Construction management

Autor(en): **Jha, Chandra K.**

Objekttyp: **Article**

Zeitschrift: **IABSE congress report = Rapport du congrès AIPC = IVBH Kongressbericht**

Band (Jahr): **11 (1980)**

PDF erstellt am: **13.07.2024**

Persistenter Link: https://doi.org/10.5169/seals-11193

IIIb

Construction Management

Gestion de projet

Baumanagement

Chandra K. JHA
President
PSM International Corporation
Chicago, Illinois, USA

SUMMARY
Construction Management at the Owner's level does ask for three well functioning main systems: an Estimating and Budgeting System, a Planning and Scheduling System and a Cost Control System. Regardless of whether the Owner performs part of the functions by his internal Organization or the CM Consultant performs all of the functions, it is sophistication in these management tools that will determine whether Construction Management is able to project a realistic budget in cost and time to impose the necessary control.

RESUME
La gestion de projet au niveau du maître de l'ouvrage requiert trois outils de gestion bien rôdés: un système de budget et d'estimation de coûts, un système de planification et de délais, et un système de contrôle des coûts. Le maître de l'ouvrage peut exécuter une partie de ces fonctions de gestion de projet, à l'aide de sa propre organisation ou peut confier ces tâches à un ingénieur-conseil en gestion de projet. Mais en définitive, le succès du programme en coûts et en temps dépendra des contrôles nécessaires imposés par les outils de gestion.

ZUSAMMENFASSUNG
Das Baumanagement auf der Stufe des Bauherrn baut im wesentlichen auf drei gut aufeinander abgestimmte Führungshilfsmittel auf: ein Ablaufplanungssystem, ein Kostenbudgetierungssystem und ein Kostenkontrollsystem. Unabhängig davon, ob der Bauherr mit seiner Bauherrenorganisation einen Teil der Baumanagementfunktionen selber übernimmt oder ob der Baumanagementberater des Bauherrn alle Funktionen übernehmen muss, geht es letztlich um den zielgerichteten und zweckmässigen Einsatz der Führungshilfsmittel, wenn man mit Erfolg ein realistisches Budget der Kosten und der Bauzeit erarbeiten und die notwendige Kontrolle durchsetzen will.

THE OWNER'S PROBLEM

Buildings of today are complex and costly. The Owner is seldom the end-user of the building he proposes to build. He regards the building as an investment and wants a maximum return on every dollar invested.

Once a project is conceived and its feasibility determined, he is under unparalled pressure to complete the project on time and within budget to get this return on his investment.

In today's market, a project is conceived, designed, financed, built and leased by independent groups of developers, architect-engineers, bankers, general contractors, sub-contractors, vendors, leasing and management agents. Each group must perform hundreds of activities under conditions and restraints that are beyond each particular group's control. Change in the availability of financing, or lack of a trade's progress due to changes in the labor market, or uncontrolled design changes during construction, or delays in deliveries can affect the project's timetable without warning and jeopardize the Owner's return on his investment.

The major cost of the project is generally determined by the design concept developed in the early stages of the design process. In this initial period, the architect, the Owner, and their consultants rapidly arrive at a preliminary design. Once work commences on that design, it becomes more and more difficult to make changes in the original concept. Designs and costs are locked in.

The Owner, in making decisions during the design process, basically relies on his AE's cost projection and knowledge of construction methods. The Owner has no reliable basis for judging the design for its practicality regarding construction process, or for choosing an alternate process that could produce a cost savings without a decrease in functional quality. Because of this, alternate solutions are known only after the bids are in. If the bids are high and over budget, lengthy negotiations on design changes must be made. At that point, changes that could easily have been made during the early stages, become costly and time-consuming.

CONSTRUCTION MANAGEMENT FUNCTIONS AND THEIR ROLE IN DECISION MAKING

There are a variety of management decisions that must be made during stages of the conceptual design, the design, the construction and the beneficial occupancy. At every decision point, the Owner's primary concern is whether his decision will meet his basic objectives of completing the project on time and within budget.

The establishment of budget costs (trade costs) and budget time (completion time) are the two most important functions during the design stage which provide a framework for control during construction.

The total cost of the project is minimized, not merely by minimizing time of design or construction but through numerous interactions between design, material alternates, competitive bidding processes, contract negotiations, and effective coordination of design and construction activities.

Let us assume that the Owner has accepted the architect's original design of an office building with aluminium curtain wall. After the bids for curtain wall were in, it was found that the lowest quote was $ 100,000 above the Owner's budget. Upon further investigation, it was realized that an alternate design with precast concrete

curtain wall could be installed at $ 100,000 less than the budget. However, the installation of the concrete curtain wall will take four weeks longer than the aluminium curtain wall. Now, what should the decision be?

The apparent answer is to choose concrete curtain wall. But is it? A pragmatic decision will require an analysis of the impact of delays over: 1) completion of the project and related cost increases, if any; and 2) the delay in the beneficial occupancy and related loss of revenues. A further sophistication may require a risk analysis for both systems before the Owner can effectively choose one system over the other.

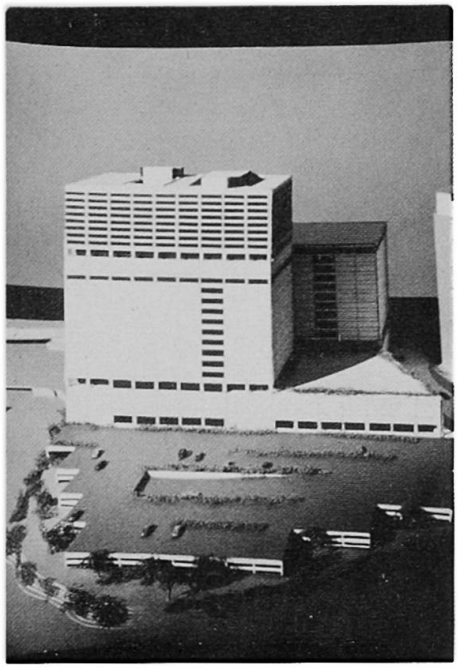
Let us assume another situation for a high-rise apartment building. During the design stage, the architect-engineer determined that the "through-the-wall units" heating and cooling system will be $ 250,000 cheaper than the central heating and cooling system. However, the operating costs including energy costs are expected to be $ 25,000/year less for the central system. Now, which system should be selected?

The answer is not simple. To make a decision, we must determine the life-cycle cost for both systems. We must have the data on operating costs including maintenance and replacement of parts of equipment during the same life-cycle. In addition, we must analyze the interrelated cost of other trades. For example the cost of window wall system and electrical work will be different in "through-the-wall units" than in the central system.

To meet the Owner's need of making business decisions that are timely and effective, one must have access to systems which can be used as a tool to analyze and synthesize information for decision making purposes.

Basically, the Owner-CM will need three main systems: 1) Estimating and Budgeting System, 2) Planning and Scheduling System, and 3) Cost Control System. Regardless of whether the Owner performs part of the functions internally or the CM performs the entire functions for the Owner, it is sophistication in these management tools that will determine whether CM is able to project a realistic budget or monitor a cost trend and schedule slippage that will seriously affect the Owner's budget and jeopardize his competitive advantage in the market. For example, without the capability of sophisticated planning and scheduling tools, one would not be able to properly compress the schedule by phasing design and construction, thereby saving construction costs for both materials and labor in an inflationary market, and insuring a smooth running project through effective dovetailing of different operations and trades. Similarly, without a good change-order-work control relating to scope and budget, the cost control system will lose its significance.

The following pictures provide some of the projects completed on a Construction Management basis:



APPAREL MART AND HOTEL: This composite steel and concrete structure comprises a hotel and an apparel mart with 125,000 square meters of space.

SUMMIT TOWERS: The complex consists of three 44-story apartment buildings connected by a 12-story base structure for parking, a theatre, commercial space and recreation facilities.

DETROIT RENAISSANCE: This is a very large and complex project consisting of a 70-story concrete structure hotel, four 39-story steel structure office buildings connected with a 7-story concrete podium for parking and commercial space.