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Achieving Value for Money (VFM) in Construction Projects

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Abstract
Value for Money is the client's assessment of the project delivered and/or services rendered by the various project stakeholders as it met the pre-determined objectives. The study focused on ways by which the required value for money can be achieved in a project, these includes detailed risk analysis and appropriate risk allocation, drive for faster project completion, curtailment in project cost escalation, encouragement of innovation in project development, preparation of a detailed specification etc. Highlighted among management tools that can aid the achievement of the desired VFM includes Life Cycle Cost analysis, Value Management, Building Information Modelling, and Lean Construction methods. The study argued for the ex-ante VFM assessment to be carried out at the design stage of a project; the importance of an ex-post VFM assessment after project completion was stressed, this is due to the fact that it helps to determine whether or not value for money has actually been delivered. Meanwhile, the barriers to achieving value for money on investment for the client were discussed with recommendations for improving VFM practices. The findings of this research provide necessary information and instruments to assist the various project stakeholders to make informed and supportable decisions.
Keywords: Value for Money (VFM), VFM techniques, barriers, construction projects

1.0 INTRODUCTION

Demystifying issues regarding the concept of achieving or assessing how to, when to, and/or where to achieve the value for money on investment for clients requires firstly, clarification of the term 'Value for Money (VFM)' and then identifying ways or stages by which it can be achieved in construction projects. Value for Money can be defined *as the client's assessment of the project delivered (or services rendered) by the various project stakeholders as it met the pre-determined objectives*. A client can attest to value for money when they feel that they have received a service that was worth the price that they paid for it. Value for money assesses the cost of a product or service against the quality of provision. It should be noted that value for money is linked to efficiency. The European Investment Bank describes it as a measure of the economic efficiency of a project (Thomson & Goodwin, 2005); but this definition according to Antoine (2012) can be more detailed since 'economic efficiency' can be vague and lead to misinterpretation. VFM according to HM Treasury (2006) is defined as the optimum combination of whole-of-life costs and quality (or fitness for purpose) of the good or service to meet the user's requirement. The whole-of-life costs could include: the initial purchase price of the goods and services; maintenance costs; transition out costs; licensing costs (when applicable); the cost of additional features procured after the initial procurement; consumable costs; and disposal costs. Meanwhile, the University of Cambridge (2010) and Erlendsson (2002), described 'Value for money' (VFM) as a term used to assess whether or not an organisation has obtained the maximum benefit from the goods and services it both acquires and provides, within the resources available to it. The value achieved through the project is measured by the ratio of benefits delivered (from the owner's perspective) – to the resources used for the whole project (Dallas, 2006). It gives:
Value = Benefits Delivered / Resources Used
The term 'Resources Used' can always be converted into money, whether it deals with raw material resources, technical resources or human resources; therefore, this value ratio is often named as Value for Money (Antoine, 2012). He argued further that the term 'Benefits Delivered' can be easily assessed since it consists of both objective and subjective components. The 'objective' value according to Antoine (2012), Erlendsson (2002) and Kelly, Male, and Graham (2004) refers to all economic aspects and it is possible to quantify it accurately in theory by knowing the price and costs of every step –feasibility studies, procurement, construction phase, operational phase; while the 'subjective' value refers to social benefits and satisfaction and this 'subjective' value is difficult to define because it depends on individual perceptions so it seems even more difficult to measure and quantify. Harvey and Green (1993), and Campbell and Rozsnyai, (2002) defined value for money in terms of quality that "*quality as value for money sees quality in terms of return on investment*" and that if the same outcome can be achieved at a lower cost, or a better outcome can be achieved at the same cost, then the 'customer' has a quality product or service.

2.0 VFM- AN OVERVIEW

Baker, Dross, Shah, and Polastro (2013) noted that Value for Money (VFM) is a concept that has been widely used for some time within the commercial and industrial sectors which collaborated the views of Bidne et al. (2012) who acknowledged that VFM had been embraced internationally as an essential tool for assessing the relative costs and benefits of alternative options available for selection for the provision of a potential public project, though an often misunderstood phrase (Barr & Christie, 2014); Baker et al. (2013) further argued that there is no universal definition for the term VFM and the most cited definition states that VFM is '*the optimal use of resources to achieve the intended outcomes*'. The '3Es definition' of Value for Money is now in common currency, providing a framework for analysis shaped by Economy, Efficiency and Effectiveness. More recently a fourth 'E' has been added to the VFM mix in the shape of equity, conveying the message that development is only of value if it is also fair (Baker et al., 2013; Barr & Christie, 2014; Burger & Hawkesworth, 2011; DFID, 2011; Jackson, 2011).

TTF (1998) stressed that in consideration and assessment of VFM, that VFM should never be automatically equated with the lowest cost. This collaborated HM Treasury (2006) and DFID (2011) who noted in their report that VFM is not the choice of goods and services based on the lowest cost bid but to have a better understanding of the cost implications. It was further stressed that in assessing and delivering VFM, it is important to note that VFM is a relative concept which requires comparison of the potential or actual outcomes of alternative procurement options, while Decorla-souza (2015) stressed that VFM analyses should be conducted once it is decided to undertake a project and wish to assess the project delivery options. However, the achievement of VFM should be assessed in conjunction with other project aspects such as service quality, risk transfer, and wider policy objectives (Akintoye, Hardcastle, Beck, Chinyio, & Asenova, 2003). They further asserted that the overall project success is to a very large extent determined by the ability of the client to adopt and sustain the VFM regime throughout the project life.

Best value for money can be defined as the most advantageous combination of cost, quality, and sustainability to meet customer requirements. In this context, cost means consideration of the whole life cost; quality means meeting a specification which is fit for purpose and sufficient to meet the customer's requirements; sustainability means economic, social and environmental benefits. Best value' (BV) is a relative notion that can be interchanged with VFM, which refers to the optimum outcome of a business process. It is applicable to all industries, sectors, geographic locations, and cultures. BV is expected to help organizations improve their performance (Akintoye et al., 2003). HA (2006) provided a better definition of best value, as 'the delivery of business objectives at the lowest affordable cost while achieving continuous improvement' with the four key components of best value being effectiveness, efficiency and economy underpinned by the demonstration of continual improvement. In a research survey carried out by Ansell, Holmes, Evans, Pasquire, and Price (2009), the respondents of their research survey rank the requirements for delivering best value to the clients as- free from defects on completion; delivered on time; delivered within budget; fit for purpose; low construction costs; pleasing to look at; short construction period; supported by worthwhile guarantees; satisfactory life of repair; low maintenance cost; minimal disruption to the public; and safety.

It is worthy of note that securing value for money is not limited to a some project delivery variants such as the traditional/conventional method of project delivery or to just design and build but to also variants such as public-private partnerships, relational contracting. Burger and Hawkesworth (2011) noted that as a matter of principle, the choice between using a PPP or traditional procurement should be simple; however, governments should prefer the method that creates the most value for money. They further argued that in practice the choice is not always as simple as it seems and that the value-for-money objective is very often blurred, and the choice between using a PPP and traditional infrastructure procurement may be skewed by factors other than value for money. Akintoye et al. (2003) attested to the fact that it is a fundamental requirement in public finance initiative (PFI) procurement for value for money to be achieved, and for it to be secured appropriate risks should be transferred to the private sector; this corresponds to the assertion of Antoine (2012) that value for money is a critical issue in PPP projects.

PFI is a type of 'public–private partnership' (PPP) where project financing rests mainly with the private sector while the rationale of PPP is to combine the resources of the public and private sectors, in the quest for more efficient service provision (Akintoye et al., 2003). Grimsey (2006) meanwhile suggested four methods for determining VFM in project procurement- a full cost-benefit analysis of the most likely public and private sector alternatives; a detailed modelling of risk-weighted and life cycle costed models of traditional state procurement (the PSC) and a shadow bid for a PPP before bids are invited; a VFM comparison of the PSC and the contractor proposals received following the tender process; reliance on a competitive bidding process. Decorla-souza (2015) revealed that only financial impacts are addressed in most VFM Analysis and that non-financial impacts (e.g., user benefits) are not usually addressed. Nonetheless, value for money enables the government to configure and measure procurement alternatives and identify optimal procurement solutions (Regan, 2014).

The Institute of Value Management (2002) stressed that the concept of value relies on the relationship between the satisfaction of many differing needs and the resources used in doing so. The differing needs are likely to include aspects such as high quality, good indoor environment, durability, cheaper to maintain, user-friendly etc. Meanwhile, Cox and Townsend (1998) claimed that value for money, productivity, and overall client's satisfactions are fairly low in the construction industry as compared to other industrial sectors and that no simple factor is responsible. Key generic factors that for drive value for money include the optimum allocation of risks between the various parties, focusing on the whole life costs, integrated planning and design of the facilities-related services, the use of an outputs specification approach, a rigorously executed transfer of risks, sufficient flexibility, ensuring sufficient incentives within the procurement, the term of the contract, sufficient skills and expertise, and proper management of the scale and complexity of the procurement (HM Treasury, 2006). In general, there are six determinants of VFM (Morallos, 2008): risk transfer, long-term nature of contracts, competition, performance measurement and the use of an output specification, performance measurement, and incentives, private party's management skills.

This paper begins by presenting the underlying concept of Value for Money (VFM). The various ways by which project stakeholders' help in achieving VFM was also expatiated on; and the potential of some construction management tools such as Life Cycle Costing (LCC), Value Management (VM), and Building Information Modelling (BIM) etc. to increase the capability of the stakeholders to achieving a good return on investment (ROI) for the clients was highlighted with supportive arguments from the literature that highlights the importance of these tools. Meanwhile, the problem or barriers to achieving value for money on investment for the client was discussed with recommendations for improving VFM. An extensive review of the relevant literature provided a good background for the discussion of the various sections and this current research aims to build on existing knowledge in the various field of knowledge highlighted in this work.

3.0 WAYS BY WHICH PROJECT STAKEHOLDERS CAN ACHIEVE VFM

This section draws attention to ways by which the various stakeholders of a project can integrate their activities so as to achieve value for money invested in such project. Baker et al. (2013) argued that to measure value for money for any given project or programme, accountability measures, and beneficiary perceptions need to be considered, since this is the final value for money 'stamp'; they further stressed that beneficiaries feel that their needs have been catered for and that the organisation has achieved or exceeded expected results, taking into account available means (time, money, human resources) in the most efficient, effective, economical and equitable way. Furthermore, a forecast assessment of the attainable value for money need to be carried to ensure the success of a project, Burger and Hawkesworth (2011) and Regan (2014) maintained that the ex-ante assessment of value for money is not sufficient to ensure that a project will deliver value for money and that a further requirement, which is the conducting of ex-post value-for-money assessments that will determine whether or not value for money has actually been delivered.

3.1 *Detailed risk analysis and appropriate risk allocation*

The risk in construction projects is of varying degree of impact and occurrence/likelihood. Risks involved in construction projects can be categorised into procedural risks (consent and licensing risk), design risks, construction risks (time and cost overrun; defective construction, financing risks (changing economic condition), maintenance risks operating risks (ineffective operation of an asset), revenue risks (disappointing performance of the asset) among others. Risk is central to delivering a successful project and it is measured by assessing the probability and cost of an outcome at variance with expectation (Regan, 2014); therefore, an effective and detailed analysis of these risks together with an efficient plan to allocate the risk to the various project stakeholders will facilitate the pursuit of securing and improving the worth of such project hence increasing its value. HM Treasury (2006) claimed that risks are allocated to the party, or parties, which are best placed to manage and minimise these risks over the relevant period. The final equation for quantifying risk is as follows (Partnerships Victoria, 2003)

Value of risk = (consequence * probability of occurrence) + contingency factor.

3.2 *Drive for faster project completion*

A purposeful collaboration among project stakeholders in conjunction with the efficient utilization of some project management tools can serve in the good stead of reducing the overall project duration. The knowledge of several project delivery methods such as design-build, a public-private partnership, single source system etc. and the correct understanding of which of them would be most suitable to fast-track the project would help to reduce the cost associated with the elongated project schedule, hence provide value for money invested by the client. Also the use of project planning tools such as Gantt chart, Network Diagram, and Team Planner etc. will also be of help in the bid to plan and monitor the progress of work on the site.

3.3 *Curtailment in project cost escalation*

A failure of the final project cost to be within the limit of initial target cost/project budget that has a significant effect on the value derivable from such project. Take, for instance, an event hall project in which the cost overrun after the project completion amounts to about 15% of the initial target cost, coupled with interest paid on borrowed capital could ultimately reduce the initial inflow and profitability for the client/owner thereby presenting a project with below par value for money invested. Hence, the identification of likely factors or activities in a project that could result in overall cost escalation and the diligence in reducing the impact (or avoiding them) could help to ensure the final project cost doesn't offshoot the pre-determined project budget.

3.4 *Encouragement of innovation in project development*

The introduction of innovating strategies and concept to the process of procuring a service and/or constructing a project can increase its value to the clients and end-users hence securing a greater measure of value and/or return on investment. Innovative strategies could come in the form of the introduction of better and more efficient plants and equipment, development of a innovative solution, better motivation strategies for workers, improved framework for communication and decision making, improved supply chain management, the introduction of hi-tech facilities, development of cost database, efficiency in tracking supplies among others. Meanwhile, DFID (2011) advocated for a more innovative way in assessing the value of projects.

3.5 *Maintenance cost being adequately accounted for*

The application of VFM tools such as value management and life cycle cost analysis will ensure the use of durable and maintainable building element and designs that will reduce the cost required to maintain such project in the long run. Accounting for the maintenance cost should be considered at the design stage (outline design) of a project, by identifying key components of the projects, objectively decide on alternative design items or components, estimate likely maintenance cost of each alternative design components, then finally choose the most cost effective design component based on the lowest cost, provided it gives the required function and conforms to the required quality standard.

3.6 *Accurate assessment of the cost of the project*

The quantity surveyor/cost engineer on the project should endeavour to carry out an accurate assessment of the cost of the project, ensuring that the unit rate assigned to each item of the bill of quantities (BOQ) takes into its calculation, the various activities, materials, labour, plants and other variable costs that are needed to carry out the task. Also, the quantity surveyor should ensure that no item of work is erroneously excluded from the BOQ, as such error of omission though may win the contract can constitute claims and subsequent disputes if not well managed could affect the cost of the project and could in adverse situations lead to project abandonment hence loss of return on investment to the clients. Goldbach and Claire (2012) noted that when calculating the costs and risks to the government and private sector it is imperative that all costs and risks included are comprehensive and realistic; failure to do so will result in biased estimates that may lead to a less-than-optimal procurement choice and subsequent loss in value. Bidne et al. (2012) affirmed that establishing baseline cost estimates is critical in all VFM projects.

3.7 *Detailed specifications*

The importance and relevance of workable specification to any project cannot be overemphasised. More so, if such specification is well detailed, that is taking into consideration all the design components, materials, the standard of workmanships, day work schedules, rates etc. The more detailed a specification is, the greater the ease by which the quantity surveyor or estimators carries out the assessment of the cost of the project, hence the more accurate his cost estimate, and as before discussed the greater the client derives a value for his investment. An undetailed specification can give rise to dispute between the various consultants, most notably between the architect, engineer and the quantity surveyor; and if by chance the quantity surveyor does not notice that some specification of a design component are missing or he just utilize his previous experience to estimate for the project, it can result to claim by the contractor, and the contractor is successfully in filing the claim, it will result in cost overrun and subsequent reduction in value derivable by the client from the project.

4.0 METHODS OF ACHIEVING VALUE FOR MONEY IN CONSTRUCTION PROJECTS

This section discusses the various methods or techniques available to project stakeholders which when efficiently and effectively utilized or applied to the project can bring about the desired value and return on investment. These VFM techniques include life cycle cost analysis, value management, building information modelling, and lean construction methods.

4.1 *Life Cycle Cost (LCC) Analysis*

One of the methods of determining whether a project can achieve a reasonable value for money invested by the client/sponsors is the life cycle cost analysis; this management tool is usually utilized at the design stage of construction projects, this statement supports the argument by Bidne et al. (2012) that performing the LCC calculations must occur before the project is implemented. The life cycle cost (LCC) analysis is a management tool that is used to analyse the cost of constructed facilities in terms of cost of acquiring the facility and as well as maintaining and operating the facility (Olanrewaju, 2013). However, he further attests that life cycle of the project alone is not sufficient as a source of creating value to the clients and end users. Extant literature (Arditi & Messiha, 1996; Morton & Jaggar, 1995; Olanrewaju, 2013) opined that the purpose of life cycle costing is to maximize the total cost of ownership of the projects over the project's lifespan. Bennett (2003) defined it as the total cash flow of the project from the conceptual stage to the disposal stage. One of the features of a formal measurement of VFM is the forecasting of operating costs over the life of the project (Regan, 2014).

Life Cycle Costing (LCC) is a technique to establish the total cost of ownership. LCC is the present value of the total cost of the building/asset over its entire operating life and includes the initial capital and construction costs, operating and maintenance costs and the cost or the benefit of eventual disposal of the asset. LCC also takes into account the capital costs of the project as well as costs of operation and maintenance; and while information on the exact time, on the origin of LCC and the time it was first applied to the construction projects, is not available, but it can be safely concluded that it preceded the VM techniques. Life cycle costing is also being referred to as whole life cost or cost-in-use (Olanrewaju, 2013); and include capital expenditures incurred rehabilitating and improving assets, all maintenance, and operating expenses, and is a major risk factor for infrastructure services procured over terms of 20 or more years (Regan, 2014). The fundamental issue in the LCC is the determination of the operation and maintenance costs of all possible alternatives which are then discounted to present worth of money (Pasquire & Swaffield, 2006) for analysis purposes. In other words, LCC is a technique that is used to relate the initial cost with future based costs like running, operation, maintenance, replacement, alteration costs (Ahuja & Walsh, 1983; Bennett, 2003; Kiyoyuki, Sugisaki, & Kobayashi, 2005; Morton & Jaggar, 1995). Elsewhere, it is defined as the total cost of project measured over a period of financial interest of the clients (Flanagan & Jewell, 2005). Life cycle costing goes hand on hand with a VM study and it is important to look at what it is and how it is incorporated into VM (Coetzee, 2010). A well-planned and structured approach to LCC analysis helps to secure value for money invested by the client while also presenting a good future profitability assessment of such project. For instance, when the LCC of incorporating various building components and/or elements is evaluated, it will provide a good information on the project overall cost beyond just the initial project commission and this will be of great help to key project decision makers.

The LCC must also consider the costs associated with the transition of the project from the private sector to the public sector at its conclusion (Bidne et al., 2012). This calculation generally takes on the following formula:
Life-Cycle Cost = First Cost + Maintenance & Repair + Energy + Water + Replacement + Salvage Value.

4.2 *Value Management*

Another technique for achieving value for money invested is the value management (VM) methodology, however as noted by Olanrewaju (2013), there are misconceptions and misunderstandings as to which of the two techniques (LCC & VM) is more involving, proactive and can ultimately create and sustain best value for construction projects. Various terms such as value engineering, value control, value analysis and value engineering have been used to describe the principle of value engineering. VM was developed due to a shortage of materials and components that faced the manufacturing industry in the North America during the World War II. VM is both problem solving and problem seeking processes. As a problem seeking system, it identified problems that might arise in future and develop or identified a solution to the problem (Olanrewaju, 2013; Woodhead & Downs, 2001). Value management as explained by Kelly and Male (2001) is a proactive and problems solving management system that maximizes the functional value of a project by managing its development from concept stage to operation stage of projects through multidisciplinary value team.

The Institute of Value Management (2002) described value management (VM) as a technique used to reconcile the different value judgements made by various stakeholders and enable an organization to achieve the greatest progress toward its stated goals with the use of minimum resources, in order to achieve value.Value management was also defined by Olanrewaju and Khairuddin (2007) as an organized set of procedures and processes that are introduced, purposely to enhance the function of a designs, services, facilities or systems at the lowest possible total cost of effective ownership, taken cognizance of the client's value system for quality, reliability, durability, conformance, durability, aesthetic, time, and cost. Meanwhile, the Construction Industry Board (1997) defined it as a structured approach to establishing what value means to a client in meeting a perceived need by clearly defining and agreeing on the project objectives and establishing how they can best be achieved. Value management involves the identification of the required functions and the selection of alternative that maximize the achievement of the functions and performance at the lowest possible total cost (Best & De-

Valennce, 2002). It makes client value system explicitly clear at the project's conceptual stage and seeks to obtain the best functional balance between cost, quality, reliability, safety and aesthetic (Olanrewaju, 2013). VM considers various issues before proposing the best solution to clients (Abidin & Pasquire, 2005)

The value management approach reduces the risk of project failure, lower cost, shorter projects schedules, improve quality, functions, performance and ensure high reliability and safety (Olanrewaju, 2013) hence, secures the requisite value for money for clients. While, life cycle costing is useful when a 'project' has been 'selected or defined', value management is introduced much earlier. Value management is introduced when a decision has not been made yet either to build or not; at this stage, the 'project' is still soft; the client's solution to the client's problem might not even be constructed facilities. According to Kelly and Male (2001), value management is introduced to determine the kind of project that will provide to the client the expected return on investment. The approach could be introduced at any stage of the projects' life cycle, but it is more beneficial if it is introduced from the pre-construction phase of the projects; before any design is committed (Ahuja & Walsh, 1983).

A vital usefulness of this VM technique is that it incorporates the idea of sustainability in its process of analysis the value of an element of a building and/or project. Other ways by which VM helps to achieve value for money include- minimising environmental and social damage, through recommending suitable site location, selecting sustainable materials, determining elements or theme of design and choice of construction; and this corresponds with the assertions of Barton, Jones, and Gilbert (2000) that VM is economically viable and Connaughton and Green (1996) that VM reduces cost (see figure 1). Coetzee (2010) maintained that the main function of VM is not to reduce costs but to improve value and that value is made up by balancing cost, time and function/quality of the product/project. He also identified benefits of utilizing the VM techniques- it helps to identify and removes unnecessary costs associated with the project; seeks to obtain maximum efficiency ratios; it can identify possible problems early on in the project; creates a clearer focus on the project objectives etc.

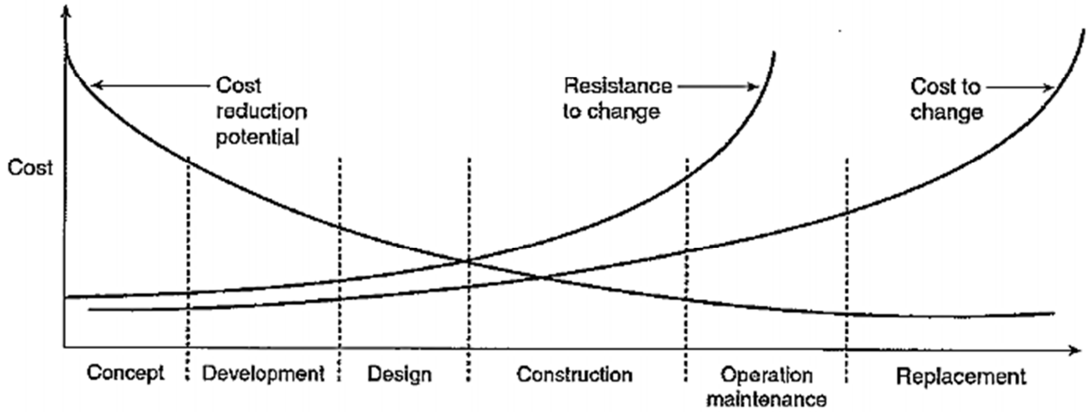

Figure 1- Opportunities and potential savings through VM (source: Ellis et al., 2004)

4.3 *Building Information Modelling (BIM)*

Building Information Modelling (BIM) can be defined as a process of generating and managing information of a building or infrastructure during its life cycle (Kuiper & Holzer, 2013); also, Eastman et al. (2011) defined it 'a modelling technology and associated set of processes to produce, communicate, and analyse building models'; they further defined BIM tools as task-specific applications that produces a specific outcome, such as tools for model generation, drawing production, specification writing, cost estimation, clash and error detection, energy analysis, rendering, scheduling, and visualization; while the National BIM Standard (NBIMS) describes it as 'a digital representation of physical and functional characteristics of a facility' (National Institute of Building Sciences, 2007, p. 21)

Building Information Modelling (BIM) represents the process of development and use of a computer generated model to simulate the planning, design, construction and operation of a building facility (Abubakar et al., 2014; Azhar, Brown, & Farooqui, 2009; Buswell et al., 2007). BIM when effectively and rigorously applied to a construction process facilitate the ease of dissemination of information, tracking of supplies, ease of estimating and building up cost rate, concept visualization among other. This, when put together, secures the needed value for money and return on investment for the client.

4.4 *Lean Construction*

Lean construction is a technique whereby efficiency in the construction process is achieved by means of minimising the waste of materials; time and effort in order generate the maximum possible amount of value. As with VM, the lean construction practice aims to reduce the unnecessary costs from the construction projects and this is done within the context of LCC as earlier discussed.

Lean principles as described by Womack et al. (1990) cited in Limon (2015) should be applied by firstly, defining the customers' requirements and expectations as the way they interpret the value. Secondly identifying the value-stream and eliminating the activity that does not add value to the process. Another basic principle is to adapt the production operations to the rate demand of the customer switching from push to pull approach (Limon, 2015). Gabriel (1997) noted that the lean approach to project management has found great usefulness in potentially difficult and complex areas which could increase the level of commitment and motivation from the project stakeholders. He further listed some its advantages as a reduction of risk to the client, with the right balance of quality, performance and value for money.

When the principles of lean construction are applied to construction projects, it helps to ensure adequate effectiveness in the utilisation of project resources such as plants and manpower, efficiency in the use of time, ensures compliance to standard and quality of workmanship, raw materials, working within budget and schedule among others (figure 2). The above benefits when aggregated, secures value for money invested by the client and increases the value of such project while reducing its cost.

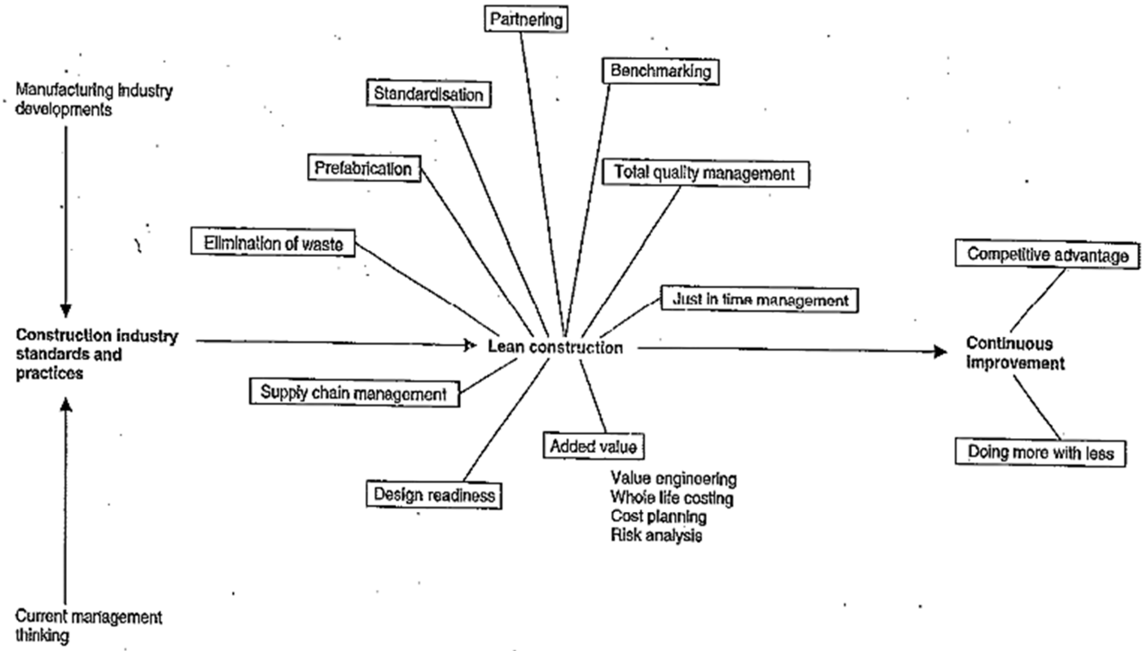

Figure 2- Lean construction. Adapted from Ashworth (2006); as cited in Coetzee (2010)

5.0 BARRIERS IN ACHIEVING VALUE FOR MONEY

Value for money assessment provides important information to assist government decision-making in matters such as the identification, measurement and allocation of risk, life cycle costing of the service options, and develops in-house expertise in matters such as specification of service requirements, business case analysis, risk-weighted financial forecasting, project appraisal, multi-stage bidding processes and bid evaluation (Regan, 2014). However, some problems had been documented and assessed as barriers to the achievement of the requisite value for money; these barriers are discussed in this section.

5.1 *Technicalities of the VFM management tools*

Abidin and Pasquire (2005) identified the absence of formal guidelines for the effective use of some of these tools as a barrier. This implied that some organisation or stakeholders have their own internal guide for the utilization of some of these VFM tools which they termed 'confidential' and thereby does not allow for a cross-collaborative framework that could have improved the effective and efficient use of some of these management tools.

5.2 *Lack of Awareness of some of the VFM tools*

These involved barriers such as the lack of cognizance of some of these tools and/or passive and negative perceptions about their application. The lack of knowledge and awareness of these tools are often related to the discussion on the barriers to VFM. This might probably be due to the fact that some of these stakeholders aren't aware that these tools (though have been in the application in the industry for over decades now) are relevant to the concept of achieving value for money for clients. It is reasonable to assert that some clients who may not adequate knowledge of the VFM tool may not be able to demand their utilization for their projects. However, informed stakeholder such as architects, engineers, and/or quantity surveyors should take this knowledge to them. If the informed stakeholders remain passive, the absorption and utilisation of this technique for VFM may remain passive.

5.3 *Unclear client priorities and objectives*

The value-for-money assessment is best carried out at the scheme design stage, however, in a situation whereby the employer/client is still unsure of the type of project, location of such project or the use to which the project will be put to after completion, can affect the correct ex-ante VFM assessment of such project. For instance, an indecision by the client on whether to let out the building after completion as either block of offices or mini-halls (for meetings and workshops), may lead to inaccurate VFM assessment; this is due to the fact that VFM assessment considers the optimum balance between the whole life cycle cost and the quality delivered.

Cox and Townsend (1998) revealed that the main problems and barriers to achieving 'value for money' include- low and discontinuous demand, frequent changes in specification, inappropriate (contractor and consultant) selection criteria, inappropriate allocation of risk, poor quality, inefficient methods of construction, poor management, inadequate investment, an adversarial culture and a fragmented industry structure.

Other barriers to achieving value for money in construction projects include:

i. Provision of incomprehensive up-front project information by clients, leading to unnecessary delays and mistakes;
ii. Demands of clients being ‘wish lists’, instead of sensible;
iii. Slow negotiations
iv. Less open communication with the client, especially on the pricing of specific risks;
v. Inconsistent risk assessment and management across different organizations of a consortium
vi. High bidding costs mainly attributed to the cost of consultancy services, of which the legal services are usually the most expensive.
vii. No standard for VFM evaluation and/or assessment procedures

6.0 CONCLUSION

Identifying value for money is sometimes a complex task, as the benefits, costs and risks need to be considered at the planning stage. Once risks, costs, and benefits have been identified, it is necessary to assess the equivalent money value where this is practicable, by making an informed and supportable decision about these benefits, costs, and risks; it is more likely that value for money can be achieved.

The study advocated that value-for-money assessment for a project should be carried out before a project is undertaken and after the project is completed to determine whether or not value for money has actually been delivered. This research also sets out ways by which VFM can be attained on a project site, these includes- detailed risk analysis and appropriate risk allocation, drive for faster project completion, curtailment in project cost escalation, encouragement of innovation in project development, maintenance cost being adequately accounted for, accurate assessment of the cost of the project, and preparation of a detailed specification.

Based on the theoretical concept and potential of VFM practices and its tools in achieve sustainable return on investment for clients; the effective introduction of VFM practices is hereby encouraged because it is realistic and practicable. However, there still exist gaps in practice and barriers to its practices, indicating room for improvement. It is proposed to introduce a way to alleviate the barriers to its practices in order to reduce the gaps and promote better efficacy and effectiveness of future VFM practices and tools. Improvement can be pursued from many angles. Among these are:

i. Improving clients’ expertise and knowledge on VFM practices.
ii. Further standardization of project risks assessment and management.
iii. Provision of standard and procedure for VFM evaluation and assessment.
iv. Seek ways to incorporate VFM practices effectively.
v. Assess current performance to identify areas of weaknesses.
vi. Introduce a guide for VFM practices and the utilisation of its tools.
vii. Promote clients’ interest on VFM practices and its tools.
viii. Prove VFM tools capability as a mechanism to deliver better sustainable value; and.
ix. Formulate strategies for effective inclusion of VFM as prequalification criteria in selecting project team members such as contractors and consultants to the project.

The findings of this research provide necessary information and instruments to assist procurement decision-makers in making informed and supportable decisions about value for money when planning procurement of projects, goods, and services.

REFERENCES

Abidin, N. Z., & Pasquire, C. L. (2005). Delivering sustainability through value management: Concept and performance overview. Engineering, Construction and Architectural Management, 12(2), 168–180. http://doi.org/10.1108/09699980510584502

Abubakar, M., Ibrahim, Y. M., Kado, D., & Bala, K. (2014). Contractors Perception of the Factors Affecting Building Information Modelling (BIM) Adoption in the Nigerian Construction Industry. COMPUTING IN CIVIL AND BUILDING ENGINEERING ©ASCE 2014, 167–178.

Ahuja H, N, & Walsh M, A. (1983), Construction Management and Engineering: Successful Methods in Cost Engineering. Canada: John Wiley & Son Inc.,

Akintoye, A., Hardcastle, C., Beck, M., Chinyio, E., & Asenova, D. (2003). Achieving best value in private finance initiative project procurement. Construction Management and Economics, 21(July), 461–470. http://doi.org/10.1080/0144619032000087285

Ansell, M., Holmes, M., Evans, R., Pasquire, C., & Price, A. (2009). Delivering Best Value in Highways Major Maintenance Schemes : Case Study. JOURNAL OF CONSTRUCTION ENGINEERING AND MANAGEMENT © ASCE, 135(4), 235–246. http://doi.org/10.1061/_ASCE_0733-9364_2009_135:4_235_

Antoine, D. du Lou. (2012). Value for Money evaluation in PPPs: difficulties and developments. KTH Architecture and the Built Environment. Retrieved from http://kth.diva-portal.org/smash/get/diva2:527412/FULLTEXT01.pdf

Arditi, D. A & Messiha, H. M. (1996), Life Cycle Costing in Municipal Construction Projects. Journal of Infrastructure System, Vol. 2 No. 1, March 1996, pp.5-14 (doi 10.1061/ (ASCE) 1076 – 0342 (1996)2; 2:1(5)

Azhar, S., Brown, J., & Farooqui, R. (2009). BIM-based Sustainability Analysis : An Evaluation of Building Performance Analysis Software. Alabama, Auburn University. http://goo.gl/MbQqwk, 1–9

Baker, J., Dross, E., Shah, V., & Polastro, R. (2013). Study: How to Define and Measure Value for Money in the Humanitarian Sector. Retrieved from http://reliefweb.int/sites/reliefweb.int/files/resources/Study-How-to-Define-and-Measure-Value-for-Money-in-the-Humanitarian-Sector-Final-Report_3659.pdf

Barr, J., & Christie, A. (2014). Better Value for Money: An organising framework for management and measurement of VFM indicators. Retrieved from http://www.itad.com/wp-content/uploads/2014/11/Itad-VFM-paper-v21.pdf

Barton, R., Jones, D. & Gilbert, D. (2000), "Initiating sustainable projects", paper presented at the International Symposium, Shaping the Sustainable Millennium, Queensland University of Technology, Brisbane.

Benntte, F. C. (2003), The management of construction: a project life cycle approach, Butterworth – Heinemann, Oxford

Best, R., & de Valence, G., (eds) (2002), Design and Construction: Building in value, Butterworth - Heinemann, Woburn

Bidne, D., Kirby, A., Luvela, L. J., Shattuck, B., Standley, S., & Welker, S. (2012). The Value for Money Analysis : A Guide for More Effective PSC and PPP Evaluation. Retrieved from http://www.ncppp.org/wp-content/uploads/2013/03/PS-051012ValueForMoney-paper.pdf

Burger, P., & Hawkesworth, I. (2011). How To Attain Value for Money : Comparing PPP and Traditional Infrastructure Public Procurement. OECD Journal on Budgeting, 2011(1), 1–56. http://doi.org/10.1787/16812336

Buswell, R. A., Gibb, A. G. F., Soar, R. C., Austin, S. A., & Thorpe, A. (2007). Applying Future Industrialised Processes to Construction. CIB World Building Congress, 2536–2547.

Campbell, C. & Rozsnyai, C., (2002). Quality Assurance and the Development of Course Programmes. Papers on Higher Education, Regional University Network on Governance and Management of Higher Education in South East Europe, Bucharest, UNESCO.

Coetzee, C. (2010). Value management in the construction industry: what does it entail and is it a worthwhile practice? The university of Pretoria. Retrieved from http://repository.up.ac.za/handle/2263/14430

Connaughton, J.N. & Green, S.D. (1996), Value Management in Construction: A Client's Guide, CIRIA, London.

Construction Industry Board (1997), Fact Sheet on Value Management, available at www.helios.bre.co.uk/valman/intro/cibfactsheet.html

Cox, A. & Townsend, M. (1998). Strategic Procurement in Construction: Towards better practice in the management of construction supply chains. Thomas Telford Publishing. ISBN- 07277 2600 5

Dallas, M. (2006). Value and risk management: a guide to best practice. John Wiley & Sons

Decorla-souza, P. (2015). Value for Money Analysis : A Tool for Evaluation of Public-Private Partnerships. Retrieved from http://www.nga.org/files/live/sites/NGA/files/pdf/2015/1511CTPPPDeCorla-Souza.pdf

DFID. (2011). DFID's Approach to Value for Money (VfM). Retrieved from https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/67479/DFID-approach-value-money.pdf

Eastman, C., Teicholz, P., Sacks, R., & Liston, K. (2008). BIM Handbook- A Guide to Building Information Modeling for Owners, Managers, Designers, Engineers, and Contractors. New Jersey, USA: John Wiley & Sons, Inc.

Ellis R.C.T., Keel D.A., & Wood G.D. (2004). Value management practises of leading UK cost consultants. Construction Management and Economics

Erlendsson, J., (2002). Value For Money Studies in Higher Education http://www.hi.is/~joner/eaps/wh_vfmhe.htm

Flanagan, R. & Jewell, C. (2005), Whole life appraisal for construction. Oxford: Blackwell Publishing Limited

Gabriel, E. (1997). The lean approach to project management. International Journal of Project Management, 15(4), 205–209.

Goldbach & Claire (2012). Public Cost Comparator for Public-Private Partnerships. National Council for Private- Public Partnerships.

Grimsey, D. (2006). Are Public-Private Partnerships value for money? Research into alternative ways of determining value for money and comparing different views, A paper delivered at a Partnerships Victoria Forum conducted in the Old Treasury Building, Melbourne, April

Harvey, L. & Green, D., (1993). 'Defining quality', Assessment and Evaluation in Higher Education, 18(1). pp. 9–34.

Highways Agency (HA). (2006). "Procurement strategy review." London, (http://www.highways.gov.uk/business/1172.aspx)

HM Treasury. (2006). Value for Money Assessment Guidance. Retrieved from https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/252858/vfm_assessment guidance061006opt.pdf

Institute of Value Management (2002), What is Value Management?, IVM, available at www.ivm.org.uk/vm_whatis.htm

Jackson, P. (2011). Value for Money and International Development: Deconstructing Some Myths To Promote More Constructive Discussion. Retrieved from http://www.oecd.org/development/effectiveness/49652541.pdf

Kelly, J., Male, S., & Graham, D. (2004). Value management of construction projects, Blackwell, Oxford, U.K

Kelly, S. R. & Male, S. P. (2001), Value management in design and construction: the economic management of the project. 1st Edition. E and FN Spon. London

Kiyoyuki, K., Sugisaki, K., & Kobayashi, K. (2005), Statistical deterioration prediction considering the non-uniformity of the visual inspection interval, In Proceedings of the International seminar on asset management. Jointly organized by Kulliyyah of Architecture and Environmental Design and Kyoto University Japan. Held on 24th – 25th, 2005 in Kuala Lumpur, Malaysia

Kuiper, I., & Holzer, D. (2013). Rethinking the Contractual Context for Building Information Modelling (BIM) in the Australian Built Environment Industry. Australasian Journal of Construction Economics and Building, 13(4), 1–17.

Limon, D. H. (2015). Measuring Lean Construction. Norwegian University of Science and Technology.

Morallos, Dorothy and Adjo Amekudzi. "The State of the Practice of Value for Money Analysis in Comparing Public Private Partnerships to Traditional Procurements." Public Works Management & Policy 13.3 (2008): 114-125.

Morton, R. & Jaggar D. (1995), Design and the economics of building, London: E and FN Spon.

National Institute of Building Sciences, (2007). National building information modeling standard: version 1—part 1: Overview, principles, and methodologies, s.l.: s.n.

Olanrewaju, A. A., & Khairuddin, A. (2007), Determining whether Value Management is practiced in the Nigerian Construction Industry, In Proceeding of Quantity Surveying International Convention (QSIC). Jointly organized by Visit Malaysia 2—7; International Islamic University Malaysia; Board of Quantity Surveyors Malaysia; Institution of Surveyors Malaysia; JKR and CIDB. Held on 4-5th September 2007, Kuala Lumpur.

Olanrewaju, A. L. A. (2013). A CRITICAL REVIEW OF VALUE MANAGEMENT AND WHOLE LIFE COSTING ON CONSTRUCTION PROJECTS. International Journal of Facility Management, 4(1), 1–12.

Partnerships Victoria (PV, 2003). "Partnerships Victoria: Public Sector Comparator". Department of Treasury and Finance, Victoria, Australia.

Pasquire, C. & Swaffield, L. (2004), Life-cycle / whole-life costing. In Kelly, J., Morledge R. and Wilkinson, S (editors) (2004) Best Value in construction. Oxford: Blackwell Publishing

Regan, M. (2014). Value for money in project procurement. Faculty of Society and Design Publications. Paper

120. Retrieved from http://epublications.bond.edu.au/fsd_papers/120
Thomson, C., & Goodwin, J. (2005) Evaluation of PPP projects Financed by the EIB. European Investment Bank
TTF (1998) Treasury Taskforce Private Finance: Step by Step Guide to the PFI Procurement Process, HMSO, London
University of Cambridge, (2010). A Brief Guide to Value for Money (summarised from HEFCE website) available at http://www.admin.cam.ac.uk/offices/secretariat/vfm/guide.html
Woodhead, R. & Downs, C. (2001), Value Management Improving Capabilities, Thomas Telford, London