Project Management Theory Exploration for Indigenous Contractors' Project Planning in Nigeria

Inuwa, I.I
Department of Quantity Surveying
Faculty of Environmental Technology (FET)
Abubakar Tafawa Balewa University (ATBU)
Bauchi-Nigeria

Kunya, S.U.
Department of Building Technology
Faculty of Environmental Technology (FET)
Abubakar Tafawa Balewa University (ATBU)
Bauchi-Nigeria

Abstract

Several studies attribute Nigerian Indigenous Contractors (NICs) poor performance to inadequate project planning due to the adoption of a non-project (traditional) management approach despite its shortcoming. This study explored how project management theory can be applied by NICs to curb poor project planning. Exploratory design was employed as a stand-alone design through literature review. The exploration reveals that project management theory can be applied by NICs to: enhance experience through the Transformation Flow Value (TFV) concept; improve cost and time performance through the control model; appropriately apply planning techniques using the concept of management-as-planning; mitigate project planning challenges using the control model; identify factors that can significantly influence project planning using the concept of management-as-planning; achieve project planning success through the adherence to project planning success indicators using the control model. The study recommends NICs to: adopt project management approach and, train their workforceon the application of project management.

Keywords: Indigenous contractors; Nigeria; project management theory; project planning; traditional management

1.0 Introduction

The construction industry is considered one of the oldest industries organized on a project basis (Chitkara, 2012; Roberts & Wallace, 2004). Well known examples are the Egyptian pyramids (3rd millennium B.C.) and the aqueducts carrying water to cities and industrial sites that were constructed in Rome in 312 B.C. (Chitkara, 2012; Gollenbeck, 2009; Ireland, 2006). One thing that is common to all these historic structures is the planning, organizing, coordinating and controlling of both human and material resources for the sole aim of realizing the projects. Though it was not until the 1950s when project management was developed as a profession in the United States, and since then other developed (UK, Japan, China, etc.)and some developing (Malaysia, South Africa, India, etc.) economies have for long recognized it as an independent and efficient way to achieve project goals and objectives (Ekundayo, *et al.*, 2013; Chitkara, 2012; Roberts & Wallace, 2004).Hence, the business world has come to recognize the importance of project management for the future as well as the present(Kerzner, 2000, p. 2). Project management according to Lewis (2007, p. 4), is the application of knowledge, skills, tools and techniques to project activities to achieve project requirements. It is accomplished through the application and integration of the project management processes of initiating, planning, executing, monitoring and controlling, and closing (Lewis, 2007, p. 4).

Despite the acknowledged benefits reaped by the developed and some developing economies in the application of project management approach, the traditional management approach where the project coordinator performs the managerial functions in addition to their core or technical duties, is still the norm in Nigeria(Inuwa, 2014; Ekundayo, *et al*., 2013). In the traditional management approach, the project coordinator, usually an architect or an engineer, performs the role of a project manager but in limited capacity as the overall responsibility and management rest with the client (figure 1). This arrangement gives the project coordinator little authority in decision making as he is only concerned with the communication and coordination of the construction aspect of the project (Ekundayo, *et al*., 2013; Kerzner, 2000). Under the traditional management approach, work flowis arranged vertically, and it becomes difficult for extensive planning and coordination to take place. This arrangement gives little opportunity to workers to work with other functional areas (Kerzner, 2000). Whereas the project management approach allows the arrangement of work flow and project coordination horizontally and vertically (figure 2), thus resulting in extensive planning and coordination (Kerzner, 2000). In addition, the project management approach, enables work to be organized across the various functional groups that work with each other. This according to Kerzner (2000) results in improved coordination and communication among employees and managers; it also generates productivity, efficiency, and effectiveness.

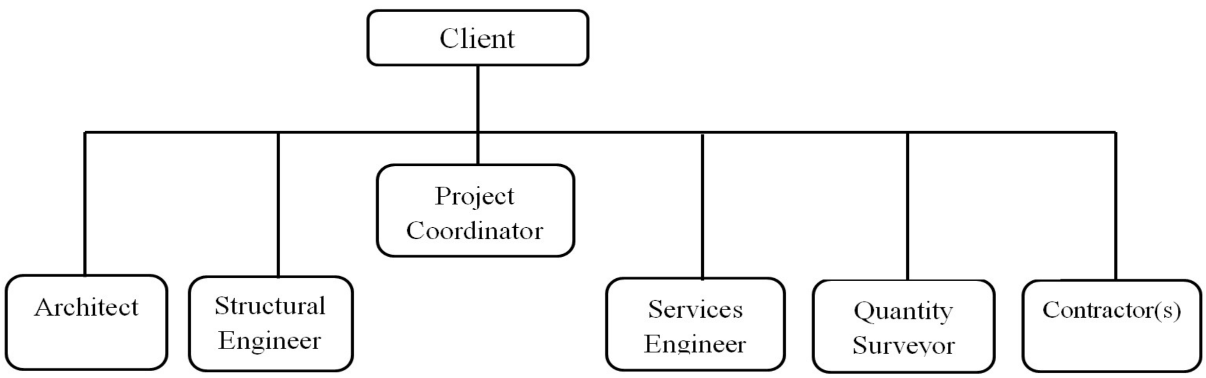

Figure 1: Traditional Management Structure (Ekundayo, *et al.*, 2013)

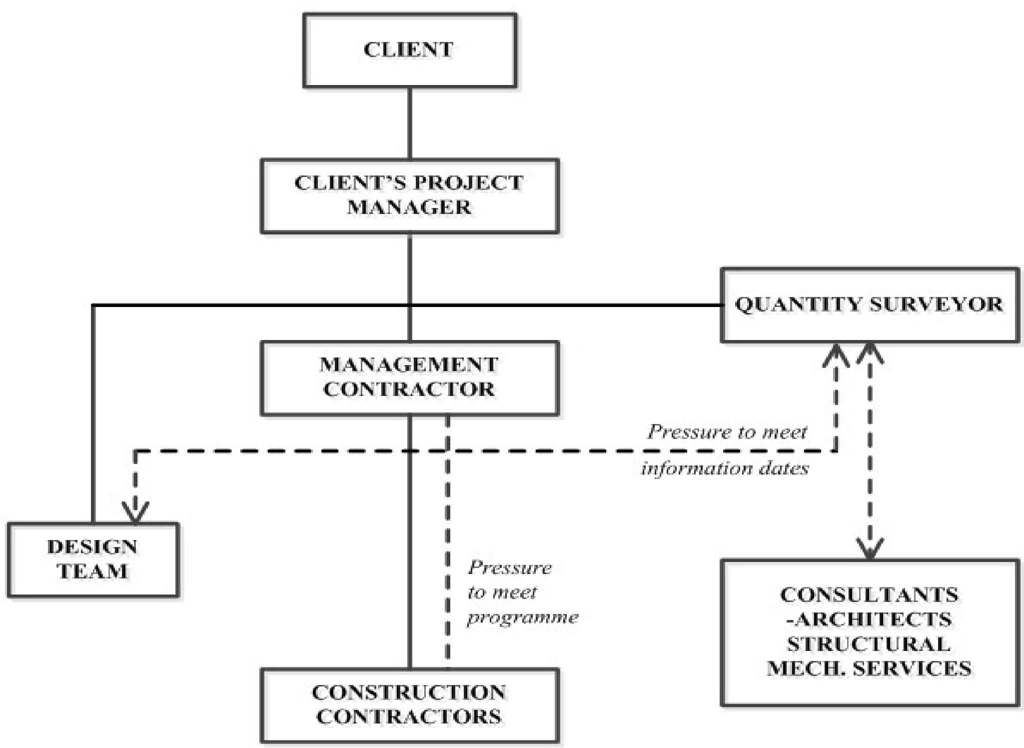

Figure 2: Project Management Structure (Ekundayo, *et al.*, 2013)

The consequences of non-project management approach adoption in the Nigerian construction industry according to several studies are responsible for the NICs poor project performance, consequently impairing the growth of the Nigerian economy (Inuwa, 2014; Idoro, 2012; Aniekwu & Audu, 2010; Bala, *et al*., 2009). NICs are contracting firms that are fully-owned and managed by Nigerians (Idoro & Akande-Subar, 2008); the nationality of the firms' ownership and management is exclusively Nigerian. Most frequently the comparison of the performances of foreign and indigenous firms is of concern to many researchers in the NCI (Inuwa, 2014; Aniekwu & Audu, 2010;Idoro & Akande-Subar, 2008;Muazu & Bustani, 2004). While few are of the opinion that the NICs are performing(Ibrahim, 2012; Uduak, 2006), many are of contrary opinion (Inuwa, 2014;Odediran, *et al*., 2012; Aniekwu & Audu, 2010; Muazu & Bustani, 2004; Bala, *et al*., 2009; Achuenu, *et al*., 2000; Adams, 1997).

According to Inuwa (2014), the NICs project performance shortfall emanates from: inexperience, incompetence, inappropriate planning techniques application, planning challenges, inadequate understanding of influencing factors for project planning, and poor understanding of project planning success indicators. Alzahrani and Emsley (2013), and Yimam (2011) affirmed that contractors' successful delivery of a project depends on their project management capability. In an attempt to address the NICs project performance shortfall, this study explored how project management theory can be applied by NICs to curb poor project operational planning for better project performance. In this light, the research objectives areto explain how project management theory can be applied by NICs to:

- enhance experience in project procurement systems
- curb poor project cost and time performance
- appropriately apply planning techniques in project operational planning
- curtail project planning challenges
- identify and adhere to factors that can significantly influence project planning
- adhere to project operational planning success indicators

1.1 Research Questions

In order to address the objectives raised in this research, the following research questions were proposed:

- How can NICs apply project management theory to enhance their experience in project procurement systems?
- How can NICs apply project management theory to curb poor project cost and time performance?
- How can NICs apply project management theory to appropriately applyplanning techniques in project operational planning?
- How can NICs apply project management theory to curtail project planning challenges?
- How can NICs apply project management theory to identify and adhere to factors that can significantly influence project planning?
- How can NICs apply project management theory to adhere to project operational planning success indicators?

This research used exploratory research design. An exploratiorydesign according to McNabb (2009, p134), is conducted for either one or two purposes: a preparatory examination of an issue for gaining insights, or for gathering information for immediate application to an administrative or a management problem. In most cases exploratory design seldom exist as a stand-alone design because of its limited scope; however, it can be used as a stand-alone design when it is used to provide information for administrative/management decision making (McNabb, 2009). Hence, exploratory design was employedas a stand-alone design to provide information for NICs organizations management decision on project planning in relation to project management adoption.Literature review according to McNabb (2009) is one of the most effective data gathering tool used in exploratory design. Hence, literature review was used to: conduct an initial inquiry to gain insights and ideas about the NICs project planning problemsand the variables and issues associated with the problems;summarize project management theory in relation to NICs project planning problems; and apply project management theory model in suggesting steps in solving the NICs project planning problems (Inuwa, 2014; APA, 2013). This research is delimited to contractors' operational planning at the post-contract stage of a building project. Operations here(Inuwa, 2014), refer to any activities or tasks a contractor is expected to accomplish in his contractual obligation in any type of construction procurement system.

3.0 Theoretical Construct

This study is modelled on the theory of project management. Construction, according to Ireland (2006), may have been the seed for developing project management. Artefacts dating back nearly 5000 years reveals the application of project management in the delivering of great construction works of history: pyramids, Great Wall of China, and Roman roads and aqueducts (Chitkara, 2012; Ireland, 2006; Roberts & Wallace, 2004). Project management as a discipline according to Chitkara (2012, p.39), originated with the development of CPM/PERT planning techniques in the early sixties, when the volume and complexity of tasks increased, especially in construction, aerospace and defence projects.

Kerzner (2000) affirmed that the understanding of project management begins with the recognition of what a project is. A project according him, is an endeavor that has a definable objective, consumes resources, and operates under time, cost, and quality constraints. A project he affirms, comes with a challenge in managing activities that have never been attempted in the past and may never be repeated in the future. With the understanding of project in mind, Kerzner (2000) defined project management as the planning, scheduling, and controlling of a series of integrated tasks such that the objectives of a project are achieved successfully and in the best interest of the project stakeholders. John and Herman (2008) cited in Abdulrazaq and Ahmad (2011,p.2) described project management as a composition of organization, structure, information processing, practice and procedure that permit integration of all project element-tasks, resources, information, stakeholders, etc.Gupta (2010), and Weiss and Wysocki (1992) reported that the development of project management theory bears its origin from the principles of general management. Though in prior literature according to Koskela and Howell (2002a, p.) it has been acknowledged that there is no explicit theory of project management. Nonetheless, Koskela and Howell (2002a) argued that it is possible to precisely point out the underlying theoretical foundation of project management as advocated in the Project Management Body of Knowledge (PMBOK) by the Projects Management Institute (PMI) and that is mostly applied in practice. This foundation according to Koskela and Howell (2002a), can be divided into a theory of project and a theory of management (Table 1).

Table 1: Theoretical Foundation of Project Management

Subject of Theory		Relevant Theory
1. **Project**		Transformation
		Flow
		Value generation
2. **Management**	Planning	Management-as-planning
		Management-as-organizing
	Execution	Classical communication theory
		Language/action perspective
	Control	Thermostat model
		Scientific experimentation model

Source: Koskela and Howell (2002b)

3.1 The Theory of Project

The theory of project is modelled from the theory of production derived from the manufacturing industry and it is built on three concepts (Kraemer, *et al*., 2014; Rooke, *et al*., 2012): transformation, flow, and value. The theory modelled the project realization process as a conversion (transformation) process that passes through a flow (watse elimination and efficiency improvement), and value matching to customer requirements (customer requirements integration) (Rooke, *et al*., 2012). Consequently (Kraemer, *et al*., 2014; Rooke, *et al*., 2012), it is referred to as the transformation-flow-value (TFV) theory.

Transformation

According to Koskela and Howell (2002a) the end product of a project passes through a transformation of inputs to ouputs in its production operations. This transformation (Knoepfel, 1992) produces an end product that is a new system or a new state of an existing system, which is more satisfying than the initial preproject situation. The total transformation path of a project can be decomposed into manageable and well-understood sub-tansformations and tasks (Koskela & Howell, 2002b). Hence, a project can be realized in an optimal manner and the tasks in optimal sequence (Koskela & Howell, 2002b).

The correlation here, according to Koskela and Howell (2002b), is that project performance can be enhanced by improving the tasks and its sequence. The assumptions behind the concept of transformation path (Koskela & Howell, 2002b)of a project is that:

I. Tasks are independent, except sequential relationships
II. Tasks are discrete and bounded
III. Uncertainty as to requirements and tasks are low
IV. All work is captured by top-down decomposition of the total transformation; work breakdown structure (WBS)
V. Requirements exist at the outset and they can be decomposed along with work.

Knoepfel (1992) described project tramsformation as a structure of systems, composed of subsystems and components that have attributes and that may be related to each other and to systems, subsystems and components in the environment of the systems, through certain attributes. According to Knoepfel (1992), a project structure operates in a defined way to achieve it objectives. These objectives can be interrelated, and their value depends on the attributes of the systems. In construction projects management (Knoepfel, 1992), projects systems, subsystems and components are identified in several levels. This allows the project management to concentrate its attention on certain system, subsystems or components for a limited time to bring it to a certain state of study, investigation, design, realization or operation. These help to surpervise operation concepts and the layout of existing and new parts of facilities, to manage the overall configuration of the systems and to control the interfaces. By comprehending the operational structure of a project, project management provides the technical basis for answers to economic, time-scheduling, quality, quantity and organization questions (Inuwa, 2014; Knoepfel, 1992).

Flow

The concept of flow according to Kraemer, *et al.* (2014), viewed production path of a project as a flow composed of value adding activities (transformation) and non-value adding activities (waiting, inspection and moving). The main objective of the flow concept is to eliminate or minimize the share of non value adding activities through the improvement of project lead time, variability reduction, flexibility, and transparency (Koskela cited in Kraemer, *et al.*, 2014). The flow concept in construction is conceptualized within four contexts (Kraemer, *et al.*, 2014): Adding and non-value adding activities, even flow, variability and, preconditions to work tasks in construction.

I. ***Value adding and non value adding activities***: value adding and non-value adding activities view flow as a value adding activities (transformation) and non value adding activities (Kraemer, *et al.*, 2014). Its concept is about improving efficiency through doing things better and reducing waste. It is a concept adopted from Henry Ford’s proposal of continous motion, that suggests that everything should be kept in motion (Kraemer, *et al.*, 2014). It requires tasks (operations) to be taken to the operatives and not the other way round (Ford & Crowther, 1998 cited in Kraemer, *et al*., 2014). Though, this proposal contradicts the production process in construction, where the building is stationary and is built through different phases of assembly (Kraemer, *et al.*, 2014). Nonetheless, Ford’s proposal advocated for efficiency improvement and waste elimination in production, and these reasons make it important to project management in construction. Value adding and non-value adding concepts see idleness as a waste (Kraemer, *et al.*, 2014). Waste might emanate from an operative waiting for a material or assistance, or a machine breakdown with no replacement waiting for repairs (Kraemer, *et al.*, 2014). Value adding and non-value adding activities of flow, are continous process aimed at identifying and eliminating all wastesthat add cost and do not add value (Liker, 2004 cited in Kraemer, *et al*., 2014).Therefore, the ultimate aim of value adding and non-value adding concepts of flow according to Kraemer, *et al*. (2014), is to reduce or eliminate waste.

II. ***Even flow***: This means leveling production rates of each task against their required resources and crews along the transformation path while aiming at a continous production process (Kraemer, *et al*., 2014). Even flow aims at leveling production rates to generate a smooth and continous construction process (Kraemer, *et al*., 2014).

III. ***Variability***: This in a project production transformation flow is concerned with how variability influences the input and output activities from one workstation to another, considering delays that will increase the project lead time (Kraemer, *et al*., 2014). Variability is the quality of non-uniformity of a class of entities (Hopp & Spearman, 2001 cited in Kraemer, *et al*., 2014). Variability is experienced in all construction production processes and have a great impact on performance (Kraemer, *et al*., 2014). Hence, it is important for contractors to understand and manage variability to achieve an effective production (Hopp & Spearman, 2001 cited in Kraemer, *et al*., 2014). Variability is divided into two: process time variability and flow variablity (Hopp & Spearman, 2001 cited in Kraemer, *et al*., 2014). Process time variability according to Hopp and Spearman (2001) cited in Kraemer, *et al*. (2014), refers to the job at an individual workstation, and its causes are natural (ie minor fluctuation in process time due to differences in operators, equipment and materials), random outages, and setup and workers availability. The delay resulting from a workstation due to process time variability can influence the next workstation in line, thus resulting in flow variability (Kraemer, *et al*., 2014). Flow variability in construction production according to Kraemer, *et al*. (2014), refers to variability caused by continous process fed diverse activities with different inputs (specialty unit workers) in different locations (floors). Consequences of variability in construction according to Kraemer, *et al*. (2014), can be: time overrun and high levels of work-in-progress, wasted capacity, or lost ouput, and cost overrun. Variabilty can occur in any activity along the transformation path (Kraemer, *et al*., 2014). However, variability occuring in the initial activities in the construction process is more disruptive than in the final activities (Koskela, 2000 cited in Kraemer, *et al*., 2014). The goal of flow variability is to eliminate or reduce variability from the construction process (Kraemer, *et al*., 2014).

IV. ***Preconditions to work tasks in construction***: According to Lindhard and Wandahl (2012), before an activity can be conducted, a number of preconditions first have to be fulfilled; the idea of preconditions to work tasks is to itemized the pre-requirements to start any activity in construction (Koskela, 2004). A fault in any of these preconditions according to Koskela (2004), result in a 'making-do-waste'. Koskela (2004) described 'making-do-waste' as a situation where a task is started without all its standard inputs, or the execution of a task is continued although at least one standard input is lacking. The consequences of 'making-do-waste' according to Kokela (2004)are: rework, increase of variability, poor quality, and cost and time overruns. The essence of the precondition is to avoid waste emanating from 'making-do-waste' (Kraemer, *et al*., 2014; Koskela, 2004). Kraemer, *et al*., (2014), and Lindhard and Wandahl (2012) itemize the following as the preconditions to work tasks in construction: construction design and management (information), components and materials are present, workers are present, equipment and machinery are present, sufficient space so that the tasks can be executed, connecting works (previous activities must be completed), climate conditions have to be acceptable, safe working conditions in relation to national laws have to be present, and known working conditions. However, Kraemer, *et al*., (2014), and Lindhard and Wandahl (2012) preconditions to work tasks seem to be centred on the design-bid-build (DBB) system alone and as such, do not consider other preconditions where the contractor task involves: design (integrated contracts, and Design &Manage), planning, management and coordination (management contracts). Thus, clients brief (business case), programme and project management organizational chart are also considered as additonal preconditions that will accommodate the pre-requirements for the commencement of activities in integrated and management oriented contracts (Passenheim, 2009, p.16; Harris & McCaffer, 2005).

Value

The value concepts focuses on how best to match customer requirement (design and production) (Kraemer, *et al*., 2014). It is expected that the design and specifications of a project capture and integrate the customer requirements. Hence, value is centred from the point of view of the customer (Kraemer, *et al*., 2014). The concept of value in the transformation of a project, therefore, requires a contractor in planning his project tasks to always take into consideration the customer's optimum requirements in the project inputs, tasks, and sequence of operations throughout the transformation path.

Kraemer, *et al*. (2014) asserted that the TFV theory is needed in understanding the nature and requirements along the project conversion (transformation) path and, for the TFV theory to be effective and efficient, it must be used at the same time in a complementary way.

The most impotant contribution of the TFV theory according to Kraemer, *et al*. (2014), is in bringing interest to modelling, structuring, controlling and improving production from all these three points of view and adding a new insight showing that these are three fundamental phenomena in production, which should be simultaneously managed.

3.2 Management Theory of Project Management

Management theory of project management is founded on three theories (Koskela & Howell, 2002b): planning, execution and control (Table 1).

Theory of Planning

The theory of planning interpreted management as planning and organizing (Koskela & Howell, 2002a). Thus, it is subdivided into: management-as-planning and management-as-organizing (Table 1) (Koskela & Howell, 2002b). In management-as-planning; management at the operations level consists of creation, revision and implementation of plans (Koskela & Howell, 2002a). Management-as-planning, conceptualized that in planning a project, there is a managerial part and an effector part (Koskela & Howell, 2002a). The primary function of the managerial part is planning, and the primary function of the effector part is to translate the resultant plan into action.

On the other hand, management-as-organizing according to Koskela and Howell (2002a, p.4), adds the idea of human activity as inherently situated. Thus, allowing planning to focus on structuring the environment to contribute to purposely acting (Koskela & Howell, 2002a). In essence, planning-as-organizing requires the assembly of the necessary resources (inputs: manpower, materials, time and money) for carrying out the work defined in the plan (Kraemer, *et al*., 2014; Weiss & Wysocki, 1992). Management-as-organizing in construction project management entails tailoring the requirements of the specific project (knoepfel, 1992). To organize in construction project management according to Knoepfel (1992), means to define the work tasks with the responsibilities, to allocate them to positions, to design the procedures in the organization, and to select adequate performers for the positions. Management-as-organizing is optimally aimed at assembling necessary resources into a cohessive structure in accordance with the project plan requirements (Weiss & Wysocki, 1992).

Theory of Execution

The theory of execution is viewed within the context of dispatching model and the language/action perspective. The dispatching model conceptualized that, managerially, execution is about dispatching tasks to work stations, and this is regarded as the classical communication theory (Koskela & Howell, 2002b). However, for execution to be effective, the classical communication theory must be complemented with the language/action perspective (Winograd and Flores, 1986 cited in Koskela & Howell, 2002b); this emphasizes two-way communication and commitment, instead of the mere one-way communication according to the classical communication theory. Thus, the vice used in communicating the tasks dispatched to work stations must be completely comprehensive to the operatives.There should be feedback mechanisms that will convey the operatives understanding of the instruction passed to him and as such, enable tasks to be executed as it is envisaged in the plan.

Theory of Control

The theory of control consist of two models: themostat model and the scientific experimentation model (Koskela & Howell, 2002a). The themostat model conceptualized that in the production process, there is a process to control, a unit for performance measurement, a standard of performance, and a controlling unit, while the scientific experimental model of control as advocated by Shewhart and Deming (1983) cited in Koskela and Howell (2002b) focuses on finding causes of deviations and acting on those causes, instead of only changing the performance level for achieving predetermined goals in the case of deviation. The scientific experimentation model adds the aspect of learning to control (Koskela & Howell, 2002a). Thus, project control involves gauging performance, identifying deviation and learning what are the causes of deviations, their effects and the best means of countering them. The learning process is an avenue that can be used by contractors to improve on their project management potentials.

3.3 Conceptual Framework

This study derived its conceptual framework (Figure 3)from the project management theory (Table 2). The study variables explained within the context of project management theory constitute the independent variables, while an effective and efficient contractor project operational planning in building procurement systems is the dependent variable.

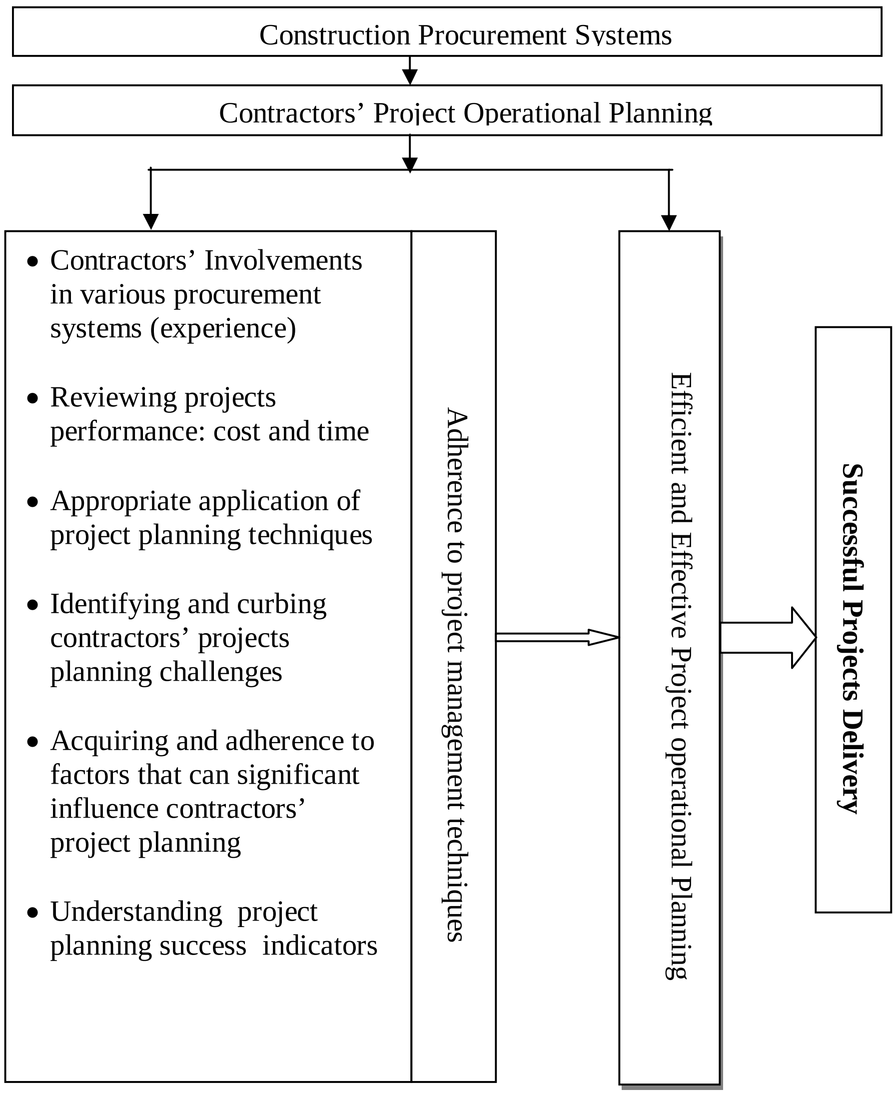

Figure 3: Conceptual Framework (Adapted from Weiss & Wysocki, 1992)

4.0 Discussion of Findings

4.1 Implication of Project Management Theory to the Study Objectives

The variables for this study are argued as independent variables to contractors' operational planning within the context of project management theory. The variables are: frequency of NICs involvement in building projects procurement systems (experience), NICs time and cost performance in building projects procurement systems, influencing factors for NICs project planning, NICs application of project planning techniques, NICs project planning challenges, and contractors' project planning success indicators.

NICs Involvement in Procurement Systems

The frequency of the NICs involvement in building procurement systems is an independent variable that can affect the outcome of the contractor's project operational planning within the context of the theory of project.

The contractors' involvement in the various types of building projects procurement systems will enable them appreciate the project conversion (transformation) path (TFV) and how it relates to project planning and organization. The contractors' understanding of the TFV theory and its application significantly contributes to construction projects planning, organizing, controlling and improving (Kraemer, *et al*., 2014). NICs frequent involvement will enable them acknowledge how a project, depending on the type of procurement system, can be decomposed into manageable and well-understood sub-transformation and tasks within the context TFV and as such, enables a contractor to realize project operational plan in an optimal manner (Koskela & Howell, 2002a). Comprehending the operations of a project TFV levels will provide contractors the technical basis for answers to economic, time-scheduling, quality, quantity and organization questions in relation to their project operational plan (Knoepfel, 1992). Moreover, understanding how a project transformation is developed from inputs to outputs (conversion); the tasks required and their sequential relationship, taking into consideration flow and value, provides a better guide to the contractors on how to develop a project operational plan that will be effective and efficient towards achieving project management success (Koskela & Howell, 2002b).

NICs Time and Cost Performance

Contractors time and cost performance in building project procurement systems is an independent variable that can influence contractors' project operational planning and this can be argued using the project management theory of control. A review of several studies revealed that contractors underperformed in terms of cost and time in the NCI (Idoro, 2012b; Mbamali & Okotie, 2012; Babatunde, *et al*., 2010; Ikediashi, *et al*., 2012). The adherence to the project management concept of control through the thermostat model and the scientific experimentation model can facilitate the performance of contractor's project operational planning. Since the thermostat model is conceptualized for controlling a process which is guided by an operational plan (Koskela & Howell, 2002a). The scientific experimentation model can be used as a learning process to study the causes of deviations resulting in time and cost overruns in the project management process (Shewhart & Deming, 1983 cited in Koskela & Howell, 2002b), thus adding to the contractor's knowledge of the causes of time and cost overruns. This, is eventually used as additional knowledge in putting measures to counter causes of time and cost overruns in project operational planning (Knoepfel, 1992).

Application of Project Planning Technique

The other complement of the concept of management-as-planning conceptualized that there is an affector part to planning, whose primary function is to translate the resultant plan into action (Koskela & Howell, 2002a). Therefore, inaddition to the management function of project planning, the contractors management within the context of project management, is required to translate its resultant operational plan into action (Koskela & Howell, 2002b). The tools required to accomplish this task are the use of project planning techniques; however, this is subject to the use of an appropriate planning technique (Bhavikatti, 2012; Roberts & Wallace, 2004; Scott, 1995). Inuwa, *et al.* (2014d) explored the various planning techniques applied in project management, and higlighted their importance as it relates to any prevailing situation in project management. Hence, NICs application of an appropriate project planning techniques is an independent variable that can affect the performance of operational planning.

NICs Project Planning Challenges

Project planning forms the basis for project control (Krishnamurthy & Ravindra, 2010; Bamisile, 2008; Eigege, 2005). The scientific experimentation model of control is concerned with studying the causes of deviations in the whole process of project planning with the sole aim of identifying causes of deviations (challenges) and how the challenges can be addressed in light of attaining a successful project operational plan (Shewhart & Deming, 1983 cited in Koskela & Howell, 2002b). Inuwa, *et al*., (2014a) identified NICs project planning challenges in projects procurement. Hence, identifying contractors project planning challenges and learning how to counter their effects will result in efficient and effective projects operational planning.

Project Planning Influencing Factors

Factors that can significantly influence NICs project planning in building projects procurement systems is a variable for contractors' project operational planning that might emanate from other parties besides the contractors'. However, it is the responsibility of the contractor's management as conceptualized by the theory of planning at the operations level, to create, revise, and implement operational plans (Koskela & Howell, 2002a).

Hence, it is their responsibility to identify and adhere to measures that will influence their ability to create an operational plan that can be easily revised and operationally implemented. This is according to the concept of management-as-planning, that conceptualized that in planning a project, there is a managerial role, which functions primarily is planning (Koskela & Howell, 2002a). Therefore, the contractors' organization through its project manager, has a managerial responsibility for planning their projects. This places a responsibility to the contractors to acquire and adhere to factors that can influence their project planning so as to be able to create, revise and implement their project operational plan (Koskela & Howell, 2002a). Inuwa, *et al*. (2014b) enumerated factors that can significantly influence NICs project planning. Hence, acquiring and adhering to these factors can significantly influence the NICs' project planning and it is a variable that can affect the effectiveness and effeiciency of project operational plans.

Contractors' Project Planning Success Indicators

Thermostat model of the theory of control conceptualized projects planning implementation as a process that is subject to control, which has a unit for performance measurement, a standard of performance and a controlling unit. Thus, a contractor's project planning success indicators can be used as a standard performance measure in contractors' project operational planning, and also serve as contractors' project operational planning controlling unit. Inuwa, *et al*.,(2014c) studied and identified project operational planning success indicators for NICs project planning. Hence, contractors' project operatioal planning success indicators are variables that can affect contractors' project operational planning, and the attainment of these success indicators will certainly enable a contractor to achieve project planning success. The implication of the project management theory to the study objectives are represented in the relationship between the study's theoretical and conceptual framework in Table 2.

Table 2: Theoretical and Concptual Framework Relationship

Theoretical Framework		**Conceptual Framework**	
Project management theory		**Variables (research objectives)**	
The Theory of project		I.	NICs involvement in building procurement systems
Management Theory	Theory of control (thermostat & scientific experimentation model)	II.	NICs time and cost performance in projects procurement systems
	Theory of planning (management-as-planning; **effector**)	III.	NICs application of project planning techniques
	Theory of control (scientific experimentation model)	IV.	NICs project planning challenges
	Theory of planning (management-as-planning; **managerial**)	V.	Factors for influencing NICs projects planning
	Theory of control (thermostat model)	VI.	Contractors' project planning success indicators

Source: Inuwa (2014)

Previous studies ascribed NICs inability to plan their contractual obligation to non-project (traditional) management approach, and in this light, advocated the adoption of project management approach to the NICs in the management of projects (Inuwa, *et al*., 2014b; Inuwa, *et al*., 2014d; Ekundayo, Jewell, & Awodele, 2013; Aniekwu & Audu, 2010; Muazu & Bustani, 2004). However, these advocates failed to explain how project management theory can be applied in addressing the NICs project planning problem. On the contrary, this study explained how project management theory can be applied by NICs in addressing project planning problem.

5.0 Conclusion

This research explored how project management theory can be applied by NICs to curb poor project planning. It objectives explained how NICs can apply project management theory to: enhance experience in project procurement systems, curb poor cost and time performance, appropriately apply planning techniques in project operational planning, curtail project planning challenges, adhere to factors that can significantly influence project planning, and adhere to project operational planning success indicators so as to achieve project planning success. Exploratory research design was used through extensive and intensive literature review to gain insights on NICs projects planning problems, project management concept and theory, and how project management theory can be related to contractors project planning. It also used explorative research to gather information on howproject management theory can be applied by NICs for making decision on project planning. This research exploration revealsthat project management theory can be applied by NICs to:

- enhance experience inconstruction procurement systems through the TFV concept,
- improve time and cost performance through the project management concept of control using the thermostat and the scientific experimentation model,
- appropriately apply planning techniques using the concept of management-as-planning; effector part,
- study and mitigate project planning challenges using the scientific experimentation model of the theory of control,
- identify factors that can significantly influenceproject planning using the concept of management-as-planning; managerial part, and
- achieve project planning success through the adherence to project planning success indicators using the thermostat model of the theory of control.

In view of the aforementioned findings, it is recommended that NICs should adopt project management approach in the execution of their construction projects tasks and, train their workforce (professionals, artisans/craftsmen, and labourers) on the adoption and application of project management approach. Further studies can be conducted on how project management skills can be integrated in the training of NICs workforce (professionals, artisans/craftsmen. Labourers, etc) for effective and efficient project management adoption in the NICs organizations.

References

Abdulrazaq, M., & Ahmad, F. (2011). Investigating Clients' Awareness of the Appointment of a Certified Project Manager. 24th NIQS Biennial Conference and General Meeting. Abuja: NIQS.

Achuenu, E., Izam, Y. D., & Bustani, S. A. (2000). Investigating the Activities of Indigenous Contractors in the Nigerian Construction Industry. Journal of Construction Technology and Management, 3(1):91-103.

Adams, S. O. (1997). Contractor Development in Nigeria: Perception of Contractors and Professionals. Journal of Construction Management and Economics, 15:95-108.

Alzahrani, J. I., & Emsley, M. W. (2013). The Impact of Contractors' Attributes on Construction Project Success: A Post Construction Evaluation. International Journal of Project Management, 31: 313-322.

Aniekwu, A. N., & Audu, H. O. (2010). The Effects of Management on Productivity: A Comparative Study of Indigenous and Foreign Firms in the Nigerian Construction Industry. Proceedings of West Africa Built Environment (WABER) Conference, 27-18 July 2010, (pp. 567-578). Accra-Ghana: WABER.

APA. (2013). Publication Manual of American Psychological Association, 6th edn. Washington, DC: American Psychological Association.

Babatunde, S. O., Opawole, A., & Ujaddaghe, I. C. (2010). An Appraisal of Project Procurement Method in the Nigerian Construction Industry. Civil Engineering Dimension, 12(1):1-7.

Bala, K., Bello, A., Kolo, B. A., & Bustani, S. A. (2009). Factors Inhibiting the Growth of Local Construction Firms in Nigeria. Procs 25th ARCOM Conference, 7-9 Sept. 2009 (pp. 351-359). Nottingham U.K.: ARCOM.

Bamisile, A. (2008). Project Planning and Scheduling for Effective Project Delivery. The Quantity Surveyor: Journal of the Nigerian Institute of Quantity Surveyors, 55(1):11-17.

Bhavikatti, S. S. (2012). Building Construction. New Delhi: Vikas Publishing House PVT Ltd.

Chitkara, K. K. (2012). Construction Project Management: Planning, Scheduling & Controlling. New Delhi: Tata McGraw-Hill.

Eigege, A. (2005). Fundamentals of Management. Jos-Nigeria: His Grace Press.

Ekundayo, D., Jewell, C., & Awodele, O. A. (2013). Executive Project Management Structure and the Challenges Facing its Adoption in the Nigerian Construction. International Journal of Architecture, Engineering and Construction, vol2(3):158-169.

Gollenbeck, L. (2008). Planning of Construction Projects: A Managerial Approach. Siegen: Ph,D Thesis Universitat Siegen.

Gupta, A. K. (2010). Engineering Management, Revised Edn. New Delhi: S Chand & Company Ltd.

Harris, F., & McCaffer, R. (2005). Modern Construction Management. Accra: EPP Books Services.

Idoro, G. I. (2012). Influence of Projects Plans on the Outcome of Construction Projecs Procured by D-B in Nigeria. Journal of Construction in Developing Countries, 17(2):77-99.

Idoro, G. I. (2014). Address Presented by Professor Godwin Idoro, Conference Co-chair CIB Conference 2014. CIB Conference. Lagos-Nigeria.

Idoro, G. I., & Akande-Subar, L. O. (2008). Clients' Assessment of the Quality Performance of Indigenous and Expatriate Construction Contractors in Nigeria. A paper presented at COBRA: The Construction & Building Research Conference of the RICS. Held on 4-5 Sept. 2008, at the Dublin Institute of Technology: RICS.

Ikediashi, D. I., Mendie, A., Achuenu, E., & Oladokun, M. (2012). Key Performance Indicators of Design & Build Projects in Nigeria. Journal of Human Ecology, 37(1):37-46.

Inuwa, I. I. (2014). Project Planning In Construction Procurement: The Case of Nigerian Indigenous Contractors. Nairobi-Kenya: PhD Thesis: Jomo Kenyatta University of Agriculture and Technology.

Inuwa, I. I., Iro, A. I., & Dantong, J. S. (2013). Construction Work Items Unit Rate Model for Building Contractors Project Pricing in Nigeria. Journal of Engineering and Applied Sciences, 5(1):95-103.

Inuwa, I. I., Saiva, D., & Alkizim, A. (2014). Investigating Nigerian Indigenous Contractors Project Planning In Construction Procurement: An Explanatory Approach. International Journal of Civil & Environmental Engineering, vol. 14(04): 16-25.

Inuwa, I. I., Wanyona, G., & Diang'a, S. (2014b). Construction Procurement Systems: Influencing Factors for Nigerian Indigenous Contractors' Project Planning. International Journal of Engineering Research and Technology, vol. 3 (4).

Inuwa, I. I., Wanyona, G., & Diang'a, S. (2014c). Identifying Building Contractors' Project Planning Success Indicators: The Case of Nigerian Indigenous Contractors. Proceedings of the 3rd Applied Research Conference in Africa (ARCA) Conferenece (pp. 92-107). Accra-Ghana: Nkum, R.K., Nani, G., Atepor, L., Oppong, R.A., Awere, E., & Bamfo-Agyei, E. (Eds).

Inuwa, I. I., Wanyona, G., & Diang'a, S. (2014d). Application of Project Planning Techniques in Construction Procurement: The Case of Nigerian Indigenous Contractors. International Journal of Economic Development Research and Investment, vol. 6 (2).

Inuwa, I. I., Wanyona, G., & Dianga'a, S. (2014a). Construction Project Procurement: Project Planning Challenges of Nigerian Indigenous Contractors. Proceedings of the Conference of the International Council for Research & Innovation in Building & Construction (pp. 107-115). Lagos-Nigeria: CIBW107.

Ireland, L. (2006, December 2). Project Management: Past, Present, Future. Retrieved from www.osun.org: www.osun.org

Jinadu, A. M. (2007). Understanding The Basics of Housing: A Book of Study Notes for Students in Tertiary Institutions Rvsd Edn. Jos: Jos University Press Limited.

Kerzner, H. (2000). Applied Project Management: Best Practices on Implementation. New York: John Wiley & Sons, Inc.

Knoepfel, H. (1992). Theory and Practice of Project Management in Construction. International Journal of Project Management, 10 (4): 243-251.

Koskela, L. (2004). Making-Do: The Eighth Category of Waste. 12th International Group for Lean Construction Conference. Elsinore-Denmark: IGLC.

Koskela, L., & Howell, G. (2002a). The Theory of Project Management: Explanation to Novel Methods. Proceedings IGLC-10. Gramado-Brazil.

Koskela, L., & Howell, G. (2002b). The Theory of Project Management-Problem and Opportunity. Working Paper. VTT Technical Research Centre of Finland & Lean Construction Institute.

Kraemer, K., Henrich, G., Koskela, L., & Kagioglou, M. (2014, May 30). How Construtcion Flows Have Been Understood in Lean Construction. Retrieved from Professor Lauri Koskela Papers: http://www.laurikoskela.com

Krishnamurthy, K. G., & Ravindra, S. V. (2010). Construction and Project Management: For Engineers, Planners and Builders. New Delhi: Satish Kumar J.

Lewis, J. P. (2007). Fundamentals of Project Management, 3rd edn. New York: AMACOM.

Lindhard, S., & Wandahl, S. (2012). Improving The Making Ready Process-Exploring The Preconditions To Work Tasks in Construction. 20th Annual Conference of the International Group for Lean Construction. San Diego-USA: IGLC.

Mbamali, I., & Okotie, A. J. (2012). An Assessment of the Threats and Opportunities of Globalization on Building Practice in Nigeria. American International Journal of Contemporary Research, vol. (4):143-150.

McNabb, D. E. (2009). Research Methods for Political Science: Qualitative and Quantitative Methods. New Delhi: PHI Learning Private Limited.

Mogbo, T. C. (2001). The Construction Sector and the Economic Growth of Nigeria, 1981-95. The Quantity Surveyor: Journal of the Nigerian Institute of Quantity Surveyors, vol. 35 (2): 8-13.

Muazu, D. A., & Bustani, S. A. (2004). A Comparative Analysis of Litigation Among Foreign and Indigenous Construction Firms in Nigeria. ATBU Journal of Environmental Technology, 3(1):13-16.

Odediran, S. J., Adeyinka, B. F., Opatunji, O. A., & Morakinyo, K. O. (2012). Business Structure of Indigenous Firm in the Nigerian Construction Industry. International Journal of Business Research and Management, vol3 (5):255-264.

Passenheim, O. (2009). Project Management. bookboon.

Roberts, A., & Wallace, W. (2004). Project Management. Edinburgh: Pearson Education.

Rooke, J., Koskela, L., Howell, G., & Kagioglou, M. (2012, 6 5). Developing Production Theory: What Issues Need to be Taken into Consideration? 12th Annual Conference of the International Group for Lean Construction. San Diego-USA: IGLC. Retrieved from Professor Lauri Koskela: http://laurikoskela.com

Saleh, M. S. (2004). A Review of the Factors Affecting Contractor Efficiency on Building Projects. ATBU Journal of Environmental Technology, vol 3(1):62-68.

Scott, S. (1995). Checking The Project Plan. Construction Management and Economics, 13, 127-136.

Shaikh, A. W., Muree, M. R., & Soomro, A. S. (2010). Identification of Critical Delay Factors in Construction. Sindh University Journal (Science Series), 42(2): 11-14.

Weiss, J. W., & Wysocki, R. K. (1992). 5-Phase of Project Management: A Practical Planning & Implementation Guide. Cambridge, Massachusetts: Perseus Books.

Yimam, A. H. (2011). Project Management Maturity in the Construction Industry of Developing Countries: The Case of Ethiopian Contractors. Maryland, USA.: MSc Thesis: University of Maryland.