Application of Project Cost Planning Techniques in the Nigeria Project Cost Management System

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Abstract
Project cost planning is a systematic application of cost criteria to the design process, so as to maintain in the first place, a sensible and economic relation between cost, quality, utility, appearance and in the second place have such overall control of proposed expenditure as circumstances might dictate. This paper, after defining project cost planning, discussed the types of project cost planning techniques, the objectives, dynamics and significance of project cost planning. Generally, the applications of project cost planning techniques in Nigeria were analyzed with example. Also pointed out are the advantages and disadvantages of project cost planning techniques. Based on the analysis, the paper concludes that there is a compelled need for the recognition and application of project cost planning techniques in Nigeria if an increased rate in construction industry is needed. Based on the listed advantages, it was recommended that enough time should be made available especially at the pre-design stage – for adequate planning.

Introduction
Cost planning is generally seen as a method of providing cost advice which assists the designer in making design decision. It is a term used to describe any
system of bringing cost advice to bear upon the design process (Nwachukwu, 2003). To some experts like Ivor (1976), cost planning is often interpreted as controlling the cost of a project within a predetermined sum during the design stage, and normally envisages the preparation of a cost plan and the carrying out of cost checks.

By interpreting cost planning as controlling the cost of a project, according to Ivor (1976) as afore-stated, one begins to wonder if cost planning and cost controlling means the same thing. Well, if that had been advocated by Ivor, we (the writers) write to object, and rather add that projects are planned first before talking about controlling them. Hence, project control is not the same with project planning, but only a mechanism to combat as to attain that, which has been planned. However, planning and control go hand in glove.

Again, cost planning uses the information gained from cost analysis to maintain a surer control over cost of future or proposed projects. It could be seen as a systematic application of cost criteria to the design so as to maintain in the first place a sensible and economic relation between cost, quality, utility and appearance, and in second place have such overall control of proposed expenditure as circumstances might dictate. In a related development, Ivor (1976) had this to say:

In cost planning, emphasis should be directed towards the proper consideration of design criteria other than cost only to produce a properly balanced design. Quantity Surveyors (cost managers) should not lose sight of this. For instance, the cost of a project could be reduced merely by using cheaper materials, finishing and fittings, regardless of the fact that maintenance and running costs would probably be increased considerably in consequences. Furthermore, the lower quality materials and components may be quite out of keeping with the class of building in which they are being incorporated. Therefore, an economically priced job is what is required and not necessarily the cheapest as a certain standard of quality and aesthetics has to be maintained and the building capable of performing its anticipated functions.

Types of Project Cost Planning
There are basically, two types of project cost planning. They are:
1. **Elemental or Target Project Cost Planning**
   An elemental or target project cost plan states the designer’s design intentions in sums of money which represents the project design budget. After which, the designer can then proceed to develop his design as he wishes within what he believes to be the correct economic frame work. The cost manager (Quantity Surveyor) will continue to guide him through cost checks throughout the design period to enable him remain within the predetermined budget (Ivor, 1976). Infact, elemental or target project cost planning is generally described as, “designing to a cost”.

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2. Comparative Project Cost Planning

A comparative cost plan sets out the estimated cost of individual sections of work or complete project and where appropriate, the estimated cost of alternative methods and materials which the designer may wish to consider. The designer selects the most suitable detail with complete awareness of the cost consequences of his decisions. It is usually based on the pricing of a specific design and specification, hence, it is very useful in cost-in-use studies that usually call for the choice of an optimal design among competing alternatives (Ivor, 1976; Bathurst and Butler, 1980). In short, comparative project cost planning is described as, “costing a design”.

Objectives of Project Cost Planning

The aims and objectives of project cost planning as a project cost management technique according to Nwachukwu (2003) are as follows:

a. To ensure that the sum of money (cost limit set at the budgeting stage) which the client set out to spend is not unnecessarily exceeded.

b. To ensure that the client obtains good value for his money in terms of cost, quality, performance (function), time and appearance (aesthetics).

c. To ensure a balanced spread or rational distribution of expenditure (money) across all parts (elements) of the projects.

The Dynamics and Significance of Project Cost Planning

All forms of cost planning require three basic processes to be carried out. These include:

1. Preliminary Estimate or Approximate Cost Estimate

   This phase is where the decision as regards how much to spend is taken or cost limit which should be decided during the brief stage, where comparative cost planning is not made until the design stage when the cost plan had been drawn up.

2. The Cost Plan

   This phase deals with the decision on how to spend the money budgeted for the subject project among the various elements of the building.

3. The Cost Check

   The cost check (using approximate quantities) serves to confirm whether the expenditure does follow the cost plan as articulated (Barthust and Butler, 1980; Nwachukwu, 2003).

Application of Project Cost Planning Techniques (PCPT) – Generically

Some writers are of the opinion that cost planning should start from the inception stage of the project while others are of the opinion that is should come up much later. For example, Cartlidge (1973) maintained that cost planning should start from the inception stage – RIBA Plan work when rudimentary sketches may not be
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available. But Burthurst and Butler (1980) contended that it is only possible to apply
cost planning techniques to projects when the very minimum of design and cost
analysis (elemental breakdown of the cost of previous similar completed projects)
information is available. No matter the literature, the writers opinion remains as
introduced.

Furthermore, Ivor (1984) contended that in the application of cost planning
techniques, the quantity surveyor (cost manager or cost engineer) is concerned with
many issues of construction economics, some involving returns on investment as well
as costs. To illustrate this, here are some examples:
1. Substitution between capital and running costs to secure the minimum total cost.
2. Investigating different ways of producing the same building at low cost.
3. Finding ways of slightly altering a building so that for the marginally greater use
   of resources, the returns are more than proportionately increased, and
4. Investigating methods of using the same resources to produce a different building
   which could give greater returns.

Recognition and Application of (PCPT) Project Cost Planning Techniques in
Nigeria
Cost Planning: - For the purpose of history, cost planning has been developed
around Critical Path Analysis (CPA), which was in itself developed for the American
Space Programme. The CPA is now well established and through the development of
user friendly software, is utilized in project management today. Basically, Critical
Path Analysis allows you to define the fastest estimated time in which a project can be
completed, by highlighting the longest path through the programme.

This is closely related to a systematic application of cost criteria to the design
process, as to maintain in the very first place, the fastest estimated time for a project
to be completed – a saleable and economic relation between cost, quality, utility and
appearance and in second place have over all control of proposed expenditure as
circumstances might dictate. Let us illustrate this with an example.

A simple example would be in making a pot of tea. If the longest time is in
the boiling of the water, it does not matter when within this period you select the tea
bags. The time spent in boiling water in the kettle can not be shortened, if you
selected the tea bags after the water boiled, you would prolong the process of making
tea, would you not? The critical path though the project of making tea is therefore,
the boiling of the water, since whilst this is going on, you can prepare the tea pot and
select the tea. These would be concurrent activities, which would obviously take less
time to complete than the boiling of water ad yet they are essential to the process of
making tea.

Imagine, putting the kettle-on to boil and then discovering that we have run
out of tea! The 20 minutes it takes to go to the corner shop for more tea will take
much longer than boiling the water!! All of a sudden our programme is in delay!!! This is an extremely simplistic example of what can happen in a project. During the development of the space shuttle programme a catastrophic delay occurred when washers costing a few cents were not produced on time because nobody thought them important enough to put on the critical path schedule. Be warned! (Source: http://www.mathinglis.com/graeeme/cost planning. html).

Without much equivocation, it must be remarked here that the application of project cost planning techniques are to a large extent absent in the Nigeria project cost management system (Nwachukwu, 2003). However, a reference to the work of Akintoye (1992) seems to disagree with assertion that cost planning techniques are to a large extent absence in Nigeria. Typically, it may be, but not to a large extent. In his research – the wage of approximate estimating methods in Nigeria, 24 out of 29 consultants surveyed (i.e 84%) use preliminary estimate or approximate cost estimate (approximate quantities) method, while 6 out of 29 surveyed (i.e 21%) use elemental cost analysis method which is closely associated with the application of cost planning techniques. This means that it is closely associated with application of cost planning techniques and not that the technique is not neglected.

What this research goes to mean is that project cost planning which is a very important ingredient or technique of project cost management is highly neglected in Nigeria. Automatically, when a cost planning tool is neglected, it then means that such a tool is not recognized, and if it is not recognized, one wonders how it could be applied.

Though network scheduling technique and other project management tools have been useful in project planning, there is always that lack of integration of the different project parameters – time, resources and cost for comprehensive project management control during project execution. The failure to successfully integrate resource information and network technique in identifying or defining the work content of a given line of activity was long recognized by Norden (1963) and according to him, this led to a lot of mathematical models to deal with this problem which hopefully would act as a basis for predicting the level of resources for future projects.

It must be noted that the existing models deal mostly with either the resource or cost. Resource – based models include among others; the Life-Cycle Model propounded by Norden (1963) and the other by Parr (1980). Though the cost – based models will not be reviewed in this paper, but it does consist of DHSS Expenditure Forecasting Model as reported by Hudson (1982) as cited in Akpan and Chizea (2002), and the one-third rule by Gates and Scarpa (1980).

Again, going by statistics given by Ferry and Brandon (1980) that at the sketch design stage (i.e. cost planning stage) in project development, over 80% of the
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Project cost would have been committed leaving only about 20% for the cost of control of the design team (at the post contract stage). Consequently, this could lead to abortive design solutions particularly where there is a need to re-design because the cost of the design solution at this stage is more than what the client could afford. On the other-hand, if the project is implemented the result will be time over run, cost over-run and ultimately project abandonment which is the prevailing phenomenon in the Nigerian construction industry today (Nwachukwu, 2003).

Advantages of Project Cost Planning Techniques

Cost planning as a project cost management technique in whatever form has several advantages. These include:

a. The preliminary cost estimate is likely to be more reliable because of the cost checks made in the early stages of design.
b. Because of the cost checking, there is less likelihood of amendments to the bills of quantities being necessary and this saves time and money for the client and consultants.
c. The design is likely to be more economic because detailed costs are studied at an early stage and random cutting out of items after tenders are received, should not be necessary.
d. Due to the division of cost of the project into sections or elements, a rational distribution of expenditure throughout the design can be achieved.
e. The quantity surveyor (cost manager) and the designer (architect or engineer) becomes familiar with each others ideas at the early stage of the project.
f. If the same quantity surveying staff are used in both the preparation of the Cost Plan and the Bill of Quantities (BOQ) the exercise will become very simple and less cumbersome.
g. There is a better chance of comparing cost of different projects.
h. Due to the increased pre-tender planning (pre-contract) the working details are likely to be available sooner and the successful contractor’s site planning will be easier.

Disadvantages of Project Cost Planning Techniques

Despite the several advantages however, the application of cost planning techniques can not be without some disadvantages. These include:

a. More preparation is necessary in the early design stage and the time for this may not be available.
b. The designer (architect/engineer) is likely to be more restricted in his method of working.
c. The quantity surveyor (cost planner) will probably require a greater knowledge of pricing and of the design factors that affect cost than he has had and needed in the past.
d. Both the architect, engineer and quantity surveyor are likely to be involved in more work.

Conclusion

Given the objectives, dynamics, significance and the numerous advantages of project cost planning techniques, the writers are of the opinion that the recognition and application of project cost control techniques will help increase the growth rate of construction industry in Nigeria.

Recommendations

Based on the listed disadvantages, the following possible remedies are hereby recommended:
1. Enough time should be made available especially at the pre-design stage – for adequate planning.
2. The professional involved vis-a-vis the architect, engineer and quantity surveyor should be restricted in their methods of working.

References


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