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DETERMINANT FACTORS INFLUENCING SELECTION OF PROCUREMENT METHODS IN CONSTRUCTION PROJECTS IN KENYA: A CASE OF NAIROBI COUNTY

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ABSTRACT

The selection of a suitable procurement method for any given project is becoming a matter of concern for any project to be successfully executed to satisfaction. It calls for a concrete decision making process by clients .consultants and procurement officers in the early stages of project lifecycle. Selection of procurement method is a resultant of a series of decisions which are made during early stages of a project. Lack of archival information on procurement method selection factors in Kenya has made it hard to come up with the suitable procurement methods of construction projects for successful execution. This study sought to establish the determinant factors fort selection of procurement method on construction projects in Nairobi County. The objectives of the study were; 1. To establish the most common factors influencing the selection of procurement methods in construction projects in Kenya 2.,To establish the degree of importance of the factors influencing the selection of procurement method in construction projects in Kenya ,3. To evaluate the level of agreement/disagreement between procurement specialists and construction consultants regarding the ranking of significant factors. The prioritization of the factors will enable practitioners in the construction industry make right decisions for any project. Study was anchored on the. A Five point Likert type scale questionnaire was used to collect quantitative data. Statistical methodologies used in analysis were Descriptive statistics and inferential statistics. The data was analyzed using the Statistical Package for Social Sciences (SPSS), ranked according to their Relative Importance Index (RII) and the rationalized priority rating and presented in tables, pie charts and bar charts. The six main factors were ranked as follows; Client factor Cost factors ,project characteristics, risk factor ,time factors and, External factors .On the sub factors,. The study established that; Price competition, Degree of project complexity, Time constrains, Client's financial capability, Client's experience in procurement methods, Availability of qualified personnel, Risk avoidance/allocation, Project type and nature, Availability of procurement systems in the local market were the most important factors influencing selection of procurement methods. These factors can be prioritized when selecting procurement methods for construction projects. The findings are necessary and useful towards project decision making at initial stages in order to realize the overall objectives. The recommendation was that there is need for assessing procurement methods, strengths, advantages, methodologies, effectiveness and setting the rate for the suitability for each procurement method before deciding on the method to adopt for a given project. The paper has further compared its findings from previous studies (Agha 2013, Cameroon 2011, Manzon 2006,Rosli 2006 Peter 2008)

KEYWORDS: *Procurement Specialists, Procurement Method, Consultants*

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INTRODUCTION

While no project delivery options is perfect, one may be better suited tan another based on the requirements of a particular project. These requirements should be evaluated to determine which of the various options would most likely produce the best outcome for the client. Many projects face poor performance when appropriate methods of procurement is not utilized. Projects tend to have higher project costs which exceeds the estimated cost(cost overruns) and go beyond the stipulated time(time overruns).others end up selecting a contractor who is not capable of exeuting the project to completion and to the client satisfaction. Selecting the most appropriate procurement method seems undefined and a daunting task leading to project failure, increased risks**.** It has been recognized that one of the principal reasons for the construction industry's poor performance is the inappropriateness of the procurement systems that have been chosen for the construction projects (Maizon 1996).In the last two decades, there has been significant changes in the technical and economic conditions prevailing in the construction industry. To overcome the shortcomings of the traditional procurement methods, the construction industry has developed a large number of different procurement systems. Asiatematic approach for selection of the most appropriate system is now needed (T.Alhazui ,MaCaffer2006).

Good procurement is one free of problems and based on public procurement practices which promote efficiency and overall performance for beteer service delivery (Basheka and Kabatereine 2013) A wrong procurement method often leads to failure or clients dissatisfaction (love et al 1998) The selection of procurement system therefore becomes a very important task for clients, as employing an appropriate procurement system may lead to project failure (Chua et al, 1999). The procurement system in key means through which the client creates pre-conditions for successful achievement of programme specific objectives. The use and development of procurement system in any construction industry are affected by various factors (Rameezdeen & Desilva, 2002).Procurement is crucial since it sets the basis for cooperation between clients and contractors. Construction procurement is an integral part of the process of organizing and acquiring a new project by care or effort within the construction delivery management processes that are associated with the risk identification and management of construction works (Shafik and Martin, 2006). The selection of such a system is one of the most important decisions the owner has to make in the early phase of the project, and is critical to the project participants (Seo and Hyan, 2004). Different procurement methods are used for different construction projects and the correct choice may help to avoid problems and be the key to the attainment of project specific goal. (Eyitope 2012).

Real life experience dictates that projects launched into the implementation stage without an appropriate thought out procurement method encounters problems which are not catered for thought and consideration are poured into the architectural designs and how stunning the development should be greater emphasis is placed on the budget and a chieving low bids. however most of the time little thought is given to how the budget can be met with the corret procurement methods in place. it is evident that construction projects contribute a significant percentage to the gross domestic product of most nations insufficient consideration at project inception stage of the procurement method has led to the adoption of inappropriate contract structures and provisions. Traditionally procurement procedures are competitive resulting in conflicts, diversarial relationships and less desirable project results (Pesamaa et al,2009).Strategies for the procurement of building projects have not changed significantly in the last 25 years though time and cost overruns are still prevalent throughout the industry (Smith &love 2001). In a response to reduce the incidence of time and cost overruns, that may always arise and the likelihood of project success alternative forms of procurement methods have been advocated (love et al,1998).Not all forms of procurement methods however are appropriate for particular types of projects, as client objective and priorities invariably differ(Skitmore& Masden 1998),(love et al,1996).

The objectives and priorities of a client need to be matched to a procurement system. To do this effectively, it is essential that the characteristics of various procurement systems and selection methods available are understood by clients and advisors before a procurement method is selected (Davis et al 2008).

For any given project a client can adopt a collaborative strategy such as a collaborating irrespective of the procurement method used, such strategy has been often used by clients who have series of projects to undertake. The performance of both contractors and consultants can be monitored using pre-defined indicators for each of the projects they are involved with and then compared. This approach is particularly useful to monitor and evaluate disbursement of incentives where appropriate (Mortledge et al 2006).once the primary strategy for a project has been established different factors should be considered when evaluating the most appropriate procurement strategy (Rowlinson 1999),Mortledge et al 2006).

Quiet many previous studies have identified a number of factors influencing the selection of the most suitable procurement system. The factors taken into account when selecting the procurement method will influence the procurement system throughout the project. Depending on the client's needs which vary widely due to the nature of the project, the procurement method could be established. However there is no universal procurement method which would be suitable for all kinds of construction projects (Luu et al,2003).Selection of an absolute optimal procurement method is difficult because even the most experienced clients or contractors do not know all the potential benefits or risks for each method. Procurement is therefore a succession of "calculated risks". Industry and academia have consistently focused on reducing risks using innovative methods of procurement. The difficulty and what sets construction industry procurement far apart from anything else is the complexity of projects.

A well-functioning procurement system is built on specific benchmarks, which revolves around four pillars legislative and regulatory framework, institutional framework and management capacity, procurement functions, market practices, and integrity of procurement practices (Agaba & Shipman, 2006). The use of alternative procurement method has increased recently due to many factors including the increase in complexity and size of projects, increased owner sophistication and requirements, demand for shorter delivery periods and others. Therefore, development and application of various approaches for the selection is essential to aid client and consultants in selecting the most appropriate procurement system. As finances decrease, government agencies and private developers are under increasing pressure to reduce development costs without diminishing their missions. An essential system for cost-cutting is purchase practices that facilitate competition among vendors so that government agencies benefit from efficiencies inherent in private enterprise. Often, the national government is the sole customer for specific products or services. (Khi, 2009). Good procurement is one devoid of problems and based on public procurement practices that promote efficiency and performance for better service delivery (Basheka and Kabatereine (2013))

STATEMENT OF THE PROBLEM

Many projects face poor performance when the appropriate method of procurement is not utilized. Some projects tend to have higher project costs which exceed the estimated costs (cost overruns) and go beyond the stipulated time (time overruns). Others end up selecting a contractor who is not capable of executing the project to completion and to client satisfaction. Selecting the most appropriate procurement method seems undefined and a daunting task leading to project failure, increased risks**.** It has been recognized that one of the principal reasons for the construction industry's poor performance is the inappropriateness of the procurement systems that have been chosen for the construction projects

(Maizon 1996).The unique nature of the construction industry coupled with the impermanent nature of project organization places a huge burden on the project team in making decisions as to which procurement method to a adopt in achieving the set goals. Furthermore the increasing complexity of constructions, the need for greater financial management, the need to reduce design and construction periods and the increasing burden of construct administration have put pressure on the clients to seek for alternative approaches to the traditional method,

One of the most important factors contributing to project success is the selection of the project delivery method (Khalil, 2012). There is no single project delivery method which addresses the needs of all types of projects. For any given project the key early decision which has an impact on the cost, time and quality of the project, is the selection of the optimal project delivery method based on the project characteristics constraints, risks and goals (Kumaraswamy and Dissanayaka, 2001; Khalil, 2012).The numerous procurement methods available, coupled with their individual unique features, have made clients' decisions to choose the appropriate method for any given project, a complex task to grapple with. Such challenges have largely resulted in the need to conduct a selection process in a disciplined and systematic manner. Various factors have to be taken into consideration before any informed decision can be made on the right choice of PM. The factors can be classified into external and internal factors (Love et al., 1998; Luu, and Chen, 2005), (Ratnasabapathy et al., 2006). It is evident that construction projects contribute a significant percentage to the gross domestic product of most nations. Yet it is an industry mired in uncertainty of outcome. Insufficient consideration at project inception of the procurement method has led to the adoption of inappropriate contract structures and provisions. Real life experience dictates that projects launched into the implementation stage without an appropriate thought- out procurement method encounters problems which are not catered for. The goal of every business is to be success (Chan et al., 2002). Organizations must work on success to be able to still competitive in business environments such as construction. The construction industry is constantly changing with developments in new technologies and business methods (Koota, 2003). Therefore, construction companies must develop new applications and design new strategies to be more competitive in the industry and get successful in their business. In recent years, there has been an increase in the studies of critical success/failure factors especially in project management subject (Hyvari, 2006).

A greater number of decisions need to be taken during the project management process and as usual the decisions at the earlier phases of design aand tendering have a bigger impact on the project management practices as compared to later stages or during building operations or construction. The project managers, the client and consultants are not aware of the criteria that would influence their goals set from the inception phase and conception phases leading to the project not being successful It has been observed that many clients have been selecting procurement systems in a cursory manner, and some clients even use a specific procurement system by default without making a deliberate choice. Majority of the clients are dissatisfied with the procurement system they have previously employed. Inexperienced clients often have to rely on expert advice when selecting a procurement approach and this could result in inappropriate decisions with unforeseeable consequences. Experienced clients may also suffer if they simply based their selection upon biased past experience and the conservative decisions of their in- house experts or consultants. The selection of an appropriate procurement system is one of the most important problem in the construction sector. The need for selecting and using an appropriate procurement system for a particular construction project together with the proliferation of differing procurement systems, calls for more systematic methods of selection. .To do this, decision criteria and factors pertinent to the selection of procurement approaches and their properties (i.e. subjectivity) must be carefully identified, evaluated and examined their effects on procurement method selection to overcome this problem.

This research therefore investigated the factors influencing the selection of procurement method in construction projects in Kenya in order to assist clients, consultants and procurement specialists to select a sound procurement method that will help realize the client's actual needs, requirements, objectives and project goals.

RESEARCH OBJECTIVES AND METHODOLOGY

The main objective of the study was to investigate the factors that influence selection of procurement method on construction projects in Nairobi County. The specific objectives included: To establish the most common internal and external factors influencing the selection of procurement methods in construction projects in Kenya, To establish the degree of importance of the factors influencing the selection of procurement method in construction projects in Kenya, To evaluate the level of agreement/disagreement between procurement specialists and construction consultants regarding the ranking of significant key factors

Bless and Higson-Smith (1995:87) stated that a population is a set of elements that the research focuses upon and to which the results obtained by testing the sample should be generalized. In this study the target population was procurement specialists and construction consultants/clients from the public sector who participate in construction project in Nairobi County.

Sample and Sampling Technique

The process of selecting a number of individuals or objects from a population such that the selected group contains elements representative of the characteristics found in the entire group is known as sampling (Kombo & Orodho, 2002).Time and money was saved by selecting a sample study rather than attempting to study the entire population of buildings. Obtaining data from the population of contractors as well as analyzing and interpreting vast amounts of data would have been impossible to accomplish within the time constraints and with the limited financial resources which were available for conducting this research.

A probability sampling design was adopted which, according to Kombo & Orodho (2002), samples are selected in such a way that each item or person in the population has a known likelihood of being included in the sample. Simple random sampling was used as it was easy to

implement with automatic dialing and computerized voice response system, the sample yield research data that could be generalized to a larger population, it permitted the researcher to apply inferential statistics to the data and provided equal opportunity of selection for each element of the population (Kombo & Orodho, 2002).

A sample is a subset of a population selected to participate in the study, it is a fraction of the whole, selected to participate in the research project (Kombo & Orodho, 2002). In this research, a subset of 35 respondents was selected out of the entire population of 72 for the procurement specialists. A subset of 44 respondents was selected out of the entire population of 120 for the professional consultants. Sample size was found as follows. n= n'/ [1+ (n'/N)] --------Kombo & Orodho, Kish equation (1965)

Where:

N = total number of population

n= sample size from finite population

n' = sample size from infinite population = S^2/V^2; where S2 is the variance of the population elements and V is a standard error of sampling population. (Usually S= 0.5 and V = 0.06)

So for 120 classes of consultants:

n=n, /(1+(n,/N)

n,=S2/V2=(0.5)2/(0.06)2=69.44

N=120

n=69.44/ [(1+ (69.44/120)]=43.978=44

For 72 class of procurement specialists

n=69.44/ [(1+ (69.44/72)]=35.36=35.

Sample Size

Table 1

Category	Population Sample	Sample Size	Percentage
Procurement Specialists	72	35	42.6%
Professional Consultants	120	44	57.4%
Total		79	100

Data was obtained from self-administered questionnaire completed by 68 participants (n=68 this constituted an 86% response rate on the sample size

FACTORS AFFECTING SELECTION OF PROCUREMENT METHOD

Price Certainty

Price certainty is related to the firm price for the total construction costs that will be obtained at the commencement of the project(Maizon et al 2006).this is due to the fact that the clients will like to have a firm price for their project before committing unto it.

Price certainty will however change during the project execution. Hence it should not be conceived as an absolute assurance but instead a predictable cost that is to say how certain the price that a procurement system could offer (Hibberd and Djebarmi1996).

By getting the firm price before construction of the project, it enables the client to have an appropriate estimate so that the project cost can be kept within the financial budget. Price may include design fees, construction costs, financing costs and management fees (Thomas et al (2002).

Quality and Procurement Method

Quality level of a construction project is one of the main actors to be considered in the selection of the suitable procurement method.

Quality is a degree to which a set of inherent characteristics fulfills client's requirements (Maizon et al, 2006).

This requirement has three components-qualities of materials, workmanship and the design concept. When high levels of quality of materials and workmanship are required a more stringent supervisory and checking process must be

adopted and one would expect that the speed an price should be more flexible to cater for the required quality standards (Thomas et al (2002), Design quality is determined by the experience of the designer and the cost and time available. The contractor's construction experience and reputation is a factor that contributes to the quality of design and it, aesthetics (love 1998)

Speed of Construction and Procurement Method

This refers to the need to complete a project more quickly than other projects of similar nature, complexity and size.it is the client's degree to have the project completed as soon as possible. Shorter construction period can be achieved by accelerating or fast tracking some key phases in the construction project. This could favour the use of design and build or management contracting (Thomas et al,2002).since the requirement for a speeder completion could often result into premium both in price and quality of construction, a strong justification for speed would be desirable. Some clients may want to fast track the project period in order to ensure a rapid return on monetary and other resources that have been expended or to reduce onerous financial charges (Chan 2001).others may need rapid responses to their needs. Whenever the client has new requirements on that project, the project team of consultants may need to respond to such new requirements as soon as possible (Al Hazrri and Mccaffer, 2002)

Time Certainty and Procurement Method

This refers to the degree of certainty that a project will be completed on the exact date and time which is agreed to by both the client and the contractor as specified in the contract agreement.it denotes the level of reductions in unanticipated time overruns (Thomas et al,2002).time certainty is crucial need of clients particularly for those involved in large or prestigious projects scheduled for a particular function or event.

There is a strong connection between the certainty of time and speed, the greater speed a procurement method can offer, the higher the degree of certainty that the project will be completed on time. Usually time is identified from the inception stage until completion stage. The completion stage can be crucial either in terms of generating revenue or providing needed functionality by a particular dateline. Some clients may prefer to start a project as early as possible whereas some may want to shorten the construction period so as to minimize the disruptions to their existing operating facilities(Masterman and Gameson 1994)

Flexibility of Design and Procurement Method

Flexibility is about the ability to accommodate variations such as design changes during the execution phase of the construction project (love et al 1998).flexibility is particularly needed for large and complex projects or when the exact requirements cannot be carefully established before tendering. Thus there could be need for design inputs Ihibberd and Djebarri 1996).during the course of the project flexibility depends on human factors such as stakeholders situation, experience and competence, and human factors such as project type, project situation and external factors(weather, strikes and political impact.)both human and non-human factors are unpredictable and very difficult to manage, hence flexibility could become relatively ambiguous to the decision makers.

Complexity Construction and Procurement Method

When it is desired that the final building product be highly specialized, technologically advanced and highly serviced, client may specify that a particular contractor carry out work or that may specify a method of construction (love et al 1998).complexity is one of the significant factors that influence the selection of suitable construction procurement method.

This is because simple constructions may best be procured in one way whereas the complex design and construction will be procured in a different way.

Project complexity can be identified by the types and physical services involved, number of sub-contractors ,resources in terms of labour, plant and materials, level of technology and the uniqueness of project activities(Maizon et al 2006) it involves the need for competent contractors to handle client's unique and high technology requirements. Simple projects will rely on the skill and judgments of a contractor by utilizing design and build method in complete projects. There will be higher level of nomination because of need to harness the design skills of specialist trade contractors**.**

Responsibility and Procurement Method

Responsibility is directly related to the degree of client involvement and control over the procurement process it.refers to the client's need for an involvement in and a need to be kept informed about the project throughout its life (Thomas et al, 2002), however, certain procurement methods afford the client a single point of responsibility and hence reduce their exposure to risk. The responsibility of the building team will be decided when a client chooses whether to appoint a separate management of consultancy works and contractors or sole responsibility after the briefing stage. Responsibility was not considered to be objective since there is no fixed definition as to what is a high, medium or low level of client involvement in a project; instead the level of responsibility varies from project to project**.**

Risk Allocation/Avoidance on Procurement Method

Construction projects are complex, having a long production cycle and involving many participants and they are therefore associated with risks and uncrtanities.it is important for a client to know how, and to what degree, risk has consciously been passed to another organization, or how it has been shared in some proportion between him and another organization(Maizon et al 2006)

This requirement reflects the degree to which the client wishes to transfer the risk of cost and time slippage to the contractor. When choosing a certain procurement method, it is important for the client to know how and to what extent the risk has continuously been passed to another organization, how it has been shared, how the risk may not have been passed on to all, or indeed how the risk to his/her organization may have been increased by the employment of another organization (Thomas et, al, 2002**)**

Familiarity and Procurement Method

The aspect of familiarity will affect the selection of procurement method this focuses on the famiality of the client with the various types of procurement methods available in the construction industry. The construction industry players are not confident in using other procurement methods because they are unwilling to change their mindset and take financial risk in case of failure of the new method Maizon et al;2006**)**

Dispute and Allocation and Procurement Method

Construction industry is a project-based industry, which is attributed by unique features of each project and the involvement of various parties within life cycle of each project.as a result of diverse nature in the involvement various parties, conflict and dispute are inevitable. Conflict and dispute rooted in construction demanded better conflict management. Dispute and resolutions has been characterized mainly by its natures as diverse business as it covers a wide range of end products and people working from a broad range of crafts and professional (Aminah,Syuhaida and Leong 2 011)

Whitfield (1994) regards construction as a rare industry that produces extremely many varied products without significant repetition. The industry is enriched by the presence of other paries. It is the variety of interests that provides the catalyst for conflict hence disputes in construction industry. Thus emphasis should be laid on the strategy to be adopted in voiding, minimizing or resolving disputes at the earliest stage as possible. The efforts to minimize dispute should be initiated as early as selecting the project delivery or procurement stage.

Productivity and Procurement Method

Productivity has been defined as a ratio of a measure of output to a measure of some or all of the resources used to produce this output(Grimes,2007,cited in Chia et al 201).according to Arditi and Mochtar 2000,cited in Vogl and abdel-wahab,2014) an increase of 10% in the UK construction labour productivity is equivalent t a saving of 1.5 billion dollars to the industry's clients, therefore improved productivity helps contractors not only to be more efficient and profitable but also knowing actual productivity levels also help to estimate accurately and be more competitive during bidding for projects(Ailabouni et al 2009).factors that impact worker productivity include organizational, economic and sociapsyychological and physical factors such as working at similar a activities. Design complexity,erro tolerance, weather conditions, disruptions, overtime and site congestion(Kazas and Ulubeyli 2006)

Sustainability and Procurement Method

The lack of consideration paid to sustainability issues during conceptual phase has resulted in higher consumptions of materials and energy during both the construction and operational phases of many building projects.(Al-Yami and price 2006)sustainability is frequently conceptualized as consisting of environmental,society,economy(Moir and Carter 2012),political and commercial (CIRIA,2011)

Government Policy and Procurement Method

Client's selection procedure of procurement method could be affected by the various government policies especially in the case of public project clients(Maizon et al,2006).this could be seen where clients have to follow government procedures. For example in order for due process to be followed in the bidding arrangements, he public procurement and disposal act for the procurement of building and civil engineering works has to be used. The acts is very clear that all procurement of goods and services by all government procuring entities shall be conducted by an open competitive bidding,where advertisements of such works or services shall be advertised on the notice boards or website open to all interested bidders**.**

THE MAIN FACTOR INFLUENCING THE SELECTION OF PROCUREMENT METHOD

The study sought to identify the degree of importance of the main factors influencing selection of procurement methods in construction projects in Nairobi County

Table 2: RII and Rank for the Main Factors for all Respondents

Sub-Factor	Mean	RII %	p-value	Rank
Factors related to client	3.91	78.24	0.00	1
Factors related to cost	3.75	75.00	0.00	2
Factors related to project characteristics	3.72	74.41	0.00	3
Factors related to risk	3.66	73.24	0.00	4
Factors related to time	3.51	70.29	0.00	5
Factors related to external environment	3. 40	67.79	0.025	6
Mean Value	3.66	**73.16**	0.00	

Table 3: RII and Rank for the Main Factors for all Respondents

Sub-Factor	Mean	RII %	p-value	Rank
Factors related to client	3.91	**78.24**	0.00	1
Factors related to cost	3.75	**75.00**	0.00	2
Factors related to project characteristics	3.72	**74.41**	0.00	3
Factors related to risk	3.66	**73.24**	0.00	4
Factors related to time	3.51	**70.29**	0.00	5
Factors related to external environment	3. 40	**67.79**	0.025	6
Mean Value	3.66	**73.16**	0.00	

From Table 2 & 3 mentioned above, it is noticed that factors related to client group Has been ranked by the all respondents in the first position with RII equal 78.24%.with mean of 3.91 At the same time, it has been also ranked by the procurement specialist respondents and Consultants' offices respondents in the first position with RII equal to 78.80% and 77.88% respectively. This group is the most important one for all respondents and it is obtained that this factor group has a similar importance for each target group because procurement specialists and consultants are usually interested with client requirements. This is mainly due to financial issues and client interference which are considered very important by consultants and this is related to client satisfaction.

Shiyamini and Rameezdeen (2007) agree with this result as client requirements group ranked in the first position and it affects strongly the selection of procurement method.

Sub Factors Influencing the Selection of Procurement Method

The study sought to identify the degree of importance of the sub- factors influencing selection of procurement methods in construction projects in Nairobi County

Table 4: RII and the Rank for "Factors Related to Client"

Sub-Factor	Mean	RII%	p-value	Rank
Client's financial capability	4.35	86.96	0.000	1
Client's experience in procurement method	4.29	85.80	0.000	2
Availability of qualified personnel (procurement staff)	4.21	84.20	0.000	3
The degree of desired client involvement	3.76	75.40	0.000	4
Accountability	3.72	74.35	0.000	5
Flexibility for changes and variations	3.71	73.98	0.000	6
Client reputation	3.65	73.00	0.000	7
Client's trust in other parties	3.65	72.85	0.000	8
Client's nature and culturea9public or private)	3.29	65.75	0.018	9
Average	**3.82**	76.33		

The mean is significantly different from 3. From table 4, Client's financial capability sub-factor has been ranked by the all respondents in the first position with RII equals 86.96%, mean-4.35, so the mean of this sub-factor is significantly greater than the hypothesized value 3.we conclude that the respondents agreed that this sub-factor is the most important one in factors related to client group.

Client's experience in procurement methods sub-factor has been ranked by the all respondents in the second position with RII equal 85.80%, mean-4.29, , so the mean of this sub-factor is significantly greater than the hypothesized value 3.we conclude that the respondents agreed that this sub-factor is very important factor in client group.

Client's nature and culture (public or private) sub-factor has been ranked by the all respondents in the ninth position (the last position) with RII equals 65.75, mean-3.29 the mean of this paragraph is significantly greater than the hypothesized value 3

Group Two: Sub-Factors Related to Cost

The relative importance index (RII) and rank of sub-factors related to cost are summarized in Table 5

Table 5: RII and Rank for 'Factors Related to Cost'

Sub-Factor	Mean	RII %	p-value	Rank
Price competition	4.51	90.24	0.000	1
Price certainty prior to commencement	3.93	78.40	0.000	2
Design cost	3.63	72.60	0.000	3
Cost control	3.44	68.75	0.000	4
Consultant fees	3.19	63.88	0.141	5
Average	3.74	74.77		

The mean is significantly different from 3. From table 4.11, Price competition sub-factor has been ranked by the all respondents in the first position with RII equals 90.24%, we conclude that the respondents agreed that this sub-factor is the most important one in the main factors related to cost group

Price certainty prior to commencement sub-factor has been ranked by the all respondents in the second position with RII equals 78.40%, ,.we conclude that the respondents agreed that this sub-factor is very important one in main factor in cost group.

Consultant fees sub-factor has been ranked by the all respondents in the fifth position(the last position) with RII equals 63.88%,.we conclude that the respondents agreed that this sub-factor is not important in main factor of cost group

Group Three: Sub-Factors Related to Time

The relative importance index (RII) and rank of sub-factors related to time are summarized in Table 6.

Table 6: RII and Rank for 'Factors Related to Time"

Sub-Factor	Mean	RII %	p-value	Rank
Time constrains of project	4.40	88.00	0.000	1
Minimize design time	3.78	75.60	0.000	2
Speed	3.62	72.44	0.000	3
Time control	3.41	68.26		4
Delay in the project completion time	3.40	67.96	0.002	5
Delivery time schedule	2.87	57.40	0.097	6
Delays in obtaining environmental approvals	2.76	55.35	0.013	7
Average	3.46	69.29		

The mean is significantly different from 3.From table 4.12, Time constrains of project sub-factor has been ranked by the all respondents in the first position with RII equals 88.00%, The sign of the test is positive, so the mean of this sub-factor is significantly greater than the hypothesized value 3.we conclude that the respondents agreed that this sub-factor is the most important one in factors related to time group.

Minimize design time sub-factor has been ranked by the all respondents in the second position with RII equals 75.60%,mean—3.78 , the mean of this sub-factor is significantly greater than the hypothesizes value 3.we conclude that the respondents agreed that this sub-factor is very important factor in time group.

Delays in obtaining environmental approvals sub-factor has been ranked by the all respondents in the seventh position (the last position) with RII equals 55.35%, mean—2.76,. Then the mean of this sub-factor is significantly smaller than the hypothesized value 3. We conclude that the respondents agreed that this sub-factor is not important factor in time group.

Group Four: Sub Factors Related To Risk

The relative importance index (RII) and rank of sub-factors related to risk are summarized in Table 7.

Table 7: RII and Rank for 'Factors Related Risk"

Sub-Factor	Mean	RII	p-value	Rank
Risk avoidance/allocation	4.21	84.06	0.000	1
Responsibility allocation	4.06	81.30	0.000	2
Disputes & arbitration	3.57	71.60	0.000	3
Geotechnical investigation	2.79	55.96	0.021	4
Average	3.67	73.23		

The mean is significantly different from 3. From table 4.13 risk avoidance/allocation sub-factor has been ranked by the all respondents in the first position with RII equals 84.06%, mean—4.21,. The mean of this sub-factor is significantly greater than the hypothesized value 3.we conclude that the respondents agreed that this sub-factor is the most important one in factors related to risk group

Responsibility allocation sub-factor has been ranked by the all respondents in the second position with RII equals 81.30%, mean—4.06 , so the mean of this sub-factor is significantly greater than the hypothesizes value 3.we conclude that the respondents agreed that this sub-factor is very important factor in risk group.

Geotechnical investigation sub-factor has been ranked by the all respondents in the seventh position (the last position) with RII equals 55.96%, mean—2.79, Then the mean of this sub-factor is significantly smaller than the hypothesized value 3. We conclude that the respondents agreed that this sub-factor is not important factor in risk group.

Group Five: Sub-Factors Related to Project Characteristics

The relative importance index (RII) and rank of sub-factors related to project characteristics are summarized in Table 8.

Table 8: RII and Rank for 'Project Characteristics"

Paragraph	Mean	RII %	p-value	Rank
Degree of project complexity	4.50	89.98	0.000	1
Project size	4.38	87.54	0.000	2
Project type and nature	4.16	83.20	0.000	3
Project completion at estimated cost	3.94	78.72	0.000	4
Constructability of design	3.87	77 36	0.000	5
Quality level of project	3.84	76.80	0.000	6
Project completion at estimated time	3.69	73.72	0.000	7
Funding method	3.63	72.56	0.000	8
Available resources of project	3.50	71.84	0.000	9
Project payments modality	3.40	68.00	0.007	10
Expected performance of project	3.31	66.10	0.009	11
Project site location	3.12	62.33	0.261	12
Project methodology	2.99	59.78	0.371	13
Average	3.72	74.46		

The mean is significantly different from 3. From table 4.14 Degree of project complexity sub-factor has been ranked by the all respondents in the first position with RII equals 89.98%, mean—4.50, The sign of the test is positive, so the mean of this sub-factor is significantly greater than the hypothesized value 3.we conclude that the respondents agreed that this sub-factor is the most important one in factors related to risk group ,Project size sub-factor has been ranked by the all respondents in the second position with RII equals 87.54%,mean—4.38 , , so the mean of this sub-factor is significantly greater than the hypothesizes value 3.we conclude that the respondents agreed that this sub-factor is very important factor in risk group. Project methodology sub-factor has been ranked by the all respondents in the thirteenth position (the last position) with RII equals 59.78%, mean—2.99, then the mean of this sub-factor is significantly smaller than the hypothesized value 3. We conclude that the respondents agreed that this sub-factor is not important factor in project characteristics group.

Group Six: Sub-Factors Related to External Environment

Table 9: RII and Rank for External Environment"

Paragraph	Mean	RII %	p-value	Rank
Availability of procurement system in local market	4.10	82.04	0.000	1
Procurement policy	4.04	81.00	0.000	2
Legal issues/factors	4.01	80.15	0.000	3
Market competitiveness	3.84	76.66	0.000	4
Other parties' involvement/role/participation	3.44	68.94	0.000	5
Political consideration	3.38	67.56	0.005	6
Market completion/structure	3.18	63.60	0.196	7
Economic conditions	3.15	63.00	0.162	8
Number of competitors	3.12	62.40	0.437	9
Commercial conditions	3.09	61.70	0.350	10
Worker conditions	3.04	60.92	0.0280	11
Technology	2.94	58.88	0.313	12
Material availability	2.88	57.65	0.072	13
Stakeholder integration	2.79	55.87	0.028	14
Environmental impact	2.72	54.55	0.001	15
Social factors	2.65	53.00	0.001	16
Average	**3.23**	**64.51**		

The mean is significantly different from 3. From table 4.15 Availability of procurement system in local market sub-factor has been ranked by the all respondents in the first position with RII equals 82.04%,mean—4.10, the mean of this sub-factor is significantly greater than the hypothesized value 3.we conclude that the respondents agreed that this sub-factor is the most important one in factors related to Availability of procurement system in local market group

Procurement policy sub-factor has been ranked by the all respondents in the second position with RII equals 81.00%, mean—4.04, the mean of this sub-factor is significantly greater than the hypothesizes value 3.we conclude that the respondents agreed that this sub-factor is very important factor in Availability of procurement system in local market group

Social factors sub-factor has been ranked by the all respondents in the sixteenth position (the last position) with RII equals 53.00%, mean—2.65, Then the mean of this sub-factor is significantly smaller than the hypothesized value 3. We conclude that the respondents agreed that this sub-factor is not important factor Social factors group

Table 10: The Top Ten Significant Sub-Factors Affecting the Selection of Procurement Method

Factor	Consultants		All respondents	
	RII %	Rank	RII %	Rank
Price competition	89.23	1	90.29	1
Degree of project complexity	88.72	4	90.00	2
Time constrains of project	88.72	3	87.94	3
Project size	86.86	5	87.65	4
Client's financial capability	86.15	6	87.06	5
Client's experience in procurement methods	84.62	6	85.88	6
Availability of qualified personnel (procurement staff)	86.67	2	85.29	7
Risk avoidance/allocation	83.59	9	84.12	8
Project type and nature	81.03	11	83.24	9
Availability of procurement systems in the local market	82.56	10	82.06	10

According to procurement specialists, consultants and all respondents ,it was obtained from table 4.17 that the price competition was the most important sub-factor as it has the first rank a among all sub-factors with relative importance index (RII) equal 91.72%.,for procurement specialists, 89.23% for consultants, and 90.29% for all respondents and it has a similar rank for all parties as it affects directly on the selection of procurement method in Kenya .this agreement between all target groups is attributed to the difficult economic situation and fund deficit that most clients face .their problems can affect strongly the price competition in construction projects in Kenya and clients and consultants feel such sensitive problem in their projects. Shiyamini et al, (2007) agree with this result as he ranked price competition sub-factor in the first position and stated that this factor was a high important parameter. This factor was considered as critical by Thomas, (2001) who illustrated that this factor should be taking into consideration for Australian clients when they selecting procurement method. On the other hand, Maison et al (2006) is differing with this result as he ranked the price competition in the sixth position in the Malaysian construction industry while Husam and Sedki (2009) ranked this factor in the thirteenth position**.**

CONCLUSION AND RECOMMENDATIONS

The primary objective of this research was to identify the determinant factors influencing selection of procurement method in construction projects in Nairobi county..

Six main categories of factors affecting selection of procurement methods identified from the literature review were ranked in accordance with their degree of importance in Kenya's construction industry.

In this study 54 key sub-factors were identified from the literature review and were all ranked in accordance with their degree of importance based on the views of the respondents. Who were construction consultants and procurement specialists.10 most key factors were identified from the overall ranking. As the most common factors influencing selection of procurement methods in construction projects in Nairobi County.

The findings from the study could be used as an archival data in improving procurement issues through making the right decisions at the initial stages of a project hence performance improvement and client satisfaction.

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