the operational stage. This was not the case with projects CS1, CS3, CS4, CS5 and CS6; the plant was not handed over completely in one installment. By implication, this has affected time, increased cost and quality standards.

The study therefore established that project performance depends on how effective the adoption of completion phase principle is. Completion phase principles do improve project performance within the building industry; but in Nigeria most projects are not completed on time, according to budget (Jambol, 2012). Projects are completed with high cost and time overrun due to lack of proper completion phase principles; as a result, project are rarely completed within quality standards, cost and time schedules.

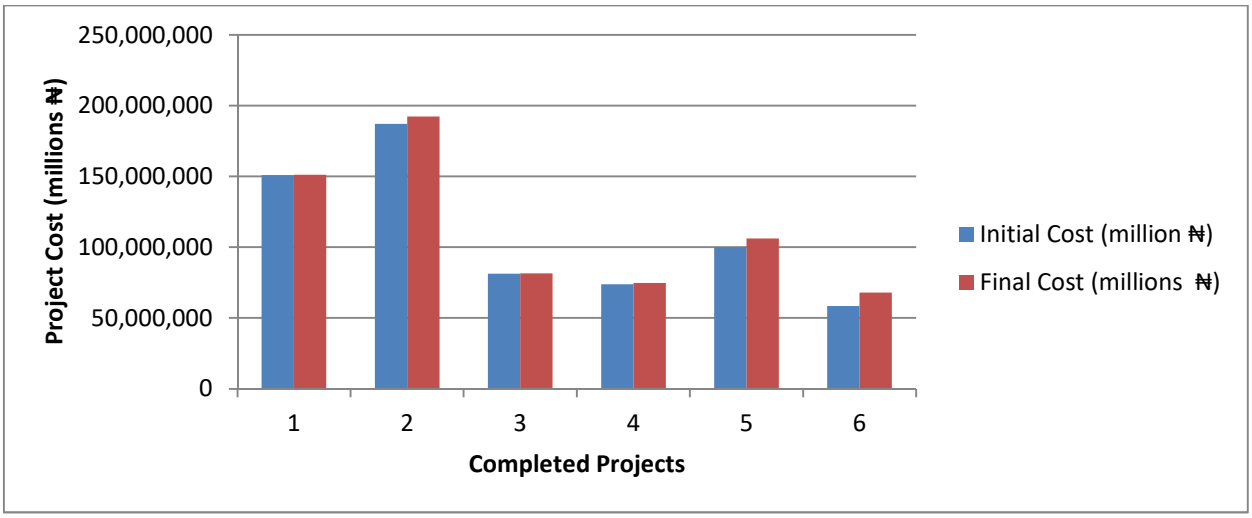

Figure 1: Project Cost. Source: Field Study, 2013

The analysis (Figure 1 and Figure 2) has indicated that delay has serious implications on time and cost overruns. The analysis indicates that most projects were completed at an amount of money and period higher than planned. For instance, public projects CS2, CS5 and CS6 (Table 2; Figure.1 and Figure. 2) were completed at ₦425.41million, ₦234.72 million and ₦129.49 million as against ₦413.82 million, ₦221.44 million and ₦129.49 million respectively.

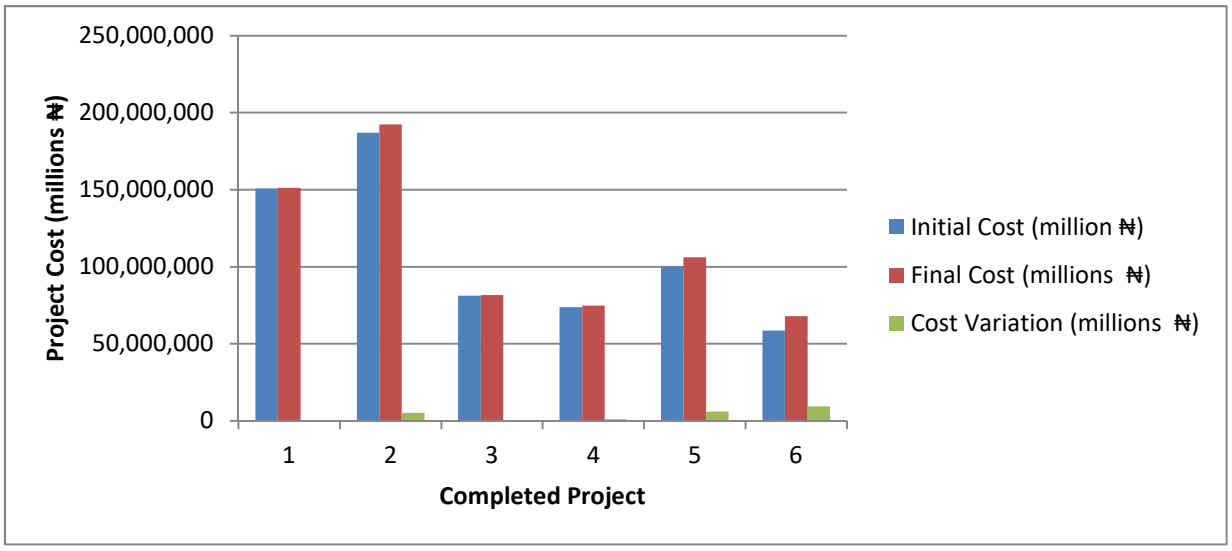

Figure 2: Project Cost and Variation. Source: Field Survey, 2013

These projects were completed within a period of 40, 46 and 36 months higher than scheduled. Another is conducting statutory assessments such as Environmental Impact and Assessment. It was established that projects CS1, CS2 and CS4 carried out Environmental Impact Assessment, while projects CS3, CS5 and CS6 did not. According to National Building Code (NBC), EIA is mandatory for any project in the building industry (FRN, 2006). Equally projects approvals should not be more than three months as per the regulatory requirements (FRN, 2006). In spite of this, projects CS1, CS2, CS3, CS4, and CS6 were approved after 10, 12, 14, 8, 15 and 18 months respectively (Table 2; Figure 3 and Figure 4 respectively).

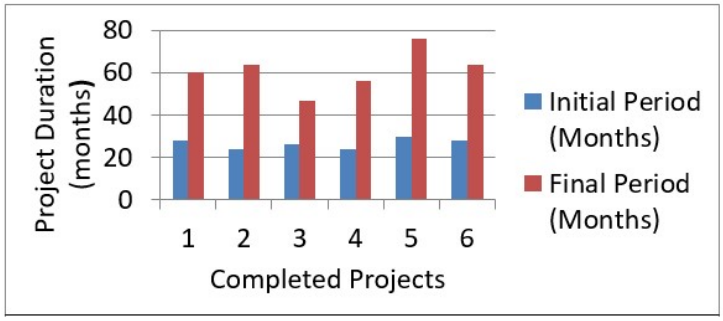

Figure 3: Project Duration. Source: Field Survey, 2013

This delay caused time and cost overruns. The price of materials increases due to inflation especially during the petroleum crisis. The cost of labour also increased.

It is a policy that once project is approved, contractors should mobilize to site within three months (FRN, 2006). However, only project CS1 (Table 2) met this standard; whereas, projects CS2 took seven months, CS3 six months, CS4 four months, CS5 eight months and CS6 nine months respectively. In the same vein, projects CS2, CS3 and CS5 were commissioned, while, projects CS1, CS4 and CS5 were not commissioned. The statutory requirement demands that all projects must be commissioned at takeoff (FRN, 2006).

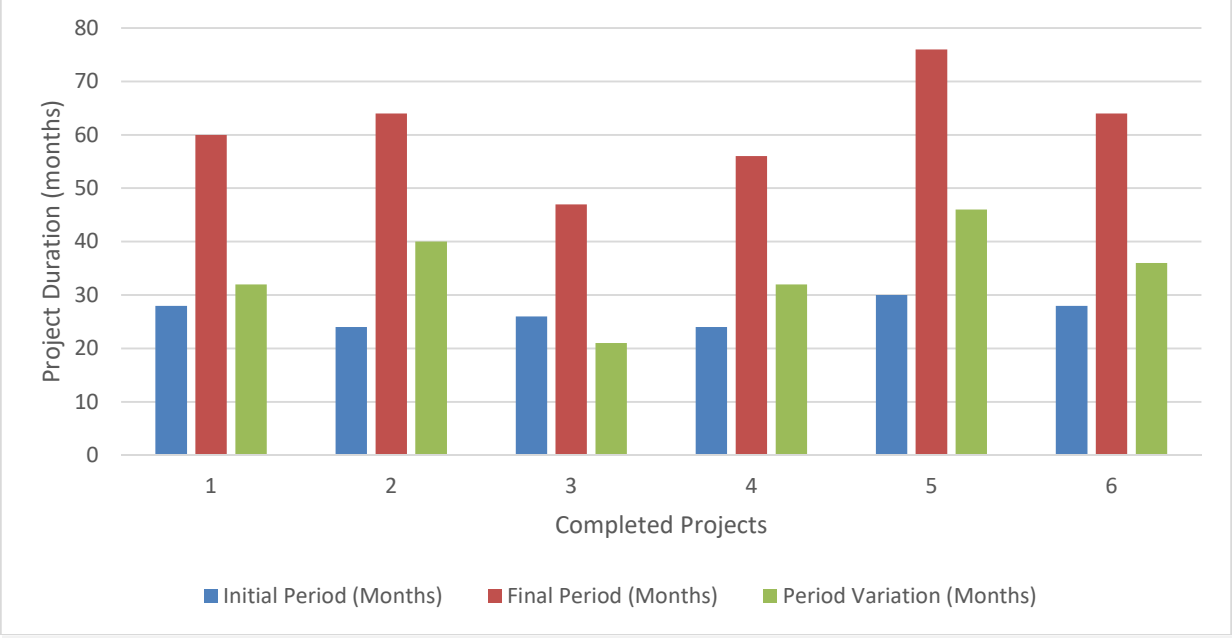

Figure 4: Project Duration and Variation. Source: Field Survey, 2013

These findings (Figure 4) indicate that policy/procedural frameworks are significant factors in enhancing project performance within the building industry in Abuja. These policies/procedural frameworks must be implemented as planned in order to deliver projects successfully. These findings are similar with other research findings that in Nigeria building regulations are not adhered to; and policies are poorly implemented especially in the building industry (Jambol, 2012; Ike, 2012, Idoro, 2014; Ofori, 2014; Usman *et al.*, 2010)

CONCLUSION

This study found that little delays have serious implications on time and cost overruns, which eventually affects quality standards. For instance, public projects CS2, CS5 and CS6 (Table 2) were completed at ₦425.41 million, ₦234.72 million and ₦150.15 million as against the initial cost of

₦413.82 million, ₦221.44 million and ₦129.49 million respectively. These projects were completed at a period of 40, 46 and 36 months higher than scheduled. The findings indicate that the adoption of completion phase principles is important for project performance. From the analysis, completion phase principles must therefore be taken into account for improvement of project performance, service delivery, costing and time saving to complete a project.

The study establishes that policies and procedural frameworks are useful as a guide to achieving effective project delivery. However, project developers do not adhere to these guidelines as stated in the National Building Code. To achieve better project performance, policies and procedural frameworks must be strictly followed. The study therefore established that project performance depends on how well the initial phase principles are adopted. It revealed that the initial phase is central to overall successful project performance and it is not done correctly it will have adverse effect on the other process which may lead to failure.

The adoption of LCM planning phase principles is central to overall project performance, so by not applying they may negatively affect project performance. For instance, if health and safety factor is not adequately addressed, the project might face litigation charges from environmentalists and public health officials. Although the implementation phase is vital in project processes, it was observed that this important step is not properly adopted due to bureaucracies, poor allocation of resources, lack of competent personnel, poor supervision, monitoring and control and unethical professional practices. This could be as a result of improper initiation, planning, implementation and poor service delivery. Therefore, projects are completed with high cost and time overruns due to lack of proper implementation.

In conclusion, right from the initiation to completion phases, project processes have been faulty which led to building collapses abandonments and delays in project delivery. All the projects studied, were completed at a higher cost and time overrun. LCM principles have not been fully applied in project delivery in Abuja, Nigeria. The BI is unable to deliver projects effectively and efficiently due to poor project management, inadequate planning, costly project execution which leads to abandoned or non-functional facilities and collapsed buildings

Recommendations

The study has established that the building industry in Abuja, Nigeria could not deliver projects efficiently and effectively. The Study found that issue of poor quality and the high cost of buildings as well as longer duration before project completion which prevents the BI from successful project delivery.

Based on the findings of this study, the following recommendations are made to help in the improvement of project delivery in Abuja. There is the need for Federal Government to review the implementation act for best practices in the building industry. The building Industry should improve the level of Adoption of LCM principles for enhanced project performance. Monitoring and supervision mechanisms need to be intensified by the 3-tiers of Government and the professional bodies. Professional bodies and the Federal Government should ensure continuous capacity building in order to improve project compliance. The professional bodies should put appropriate regulations and measures to punish erring professionals for any unethical practices in the building industry.

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