



جامعة الجميع الذكية
EVERYONE'S SMART UNIVERSITY

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Title: Budget Plan of School Construction Project

1. Introduction

The study report is about a construction of a six-classroom primary school & a six classroom secondary school for over 400 underprivileged children hailing from the poorest families who cannot afford to pay for quality education in other schools.

The objective is to provide a free quality education that will equip underprivileged children for employment upon graduation. Funding in the amount of SR 250,000 is required for the construction of the two schools and administration building.

The contractor estimates the cost of construction is SR 250,000.

Upon completion, the school will include the following as shown in the blueprint and specifications.

- 6 primary classrooms and 6 secondary classrooms (10 x12' ft each)
- Two washrooms (5 x 8' ft)
- One staff room and two labs (8 x 10' and 12 x 14' ft)
- Small cafeteria

To achieve the project objective, it is crucial to plan a project budget. A project budget is a plan for how we will spend money on each work package in a project. It estimates how much and when money is needed. Usually it includes “contingency” or “management reserve” to cover unexpected expenses. It enables us to stay organized and account for all important components in the budget plan. Construction projects are disreputable for going over the predefined budget limit. Whether it's because of other vendors, lack of technical staff, unforeseen challenges, or other planning loopholes, the project is not going to be perfect if all are not properly aligned and organized. Contractors may need to readjust the contraction plan when they start the work that increases the budget to overcome the construction on the spot. Therefore, good estimations and efficient budget management are the driving force in the creation of a construction budget plan (Raz & Micheal, 2001). Once the prime contractor has identified the goals and requirements of the construction of a school, then the first most

things is to plan a budget for the school by setting realistic expectations (Jorgensen, 2004). The contractor uses the cost code that helps to organize the project costs into specific categories by assigning them to specific codes or divisions. This supports the contractor to accurately see how much a specific task or job costs.

2. Literature Review

The development of designs for a facility that will satisfy business expectations and owner requirements is the first step in the design process for a construction project. A cost management plan determines budget updates for approved project changes. Budgeting is the total projected costs needed to complete a project over a defined period. It's used to estimate what the costs of the project will be for every phase of the project. The project budget will include such things as labor costs, material procurement costs, and operating costs. But it's not a static document. The project budget will be reviewed and revised throughout the project. The project budget is estimated by the project manager and/or the project management team.

The project manager needs to estimate the cost at each stage of the life cycle. Estimation is required to be completed before the start of the project. It focuses on capital investment decisions. It also projects how much funding is required for completing the project.

Importance of Estimating the project:

It is not an easy task to estimate accurately. However, it is critically important to successfully estimate the project budget. The most challenging part for every project manager is to complete the project within time and within the budget limit. However, project estimation or projection usually exceeds the amount decided at the start. Therefore, it is important to collect the data/information regarding the project to get a good estimate about the project. This information includes material cost, inventory cost, indirect cost, direct cost, fixed cost, variable cost, labor cost, overhead, logistic, administrative cost, and machinery cost, etc.

There are four ways for the project manager to estimate the project's budget. The four estimating techniques that a project manager can use are analogous, parametric, top-down, and bottom-up (Oberlender, 2014).

- **Bottom-up estimate:** The work breakdown structure (WBS) is made to estimate the budget. It requires identifying each discrete activity or work package that is necessary to complete the project. These activities and work packages are identified (labor, material, training, equipment) then all activities are added and rolled up to higher levels to provide a detailed estimate for the project. It is the most time-consuming approach.
- **Comparative estimate (analogous):** Compare current and completed tasks of which some measures are already with the project manager. This method is based on experience rather than opinion-based. It is a gross value estimate of project cost based on historical data. Comparing to other techniques, it's less costly and less accurate technique.
- **Parametric estimate (statistical modeling):** The project manager defines the project parameters through which the project will be measured. These parameters are time, cost, and material, etc. is involved to construct a project. This process can be repeated for several different deliverables then multiplied by each parameter required to complete the project requirements. It is a statistical relationship between historical data and cost estimate of project work.
- **Top-down estimate:** It's practical for the initial stage of strategic decision-making and in situations where the information of the project details is less.

3. METHODOLOGY

This is a one-time project for the company and the project manager doesn't have any history of a similar project. Therefore, we have selected the bottom-up approach for estimating the budget. The method is adopted to create a budget estimate using (WBS) by below steps:

- List all project activities/tasks
- Define project activities and estimate a hypothetical amount

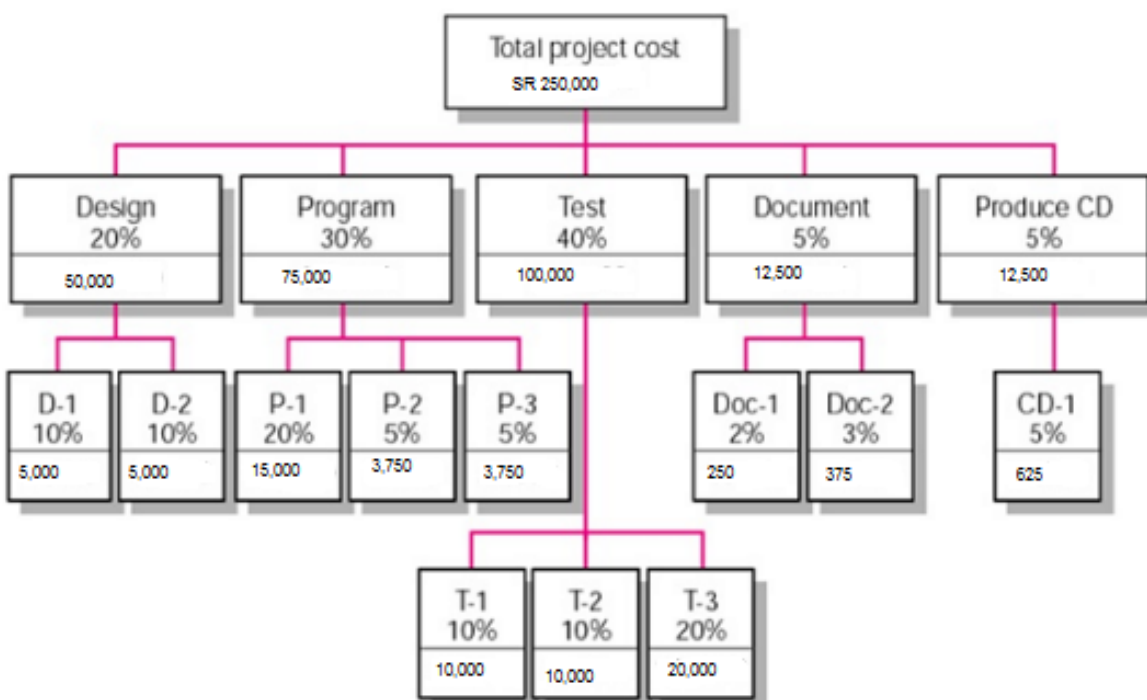
- Identify the task dependencies.
- List the resources required to complete the task
- Schedule the time when resources complete the task

The benefit of the bottom-up estimate is that it provides great accuracy (Liedl, 2011). Other benefits are that estimation errors balance out across the components. Whereas the bottom-up approach ignores the overhead and integration efforts, that may come up in addition to the defined activities.

4. Discussion on Bottom-up estimation

Bottom-up Estimate (BuE) is a useful technique for producing an accurate estimate for cost and schedule. This approach starts with the lowest activity or work package and then identifies the all activities or work packages required for the project. All team members need to share their opinions and suggestions on the activities. The project manager can adopt a three-point estimating technique to provide a sizeable estimate on the task/activities. The project manager needs to write all dependent and independent activities where finance is required to conduct such activities. Work breakdown structure WBS and precedence diagram method are used to write/list all activities. The bottom-up estimate also supports the risk management plan.

The hypothetical example of work break down structure is as follows:



- Figure 1: Work Breakdown structure through BuE

5. Conclusion:

Accurate estimating is an essential part of assuring a realistic schedule. Bottom-up estimating is more accurate because it provides confidence in the level of accuracy of the associated estimates. Therefore, we can conclude that estimating a cost for budget support us to know what company can afford, take benefits from the buying opportunities, and plan accordingly. It also supports us to allocate the funds to the important activity and discard the doubling of activities. Moreover, the benefit of determining budget using the Bottom-up-estimating is that it establishes an authorized cost baseline which is used against which project performance can be monitored and controlled.

References:

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