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The Assessment of Prudence Practice of Built Environment Professionals in Construction Project Management

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Abstract

Purpose – Construction industry is experiencing an increasing challenge in project performance due to many factors with owners expressing dissatisfaction with delivery of project objectives thus, a call to prudence practice as a new strategy to solving construction project challenges.

Design/methodology/approach – Twenty-seven (27) prudent practice criteria used to test the prudence of fiduciaries were adapted for the instrument used in a cross-cultural (occupational) research instrument adaptation to assess the prudence practice of construction project managers. A total 122 questionnaires were successfully retrieved using stratified random sampling in a quantitative research approach using descriptive statistics and Analysis of Variance (ANOVA) for data analysis.

Findings–Project managers performed typically in eight of the prudence practice criteria including awareness of their duties and responsibilities. The Quantity Surveyors were ranked as project managers that displayed high prudence practice among other professionals

Research limitations– This study is limited due to its novelty and dearth of literature that specifically address the prudence of construction professionals engaged in project management and therefore, further research would be necessary.

Theoretical/Social/Practical implications – The construction project management practitioners need to fully exploit the potentials of prudence practice for education and training of future project managers. The new adapted instrument is useful for practical application in the assessment of prudence practice of project managers.

Originality/value – The outcome of this study provides basis for assessing the prudence of project managers and also gives information about the performance of prudence practice across built environment professionals. Thus, prudence of project managers becomes measurable rather than subjective.

Keywords: Adapt instrument, Built environment, Construction professionals, Prudence practice.

1.0 Introduction

New strategies are to be constantly developed to deal with construction circumstances due to the nature of the construction industry. Ogunsemi, Oyediran, Rotimi and Ekundayo (2008a) recognised the dynamism of the construction industry by affirming the unprecedented growth and developments in construction industry practice. Clients express dissatisfaction with projects being over-budgeted, past-schedule, or poorly handled (Egan 1998, Butler 2002). Most of these detrimental attributes can be attributed to project managers' poor and careless judgments; failing on ethical standards of which prudence is considered as the mother of all virtues. This to establish the fact that new innovations are needed to handle the dynamism of the construction industry. The project managers' principal responsibilities according to Odusami and Ameh (2006) and Mahmood, Hamidaddin, and Shafiei (2006) is to deliver the project end-item within budget and time limitations in accordance with technical specifications and in fulfilment of project objectives. According to Mahmood *et al.* (2006), project managers are responsible for the overall success of delivering the owner's physical development within the constraints of cost, schedule, quality and safety requirements. This implies that project managers play a crucial role not only in the operational activities of architectural and engineering construction companies but also the development of infrastructure in every country. Project in the construction industry covers several areas of specialisation; hence the need for a competent project manager, well trained and certified to carry out this comparatively new expanding role of project management based on knowledge and skills in the relevant discipline (Ogunsemi, Oyediran, & Ekundayo, 2008b).

The question then is "What are these new expanding roles required of project managers to tackle the challenges posed by the construction industry?" Identifying these roles and the knowledge, skills and mechanisms by which consultant project managers may perform such requisite roles could provide options for addressing the training of future consultant project managers that will ensure strengthening their continued relevance and integrity in the industry. The concept of 'prudence of construction project managers' is a means to achieving this. Prudence as a successful Framework for Financial Reporting used by the International Accounting Standards (IAS)/International Financial Reporting Standards, (Oreshkova, 2017) is to have a dynamic trait and not being static as Lehtonen (2023) traced the understanding of Prudence through Aristotelian approach as effort in determining the right course of action for a given situation to achieve a desired objective, described as "excellence of deliberation" rather than what should be believed. It is indeed a call to assess the prudence being practiced by professionals in thebuilt environment with a view to presenting a measurable checklist of standard principles adapted from related field of financial undertakings. Mengel (2004) suggested that in a complex project environment (such as the construction industry), there may be need to move on from traditional tools and techniques into the use of multiple intelligences and of the virtue of prudence. Kloppenborg and Petrick (1999) also suggested that project leaders have a role in developing team characteristics into a collective set of virtues including: ethics, respect and trust for others, honesty, prudence, courage, responsible use and sharing of power. Their capabilities are dependent on these innate qualities and on the knowledge gained during training. According to Ogunsemi*et al*. (2008b), the Association of Project Managers and the Federal Government of Nigeria regulate the requirements for the practice of project management in Nigeria. Ogunsemi*et al*. (2008b) also stated that the all-encompassing project manager's basic qualification is training in one of the listed construction related professions which include architecture, quantity

surveying, estate surveying, building and civil engineering, culminating in either a degree or diploma or both in a recognised institution of learning. Project Management is an important topic because all organisations are involved in implementing new undertakings as diverse as construction, the development of a new product or service, or a public relations campaign. The concern on reliability of different professionals exists in the Nigerian construction industry as to prudent project management. This study will serve to create and increase the awareness of prudential practices in project management in the construction industry. Therefore to achieve the purpose of this research, the level of prudence exhibited by the professionals in these five professions are assessed.

Cleland (1985) lamented that too many large construction projects are not prudently managed despite some successes while many encounter problems attributable to management failures. Therefore project managers are faced with decision making challenges (Górecki & Núñez-Cacho, 2022) and sometimes engage unwholesome decision making judgments in an environment full of uncertainties like the construction industry. Construction industry is experiencing an increase in construction inefficiency, thus, despite rising construction opportunities, revenue is declining as contractor failure has also increased, with payouts for poor and unfinished work rising (Kashiwagi, Sullivan and Kashiwagi, (2006) Armendariz, 2004).Overall construction performance has mirrored these results, with a majority of owners expressing dissatisfaction with projects being over-budgeted, past-schedule, or poorly handled (Egan 1998, Butler 2002) thus, a call to prudence practice. Reports such as those of Latham (1994) and Egan (1998) have led the way for the industry to look at itself, compare itself with other industries and eventually re-engineer its processes by overhauling its methods of contracting and management. Wolstenholme (2020) reaffirmed the relevance of the report today for which a patchy result of 4 of 10 was given by Sir John Egan in May 2008.This study seeks to look at the concept of prudence from the Accounting sector including the Association of Chartered Certified Accountants, ACCA (2014) as applicable to project management in the Construction industry.

2.0 Literature Review

Prudence was long considered one of the fundamental accounting concepts, determining the time for revenue recognition (ACCA, 2014; HMRC, 2011). The 2001 Conceptual Framework for Financial Reporting of the IASB (International Accounting Standards Board) however listed Prudence as a characteristic of Reliability (Faithful Representation). It states that Prudence is the inclusion of a degree of caution in the exercise of the judgments needed in making the estimates required under conditions of uncertainty, such that assets or income are not overstated and liabilities or expenses are not understated (Hoogervorst, 2012). The construction industry being a fragmented industry, requires a management efficiency and competency in the industry that is needed to gain a higher level of competitiveness (Ismail, Zin and Latif; 2006). In their submission, Ismail et al (2006) asserted that one of management solutions that have been widely used to improve efficiency of a project is the use of Project Management Consultant services. Project Managers are confronted by issues and undertaking additional roles that have traditionally not been part of their responsibility (Ogunsemi et al., 2008b). Bresnahan (2000) also recognised this changing role for construction project managers and argued that they must

supplement their traditional functions with other non–engineering knowledge and skills to meet today's professional demands for which they become responsible.

In the 21st Century, the practice of project management is rapidly spreading beyond traditional project-based industries and is being adopted as an approach to management in areas of emerging technologies, and of entire organizations (Crawford, 2000) and in order to maintain its relevance for project delivery well into the future (Lampel, 2001). This wider application of project management is an important factor in the maturing of project management as a profession and raises questions about the value of existing project management standards in relation to the nature of projects and project management roles. According to Nader, Ooi and Abdollahi (2011), to successfully reach the ambitious project objective or goal, the project manager is responsible for collaborating and managing all the processes. Construction Project Managers are the project owners' expert representatives on construction projects (Ogunsemi*et al.*, 2008a). Ogunsemi*et al.* (2008a) asserted that project management services offer an innovative approach for the achievement of project objectives.The premise that construction has failed in adopting techniques that have improved performance in other industries (Shammas-Thoma*et al*., 1998) has been suggested otherwise. For example Ogunsemi*et al.* (2008a) stated that since the 1990s there has been an unprecedented growth and development in construction industry practice, the major driving force has been the need to adopt best practices from the manufacturing industry.

2.1 The Concept of Prudence in the Accounting World

According to Prudence Bulletin (2013); a document jointly published by European Financial Reporting Advisory Group (EFRAG): the French Autorité des NormesComptables (ANC), the Accounting Standards Committee of Germany (ASCG), the OrganismoItaliano di Contabilità (OIC) of Italy and the UK Financial Reporting Council (FRC):

> "The origins of prudence may in part, reflect the use of financial statements in showing the amount of profit that is available for distribution. The essence of prudence is that assets and income are not overstated and that liabilities and expenses are not understated. The application of prudence ensures that gains are reported only if they are highly probable or reasonably certain but that (expected) losses are recognised as soon as they are identified. ... It may play a role both in the development of accounting standards and, in practice, the preparation of financial statements based on these standards."

According to the Accounting Advisory Forum (AAF, 1995), it is difficult to avoid different interpretations of prudence because of the way of perceiving risk and uncertainty. One school of thought (International Accounting Standards Committee (IASC) Framework, Financial Accounting Standards Board (FASB) Concept No.2, and The United Kingdom (UK) Statement of Principles) lists prudence among the several qualitative characteristics (attributes) which make the information provided in financial statements useful to users, while another school of thought understands prudence as a principle having precedence over all other principles, a fundamental valuation rule to be applied in the preparation of the accounts (AAF, 1995).

2.2 Prudence in Project Management

Prudence has been defined as an attitude of mind, denoting the careful assessment of all uncertainties and vigilance to possible risks (rather than a systematic measurement bias) before making a judgment or decision (AAF, 1995). The essence of prudence in project management is to ensure the careful assessment of all uncertainties and vigilance to possible risks that will increase construction efficiency. Cleland, (1985) lamented that too many large construction projects are not prudently managed as they encountered problems of management failures. Lehtonen (2023) uncovered an understanding of Prudence from Aristotelian approach, not being a static trait but a dynamic effort in determining the right course of action for a given situation to achieve a desired objective, rather than what should be believed. It is therefore important that the management of construction projects should be properly treated as action based rather than what is believed and thus, we assess the performance of prudence being practiced by built environment professionals that perform the role of project manager. Cleland (1985) while challenging project managers on management failures emphasised the relationship between the work breakdown structure (WBS) and the roles within an organisational structure. Therefore, there is a need to check for measurable details properly broken down as measurable deliveries.

2.3 Application of Prudence from Accounting Industry to the Construction Industry

Prudence as defined is very relevant to the construction industry as the construction industry has been associated with complexity and uncertainty. Table 1 present's prudent investment practices as identified by Foundation for Fiduciary Studies (FFS) (2003) and edited by the American Institute of Certified Public Accountants. These Practices are easily adaptable to all types of portfolios, regardless of size or intended use and are used to test the prudence of fiduciaries (FFS, 2003). These prudent practices serve as variables that are used to test the prudence of fiduciaries which in this case is adapted for project manager. They were redrafted to fit the construction industry and form the basis for the instrument used in this research. A project manager in this case demonstrates prudence by the process through which investment decisions are managed, rather than by showing that investment products and techniques are chosen because they were labelled as "prudent" (FFS, 2003). Most investments are not imprudent on their face, it is the way in which they are used, and how decisions as to their use are made, that will be examined to determine whether the prudence standard has been met. Jones, (2013) re-echoed the specific reference to "prudence" as being legally binding (earlier removed in 201 0 revision (Sestanj-Peric, and Kozjak, (2020)) had been emphasized to improve international accounting standards in Britain to end any uncertainty, and according to Oreshkova (2017) and Sestanj-Peric, and Kozjak (2020), it has been introduced again, as the International Financial Reporting Standards (IFRS) Foundation, Conceptual Framework CF now again contains prudence, after many complaints that accounting should be prudent. This underscores the importance of prudence practice to accountability related endeavours like project management. Lehtonen (2023) emphasised in his study that the prudence is a virtue that only few can master while uncovering one's blind spots for achieving desired result with dynamic effort. These prudent practices provide the foundation and framework for following a disciplined project management process, and also help to keep project managers from making ad noninvestment decisions influenced by emotions. According to Peters (2021) in 2021 Supreme Court in California joined the State of Washington United States to replaced an established medical standard care which

was found to be inadequate with a medical standard of practice premised on rule of reasonable prudence that is judicially constructed thus, sanction the invocation of reasonable prudence in judicially formulated medical standards of care thereby imposing a greater duty of care on physicians.

3.0 Research Methods

In this research the general design of prudence practices of fiduciarieswas adapted as the instrument to assess the prudence practice of project managers using quantitative research approach. According to Tran (2009) there are three steps in the process of adopting and adapting existing research which include reviewing the existing translation approaches to offering practical guidelines to readers (in a cross-cultural (occupational) adaptation of research instrument), employ translation process encompassing expert evaluation and lastly evaluation of the adopted or adapted instrument.Removal or addition of items were avoided though used sparingly as necessary within the contents of the items but substantial changes in adapting the content of each item to suit the current research were adopted in adapting the existing accounting prudent practice of fiduciaries for forming a new instrument used in the research adapted into the target group's (project manager's) language as depicted in Table 1. Thus, a new instrument is developed (Korb, 2012; Seel, 2020).

In furtherance to the adaptation process, experts in project management were involved for expert assessment of the adapted instrument before being used for the survey; this is to ensure content validity that the variables that have been adapted are appropriately useful and applicable to the proposed survey. The expert review was essential to understanding the contents of the practice by interactive session which allowed the researcher to probe fully the understanding of the wordings added in supporting contextual details.

A total of two thousand and sixty (2060) questionnaires were distributed using stratified random probability sampling in Lagos state, Nigeria due to concentration of construction companies and the fact that a vast majority of construction activities in the country are in Lagos. A list of addresses and emails of registered construction professionals were obtained from their respective institutes using internet sources and registry of members of institutes of professionals concerned and the questionnaire was sent to them. The electronic questionnaires were distributed to two thousand (2000) emails using Google form on the internet while another sixty (60) of the questionnaires were distributed manually to organisations. A total of one hundred and twenty two (122) questionnaires were successfully retrieved and used for analysis using descriptive statistics and, Analysis of Variance (ANOVA) for the assessment of prudence practice of project managers among built environment professionals. The percentage of response of online questionnaire among the construction professionals surveyed is very low (4%) although with higher number of respondents compared to 67% response rate from manual distribution with lower number of respondents. Reliability of the data set used in this research was carried out as the internal consistency of these items was evaluated using Cronbach's Alpha. This is an important recommendation for researchers in order to ascertaining whether they measure the same construct (Pallant, 2005; Field, 2013). The overall Cronbach's alpha coefficient for data set in this study is 0.952, this confirms excellent reliability and internal consistency (Ajayi, et al.,

2016) in the 0 to 1 range, the benchmark is an overall value of 0.7 which represents an acceptable consistency among researchers.

Table 1: Adapting Prudent Accounting Management Practices to Construction Project Management

Prudent Practice for Fiduciaries in Accounting Industry	Prudent Practice Adapted to Suit the Construction Industry
Practice No. 1 Investments are managed in accordance with applicable laws, trust documents, and written investment policy statements.	**1.** The Project is managed in accordance with applicable statutory laws, construction documents, and the client's brief.
Practice No. 2 Fiduciaries are aware of their duties and responsibilities. **Note:** A fiduciary is defined as someone acting in a position of trust on behalf of, or for the benefit of, a third party (FFS, 2003).	**2.** The Project manager is aware of his/her duties and responsibilities.
Practice No. 3 Fiduciaries and parties in interest are not involved in self-dealing.	**3.** The Project manager and other service providers are not involved in self-dealing.
Practice No. 4 Service agreements and contracts are in writing, and do not contain provisions that conflict with fiduciary standards of care.	**4.** Contract provisions and contract are in writing, and do not contain provisions that conflict with the project manager's professional standards of work.
Practice No. 5 There is documentation to show timing and distribution of cash flows and the payment of liabilities.	**5.** There is documentation to show timing (programme of works) and distribution of cash flows (cash flow analysis) and the payments of valuations e.g. ∫curve forecast.
Practice No. 6 Assets are within the jurisdiction of U.S. courts, and are protected from theft and embezzlement. **Note:** Asset here means capital.	**6.** Project funds are within the jurisdiction of a legal court, and are protected from theft and embezzlement e.g. Client's designated bank account for a project.

Table 1: Adapting Prudent Accounting Management Practices to Construction Project Management (Continued)

Prudent Practice for Fiduciaries in Accounting Industry	Prudent Practice Adapted to Suit the Construction Industry
Practice No. 7 A risk level has been identified.	**7.** The risk level in a project has been identified. E. g. adequacy of contingency fund.
Practice No. 8 An expected, modeled return to meet investment objectives has been identified.	**8.** An expected, modeled return to meet client's construction objectives has been identified (in regards to budget and completion date).
Practice No. 9 An investment time horizon has been identified.	**9.** The construction contract duration has been identified.
Practice No. 10 Selected asset classes are consistent with the identified risk, return, and time horizon	**10.** The division of the project (Work Breakdown Structure (WBS) or elements) is consistent with the identified risk, return, and contract duration.
Practice No. 11 The number of asset classes is consistent with portfolio size.	**11.** The WBS or elemental breakdown is consistent with the size of the subcontract.
Practice No. 12 There is detail to implement a specific investment strategy.	**12.** There are details to implement different stages of the project e.g. construction methodology/ method statement.
Practice No. 13	**13.** The contract defines the duties and

The investment policy statement defines the duties and responsibilities of all parties involved.	responsibilities of all parties involved in a project.
Practice No. 14 The investment policy statement defines diversification and rebalancing guidelines. **Note:** Rebalancing is inherent to the element of diversification, where the goal is to create a portfolio that balances appropriate levels of risk and return.	**14.** The contract defines guidelines that ensure that the project is not deviated from achieving the client's objectives
Practice No. 15 The investment policy statement defines due diligence criteria for selecting investment options.	**15.** The contract conditions define due diligence criteria for selecting construction methodology in regards to the method of construction procurement.
Practice No. 16 The investment policy statement defines monitoring criteria for investment options and service vendors.	**16.** The project management is clear in defining the procurement route/method. The project's procurement method is clear in defining the type of contract and the choice of contractor.
Practice No. 17 The investment policy statement defines procedures for controlling and accounting for investment expenses.	**17.** The procurement method clearly defines procedures for controlling and accounting for construction cost.
Practice No. 18 The investment policy statement defines appropriately structured, socially responsible investment strategies (when applicable).	**18.** The project management strategy defines appropriately structured, environmentally friendly and socially responsible construction methods in regards to Health, Safety, Environment and Quality (HSEQ)

Table 1: Adapting Prudent Accounting Management Practices to Construction Project Management (Continued)

Prudent Practice for Fiduciaries in Accounting Industry	Prudent Practice Adapted to Suit the Construction Industry
Practice No. 19 The investment strategy is implemented in compliance with the required level of prudence.	**19.** The project management of the contract is implemented in compliance with the required level of prudence (project manager is professionally liable for other professionals as though he is the actual professionals).
Practice No. 20 The fiduciary is following applicable "Safe Harbor" provisions (when elected). **Note:** Safe harbor rules are voluntary, but when adopted, the fiduciary's liabilities associated with the management of the portfolio's assets may be reduced. If investment decisions are being managed by a committee and/or by an investment advisor, then there are five generally recognized provisions to the safe harbor rules :(i) Use prudent experts to make the investment decisions. (ii) Demonstrate that the prudent expert was selected by following a due diligence process. (iii) Give the prudent expert discretion over the assets. (iv) Have the prudent expert acknowledge their co-fiduciary status. (v) Monitor the activities of the prudent expert to ensure that the expert is performing the agreed upon tasks.	**20.** The project manager follows provisions to ensure that only competent professionals are involved in the project (If he is responsible for appointing other professionals).

Practice No. 21 Investment vehicles are appropriate for the portfolio size. **Note:** Investment Vehicle here means mechanism for finance**.**	**Practice No. 21** Investment vehicles are appropriate for the portfolio size. **Note:** Investment Vehicle here means mechanism for finance**.**
Practice No. 22 A due diligence process is followed in selecting service providers, including the custodian.	**Practice No. 22** A due diligence process is followed in selecting service providers, including the custodian.
Practice No. 23 Periodic reports compare investment performance against an appropriate index, peer group, and Investment Policy Statement (IPS) objectives.	**Practice No. 23** Periodic reports compare investment performance against an appropriate index, peer group, and Investment Policy Statement (IPS) objectives.
Practice No. 24 Periodic reviews are made of qualitative and/or organizational changes of investment decision-makers.	**Practice No. 24** Periodic reviews are made of qualitative and/or organizational changes of investment decision-makers.
Practice No. 25 Control procedures are in place to periodically review policies for best execution, soft dollars, and proxy voting. **Note:** Soft dollars represent the excess in commission costs; the difference between what a brokerage firm charges for a trade versus the brokerage firm's actual costs. Proxies are voted in a manner most likely to preserve or enhance the value of the subject stock. The fiduciary can either retain the power to vote the proxies, or instruct the money manager to vote on behalf of the fiduciary.	**Practice No. 25** Control procedures are in place to periodically review policies for best execution, soft dollars, and proxy voting. **Note:** Soft dollars represent the excess in commission costs; the difference between what a brokerage firm charges for a trade versus the brokerage firm's actual costs. Proxies are voted in a manner most likely to preserve or enhance the value of the subject stock. The fiduciary can either retain the power to vote the proxies, or instruct the money manager to vote on behalf of the fiduciary.

Table 1: Adapting Prudent Accounting Management Practices to Construction Project Management (Continued)

Prudent Practice for Fiduciaries in Accounting Industry	Prudent Practice Adapted to Suit the Construction Industry
Practice No. 26 Fees for investment management are consistent with agreements and with the law.	**21.** Fees for the project consultants are consistent with contract agreements and with the law.
Practice No. 27 "Finder's fees," 12b-1 fees, or other forms of compensation that have been paid for asset placement are appropriately applied, utilized, and documented. **Note:** The fiduciary has a duty to account for all dollars spent on investment management services, whether those dollars are paid directly from the account or through 'soft dollars', 12b-1 fees, or other fee-sharing arrangements. In addition, the fiduciary has the responsibility to identify those parties that have been compensated from the fees, and to apply a 'reasonableness' test to the amount of compensation received by any party.	**22.** All forms of compensation that have been paid for the project is appropriately applied, utilized, and documented (valuations and variations leading to claims).

Adapted from: Foundation for Fiduciary Studies (FFS) (2003)

4.0 Analysis and Discussion

A total of 122 questionnaires were retrieved. Respondents from architecture background were 23% while 22%were from quantity surveying background, 10% were from civil engineering background, 14% from building background, 11% from estate management background, 9% from mechanical/electrical services background, while another 11% of the respondents are from other backgrounds including accountancy, law, and public relations; these were discovered to be directors in their organisations. The difference in the frequency of respondents is due to the different response rates from each group of respondents.

Fifty-three of the respondents are partners of firms, twenty-four of the respondents are senior staff of firms, twenty-five of the respondents are Assistants in their firms, while twenty of the respondents fall under the 'others' category which includes Chief Executive Officers, Managing Directors, Directors, Head of Departments of Institution. A majority of the respondents are partners of firms. Importantly, all the respondents have professional qualifications which indicate that the respondents are well informed to provide the required information and they are all experienced. All respondents have minimum academic qualification of Higher National Diploma (HND) holders or Bachelor of Science (B.Sc.) with 18% having Masters Degree and seven percent having Doctorate degree. A majority of the project managers on the projects surveyed were Architects, 34% followed by Civil Engineers, 30%; Quantity Surveyors, 16%; Estate Surveyors, 8%; Builders, 6%, M&E Services Engineers 4% and 2% were from other professions not related to the six listed in the survey. This indicates that out of the construction project managers surveyed, the Architect is the most patronised for construction project management services, closely followed by the Civil Engineer, and then Quantity Surveyor.

4.1 Analyses and Discussion of Prudence Practice Criteria

The respondents were required to give information on a previous project which they were involved and the measurement for prudence practice were chosen from a scale of 1 to 6 representing 'not prudent' to 'very highly prudent' respectively. Data analysis process was carried out using statistical tools such as frequency tables, mean and analysis of variance (ANOVA). The prudence practice assessment on Mean value ranking is as shown in Table 2 which reveals that Prudence Practice No2; 'the project manager was aware of his/her duties and responsibilities' was ranked first with a Mean value of 4.84 from a scale of 6 which is close to being highly practiced according to the scale of measurement. This is followed by seven other practices comprising Prudence Practice No13, 9, 1, 4, 14,17 and 21depicted as 'the contract defined the duties and responsibilities of all parties involved in the project(4.79)', 'the construction contract duration was identified (4.78)', 'the project was managed in accordance with applicable statutory laws, construction documents, and the client's brief (4.73)', 'contract provisions and the contract were in writing, and do not contain provisions that conflict with the project manager's professional standards of work (4.71)', 'the contract defined guidelines that ensured that the project is not deviated from achieving the client's objectives (4.70)','the procurement method clearly defined procedure for controlling and accounting for construction cost(4.58), and 'the financing method is appropriate for the project size(4.58)'respectively. All other practices were ranked as being averagely or typically practiced while the least on the scale is Practice No3 which is 'the project manager and other service providers were not involved in self-dealing' ranked twenty-seventh with a Mean of 3.80 a relative drop from being typically practised. From Table 2, the areas of low prudence include inability to properly identify risk

levels in construction projects; lack of proper utilisation, application, and documentation of compensations that are paid in projects; inconsistency in ensuring that the fees for project consultants are consistent with contract agreements and with the law among others.

Table 2: General Prudence Practice Criteria of Project Managers Surveyed

Variables	Rank	Mean	Std Deviation
Practice No 2	1	4.84	1.15
Practice No 13	2	4.79	1.19
Practice No 9	3	4.78	1.06
Practice No 1	4	4.73	1.13
Practice No 4	5	4.71	1.29
Practice No 14	6	4.70	1.25
Practice No 17	7	4.58	1.18
Practice No 21	7	4.58	1.21
Practice No 5	9	4.49	1.41
Practice No 16	10	4.48	1.27
Practice No 22	11	4.47	1.35
Practice No 20	12	4.44	1.25
Practice No 18	13	4.34	1.43
Practice No 23	14	4.32	1.31
Practice No 6	14	4.32	1.55
Practice No 25	14	4.32	1.31
Practice No 12	14	4.32	1.19
Practice No 19	18	4.29	1.33
Practice No 15	18	4.29	1.41
Practice No 7	20	4.20	1.27
Practice No 11	21	4.19	1.29
Practice No 27	21	4.19	1.36
Practice No 26	23	4.08	1.41
Practice No 24	24	4.07	1.25
Practice No 10	25	4.02	1.25
Practice No 8	26	4.01	1.27
Practice No 3	27	3.80	1.69

4.2 Analysis of Variance to Investigate the Conformity of Construction Professionals on the Significance of Prudence Practice Criteria

The result in Table 3 shows the Descriptive Statistics and Analysis of Variance (ANOVA) for the prudence of project managers based on the prudence practice criteria as measured by the questionnaire. A between-groups analysis of variance was conducted to investigate the agreement of construction professionals on the significance or otherwise of the twenty-seven (27) prudence practice criteria used in this dissertation to measure the prudence of construction project managers.

The project managers were grouped based on the professional backgrounds as Architects, Quantity Surveyors, Civil Engineers, Builders, Estate Managers, and M & E Services Engineers. There was a statistically significant difference at the $p < .05$ level in eleven (11) of the prudence practice criteria. These eleven (11) prudence practice criteria show areas where construction professionals from the different groups are not in conformity as to whether those practices are

really very significant for project management as assessed in the Nigerian construction industry, hence the statistically significant difference in their means.

Table 3: Professionals' Agreement on Prudence Practice Criteria

	Mean								
	ARC	**CE**	**QS**	**BLD**	**ESM**	**MES**	**Others**	**Total**	**Sig.**
Frequency (N)	42	36	20	7	10	5	2	122	
Prudence Criteria									
Practice No 2	4.45	5.44	4.75	5.00	4.90	4.60	3.00	4.84	.002*
Practice No 5	4.26	5.08	3.80	4.43	4.40	5.20	5.00	4.49	.035*
Practice No 8	3.57	4.47	4.45	4.29	3.90	3.60	3.00	4.01	.043*
Practice No 9	4.62	5.28	4.70	4.86	4.10	5.00	3.00	4.78	.004*
Practice No 12	3.90	4.89	4.10	4.86	4.20	4.40	4.00	4.32	.017*
Practice No 16	3.98	4.92	4.80	5.00	4.40	4.00	5.00	4.48	.039*
Practice No 17	4.07	5.00	4.85	5.29	4.40	4.40	5.00	4.58	.015*
Practice No 22	4.00	4.89	5.00	4.86	4.30	3.60	4.00	4.47	.027*
Practice No 23	3.79	4.92	4.55	4.29	4.20	4.00	3.50	4.32	.007*
Practice No 24	3.74	4.58	4.20	4.00	3.10	4.20	4.50	4.07	.007*
Practice No 25	4.14	4.83	4.40	4.29	3.80	2.80	4.50	4.32	.018*

* The mean difference is significant at the 0.05 level.

The Table 4 shows the relative level of the prudence of construction project managers. The Quantity surveyors were ranked first. The Architects were ranked second, followed by the Civil Engineers, Builders, Mechanical/Electrical Engineers and then the Estate Managers respectively. The result shows that the construction project managers surveyed from Quantity Surveying background are believed to be closer to high implementation of prudent practice but far from extremely implementing the practices.

Table 4: Level of Prudence of Construction Professionals

	Rank	**Mean**	**Std. Deviation**
Quantity Surveyor	1	4.75	1.04
Architect	2	4.10	1.06
Civil Engineer	3	3.91	1.03
Builder	4	3.90	1.23
M & E Services Engineer	5	3.59	1.18
Estate Manager	6	3.53	1.51

5.0 Conclusion and Recommendations

Generally, the construction project managers surveyed exhibit typical knowledge and practice of prudent practices in the construction industry. The study revealed that project managers in the Nigerian construction industry are better in the areas of awareness of their duties and responsibilities; defining the duties and responsibilities of all parties in projects; identifying the

duration of construction contracts and managing construction contracts in accordance to applicable statutory laws, construction document and clients' brief. The construction project managers surveyed performed low in the prudence practice exhibited in the area of self-dealings. This means that involvement in self-dealing is an issue of concern in project management in the Nigerian construction industry. Quantity Surveyors were ranked highly among other built environment professionals in prudent practice. Although, there is significant difference in the level of prudence exhibited by different professionals of different backgrounds in construction project management including the Architect, Quantity Surveyor, Civil Engineer, Builder, Estate Manager and M & E Services Engineer.

The established checklist for the construction project management prudence practices is a veritable tool that is to be adopted as one of the tools in the field of project management for the assessment of project managers as this concept could be incorporated in the Project Management Body of Knowledge . The research also opened an important area of concern in the Nigerian construction project management that is central to prudence practice and that is the problem of Self-dealing. Prudence is mother of virtue and if project managers' conduct as a trustee, attorney and or corporate officer, is found to consists of taking advantage of their position as project managers acting in their own interests rather than in the interests of the clients in a transaction, it shows the lack of interest and or understanding to act prudently and thus, the need to beam the searchlight of research on this all important principle and practice. The elements of prudential management practices should be carefully studied and incorporated into the education and training of future project managers. There should also be more awareness of prudence in the construction industry to make current project managers more efficient. Further research should be conducted in the area of prudence practice of construction project management to fully exploit its potentials.

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