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Competitiveness and Informal Economy Practices of Architecture Engineering and Construction Consultants

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Abstract

Purpose *–The Nigerian informal economy is expanding significantly particularly in the built environment due to the ever-increasing demand for infrastructure development for Nigeria's developing economy. The increased demand for infrastructure results in active competition between the formal and informal sectors' activities of built environment consultants. The study investigates informality and competitiveness among Architecture, Engineering, and Construction (AEC) consultants.*

Design/methodology/approach *– The study deployed the quantitative method and adopted a survey design. A structured questionnaire was administered by hand among AEC consultants randomly selected from various AEC consultancy practices in Lagos.*

Findings *– The study established that some AEC consultants operated informally due to the tedious process and documentation involved in obtaining a business license and not necessarily to avoid tax payments. The study established a positive relationship between the competitiveness of AEC consultants in the informal sector.*

Research limitations*– This study focused on consultancy firms in the AEC sector as an integral part of the built environment. The research is limited to AEC consultancy firms in Lagos, Nigeria. Some respondents were reluctant and declined to disclose information involving their participation in the informal economy.*

Theoretical/Social/Practical implications *– The study established a positive formal-informal linkage among AEC consultants in the AEC sector, consultants should take advantage of this linkage to enhance their competitiveness in the AEC sector****.***

Originality/value *– There is a positive relationship between the competitiveness of AEC consultants in the formal and informal sectors. The implications of informality among AEC consultants are social, economic, financial, contractual, and governance-related.*

Keywords*: Informal economy, AEC consultants, Competitiveness.*

1.0 Introduction

There is renewed research interest in the informal economy worldwide, this is because the informal economy has expanded rapidly both in developed and developing countries (ILO, 2002). Onwe (2013); and Awojobi (2014) submitted that the informal economy is expanding significantly in Nigeria and it contributes immensely to the economic growth of Nigeria. Furthermore, Deléchat and Medina (2020) affirmed that the informal economy accounts for about a third of low and middle-income countries' economic activities. The informal economy represents an important

segment in developing nations. The informal economy will employ the growing workforce in nations with high populace growth and urbanization.

The AEC sector in developing countries comprises formal and informal sector participants (Mlinga & Wells 2001). The informal economy represents a huge and important part of the AEC sector and other industries in developing countries. The informal construction sector has grown in size and importance in many African countries (Wells, 2001). Small informal construction firms were involved in building maintenance and repair of individual residential buildings and in the construction of complex and much larger commercial buildings (Wells, 2001).
Hart (1973), posits that informality exists because of the insufficiency of the formal sector for individuals to generate sufficient livelihood. This implies that formal-informal linkages have shaped stakeholders' participation in the built environment. AEC consultants, especially consultants in the AEC sector have been observed to participate in both formal and informal capacities on construction projects (Wells, 2001). Formal and informal linkages are geared towards personal or corporate competitiveness.

The decline in revenue to consultants coupled with inflation in the AEC sector spurs the need for consultants to stay competitive and survive. Competitiveness has become a center of attraction both locally and internationally. Mochtar and Arditi (2001) contended that the AEC sector is characterized by extreme competition and uncertainty risk. Therefore, consultants consistently quest for growth and improvement in the performance and delivery of construction projects.

participants at the first meeting of CIB Task Group 29 ('Construction in Developing Countries') in Arusha, Tanzania in 1998 defined informal Construction Economy as unregulated and unprotected individuals and enterprises engaged in economic activities in construction, including the supply of labor and production of building materials and components for both the formal construction sector and directly in response to client needs. Mlinga and Wells (2002) viewed it from the supply of labor to contractors engaged in large projects in other sections of the industry. However, there is a dearth of knowledge on informality among consultants in the AEC sector. It is on this basis that this study evaluates the informality and competitiveness of consultants in the built environment.

2.0 Literature review

2.1 Theories of Informal Economy

Over the years, the debate on the large and heterogeneous informal economy has crystallized into four dominant schools of thought regarding its nature and composition, as follows:

2.1.1 The Dualist Theory

The Dualist school sees the informal sector of the economy as comprising marginal activities distinct from and not related to the formal sector; that is, the informal sector provides income for the poor and a safety net in times of crisis (Hart 1973; ILO 1972; Sethuraman 1976; Tokman 1978). The Dualists argue that informal operators are excluded from modern economic opportunities due to imbalances between the growth rates of the population and modern industrial employment, and a mismatch between people's skills and the structure of modern economic opportunities. The Dualists subscribe to the notion that informal units and activities have few (if any) linkages to the formal economy but, rather, operate as a distinct separate sector of the economy and that the informal workforce—assumed to be largely self-employed—comprises the

less advantaged sector of a dualistic or segmented labor market. They pay little attention to the links between informal enterprises and government regulations. However, they recommend that governments create more jobs and provide credit and business development services to informal operators, as well as basic infrastructure and social services to their families.

2.1.2 The Structuralist Theory

The Structuralist school sees the informal economy as subordinated economic units (micro-enterprises) and workers that serve to reduce input and labor costs, thereby increasing the competitiveness of large capitalist firms (Castells and Portes 1989). The Structuralists argue that the nature of capitalism/capitalist growth drives informality: specifically, the attempts by formal firms to reduce labor costs and increase competitiveness and the reaction of formal firms to the power of organized labor, state regulation of the economy (notably, taxes and social legislation); to global competition; and the process of industrialization (notably, off-shore industries, subcontracting chains, and flexible specialization). The Structuralists see the informal and formal economies as intrinsically linked. They see both informal enterprises and informal wage workers as subordinated to the interests of capitalist development, providing cheap goods and services. They argue that governments should address the unequal relationship between "big business" and subordinated producers and workers by regulating commercial and employment relationships. They see the informal sector's existence as a product of underdevelopment in a nation.

2.1.3 The Legalist Theory

The Legalist school assumes that the informal sector is comprised of "plucky" micro-entrepreneurs who choose to operate informally to avoid the costs, time, and effort of formal registration particularly concerning registration and taxation, and who need property rights to convert their assets into legally recognized assets (De Soto 1989, 2000). The Legalists argue that a hostile legal system leads the self-employed to operate informally with their informal extra-legal norms. The Legalists focus on informal enterprises and the formal regulatory environment to the relative neglect of informal wage workers and the formal economy per se. However, they acknowledge that formal firms collude with the government to set the bureaucratic "rules of the game" (De Soto 1989). They argue that governments should introduce simplified bureaucratic procedures to encourage informal enterprises to register and extend legal property rights for the assets held by informal operators to unleash their productive potential and convert their assets into real capital.

2.1.4 The Voluntarist Theory

The Voluntarist school focuses on informal entrepreneurs who deliberately seek to avoid regulations and taxation. (Maloney, 2004). Unlike legalist schools, the voluntarists do not blame the cumbersome registration procedures. The Voluntarists argue that informal operators choose to operate informally after weighing the cost benefits of informality relative to formality. The Voluntarists pay little attention to the economic linkages between informal enterprises and formal firms but subscribe to the notion that informal enterprises create unfair competition for formal enterprises because they avoid formal regulations, taxes, and other construction production. They argue that informal enterprises should be brought under the formal regulatory environment to increase the tax base and reduce the unfair competition to formal businesses.

To reduce informality, voluntarists propose public measures that usually aim at relocation of the fiscal system by reducing fiscal pressure, widening the tax base, more drastic measures to sanction

informal operators, and better regulation of the tax framework, knowing that the tax evasion practiced by economic agents encompasses both the "illicit" (tax fraud) and the "licit" form (at the limit of the law), the latter speculating on the existing "legislative vacuum" in a state (Maloney, 2004).

2.2 Formal-Informal Economy Linkages

The general literature on the informal economy recognizes that numerous and complex links exist between the informal and formal economy (Thomas, 1995; United Nations, 1996). Chong and Gradstein (2007) opine that formal enterprises hire wage workers under informal employment relations and may be employed as part-time or temporary workers through contracting or subcontracting. Fapohunda (2012) further opines that the informal sector does not appear to have a meaning independent of the formal sector, as it only derives its meaning when contrasted with the formal sector. Thus, the survival and functioning of the informal sector is a function of the survival and functioning of the formal sector. Adamu (2006) affirms that the informal sector comprises those employment-generating activities undertaken for survival in the absence of formal employment. These activities are characterized by a lack of regulations by institutions of society in a social and legal environment in which similar activities are regulated (Fapohunda, 2012).

The linkages may be divided into "economic" and "social/political" Thomas (1995) and into "technological, consumption and credit financing" links (United Nations, 1996). Social/political links are indirect and are institutional. They depend largely on how the two parties accept each other and to what extent they will use their influences to pressurize the government to take legal action against one another (Thomas, 1995). Of course, since it is the informal sector that operates outside the legal system, this will reflect how the informal sector is accepted by the formal sector. In Tanzania, formal sector contractors have been calling for the government to take legal action against unregistered contractors who unfairly compete with registered contractors through non-payment of fees, taxes, non-adherence to labor and safety regulations, etc.

Economic linkages involve direct transactions between the two sectors and are distinguished into "backward" and "forward" linkages. Backward linkages from the informal sector involve the trading of goods produced in the formal sector by the informal sector so that the informal traders act as a link between formal producers and customers. Forward linkages from the informal sector involve the production of goods and services in the informal sector for use in the formal sector. It is believed that strong forward linkages exist within construction, with informal sector enterprises producing building materials for use by contractors in the formal sector. Formal sector contractors are also believed to obtain their labor from the informal sector through subcontracting arrangements. This is due to the inability of large firms to employ a permanent labor force due to lack of a continuous workload, varied geographical location of sites, and more importantly, survival strategies of being more competitive in running bids.

Technological linkages involve the transfer of technology and skills between the two sectors.
This takes place mainly as a result of the movement of skilled workers, subcontracting, and other ways of exchanging knowledge. A typical example of technological linkage is that of employees in the formal sector forming informal sector enterprises, on part-time or permanent terms, using skills gained in the formal sector.

Consumption linkages involve direct links between the informal sector and final consumers in the formal sector. The final consumers may be households whose income depends fully on the formal sector or government holdings (United Nations, 1996).

Finally, the credit financing linkages mainly refer to the transfer of funds from the formal sector for investment and development in the informal sector. This is a special form of backward linkages only in this case it is the finance that originates from the formal sector and not the goods as discussed previously. Credit financing linkages manifest themselves when people use the income obtained in the formal sector to set up informal sector enterprises. In some instances, consultants involved in the informal sector accumulate sufficient capital to start a formal business (United Nations, 1996).

The importance of the interaction between the formal and informal parts of the construction sector is supported by literature. UNCHS (1991) argues for the strengthening of direct links between formal and informal sectors so that the latter would produce the much-needed construction materials and components and undertake subcontracts for the former. In Tanzania, Bjorklof, Klingberg, Muhegi, and Temba (1992) urged the formal and informal sectors to address the housing problem in Tanzanian cities.

It would appear that both formal and informal contractors stand to gain from the linkages that are established through subcontracting. There are multiple sources of contracts for contractors and subcontracting. It can also enable enterprises to acquire both technical and managerial skills, particularly when involved in large and complex projects. For larger, formal sector companies, subcontracting offers an opportunity to lower overhead costs and increase flexibility (UNCHS, 1996). Hence subcontracting is widely practiced in construction. This is true even in developed countries, where there has been an increase in "labor only subcontracting" (Wells, 1998).

2.3 Factors Affecting Competitiveness and Informality among AEC Consultants

Wells (2007) believes informality in construction activities exists in four areas: informal sector enterprises, informal labor, informal construction system, and informal building/settlements. There has been no specific focus in previous studies on the informal sector activities of consultants individually or at the firm level within the AEC sector.

The construction market is nowadays dominated by clients, so it is vital to understand what they seek in potential contractors. According to Pettinger (1998), there are several key points that a client concentrates on. Process, service, corporate citizenship, cost leadership, repeat business, after-sales, and duration of contract.

2.4 Drivers of Competitiveness among AEC Consultants

The consulting industry is noted to be constantly evolving (Hartz, 2002; Buono, 2009). Kipping and Clark (2012) emphasize the dynamic nature of consulting services, stressing the fact that methods that were previously seen as adequate became inadequate with time and noted the conflicts that resulted from the entry of new firms into the consulting industry. The study found this was a result of the competitive nature of the market, lack of government continuity, and challenging economic conditions. These variables mean that consulting firms within this region

need to develop the resilience to withstand or recover irrespective of the negative changes; when they occur.

Consequently, the need for consulting firms to adopt certain factors to enhance and sustain success rates is imperative In the case of Uganda, competitiveness has become paramount for the local consultants in realizing business growth and continuous performance improvement. Factors that bring about changes in economic growth patterns, competition, and improved performance are closely linked to organizational competitiveness which closely correlates to the composition and practice of the consulting industry (Li-yin et al, 2007).

2.5 Theories of Competitiveness in the AEC Sector

One theory that measures competitiveness in the AEC sector is Porter's Competitive Theory, which studies how companies position themselves strategically for competition. Porter developed models to examine competitiveness among companies and their connection to competitiveness abilities and advantages. The model includes forces that inform competition in industries, three generic competitive strategies, the diamond model, and the value chain (World Economic Forum, 2004). A concrete analysis of competitiveness requires an examination of both the internal and external factors in an integrated model. Yet, Porter's model lacks the internal mechanisms to convert the impact of undesirable external elements into internal capabilities. The model studied factors such as threats to new entrants and substitute products or services in addition to the bargaining power of suppliers and buyers and how they could affect the rivalry among competitors.

2.6 Factors Promoting Competitiveness among Consultants in the AEC sector

Critical Success Factors (CSF) include a business support model that ensures organizations can achieve their goals and missions. They are activities or critical factors required to guarantee the success of a business. CSFs were assessed and modeled in various construction organizations based on data from surveys in several companies in different countries such as Egypt and Canada (Mazri, 2013). CSFs of construction firms have been identified by previous studies. Ngowi (2001) adopted a model combining the latest strategic management theories: the seven guiding principles that support strategic management in civil engineering. Momaya & Selby (1998) added another dimension that included critical information from organizations with double knowledge domains. CSFs identify and define the main elements required for a firm to become successful in any industry. Researchers view the CSF model as an approach that affects the competitive capacity of companies within a strategic group or an industry. Ngowi (2001) categorically stated that some of these factors are determined by the technological and economic attributes of sectors, including a firm's competitive power that enables it to apply strategic variables, focus on the quality of products, and command organizational competency in the wake of realizing more value for customers.

Another useful analysis framework, SWOT (strengths, weaknesses, opportunities, and threats), is used to evaluate the internal and external environments of organizations. The first two elements (the strengths and weaknesses) aid business executives to understand their internal environment and make effective recommendations. The last two (opportunities and threats) study the external environment to make the most rational steps. Each element makes it possible for companies to make beneficial initiatives or become aware of losses resulting from wrong decisions (that do not align with demands from the internal and external environments). This model can be used to

improve the competitiveness of firms in the AEC sector. The last two provisions of the model assess the external environment, focusing on the threats that the business faces and the opportunities that it can capitalize on as a way of countering them

Competitiveness in construction has been analyzed on different levels, including industry, country, project, and company. Two main variable types, the factors affecting the competitiveness ability of a company and indexes measuring various aspects, were identified. These are also known as results and cover competitiveness, including performance projects, profitability, client satisfaction, and market share. Competitive factors can be further divided into external and internal capacities. The latter includes elements of management inside a company (e.g. training, leadership, and innovation). External factors are induced from outside the company and management has limited control over (e.g. number of competitors on the market, government rules and regulations, public investment, interest rates, and others). These factors shape the environment companies operate, creating a different atmosphere of competition for each country or industry.

3.0 Research Methods

The study used a descriptive design and a quantitative research design through which information was gathered from various consultants in the AEC sector in Lagos. The choice of Lagos for the study was due to its large economic and commercial activities fuelling a vibrant built environment business space with multiple infrastructure projects. A sample size of 100 was adopted for this study. This is in tandem with Sekaran (2013) who proposed that sample sizes larger than 30 and less than 500 are appropriate for most research. Further, sampling adequacy was confirmed using the Kaiser-Meyer-Olkin test (KMO) and the result indicated that the sample size was adequate because a KMO value greater than .6 is considered to be good. Data for this research was collected using a structured survey questionnaire administered by hand, face to face. Previous literature was reviewed and domesticated to extract suitable indicators for informality and competitiveness among AEC consultants. Likert scale was adopted for the ordinal scale because it represents the likelihood and the accuracy of the respondents' responses (Burns, Bush, and Sinha, 2014; Barry & William, 2015) and it measures the intensity or degree of usage and or agreement by the respondent to a particular issue under investigation. In the study of Likert (1932), the reliability of the entire scale is maximized when the respondent answers using a 5-point scale. The Cronbach's alpha reliability value was computed. Comparative evaluation of the competitiveness of consultants in formal and informal sectors presented Cronbach's value of .980. Statistical analyses were conducted using Statistical Package for Social Science (SPSS) 25.0 software. Descriptive and inferential statistics were deployed.

4.0 Analysis and Discussion

4.1 Socio-Demographic Characteristics of Respondents

Social-demographic characteristics of respondents are used to group respondents. Respondents were asked to indicate their area of specialization, professional body, status in a professional body, highest academic qualification, years of experience, owners of a registered company, patronage per year, payment method, and sharing ratio of payment if any.

The specialization of respondents is presented in Table 1. The table shows that 7 respondents specialized in architecture, 67 in quantity surveying, 5 in mechanical engineering, 6 in electrical

engineering, and 10 in building while 1 of the respondents' specialization was on heat, ventilation, and air conditioning (HVAC).

Table 1: Social-Demographic Study of Respondents

Description	Frequency	Percentage
Specialization of Respondents		
Architecture	7	7.0%
Quantity Surveying	67	67.0%
Mechanical Engineering	5	5.0%
Electrical Engineering	6	6.0%
Structural Engineering	4	4.0%
Building	10	10.0%
Others (HVAC)	1	1.0%
Professional Body of Respondents		
NIA	7	7.0%
NIQS	66	66.0%
NSE	12	12.0%
NIOB	13	13.0%
Others (COREN, ASHRAE)	2	2.0%
Ownership of Registered Company		
Yes	31	31.0%
No	69	69.0%
Patronage in a Year		
1-5	52	52.0%
6-10	26	26.0%
11-15	7	7.0%
16-20	8	8.0%
21-25	1	1.0%
More than 25	6	6.0%
Payment for Professional Service		
Personal Account	50	50.0%
Company Account	43	43.0%
Third-Party Account	2	2.0%
Cash Payment	5	5.0%
Percentage of Payment for Professional Service that goes to Company's Account		
1-20%	28	28.0%
21-40%	8	8.0%
41-60%	3	3.0%
61-80%	4	4.0%
81-100%	10	10.0%
I do not have a company account	47	47.0%

The professional body of respondents is presented in Table 1. The table shows that 7 respondents are affiliated with NIA, 66 with NIQS, 12 with NSE and 13 with NIOB. 2 respondents stated that they are affiliated with COREN and ASHRAE respectively.

The professional body of respondents is presented in Table 1. The table shows that 9% of the respondents are student members, 4% are graduate members, 52% are probational members, 32% are corporate members and 3% are fellows. This data reveals that 65% which represents the majority of the respondents are yet to be certified as members of the different professional bodies but have attempted the processing of membership status or are in the process of obtaining a membership from professional bodies considered in this study.

The highest academic qualifications of respondents are presented in Table 1. 1% are OND holders, 20% are HND holders, and 53% are BSC/B. Tech holders, 1% are PGD holders, and 25% are MSc/MBA holders.

The working experience of respondents is presented in Table 1 The table shows that 48% of the respondents have working experience of 1-5 years, 36% have 6-10 years, 6% have 11-15 years, 5% have 16-20 years and 5% has more than 20 years working experience. This indicates that some respondents have worked for a reasonable number of years without obtaining membership with their professional bodies.

Respondents' indication of ownership of a registered company is presented in Table 1. 31% of the respondents have a registered company while 69% of the respondents do not have a registered company.

Table 1 further shows the outcome of respondents' responses to how much patronage they get on average in a year. The table shows that 52% of respondents have 1-5 patronage(s) in a year, 26% of the respondents have 6-10 patronages in a year, 7% of the respondents have 11-15 patronages in a year, 8% of the respondents have 16-20 patronages in a year, 1% of the respondents have 21-25 patronages in a year and 6% of the respondents have more than 25 patronages in a year.
Respondents were asked where payment for professional service rendered to clients is made. The table shows that 50% of the payments are made to personal accounts, 43% are made to the company's account, 2% are made to third-party accounts and 5% are made as cash payments.
Respondents were asked what percentage of the payment made for professional service goes to the company's account. The table shows that 28% of respondents make 1-20% of payments for professional services to company's account, 8% of respondents make 21-40% of payment for professional services to company's account, 3% of respondents make 41-60% of payment for professional services to company's account, 4% of respondents make 61-80% of payment for professional services to company's account, 10% of respondents make 81-100% of payment for professional services to company's account, 47% of respondents make 0% because they do not have a company's account. This implies that some AEC consultants pay a fragment for services to the company's account but the majority of them are operating in an informal economy without a company's account.

4.2 The client base of Respondents

Respondents were asked to categorize the client base they often render professional services to in an informal economy within the last year. The responses are presented in Table 2. From the table, the Public department has a mean of 3.6, non-governmental organization has a mean of 3.41, the corporate organization has a mean of 2.74 and private individuals have a mean of 1.88. The study indicated that most clients are private individuals and sometimes corporate organizations.

Table 2: Client base of Respondents

Client of respondents	Mean
Public department	3.60
Non-governmental organization	3.41
Corporate organization	2.74
Private Individuals	1.88

N=100; 1=very often; 2=often; 3=sometimes; 4=rarely; 5=Never

4.3 Ease of obtaining a Business License

Respondents were asked about the extent to which they agreed or disagreed with some identified variables affecting the ease of obtaining a license as presented in Table 3. From the table, cumbersome procedure ranked highest with a mean of 3.27, document for obtaining a business license not easily sources ranked 2nd with a mean of 3.22, followed by high cost involved with a mean of 3.17, business can operate without a business license ranked 4th with a mean of 3.06 and avoidance of statutory fees ranked least with a mean of 2.89.

Table 3: Factors Affecting the Obtaining a Business License

Factors	Mean	Rank
Cumbersome procedure	3.27	1
Document for obtaining a license not easily sourced	3.22	2
High cost involved	3.17	3
Business can operate without a license	3.06	4
Avoid statutory fee	2.89	5

N=100; 1=Strongly disagree; 2=Disagree; 3=Neutral; 4=Agree; 5=Strongly agree

4.4 Informality among AEC consultants

The professional services rendered by consultants in the built environment at the feasibility stage, pre-construction stage, and construction stage of a project are presented in Table 4. Using a Likert scale of 1 to 5 from "very often to never" consultants were asked to indicate their frequency of participation in the various activities involved in the stages of a construction project as a group or individual outside a company's economy. Using descriptive statistics, all the mean of the various constructs tends toward 3.0 which is interpreted that consultant provide services to clients at all 3 stages of a construction project.

Table 4: Respondents Participation in Built Environment in an Informal Economy

Variables	Sub variables	Mean	S.D.	Rank
Feasibility Stage	Discuss the proposed project design	2.25	0.93	6
	Carried out site survey and appraisal of a proposed project for a client	2.35	1.12	5
	Cost studies of a proposed design	2.38	1.13	4
	Feasibility studies	2.47	0.99	3
	Involved in risk assessment of a proposed project	2.73	1.18	2
	Involved in value management	2.75	1.19	1
Pre-construction Stage	Bill of quantities for a client for a proposed project	1.99	1.14	10
	Involved in tendering for a proposed project	2.27	1.02	9
	Pretender estimate	2.42	1.17	8
	Advise client on procurement option for a proposed project	2.45	1.23	7
	Design for a proposed project	2.50	1.24	6
	Develop detailed design	2.59	1.12	5
	Agree on consultancy fee with client for professional services to be rendered within a time frame	2.63	1.22	4
	Appraisal of tenders and selection of suitable contractor for a proposed project	2.66	1.17	3
	Involved in preliminary consultation with statutory authorities for the client on a proposed project design	2.84	1.22	2
	Appoint other consultants for clients on a proposed project	2.89	1.25	1
Construction stage	Inspection of works executed by a contractor in an ongoing project	1.98	1.08	6

Variables	Sub variables	Mean	S.D.	Rank
	Estimate of an ongoing project	2.15	1.10	5
	Final inspection and handing over of the project to the client	2.20	1.16	4
	Involved in major decisions such as variation that affects completion date	2.22	1.22	3
	Involved in contract administration of an ongoing project	2.27	1.24	2
	Preparation of schedule of defects	2.55	1.11	1

N=100; 1=very often; 2=often; 3=sometimes; 4=rarely; 5=Never

The result indicated that during the feasibility stage, consultants are sometimes involved in proposing project designs informally and carry out site surveys of a proposed project for clients informally. Sometimes, bills of quantities are prepared informally in the pre-construction stage, and inspection of ongoing projects in the construction stage. This indicates that informal practices exist among consultants at different stages of construction projects.

4.5 Hypotheses One

The study tested the null hypothesis that there is no significant difference between informality among AEC consultants. One-way analysis of variance (ANOVA) was conducted on the various variables to assess informality among AEC consultants (Architects, Quantity surveyors, Structural Engineers, Mechanical Engineers, Electrical Engineers, and Builders) as shown below in Table 5.

Table 5: **Informality among AEC consultants**

			Test of Homogeneity of Variance		ANOVA	
Professionals	Mean	S. D.	Levene's statistics	Sig.	F	Sig.
Architecture	56.29	17.67	5.92	.076	2.85	.942
Quantity Surveying	53.56	19.92				
Mechanical Engineering	44.20	16.66				
Electrical Engineering	57.67	11.79				
Structural Engineering	53.75	13.67				
Building	53.80	15.11				
Others	51.00					

The result of the analysis reveals that there is no significant difference (F=2.85 *P*=.942) between informality among the Architects, Quantity surveyors, Structural Engineers, Mechanical Engineers, Electrical Engineers, and Builders as AEC consultants. Therefore, the null hypothesis is accepted.

4.6 Formal-Informal Linkage AEC consultants

The mean of the variables of linkages among AEC consultants are presented in Table 5.5. The study used a Likert scale of 1 to 5 from "very often to never" Consultants were asked to indicate how regularly they provided formal and informal services.

Table 6: Formal-Informal Linkage among AEC Consultants

Variables	Sub variables	Mean	Rank
Backward linkage			
Economic linkage	Render professional services personally as an individual (outside of a company economy)	2.11	2
	Utilize the credit facility of a formal business to run a job outside of a company economy	3.42	1
Technological linkage	Adapt documents used in delivering professional services by a registered company to deliver professional services of jobs outside of a company economy	3.03	2
	Utilize soft wares serviced by a registered company to render professional services of job outside of a company economy	3.13	1
Social linkage	Corporate accounts are used for payment of services rendered in formal organizations	2.41	5
	Projects run informally create unhealthy competition for those run formally	2.91	4
	Different bank accounts are used for services rendered in a formal economy and in an informal economy	3.04	3
	Personal accounts are used for payment of services rendered in formal organization	3.05	2
	Remit tax for services rendered in a formal economy but payment made to personal account	3.48	1
Forward linkage	Projects whose preliminary stages were done informally but were later formalized during construction stages	2.98	2
	Contracts are made, supervised and payments are made informally but the seal of a registered company is used on documents	3.08	1

N=100; 1=very often; 2=often; 3=sometimes; 4=rarely; 5=Never

Using descriptive statistics, the mean shown in Table 6 shows that although there is a backward linkage (economic linkage and social linkage) and a forward linkage between consultants in the formal and informal sectors, economic linkage is most common among AEC consultants with a mean of 2.11. Social linkage is the least formal-informal linkage among AEC consultants.

4.7 Hypotheses Two

The study tested the null hypothesis that there is no significant difference between formal-informal linkages among AEC consultants. A one-way analysis of variance (ANOVA) was run on the various variables to assess formal-informal linkage among AEC consultants (Architects, Quantity surveyors, Structural Engineers, Mechanical Engineers, Electrical Engineers, and Builders). This construct focuses on hypothesis two of this research to test if there is a significant difference between formal-informal linkages among AEC consultants. The responses of the respondents are shown below in Table 7.

Table 7: **Formal-Informal Linkage among AEC Consultants**

			Test of Homogeneity of Variance		ANOVA	
Professionals	Mean	S. D.	Levene's statistics	Sig.	F	Sig.
Architecture	36.71	7.80	7.44	.0593	1.17	.320
Quantity Surveying	31.60	10.62				
Mechanical Engineering	31.60	9.42				
Electrical Engineering	41.67	10.31				
Structural Engineering	32.00	9.20				
Building	31.70	6.41				
Others (HVAC)	37.00	.				

The result of the analysis reveals that there is no significant difference (F=1.17 P=.32) between formal-informal linkage among the Architects, Quantity surveyors, Structural Engineers, Mechanical Engineers, Electrical Engineers, and Builders as AEC consultants. This implies that we accept the null hypotheses.

4.8 Competitiveness of Consultants in Formal and Informal Sector

The outcome of the test conducted on the competitiveness of consultants in formal and informal sectors is presented in Table 8.

Table 8: Correlation Analysis of Competitiveness of Consultants in Formal and Informal Sector

		Formal	Informal
Formal	Pearson Correlation	1	.240*
	Sig. (2-tailed)		.016

*Correlation is significant at the 0.05 level (2-tailed).

Using Pearson product correlation, it is found that there is a weak positive correlation between the competitiveness of consultants in the formal and informal sectors. The relationship between the practices of consultants in both sectors is statically insignificant. ($r=.24$, $p>0.05$). This implies that even though the competitiveness of a consultant in the formal sector leads to an increase in the competitiveness of the consultants in the informal sector, the strength of the relationship is not significant enough.

4.9 Impact of Informality on AEC Consultant's Competitiveness

The outcome of descriptive statistics run on variables of impacts of informality on AEC consultants is presented in Table 9. Lack of formalized contract ranked highest in social impact with a mean of 1.80 which indicates a high impact, VAT fraud ranked highest in economic impact with a mean of 2.05 which indicates a high impact, profitability ranked highest in financial impact which indicates a high impact while regulatory control of quality of professional service ranked highest in governance impact. Generally, the variables have a mean within 2 which is interpreted that there is a high impact of informality among AEC consultants.

Table 9: Impacts of Informality on AEC Consultants

Variables	Sub variables	Mean	S.D.	Rank
Social Impacts	Lack of a formalized form of contract	1.80	0.75	6
	Lack of training and technology	1.81	0.80	5
	Lack of entitlement to labor rights e.g sick leave, working hours	1.85	0.86	4
	Irregularity of income	1.93	0.82	3
	Unsafe working conditions with no benefits	1.94	0.89	2
	Increased poverty level	2.28	1.03	1
Economic impacts	VAT fraud	2.05	0.93	2
	Tax evasion	2.07	0.93	1
Financial Impacts	Profitability	1.97	0.95	4
	Lack of access to credit and financial services	1.98	0.95	3
	Lack of financial records	2.00	0.82	1
	Cash flow	2.00	0.82	1
Contractual Impacts	Inability to participate in competitive bidding	1.97	0.87	3
	Lack of contractual arrangement	2.07	0.86	2
	Lack of opportunity to advertise in professional journals and/or letters	2.09	0.89	1
Governance Impacts	Regulatory control of quality of professional service	1.77	0.80	2
	Labor and environmental regulation compromise	2.01	0.90	1

N=100; 1=very high impact; 2=High impact; 3=Moderate impact; 4=Low impact; 5=No impact

4.10 Hypotheses Three

The study hypothesized no significant influence of informality among AEC consultants. Regression analysis was used to test the impact of informality among AEC consultants. The result is presented in Table 10.

Table 10: Regression of Impacts of Informality on AEC Consultants

Regression weight	Beta coefficient	R^2	F	P-value
Consultants→ impacts of informality	1.02	.019	1.87	.175

The result reveals a 19% variance in the impact of AEC consultants on informality among AEC consultants. The P-value of the Anova table shows that the change in the impact of informality among AEC consultants is not significant (P=.175 which is greater than 0.05). This analysis reveals that the impact of informality on AEC consultants is not significant enough even though there is a 19% impact. There we accept the null hypotheses.

5.0 Conclusion and Recommendations

The study established that some AEC consultants operated informally with unregistered companies. Such operation is attributed to the tedious process and documentation involved in obtaining a business license and not necessarily to avoid tax payments. The practice of informality among AEC consultants exists at the feasibility, preconstruction, and construction stages of

construction projects. Informality is rampant at the construction stage of projects. Informality exists among Architects, Quantity surveyors, Mechanical Engineers, Electrical Engineers, Structural Engineers, and Builders. The difference between informal practices is not significant. The formal-informal linkages among AEC consultants have both backward and forward integration. Social linkages, financial linkages, technological linkages, and economic linkages are forms of backward linkage that exist among AEC consultants with economic linkage being the highest. Although there are formal-informal linkages among AEC consultants, the linkages are not significant enough among the consultants. The study established a positive relationship between the competitiveness of AEC consultants in the formal and informal sectors. The competitiveness of AEC consultants in the formal sector serves as a competitive advantage for more advantage in the informal sector and vice versa. The impact of informality among AEC consultants is numerous. The impacts are social, economic, financial, contractual and governance impacts with social impact being the highest among AEC consultants. However, the consequence of informality in general is minimal among AEC consultants.

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