VALUE ENGINEERING/MANAGEMENT IN CONSTRUCTION PROJECT IMPLEMENTATION, MONITORING AND EVALUATION IN NIGERIA

1.00 Preamble

Construction projects contain numerous inter-dependent and inter-related activities that employ voluminous resources. The fast changing environments of the present era impose numerous time, cost, financial, legal, ethical, environmental and logistics constraints. They have in-built difficulties, uncertainties and risks. This underscores the importance of the project management as emerging discipline which involves application of knowledge, skills, tools, and techniques to project activities to achieve project requirements. Project management is accomplished through the application and integration of the project management processes of initiating, planning, executing, monitoring and controlling, and closing. The paper presents the nexus between the Theme of the Workshop and the Sub-theme - Value Engineering (VE)/Value Management (VM) in Construction Project Implementation, Monitoring and Evaluation in Nigeria. Unfortunately, the application of Value Management/Engineering in Construction project implementation, monitoring and evaluation in Nigeria is still at infancy or non-existent. The new Scale of Fees for Quantity Surveying and Project Management Consultancy (Agreement, Charges and Conditions of Engagement) issued by the QSRBN with effect from 13th July, 2016 listed Value Management as one of the Management Services (Service Type C) under First Schedule to be offered by Quantity Surveyors under special engagement. The Institute's professional development trajectory in creating awareness among Quantity Surveyors to leverage on the potential opportunities abound in the Value Management application as a tool in construction project implementation, monitoring and evaluation in Nigeria is commendable.

2.00 Overview of the Sub-Theme

In view of the imposed constraints and limited resources, construction projects activities require optimal resource allocation and resource levelling by application of the process of Value Engineering/Value Management at the inception stage of a project where the primary goal is to determine the client's needs and wants related to both cost and worth by the use of *functional analysis and other problem solving techniques* (OR techniques); for effective implementation, monitoring and evaluation. The paper discussed taxonomy of VE/VM and its definition; general principles and conduct of VE/VM studies; alternative approaches to value management; value engineering process and nexus between the Theme and Sub-theme of the Workshop. However, while the term Value Management (VM) is favoured in the UK; the term Value Engineering (VE) is used extensively in the USA where it is often performed by engineers with applications to manufacturing industry as accentuated by Society of American Value Engineers (SAVE) standard methodology. The SAVE methodology is based on the Standard North American 40-Hour Workshop that takes place over five days. Hence, in this paper, the two terms VE/VM will be used interchangeably.

With regard to limited resources in Nigeria today, the process of VM/VE is more than ever before quintessential now, due to dwindling resources of government when budgeting; for efficient capital project monitoring and evaluation to achieve: value for money by cutting down wastes, reduce superfluous design, meet users' requirements, address technical/environmental/legal/socio-economic issues and project prompt delivery.

To curb wastes and meet client's and user's needs, different approaches have been formulated to come up with a job plan incorporating a recognisable strategy for value management. There are several definitions, but for the purpose of this paper, we will adopt the following definitions for the sake of emphasis:

- Value Management/Value Engineering process is a structured technique that attempts to determine, at an early stage prior to detailed design, the functions that the completed project is required to fulfil (SAVE).

- Miles' descriptions of the fundamentals of value analysis in the USA in 1972 defined VE/VM as follows:

i. "An organised approach to provide the necessary functions at lowest cost (whilst not affecting the quality of the product)"
ii. "A structured analysis of a project by an independent consultant or person to determine the required functions of the building (product) and to consider alternative (design/consideration) solutions to eliminate unnecessary cost".
iii. "The search for (and elimination of) unnecessary cost; unnecessary cost being that cost which provides neither use, nor life, nor quality, nor appearance, nor customer features".

- Furthermore, Kelly and Male, (1993) opined that VE/VM is "a service which maximises the functional value of a project by managing its evolution and development from concept to completion, through the comparison and audit of all decisions against a value system determined by the client or customer".

3.00 General Principles and Conduct of Value Engineering/Value Management Studies

The VE/VM process was first developed and introduced into the manufacturing sector in America immediately after the Second World War.

The principal objective of this technique is to gather together the principal stakeholders of a new project in a workshop over a four or five day period. This enables the functional requirements and alternative solutions, with their associated costs, to be identified and developed to a strict timetable.

The process is managed by a value management practitioner, an independent team of experienced design team professionals acting in a consultative capacity to the client. The process involves the analysis of the required functions of a new project and then the investigation of how these functions may be achieved as shown in figure 1. Concentrating of functions allows items that do not contribute to the identified functions, referred to as wastes, to be removed from the design. On the completion of the workshop, the value management practitioners produce a comprehensive report, with recommendations, for review and assessment by the client and his project design team.

It is a complementary role, acts as a positive catalyst for savings and improved design efficiency. VE can be undertaken at any stage of the design process. But, the earlier the study is undertaken the more effective to rationalise design to avoid significant increase in design/planning costs.

In the traditional cost planning approach, cost is apply to the product (summation of elemental costs), whereas, VE takes sideways step and applies costs to the required functions, and then looks at ways, through design and construction, for providing *functionally optimised* building projects. The approach is termed; *"don't buy product, buy function"*.

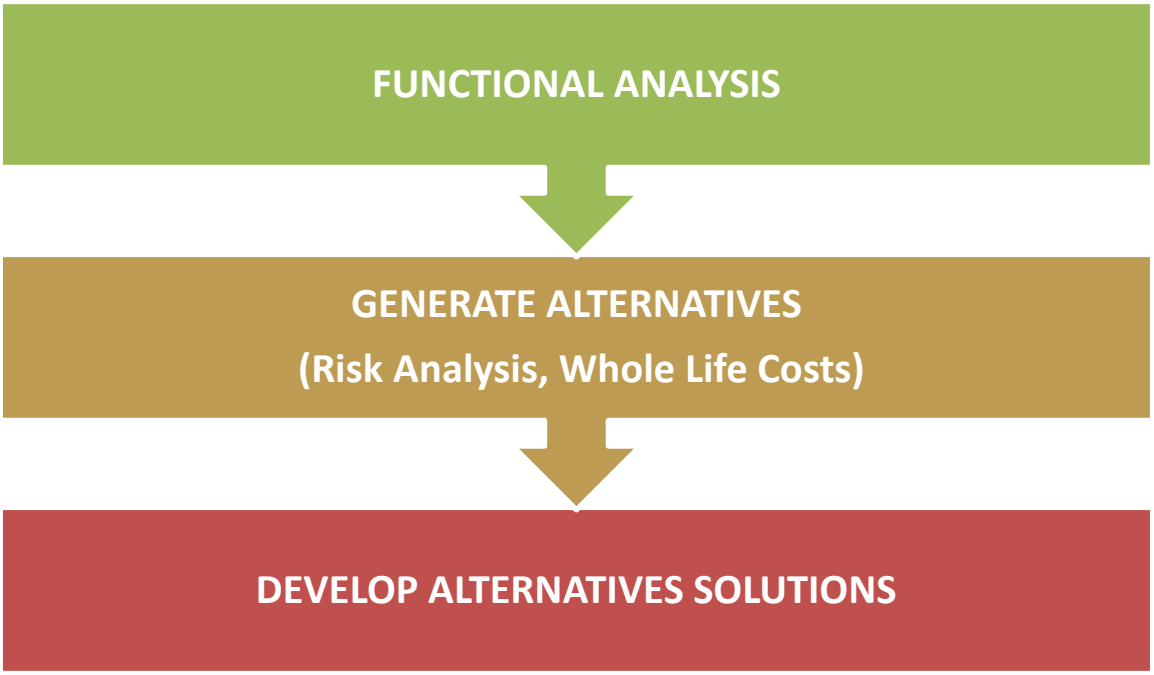


Figure 1: A structured technique for VM/VE

4.00 Eliminating Unnecessary Costs

Unnecessary cost can be defined as: cost that provides neither additional function, length of life nor user's benefit and can be as a result of:

1. The need to check escalation of estimated costs
2. Disparity in tenders figure received in excess of budget
3. Eroded confidence in the design team and/or project, arising from such factors as planning delays, external factors or lack of competence
4. Due diligence that requires an independent audit or appraisal of the project before it is submitted for authorization.
5. Pursuit for value-for-money which requires capital and/or operational minimisation and profit maximisation.
6. Appetite for innovative techniques for function efficiency
7. Optimisation of scare resources to achieve required performance standards at lower cost or improved standards for the same cost.

5.00 Value Management/Engineering Process

The process that has evolved based on the concept of value and functional approach. It is *proactive, creative, problem-solving or problem-seeking service* which maximises the functional value of a project by managing its development from concept to use.

The underlying philosophy of VM is to eliminate all COSTS that do not contribute to the performance of the required FUNCTION (unnecessary cost) or sourcing for an alternative that will equally deliver the same or better function at a reduced cost.

The application of the VM process during briefing phase, i.e. prior to any design work being done, precludes the inclusion of poor design and unnecessary cost. VE includes assembling of multidisciplinary team to define, challenge and question the role or function of either the whole facility or an individual component part in a controlled environment that the quest to remove unnecessary cost can be satisfied. It is through the removal of unnecessary cost that it is possible to enhance VALUE.

5.10 Value Management/Engineering Approaches

There are a number of different approaches (dependent on the type and nature of project) that can be adopted when carrying out VM such as: The Charette; The One-Two Day Workshop/Study; The Two or Three Day Workshops; The Concurrent Study; The Package Review; The Contractor's Change Proposal; The Design and/or Construction Audit and The 40-Hour Value Engineering Workshop/Study Methodology (SAVE).

i. **The Charette** – undertaken after the project brief has been formulated and the design team appointed before the actual design is commenced. Ideas generated during functional analysis are evaluated, and if accepted are incorporated in a revised brief.

ii. **The One-Two Day Workshop/Study – Carter (1992a):** all members of project design team usually make a brief verbal presentation to other stakeholders. The value manager records relevant data to identify major constraints e.g. physical (site, ground conditions, etc.); operational, statutory, time, cost and their impact on the project. FAST diagram (Functional Analysis System Technique) is prepared, while the quantity surveyor/cost engineer then breaks down the cost plan (where available). The FAST diagram is then examined to identify any functions with abnormally high cost or functions which can be omitted or modified. Next is brainstorming session to modify the brief, relax the constraints or modify the design/construction proposals to achieve a more efficient design or technical solution to eliminate unnecessary costs. The value manager produces a comprehensive report encompassing all the elements of the study and concluding with recommendations as to which items are to be developed by the project team for implementation by the client/project sponsor.

iii. **The Two or Three Day Workshops – Doyle (1993):** a joint venture that involves a planned series of highly structured think tank session chaired by an outside professional facilitator. The two successive workshops explore the objectives, perceptions and interpretations of the brief and address issues in a pre-emptive way.
Workable shortlist of ideas is produced by rating their cost and functional values; approximate cost implications are identified and finally rated and prioritised for possible incorporation in the brief but ensuring that the original aims are reflected and cost effective solutions are identified.

iv. **The Concurrent Study – (Smith, 1993)**: this approach uses the existing project team under the chairmanship of a value manager or facilitator. The group meet on regular basis during the project design phase offering maximum continuity. However, it has the disadvantage that creativity is not so evident and may be expensive than the 40-hour workshop.

v. **The Package Review – (Smith, 1993):** normally adopted in Management Form of Contract, where comprehensive package reviews with detailed appraisal of individual package carried out by project design team on continuing basis throughout the design, procurement and construction phases. Specialist contractors and manufacturers are essential part of the process.

vi. **The Contractor's Change Proposal (Smith, Kelly and Male, 1993):** in this approach, the contractor is encouraged under the US government contract to initiate value engineering proposal on a voluntary basis that are critical for positive change proposal value addition to the design after the award of contract. The contractor shares in any resultant savings if the VE proposal is implemented. It promotes proactive ideas and opportunity to bring to bear, construction/engineering knowledge and expertise to improve the facility at the on-site stage; albeit there is possibility of delay while the design team investigate the merit and viability of the proposed changes which tend to be relatively superficial.

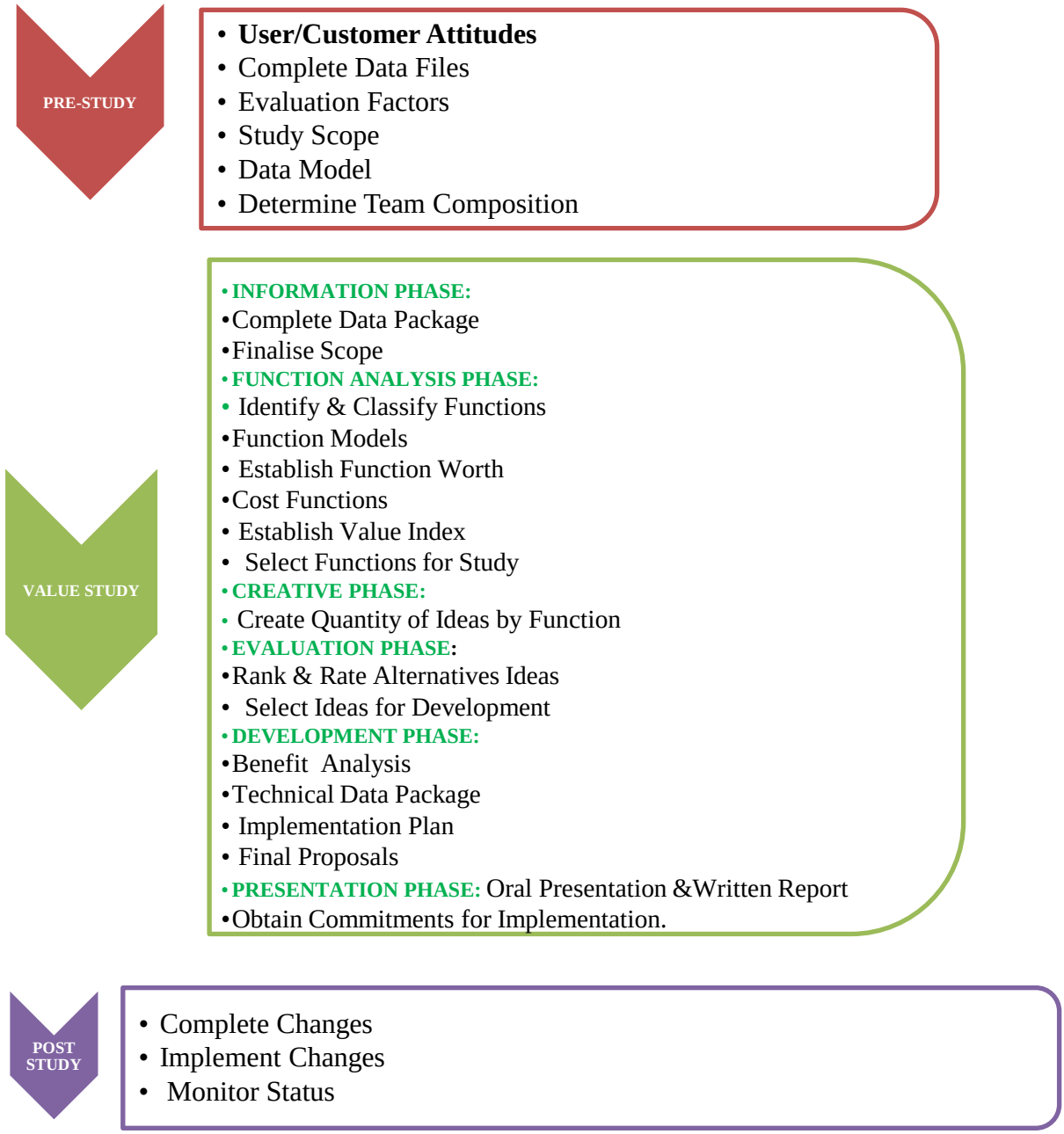
vii. **The Design and/or Construction Audit (Smith, Kelly and Male, 1993):** in this approach, project objectives are defined with provision for their costs and that of project's worth. The procedure is similar to that of Charette or 40-hour Workshop of SAVE (Smith, 1993). **Similarly,** VE Audit (Kelly and Male, 1993) is whereby a value engineer acting on behalf of a large corporation company or government department reviews expenditure proposals submitted by subsidiary companies or agencies, and the procedure follows that of the normal job plan.

For the purpose of this paper "The Standard North American 40-Hour Workshop that takes place over five days will be recommended, probably being the most widely accepted formal approach to Value Management use for training value engineers as prescribed by the Society of American Value Engineers (SAVE). This procedure is fit for purpose of budgeting.

5.20 The 40-Hour Value Engineering Workshop/Study Methodology (SAVE)

The Methodology is based on 40-hour workshop and it is customary to prepare a "Job Plan" integrating an identifiable strategy for the VE process broadly segmented into 3 Phases: Pre-Study; Value Study and Post Study as depicted in figure 2.

Figure 2: Value Management Process (Source: Society of American Value Engineers)



The process is managed by a Value Management Practitioner, who can be any of construction professionals with competency in Value Management; often decided by the *type and nature of the project*, *the timing of the operation* and *the composition of the design team*.

1. **PRE-STUDY PHASE:** Where members of the Value Management team become familiar with the project parameters such as user/customer attitude, project data/objectives, evaluation factors, scope of study, data models and team composition.

2. **VALUE STUDY PHASE** (Functional Analysis): This Phase is broken down into the following ***Six (6) Phases*** that take the workshop through a 'structured process':

i. Information Phase - Assembly of relevant information about the project under review to prepare Cost/Benefit Analysis of the Project Objectives.

ii. **Function Analysis Phase:**

- **Functional Analysis** is a powerful technique in the identification of the primary functional requirements of a project. Firstly, Functions are defined, classified into primary (needs) or secondary/supporting (wants) function(s). (Primary function impacts on the functionality of the completed project). Out of the list of functions emerges the highest order function that can be defined as the overall reason for the project and meets the overall needs of the client. Function of an item or system can be expressed as a concise phrase that provides a precise and readily understandable description of the function: e.g. 'control access'; 'increase safety'; 'support environment'; etc.

  Cost and **Worth are allocated to each function.** The cost is the amount derived from the cost estimate while worth is the lowest possible cost at which the function can be performed. In practice, worth is generally derived by the value management team making evaluation based on comparison of standards of the design component, historical cost data and/or experience. The Total Cost and Worth of the component's functions are calculated and converted to a **Cost/Worth Ratio**. Generally, when a **Cost/Worth ratio is 2.00 or above,** the component is likely to be adopted for its cost reduction effect. It should be recognised that it is not usually possible to seek alternatives to a technical solution without first identifying the functional definition.
- Next, having established the Worth and the Cost, the **Value Index** can be calculated with the formula: **Value = Worth/Cost. Note: The benchmark is to achieve a ratio of 1**. Worth of secondary function, non-essential function is taken as zero. The first areas to examine for savings are those that perform secondary functions that can be reduced or deleted entirely without affecting the basic function of the component (Norton, 1992a).
- Alternatively, another Model to do functional analysis is Function Analysis System Technique (FAST) Diagram.

Based on client's or user's method of calculating costs of using a facility, cost /benefit analysis is carried out with the aid of **Function Analysis Technique** and construction of cost models such as **Function Analysis System Technique (FAST) Diagram**.

iii. **Creativity/Speculation Phase -** This comprises the generation of suggestions as to how the required functions can be performed or improved. Group creative technique should be introduced such as 'synetics' (the art of producing a greater end result than the sum of the individual parts).

iv. **Evaluation/Analysis Phase -** Consists of the evaluation of ideas generated in the creative phase, e.g. collective or individual rating systems. It also entails the rejection of any unproductive speculative ideas with high numbers.

v. **Development Phase -** Here the accepted ideas generated at the evaluation phase to have merits are examined and potential savings are calculated, taking cognisance of both capital cost and the effect of operational and maintenance costs (life cycle costing). The use of Cost Models and Computer aided calculation is advisable due to considerable scope of work involved. Any ideas which either cost more than the original or are found to reduce quality are discarded.

vi. **Presentation/Proposal Phase -** comprising the presentation (oral presentation and written reports) of the refined ideas considered to worth implementing, supported by drawings, calculations and costs.

3. **POST STUDY PHASE:** Completes changes, implements changes and monitors status. Feedback from the sponsors of the VM exercise should ideally be passed back to the VM team to complete the learning cycle.

5.30 Value Management Techniques

From the aforementioned, there are two fundamental and more operationally important techniques used in value management, namely **Functional Analysis** and **FAST Diagram**. An understanding of these processes will be essential knowledge and helpful when studying the application of Value Management to construction project implementation, monitoring and evaluation in Nigeria.

5.3.1 Application of Functional Analysis to Construction Projects

The approach to Functional Analysis had been dealt with in the course of the discussion; however, the following **Procedural Notes** are important for ease of understanding.

Kelly and Male (1992) described how in a Functional Analysis the function of each component is examined by asking the question **'what does it do?'** In a Value Management study, the next

question is likely to be **'how else can this be achieved?'** An intensive brainstorming session is held and other technical solutions are then generated.

Kelly and Male (1993) have subdivided Functional Analysis into four (4) phases or levels **(CEST)** as follows:

1) **Task:** When a client perceives a problem in a facility through a study of the facility in terms of efficiency, safety, market or profitability during the post occupancy evaluation (POE) phase of the project, the client will be more inclined towards functional analysis of subsequent projects. Thus, an alternative is to approach a value manager who, with representatives of the client organisation, can carry out a value audit and this will help the client to decide whether the provision of a new facility offers the best solution to the perceived problem.
2) **Spaces:** The next step is for the design team to prepare the brief along with client with a view to addressing the perceived problems. A full performance specification of requirements may not be available from the client, therefore, it may be necessary for the design team to determine the client's functional requirements in terms of space requirement and other functional requirements to address the problems through production of sketches and cost plans.
3) **Elements:** This is the stage at which the facility assumes a structural form. The purpose of an element is to enclose and perform specific function and make comfortable the space provided, but it does not contribute to the client's requirements.
4) **Components:** This is where the elements become part of the built form. Contact with the client is limited at this stage since the client value system is likely to have been incorporated at previous levels. Components are chosen to satisfy the requirements of the elements in terms of surrounding and servicing space.

However, according to Norton (1992a) function determination may not always be straightforward, particularly as the basic (primary) functions of one item may be considered at different levels termed **levels of abstraction**. Hence, it is important to know at the outset of a VM study the operative levels of the functions (**Level of Service**), which in practice, the level of abstraction, are defined by factors such as the client's requirements for the study, design stage, etc.
In order to assist the identification of level of abstraction, a hierarchy may be determined based on the **'how-why' approach.**

5.3.2 Application of FAST (Functional Analysis System Technique) Diagram to Construction Projects

The FAST diagram developed from the functional analysis approach to establish a ***hierarchy of functions*** and **to identify the means by which they can achieve an end result or objective**. The principal advantage of the method is that it breaks the overall problem down into individual and readily manageable components and permits a balance analysis at different levels. It leads naturally to the identification of those items in the current brief or design which attract high cost for low functional value and those items of high importance coupled with low cost.

The value of FAST diagrams can be much enhanced by adding the costs of the various activities. The system revolves around 'how-why' relationships in the studies by Norton (1992a) and Kelly and Male (1991). Thus, they resemble a decision tree, by answering the questions 'WHY' when reading from right to left and 'HOW' when reading from left to right as shown in figure 3.

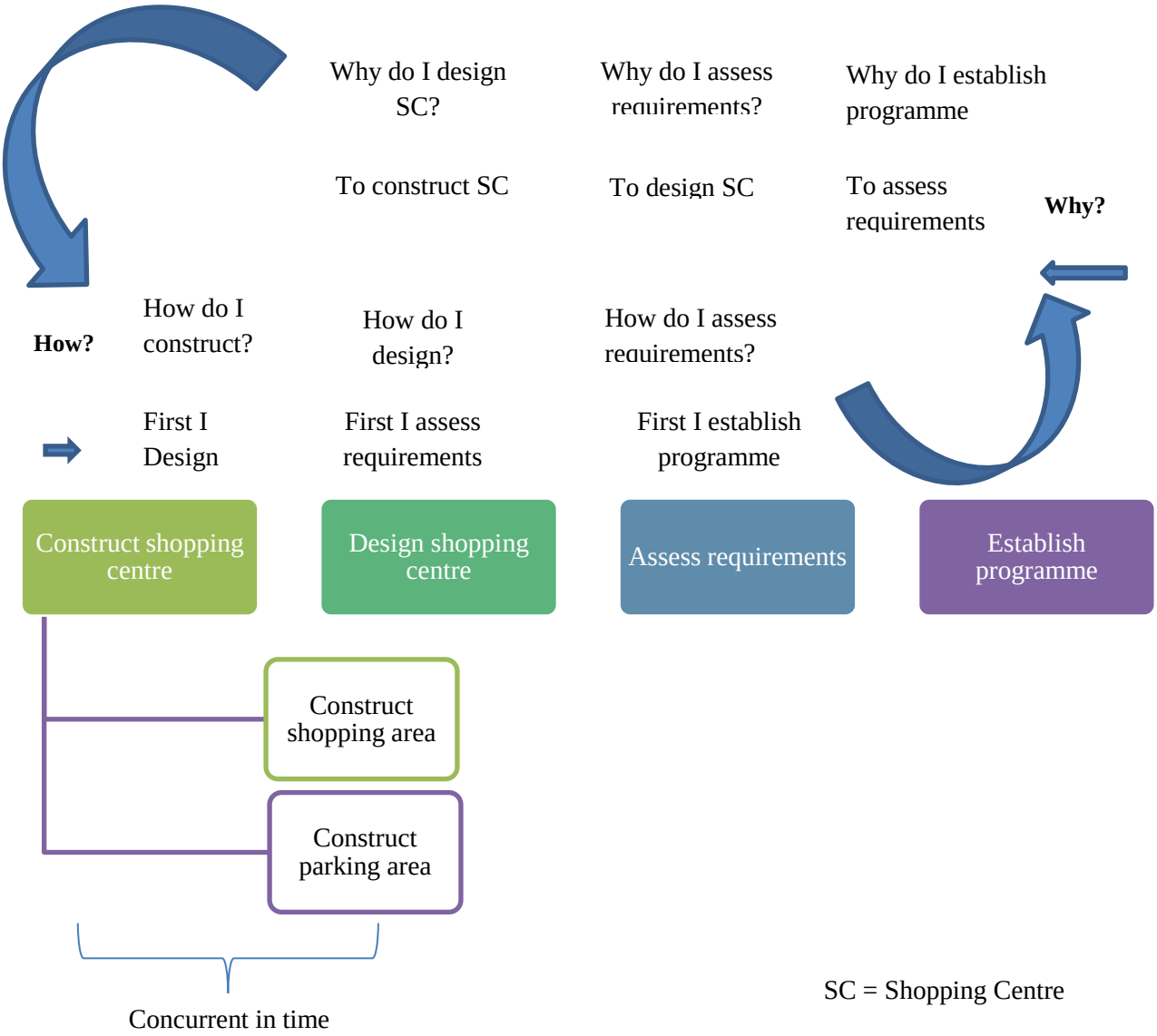


Figure 3: Extract from a typical FAST diagram (Norton, 1992a)

However, Carter (1991/1992) works in the opposite direction through a study on how to compile FAST diagrams for construction project by following **procedural notes** as follows:

i. Identify key function(s) of project
ii. Compile FAST diagram, working from Left to Right WHY? – HOW?
iii. Divide/Subdivide functions and elements into components to appropriate level of details.
iv. Number each item as indicated in figure 4.

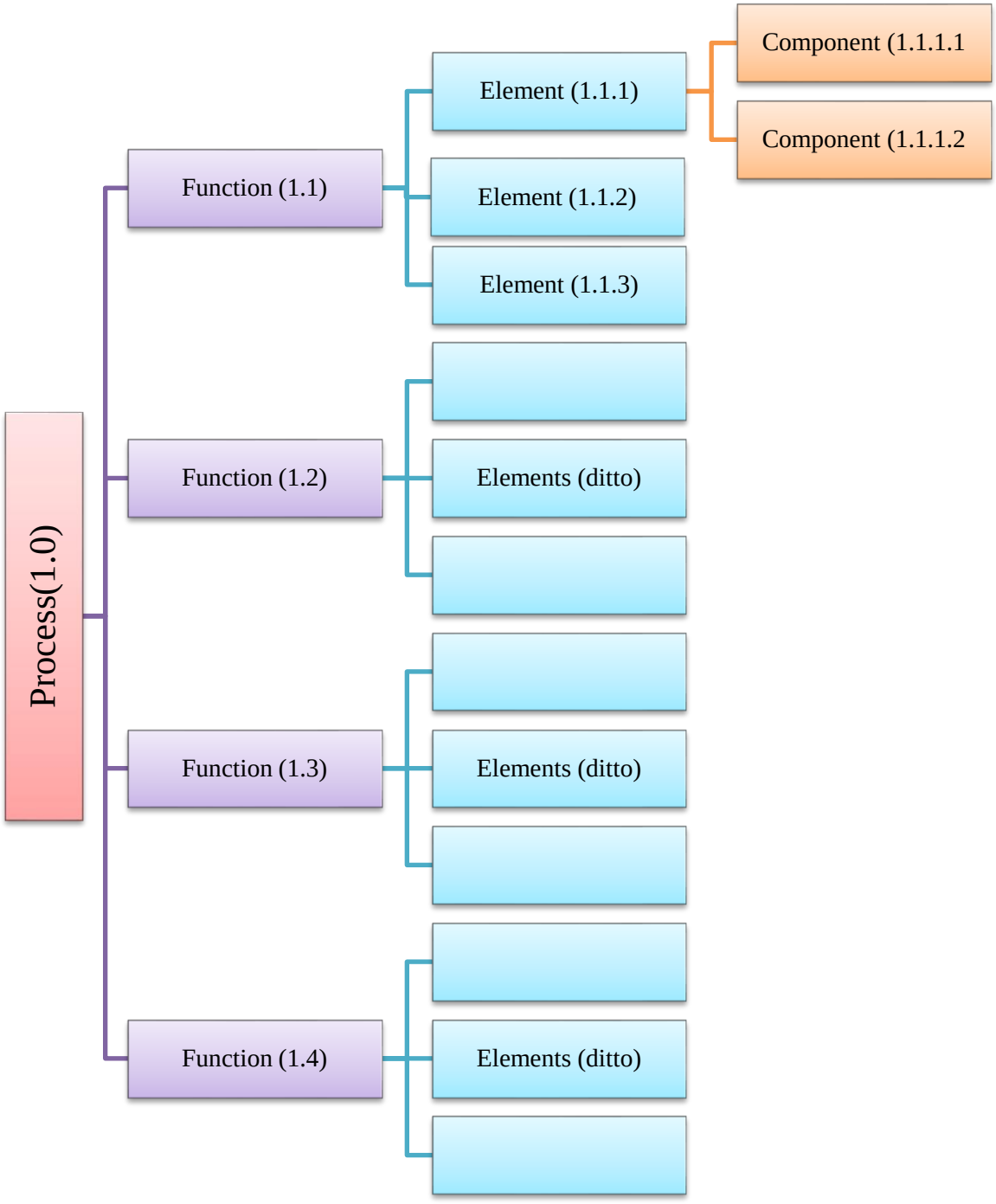


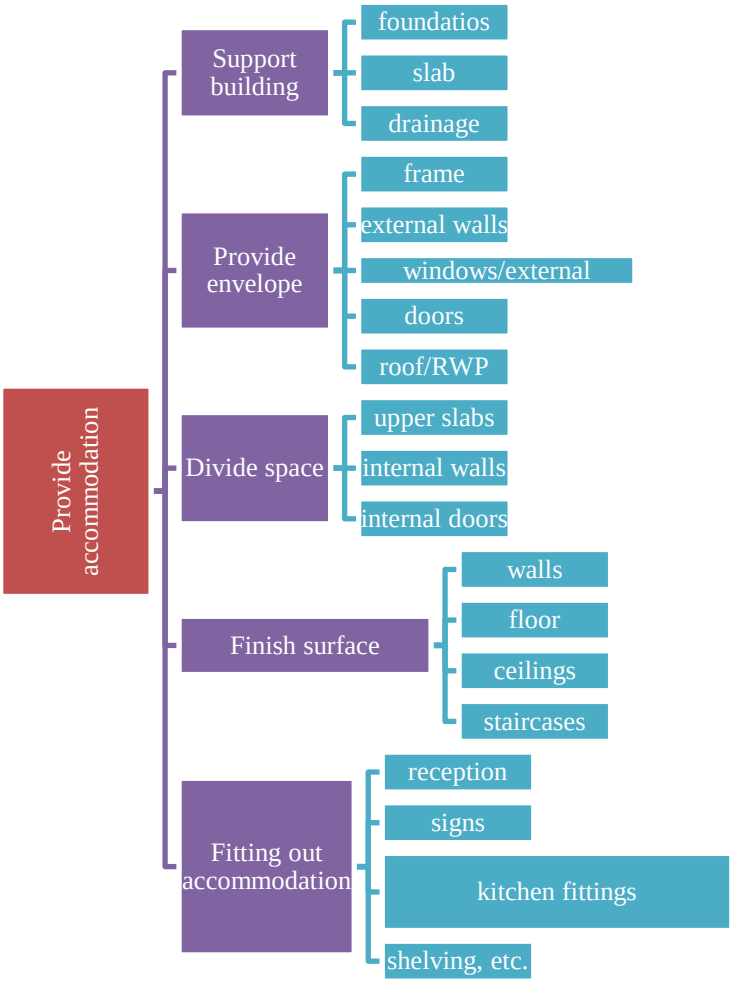
Figure 4: Compiling a FAST diagram
Courtesy: Tim Carter of Davis Langdon Management

Typical Functions (not exclusive) identified in earlier studies:

- ✓ Prepare site
- ✓ Provide temporary facilities
- ✓ Provide accommodation (A)
- ✓ Provide internal environment (B)
- ✓ Accommodate services (plant rooms, ducts, floor/ceiling void, etc.)
- ✓ Enhance quality (prestige)
- ✓ Reduce cost (operational and/or maintenance)
- ✓ Provide flexibility
- ✓ Provide for expansion
- ✓ Comply with regulations (in house or statutory)
- ✓ Ensure equipment reliability/availability
- ✓ Secure operations
- ✓ Safety requirements
- ✓ Enhance working conditions (provide acceptable working environment)
- ✓ Provide external environment (works)
- ✓ Provide welfare facilities
- ✓ Circulation facilities
- ✓ Accelerate completion

Typical Subdivision of Functions

A) Provide accommodation:



6.00 Value Engineering/Management Vs. Budgeting and Capital Project Monitoring and Evaluation: Any Nexus?

It is pertinent to mention and discuss the application of Value Engineering/Management in the process of budgeting and capital project monitoring and evaluation in constrained economic situation presently plaguing the Nigerian economy necessitating prudent fiscal and monetary policies of the present administration.

In the same vein, government had introduced "Zero- Based Budget" (ZBB) approach to ensure resource optimization in line with priorities of government and fiscal discipline that will optimize the impact of public expenditure and link budget preparation to strategic planning. The underlying philosophy of VM is to eliminate all costs that do not contribute to the performance of the required function (unnecessary cost) or sourcing for an alternative that will equally deliver the same or better function at a reduced cost- the main objective of Zero-Based Budgeting.

Just as in the traditional cost planning approach, cost is apply to the product (summation of elemental costs), the VE takes sideways step and applies costs to the required functions, and then looks at ways, through design and construction, for providing functionally optimised building projects. The traditional approach to budgeting known as **Incremental Budgeting** bases the budget on the current year's result plus an extra amount for estimated growth or inflation next year – the practice before the 'Change Mantra' of the present administration of President Muhammadu Buhari. Incremental Budgeting encourages slack and wasteful spending to creep into budgets.

Incremental budgeting is a budget that is mainly concerned with the increments in costs and revenues which will occur in the coming period. It is a reasonable procedure if current operations are as effective, efficient and economical as they can be! But in Nigerian context, how effective, efficient and economical are the operations of the civil service, with the epileptic service delivery systems? It is useful for rent, salaries, etc. In general however, it is an inefficient form of budgeting as it encourages slack and wasteful spending to sneak into budgets as past inefficiencies are perpetuated.

While Incremental Budgeting is considered to be the quickest and easiest method of budgeting and suitable in a stable environment where historical costs are reliable and not expected to change significantly; Incremental Budgeting builds in previous problems and inefficiencies which may encourage managers to spend up the budget allowances so they can get same or larger next year. Thus, uneconomical activities may be continued.

Likewise, in the face of dwindling resources of the Nigerian government, alternative approaches to budget preparation were considered such as: Zero Based Budgeting (ZBB), Rolling Budget and Activity Based Budgeting (ABB). However **Zero-Based Budgeting (ZBB)** is currently being adopted by the Nigerian government. For ease of understanding, a snap shot of the ZBB is briefly discussed to draw nexus between Value Management and Budgeting / Capital Project Monitoring and Evaluation albeit outside the scope of this paper.

6.10 Zero-Based Budgeting (ZBB):

A budget is a quantified plan of action for a forthcoming accounting period. A budget can be set from the **top down** (**imposed** budget) or from the **bottom up** (**participatory** budget). The objectives of a budgetary planning and control system are:

i. Ensure the achievement of the organisation's objectives
ii. Compel planning (the most important feature of a budgetary planning& control system)
iii. Communicate ideas and plans
iv. Coordinate activities
v. Provide a framework for responsibility accounting
vi. Establish a system of control
vii. Motivate employees to improve their performance.

Similar process as in a structured technique for Value Management Process in figure 2 above occurs in budget planning and control system. The budget planning and control cycle has Seven 7 Steps:

Step 1: identify objectives
Step 2: Identify potential strategies
Step 3: Evaluate strategies
Step 4: Choose alternative courses of action
Step 5: Implement the long-term plan
Step 6: Measure actual results and compare with plan
Step 7: Respond to divergences form the plan

Planning Process

Control Process

The first five steps cover the **planning** process. Planning involves making choices between alternatives and is primarily a decision-making activity. The last two steps cover the **control** process, which involves measuring and correcting actual performance to ensure that the alternatives that are chosen and the plans for implementing them are carried out.

6.20 Principle of Zero-Based Budgeting (ZBB) and VE/VM Philosophy

Recall that Functional Analysis is a powerful technique in the identification of the primary functional requirements of a project, and the underlying philosophy of VM is to eliminate all costs that do not contribute to the performance of the required function (unnecessary cost) or sourcing for an alternative that will equally deliver the same or better function at a reduced cost.

So also, the principle behind ZBB is that the budget for each cost centre should be made from 'scratch' or zero. Every item of expenditure must be justified in its entirety in order to be included in the next year's budget. ZBB rejects the assumption inherent in incremental budgeting that next year's budget should be based on the current financial year results (or the current year budget), with adjustments for incremental changes, such as growth and inflation.

It is based on recognition that:

- ✓ The current year's results may include wasteful spending and inefficiencies
- ✓ Budgeted activities should be reviewed and assessed to establish whether they are still required or whether they should continue at the same level of activity as in the past.

In practice, however, mangers do not have to budget from zero, but can **start from their current level of expenditure and work downwards**, asking what would happen if any particular aspect of current expenditure and current operations were removed from the budget. In this way, every aspect of the budget is examined in terms of its costs and the benefits it provides and the selection of better alternatives is encouraged.

6.30 Implementing Zero-Based Budgeting and Value Engineering/Management

Furthermore, recall application of FAST diagram to construction projects: The FAST diagram approach is to establish a hierarchy of functions and to identify the means by which they can achieve an end result or objective. It breaks the overall problem down into individual and readily manageable components and permits a balance analysis at different levels; and leads naturally to the identification of those items in the current brief or design which attract high cost for low functional value and those items of high importance coupled with low cost.

Similarly, there is a three-step approach to ZBB:

- ➢ Define items or activities for which costs should be budgeted, and spending decisions should be planned these are **"decision packages".**
- ➢ Evaluate and rank the packages in order of priority: eliminate packages whose costs exceed their value
- ➢ Allocate resources to the decision packages according to their ranking. Where resources such as money are in short supply, they are allocated to the **most valuable activities.**

The implementation of ZBB involves a number of steps, but the success of ZBB depends on the application of **a questioning attitude** by all those involved in the budgeting process. Existing practices, activities and expenditures must be challenged and searching questions about their **value** should be asked:

- ✓ Does the activity need to be carried out?
- ✓ What would be the consequences if the activity was not carried out?
- ✓ Is the current level of provision sufficient?
- ✓ Are there alternative (and cheaper) ways of achieving the same objective?
- ✓ How much should the activity cost?
- ✓ Is the expenditure worth the benefits achieved?

- ❖ The commanding objectives of value engineering/management and zero-based budgeting are not just cost cutting exercises, but rather techniques take account of the three-way relationship between **FUNCTION, COST AND VALUE.**

7.00 Conclusion

The two techniques – Value Engineering/Management and Zero-Based Budgeting (ZBB) have identified three important aspects of value improvement and addition: same performance at reduced cost; improving performance at same cost and improving performance at reduced cost.

The paper endeavoured to outline the way in which value engineering/management can complement cost planning, to provide an improved service to the client. It emphasised the optimum timing the value management study should be conducted which is between 10 – 35 % stage of the design process (Carter, 1991/92); using the design team chaired by a value management team coordinator or by an independent value management team

The paper emphasised that, where appropriate, consideration should be given to capital cost, life cycle costs, programme, buildability and/or optimum return on money to achieve value for money. The design teams should not see value management or design/cost reviews as an attack on aesthetics or quality or alternative solutions as criticisms of the existing design.
According to Brown (1992), value management represents a natural progression for the Quantity Surveyors in leading the search for alternative technical solutions and presenting them as evaluated and costed options.

In view of the present economic downturn in Nigeria, application of value engineering /management techniques in construction project implementation, monitoring and evaluation will promote inherent benefits such as: reduced project costs; improve design efficiency; optimise value for money; advance design decisions; highlight design options for selection; afford an independent functional review; examine function and cost seek better technical and more cost-effective solutions; identify and eliminate unnecessary costs; generate greater client confidence; and assist client decision making resulting in shortened overall programme period.

It should be noted, however, that the VE/VM exercise will inevitably lead to extra work for existing project team, which is not always reimbursed, as tit is at the client's discretion; disrupt project team and programme; can incur extra fees and extend design period.

By and large, the exercise is worthwhile, in view of the incessant tender exceeding budget, and reluctance on the part of the design team to look for any savings/improved value, even though there could be a potential saving within the scheme.

The Institute's professional development trajectory in creating awareness among Quantity Surveyors to leverage on the potential opportunities abound in the Value Management application as a tool in construction project implementation, monitoring and evaluation in Nigeria is commendable.

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