

2017

# Correlates of Project Success in the Nigerian Real Estate Construction Sector

Augustine Ofodile Onyali  
*Walden University*

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# Walden University

College of Management and Technology

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AUGUSTINE OFODILE ONYALI

has been found to be complete and satisfactory in all respects,  
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the review committee have been made.

## Review Committee

Dr. Gregory Uche, Committee Chairperson, Doctor of Business Administration Faculty

Dr. Craig Martin, Committee Member, Doctor of Business Administration Faculty

Dr. Judith Blando, University Reviewer, Doctor of Business Administration Faculty

Chief Academic Officer  
Eric Riedel, Ph.D.

Walden University  
2017

Abstract

Correlates of Project Success in the Nigerian Real Estate Construction Sector

by

Augustine Onyali

MSc, University of Nigeria, 1992

BSc, University of Nigeria, 1989

Doctoral Study Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Business Administration

Walden University

July 2017

## Abstract

Project managers in the Nigerian real estate construction sector are facing challenges in delivering real estate projects profitably. The purpose of this correlational study was to examine how comprehension, motivation, skills, resources, and communication can predict project success in the real estate construction sector in Nigeria. Understanding these elements was necessary for developing project management strategies aimed at optimizing profitability. The population of the study was project management practitioners in the Nigerian real estate construction sector who are facing challenges in delivering real estate construction projects profitably. The duck alignment theory served as the theoretical framework for the study. Data collection was through a survey instrument questionnaire called the Project Implementation Profile. Multiple linear regression analysis confirmed a significant relationship between each of the 5 independent variables and the dependent variable,  $F(5, 70) = 216.704$ ,  $p = .000$ ,  $R^2 = .939$  upholding all the alternative hypotheses. The regression model results showed that each independent variable is a significant predictor of the dependent variable, project success at  $p < 0.05$  and C.I. = 95% criteria. Project managers may use the findings of this study to increase the profitability of the real estate construction sector, which would translate to a business expansion resulting in an increased production of houses and housing services. The implications for positive social change may include the generation of employment for skilled and unskilled workers and the multiplier effects, which support the stimulation of sustainable economic activities in the developing economy of Nigeria.

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## Dedication

The educational journey is not without its toils. I dedicate this doctoral study to Almighty God, the creator, for giving me the courage, strength, and wherewithal to embark on this journey.

I dedicate this doctoral study to the three women in my life: my wife, Hope and my two lovely daughters, Chisom and Chinalurum. They gave me the strength and belief in myself. They are the reason. They are my reason.

While I took the toils, the toils took its tolls on them.

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I experienced a significant personal growth in terms of research capabilities, logic, clear thoughts, analytics, and communications writing in this DBA journey and these showed in my professional life. The DBA journey could not have been accomplished alone. Acknowledgement and special thanks goes to my committee chair, Dr. Gregory Uche, my second committee member, Dr. Craig Martin, and the University Research Reviewer, Dr. Judith Blando. I am forever grateful for the understanding and guidance from these fine individuals and could not have asked for a better team.

God bless.

## Table of Contents

List of Tables .....	v
List of Figures .....	vi
Section 1: Foundation of the Study.....	1
Background of the Problem .....	1
Problem Statement.....	2
Purpose Statement.....	3
Nature of the Study .....	4
Research Question .....	5
Research Subquestions.....	5
Hypotheses .....	6
Theoretical Framework.....	7
Definition of Terms.....	8
Assumptions, Limitations, and Delimitations.....	9
Assumptions.....	9
Limitations .....	10
Delimitations.....	10
Significance of the Study .....	11
Contribution to Business Practice.....	11
Implications for Social Change.....	11
Review of the Professional and Academic Literature.....	12
The Foundations of the Real Estate Sector in Nigeria.....	13



The Duck Alignment Theory .....	29
Analysis of the Independent Variables .....	31
Analysis of the Dependent Variable .....	49
Rival Theories of the Duck Alignment Theory .....	55
Measurement Instrument .....	56
Conclusion .....	57
Transition and Summary.....	58
Section 2: The Project.....	60
Purpose Statement.....	60
Role of the Researcher .....	61
Participants.....	62
Research Method and Design .....	63
Method .....	64
Research Design.....	65
Population and Sampling .....	66
Ethical Research.....	70
Data Collection .....	72
Instruments.....	72
Data Collection Technique .....	76
Data Analysis Technique .....	77
Study Validity .....	82
Transition and Summary.....	84

Overview of Study .....	85
Presentation of the Findings.....	87
Descriptive Statistics.....	88
Statistical Model Assumption Testing .....	90
Research Questions and Hypotheses Tests .....	96
Relating Findings to the Literature .....	100
Applications to Professional Practice .....	101
Implications for Social Change.....	103
Recommendations for Action .....	104
Recommendations for Further Study .....	105
Reflections .....	106
Summary and Study Conclusions .....	107
References.....	108
Appendix A: National Institute of Health Certification.....	137
Appendix B: Invitation Letter to Participants.....	138
Appendix C: Introduction Letter to Professional Groups.....	139
Appendix D: Introduction Letter to Construction Companies.....	141
Appendix E: Protocol of Power Analyses Using G*Power 3.1.2.....	143
Appendix F: Informed Consent Form.....	144
Appendix G: Permission to use Measurement Instrument .....	148
Appendix H: The PIP Survey Instrument .....	149
Appendix I: Sample of Raw Data from SurveyMonkey® .....	153

Appendix J: Sample of Raw Data from PIP Survey Instrument on Project Success

Ranking for valid responses.....160

Appendix K: Breakdown of References .....161

## List of Tables

Table 1. Population Frequencies.....	89
Table 2. Descriptive Statistics.....	90
Table 3. Outliers Effects Check .....	91
Table 4. Results for Skewness and Kurtosis.....	92
Table 5. Test of Homogeneity of Variances .....	94
Table 6. Correlations.....	95
Table 7. Collinearity Statistics.....	96
Table 8. Regression Analysis Summary for Predictor Variables .....	96
Table 9. Regression Analysis ANOVA Results .....	97
Table 10. Regression Analysis Coefficients Results .....	97

## List of Figures

Figure 1. Boxplot for Scores on the Independent Variables showing Outliers. ....	91
Figure 2. Normal P-P plot of Regression Standardized Residual for the Dependent Variable, Project Success .....	93

## Section 1: Foundation of the Study

In Nigeria, the real estate sector is booming because of the shortage of housing for the growing population. The operators of the industry may optimize the situation by embarking on housing construction projects to meet the demand for housing. To retain market share and remain profitable, housing projects in Nigeria should be competitive. Efficiency and effectiveness in project management may result in project success and lead to profitability (Mir & Pinnington, 2014). The purpose of this study is to show how some selected predictors in project management can predict project success in the real estate construction sector in Nigeria.

### **Background of the Problem**

According to The National Association of Home Builders (NAHB; 2015), the real estate sector is a profitable business venture, resulting in approximately 18% of the gross domestic product (GDP) of the United States economy. The operators of the real estate sector contribute to the GDP through a combination of private investments and consumption spending on housing services (NAHB, 2015). In the Nigerian growing economy, the real estate sector represented 6.82% of the GDP in the opening quarter of 2014 (National Bureau of Statistics [NBS], 2014). The real estate sector is of immense social benefit to the populace as a provider of a basic need of human existence and fundamental human right as recognized by the United Nations (United Nations [UN], 2015). The real estate sector as the provider of a basic need has an inexhaustible demand for housing and housing services.

Nigeria needs real estate construction projects to satisfy required housing demands. Construction organizations as project-based organizations carry out construction projects as their core function (Eriksson, 2013). Considering slim profit margins, construction projects when not properly managed may lose money. Witell, Gustafsson, and Johnson (2014) in a study of industries' profitability, found that the profit margins in the construction sectors ranged from 1.70% to 2.18%. Real estate construction companies may pass their losses to the end user, which could result in increased home prices and unaffordability. In the long run, a reduction of homebuyers could result in a decline in the business turnover of the construction sector, leading to further losses.

Construction organizations need systemic project management to ensure project success resulting in profitability. The primary goal of this study was to equip the project management team with knowledge of how comprehension, motivation, skills, resources, and communication in project management can predict real estate construction project success. The successful execution of projects would ensure the profitability of the organization.

### **Problem Statement**

A housing deficit caused by a growing population is opening up investment opportunities in real estate construction in Nigeria (Makinde, 2014). In 2012, Nigeria had a housing deficit of 17 million homes (National Bureau of Statistics, 2015), and to overcome this deficit, there exists a need for the construction of 720,000 housing units each year (Aliyu, Usman, & Alhaji, 2015). The general business problem is that project

managers in the real estate construction sector in Nigeria are facing challenges in successfully and profitably providing adequate housing for the growing population. The specific business problem is that some project managers in real estate construction lack the knowledge of how comprehension, motivation, skills, resources, and communication (independent variables) in project management can predict real estate construction project success (dependent variable).

### **Purpose Statement**

The purpose of this quantitative correlational study was to provide real estate construction project managers with the knowledge of the relationship between the predictors of comprehension, motivation, skills, resources, and communication in project management and real estate construction project success. The independent variables were comprehension, motivation, skills, resources, and communication. The dependent variable was project success. The targeted population consisted of the real estate construction project managers in Nigeria. The findings of the study might assist the project managers in real estate construction to identify the predictor variables for forecasting real estate construction project success. Business leaders in the real estate sector may use the findings from the study in affecting positive social change by promoting effectiveness in housing delivery, which would assist in alleviating the housing problem while carrying out a profitable business venture. An improved real estate industry would enhance the Nigerian GDP and stimulate the economy for growth, stability, and sustainability.



### **Nature of the Study**

The purpose of this quantitative correlational study was to determine how the predictors comprehension, motivation, skills, resources, and communication can predict real estate construction projects' success. The research method employed in this study was the quantitative method. The quantitative method of research is an analytical method that involves a numerical approach with measurable and verifiable data (Yilmaz, 2013). In a quantitative study, data collated from a large number of people in a structured way comprise the source for data analysis. Participants provide their opinions or views of the situation and make possible a collection of facts and statistics for analyzing and establishing empirical evidence for testing hypotheses (Stroet, Opdenakker, & Minnaert, 2014). The qualitative method of research is an inductive and nonnumerical approach involving the dynamics of the organization and the participants' lived experiences (Gioia, Corley, & Hamilton, 2013; O'Reilly & Parker, 2013). The qualitative method was not suitable for this study because the purpose of the study was to examine the relationship between constructs in the production of real estate construction projects and not the lived experiences of the participants. The mixed methods approach combines the quantitative and qualitative methods in cases wherein the exclusive use of each of the methods would not yield a full understanding of the phenomena of interest (Venkatesh, Brown, & Bala, 2013). The mixed method was not appropriate for this study because mixed methods are time consuming, the quantitative method meets the intention of the study, and there was no requirement for a qualitative inquiry as the study focus was not on the participants' lived experiences.

The research design for this quantitative study was correlational. Researchers using correlational design evaluate the extent and nature of the quantitative relationship between two or more variables (Ladd, Roberts, & Dediu, 2015). The experimental research design, which researchers use to determine if a particular treatment to one or more variables causes another outcome (Ladd et al., 2015), was not applicable to this study as the research focus was on recognizing a trend, pattern, or relationship in collated data. The quasi-experimental design is similar to the experimental one but lacks the ingredient of random assignment of treatments to experimental units. Other quantitative research designs are causal and comparative. A causal research design is an explanatory investigation into the cause and effect relationships of constructs (Fernbach & Erb, 2013), which was not applicable to this study. The comparative research design is an exploration of the parallels, similarities, and differences between two or more cases, compared and contrasted against each other and are within a specific context (Abadie, Diamond, & Hainmueller, 2015). The comparative research design was not applicable, as the researcher was not comparing cases.

### **Research Question**

The overarching research question for this study was: How do the predictors comprehension, motivation, skills, resources, and communication in project management, correlate with real estate construction project success?

### **Research Subquestions**

RQ1: Does a significant relationship exist between the project team's project comprehension and project success?

RQ2: Does a significant relationship exist between the project team's motivation and project success?

RQ3: Does a significant relationship exist between the project team's skills and project success?

RQ4: Does a significant relationship exist between the project team's resource management and project success?

RQ5: Does a significant relationship exist between the project team's communication management and project success?

### **Hypotheses**

The testing of the following hypotheses is necessary to answer the research question:

$H_{01}$ : There is no significant relationship between the project team's project comprehension and project success.

$H_{a1}$ : There is a significant relationship between the project team's project comprehension and project success.

$H_{02}$ : There is no significant relationship between the project team's motivation and project success.

$H_{a2}$ : There is a significant relationship between the project team's motivation and project success.

$H_{03}$ : There is no significant relationship between the project team's skills and project success.

*Ha<sub>3</sub>*: There is a significant relationship between the project team's skills and project success.

*Ho<sub>4</sub>*: There is no significant relationship between the project team's resource management and project success.

*Ha<sub>4</sub>*: There is a significant relationship between the project team's resource management and project success.

*Ho<sub>5</sub>*: There is no significant relationship between the project team's communication management and project success.

*Ha<sub>5</sub>*: There is a significant relationship between the project team's communication management and project success.

### **Theoretical Framework**

The classic project management definition of project success is when the project meets its objectives within the constraints of budget and schedule. The duck alignment theory goes beyond the classic project management definition of success and elaborates certain actions taken in sequence, which can facilitate the execution of projects, and increase the chances of project success (Lidow, 1999). Lidow (1999) proposed the duck alignment theory (DAT) by viewing the sequential actions as ducks kept in line for achieving projects' objectives. The sequential actions depict the problem areas through which the known problems associated with projects occur. These sequential actions are comprehension, motivation, skills, resources, and communication. The associated execution of the projects minimizes anticipated problems to enable the project to proceed without major problems (Lidow, 1999). The duck alignment method supports using

problems as learning experiences during executing and implementing of plans for future and current projects.

The project manager's goal as given by the performing organization is to interpret and successfully realize the project's objectives (Project Management Institute [PMI], 2013). As no system can ensure or guarantee project success, the project manager uses systems that maximize the chances of achieving success. With Lidow's (1999) duck alignment theory, there exists a higher chance of project success under a variety of operating conditions. Lidow's theory does not require extra performance or assignments on the project beyond the expectations of regular project activities. The requirements are the scrutiny of sequential actions at each project stage, the recognition of problem areas, and leveraging on the recognized problems by creating alignments and ensuring the ducks are in line before further action.

### **Definition of Terms**

Below are the definitions of some terms in this study.

*Iron triangle:* The iron triangle refers to the three basic constraints experienced in a project and listed as cost, time, and scope/quality (Williams, Ashill, Naumann, & Jackson, 2015).

*Nonperfect market:* A nonperfect market is a market condition where the need is high, the demand is low, and the supply is limited (Akinbogun, Jones, & Dunse, 2014).

*Price-taking behavior:* Price-taking behavior is the market-determined price of property not influenced by its operators (Anglin & Wiebe, 2013).

*Stakeholders:* Stakeholders are persons or organizations affected by the project activities (Purvis, Zagencyk, & McCray, 2015; Turkulainen, Aaltonen, & Lohikoski, 2016).

*Instrumentality:* Instrumentality is an evaluation of successful performance backed by efforts and innovative input (Purvis et al., 2015).

*Expectancy:* Expectancy is an evaluation of the extent of the effort required to achieve the expected performance (Purvis et al., 2015).

*Valence:* Valence is the motivation induced by the attractiveness of receivables because of performance (Purvis et al., 2015).

*Work breakdown structure (WBS):* The WBS is a project planning tool in which the project team further breaks down deliverables or tasks into smaller manageable components (Project Management Institute, 2013).

*Perceived usefulness:* Perceived usefulness is a term used to describe the degree to which a team member feels an increased job performance in using a new technology (Palacios-Marques, Cortes-Grao, & Carral, 2013).

### **Assumptions, Limitations, and Delimitations**

#### **Assumptions**

Assumptions are unverifiable items of the study that may affect the research findings (Roy & Pacuit, 2013). The first assumption was that participants are project management practitioners who implement industry laid down processes as prescribed in the *Project Management Body of Knowledge (PMBOK)*. To mitigate the risk associated with this assumption, the selection of a majority of participants occurred through the

membership of the PMI. The second assumption was that participants would respond to the questionnaire truthfully and that the survey host would deliver data accurately.

### **Limitations**

Limitations are uncontrollable conditions, which form internal threats or weaknesses in the study and affect the generalizability of the research findings (Marshall & Rossman, 2014). The first limitation was in the collection of data through an online survey. The use of the Internet became common from around 2004 and is more widespread with the younger generation. Access to the Internet, while necessary, could potentially limit the number of participants, especially the older and more experienced. The second limitation of the study was the decision to use the correlational analysis, which results could limit to the relationship between the independent and dependent variables.

### **Delimitations**

Delimitations are the study boundaries (Ody-Brasier & Vermeulen, 2014). The first delimitation of the study was that all analysis, discussions, and definitions of the success of real estate construction projects limits the successful completion of the construction phase of real estate development. Prior and later activities such as obtaining financing and successful marketing to homebuyers respectively were not within the scope of project success as applied to this study. The second delimitation was the restriction of the study participants to only the members of the project management team in the real estate construction sector in Nigeria.

## **Significance of the Study**

### **Contribution to Business Practice**

Conducting this study was necessary and applicable to businesspersons, especially the project managers of the real estate construction sector in Nigeria, for developing knowledge of how comprehension, motivation, skills, resources, and communication act as predictors of real estate construction project success. There is an existing market for real estate construction requiring the execution of construction projects to meet with current market demands. The success of the construction projects would lead to profitability for the real estate sector. From the results of this study, project management practitioners could identify the correlates of project success in real estate construction for the provision of residential development. Consequently, the implementation of the study findings could result in an expanded real estate sector with increased provision of housing for the populace. Increased housing provision would trigger an increased consumption of housing services (NAHB, 2015) resulting in a more buoyant real estate construction sector with a continuous income stream from housing services.

### **Implications for Social Change**

Social change is an amendment or transformation to the workings of the order in a social structure or group (De la Sablonniere, Auger, Taylor, Crush, & McDonald, 2013), and is synonymous with changes in nature, cultural symbols, social institutions and organizations, rules of social behavior, social relations, and value systems. The type of future goals planned for the social group guides the motivations for social changes and results in actions that influence society (Bain, Hornsey, Bongiorno, Kashima, &



Crimston, 2013). Abed, Awada, and Sen (2013) and Ayotamuno and Owei (2014) stated that affordable and satisfactory housing is also desirable for work efficiency, social stability, and a better environment for all. Possibly, from the findings of this study, there could emerge a possibility of social change whereby housing would become more easily available. There is a more realistic possibility of attaining the UN agenda and policy for adequate shelter-for-all (United Nations General Assembly, 1996) through making housing habitable, affordable, and accessible.

### **Review of the Professional and Academic Literature**

The objective of this quantitative correlational study was to determine how comprehension, motivation, skills, resources, and communication act as predictors that correlate with real estate construction project success. The literature review covered the fundamentals of the real estate sector, which expanded the background of the study, followed by a review of the literature on housing, which comprised fundamentals, the real estate market (segmentation, pricing, and financing), and real estate construction project management. An in-depth discussion of the theoretical framework follows with an analysis of the independent and dependent variables.

The databases in the literature search included: ABI/INFORM Complete, Academic Search Complete, Business Source Complete, Dissertations, and Theses, EBSCO eBooks, Emerald Management, Google Scholar, ProQuest Central, SAGE Premier, and ScienceDirect. The keywords for the search were: real estate, realty, project management, project success, comprehension, motivation, skills, resources, and communication. References for the literature review were from 99 sources, comprising of

journal articles, seminal literature, and government articles. The peer-reviewed articles were at 95% in conformity with the 85% rule as verified by the Ulrich Periodicals Directory. Ninety two percent of the articles were published within 5 years of the anticipated completion date. The literature review will begin with the purpose of the study, detailing the background of the study and the fundamentals of the real estate sector in Nigeria.

### **The Foundations of the Real Estate Sector in Nigeria**

In this study, I examined the relationship between the predictors of comprehension, motivation, skills, resources, and communication in project management and real estate construction project success. These predictors are sequential management actions taken by project managers during project execution to increase the chances of project success. The predictors relate to the duck alignment theory, as stated by Lidow (1999). In the context of this study, these sequential actions and their alignments apply to the management of projects in the real estate construction sector of Nigeria.

The business opportunity, which was the basis of this study, is the provision of housing for the growing population of Nigeria. Aliyu et al. (2015) stated an estimated investment in the real estate sector of \$300 billion, spread over the next 5 years, is necessary to cancel the deficit. A ready demand for housing and housing services is evident from this situation and requires multiple real estate construction projects to meet this demand. The review included the desirability of the home ownership concept, which in part drives the demand in the real estate market, and the management of housing construction projects.

**Housing fundamentals.** In its declaration of human rights, the UN (2015) stated that housing is significant to the enjoyment of a quality life and is a basic need and right. Housing is a critical basic need, comprising of a physical shelter, which is also a commercial service (Taiwo, 2015). The business of the housing or real estate sector is the selling of land, buildings, and other fixed or immovable items along with the rights of use and enjoyment. Paciorek (2013) posited that owned land, as the main component in real estate, is a fixed supply. Nonowned land, for example land on the moon, is not considered real estate. In the context of this study, home ownership focused on the owner-occupier concept, which denotes an occupant owns the home in which he or she is residing. In this study, the real estate sector is the business of providing homes and achieving home ownership.

Affordable and satisfactory housing are further requirements in housing provision, which are desirable for work efficiency, social stability, and environmental enhancement (Abed et al., 2013; Ayotamuno & Owei, 2014). Affordable housing is a quantitative construct while satisfactory housing is a qualitative construct (Makinde, 2014). The quantitative construct focuses on the availability of mass housing units to meet with the demand. The provision and availability of the required number of houses affects affordability. A housing shortage encourages higher house prices because of limited supply. Makinde (2014) stated that people who lack houses in Nigeria are predominantly in the low-income bracket segment. The qualitative construct focuses on residential satisfaction. Ibe and Amole (2014) found a correlation between residential satisfaction and satisfaction with life.

Grinstein-Weiss, Key, Guo, Yeo, and Holub (2013) studied the desirability of the owner-occupier concept and indicated three sources of growth of low and middle-income homeownership. These are: (a) increases in income education and wealth, (b) market innovations, and (c) increased governmental policies and incentives for the expansion of credit and mortgage lending to low-income households (Grinstein-Weiss et al., 2013). Home ownership attainment improves social interactions (Grinstein-Weiss et al., 2013) and makes the homeowner more participative within their resident communities (McCabe, 2013; Roskrug, Grimes, McCann, & Poot, 2013).

Homeownership also has economic benefits as a principal investment and with the passage of time and income growth, the home becomes more of a form of security than a necessity (Said, Adair, McGreal & Majid, 2014). The homeowner protects this investment by participating in matters concerning its location, which could affect the investment (McCabe, 2013; Paciorek, 2013; Roskrug et al., 2013). Further economic benefits are in the ability of real estate to generate wealth and act as an individual's fixed capital (Taiwo, 2015).

The real estate sector's importance in a nation's economic indices is evident in the comparison of developed and developing economies. In developed countries, housing or homeownership finance is a large-scale business activity, constituting a portion of the GDP, but in the developing and emerging markets, the real estate sector is slow and mostly self-financed (Johnson, 2014). In 2013, Nigeria, which is a developing and growing economy, had a population of 173.6 million people, a GDP of \$521.8 billion, and a GDP growth rate of 5.4% (The World Bank Group, 2015). The real estate sector

represented 6.82% of the GDP in the opening quarter of 2014, declining from 10.13% in the corresponding quarter in 2013 (NBS, 2014). Comparatively, in the developed economies of the United States, the real estate sector GDP representation is 18% (NAHB, 2015). In Europe, the real estate sector has a gross product of 965 billion Euros (Abatecola, Caputo, Mari, & Poggesi, 2013); therefore, an opportunity exists for growth in the sector.

In Nigeria, the housing supply is at 23 per 1000 inhabitants (Makinde, 2014). There is a housing deficit requiring 720,000 housing units constructed each year (Aliyu et al., 2015). Taiwo (2015) identified certain challenges that created this shortfall. The challenges include: (a) land accessibility; (b) high construction costs; (c) nonimproved building technologies; (d) poor housing design, maintenance, and management; (e) high financing costs; (f) high rent; and (g) insufficient housing subsidies (Taiwo, 2015). Makinde (2014) recognized significant obstacles in housing development including the Land Use Act, loan origination procedures, slow administrative processes, lack of integrated planning in housing programs, an inadequacy of housing information systems, and a limited private sector involvement.

The public and private sectors are the sources of housing provision. Agunbiade, Rajabifard, and Bennett (2013) noted the limitations in public-sector-backed real estate developments in Nigeria. Public sector real estate developments in Nigeria are expensive, require significant subsidies, and are not easily replicated (Agunbiade et al., 2013). Consequently, the private sector providers cannot fill the gap and require governmental and institutional support, which is not the substantive working model for the provision of

housing in developing countries (Agunbiade et al., 2013). In the real estate practice in Nigeria there is lax regulation (Agboola, Ojo, & Amidu, 2012). The legislation establishing the professional practice exclusively reserved valuation for the licensed professional, and left other services to all comers (Agboola et al., 2012). Consequently, there is a proliferation of persons not bound by professional practice and ethics creating a norm of illegal activities in the Nigerian real estate business (Agboola et al., 2012).

Housing policy failures exist in Nigeria (Taiwo, 2015). The distinct factors attributable to housing policy and legislation failure are: (a) instability occasioned by political upheavals, (b) over-centralization of policies irrespective of regional differences, (c) low program execution, (d) little or no database, and (e) reduced economic activities (Taiwo, 2015). With the given background on the real estate sector in Nigeria, this literature review continues with an analysis of the housing market and a discussion of pricing, segmentation, and financing of the real estate sector.

**The real estate market.** The real estate market, as every market, comprises of demand and supply pressures. Kotler and Keller (2012) defined demand as the want for a product, backed by the capacity to pay. The real estate market is a *nonperfect market* where there exists a paucity of actual demand as compared with a large demonstration of needs and a limited supply (Akinbogun et al., 2014); however, in Nigerian real estate, the limited demand, as compared to the need, still outstrips the supply. Limited transactions exist in the market, which favor only buyers with substantial upfront funds needed for an outright purchase of a house (Okonjo-Iweala, 2014). A seller's market scenario that leads

to maximum profits is obtainable, because of high and unmet demand (Kotler & Keller, 2012).

The demand and supply pressures are significant determinants of house prices and cause arbitrary increases and volatility. Significant supply constraints with high demand cause house prices volatility (Paciorek, 2013). This means large swings in house prices. The effects of house price volatility on the economy are many. Increases in home prices are beneficial to homeowners as there is a growth in the property value and reduced constraints on borrowing (Paciorek, 2013). Conversely, declines in prices indicate restrictions incapacitating homeowners in the lending and borrowing markets (Paciorek, 2013). In metropolitan areas with space limitations, there exist less new constructions, rising house prices, and high real estate incomes resulting in superstar cities, such as, San Francisco and Boston (Paciorek, 2013).

The real estate market has nonperfect pricing characteristics in the areas of information and *price-taking behavior*, which is when operators do not have control over the market-determined price of property (Anglin & Wiebe, 2013). Akinbogun et al. (2014) posited the market as being constrained by information, demand, and supply flows, which affect the transacting parties. Further influences on house prices include lot size and neighborhood facilities (Anglin & Wiebe, 2013; Chinloy, Hardin III, & Wu, 2013). The housing market differs from most other products because of the rigid supply of land as its main constituent (Paciorek, 2013). In nonperfect market, there exist market offers, which are not demand and supply determined but provide liquidity through allowing a match with buyers for immediate sale (Chinloy et al., 2013).

As an emerging and growing economy, foreign investments in Nigeria influence house prices. Foreign investments in the emerging economies are vast in the real estate and grew considerably over a period in which house prices rose rapidly (Gholipour, 2013). Foreign funding in the property market results from globalization (Liao, Zhao, Lim, & Wong, 2014). Gholipour (2013) said that in 21 emerging economies, home prices increased by 0.36% through foreign real estate investment. Gholipour (2013) attributed the following factors as responsible for this increase in real estate prices: (a) raising the demand for a fixed supply of real estate, (b) creating the liquidity channel that allows an increased money supply, and (c) creating an economic boom through capital inflows that result in asset price increases.

Market segmentation is the identification and profiling of diverse groups of buyers of a product by their wants and demand (Kotler & Keller, 2012). In the growing economy or emerging markets, the primary segmentation influences of the housing market are pricing and affordability. Consequently, increases and fluctuations in house prices may result in an inaccessible real estate market for low and middle-income earners. Ensign and Lunney (2015) stated that the features and pricing of a product are important determinants of its ability to penetrate the market. Conversely, the real estate market segmentation types in developed economies are: (a) inner and outer areas of the city; (b) characteristics or types of dwellings, for example, flats, terraced apartments, and bungalows; (c) racial composition; (d) income levels; and (e) ghetto or non-ghetto (Tu, Sun, & Yu, 2007). The factors creating these differences are the land and its spatial features, consisting of the physical environment and the social grouping (e.g., income



class and race), which by natural selection, combined their attributes for a benefit to the environment (Tu et al., 2007).

In the growing economy or emerging markets, the housing market segmented by pricing and affordability resulted in an unfulfilled demand for low and middle-income earners. The low and middle-income earners, also known as the bottom of pyramid (BOP), constitute the vast majority of persons in any economy (Piacentini & Hamilton, 2013). Economic segregation, best defined by earning or purchasing power, ensures a limitation on the actual demand placed on real estate sellers in which the demand is confined to the high-income bracket and high net worth clients. The BOP population is not limited to location as it consists of both the rural and urban poor (Jha, 2013). Omotosho (2015) estimated the urban poor as over 40% of urban residents in Nigeria. Piacentini and Hamilton (2013) excluded the poor in developed countries as the social welfare policies of those countries provide a safety net.

The primary issue in real estate development is financing (Ezimuo, Onyejiaka & Emoh, 2014). The financing method for the achievement of home ownership varies. The financing method is either self-help or a structured or tenured facility. Said et al. (2014) defined housing finance as the system of money, funds, or credit that ensures the construction, improvement, maintenance, and acquisition of housing for homeowners' needs. In developed nations, governments, individuals, pension funds, and loan institutions fund the real estate sector, which requires a large capital outlay (Adjekophori, 2014).

The use of mortgages best accomplishes housing financing (Adekunle, 2013). Mortgages are legal agreements which give ownership rights of property by the mortgagor to the lender or mortgagee as a form of security for the loan and classed as long-term finance. In Nigeria, the sourcing of long-term finance for real estate development funding is a challenge because of other sector demands and a high interest rate culture (Ezimu et al., 2014). In consequence, the reality is that financing for the real estate sector is mainly self-produced because of the lack of long-term finances (Adjekophori, 2014). Short-term borrowing subsequently affected the development of the housing sector.

The slow development of the housing sector also directly relates to the mortgage finance to GDP ratio. Okonjo-Iweala (2014) showed the mortgage finance to GDP ratios in the developed economies as 80% in the UK, 77% in the US, 50% average across Europe and Hong Kong, and 32% in Malaysia. Comparatively, for the developing countries the ratios are: 2% for Botswana, 2% for Ghana, and only 0.5% for Nigeria (Okonjo-Iweala, 2014). An increased GDP boosted by foreign real estate investment also resulted in a decreased interest rate and construction costs after two years (Gholipour, 2013).

Governmental policies can also drive real estate financing. After the financial crisis of 2007, the increase in the demand for affordable housing led the United Kingdom and Australian governments into efforts to initiate policies that favor private driven institutional investments into the rental house-building sector (Pawson & Milligan, 2013). In Nigeria, a government policy of banking consolidation took place in 2005. The

exercise was a bank crash mitigating measure to ensure banks could meet up with their financial obligations. The consolidation entailed a 1250% increase of the bank's minimum capital base from two billion to 25 billion Naira. Bello and Abdulazeez (2014) stated that preceding the consolidation, the capital base of the banks was not sufficient to finance the various sectors of the economy, real estate included. A study to appraise the effect of the banking consolidation on the real estate in Nigeria by Bello and Abdulazeez, demonstrated improved commercial banking activities in the real estate sector after the consolidation exercise.

With intense competition for trading finance amidst economic sectors, other forms of finance, such as equity, are open to examination for mortgage funding. Equity is the most economically viable form of long-term funding (Pebereau, 2015). Equity financing is the process of raising funds through sales of shares or ownership interest for business intentions. Ezimuo et al. (2014) defined equity as the traditional form of finance operable in real estate financing. Equity in property investment requires a publically traded medium like a property company known as real estate investment trusts (REIT; Fuerst & Matysiak, 2013).

REITs are as volatile in pricing as the equity market but lack the volatility and sentimentality of the stock market because the valuation of the asset is professionally determined and not market driven (Fuerst & Matysiak, 2013). In line with this position, Emele and Umeh (2013) stated that investing in a property company is better than owning property in itself in the considerations of liquidity concerns, diversification, and optimizations of investments as equities in the real estate sector show different returns

over time (Emele & Umeh, 2013). The robustness of the housing finance market, which means its ability to withstand economic crisis, influences the performance of the housing market, and this forms the basis of housing economics (Said et al., 2014).

Other sources of finance are government bonds and pension funds. The entry of pension funds in the business world as a lender investor is another source of finance and positively affects the real estate business worldwide. The Pension Reform Act of 2004 in Nigeria had all pension matters regulated under a singular authority while addressing all the challenges seen in previous pension schemes. Adjekophori (2014) explored the financing options for the real estate sector in Nigeria through the possible use of pension funds as the source of long-term finance. Adjekophori posited that the pension funds have the necessary capital to support real estate needs for long-term finance. Because there is no allocated percent of pension funds for housing finance in the Pension Reform Act, pension funds are not deployable to the real estate sector (Adjekophori, 2014).

The examination real estate market has laid the foundation and background of the operations of the real estate market in Nigeria. Construction projects for the buildings and support facilities are the progenitors of the real estate products, which would require financing, marketing, and pricing. In summary, the real estate sector is a viable business with its funding challenges that exposes an untapped market of low and middle-income buyers, especially in Nigeria. With the growth of the economy, an expansion of the sector to cater for this untapped market would require successful construction project execution for profitability.

**Real estate construction project management.** The objective of this study was the attainment of real estate construction project success while providing housing for the growing population of Nigeria. Construction projects encompass erection, demolition, maintenance, and repair of fixed structures, as well as land development (Fulford & Standing, 2014). In the developed economies, the construction industry contributes significantly to the GDP with 6-10% attributed to the sector (Eriksson, 2013). Because of developments in the society, especially in a growing economy, construction projects transited from the rudimentary level to large operations involving diverse professionals, intricate interfaces, and increased complexities (Chou & Yang, 2012).

Complexity in projects is a situation caused by the multiplicity of challenges where resolutions would influence the project outcome successfully or otherwise (Ochieng & Hughes, 2013). Brady and Davies (2014) in a study comparing the Heathrow Terminal 5 and the London 2012 Olympic park projects, agreed that complexity could determine projects' success, especially large engineering projects. Increased complexities in projects resulted in the management of construction companies evolving from the single and separate entity organizational management style to interdependent supply chain management (Fulford & Standing, 2014). Alluding to the existence of complexities in the construction industry, Jallow, Demian, Baldwin, and Anumba (2014) stated that the construction sector is part of the large and diverse commercial engineering discipline with intensive information dissemination. The development of the projects in the construction industry happens through integrated project teams (Jallow et al., 2014).

While complexity is a challenge, to survive construction organizations evolved to meet that challenge.

In developing countries, project performance in construction is not usual (Halawa, Abdelalim, & Elrashed, 2013). In the Nigerian construction industry, Akanni, Oke, and Akpomiemie (2014) recognized the peculiar challenges to project performance as bureaucracy, political instability, and infrastructural deficiencies. The external environmental factors affecting the sector include the vagaries of weather, economic situation, governmental policies, and host community issues (Akanni et al., 2014). Ngacho and Das (2014) posited that construction projects significantly affect the local environment in terms of waste and pollution creation. The problems caused by environmental factors are challenges that are outside the control of the project manager (Akanni et al., 2014).

The construction market is highly volatile but mostly localized with 90% of the labor and materials outsourced (Fulford & Standing, 2014). Sharma and Chaudhury (2014) defined the relationship between the outsourcing parties as a strategic alliance where the benefits of forming an alliance are in four categories as follows: (a) financial, (b) technological, (c) strategic, and (d) managerial. The concept of outsourcing, which is a product of the evolution of modern business practices, globalization, and increased competitiveness, led to the creation of project-based organizations (PBOs).

PBOs are organizations whose primary services are the execution of projects for other organizations or individuals (Eriksson, 2013; Sydow, Lindkvist, & DeFillippi, 2004; Wickramasinghe & Liyanage, 2013). Construction organizations are mostly PBOs

(Eriksson, 2013). PBOs are repositories of processes, procedures, and learning opportunities, which are deployable on other future projects (Sydow et al., 2004). PBOs are set up to temporarily support a client or an outsourcing organization with services, which are not the core function of the client. The outsourcing of these services frees the outsourcing organization to concentrate on their normal production activities and avoid an irreversible increase in fixed costs (Sydow et al., 2004). The construction organization mobilizes human, material, and equipment resources to execute construction activities while the client or owner is free to concentrate on his or her specific line of business.

Noting the evolution of the construction sector into a supply chain, the necessity of a different management approach became apparent for the successful coordination of projects. Chou and Yang (2012) stated that the construction sector uses project management methodologies through highly specialized knowledge and experiential feedback. Project management is an established process of carrying out tasks with varying constraints of time, cost, and resources, requiring experts and specialists from different fields, and coordinating multiple disciplines and organizations (Lappe & Spang, 2014). Historically, the defense industry in the USA developed the project management system, which accentuates the operational connections between different activities required on a project (Chou & Yang, 2012). Subsequently, project management became recognized and widely used in various industries.

Differing scholars defined project management either from the perspectives of an organizational strategy or as an execution approach. Wysocki (2014) defined project management as organized common sense, aligned with value-adding business decisions.

Creasy and Anantatmula (2013) and Neverauskas and Railaite (2013) stated that organizations depend on project management methodologies to achieve organizational strategic goals. The project management process as simply defined by Usman, Kamau, and Mireri (2014), comprises of two activities, namely planning and execution. Alias, Zawawi, Yusof, and Aris (2014) expanded these two project management activities specifically in construction to include: (a) implementation of initiating phase, (b) performance of executing phase, (c) project monitoring, and (d) proper communications and conflict resolution. PMI (2013) defined project management as the use of knowledge, skills, tools, and techniques to project activities to meet project requirements. PMI annual reports of 2013 stated an estimated involvement of 51 million people worldwide in the management of projects (Chiocchio & Hobbs, 2014). In any of these operations, organizational strategies or execution approaches, there exists an associated cost of using project management methodologies. Lappe and Spang (2014) indicated that the costs would include organizational costs (process, personnel, and infrastructure), investment costs (enhancement, development, and refinement), and project costs (planning, supervision, and coordination).

Projects are unique temporary activities, undertaken toward a known objective (PMI, 2013). Projects in the construction industry have five major actions: (a) feasibility analysis, (b) planning, (c) design, (d) construction, and (e) operation, and each of these actions or stages could occur as a distinct project (Chou & Yang, 2012). Satankar and Jain (2015) argued that the planning stage of a project is most critical, as mistakes made are compounded and difficult to overcome throughout the project life. Alternatively,



Usman et al. (2014) considered the completion phase of the project as the most important stage in the real estate construction production but admitted that timely completion and cost effectiveness were also critical. The success of each of these activities individually would determine the collective success of the project. For project success and effectiveness, the project goals may essentially include ensuring the achievement of all the stages and measures that shall be to the satisfaction of the client while adding value to the organizational goals.

Projects are not open-ended but operate within constraints. Jallow et al. (2014) argued that the constraints in the construction project comprise of schedule, budget, workmanship ability, material quality, and understanding and managing the client's brief. Jallow et al. (2014) argued the use of information management to overcome the challenges. Important information constructs include information management processes, information management system requirements, and effective coordination of change management system (Jallow et al., 2014). Additional information constructs include change management methods and impact assessment and existing system integration (Jallow et al., 2014). These are all business management processes used for effective and systemic administration in business organizations.

Specifically for real estate construction, Agunbiade et al. (2013) explored how the productions factors of land, labor, and capital could affect real estate construction projects in developing countries with Lagos, Nigeria as the sample location. Agunbiade et al. demonstrated that an efficient land supply system would benefit developers with the support of governmental policies. In support, Abed et al. (2013) discussed the challenges

that could mitigate against erecting cost efficient residences. Agunbiade et al. further listed the challenges to project effectiveness as: (a) adoption of labor expertise, (b) cost of building materials, (c) processes of building approvals, (d) land allocation, (e) development rights, and (f) the technologies of construction.

The real estate developers use construction projects to carry out real estate developments. Because of their complexities, construction projects require proper project management to maximize the chances of project success. Project management benefits outweigh its costs (Lappe & Spang, 2014) and project management adds value by focusing on achieving organizational strategic goals (Neverauskas & Railaite, 2013). Real estate construction projects have discipline specific challenges and complexities attributable to construction projects in general. Overcoming these challenges and constraints may indicate an increased chance of project success. The theoretical framework of this study focused on the critical elements required for maximizing the likelihood of project success. The literature review continues below with the analysis of the theoretical framework and the variables (independent and dependent) that constitute the framework.

### **The Duck Alignment Theory**

The DAT as proposed by Lidow in 1999 was the theoretical framework for this study. A project is a change process (Lundy & Morin, 2013). Lidow (1999) argued that the core principle of successful project management is creating the right conditions for the change process. Lidow enumerated the various variables or critical elements that need proper preparations, positioning, and execution to facilitate an increased or maximized

chances of project success. Lidow referred to these variables or critical elements as ducks, sequentially aligned and executed, and essential prerequisites for successful project management processes. The variables or critical elements are the specific actions taken in instituting the right conditions.

The DAT is beyond classic project management concepts for achieving project success (Lidow, 1999). Cost, time, and scope are the traditional evaluation criteria for project success (Ngacho & Das, 2014). Practitioners refer to these three criteria as the *iron triangle* (Williams et al., 2015). Walley (2013) referred to the classic project management elements as hard elements, which supports the perception of the iron triangle. PMI (2013) listed project success indices as quality (scope), timeliness, budget (cost), with the additional factor of customer satisfaction.

Lidow (1999) stated that classic project management views success achievement as meeting the iron triangle objectives and consequently overlooks the critical elements necessary for ensuring the realization of these goals. These critical elements are the likely areas where the project can become problematic if not properly addressed. Lidow indicated these elements as: (a) comprehension, (b) motivation, (c) skills, (d) resources, and (e) communication. These DAT elements focused on soft skills for project management (Walley, 2013).

The systemic and systematic attendance to these critical elements would maximize the chances of project success. The use of the term, *maximize* was preferable rather than the term *ensure* as no process can guarantee the success of all projects

(Lidow, 1999). An analysis of these elements, which are the independent variables of the study, follows.

### **Analysis of the Independent Variables**

The independent variables for this study were the critical elements, which would need alignment to maximize the chances of project success (Lidow, 1999). The literature review of these elements, listed as comprehension, motivation, skills, resources, and communication, follow to analyze the scholarly dispositions toward these elements.

**Comprehension.** To Merriam-Webster.com (1828), to comprehend entails holding information within a total scope, implication, or quantity. Ganiron Jr. (2014) described comprehension as a higher order thinking skill. In critical thinking discussions, Dubrie and Pun (2013) posited that comprehension is an identified level of learning in the cognitive domain of intelligent behavior. Combining these descriptions, comprehension is knowledge acquired through an intellectual activity while using a higher order thinking skill.

Lidow (1999) argued comprehension in project management as an alignment of understanding, which is necessary and important at the initial phases of the project. The project manager's core activity is to lead and manage the project team to meet the project goals and objectives (PMI, 2013). The authorization to carry out this function derives from the project sponsor's approval of the project charter, prepared by the project manager (PMI, 2013). The project charter specifies the measurable project objectives and its related success criteria (PMI, 2013). A complete understanding of the project mission and objectives by the project management team is necessary for a successful project

execution (Lidow, 1999). Complete understanding connotes unified comprehension from the entire project team.

During project scope definition, facilitated workshops are a practice used to determine product requirements by bringing together primary stakeholders to the project (PMI, 2013). The facilitated workshops achieve an alignment of understanding of the project objectives for the entire project team at the initial stages of the project (Lidow, 1999). An alignment of understanding is necessary at this early stage, as any misalignment would be detrimental to the smooth execution of the project. Realignments at later stages shall necessitate repairs and reworks, which would affect the schedule and cost. Lidow (1999) said that in some cases, especially large, long-term projects, the process of achieving the alignment of understanding should be a standalone project because of its importance and the difficulties involved in ensuring the team's complete understanding.

Project risk analysis and evaluation also occur at the commencement of the project and form part of the process of comprehension. Park and Kim (2013) stated that evaluation of accident risks in projects included identification, comprehension, and communication. The avoidance of unknown unknowns is also a part of risk analysis and requires comprehension (Ramasesh & Browning, 2014). An improved team comprehension is possible through the communication skills required of the project manager (Rojas, 2013).

Lidow (1999) demonstrated a four-step process used for the alignment of understanding: (a) questioning, (b) discussing, (c) assessing, and (d) improving.

Questionnaires administered on team members, sponsors, and stakeholders are for the collation of information regarding what the project is about and the effects of its non-execution, how to bring about the project execution, and who the project impinges on (Lidow, 1999). In the second step, the participants and a nongroup member discuss the responses from the questionnaires, with the nongroup member standing in for unattributed responses (Lidow, 1999). The requirement of this activity is to ensure a common understanding of the responses.

The third step is assessing the group alignment through the scores assigned to the questionnaire responses with the totals representing the group alignment scores (Lidow, 1999). Lidow (1999) stated the next activity as commencing with another group discussion regarding the improvement or lack of improvement of the scores. This activity also includes taking alignment actions to ensure everybody has the same understanding. The replacement of nonaligned group members is necessary at this point while new members' introduction and briefing take place to ensure a continuous alignment with the existing team (Lidow, 1999).

**Motivation.** Human emotions and feelings are necessary considerations to project execution and success as emotions underlie or motivate actions (Lidow, 1999). Actions are the necessary inputs required to meet a need or objective. The stimulus required by humans to satisfy their needs or achieve their goals is motivation (Kim, Kim, Shin, & Kim, 2015). Motivation is the eagerness to apply effort to accomplish set goals (Kim et al., 2015). Self-propelled motivation is that inner drive, persistent effort, or self-initiated mobilization of cognitive and behavioral resources directed toward an objective (Bledow,

2013) that makes one act in a particular manner, spurred by the basic instinct to optimize well-being. In the context of project management, externally induced motivation is common, but the results are similar to self induced motivation. Motivation influences the way people work, learn, and adapt to changing environmental conditions (Palacios-Marques et al., 2013). In modern markets, human resources are the greatest asset in the organizational quest to possess and retain a competitive advantage (Oyedele, 2013). The motivated worker is financially advantageous to the organization (Oyedele, 2013). To ensure a project team is working toward a specific and shared goal, the project manager undertakes a motivational alignment (Lidow, 1999).

Strategically, project management uses motivation to enable the team to adequately engage to solving new problems, overcoming challenges, and learning new processes while maintaining a consistent and pragmatic workflow system necessary for project execution (Palacios-Marques et al., 2013). In support, Kim et al. (2015) stated the motivational effort was intentionally aimed at influencing individual and team efforts toward an organizational goal. Purvis et al. (2015) posited a project stakeholder motivation against the backdrop of a psychological and organizational climate where a shared psychological climate between stakeholders increases stakeholder participation in an existing organizational climate. Project team members that have shared goals because of the organizational climate are easier to align to project objectives (Purvis et al., 2015). Lidow (1999) argued that the project manager should understand what motivates participating team members. Such an understanding would assist in the motivational alignment.

Participation motives of individual team members in the team have two facets: the satisfaction of personal needs and vision and the achievement of group objectives while working in cooperation with others (Kim et al., 2015). Regarding the first part, the strength and level of motivation, driven by personal needs are dependent on the degree of the need (Kim et al., 2015). Responses to inducement are natural actions taken to satisfy unmet needs. Regarding the second part, individual motivation alignment would promote a successful joint effort of achievement and organizational performance (Kim et al., 2015; Lidow, 1999).

Further reviews of needs show that Maslow, McClelland, and Herzberg all argued needs at different levels where the satisfaction of the needs at the lower level triggers unmet needs at a higher level (Kim et al., 2015). Maslow's theory stated a hierarchy of needs to include: (a) physiological, (b) safety, (c) social, (d) self-esteem, and (e) self-actualization (Cao et al., 2013). McClelland's acquired needs theory stated that a person's needs are acquired over time, shaped by the environment and life experiences, and are of three types: (a) achievement, (b) affiliation, and (c) power (Han & Lynch, 2014). In motivating team members, there are levels of motivation that exist and are necessary to meet up with the short- and long-term needs of the individual. The levels of motivation for the worker would depend on his or her status on the hierarchy of needs. Recognition of each individual's level of motivation may be necessary for the motivation alignment.

The process theory of motivation, known as the expectancy theory, is the chosen employee theory of motivation (Purvis et al., 2015). According to Purvis et al. (2015), the expectancy theory highlights the team member's assessment of the environment, his or



her subsequent actions as a reaction to expectations, and consists of three constructs: instrumentality (an evaluation of successful performance backed by efforts and innovative input); expectancy (an evaluation of the extent of the effort required to achieve the expected performance); and valence (the perception of the attractiveness of the rewards accruing to the performance).

Kim et al. (2015) found cultural differences as considerations in motivational factors. Motivational factors come in different forms. In project teams, motivational factors can also come through the introduction of technology. A project team member's job performance increases by using a new technology. This is known as *perceived usefulness* (Palacios-Marques et al., 2013). Friendly environments within the project teams created by project managers are also means of motivation for team members (Palacios-Marques et al., 2013). A positive correlation exists between levels of motivation and job performance (Kim et al., 2015). Motivation level is the interaction between personal and environmental factors (Kim et al., 2015). Oyedele (2013) said that motivation and de-motivation are the same but are dependent on the individual frame of reference.

Purvis et al. (2015) noted three types of participation of stakeholders in a project. The first is active participation where the three constructs of the expectancy theory, instrumentality, expectancy, and valence are all positive, and the worker participates readily. The second is token participation where either the instrumentality or the expectancy constructs are negative, and the employee employs effort only to pacify management. The third is counter-implementation participation, where the valence

construct is negative. Here the worker is negatively motivated, and would revert to taking actions that would be detrimental to the success of the project (Purvis et al., 2015).

Alternatively, the non-use or avoidance of motivation exposes the project team to sabotage, chaos, or works executed at cross-purposes (Lidow, 1999). Individual team members would have their personal agenda, negatively reflecting project performance and at most times, perpetrated unconsciously (Lidow, 1999).

As motivation deals with personal feelings and perceptions, its alignment is most difficult (Lidow, 1999). Asking team members for their reasons for participating would be misleading as most reasons would not be factual or thought through. Lidow (1999) demonstrated a four-step process for the alignment of the motivation duck, which would be to obtain the required information, analyze it, and activate the incentives.

The first step is the identification of personal goals, and it encompasses scheduling meetings and structured interviews. The answers to the probing questions, display of emotions, and the body language accompanying the answers form part of the output of this step (Lidow, 1999). The second step is the alignment of organizational and personal goals. After the analysis of the data collected during the first step, the project manager meets with the sponsor to develop a better realignment of the objectives of the project and the goals of the team members. The slight adjustments required should not derail the intent of the project or overtly favor any individual over another (Lidow, 1999).

The third step is the creation of incentives, which could include recognitions and awards while excluding threats previously shown as ineffective (Lidow, 1999). The managers' facilitation of project implementation and execution is the last activity. The

project manager follows through on the requirements of the project and ensures a smooth execution free of distractions, while making sure all team members receive their due remunerations and training (Lidow, 1999).

**Skills.** The third duck alignment for the increased chance of project success involves the project manager ensuring that the project team members have the requisite skills necessary for their assigned tasks and consequently the execution of the project (Lidow, 1999). Skill is the ability to perform a task (Mazur & Pisarski, 2015). Matteson, Anderson, and Boyden (2016) defined skills as structured actions, attributable to achieving an objective, developed over time with practice, and in its performance, display an economy of efforts. Claxton, Costa, and Kallick (2016) described skill as a procedure acquirable by training. Fundamental to these definitions is the notion of execution or action. The deployment of skills for the implementation of a task in the project is meant toward the achievement of project objectives or goal.

The skills deployable regarding a task can be hard or soft skills. Hard skills are objective, measurable, defined in a discipline, and reliable (Claxton et al., 2016). Hard skills are the technical requirements for executing a task (Pandey & Pandey, 2015). Hard skills examples may include proficiency in a foreign language, designing, typing speed, certification, machine operation, and computer programming. Soft skills are subjective, impossible to measure (Claxton et al., 2016), nontechnical, and domain independent skills (Matteson et al., 2016). The most common soft skills include initiative, innovation, integrity, communication, leadership, flexibility, teamwork, positive attitude, and collaboration and cooperation (Matteson et al., 2016). Soft skills, which are 85% of an

individual's skill success, are complementary to hard skills at 15% skill success and engender a competitive advantage to both the individual and the organization (M. Pandey & Pandey, 2015).

In varied literature, the discussion on skills evolved as a part of competency. Competency is the ability and expertise required to master and carry out tasks and solve performance related problems (Mazur & Pisarski, 2015). Human competencies are the employee skills accessible to an organization (Ekrot, Kock, & Gemunden, 2016). In the same light, Takey and de Carvalho (2015) defined individual competence as the use of knowledge, skills, and resources in the performance of set goals, which adds value to the organization. Competency constructs analyzed through frameworks developed by project management regulatory organizations are quite similar (Ahsan, Ho, & Khan, 2013). The project management organizations include the International Project Management Association (IPMA) and PMI. The IPMA described competencies as (a) technical, (b) contextual, and (c) behavioral while the PMI constructs were (a) knowledge, (b) performance, and (c) personal (Ahsan et al., 2013). In project management, Takey and de Carvalho identified seven management competencies as (a) technical, (b) process, (c) time, (d) client, (e) business, (f) personal, and (g) uncertainty management.

Loufrani-Fedida and Missonier (2015) posited knowledge, skills, and attitudes as the critical competencies analyzed on three levels: individual, collective, and organizational. Loufrani-Fedida and Missonier further demonstrated a positive attribute where the project manager can combine competencies on these different levels to achieve project strength not possible when used on single level. Ahsan et al. (2013) opined that

project management competencies deploy into three parts: knowledge, skills, and abilities. The three parts argued by Ahsan et al. apply to each of the three levels posited by Loufrani-Fedida and Missonier.

Ekrot et al. (2016) explored project management competence retention (PMCR) in the organization. Ekrot et al. posited that maintaining personnel that represent critical skills and establishing learning that continually develop new skills facilitated PMCR. The practice of PCMR enhanced project success in the organization (Ekrot et al., 2016). The reoccurring consideration for competence is knowledge, which aligns with Matteson et al.'s (2016) first two skill components: field-specific knowledge base and access to the knowledge. The third skill component is ability (Matteson et al., 2016).

A project is a change process that requires a particular set of skills because of its uniqueness (Lidow, 1999). The determination of the specific skills set necessary for the project is dependent on the type, size, and duration of the project (Ahsan et al., 2013; Lidow, 1999). For example, a short-term low-budget project uses different skill sets compared to a large-scale, long-term project (Ahsan et al., 2013). Lidow (1999) demonstrated six core general skills that apply to any project.

The first is the listening skill, which is a requirement on the project team, as someone needs to listen, find out, and document all the project stakeholders along with their interests. In the multicultural construction project environment, Kim et al. (2015) stated listening skills as an important attribute for multicultural leaders. In many cases, listening skills would include the ability to use surveys (Lidow, 1999).

The second skill is the communication and training skill. The need to communicate the aims and objectives of the project to the stakeholders would necessitate possessing in the project team an individual skilled in this art (Lidow, 1999). The ability to design and facilitate training for the maximum benefits of the stakeholders is important (Lidow, 1999).

The third skill required is the project leadership, which is of high importance, as the right leadership of a project is a critical determinant of its success. Leadership is a process or ability of an individual to encourage a set of people to work toward a goal or an objective (Lidow, 1999; Northouse, 2013). The leadership of a project is a project manager's function. The project manager is responsible for planning, executing, monitoring, controlling, and closing the project (PMI, 2013; Rojas, 2013). The project manager has an overall view of the project, and his performance directly affects the project performance (Rojas, 2013).

The level and styles of leadership competence required of a project manager vary between projects depending on the type and scope of the project. Simple projects might require transactional leadership style while complex projects might require the transformational style (Ahsan et al., 2013). Because of its evolving nature, project management leadership requirements moved from the reliance on technical expertise (hard skills) to interpersonal behaviors (soft skills), tempered by project type and organizational dynamics (Creasy & Anantatmula, 2013). Project manager competencies are highly necessary for project success as project manager skills can traverse different projects with varying type, scope, and size (Ahsan et al., 2013). In some instances, the

project manager for a specialized project might be required to possess specific technical skills to enable an easier management system. For example, in real estate development, the design phase is critical, as a faulty design output is responsible for 50% or more of reworks (Ahadzie, Proverbs, & Sarkodie-Poku, 2014). Design management is a required competence of the project manager in the turnkey construction environment (Ahadzie et al., 2014).

Lidow (1999) defined project leadership skills to include: (a) communication, (b) motivation of team members, (c) creation of a pleasant operating atmosphere, (d) evaluation of team performance, and (e) measurement of project progress. In agreement, Ahsan et al. (2013) indicated project leadership skills to include communication, organizational, team building, leadership, coping, and technological skills. Ahsan et al. demonstrated the existence of the correlations between three leadership competency variables of the project manager: emotional, managerial, and intellectual and project success.

The process design skills required in situations in which the project requires a process implementation to come into effect is another required skill (Lidow, 1999). As most projects are change processes, there is a skill requirement, which involves creating different processes to enable the change task (Lidow, 1999). Formulation of working procedures and ensuring compliance with the approved procedures are all processes required for this skill to function.

The fifth skill is failure analysis. Failures are nonconformance to requirements (PMI, 2013). Failure analysis prevents an occurrence or a reoccurrence of failure as part

of quality management planning. Lidow (1999) likens the failure analysis skill to the process design skill but only applicable in some cases.

The planning skill, which is applicable where the project has some constraints especially in time and resources, is the sixth skill (Lidow, 1999). Planning is a process group wherein its performance establishes the total scope of effort and the course of action required to attain the project objectives (PMI, 2013). Effective planning skills would minimize the effort used in project execution, resulting in added business value (Lidow, 1999).

The required skills for the project are outputs of the *work breakdown structure (WBS)*. The WBS further breaks down the project deliverables or tasks into smaller manageable components (PMI, 2013), which ensures a complete understanding of the work to be carried out. Consequently, the WBS highlights the skills needed to complete the deliverables. Occasionally, some skills are difficult to obtain, requiring an allocation of time in the project for the development of that skill (Lidow, 1999). The lack of skills, the inability to predict in advance the required skills for project execution, and the failure to apply flexibility with the inherent skills at unfamiliar circumstances are challenges in aligning the skills construct to maximize project success (Lidow, 1999). However, while possession of a supply of the required knowledge, skills, and resources is essential to project success, their application for high performance and added value is highly significant (Takey & de Carvalho, 2015).

**Resources.** Ensuring the availability and allocation of the resource requirements before the commencement of the project is the next duck alignment process for the



enhanced prospects of project success (Lidow, 1999). Resources are productive factors or means used to carry out an activity to achieve set goals. Projects are unique temporary activities carried out to achieve set goals (PMI, 2013). Projects are comparable to developing new products. De Brentani and Kleinschmidt (2015) mentioned resource commitment as a background factor associated with new products development (NPD) or project success. Resources can be capital (finance), land, equipment, material, expertise, information, time, human (labor), or energy.

PMI (2013) stated the company's operating organizational structure as an enterprise factor, which affects resource availability and deployment. Organizational structures are mainly functional, matrix, or project based with mixed variants in between. In functionally organized firms, the technical managers control the resources, and the project manager is part-time (PMI, 2013). Fulford and Standing (2014) stated that projects are not the major focus of the business in functional organizations where the project manager is disadvantaged in resource allocation and use because the project manager needs to borrow resources from different functional units to support the project.

Early descriptions of project management focused on resource management and control within certain constraints (Ngacho & Das, 2014). Project managers compete for resources for their projects and these projects would succeed or fail from its ability or lack of it, to avail themselves of required resources at the appropriate time (Lidow, 1999). Olawale and Sun (2015) discussed meeting the time constraints of the project by carrying out an early assessment of the resources required to ascertain sufficiency. Regarding cost analysis, Ngacho and Das (2014) stated that increases in resources would escalate the

project cost. Consequently, project stakeholders would assign enough resources to meet precisely and adequately with the time and cost constraints of the project (Ngacho & Das, 2014).

Alzahrani and Emsley (2013) further linked the deployment of resources and time constraints with success in construction project management and defined construction management project success as foreseeing requirements needed and providing the necessary resources to meet those timely needs. As resources use influences efficiency, Ngacho and Das (2014) stated that the maximal use of a resource input is the measure of organizational efficiency. Timely delivery of resources also aids efficiency (Ngacho & Das, 2014). A time factor significantly affects the effectiveness of resource deployment.

The project manager or project stakeholders use different strategies to manage resources. Some project managers or stakeholders withhold resources with the intention to achieve more with less (Lidow, 1999). Invariably, this approach would lead to the devastation of team motivation, which would affect the deployment of skills and communication between team members, and eventually erode the chances of project success (Lidow, 1999). Other project managers or stakeholders would set unrealistic and unattainable targets to drive the project towards achieving success. Lidow (1999) stated that setting unattainable goals would waste resources because experienced personnel would not work at their best while knowing that the set target is unachievable. Realistic targets would have better results, as they do not waste resources or demotivate the project team (Lidow, 1999).

In a situation comprising of a resource problem, the project manager either increases the resources to match with the work scope or reduces the work scope to match with the available resources. If challenges exist in the project after these actions, either the motivation or the skills duck is out of alignment (Lidow, 1999). As seen, the motivation duck, the skills duck, and the resources duck have a significant relationship.

**Communication.** The attributes and actions of the leader are human elements that significantly affect the outcome of a project (Hagen & Park, 2013). The human element is the critical part of managing projects and can include people's behaviors, the social system, political issues, and communications problems (Chiocchio & Hobbs, 2014). Communication is an essential leadership skill (Gladden, 2014). Communication is a soft and subjective skill required by project managers (Chiocchio & Hobbs, 2014). Communication is necessary for project success and communications skills include reporting, presenting, relations management, and interpersonal skills (Ahsan et al., 2013). Communications problems are a part of known project management challenges.

Project communications management is one of the ten knowledge areas of the Project Management Body Of Knowledge (PMBOK) guide. The primary processes for communications management are planning communications, managing communications, and controlling communications (PMI, 2013). The activities involved in communications vary in dimensions and include internal and external, formal and informal, vertical and horizontal reporting, official and unofficial, and written, oral, and verbal and nonverbal (PMI, 2013).

Communication is necessary in project management, as communication is useful for the engagement of stakeholders in projects stakeholder management (Turkulainen, Aaltonen, & Lohikoski, 2016). Stakeholder management is another knowledge area of the *PMBOK* (PMI, 2013). Stakeholder management is important for project success because an ineffectual engagement of the stakeholders would result in withdrawal of stakeholders' support, which may lead to hostility or sabotage of the project goals. Different stakeholders require diverse communications approaches (Turkulainen et al., 2016).

For the duck alignment, communication is an early action to ensure that the stakeholders understand the importance of the project (Lidow, 1999). Creasy and Anantatmula (2013) stated the importance of project manager communication and the significance of dispensing with likely obstacles to communication early in the project. While achieving this alignment is difficult for larger projects with multiple and varied stakeholders, it remains critical that communications with all stakeholders are initiated at the beginning and continued throughout the project life (Lidow, 1999).

The method of delivery of the stakeholder communications is important. Lidow (1999) argued the use of delivery methods with a feedback mechanism. Memos and newsletters are not appropriate because of the one-way and non-personalized nature of the communication and at most times, they tend to alienate recipients instead of informing and attracting them to the idea (Lidow, 1999). Memos and newsletters deliver data.

Lidow (1999) explained a three-step communications process for ensuring the support of stakeholders. The three-step process closely follows the communications process stated in the *PMBOK*. The first step is to identify and group the stakeholder affected similarly, whether negatively or positively (Lidow, 1999). The second step is to plan and deploy a specific segment-targeted communications strategy (Lidow, 1999). The third step is to monitor and modify the communications plan with the collected results and feedback (Lidow, 1999).

Differing scholars presented various discussions of communications in project management depending on project type. While arguing coordination in multi-team projects, Dietrich, Kujala, and Artto (2013) explained an interdependency of functions that requires coordination and an exchange of information bordering on communication. In virtual, culturally diverse, or geographically dispersed teams, collaboration and coordination is complicated but made easy by the establishment of a flawless communications process (Gladden, 2014). In exploring how architecture, engineering, and construction (AEC) project teams communicate in integrated project delivery (IPD), Sun, Mollaoglu, Miller, and Manata (2015) stated communication behaviors as significant to team performance and innovation implementation. Sun et al. listed the communication behaviors as monitoring, challenging, managing, and negotiating.

The action of executing communications would come with some apprehension, which varies in level between project managers. A project manager's level of communication apprehension is the real or perceived anxiety toward a communication action with other persons (Creasy & Anantatmula, 2013). In discussing communication

apprehension, Creasy and Anantatmula (2013) argued the possibility of low and high levels of apprehension occurring in four interactive environments of the project manager. These interactive environments are formal meetings, presentations, interpersonal conversations, and group discussions. In all types of projects, Hagen and Park (2013) argued that open communication, as a practice of the project manager, is critical to the success of the project.

### **Analysis of the Dependent Variable**

The dependent variable for this study was project success. Project success, though related to business success, differs from it because of the internal or external viewpoints. The difference in viewpoints is whereas business success is a comparison of the organization's economic market success against that of the competition, project success measures observance with approved criteria, goals, and objectives (Ekrot, Kock, & Gemünden, 2016). Business success in the construction sector relates to project success because the survival of an organization depends largely on the successful completion of their projects (Zavadskas, Vilutiene, Turskis, & Sapauskas, 2014). Project success is important in the construction industry.

Project success is the completion of a project with the most desirable outcome (Alzahrani & Emsley, 2013). Project success is the immediate goal of project management performance (Berssaneti & Carvalho, 2015; Satankar & Jain, 2015). Project management success differs from project success. Project management success is the accomplishment of the iron triangle comprising of time, budget, and specifications (Alzahrani & Emsley, 2013), achieved by aligning to the strategic objectives of the

organization (PMI, 2013). Project success is simply the accomplishment of the project objectives (Alzahrani & Emsley, 2013). In real estate, project management activities determine the success of any significant development because of stakeholder engagement (Bernhold, Lattuch, & Riemenschneider, 2014).

Construction project success is dependent on the contractor (Alzahrani & Emsley, 2013) especially in its management and control (Alias et al., 2014). Construction projects success is measured through the constraints of the iron triangle consisting of cost, schedule, and scope with the addition of stakeholder's satisfaction (Halawa, Abdelalim, & Elrashed, 2013). These project complication-causing constraints become more rigorous through increasing demands from the client regarding the use of lesser resources and shorter durations to achieve higher quality (Brammah & Ghadamsi, 2013). The contractor's focus is on achieving client's satisfaction.

In exploring the construction of mass building projects, Chou and Yang (2012) added environmental impact and safety as part of the success factors under consideration. Bernhold et al. (2014) examined the success dimensions of real estate construction projects as emphasized in stadium development. Bernhold et al. named five success factors prospects, viability, planning, administration, and operations. The five factors from Bernhold et al. encompass the whole stages of the project from prospects, when the project is in conceptual state, to operations, when the project is in use. Lidow (1999) examined maximizing the chances of project success while the project is still at its early stages.

Alzahrani and Emsley (2013) examined critical success factors in construction projects through the lens of the contractors' success attributes. Alzahrani and Emsley found the most significant construction contractors' success attributes were turnover history, quality observance, resources, waste management, size of completed projects, and corporate image. Alzahrani and Emsley viewed contractor success attributes through the lens of business and organizational success. Project success formed part of the organizational goals to achieve business success. Lidow (1999) viewed project success without the considerations of other organizational goals. Alias et al. (2014) explored the relationship between critical success factors and project performance in construction projects. Alias et al. demonstrated that management activities are a veritable link between critical success factors and project performance.

In organizational performance evaluation for developmental projects, the development assistance committee of the organization for economic co-operation and development (OECD) espoused five evaluation criteria best suited to their priorities and policies: relevance, efficiency, effectiveness, effect, and sustainability (Ngacho & Das, 2014). The five evaluation criteria, as a general application, may be used to assess each of the five constructs of the duck alignment theory. Zavadskas et al. (2014) indicated success factors premised on the construction value stream, which begins the initiation of the project by the involvement of the project managers and proper and sufficient preparations. The preparations include: (a) incompetent design, (b) poor estimation and change management, (c) social and technological issues, (d) site related issues, and (e) improper techniques and tools (Zavadskas et al., 2014). Accordingly, this aligns with the



DAT by Lidow (1999) where the alignment actions are at the beginning of the project to maximize the chances of project success.

Critical project success factors are abstract and immeasurable factors such as project manager's leadership skills, organizational support, stakeholders' feedback, owner's competence, and favorable climatic conditions (Zavadskas et al., 2014). Some Lidow (1999) constructs closely aligns with and relates to Zavadskas et al. success factors with project manager's leadership skill as skills, organizational support as resources, and stakeholders' feedback as communication. Zimmermann and Eber (2014) reviewed the performance indicators through a mathematical base for the organizational structures in the construction and real estate sector. Zimmermann and Eber defined the structure as a complex interacting network driven by coordination and motivation with interfaces defined. Project success involves managing risks of differing variables including probabilities, control, and mitigation (Zimmermann & Eber, 2014).

Diverse and varied factors affect project success, making it difficult to measure (Kim et al., 2015). Although the iron triangle is simple and has some degree of measurability, different authors stated it to be rigid and not inclined to performance evaluation (Ngacho & Das, 2014). Accordingly, several dimensions of success criteria in construction projects exist. Considerations of project success issues could be at the point of project success experience, different performance measurement criteria depending on project type, and project management performance and effectiveness (Alzahrani & Emsley, 2013). Finally, project success factors include measures taken during project execution (Braumah & Ghadamsi, 2013; Halawa et al., 2013; Satankar & Jain, 2015),

contractor management attributes (Alias et al., 2014; Alzahrani & Emsley, 2013), and overall expectations of the project (Bernhold et al., 2014; Ngacho & Das, 2014). A systematic assessment of real estate construction project success would incorporate financial and nonfinancial features and short and long-term elements (Satankar & Jain, 2015). In the final analysis, contractor management, project leadership ability, risk management, and developed working attributes are critical enablers of construction project success.

Differing scholars had earlier conducted studies on the dependent variable, project success, using the three research methods of quantitative, qualitative, and mixed methods. Alzahrani and Emsley (2013), Bernhold, Lattuch, and Riemenschneider (2014), and Satankar and Jain (2015) used these research methods respectively. With the quantitative aspect, project success is a numerically measurable construct, which the quantitative method can address. As stated by Yilmaz (2013), the quantitative method of research involves a numerical approach with measurable data. Alzahrani and Emsley (2013) studied the critical success factors (CSF) in construction projects using a self-administered survey. Participants of the survey rated the effect of nine contractor-CSFs clusters on construction projects (Alzahrani & Emsley, 2013).

The nine CSF clusters are health, safety and quality; past performance; environment; management and technical aspects; resource; organization; experience; size/type of previous projects; and finance (Alzahrani & Emsley, 2013). Alzahrani and Emsley (2013) found a significant association of project success with seven of the 35 CSFs categorized under the nine clusters. The seven CSFs occurred within six of the

clusters (Alzahrani & Emsley, 2013). The null clusters include past performance, management and technical aspects, and experience (Alzahrani & Emsley, 2013).

Using constructivism, Bernhold et al. (2014) studied project success dimensions of major real estate projects. Constructivism involved the use of understanding, knowledge, and experiences for scientific study, which depict the qualitative method (Creswell, 2013). Bernhold et al. focused the study on stadium development and used five critical success dimensions for the analysis: vision and expectation, risk and feasibility, project planning and design, construction management, and stadium operations. The conceptual framework of the study was stakeholder influence and its efficient management to enhance project success. Bernhold et al. concluded that a careful involvement of the stakeholders with a better understanding of the entire endeavor would erase ambiguities and eliminate problems occurrences at construction and operations phases.

Satankar and Jain (2015) identified and examined the constraints and contributing success factors in real estate construction projects. The research method applied was mixed methods and the sequential exploratory strategy. Terrell (2012) stated the sequential exploratory strategy was a mixed method strategy where the qualitative data collection and analysis commences the research, and the quantitative phase builds on the initial result of the qualitative research. Satankar and Jain used the qualitative aspect of the mixed methods study to identify the variables through a literature search on real estate project success and a pilot study, which involved interviews with four practitioners in the real estate sector. Satankar and Jain identified 23 success factors in four variable clusters.

These clusters were financial, customer, value adding, and operational (Satankar & Jain, 2015). These clusters relate to project success on the organizational level. The DAT by Lidow (1999) related to projects on the operational level and aligns with the operational cluster variable. The quantitative aspect involved a survey with data to classify causes of project delays collected from various architects, contractors, and developers in Pune City. Satankar and Jain found that the implementation of the 23 critical success factors by a construction company increases the chances of project success.

The three research methods are possible for application of the dependent variable as exemplified by the literature cited. The quantitative method uses a mathematical model for the analysis of variables. For this study, I chose to use the quantitative method for the analysis of five variables, which represented early alignment actions to maximize the chances of project success.

### **Rival Theories of the Duck Alignment Theory**

Lidow (1999) discussed the DAT as prior actions taken at the commencement of the project to increase the chances of project success. Prior to Lidow's theory, the regular lens of viewing project success, as encapsulated by PMI (2013), was through the three critical elements of cost, schedule, and resources. The core responsibility of the project manager is to track and monitor the three critical elements during the project execution phase to ensure project success.

PMI (2013) initially theorized the three elements of cost, schedule, and resources as constraints to the project, which the project manager would need to balance to achieve project success. The iron triangle comprises of constraints (Williams et al., 2015). Client

satisfaction is an additional constraint (PMI, 2013). The implementation and monitoring of the four constraints occurs during the project execution phase. Comparatively, Lidow (1999) focused the DAT on front-end activities that ensure starting the project right through proper alignment to increase the chances of project success. The importance of the DAT is in the reduction of remediation and corrective actions, which would negatively affect the constraints of cost, schedule, resources, and client satisfaction during project execution.

### **Measurement Instrument**

A measurement instrument is a device used by the researcher to measure the variables. The measurement instrument for this study was a questionnaire delivered through survey. The questionnaire is the project implementation profile (PIP) developed by Slevin and Pinto (1986). The PIP is a ten-factor measurement instrument used for measuring the human and managerial aspects of project success. The questionnaire is on a Likert scale format scored from a 0 to 10 range. Project managers also use the PIP to monitor project success, anticipate future challenges, and allocate resources to forestall seen challenges.

The ten factors in the PIP encompass multiple activities encountered during project execution and critical to successful project implementation (Slevin & Pinto, 1986). Some of the ten PIP factors are early activities in the project, and others occur throughout the project life and the rest toward the end of the project. The 10 PIP factors are project mission, top management support, project schedule and plan, client consultation, personnel, technical tasks, client acceptance, monitoring and feedback,

communication, and trouble-shooting (Slevin & Pinto, 1986). Within the context of this study, the PIP factors aligned to the five study variables by Lidow (1999) formed the measurement criteria for the independent variables. The five PIP factors chosen for measurement for the scope of this study and matched with Lidow's (1999) five variables are: (a) project mission – comprehension, (b) top management support – resources, (c) personnel – motivation, (d) technical tasks – skills, and (e) communication – communication.

### **Conclusion**

The real estate sector in Nigeria is open to an expansion of its business because of the unmet demand for housing from the growing Nigerian population. The operators of the sector do not contribute as expected to the GDP. Obstacles to real estate developments exist, which range between faulty administrative procedures and unfavorable financing regulations resulting in a housing policy failure. The property market is robust because of its product, which is a basic need, and the self-motivated drive of individuals in their bid to achieve the desired home ownership. High home prices and unaffordability created an unfulfilled housing demand for low and middle-income earners. Financing for the sector may be through government funds, private and institutional financiers, and foreign investment. Mortgages are not easily available and because of this the mortgage to GDP ratios are below 1%.

The operators of the real estate construction sector can leverage market opportunities through executing successful projects. Challenges to project performance may include bureaucracy, political instability, infrastructural deficiencies, and

environmental factors. For real estate construction, the specific challenges may include land, labor, building materials, and the technologies of construction. The objective of project management methodologies is to deal systemically with the challenges and achieve project success. Project managers in the real estate construction sector are responsible for ensuring project success, which may improve profitability. To maximize the chances of project success, Lidow (1999) proposed the DAT. The DAT comprised of predictor critical elements comprehension, motivation, skill, resources, and communication. The critical elements were the independent variables for the study and are early project activities, which when aligned, maximize the chances of project success.

In an analysis of the independent variables, comprehension is an alignment of the understanding of the scope of the project. Motivation is the stimulus required to carry out project activities. Skill is the ability to perform project tasks. Resources are the production requirements for achieving set goals. Communication is an element that ensures interaction of all project stakeholders. Project success is the completion of the project with the most desirable outcome (Alzahrani & Emsley, 2013). PMI (2013) viewed project success through the lens of the three constraints of cost, schedule, and resources, and tracked during the execution phase. The DAT is an early activity, which aligns its elements to maximize the chances of project success.

### **Transition and Summary**

Section 1 of this study included the elements of the problems existing in real estate construction projects and the business opportunities made available while surmounting the problems. The components of section 1 are the background of the

problem, the problem and purpose statements, nature of the study, research questions and sub-research question, hypotheses, theoretical framework, definition of terms, assumptions, limitations, delimitations, and significance of the study. The review of the academic and professional literature comprised of an analysis of the real estate sector emphasizing its fundamentals, market (segmentation, pricing, and financing), and the requirements of project management in housing construction. Section 1 also included a deeper analysis of the theoretical framework comprising of the independent and dependent variables, other opposing theories, and other methodologies previously used in exploring the dependent variable. In the Section 2, I discussed the role of the researcher, participants, research method and design, population and sampling, ethical research, data collection, data analysis, and reliability and validity.



## Section 2: The Project

This study, which involved the examination of the correlates of project success in the Nigerian real estate sector, was a quantitative correlational study. In this section, I described the research methodology and other elements of research. The various topics for examination included the role of the researcher and the ethical considerations to ensure fair treatment of participants, the participants and the selection criteria, and the research method and design. Further topics included population, the sampling method, data collection and analysis, and study validity.

### **Purpose Statement**

The purpose of this quantitative correlational study was to provide real estate construction project managers with the knowledge of the relationship between the predictors of comprehension, motivation, skills, resources, and communication in project management and real estate construction project success. The independent variables were comprehension, motivation, skills, resources, and communication. The dependent variable was project success. The targeted population consisted of the real estate construction project managers in the geographic location of Nigeria. The findings of the study might assist the project managers in real estate construction to identify the predictor variables for forecasting real estate construction project success. Business leaders in the real estate sector may use the findings from the study in affecting positive social change by promoting effectiveness in housing delivery, which would assist in alleviating the housing problem while carrying out a profitable business venture. An improved real

estate industry would enhance the Nigerian GDP and stimulate the economy for growth, stability, and sustainability.

### **Role of the Researcher**

Whitley and Kite (2013) stated that the later processes of the research after the development of the hypothesis and choosing a research strategy include the following data collection and storage, data analysis and data integrity, interpreting the results and study conclusions, and publishing the results for future uses. As the researcher, I actively engaged in all the processes of research. The role of the researcher, especially as an insider, includes acknowledging and eliminating personal bias in research (Fassinger & Morrow, 2013). I have 24 years of experience working in the housing sector in Nigeria as a design architect. I am a member of the PMI, and certified as a project management professional, which implies further professional involvement with the study background and constructs.

The Belmont Report of 1978 contains the ethical principles and guidelines for researchers conducting studies that involve human participants. The objective of the Belmont report is to protect human participants in research from maltreatment or abuse by the researcher (Office of the Human Research Protections [OHRP], 1979). I reviewed and completed the training for Protecting Human Research Participants by the National Institute of Health, Office of Extramural Research with certificate number 1722472 (see Appendix A). The Belmont Report has three basic ethical principles: respect for persons, beneficence, and justice (Nicolaidis, 2016). I applied these principles by ensuring respect for participants through informed consent of the participants, sustaining beneficence

through assessment of risks and benefits of the research, and upholding justice through the selection of subjects.

### **Participants**

Participants meet the eligibility criteria for research on qualifying for some preset factors (Yilmaz, 2013). Ogbuagu (2013) listed the preset eligibility factors for the participants in a study to include age, race, gender, location, years of working experience, job roles, and overall perception of the knowledge and experience of subject matter. Eligible participants consisted of project management practitioners in the real estate construction sector in Nigeria. Bowen, Edwards, Lingard, and Cattell (2014) listed project management practitioners to include the following categories of staff: project managers, project engineers, project architects, estate developers, construction managers, site managers, and project control managers. I used the following eligibility criteria to select participants: location in Nigeria, operating in the real estate construction, and a job role in the project management team.

I selected participants using the purposive sampling technique. Purposive sampling involves a nonprobability sampling approach in which the selection of the participants is specifically through the researcher's field knowledge and connection with the target population (Acharya, Prakash, Saxena, & Nigam, 2013; Barratt, Ferris, & Lenton, 2015). According to Bowen et al. (2014), professional registration and association forms a large catchment of eligible participants and the assistance of voluntary professional institutes' management provides the necessary access to potential participants. I gained access to the potential participants by using the links through the

professional groups on LinkedIn to send them invitations (see Appendix B). The invitation contained an explanation of the research purpose and a request to participate in an online survey questionnaire (see Appendix C). The online survey has the characteristics of time and cost saving while providing a wider reach of participants (Alzaharani & Emsley, 2013). I also approached other potential participants through the management of construction companies operating in the real estate sector (see Appendix D).

The rapport between a researcher and participants is critical in a study. Treating the participants as coresearchers optimizes the rapport with the researcher (Fassinger & Morrow, 2013). Confidentiality and participant protection is a top priority for the researcher (Fassinger & Morrow, 2013). Potential participants were required to sign an electronic consent form built into the online questionnaire. In addition to giving consent, the researcher stipulates in the consent form the following: the basis and extent of the participants' involvement in the research, their ability to withdraw without consequences, and the contact information of the researcher (Rubinstein, Karp, Lockhart, Grady, & Groft, 2014). After attaining Walden Institutional Review Board (IRB) approval, I ensured the participants completed an electronic consent form before gaining access to the online survey.

### **Research Method and Design**

The three primary research methods are qualitative, quantitative, and mixed methods (Maxwell, 2016). There are many research designs for each of these methods. I used the quantitative correlation approach as the research method and design to determine

how the predictors of comprehension, motivation, skills, resources, and communication correlate with real estate construction projects' success. In this section, I explained in detail the choice of the quantitative method and the correlational study design as compared to other methods and designs.

### **Method**

The research paradigm is the organization of ideas and assumptions for the attainment of a worldview or perception (Khan, 2014). The quantitative method selected for this study aligns with the positivism worldview, which supports objective and logical analysis of data, unbiased and tightly controlled experiments, empirical observations, and scientific results (Gray, 2013; Whitley & Kite, 2013; Yost & Chmielewski, 2013). Researchers use the quantitative approach by utilizing a set of standardized responses from sampling and surveys to attain generalized or wide-ranging findings (Yilmaz, 2013). The findings are through statistical aggregation of the data obtained for testing the theories and hypotheses supporting a research question (Fassinger & Morrow, 2013; Yilmaz, 2013). The researcher, through statistical testing, examines the relationships between independent and dependent variables (Hoare & Hoe, 2013). The selection of the quantitative research method for the study was chosen because the method is objective and impartial in the data collection and analysis process, which ensures the independence of the researcher and the subject (Yilmaz, 2013). The quantitative research method was suitable for this study because I tested five independent variables: comprehension, motivation, skills, resources, and communication against the dependent variable: project success.

The qualitative approach is an inductive, nonnumerical approach involving the lived experiences of the participants (O'Reilly & Parker, 2013). Researchers use the qualitative method to collect nonnumerical data on human behavior to answer the *how*, *what*, and *why* questions of a person's behavior, in certain conditions, and toward a particular subject (Oun & Bach, 2014). The rigors of the qualitative approach require the researcher to optimize the interview questions, carry out analysis of the first and second order, conduct specific tests for acceptance, and ensure data saturation (Gioia et al., 2013). The qualitative approach was not suitable for this study because the study was numeric, objective, and did not involve exploring the behavior or lived experiences of the participants.

The mixed methods approach involves the use of both the qualitative and quantitative methods of research in the same study (Dupuis, 2013; Maxwell, 2016). The best application of the mixed methods is when the sole application of either the qualitative or the quantitative method cannot answer the research question satisfactorily (Venkatesh et al., 2013). Researchers use the mixed methods approach to promote a challenge to the paradigmatic and methodological characteristic and uphold differing knowledge of constructs and traditions (Archibald, 2016). I did not use the mixed methods research for this study because there was no qualitative aspect of the investigation and the quantitative method exclusively answered the research question.

### **Research Design**

A quantitative research design is comprised of three main types: experimental, quasi-experimental, and nonexperimental (Kucuk, Aydemir, Yildirim, Arpacik, &

Goktas, 2013). The purpose of the study was to examine the correlation between the predictors: comprehension, motivation, skills, resources, and communication and real estate construction project success. Quantitative researchers use predictors to develop research hypotheses from theories by testing the relationship between variables to check the theory validity (Whitley & Kite, 2013). The study was nonexperimental. A correlation research design is a nonexperimental and nonmanipulative observation of the relationships between variables with consistency across a population (Ladd et al., 2015; Whitley & Kite, 2013). The study variables were personality-based soft skills for project management. The use of the correlation research design is exclusive to these kinds of variables because such variables are not easy to manipulate (Whitley & Kite, 2013). I used the correlation design for this study.

The experimental and quasi-experimental designs are similar except for the characteristic of random assignment of treatment variables used in the experimental design. Researchers use experiments to determine causality because of the control requirement (Whitley & Kite, 2013). The researcher manipulates the variables to determine the effects of one variable on another (Field, 2013; Mouton & Roskam, 2015). I did not use the experimental or the quasi-experimental research design for this study because my intent was to test the relationship between the variables in their natural form.

### **Population and Sampling**

Griffin, Abdel-Monem, Tomkins, Richardson, and Jorgensen (2015) defined four stages of the research activity as clarifying the population, selecting the sampling method, sampling, and executing the survey. The population of this study was the project

management practitioners in the real estate construction sector in Nigeria. These practitioners operate in client, consultants, and contractor organizations (Alzahrani & Emsley, 2013). The project management practitioners were also found in professional groups and associations on LinkedIn and certification affiliated bodies. The project management professionals in real estate construction were not exclusive to any gender, race, religion, geographic location, or education level, which eliminated these criteria from selection considerations. In a study on project management and burnout, Pinto, Dawood, and Pinto (2014) examined a population of project management practitioners who comprised of project managers, project administrators, executives, team members, and support individuals. Bowen et al. (2014) specified job roles carried out under the practice of project management.

In this study, I examined how the predictor variables in the overarching research question correlated with the dependent variable, project success. The performances of the project management practitioners on a project determine project success (Alias et al., 2014; Bernhold et al., 2014; Berssaneti & Carvalho, 2015). In construction projects specifically, project management activities determine the relationship between project success and project performance (Alias et al., 2014). The population of the study aligned with the overarching research question.

With limited access to the whole population, the sample is a small subset of the population and infers the behavior of the whole (Field, 2013). An adequate sampling dictates the internal and external validity of the study (Uprichard, 2013). Probabilistic and nonprobabilistic are the two main types of sampling (Brick, 2015; Callegaro, Villar,



Yeager, & Krosnick, 2014). Random and nonrandom characteristics refer to the probabilistic and nonprobabilistic methods respectively (van Hoeven, Janssen, Roes, & Koffijberg, 2015). The probabilistic sampling is historically the best sampling method for empirical studies; however, nonprobabilistic sampling is more popular because of its cost savings (Brick, 2015; Callegaro et al., 2014). Brick (2015) stated a consideration of nonprobabilistic sampling when the population is stable, and the survey requirement does not need high accuracy. The use of the nonprobabilistic method deepens the existing knowledge of the sample (Uprichard, 2013). A low response rate to a survey may lead to a decreased efficacy of a probabilistic sampling (Brick, 2015). I used the nonprobabilistic sampling method and obtained samples of the population.

Purposive sampling is a nonprobabilistic sampling subcategory carried out through the researcher's field knowledge and connections with the target population (Acharya et al., 2013; Barratt et al., 2015). Purposive sampling is a straightforward application as the basis for participants' selection is on preferences, convenience, and expectations, which makes participants easy to enlist (van Hoeven et al., 2015). On the contrary, random sampling, accepted as a gold standard of sampling strategies because of its unbiased nature, requires more resources of time and cost, making purposive sampling a more logical choice (van Hoeven et al., 2015). I used purposive sampling as the sampling method subcategory.

An adequate sample size used in the research promotes the reliability of the research findings (Field, 2013). The statistical technique for the analysis determines the methodology for estimating the sample size, as most techniques are sample size sensitive

(Siddiqui, 2013). The calculations of the adequate sample size require the following as inputs: (a) the required effect size, (b) the alpha value of statistical significance criterion, and (c) the power level (Cohen, 1992; Field, 2013). The effect size is a standardized method of measuring the magnitude of the observed effect. Cohen (1992) stated that the effect size is the degree to which the null hypothesis is false. The power level is the probability that the test would detect an effect (Field, 2013). The alpha value of statistical significance criterion is the point where the statistical analysis accepts or rejects the null hypothesis, and is typically assumed as .05 (Field, 2013). The mathematical relationship among the four variables of statistical inference is that as sample size increases, the power level increases alongside while the effect size and significance criterion decrease (Cohen, 1992).

For a correlation study, Cohen (1992) proposed effects sizes of small (.02), medium (.15), and large (.35) and recommended the use of medium effect size as a careful observer would easily experience such an effect. Berssaneti and Carvalho (2015) and Field (2013) used the same conventions in the use of medium effect size. I used the medium effect size of .15 to calculate the sample size.

Cohen (1992) proposed the conventional use of .80 as the required power level and stated that a lower value would increase the risk of a type II error. A larger power level value would require additional resources from the researcher (Cohen, 1992). Field (2013) also advocated for the use of 0.80 power level. Berssaneti and Carvalho (2015), in a correlational study on project success, used the power level of .80. I used the power level of .80 to calculate the sample size.

Researchers use a statistical software, G\*Power, to carry out sample sizing (Field, 2013; Faul, Erdfelder, Buchner, & Lang, 2009). Berssaneti and Carvalho (2015) used the G\*Power software to check the sample size in the study of variables that affect project success. I used the G\*Power software, version 3.1.9.2, and determined the appropriate sample size for data collection. The inputs for generating the sample size using the G\*Power 3.1.2 software were  $\alpha = .05$ , power = .80, and effect size = .15 for five predictor variables. The sample size calculated was 71 participants (see Appendix E).

### **Ethical Research**

The guiding principle for ethical research is informed consent (Nicolaidis, 2016; Tam et al., 2015). The researcher uses informed consent to protect the participant and to respect the participant's privacy (Tam et al., 2015). Informed consent comprises of the following concepts: capacity, disclosure, understanding, decision, and voluntariness (Tam et al., 2015). The concepts are interrelated. Capacity is a participant's ability to make a decision to participate or not while in possession of a complete understanding of the fully disclosed information and its implications. The participants filled an online survey incorporated with an electronic informed consent form that grants access to the survey (see Appendix F). How participants understand the informed consent process could determine the quality of informed consent (Tam et al., 2015). The informed consent form had all the information about the survey.

According to Tam et al. (2015), participation in a research study should be voluntary. Participants voluntarily made the decision to participate, that is, without coercion. Participants could withdraw from the study at any time by terminating the

online survey process without consequences or further contact. A full disclosure of this right was on the informed consent form. Singer and Ye (2013) stated that a participant to a survey must have a motive to respond, which could be monetary or otherwise. Participants in this study were members of the project management team, which included junior and senior managers. Participants did not receive monetary incentives but a perceived increase in the project management knowledge.

Fully disclosed information on the research and access to the researcher are additional ethical considerations of the research process (Nicolaidis, 2016). I ensured full disclosure of research information at the informed consent stage and in a clear and concise language to uphold understanding and reduce ambiguity. I provided personal contact details for any participant with questions or concerns. I did not initiate a direct contact with any participant. Before data collection, I obtained IRB approval from the Walden University IRB with approval number 03-15-17-0485517 expiring on March 14, 2018.

Mitchell and Wellings (2013) stated the need to protect the privacy of the participants or organizations by keeping their names confidential. I ensured confidentiality by withholding the names of any participant or organization. I took the following precautions to ensure the privacy and autonomy of participants: (a) use of identifying numbering tags for participants because names are unnecessary, (b) maintaining confidentiality on information obtained from companies approached for enlisting members of their project management team by using pseudo identifiers if necessary, and (c) excluding personal information in the questionnaire. I have the sole

access to the data generated, saved on password-protected files, stored in a lockable fireproof cabinet for a 5-year period, and destroyed after.

## **Data Collection**

### **Instruments**

The PIP is a survey instrument with prior validation in research and is widely accepted in the project management field (Nzekwe, Oladejo, & Emoh, 2015; Rusare & Jay, 2015; Slevin & Pinto, 1986). In 1986, Slevin and Pinto developed the PIP for measuring the human and managerial aspects of project success. I used the PIP as the survey instrument for this study. I sought and obtained permission to use the PIP from Dr. D. P. Slevin (see Appendix G).

Slevin and Pinto (1986) analyzed the human and managerial aspects of project success through a 10-factor model that include the following: project mission, top management support, project schedule and plan, client consultation, and personnel. Also included are technical tasks, client acceptance, monitoring and feedback, communication, and trouble-shooting (Slevin & Pinto, 1986). Slevin and Pinto used Project Echo, a procedure developed by Bavelas (1968), which entailed a survey of project management personnel. The researchers asked the participants in this procedure to indicate factors that would help achieve project success. Slevin and Pinto sorted and classified the responses into 10 categories from a total of 94 good responses after eliminating duplications and miscellaneous responses. The 10 categories are the questionnaire elements.

The variables for this study are project management soft skill activities, which are subjective attributes (Claxton et al., 2016). Researchers use instruments developed on the

Likert scale to measure subjective attributes of a population (Murray, 2013). The Likert scale used for data collection is a psychometric scale for survey questionnaires (Barua, 2013). The Likert scale is on the interval scale measurement (Murray, 2013). The PIP survey is on an 11-point Likert scale format ranging from *strongly disagree* at 0, to *neutral* at 5, to *strongly agree* at 10 (see Appendix H). The range on the Likert scale demonstrates the intensity of the opinion of the respondents concerning a particular item (Barua, 2013). The PIP Likert scale range shows a range broad enough to express a varied opinion without a misunderstanding in scores among respondents.

In this study, I used the instrument variables to measure the aligned DAT variables. The first factor, project mission or comprehension, denotes the initial understanding of the project and the general direction required of the project team (Nzekwe et al., 2015; Ofori, 2013; Slevin & Pinto, 1986). Top management support or resources is the second factor and represents the willingness of the executive management of the organization to support the project team with the necessary authority and the right type of resources needed for the execution of the project (Nzekwe et al., 2015; Ofori, 2013; Slevin & Pinto, 1986). The third factor is personnel, where the right highly motivated staff is necessary for the successful execution of the project (Ofori, 2013; Slevin & Pinto, 1986). Technical tasks or skills are the available competences required to accomplish specific work processes (Nzekwe et al., 2015; Ofori, 2013; Slevin & Pinto, 1986). Communication, as the fifth factor, is the system that allows for the dissipation of information and data to all the necessary recipients to ensure smooth project execution (Nzekwe et al., 2015; Ofori, 2013; Slevin & Pinto, 1986). Thus, the use

of the PIP was suitable. I used the PIP as the instrument for this study on correlates of project success in real estate construction.

The United Nations General Assembly (2014), in its resolutions on the fundamental principles guiding statistics, stated that the source of statistical data should take into consideration the burden on respondents. Response burden is the respondents' perception of how arduous completing the processes of the survey feels (Bavdaz, Giesen, Cerne, Lofgren, & Raymond-Blaess, 2015). Response burden can affect data quality through nonresponse, late response, and measurement errors (Axhausen & Weis, 2010; Bavdaz et al., 2015; Stern, Bilgen, & Dillman, 2014). Bavdaz et al. (2015) viewed the response burden of studying and completing a questionnaire as a minimalistic burden. There were 10 numbered survey questions for each variable; therefore, there were a total number of 50 questions for all five variables. The estimated completion time for the online survey was 20 minutes. There were no special tools or requirements for the survey.

The total scores on the 10 questions for each variable represented the score accruable on the variable. The PIP results measure against 82 successful projects used for the instrument calibration and validation (Slevin & Pinto, 1986). The cut-off is the 50th percentile on any of the independent variables (Slevin & Pinto, 1986). The cut-off or pass mark is necessary for opinion-based questionnaires (Barua, 2013). The pass mark on the PIP is as set by the developers of the instrument. The developers also set project success percentile scores as compared to the 82 successful projects. The independence of the variable scoring was necessary because the data analysis of each variable is autonomous and the study is not causal.

Slevin and Pinto (1986) designed the PIP for project management practitioners. The application of the PIP has been to various disciplines of the project management field. Rusare (2015) studied nongovernmental organizations (NGO) projects using the PIP. Coleman (2014) investigated project manager competence concerning professional experience and educational level. Pelletier and Mukiampele (2014) used the PIP to study livestock production in foreign aids projects.

Instrument validity is the ability of the instrument to measure the stated constructs (Field, 2013). Instrument reliability denotes a consistent interpretation of data in varying research conditions (Field, 2013). Cronbach's alpha coefficient is a measure that determines internal consistency reliability across test items of an instrument and establishes reliability. Field (2013) stated .7 as the minimum acceptable Cronbach's alpha coefficient. Bonett and Wright (2015) adopted .68 in a study of the effect of critical success factors on project success. Slevin and Pinto (1986) documented and published validity and reliability scores above .7. The average Cronbach's alpha scores across the PIP 10 factors was .78 (Coleman, 2014). The PIP is an existing instrument with established validity and reliability; therefore, I did not conduct field and pilot testing.

Pinto and Slevin (1987) defined the project life cycle in four distinct stages: conceptualization, planning, execution, and termination. The project success factors could occur as early activities in the project, during the project life, or at the end of the project (Rusare & Jay, 2015). The five correlates for this study are early activities that occur within the conceptualization and planning stages. The five correlates for the study align with the PIP success factors as follows: comprehension – project mission, resources



– top management support, motivation – personnel, skills – technical tasks, and communication – communication. Ofori (2013) stated that various scholars had acknowledged the PIP factors as significant in ensuring project success. Pelletier and Mukiampele (2014) used an adapted PIP with a reduction in scope of factors as the instrument for a study of foreign aid projects in livestock production. I used the PIP to measure only the constructs related to the study as discussed in the literature review. I stored the raw data from the survey and make them available on request.

### **Data Collection Technique**

The participants, contacted through professional groups on LinkedIn and real estate construction companies, accessed the survey through the online platform SurveyMonkey. SurveyMonkey is an online service company that allows researchers to design and conduct online surveys. An online survey is a convenient method of reaching large numbers of participants rapidly (Anderson, 2015). Hayes (2015) and Isaacs (2015) used the SurveyMonkey services in their researches. The subscribed version is more flexible and can accommodate many questions, participants, and other specialized features. SurveyMonkey can export data to SPSS. I collected data by inviting participants to fill in the PIP questionnaires online. The advantages of using the online data collection technique include: ease of access to participants, minimal contact with participants, and efficiency and simplicity of data organization at survey completion. The disadvantages of using this technique are the cost outlay of the survey platform and the exclusion of noninternet savvy participants.

### **Data Analysis Technique**

The overarching research question for this study is: How do the predictors: comprehension, motivation, skills, resources, and communication in project management, correlate with real estate construction project success? I tested the following hypotheses to answer the research question:

*H<sub>01</sub>*: There is no significant relationship between the project team's project comprehension and project success.

*H<sub>a1</sub>*: There is a significant relationship between the project team's project comprehension and project success.

*H<sub>02</sub>*: There is no significant relationship between the project team's motivation and project success.

*H<sub>a2</sub>*: There is a significant relationship between the project team's motivation and project success.

*H<sub>03</sub>*: There is no significant relationship between the project team's skills and project success.

*H<sub>a3</sub>*: There is a significant relationship between the project team's skills and project success.

*H<sub>04</sub>*: There is no significant relationship between the project team's resource management and project success.

*H<sub>a4</sub>*: There is a significant relationship between the project team's resource management and project success.

*H<sub>05</sub>*: There is no significant relationship between the project team's communication management and project success.

*H<sub>a5</sub>*: There is a significant relationship between the project team's communication management and project success.

Inferential statistics should align with the central limit theorem, which states that a sample of a particular size can reasonably estimate an unknown parameter (Field, 2013; Gibbs, Shafer, & Miles, 2015). Inferential statistics support generalization of results obtained from the sample (Devore, 2015; Jones & Berninger, 2016). Data analysis for this study comprised of an inferential statistical evaluation of the predictors in the research question. The evaluation requirements included the performance of the following actions: carrying out an exploratory analysis, conducting a standard multiple linear regression analysis to test the hypotheses, addressing missing data, and ensuring achievement of all statistical assumptions.

Multivariate data are from observations made with more than two predictor variables (Devore, 2015). A multiple linear regression analysis uses multivariate data to predict the relationship between several predictor variables and an outcome variable (Field, 2013). In the multiple linear regression analysis, the independent variables have scores attained from the survey on the dependent variables. Linear combinations of the independent variables would calculate the prediction of the dependent variable (Green & Salkind, 2014). I used the multiple linear regression analysis to test the hypotheses.

A bivariate or simple linear regression is only applicable when there is an independent variable and a dependent variable (Davore, 2015; Field, 2013; Green &

Salkind, 2014). A bivariate linear regression was not applicable to this study as there are five independent variables and one dependent variable. The analysis of variance (ANOVA) assesses the relationship between factors and the dependent variable (Green & Salkind, 2014). The ANOVA tests the null hypothesis to establish if all the group means are equal (Field, 2013; Green & Salkind, 2014). The ANOVA applies to only experimental studies as it evaluates the differences between and within group observations, as affects the dependent variable (Davore, 2015; Field, 2013; Green & Salkind, 2014). The ANOVA test was not applicable to this study, as the study was nonexperimental.

A researcher uses the exploratory analysis to establish that the statistical assumptions supporting the primary analysis are valid. Exploratory analysis entails the processes of data cleaning and screening, carried out on the initial output of the statistical model known as the descriptive statistics (Field, 2013). Exploratory data analysis also involves visuals and numerical summaries for data characteristics evaluation (Devore, 2015; Morrison, 2014). Visual techniques, which give preliminary impressions and insights, may include histograms, pie charts, and scatter plots (Devore, 2015). Numerical techniques are more of formal data analysis requiring calculations and may consist of the mean, the median, standard deviation, range, number of cases, and missing data (Devore, 2015; Field, 2013). Others may include normality tests and Kurtosis (Green & Salkind, 2014).

Missing data occurs from incompletely filled survey questionnaires that would affect the outcome data (Akl et al., 2015; Eekhout et al., 2015; Field, 2013). The average

or sum of item scores in a questionnaire represents the outcome data. Missing data would, impair a response (Eekhout et al., 2015). An option of handling missing data is a complete-case analysis where the analysis includes only the respondents with complete data and results to unbiased analyses (Eekhout et al., 2015). The use of the online questionnaire may eliminate the incidence of missing data, as the online survey platform would remind the participants of all unanswered questions. Where the participant fails to answer a question, the survey will record the entry as a withdrawal or incomplete. The default position of SPSS on missing data assumes no missing data in the collection (Field, 2013). I used the default position of SPSS on missing data. I used the complete-case analysis, and ensured the elimination of incomplete and missing data as detected by the online survey. I ensured meeting the required sample size without the incidence of missing data.

The statistical analyses have different assumptions, which need to be true for an accurate prediction of reality (Field, 2013). The underlying assumption for a parametric test is that the data measurement is at an interval level as a minimum (Field, 2013). According to Green and Salkind (2014), the appropriate assumptions in a multiple linear regression analysis for a nonexperimental quantitative study are the two random-effects model assumptions. The first random-effects model assumption is that the distribution of each variable is normal irrespective of the other variables (Field, 2013; Green & Salkind, 2014). In addition, the distribution of each variable is normal when combined with other variables (Green & Salkind, 2014). The second assumption is that scores on each variable is independent of scores on other variables (Field, 2013; Green & Salkind, 2014).

Violated assumptions would result in inaccurate significance results in the regression analysis. Visual inspection of scatter plots would detect nonlinear variables (Field, 2013; Green & Salkind, 2014). The action taken in the event of a violation of the assumptions of a normal distribution is bootstrapping. Bootstrapping uses smaller samples of the sample data to estimate the sampling distribution (Field, 2013). In nonnormal distributions, the researcher uses bootstrapping to determine statistical parameters (Davore, 2015). The standard deviation and standard error of the bootstrap samples enable the calculations for the confidence interval (CI) and significance tests (Field, 2013).

Key parameter estimates are the descriptive statistics output from the statistical model. Descriptive statistics output may include the following: measures of the central tendency, confidence interval, indices of variability, skewness, and kurtosis (Green & Salkind, 2014). Measures of central tendencies include the mean, the median, and the mode (Deshpande, Gogtay, & Thatte, 2016; Green & Salkind, 2014). Any of these measures may become applicable depending on the distribution, outliers, and cutoffs. CI is the boundary in which the mean would fall (Field, 2013). Typically, 95% is the assumed CI for the calculations and denotes that the actual value of the population mean would fall within this limit (Field, 2013). Measures of variability include the variance and its square root; the standard deviation (Green & Salkind, 2014). Skewness denotes the degree at which the scores fall at either end of the distribution (Green & Salkind, 2014). The kurtosis is the frequency of the scores at both ends of the distribution (Green & Salkind, 2014).

Gumpert, Moneta, Cranmer, Kreiss, and Verkerke (2014) stated the simplification of statistical analysis by the use of computer software. Typical tasks in the statistical analysis may include: goodness of fit evaluation, parameter estimation with CI calculation, and hypothesis testing (Gumpert et al., 2014). The development of computational infrastructure and data storage methods led to the resolutions of statistical challenges experienced with large samples otherwise known as big data (Fan, Han, & Liu, 2014). SPSS is software, used by students, teachers, and researchers, for conducting statistical analyses rapidly and efficiently (Green & Salkind, 2014). I used the IBM SPSS® 23.0 software as the statistical analytical tool as I am conversant with the software and its applications.

### **Study Validity**

The two main concerns of the research outcome are the internal and external validity. The cardinal objective of the research is to evolve a scientific generalization (Field, 2013). The research must attain internal validity through maintaining a consistent treatment to all disturbing variables (Rothman, 2014). The internal validity is the evaluation of the conduct of the experiment and its applicability to casual or cause-effects relationships. Internal validity is applicable to experimental and quasi-experimental designs. Internal validity threats are not a consideration in correlation studies. Threats to statistical conclusion validity are present in correlations and may require mitigation.

Statistical conclusion validity threats are those conditions that may affect the conclusions drawn from the data collection and analysis process (Neall & Tuckey, 2014). The statistical conclusion validity threats provoke two types of errors namely type I and

type II error rates. Type I error rates are the conditions that result in the rejection of the null hypothesis when true (Devore, 2015; Field, 2013). Lieberman and Cunningham (2009) defined type I errors as false alarms by displaying a false positive when no true effect exists. Type II error is failing to recognize a true effect (Lieberman & Cunningham, 2009). Type II error rates accept the null hypothesis when false (Devore, 2015; Field, 2013). Type II errors are more likely with a small sample size, however moderating against any of the type errors in a given sample size would increase the rate of the other type error (Field, 2013; Lieberman & Cunningham, 2009).

The mitigation of the threats of statistical conclusion validity may include ensuring the following: reliability of the instrument, nonviolation of data assumptions, and adequacy of sample size. The PIP instrument, as stated earlier at data collection, is an existing instrument with an average Cronbach's alpha score of .78, which shows a reliability score above the minimum acceptable score of .7 (Coleman, 2014). Discussions on data assumptions carried out in data analysis techniques section showed that data assumptions validity checks starts from the initial exploratory analysis. Green and Salkind (2014) stated the assumptions for a multiple linear regression analysis. The application of bootstrapping corrects assumptions violations. Sample size, discussed in the population and sampling section, covered the threat of adequacy of sample size by the use of G\*Power software for sample sizing (Berssaneti & Carvalho, 2015). Calculations for the required power level and the effect size were available and inputs to the software.

External validity is the extent of the generalization of research findings to a larger population (Alm, Bloomquist, & McKee, 2015). Verification of the external validity is



with reference to the specific environment of the study (Alm et al., 2015). External validity is dependent on the sampling method and the statistical analysis used in the research. The sampling method chosen for the study was the purposive sampling method. Researchers use the purposive sampling method to exploit their field knowledge and connections with the target population making participants easy to enlist (Acharya et al., 2013; Barratt et al., 2015). The selection of participants as project management practitioners in the real estate construction sector resulted in findings deemed generalizable for the real estate construction sector. The use of the SPSS software, a proven analysis program, also reduced the threat to external validity.

### **Transition and Summary**

Section 2 of this study included rationalizations of the use of the quantitative study method and the correlation design. In addition, Section 2 contained the following: role of the researcher; details of participants' selection, the population, and sampling; ethical considerations for the protection of the participants; data collection comprising the instrument and the collection technique; and data analysis. I discussed the following issues in Section 3: presentation of findings, application to professional practice, implications for social change, recommendations for action, recommendations for further study, reflections, and study conclusions.

### Section 3: Application to Professional Practice and Implications for Change

Section 1 of this study was the introductory and exploratory analysis of the problem and purpose statement, the research question and hypotheses, and the review of the literature as it pertained to real estate construction and project management. Section 2 encompassed the processes and procedures undertaken to conduct a quantitative correlational study using the multiple linear regression analysis, while ensuring ethical behavior in the protection of participants. In Section 3, I included the results of the field work, discussed the findings, made recommendations for action, and highlighted opportunities for future research work.

#### **Overview of Study**

The purpose of this quantitative correlational study was to provide real estate construction project managers with the knowledge of the relationship between the predictors of comprehension, motivation, skills, resources, and communication in project management and real estate construction project success. The predictors are soft elements of human behavior management. Project success relates to business success and influences the survival of the organization (Zavadskas et al., 2014). To achieve project and business success and ensure profitability, organizational leaders in a project-based organization like the real estate construction companies apply project management systems (Alias et al., 2014). The critical part of implementing project management systems is the monitoring of elements of human behavior (Chiocchio & Hobbs, 2014).

I examined the correlations between the independent variables and the dependent variable by testing the hypotheses using the multiple linear regression analysis. The null and alternative hypotheses developed to answer the research question were as follows:

$H_{01}$ : There is no significant relationship between the project team's project comprehension and project success.

$H_{a1}$ : There is a significant relationship between the project team's project comprehension and project success.

$H_{02}$ : There is no significant relationship between the project team's motivation and project success.

$H_{a2}$ : There is a significant relationship between the project team's motivation and project success.

$H_{03}$ : There is no significant relationship between the project team's skills and project success.

$H_{a3}$ : There is a significant relationship between the project team's skills and project success.

$H_{04}$ : There is no significant relationship between the project team's resource management and project success.

$H_{a4}$ : There is a significant relationship between the project team's resource management and project success.

$H_{05}$ : There is no significant relationship between the project team's communication management and project success.

$H_{a5}$ : There is a significant relationship between the project team's communication management and project success.

The results of the regression analyses show that none of the null hypotheses comprising of  $H_{01}$ ,  $H_{02}$ ,  $H_{03}$ ,  $H_{04}$ , and  $H_{05}$  were supported. Therefore, the regression analysis testing supported statistically significant relationships between the predictors of comprehension, motivation, skills, resources, and communication in project management and real estate construction project success. The assumption tests showed no violation of the multiple linear regression analysis assumptions.

### **Presentation of the Findings**

The research subquestions that guided this study were:

RQ1: Does a significant relationship exist between the project team's project comprehension and project success?

RQ2: Does a significant relationship exist between the project team's motivation and project success?

RQ3: Does a significant relationship exist between the project team's skills and project success?

RQ4: Does a significant relationship exist between the project team's resource management and project success?

RQ5: Does a significant relationship exist between the project team's communication management and project success?

I used the multiple linear regression analysis, through the SPSS v23 software to examine the statistical significance of the relationships between the five independent

variables of comprehension, motivation, skills, resources, and communication in project management and real estate construction project success as the dependent variable.

### **Descriptive Statistics**

The survey instrument used for the data collection was the PIP. The distribution of the PIP questionnaire was through the SurveyMonkey online survey service. The participants were project management practitioners in the real estate construction sector comprising of project managers, project engineers, project architects, estate developers, construction managers, site managers, project control managers, and others as applicable in the professional body. Eighty-seven respondents logged in and started the survey while 76 respondents completed the questionnaire by answering all the questions, meeting the required sample size of 71 participants. The dataset eliminated all the incomplete responses. The online survey platform provided the raw data for the study's independent variables (see Appendix I). The survey instrument calculations produced the raw data from the PIP project success percentile ranking per respondent for the dependent variable (see Appendix J).

Descriptive statistics data comprising of the mean, median, range, and standard deviation were used to summarize the characteristics of the data collated. Descriptive statistics is not influential in regression analysis (Field, 2013) but used to evaluate and understand the distribution of data (Devore, 2015). Table 1 shows the descriptive frequencies and percentages for the demographic data.

Table 1. Population Frequencies

*Population Frequencies from the Qualifying Criteria of the Sample*

Category	Frequency	%
<b>Age</b>		
18 - 29 years	15	19.7
30 - 49 years	45	59.2
50 years and over	16	21.1
<b>Gender</b>		
Female	20	26.3
Male	56	73.7
<b>Job Role</b>		
Project Manager	8	10.5
Project Engineer	6	7.9
Project Architect	7	9.2
Real Estate Developer	15	19.7
Construction Manager	3	3.9
Site Manager	3	3.9
Project Control Manager	6	7.9
Other	28	36.8
<b>Experience</b>		
At least 1 year but less than 3 years	6	7.9
At least 3 years but less than 5 years	11	14.5
At least 5 years but less than 10 years	15	19.7
10 years or more	44	57.9

*Note, N = 76*

Table 2 is the descriptive statistics for the independent variables for all 76 valid responses. The average weights for the valid responses on the independent variables, comprehension, motivation, skills, resources, and communications were 8.857, 6.747, 8.118, 7.800, and 5.924 respectively.

Table 2. Descriptive Statistics

*Descriptive Statistics for the Independent Variables*

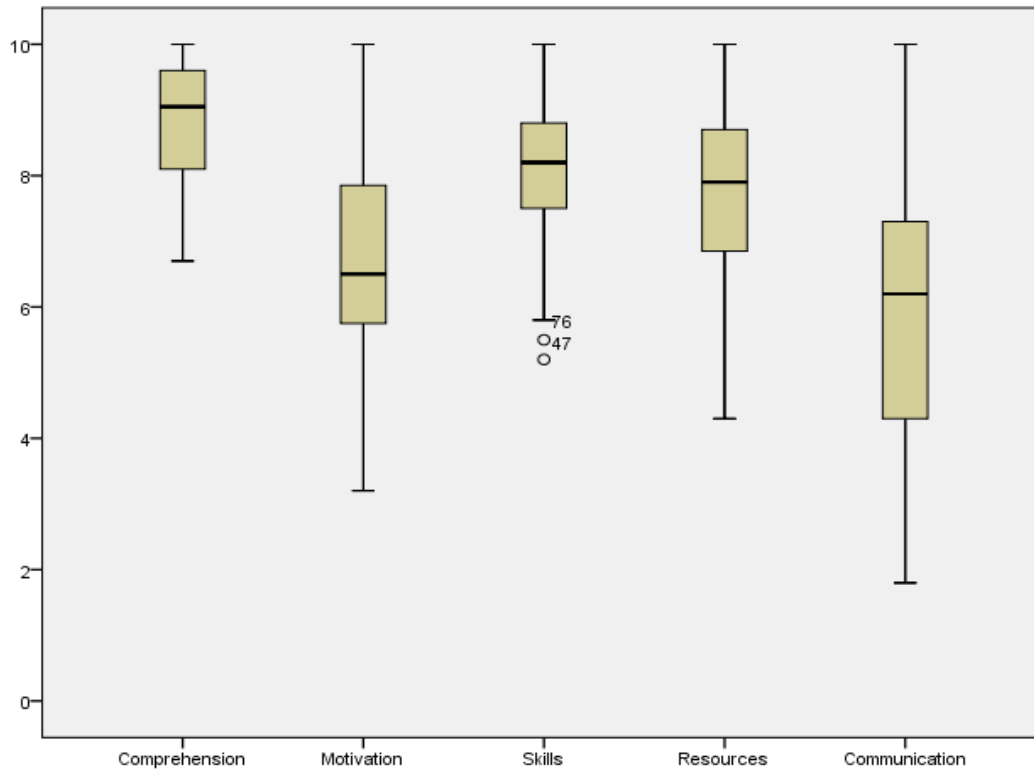
	Comprehen- sion	Motivation	Skills	Resources	Communi- cation
N	76	76	76	76	76
Mean	8.857	6.747	8.118	7.800	5.924
Std. Error of Mean	.1034	.1632	.1162	.1435	.2237
Median	9.050	6.500	8.200	7.900	6.200
Mode	9.6 <sup>a</sup>	6.0 <sup>a</sup>	7.9 <sup>a</sup>	7.3	6.2
Std. Deviation	.9013	1.4228	1.0131	1.2513	1.9505
Variance	.812	2.024	1.026	1.566	3.804
Skewness	-.624	.057	-.700	-.364	-.234
Std. Error of Skewness	.276	.276	.276	.276	.276
Kurtosis	-.496	-.578	.332	-.130	-.723
Std. Error of Kurtosis	.545	.545	.545	.545	.545
Range	3.3	6.8	4.8	5.7	8.2
Minimum	6.7	3.2	5.2	4.3	1.8
Maximum	10.0	10.0	10.0	10.0	10.0
Percentiles					
25	8.100	5.725	7.500	6.825	4.300
50	9.050	6.500	8.200	7.900	6.200
75	9.600	7.875	8.800	8.700	7.300

a. Multiple modes exist. The smallest value is shown

**Statistical Model Assumption Testing**

The assumptions of a linear regression analysis include normality in distribution, independence of data, and linearity in variables relationship. To screen visually for normality the data is screened. Data screening involves spotting outliers (Field, 2013). An outlier is a score that is different from the rest of the data and may have the capability of biasing the statistical model (Field, 2013). I visually screened the boxplot to spot outliers. The outliers shown on the boxplot for the predictor variables are on the skills variable

(see Figure 1). The outliers were close to the normal scores and did not bias the mean or standard deviation. A quick check carried out showed that the mean for the skills variable, with and without the outliers, were 8.184 and 8.1932 respectively depicting < 1% change (see Table 3).



*Figure 1.* Boxplot for scores on the independent variables showing outliers.

Table 3. Outliers Effects Check

<i>Skills Variable Statistics with and without Outliers</i>		
Statistics	With Outliers	Without Outliers
N	76	74
Mean	8.1184	8.1932
Std. Deviation	1.01308	.91552



Statistical check on the normality in distribution included an exploration of the skewness of data and Kurtosis. The results of skewness and Kurtosis are shown on Table 2. Field (2013) stated the necessity of converting the skewness and Kurtosis absolute scores to  $z$ -scores before the checks for normality. The conversion of absolute scores to  $z$ -scores required dividing the absolute scores by the standard error. Table 4 shows the  $z$ -scores for the independent variables in skewness and Kurtosis.

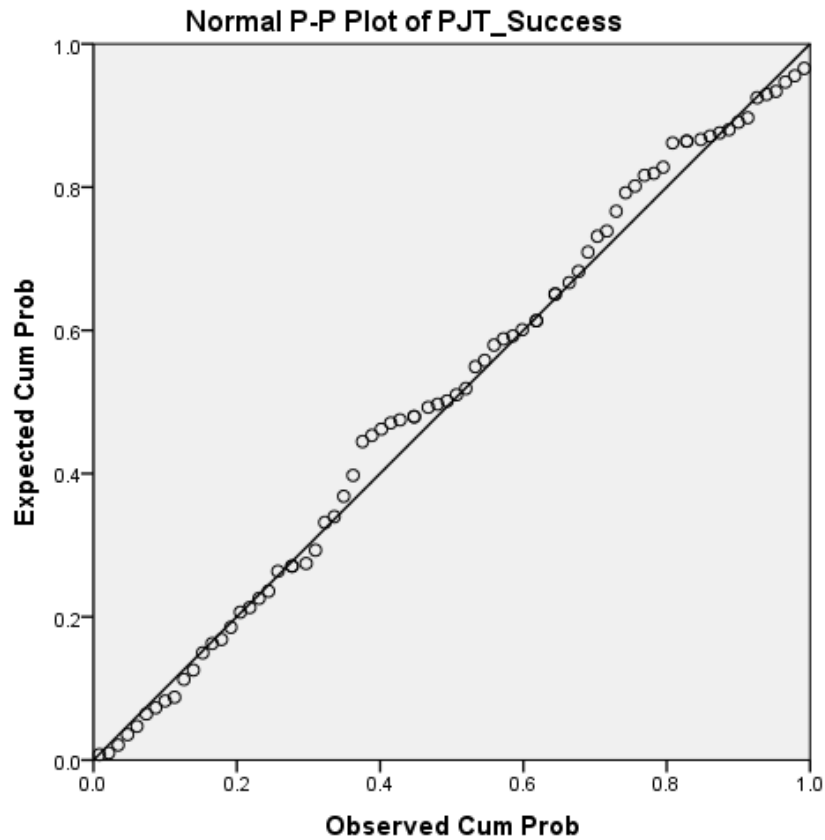
Table 4. Results for Skewness and Kurtosis

<i>Skewness and Kurtosis Z-scores for Checking Normality in Distribution</i>						
Variable	Skewness			Kurtosis		
	Absolute Skewness	S.E. of Skewness	Skewness Z-Scores	Absolute Kurtosis	S.E. of Kurtosis	Kurtosis Z-Scores
Compre- hension	.624	.276	2.261	.496	.545	0.910
Motivation	.057	.276	.207	.578	.545	1.061
Skills	.700	.276	2.536	.332	.545	0.609
Resources	.364	.276	1.319	.130	.545	0.239
Communi- cation	.234	.276	.848	.723	.545	1.327

Kim (2013) graded sample sizes as follows: (a) small samples at less than 50 respondents, (b) medium samples at between 50 and 300 respondents, and (c) large samples at over 300 respondents. The sample size of the study at 76 respondents was medium sized. For a medium sized sample at  $p < .05$ , the criterion for normality for any predictor variable is a  $z$ -score  $< 2.58$  (Field, 2013). All the independent variables are normally distributed at  $z$ -scores  $< 2.58$  (see Table 4).

Further test for normality was the visual inspection of the probability-probability (P-P) plot on the dependent variable. P-P plots are internally plotted points of the actual

$z$ -scores against the expected  $z$ -scores present in a normal distribution (Field, 2013). A P-P plot with the values on the diagonal line shows a normally distributed variable (Field, 2013). Figure 2 showed a normally distributed P-P plot where the variables plots are reasonable in a straight diagonal line from bottom left to top right.



*Figure 2.* Normal P-P plot of regression standardized residual for the dependent variable, project success.

Another assumption test on the normality of distributed data was the homogeneity of variances. The homogeneity of variance implies that the variance of one variable should be consistent at any change in the other variables (Field, 2016). The test of the homogeneity of variances was through the Levene's test, which showed an assessment of

the absolute difference between each deviation score and the mean of the group. The Levene's test is non-significant at  $p > .05$  implying that the assumptions of homogeneity are true and homoscedasticity is not present (Field, 2013). The Levene's statistics tests of homoscedasticity for the independent variables; comprehension, motivation, skills, resources, and communications was .188, .273, .216, .967, and .226 respectively, which were  $> .05$  indicating a nonviolation of the assumptions (see Table 5).

Table 5. Test of Homogeneity of Variances

<i>Test of Homogeneity of Variances for Checking Normality in Distribution</i>				
Variables	Levene's Statistic	df1	df2	Sig.
Comprehension	1.770	1	74	.188
Motivation	1.218	1	74	.273
Skills	1.555	1	74	.216
Resources	.002	1	74	.967
Communication	1.493	1	74	.226

The independence of data check and linearity is through the correlation table, which would indicate if the independent variables correlate. Field (2013) stated the criterion for multicollinearity between variables as  $> .900$ . Table 6 showed the correlation between predictors as  $< .900$ . The highest correlation was between project success and resources ( $r = .865$ ,  $p < .001$ ) indicating that resources had the strongest correlation to project success.

Table 6. Correlations

*Correlations for all Variables*

<i>Correlations</i>		PJT_ Success	Compre- hension	Moti- vation	Skills	Resources	Commu- nication
Pearson	PJT_Success	1.000	.679	.760	.657	.865	.546
Correlation	Compre- hension	.679	1.000	.204	.661	.715	.015
	Motivation	.760	.204	1.000	.277	.595	.686
	Skills	.657	.661	.277	1.000	.612	-.049
	Resources	.865	.715	.595	.612	1.000	.339
	Commu- nication	.546	.015	.686	-.049	.339	1.000
	Sig. (1- tailed)	PJT_Success	.	.000	.000	.000	.000
Compre- hension		.000	.	.039	.000	.000	.449
Motivation		.000	.039	.	.008	.000	.000
Skills		.000	.000	.008	.	.000	.337
Resources		.000	.000	.000	.000	.	.001
Commu- nication		.000	.449	.000	.337	.001	.

*Note.*  $N = 76$

Further diagnostics on multicollinearity is by the statistical examination of the collinearity tolerance and variance inflation factor (VIF) values. The VIF indicates a strong linear relationship between predictors and the tolerance is its reciprocal (Field, 2013). The support criterion values for these statistics are  $> .10$  for tolerance and  $< 10$  for VIF (Field, 2013). The values for these statistics are in Table 7. For the five predictor variables, all outputs are  $> .10$  for the tolerance and  $< 10$  for the VIF.

Table 7. Collinearity Statistics

<i>Collinearity Statistics</i>		
Variables	Tolerance	VIF
(Constant)		
Comprehension	.352	2.839
Motivation	.343	2.918
Skills	.471	2.124
Resources	.267	3.740
Communication	.462	2.167

*Note.* N = 76

### Research Questions and Hypotheses Tests

In the examination the research questions (RQ1 – RQ5), I used a multiple linear regression model to explore the relationship and its significance between the independent variables; comprehension, motivation, skills, resources, and communications and the dependent variable, project success. The criterion for alpha level of significance was set at  $p < .05$ . In summary, the regression equation with all five predictors was significantly related to dependent variable,  $R^2 = .939$ , adjusted  $R^2 = .935$ ,  $F(5, 70) = 216.704$ ,  $p = .000$  (see Tables 8 & 9). All null hypotheses, Ho1, Ho2, Ho3, Ho4, and Ho5 were rejected. All alternative hypotheses, Ha1, Ha2, Ha3, Ha4, and Ha5 were accepted (see Table 10).

Table 8. Regression Analysis Summary for Predictor Variables

<i>Model Summary</i>				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.969 <sup>a</sup>	.939	.935	4.6537

a. Predictors: (Constant), Communication, Comprehension, Skills, Motivation, Resources

Table 9. Regression Analysis ANOVA Results

*ANOVA<sup>a</sup>*

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	23465.249	5	4693.050	216.704	.000 <sup>b</sup>
	Residual	1515.953	70	21.656		
	Total	24981.202	75			

a. Dependent Variable: PJT\_Success

b. Predictors: (Constant), Communication, Comprehension, Skills, Motivation, and Resources

Table 10. Regression Analysis Coefficients Results

*Coefficients for Predictor Variables*

Variables	B	Std. Error	Beta	t	Sig.	95% C.I. Lower	95% C.I. Upper
(Constant)	-92.652	6.147		-15.072	.000	-104.913	-80.391
Comprehension	5.414	1.004	.267	5.390	.000	3.411	7.418
Motivation	4.017	.645	.313	6.228	.000	2.731	5.304
Skills	4.637	.773	.257	6.000	.000	3.096	6.179
Resources	3.540	.830	.243	4.263	.000	1.884	5.196
Communication	2.409	.406	.257	5.941	.000	1.600	3.218

Note. N = 76

$R^2$  as a coefficient of determination is the measure of how fitted the data is to the regression model (Field, 2013).  $R^2$  is a coefficient that ranges from 0 to 1 and the higher the value, the better the model fits with the data. The  $R^2$  value as seen in the model summary (see Table 8) indicated that all the five independent variables effect on the dependent variable variances was 93.9%. The adjusted  $R^2$  shows the actual effect of all the predictors on the regression model (Field, 2013). The lower adjusted  $R^2$  value (.939 to

.935) showed that there was an improved model than expected with less variance in the outcome (see Table 8).

I examined the  $F$  ratio for ANOVA table (see Table 9).  $F$  ratio is the ratio of two mean square values; the mean square of the model and the residual mean square (Field, 2013).  $F$  ratio denotes the improvement in the prediction of the outcome as compared with the inaccuracies in the model (Field, 2013). A good model would have an  $F$  ratio greater than 1 as the mean square of the model is expected to be larger than the residual mean square. A large  $F$  ratio means that the regression is formative and the model is acceptable (Field, 2013). In the ANOVA table, the  $F$  ratio showed as 216.704, making regression formative and the null hypothesis acceptance highly unlikely to occur ( $p < .001$ ). All null hypotheses were not supported in this study.

$B$  is the unstandardized coefficient weighting of the predictor variable as associated with the regression equation and shows the relative importance of the predictor (Green & Salkind, 2014). For a better understanding of the relative importance on the weighting, the standardized coefficient, Beta is applicable, which is the weighting where the variables have a mean of 0 and a standard deviation of 1 (Green & Salkind, 2014). The order of relative importance of the variables is as follows: (a) motivation = .313, (b) comprehension = .267, (c) skills and communication = .257, and (d) resources = .243 (see Table 10).

A 95% CI denotes a 0.95 probability of having the population mean in the sample (Devore, 2015; Field, 2013). A lower and upper bounds surmise that the true population

mean is found within these boundaries. The individual predictor regression model results in accordance to the research questions are stated next.

A multiple linear regression analysis was conducted to investigate RQ1 which stated; does a significant relationship exist between the project team's project comprehension and project success. The predictor variable was comprehension and the outcome variable was project success. The predictor variable, comprehension, was found to be statistically significant.  $B = 5.414$ , 95% C.I. (3.411, 7.418),  $p < .01$ .

A multiple linear regression analysis was conducted to investigate RQ2 which stated; does a significant relationship exist between the project team's motivation and project success. The predictor variable was motivation and the outcome variable was project success. The predictor variable, motivation, was found to be statistically significant.  $B = 4.017$ , 95% C.I. (2.731, 5.304),  $p < .01$ .

A multiple linear regression analysis was conducted to investigate RQ3 which stated; does a significant relationship exist between the project team's skills and project success. The predictor variable was skills and the outcome variable was project success. The predictor variable, skills, was found to be statistically significant.  $B = 4.637$ , 95% C.I. (3.096, 6.179),  $p < .01$ .

A multiple linear regression analysis was conducted to investigate RQ4 which stated; does a significant relationship exist between the project team's resources and project success. The predictor variable was resources and the outcome variable was project success. The predictor variable, resources, was found to be statistically significant.  $B = 3.540$ , 95% C.I. (1.884, 5.196),  $p < .01$ .



A multiple linear regression analysis was conducted to investigate RQ5 which stated; does a significant relationship exist between the project team's communication and project success. The predictor variable was communication and the outcome variable was project success. The predictor variable, communication, was found to be statistically significant.  $B = 2.409$ , 95% C.I. (1.600, 3.218),  $p < .01$ .

### **Relating Findings to the Literature**

Lidow (1999) opined the five predictors as critical elements required in the change process of project management and stated an additional requirement of early alignment to maximize the chances of project success. Project success is the accomplishment of the project objectives (Alzahrani & Emsley, 2013). Lidow stated the DAT as beyond the classic project success evaluation criteria comprising of cost, time, and scope. Cost, time, and scope are hard objectives and easily measurable. The predictors of this study are soft project management objectives, and only measurable in perceptions (Walley, 2013). I used the Likert scale to enable a measurement of the perceptions of the project management practitioners in predicting project success through the PIP measurement instrument.

The project management team is responsible for project success as its immediate goal (Berssaneti & Carvalho, 2015; Satankar & Jain, 2015). The soft skills of the project management team may influence project success. The results of this study showed a statistically significant relationship between the five predictors, which are soft skills espoused by Lidow (1999) and project success. The DAT supports that the predictors

when aligned may maximize the chances of project success and the study findings also support that assertion.

### **Applications to Professional Practice**

Project success in the real estate construction sector as the completion of a project with the most desirable outcome translates to business success (Alzahrani & Emsley, 2013). Business success is an external view of the organization's market success in comparison with the competitions' market success (Ekrot et al., 2016). A construction company's evaluation on business performance is against the sector average, which is inclusive of the competitions' performance (Horta & Camanho, 2014). With competition as the driving factor of performance, Horta and Camanho stated that construction companies develop performance improvement systems to ensure a competitive advantage. Such development systems may include project management systems, which gears towards achieving project success.

The project management systems for project success may leverage on applying the precepts of the critical project success factors. Critical project success factors may be measures taken at various points of project execution (Brammah & Ghadamsi, 2013). In the construction sector, Zavadskas et al. (2014) argued success factors premised on the development stages. Early stages comprised of project initiation require the engagement and involvement of the project management team to ensure sufficient preparations (Zavadskas et al., 2014). The predictors used in this study were critical project success factors that are early actions undertaken to maximize the chances of project success. These predictor elements comprehension, motivation, skills, resources, and

communication were theorized by Lidow (1999) as project initiation elements that are aligned to maximize the chances of project success. The results of the study indicated that monitoring and systemic applications including alignment of the predictors would influence project success. Project success in real estate construction would result in business performance and subsequently profitability.

The practice of ensuring comprehension of the project is necessary as it aligns all parties and stakeholders to the objectives and intent of the project. The PMI (2013) stated the process of achieving a unified comprehension through having facilitated workshops aimed at bringing all stakeholders together for a complete understanding. The study results showed that comprehension had a statistically significant relationship with project success and supported the efforts deployed by the project management to ensure an alignment of understanding.

Motivation being the stimulus required by humans to achieve their goals (Kim et al., 2015) is an important factor in ensuring project success. Motivation is a construct that deals with human relations and its application gears towards assisting the staff in their personal desire to optimize well-being. The motivated personnel apply efforts in accomplishing set goals, which would improve the competitive advantage of the organization (Oyedele, 2013). The study results showed that with properly motivated personnel, concerted efforts applied on projects would enhance project success and profitability.

Skills are the required competence necessary for the project to succeed. As the essential ability to perform a task (Mazur & Pisarski, 2015), skill is critical for the

performance of the project execution to enable the project met its technical objectives. The project team should ensure the engagement of skilled personnel required for the project as supported by the results of the study, which showed a statistically significant relationship between skills and project success.

Availability and allocation of adequate resources are other elements tested by the study, and the results demonstrated that there is a statistically significant relationship between resources and project success. An optimal use of resources denotes efficiency in an organization (Ngacho & Das, 2014). Resources management is critical to the successful management of projects (Ngacho & Das, 2014). Timely deployment of resources to meet project needs is important in construction projects to ensure project success (Alzahrani & Emsley, 2013).

Communication is a leadership skill required in human management (Gladden, 2014). As the execution of construction projects are by human endeavor, communications problems are a known part of the project challenges. The study results showed a statistically significant relationship between communications and project success, which implied that communications is a critical element for project managers for an early alignment and to ensure proper information dissemination. Feedback from the recipients of the communication is also important to be sure of accurate understanding.

### **Implications for Social Change**

The social change implications of this study are multiple because the causes are direct advantages derived from an enhanced real estate construction sector. The study's final purpose was for an improved profitability of the industry, which may be impactful

to the social strata of the Nigerian community. The UN categorized housing as a basic need of human existence (UN, 2015) and the shelter-for-all policy, endorsed by the UN General Assembly (UN General Assembly, 1996) was to ensure affordable and habitable housing provision for the world population. The implementation of the findings of this study may stimulate social change as managers of the real estate construction sector would revamp their businesses for maximal profitability resulting in a greater production of residential accommodation. With more development activities occurring, houses may become more affordable as competition takes place in the housing market.

The NBS (2016) stated an unemployment and underemployment rates of 13.9% and 19.7% respectively in quarter three. With improved business practices resulting in increased transactions, the real estate construction may employ more tradespersons, artisans, suppliers, and contractors, which may help alleviate the unemployment rate thereby bringing social change. A multiplier effect of this may also increase the social change implications as there shall be a stimulation of economic activities for inclusive and sustainable growth in the economic activities of Nigeria.

### **Recommendations for Action**

The results of the study showed a statistically significant relationship between the predictors and project success and may be useful in optimizing business practices and improving profitability in the management of projects in the real estate construction sector. Project managers leading project teams in this industry may note the importance of aligning the elements of the DAT namely comprehension, motivation, skills, resources, and communication at the initiation phase of the project to maximize the

chances of project success. Properly aligned projects elements in the initiation phase may reduce the risk and cost associated with realignments and corrections when projects suffer setbacks. I recommend the DAT for the project teams in the real estate construction sector as a framework to initiate, plan, monitor, and manage projects.

The results and recommendations are of interest to the practitioners and the academia. I intend to disseminate the results through a submission for publishing to the scholarly journal, *Project Management Journal*, published by the project management institute, USA. The submission shall be as a further study to the DAT published in the same journal by Lidow (1999). I will also present the results to the real estate companies, construction companies, engineering companies, and architectural companies that assisted in the research by recruiting their project management practitioners in filling out the survey questionnaires.

### **Recommendations for Further Study**

The five predictors showed a correlation with project success. Further studies may examine if there are statistically significant relationships amongst these predictors pair wise. For example, a research question may be: does a significant relationship exist between comprehension and communication? The research may tilt towards examining if a lack of comprehension would affect the ability to dispense effective communication. In applying the same type of research question to all pairs of predictors, an examination of all the elements and the degrees to which they are related to each other may assist the project team in developing a strategy for seamless project execution.

Though examined in the literature review for proper background understanding, the study delimited financials and marketing in its final analysis. Further study may include these activities such as obtaining finance, budgeting, and project size in critically analyzing how the predictors could correlate with project success. Marketing of the finished product to home buyers could also be another consideration as the target market is a valid criterion during the execution phase and therefore may have an effect on the independent variables. Finally, the study limited respondents to the survey to project management practitioners. The views of other cadres of personnel in the real estate construction sector may deepen the knowledge of the effects of these predictors on project success.

### **Reflections**

With a certification and a working experience in the project management practice, I had developed a personal bias and assumptions to some of the predictors. The results of the study showed a degree of significance that did not support my bias in some of the predictors. For example, I held a personal view that comprehension is necessary for project execution, but communication is on a need-to-know basis. Motivation applied as far as the economic indices allowed while resources and skills were valuable.

Using an anonymous approach to conduct the online survey helped to eliminate all forms of biases and personal influences on the study while upholding the ethical standards of research of the university. Without respondents' identity, it is not possible to reanalyze the responses in the bid to justify previously held biases. The change in

thinking towards project management is complete, and the next step is disseminating and applying the knowledge in professional practice.

### **Summary and Study Conclusions**

In this quantitative correlational study, I examined the relationship between the predictors; comprehension, motivation, skills, resources, and communication in project management and project success using the duck alignment theory by Lidow (1999) as the theoretical framework for the study. Data collection was an online questionnaire using SurveyMonkey, and I deployed the project implementation profile as the survey measurement instrument. I used the excel spreadsheet to prepare the collated raw data for export to the analysis software.

The analysis of the data was through the SPSS 23 software where the multiple linear regression models checked the statistical significance of the relationship between the independent variables and the dependent variable. Assumptions tests found no violations of the assumptions and the data analysis showed an acceptance of the five research alternative hypotheses;  $H_{a1}$ ,  $H_{a2}$ ,  $H_{a3}$ ,  $H_{a4}$ ,  $H_{a5}$ . The results supported a positive correlation and a statistically significant relationship between the five predictors and project success. The academic and professional practices could further study these predictors as enumerated in the duck alignment theory.



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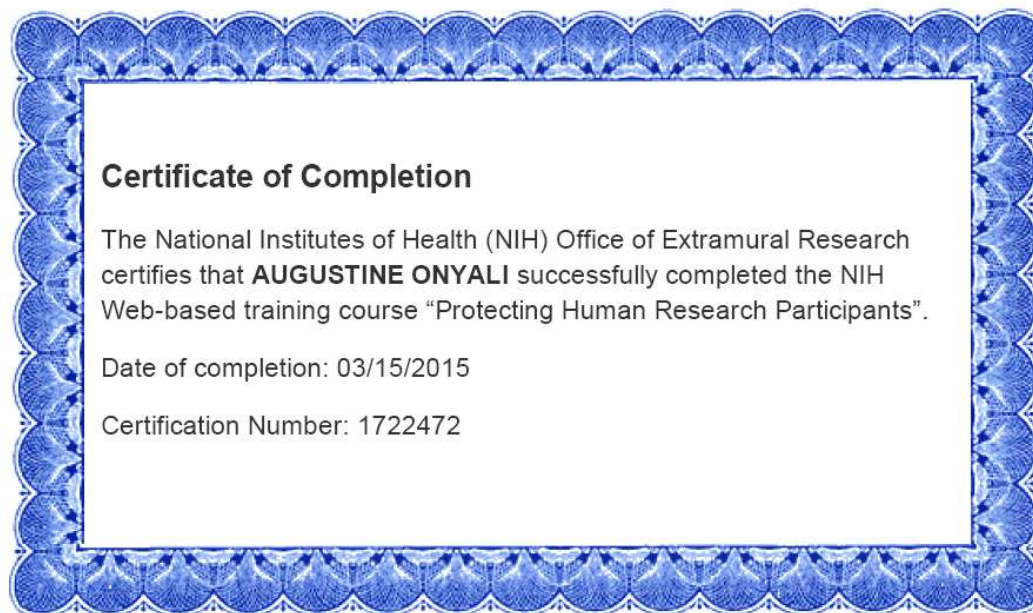
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## Appendix A: National Institute of Health Certification



## Appendix B: Invitation Letter to Participants

Dear Sir/Madam,

My name is Augustine Onyali and I am a doctoral student in business administration specializing in project management at the College of Management and Technology of the Walden University, USA. My research is to examine how the predictors: comprehension, motivation, skills, resources, and communication correlate with project success in the real estate construction sector.

I will conduct this study through an online survey administered by SurveyMonkey®. The survey consists of four introductory questions and 50 Likert type questions on an 11-point scale and takes approximately 20 minutes to complete. You will not be required to provide any identifying information. All other information provided will be confidential and protected.

You can access this online survey anywhere you have Internet access by clicking this link: <https://www.surveymonkey.com/r/8BBQVMX>. You will have to read and agree with the online consent form (on the first page of the survey) before you can access and complete the survey. If necessary, please contact me at [augustine.onyali@waldenu.edu](mailto:augustine.onyali@waldenu.edu) for all further correspondences.

Your participation is appreciated.

Best Regards,

Augustine Onyali (PMP)

### Appendix C: Introduction Letter to Professional Groups

Dear Sir/Madam,

My name is Augustine Onyali and I am a doctoral student in business administration specializing in project management at the College of Management and Technology in the Walden University, USA. My research is to examine how the predictors: comprehension, motivation, skills, resources, and communication correlate with project success in the real estate construction sector.

I am reaching out to this professional group for the enlistment of members comprising of project management practitioners in the real estate construction sector to participate in this study. The participants may include: **(a) project managers, (b) project engineers, (c) project architects, (d) estate developers, (e) construction managers, (f) site managers, (g) project control managers, and (f) others as applicable in the professional body.**

I will conduct this study through an online survey administered by SurveyMonkey®. The survey consists of four introductory questions and 50 Likert type questions on an 11-point scale and takes approximately 20 minutes to complete. The participation and experiences from the members of this professional group will be essential to the study. You can access this online survey anywhere you have Internet access by clicking this link: <https://www.surveymonkey.com/r/8BBQVMX>. The participants will have to read and agree with the online consent form (on the first page of the survey) before they can access and complete the survey. All information will be confidential and protected.



Please contact me at [augustine.onyali@waldenu.edu](mailto:augustine.onyali@waldenu.edu) for all further correspondences.

Your participation is highly appreciated.

Best Regards,

Augustine Onyali (PMP)

#### Appendix D: Introduction Letter to Construction Companies

Dear Sir/Madam,

My name is Augustine Onyali and I am a doctoral student in business administration specializing in project management at the College of Management and Technology in the Walden University, USA. My research is to examine how the predictors: comprehension, motivation, skills, resources, and communication correlate with project success in the real estate construction sector.

I am reaching out to your organization as a foremost construction company in the sector and your participation and experiences will be essential to this study. I hereby solicit for your assistance in the research through enlisting employees that are project management practitioners to participate in this study. These categories may include: **(a) project managers, (b) project engineers, (c) project architects, (d) estate developers, (e) construction managers, (f) site managers, (g) project control managers, and (f) others as applicable in the organization.**

I will conduct this study through an online survey administered by SurveyMonkey®. The survey consists of four introductory questions and 50 Likert type questions on an 11-point scale and takes approximately 20 minutes to complete.

Consequent to your approval of this research exercise, I will send you or your designated representative a summary of the research purpose and an URL link to the online survey to distribute to your project management team members. With your agreement, I will also send you a 1-2 page summary of the research findings at the end of the research, which

you may use to learn the correlates of project success in the real estate construction sector.

Your employees will have to read and agree with the online consent form (on the first page of the survey) before they can access and complete the survey. All information will be confidential and protected.

Please contact me at [augustine.onyali@waldenu.edu](mailto:augustine.onyali@waldenu.edu) for all further correspondences.

Your approval and participation is appreciated.

Best Regards,

Augustine Onyali (PMP)

## Appendix E: Protocol of Power Analyses Using G\*Power 3.1.2

1] -- Sunday, January 01, 2017 -- 03:45:58

**Exact** - Linear multiple regression: Random model

**Options:** Exact distribution

**Analysis:** A priori: Compute required sample size

**Input:** Tail(s) = One

H1  $\rho^2$  = 0.17

H0  $\rho^2$  = 0

$\alpha$  err prob = 0.05

Power (1- $\beta$  err prob) = 0.8

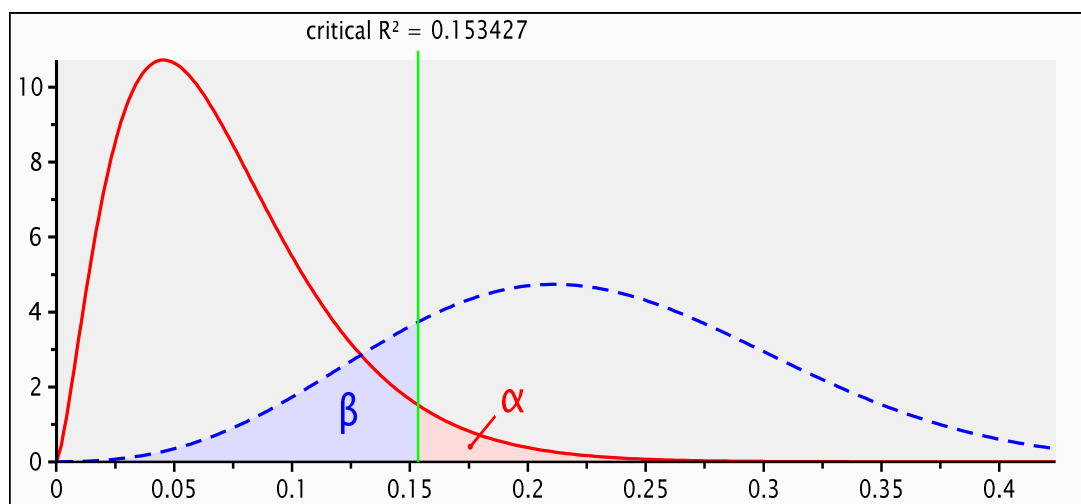
Number of predictors = 5

**Output:** Lower critical  $R^2$  = 0.1534269

Upper critical  $R^2$  = 0.1534269

Total sample size = 71

Actual power = 0.8003827



## Appendix F: Informed Consent Form

### Participant Consent Form

You are invited to take part in a research study about the correlates of project success. The researcher is inviting project management practitioners, which may include the following categories of staff: (a) project managers, (b) project engineers, (c) project architects, (d) estate developers, (e) construction managers, (f) site managers, (g) project control managers and (f) others (specified by participant where applicable) to be in the study. This form is part of a process called “informed consent” to allow you to understand this study before deciding whether to take part.

This study is being conducted by a researcher named Augustine Onyali, who is a doctoral student in business administration, specializing in project management at the College of Management and Technology in the Walden University, USA. You might already know the researcher as an architect and project manager but this study is separate from that role.

#### **Background Information:**

The purpose of this study is to examine the predictors of project success through the early alignment actions by the project management team and is a partial requirement for the completion of the degree of doctor of business administration. Previous studies have used meeting the constraints of cost, time, and resources to define project success. This study aims to determine how comprehension, motivation, skills, resources, and communication, aligned early in the project, could maximize the chances of project success.

**Data Collection Procedure:**

- If you agree to be in this study, you will be asked to:
- Take part in a research study about project success.
- Provide electronic consent to this invitation to participate in the survey by clicking the link below.
- Fill out an electronic questionnaire on an 11-point scale that shall take not more than 20 minutes to complete.
- Click on the submit button after all the questions on the survey are completed.

Here are some sample questions from each predictor group on the questionnaire, which would require a scaled answer in a 0 to 10 range:

1. The basic goals of the project are clear to me.
2. Upper management understands the amount of resources (money, time, manpower, equipment, etc.) required to implement this project.
3. Adequate technical and/or managerial training (and time for training) is available for members of my project team.
4. The appropriate technology (equipment, training programs, etc) has selected for project success.
5. The reasons for any changes to existing policies/procedures are explained to members of the project team, other groups affected by changes, and upper management.

**Voluntary Nature of the Study:**

This study is voluntary. You are free to accept or turn down the invitation. No one at the professional association/company will treat you differently if you decide not to be in the study. If you decide to be in the study now, you can still change your mind later. You may stop at any time. There is no penalty for refusing or discontinuing your participation in this study.

**Risks and Benefits of Participating in the Study:**

Being in this type of study involves some risk of the minor discomforts that can be encountered in daily life, such as experiencing a minimal amount of stress by filling out an online survey. Some people may experience slight anxiety, which may affect their ability to complete the survey. Being in this study would not pose risk to your safety or wellbeing.

If you decide to participate in this research, you will be helping the real estate construction industry to understand further the correlates of project success. By understanding these factors, organizations executing projects can create the necessary alignments to maximize the chances of project success.

**Payment:**

While there is no compensation for your participation, I will be grateful for your selflessness and decision to participate in this short survey.

**Privacy and Confidentiality:**

Reports coming out of this study will not share the identities of individual participants. Details that might identify participants also will not be shared. Any information you provide will be kept confidential. Even I, as the researcher, will not

know who you are, have access to, nor include any personal identifying information. I will not use your personal information for any purpose outside of this research project. Your participation in this survey has no connection to your employer, and everything involved is strictly confidential. Data from the survey will be kept secure by the use of password-protected files and will be kept for a period of at least five years, as required by the university.

**Contacts and Questions:**

You may ask any questions you have now. Or if you have questions later, you may contact the researcher via +2348033132976 and [augustine.onyali@waldenu.edu](mailto:augustine.onyali@waldenu.edu). If you want to talk privately about your rights as a participant, you can call the Research Participant Advocate at my university at +1612-312-1210. Walden University's approval number for this study is 03-15-17-0485517 and it expires on March 14<sup>th</sup>, 2018.

Please print or save this consent form for your records.

**Obtaining Your Implied Consent:**

If you feel you understand the study well enough to make a decision about it, please indicate your consent by selecting "Yes" below.



## Appendix G: Permission to use Measurement Instrument



AUGUSTINE ONYALI &lt;augustine.onyali@waldenu.edu&gt;

---

**Permission to use the Project Implementation Profile as a Measurement Instrument.**

---

**Slevin, Dennis P** <DPSLEVIN@katz.pitt.edu>  
To: AUGUSTINE ONYALI <augustine.onyali@waldenu.edu>

Fri, Nov 25, 2016 at 4:16 PM

Dear Mr. Onyali,

This response denotes our permission for you to use the PIP as a survey instrument for your research project. Please note that this permission is only for research purposes and does not include using it for consulting or training reasons. If you need a hard copy of the instrument, please e-mail me.

Best of luck with your research.

Regards,

*Dennis P. Slevin, Ph.D.  
Tom W. Olofson Chair in Entrepreneurial Studies, Emeritus  
Katz Graduate School of Business  
University of Pittsburgh  
Pittsburgh, PA 15260  
E-mail: [dpslevin@katz.pitt.edu](mailto:dpslevin@katz.pitt.edu)*

## Appendix H: The PIP Survey Instrument

### Part 1: Participants' demographic data and qualification criteria

1. Your age: \_\_\_ Below 18 years, \_\_\_ 18-29, \_\_\_ 30-49, \_\_\_ 50 and over.
2. Your Gender: \_\_\_\_\_ Female, \_\_\_\_\_ Male.
3. Your Job role: \_\_\_ Project Manager,  
 \_\_\_ Project Engineer,  
 \_\_\_ Project Architect,  
 \_\_\_ Real Estate Developer,  
 \_\_\_ Construction Manager,  
 \_\_\_ Site Manager,  
 \_\_\_ Project Control Manager  
 \_\_\_ Others (please specify) \_\_\_\_\_
4. Numbers of years you have been in this role: \_\_\_.

### Part 2: 11-point Likert-type scale survey questions (0 – 10 rating)

Think of a successful real estate construction projects in your establishment alongside your role in the project. Consider the statements below and using the scale of 0 to 10, rate each statement according to the degree to which you agree with the statement as it concerns your project, your role, and as required to have a successful project.

A rating of 5 indicates that the statement is neutral and you neither agree nor disagree.

A rating of above 5 indicates agreement with the statement.

A rating of below 5 indicates disagreement with the statement.

#### ***Comprehension:***

5. The basic goals of the project are clear to me.
6. When the project goals are achieved, the results will benefit the organization.

7. I am aware of and can identify the beneficial consequences to the organization of the successful project.
8. Other project team members at my level share the basic goals of the project that we hold.
9. Upper management shares the same basic goals of the project.
10. All other project team members at my level involved in the project foresee the same beneficial consequences.
11. I am enthusiastic about the chances for success of this project.
12. The project goals are not contradictory; they basically can all be achieved.
13. The project goals have explained to all personnel affected by the project.
14. The goals of this project are in line with the general goals of the organization.

***Resources:***

15. Upper management understands the amount of resources (money, time, manpower, equipment, etc.) required to implement this project.
16. Upper management is provided with regular feedback concerning the progress of the project.
17. Upper management has issued their support of the project, in writing, to all managers and organizational members affected by the project.
18. I agree with upper management on the degree of my authority and responsibility for the project.
19. Upper management will support me in crisis.
20. Upper management has granted me the necessary authority and will support my decisions concerning the project.
21. Upper management will be responsive to my request for additional resources, if the need arises.
22. Upper management shares the responsibility for ensuring the project success.
23. I have the confidence of upper management.

24. Upper management recognizes the negative consequences of an unsuccessful implementation.

***Motivation:***

25. My project team includes personnel with adequate technical and managerial skills.
26. Adequate technical and/or managerial training (and time for training) is available for members of my project team
27. The personnel on my project team are committed to the project's success.
28. The members of my project team understand how their performance will be evaluated.
29. There is a list of internal and/or external consultants who can be brought in if crises develop.
30. The lines of authority and communication are well defined on my project team.
31. There is enough manpower to complete the project.
32. Job description for team members have been written and distributed and are understood.
33. My project team members are motivated by adequate rewards for project success.
34. My project team personnel understand their role on the project team

***Skills:***

35. The appropriate technology (equipment, training programs, etc) has been selected for project success.
36. Experts, consultants, or other experienced project managers outside the project team have reviewed and criticized my basic plans/approach.
37. I have considered alternative plans/approaches for the project.
38. The results of the project are subject to periodic adjustment and "fine-tuning".
39. The technology that is being implemented works well.
40. The engineers and other technical people are capable.

41. The people implementing this project understand it.
42. Specific tasks are well managed.
43. I understand how this project may be integrated with other current projects (personnel, time schedules, etc.)
44. The personnel understand their specific tasks for the project.

***Communication:***

45. The reasons for any changes to existing policies/procedures are explained to members of the project team, other groups affected by changes, and upper management.
46. The project goals have been well defined and explained to members of the project team, other groups affected by project work, and upper management.
47. Input concerning project goals and strategy has been sought from members of the project team, other groups affected by the project, and upper management.
48. Individual/groups supplying input have received feedback on the acceptance of their input.
49. The results (decisions made, information received and needed, etc) of planning meetings are published to applicable personnel.
50. There are provisions for issuing exception reports - who is responsible for recognizing the need for exception reports, who will write them, who will receive them, etc.
51. There exist well-defined channels for feedback from clients, upper management, members of other groups, and project team members when project implementation begins.
52. All groups affected by the project know how to make problems known to responsible parties.
53. Someone has been designated to receive complaints and channel them to individuals who can take corrective action.
54. I expect problems and complaints to receive timely responses.

Appendix I: Sample of Raw Data from SurveyMonkey®

RespondentID	Obtaining Consent	Your age	What is your gender?	What is your job role?		About how many years have you been in this role?
	Yes - 1, No - 2	Below 18 years (1), 18 years - 29 years (2), 30 years - 49 years (3), 50 years and over (4)	Female (1), Male (2)	Project Manager (1), Project Engineer (2), Project Architect (3), Real Estate Developer (4), Construction Manager (5), Site Manager (6), Project Control Manager (7), Other (8)		Less than 1 year (1), At least 1 year but less than 3 years (2), At least 3 years but less than 5 years (3), At least 5 years but less than 10 years (4) 10 years or more (5)
Respondent #87	1	18 years - 29 years (2)	Male (2)	Real Estate Developer (4)		At least 1 year but less than 3 years (2)
Respondent #86	1	18 years - 29 years (2)	Female (1)	Real Estate Developer (4)		At least 1 year but less than 3 years (2)
Respondent #85	1	30 years - 49 years (3)	Male (2)	Real Estate Developer (4)		10 years or more (5)
Respondent #84	1	50 years and over (4)	Male (2)	Construction Manager (5)		10 years or more (5)
Respondent #83	1	30 years - 49 years (3)	Female (1)	Other (please specify)	Cost Controller	10 years or more (5)
Respondent #82	1	18 years - 29 years (2)	Male (2)	Other (please specify)	Site Supervisor	At least 1 year but less than 3 years (2)
Respondent #81	1	30 years - 49 years (3)	Male (2)	Real Estate Developer (4)		10 years or more (5)
Respondent #80	1	50 years and over (4)	Female (1)	Real Estate Developer (4)		10 years or more (5)
Respondent #79	1	50 years and over (4)	Male (2)	Other (please specify)	Design Manager	10 years or more (5)
Respondent #78	1	18 years - 29 years (2)	Male (2)	Other (please specify)	Site Engineer	At least 3 years but less than 5 years (3)
Respondent #77	1	18 years - 29 years (2)	Female (1)	Other (please specify)	Civil Engineer	At least 3 years but less than 5 years (3)
Respondent #76	1	30 years - 49 years (3)	Female (1)	Real Estate Developer (4)		10 years or more (5)
Respondent #75	1	50 years and over (4)	Male (2)	Project Control Manager (7)		10 years or more (5)
Respondent #74	1	30 years - 49 years (3)	Male (2)	Site Manager (6)		10 years or more (5)
Respondent #73	1	30 years - 49 years (3)	Male (2)	Project Engineer (2)		At least 3 years but less than 5 years (3)
Respondent #72	1	18 years - 29 years (2)	Female (1)	Project Architect (3)		At least 1 year but less than 3 years (2)
Respondent #71	1	30 years - 49 years (3)	Male (2)	Other (please specify)	Project Supervisor on Site	At least 5 years but less than 10 years (4)
Respondent #70	1	30 years - 49 years (3)	Female (1)	Project Manager (1)		10 years or more (5)
Respondent #69	1	30 years - 49 years (3)	Male (2)	Other (please specify)	Field Engineer	10 years or more (5)
Respondent #68	1	30 years - 49 years (3)	Male (2)	Other (please specify)	Field Engineer	10 years or more (5)
Respondent #67	1	30 years - 49 years (3)	Male (2)	Other (please specify)	Lead Pipelines/Corrosion Engineer	At least 1 year but less than 3 years (2)
Respondent #66	1	30 years - 49 years (3)	Male (2)	Other (please specify)	Discipline Engineer	10 years or more (5)
Respondent #65	1	30 years - 49 years (3)	Male (2)	Other (please specify)	Discipline Engineer	At least 5 years but less than 10 years (4)
Respondent #64	1	50 years and over (4)	Male (2)	Construction Manager (5)		10 years or more (5)
Respondent #63	1	30 years - 49 years (3)	Male (2)	Other (please specify)	Cost Controller	At least 5 years but less than 10 years (4)
Respondent #62	1	50 years and over (4)	Female (1)	Other (please specify)	Real Estate Manager	10 years or more (5)
Respondent #61	1	30 years - 49 years (3)	Male (2)	Project Control Manager (7)		10 years or more (5)
Respondent #60	1	50 years and over (4)	Female (1)	Project Manager (1)		10 years or more (5)
Respondent #59	1	30 years - 49 years (3)	Male (2)	Project Engineer (2)		At least 5 years but less than 10 years (4)
Respondent #58	1	30 years - 49 years (3)	Male (2)	Other (please specify)	Discipline Engineer	At least 5 years but less than 10 years (4)
Respondent #57	1	30 years - 49 years (3)	Male (2)	Other (please specify)	Field Engineer	At least 5 years but less than 10 years (4)
Respondent #56	1	30 years - 49 years (3)	Male (2)	Other (please specify)	Lead Pipelines/Corrosion Engineer	At least 1 year but less than 3 years (2)
Respondent #55	1	18 years - 29 years (2)	Male (2)	Other (please specify)	Planner	At least 3 years but less than 5 years (3)
Respondent #54	1	30 years - 49 years (3)	Male (2)	Other (please specify)	Estate Surveyor and Valuer	At least 5 years but less than 10 years (4)
Respondent #53	1	30 years - 49 years (3)	Male (2)	Project Engineer (2)		10 years or more (5)
Respondent #52	1	30 years - 49 years (3)	Male (2)	Real Estate Developer (4)		10 years or more (5)
Respondent #51	1	30 years - 49 years (3)	Male (2)	Project Architect (3)		10 years or more (5)
Respondent #50	1	50 years and over (4)	Male (2)	Project Manager (1)		10 years or more (5)
Respondent #49	1	50 years and over (4)	Female (1)	Real Estate Developer (4)		10 years or more (5)
Respondent #48	1	30 years - 49 years (3)	Female (1)	Project Engineer (2)		At least 5 years but less than 10 years (4)
Respondent #47	1	18 years - 29 years (2)	Female (1)	Other (please specify)	Designer	At least 3 years but less than 5 years (3)
Respondent #46	1	30 years - 49 years (3)	Male (2)	Real Estate Developer (4)		At least 5 years but less than 10 years (4)
Respondent #45	1	30 years - 49 years (3)	Male (2)	Other (please specify)	IT Manager	At least 5 years but less than 10 years (4)
Respondent #44	1	18 years - 29 years (2)	Male (2)	Other (please specify)	Estate management	At least 3 years but less than 5 years (3)
Respondent #43	1	30 years - 49 years (3)	Male (2)	Real Estate Developer (4)		At least 3 years but less than 5 years (3)
Respondent #42	1	50 years and over (4)	Male (2)	Other (please specify)	Admin Manager of Real Estate Firm	10 years or more (5)
Respondent #41	1	30 years - 49 years (3)	Female (1)	Other (please specify)	Real Estate Administrator	At least 5 years but less than 10 years (4)
Respondent #40	1	30 years - 49 years (3)	Female (1)	Real Estate Developer (4)		10 years or more (5)
Respondent #39	1					
Respondent #38	1	30 years - 49 years (3)	Male (2)	Project Architect (3)		10 years or more (5)
Respondent #37	1	30 years - 49 years (3)	Female (1)	Project Manager (1)		At least 5 years but less than 10 years (4)
Respondent #36	1	30 years - 49 years (3)	Male (2)	Project Engineer (2)		10 years or more (5)





RespondentID	Resources									
	Upper management understands the amount of resources (money, time, manpower, equipment, etc.) required to implement this project.	Upper management is provided with regular feedback concerning the progress of the project.	Upper management has issued their support of the project, in writing, to all managers and organizational members affected by the project.	I agree with upper management on the degree of my authority and responsibility for the project.	Upper management will support me in crisis.	Upper management has granted me the necessary authority and will support my decisions concerning the project.	Upper management will be responsive to my request for additional resources, if the need arises.	Upper management shares the responsibility for ensuring the project success.	I have the confidence of upper management.	Upper management recognizes the negative consequences of an unsuccessful implementation.
Respondent #87	8	5	6	3	6	7	4	8	8	9
Respondent #86	8	8	6	6	5	4	7	8	7	9
Respondent #85	7	8	7	8	7	8	6	9	9	10
Respondent #84	8	9	7	8	9	9	8	10	10	10
Respondent #83	8	7	6	6	5	6	7	8	7	9
Respondent #82	8	9	6	6	4	5	6	8	7	9
Respondent #81	6	7	5	6	4	4	5	8	8	9
Respondent #80	7	8	6	8	8	8	7	9	10	10
Respondent #79	8	10	8	9	7	7	8	10	10	10
Respondent #78	6	8	7	4	4	5	3	8	6	9
Respondent #77	8	8	6	7	7	7	4	8	8	9
Respondent #76	7	9	6	9	7	7	5	9	9	10
Respondent #75	8	9	7	8	6	7	7	8	9	10
Respondent #74	8	8	3	6	7	7	8	8	9	10
Respondent #73	10	10	10	10	10	10	10	10	10	10
Respondent #72	8	9	2	6	5	6	3	8	8	9
Respondent #71	6	10	9	7	7	8	6	8	8	8
Respondent #70	7	9	3	9	8	9	7	10	10	10
Respondent #69	7	8	7	6	5	6	5	8	6	8
Respondent #68	6	9	8	6	6	6	5	6	6	6
Respondent #67	10	9	9	7	7	7	7	8	7	10
Respondent #66	10	9	9	10	5	5	7	10	7	10
Respondent #65	7	10	5	3	5	3	5	7	5	7
Respondent #64	7	8	4	7	6	7	6	8	10	10
Respondent #63	6	8	8	6	7	6	6	6	7	7
Respondent #62										
Respondent #61	7	7	8	8	8	8	9	9	9	9
Respondent #60	9	10	8	9	7	8	5	10	10	10
Respondent #59	10	10	5	10	5	8	8	10	8	10
Respondent #58	10	10	10	10	5	5	3	10	2	10
Respondent #57	8	10	8	8	7	8	8	7	8	8
Respondent #56	10	9	10	9	9	9	10	9	9	10
Respondent #55	7	8	4	9	5	8	3	10	9	10
Respondent #54	7	6	4	6	6	5	6	6	6	7
Respondent #53	7	8	8	6	8	8	6	10	10	10
Respondent #52	5	7	4	8	6	9	8	10	10	10
Respondent #51	7	10	3	8	7	9	10	10	10	10
Respondent #50	7	10	4	6	7	10	8	10	10	10
Respondent #49	9	10	7	10	9	10	10	10	10	10

RespondentID	Motivation									
	My project team includes personnel with adequate technical and managerial skills.	Adequate technical and/or managerial training (and time for training) is available for members of my project team.	The personnel on my project team are committed to the project's success.	The members of my project team understand how their performance will be evaluated.	There is a list of internal and/or external consultants who can be brought in if crises develop.	The lines of authority and communication are well defined on my project team.	There is enough manpower to complete the project.	Job description for team members have been written and distributed and are understood.	My project team members are motivated by adequate rewards for project success.	My project team personnel understand their role on the project team.
Respondent #87	8	6	5	4	2	3	7	2	5	8
Respondent #86	8	5	6	3	1	2	4	3	6	4
Respondent #85	9	8	6	4	2	5	8	3	4	9
Respondent #84	9	7	8	5	4	5	9	6	6	9
Respondent #83	8	6	7	5	2	3	7	5	6	8
Respondent #82	9	5	6	3	2	2	7	4	5	8
Respondent #81	10	8	7	5	3	4	8	2	5	8
Respondent #80	9	6	7	4	2	5	8	3	5	9
Respondent #79	9	6	7	7	2	3	8	4	5	8
Respondent #78	9	5	7	4	1	2	8	3	4	8
Respondent #77	9	6	7	6	1	2	8	2	3	7
Respondent #76	9	6	6	3	4	4	8	3	5	8
Respondent #75	10	7	6	4	3	4	8	2	4	9
Respondent #74	9	4	6	2	0	3	8	1	8	2
Respondent #73	10	10	10	10	10	10	10	10	10	10
Respondent #72	8	3	8	2	1	2	7	8	5	8
Respondent #71	8	8	9	7	7	10	8	8	8	8
Respondent #70	10	7	8	4	1	3	9	5	3	8
Respondent #69	9	6	8	6	5	7	7	7	4	7
Respondent #68	9	6	8	6	5	7	5	8	4	8
Respondent #67	9	7	7	7	7	9	5	9	9	9
Respondent #66	8	5	8	5	2	8	7	7	3	7
Respondent #65	7	3	5	5	7	7	5	7	3	7
Respondent #64	9	1	7	1	0	0	6	2	1	5
Respondent #63	7	6	6	6	5	6	7	6	6	6
Respondent #62										
Respondent #61	7	8	8	7	8	8	8	8	7	8
Respondent #60	10	3	3	4	1	2	5	3	6	7
Respondent #59	10	5	10	7	9	9	5	8	5	8
Respondent #58	10	5	10	3	3	7	7	7	3	10
Respondent #57	10	8	10	8	8	7	7	10	7	8
Respondent #56	9	9	9	9	8	10	6	10	8	10
Respondent #55	9	5	9	7	10	9	8	9	10	9
Respondent #54	5	4	6	6	7	7	5	5	8	7

RespondentID	Skills									
	The appropriate technology (equipment, training programs, etc) has been selected for project success.	Experts, consultants, or other experienced project managers outside the project team have reviewed and criticized my basic plans/approach.	I have considered alternative plans/approaches for the project.	The results of the project are subject to periodic adjustment and "fine-tuning".	The technology that is being implemented works well.	The engineers and other technical people are capable.	The people implementing this project understand it.	Specific tasks are well managed.	I understand how this project may be integrated with other current projects (personnel, time schedules, etc.)	The personnel understand their specific tasks for the project.
Respondent #87	8	5	6	7	7	9	9	7	5	9
Respondent #86	8	4	5	7	9	10	10	6	4	8
Respondent #85	8	6	7	8	9	10	9	9	7	8
Respondent #84	9	5	9	9	10	10	10	8	10	10
Respondent #83	9	7	7	8	9	10	10	7	6	9
Respondent #82	9	6	7	8	9	9	10	10	5	7
Respondent #81	9	7	7	8	9	10	10	9	7	9
Respondent #80	9	7	8	8	9	10	10	10	8	9
Respondent #79	10	7	8	9	10	10	10	10	5	9
Respondent #78	8	7	8	9	10	10	10	10	4	7
Respondent #77	10	5	8	9	10	10	10	10	6	8
Respondent #76	8	6	7	9	10	10	10	9	7	9
Respondent #75	10	8	9	5	10	10	10	10	9	10
Respondent #74	7	6	7	8	10	10	10	10	8	10
Respondent #73	10	10	10	10	10	10	10	10	10	10
Respondent #72	9	8	6	9	10	10	10	10	8	10
Respondent #71	7	7	7	5	7	7	7	6	6	7
Respondent #70	8	6	9	10	10	10	10	10	10	10
Respondent #69	7	6	7	7	7	8	8	8	7	8
Respondent #68										
Respondent #67	9	9	8	0	8	9	9	8	7	9
Respondent #66	7	7	7	7	7	8	8	8	8	8
Respondent #65	3	7	10	7	5	7	7	7	10	7
Respondent #64	8	3	9	8	10	10	10	10	10	10
Respondent #63	6	8	5	5	7	8	8	9	7	6
Respondent #62										
Respondent #61	8	8	8	8	7	8	8	8	7	8
Respondent #60	10	7	8	10	10	10	10	10	9	10
Respondent #59	6	5	8	8	7	9	9	9	10	10
Respondent #58	6	5	7	7	7	7	7	7	7	7
Respondent #57	7	7	6	7	7	7	7	7	7	7

RespondentID	Communication									
	The reasons for any changes to existing polices/procedures are explained to members of the project team, other groups	The project goals have been well defined and explained to members of the project team, other groups affected by project work, and upper management.	Input concerning project goals and strategy has been sought from members of the project team, other groups affected by the project, and upper management.	Individual/groups supplying input have received feedback on the acceptance of their input.	The results (decisions made, information received and needed, etc) of planning meetings are published to applicable personnel.	There are provisions for issuing exception reports - who is responsible for recognizing the need for exception reports, who will write them, who will receive them, etc.	There exist well-defined channels for feedback from clients, upper management, members of other groups, and project team members when project implementation begins.	All groups affected by the project know how to make problems known to responsible parties.	Someone has been designated to receive complaints and channel them to individuals who can take corrective action.	I expect problems and complaints to receive timely responses.
Respondent #87	7	4	3	2	2	0	1	1	3	6
Respondent #86	7	5	7	6	4	0	2	4	1	7
Respondent #85	6	6	5	4	4	0	1	2	0	3
Respondent #84	3	7	3	3	2	0	1	2	0	7
Respondent #83	6	7	5	4	4	0	1	3	2	6
Respondent #82	5	4	5	3	3	0	0	2	1	5
Respondent #81	4	5	7	6	4	1	2	4	3	7
Respondent #80	8	8	5	3	4	1	1	4	0	7
Respondent #79	5	6	6	3	3	0	1	1	1	6
Respondent #78	5	7	3	3	2	0	1	1	0	5
Respondent #77	3	5	4	3	3	1	2	3	0	7
Respondent #76	7	8	5	4	4	1	2	5	3	7
Respondent #75	6	8	4	3	3	0	1	4	3	5
Respondent #74	2	3	1	1	1	0	1	3	1	6
Respondent #73	10	10	10	10	10	10	10	10	10	10
Respondent #72	5	7	6	4	4	1	1	5	2	8
Respondent #71	9	9	8	8	10	8	9	8	8	6
Respondent #70	5	8	4	3	2	0	5	4	1	7
Respondent #69	7	7	6	7	5	6	6	6	6	6
Respondent #68										
Respondent #67	7	7	7	7	5	5	9	9	9	8
Respondent #66	7	7	7	7	7	7	7	7	7	7
Respondent #65	7	7	10	5	7	7	7	7	7	10
Respondent #64	7	2	2	1	2	0	1	4	0	5
Respondent #63	7	6	4	5	4	3	6	5	4	5
Respondent #62										
Respondent #61	8	8	8	8	7	8	8	8	8	8
Respondent #60	5	3	4	5	6	0	7	4	1	5
Respondent #59	9	9	9	9	10	9	10	9	10	10
Respondent #58	7	7	7	7	3	7	7	7	7	7
Respondent #57	5	7	6	6	5	5	7	7	6	6
Respondent #56	7	7	7	7	6	5	10	9	6	8
Respondent #55	3	8	1	1	0	0	0	2	1	2
Respondent #54	5	6	2	3	4	5	7	6	7	7
Respondent #53	8	8	3	2	4	0	1	2	1	7
Respondent #52	7	8	5	3	3	0	0	5	2	8
Respondent #51	10	8	5	3	8	0	1	5	0	6
Respondent #50	9	8	9	5	6	1	2	3	2	7
Respondent #49	9	7	9	8	10	2	3	7	2	5
Respondent #48	8	9	5	3	5	2	8	9	7	9
Respondent #47	8	9	8	7	5	2	4	8	5	6
Respondent #46	8	8	8	8	8	8	9	8	7	8
Respondent #45	7	6	4	7	5	7	7	5	8	8
Respondent #44	9	10	10	8	7	10	9	8	9	9
Respondent #43	8	8	5	8	9	6	7	6	9	7

Respondents with Missing / Incomplete data

## Appendix J: Sample of Raw Data from PIP Survey Instrument on Project Success

Ranking for valid responses

Serial Number	RespondentID	Project Success Percentile Ranking from the PIP Instrument per Respondent					
		Comprehension	Motivation	Skills	Resources	Communication	Average
1	Respondent #87	70	19	45	38	5	35.4
2	Respondent #86	60	9	42	52	8	34.2
3	Respondent #85	92	35	82	72	5	57.2
4	Respondent #84	99	60	94	88	4	69
5	Respondent #83	77	30	84	54	7	50.4
6	Respondent #82	43	20	80	52	4	39.8
7	Respondent #81	63	42	90	34	8	47.4
8	Respondent #80	97	35	92	76	8	61.6
9	Respondent #79	100	40	92	86	5	64.6
10	Respondent #78	43	20	86	30	4	36.6
11	Respondent #77	80	20	91	58	5	50.8
12	Respondent #76	100	28	90	70	9	59.4
13	Respondent #75	100	30	94	72	7	60.6
14	Respondent #74	50	10	91	62	2	43
15	Respondent #73	100	100	10	100	100	82
16	Respondent #72	43	22	94	38	8	41
17	Respondent #71	80	84	23	68	81	67.2
18	Respondent #70	93	35	96	78	7	61.8
19	Respondent #69	47	53	48	45	29	44.4
20	Respondent #67	82	80	60	76	62	72
21	Respondent #66	93	42	55	78	53	64.2
22	Respondent #65	63	28	40	24	65	44
23	Respondent #64	100	5	92	60	3	52
24	Respondent #63	18	44	35	50	10	31.4
25	Respondent #61	67	78	70	78	75	73.6
26	Respondent #60	100	11	96	85	7	59.8
27	Respondent #59	90	76	82	82	95	85

## Appendix K: Breakdown of References

Source	Quantity	Percent of Total
Peer-Review Status		
Peer-reviewed Publications	187	94%
Nonpeer-reviewed Publication	11	6%
Total	198	100%
Type of Source		
Journal Articles	168	85%
Books	11	6%
Doctoral Dissertations	6	3%
Government Websites	9	5%
Professional Associations	2	1%
Conferences	2	1%
Total	198	100%
Age of Resources		
Current within 5 years (2013-2017)	182	92%
Noncurrent (<2012)	16	8%
Total	198	100%