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To Analyze Engineering Economy and Life Cycle Cost Analysis

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Abstract - The literature on life cycle cost models and applications was examined in order to offer an overview of life cycle costing employment and applications. The accuracy and adaptability with which life cycle cost analysis approaches can estimate long-term expenditures is also studied. Cost-benefit analysis and employment models that take into account the entire lifecycle are by no means perfect. A reliable life cycle cost analysis may be difficult to do, and this research will detail some of the main problems that should be taken into account before reaching any conclusions.

Keywords - Life Cycle Cost Analysis, Engineering Economy, Life Cycle, Project Cost, LCCA Cost Analysis

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1. INTRODUCTION

Systems managers are forced to constantly improve and modernise current systems in order to maintain the long-term viability of their equipment. The total cost of ownership of a system can be considerably influenced by decisions made during the design phase of the system and subsequent improvements in planning. The addition and continued use of numerous assets, such as equipment and buildings to house it, necessitate decisions by owners, users, and managers. The cost of acquiring a new asset is typically a deciding factor when there are a variety of options to choose from. Preparation of a system's life-cycle costs is a key component in front-end planning for design and manufacturing. It is important to remember that the initial capital cost is only a small portion of the overall costs that must be considered when making an asset investment choice All of an asset's costs are accounted for during its useful life in a Life Cycle Costing Analysis (LCCA) (LCCA). Assist in the allocation of resources and decision-making by calculating the total cost of the system's life cycle.

2. OBJECTIVES OF THE STUDY

- Calculate the total expenses of various project options.
- To determine which facility will have the lowest total cost of ownership while maintaining its quality and functionality.
- Objectives Reduce the total cost of ownership of the Utility's infrastructure for its consumers while maintaining the appropriate level of service..
- Assist management in making decisions at any stage of the life cycle.
- Determine the asset's accredit, which has a large impact on the life cycle cost drivers, so that the assets may be successfully managed.
- Determine the project's cash flow requirements.

3. THEOROTICAL FORMWORK

Total Cost of Ownership and Life Cycle Costing

There are many other ways of measuring the financial impact of an item, system, or facility across its life cycle, but life cycle costing is the most commonly used method. To evaluate several choices, life-cycle costing is used to estimate the economic effect of each option throughout the course of its existence. The overall cost of a product's life cycle system is easily comprehended.

Life Cycle Scope & Life Cycle Costing

The life cycle costing approach is difficult to use in industries that are categorically aligned. Using life cycle cost as a decision-making tool provides the notion that it's universally applicable. For example, standard goods and client categorised items, such as defendedcognate products, appear to vary in this way. In addition, the seller and the customer take different tacks when it comes to life cycle costing. Design and life cycle management must take the life cycle cost into consideration. Many approaches and models for life cycle cost analysis have been created as a result of the features of various outcomes or systems.

Process of Life Cycle Costing Formulation

The substructure of the lifetime costing model includes all of the aspects listed above. With the eight-step technique, it was able to make a significant contribution to the development of a life cycle costing modelling formulation.

In a Life Cycle Cost Model, the life of an asset/equipment is calculated.

The estimation of an asset's life cycle has a significant impact on life cycle analysis. Anasset's life expectancy can be determined by any one of five factors:-

- **Functional life --** span of time that the asset is expected to be sought after.
- **Physical life --** what is the estimated lifespan of the asset, from when a big rehabilitation or super session is physically required?
- **Technological life --** the span of time until a technologically superior alternative necessitates a super session.
- **Economic life --** the amount of time until the super session is replaced by a lower-cost equivalent due to economic obsolescence.

Uncertainty and Sensitivity

Input data for a lifespan cost analysis are based on estimations rather than kenned numbers, which necessitates skepticality judgments. Consequently, the quality of the data is questionable. Any time anything is unpredictable, unpredictable, open-ended, or involuntary, there is a sense of apprehension. The assumptions and estimations made while collecting data are critical to life cycle costing. When using historical data and statistical approaches, it's feasible to improve these estimates' quality, but there is always an element of doubt attached to them.

In the Indian context, life cycle costing

The Indian government has taken a number of steps to encourage the development of weaponry in the country. Even yet, over 70 percent of India's military inventory is made up of imported weapons systems, which have been compelled on an ongoing basis by delays in domestic weapons programmes. This contradiction is what makes the search for cost-effective choices so important for the purchase process in India. In order to compete on the global market, Indian firms also began working on the notion of life cycle costing. Visualizing the method and approach for determining a system's life cycle costs has also taken a lot of time and effort.

LCCA Markets vs. Defense Markets

From armoured vehicles to air defence systems to weapons to C4ISR systems (Computer-Assisted Target Acquisition and Reconnoitering), military equipment is no exception. Although these assets are expensive to acquire, managing and maintaining them throughout their full life-cycle might be far more expensive than the initial acquisition cost, which could range from forty to fifty years. Including or without midlife improvements. There is little doubt that this will have an effect on the regime's ability to provide financial assistance in the now and the future. Asset purchase and development decisions should be made with the life-cycle cost in mind for best use of limited financial resources.

Proposed Life Cycle Costing Model Framework

Examine the model's attributes. In order to evaluate the impact of lifecyclecosting on a system's durability, The three characteristics are used: performance, cost, and efficiency: The overall cost of any system is determined by the expenditures associated with its conception, production, and ongoing maintenance. Life-cycle costing's major purpose is to regulate and reduce long-term system maintenance costs. Over the Long Run, Total Cost of Ownership Longevity and performance in the field of use will be improved. The life cycle expenses aren't in your favour. Certain expenses, on the other hand, climb and fall over the course of a product's life cycle. There are no fluctuations in the useful life or performance. To find out why things are changing, further research is needed. Reduced life-cycle costs Performance Parameters Get Better Calculation of life-cycle costs and approval of the model As shown in the above table, a life-cycle costing theory considers not only the price of a product or service, but also its overall performance and expected lifespan. Reliability,maintenance, and supportability are key factors in life-cycle pricing.

4. METHODOLOGY

This study presents a complete framework for resource management that is directly related to manpower in the construction industry. The research is divided into two parts. During the first stage, all of the necessary data and information was gathered in order to assess the available resources. Resources necessary for each task are listed in a Gantt chart, which depicts the project timetable using the projected resources. Resourceleveling with increased length was used to examine the authentic resources available for the project in the second phase. An analysis of the time and cost implications has been done to warn management.

5. LIMITATIONS

The validity of the research technique, the dependability of the data gathered, and the applicability of the statistical tools utilised are all critical to study conclusions. -

(1) Analyzing the data quantitatively is impossible since the sample size is too small.

(2) The sample was collected using a non-precision accomodation sampling strategy.

(3) Despite their best efforts, the writers were unable to determine who each organisation selected to be questioned, despite their best efforts.

(4) Many of the people who answered the survey were reluctant to speak out about problems in their workplaces.

(5) Some respondents were unable to fully focus on the interview sessions because of their professional commitments, resulting in a lack of an in-depth interview.

6. CONCLUSION & RECOMMENDATIONS

Risk is inherent in the construction sector because of the involuted deployment of resources. In truth, the successful completion of a building project's goals requires cutting-edge resource management. To complete a construction project on time, resources must be allocated for each activity. Resources must be levelled during building projects to avoid the problems caused by huge differences in resource use. As a result of a time constraint imposed by the customer, this report gives a project timetable. All of the tasks on the to-do list are vital. Resource levelling is the sole way to increase planned time. This schedule solely considers manpower as a resource category. Due to a sudden need for labour, the day-to-day cost of the project rises as a result of the proposed timeline.

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