Construction and Project Management

Lecture 8

Necessity

Objectives:

Our main objective is to understand the construction project management technique we are following and how we provide an easy approach in using the software for planning and scheduling activities and also controlling and monitoring the project schedule. We will also look at a particular software in detail to understand the various steps and method used for computerization of activities that we have manually done till date like work break down structure, assigning activities and events, numbering the events, giving them inter relationships, forward pass, backward pass and floats.

Definition:

Computerized project management means easily maintaining project records and communication in a digital format, by transferring your paper work to a system. The software we use to input data and run a set of applications to give the desired result is called project management software. The software has the capacity to plan, organize and manage the resources, which we give as inputs, and develop resource estimates and depending upon the software type and sophistication, help us in planning, scheduling, resource allocation and even giving us the cash flow and indicating the critical path of a particular project. It also helps us to maintain the documentation of the project.

History:

The origin of project management was in the 1950s. Networking methods CPM, experimented by a chemical industry, and PERT, experimented by the US Navy, were simultaneously exploring the option of computerization due to the complexity of the projects they were dealing with. With the help of IBM, Polaris and other such major software players, computers became a common feature from the 1980s and computers came into project management to attend to the complexity of the projects.

What is the necessity for computerized project management?

Time is a constraint for fast track projects and tracking each event manually on a daily basis involves a lot of manpower and time, to avoid which computerization came into the picture. Suppose a fast track project of 3-4 floors needs to be completed in, say, 3 months, then managing it manually on a daily basis itself will eat into your resources and time. Instead, if you key in inputs like materials received with the date into your system, the software program assesses the inputs and gives us the results we require, like how much material to procure to achieve the target duration.

Projects have become complex with a lot of multi-storey buildings coming up and it involves numerous activities to be executed within the constraints of time, cost and quality. Once the projects become complex, tracking each and every detail becomes a herculean task. Hence, computer-based network software techniques have become indispensable for the efficient and effective management of large and complex projects.

By employing powerful project management software for efficient planning and scheduling, a single project manager is sufficient to take care of the planning, find the areas of risk and rectification measures. Thus, manpower, time and indirect cost are reduced. Baselines, i.e. master schedules, can be set and the plan can be revised as per requirement. Revisions will add to the baseline so that you can identify the difference. The same can be done manually for a small project, but for a complex project it would become difficult and cause a delay. Scheduling and costing resources have become faster with the use of computers. At the click of a button, you can get the current status of the project, the costing involved and resource allocation.

Project management information is nothing, but a particular platform for collecting all the data relevant to particular project in a single platform, like cost, time and resources required for each and every activity. One look at it would give an overview of the project and the status of the project, resources, cost, or project completion time can be understood. Thus, it has become imperative for project managers, planners, executives and engineers to become proficient in the use of computers for project management as it is easy, effective and error-free.

Functions and Types:

The major functions of computerized project management are scheduling and providing project management information. Scheduling is a common project management software tool used to sequence the project activities, assign the start date and end date, allocate resources required for a particular activity and give the inter dependencies. Resource assignment and leveling for the particular activity can be ascertained with the help of the software, critical path found out for crashing and optimum duration and optimum cost for the project can be achieved.

Activity duration estimation and probability-based simulation - Not only for critical path analysis, but also for PERT related projects, probabilistic time estimate and the total project duration can be determined with scheduling of events.

Activity cost accounting - The cost for each activity and the total project cost can be worked out and cross checked with your budget to see if the final cost is within the budget. Cash flow and money requirements can also be ascertained by scheduling of projects.

Next is providing information. When we key in inputs into the project management software, it will provide details like how long that particular task will take to complete, early warning of any risk for the project, whether this particular activity can start only after an event is completed, and inter dependent activities getting delayed.

Information on workload for planning holidays – The calendar in the software lets you preset the work hours of your manpower, whether it is a 8hrs single shift or 3 or 4 shifts, to give you the workload, say, for a week. If the particular activity is unable to get completed, you can increase the manpower. Besides, any forthcoming holiday can be included in the calendar so that it can be accordingly worked out.

Evidence keeps record of everything. Planning officials may quit the organization anytime, but the work done and history of the project will be in the computer. So, you are not dependent on that particular manpower for any assistance in future. The progress of the project, any hindrance to the progress of the project, any

change in design, how the project has progressed all these can be recorded and reviewed at a later date.

What is cost maintenance? The cash flow I will be requiring for future months, how much I have spent, is it within my budget, these details can be determined. This will also enable the developer to get payments. When the customer is fed photos and information via website about the progress of the project, he can plan his funds accordingly or in the case of a loan, it will be easy for the bank to process the particular payment. Thus, it is useful not only for the project developers, but also for customers. It is nothing but instant communication to the collaborators and customers.

Computerized tasks:

Let us now look into the tasks that have been computerized. First is budget and real time costing. In real time costing, we input the resources and materials used and that will give us the actual cost. As we already know the budget of the project, we can compare the actual cost and budget. In case we exceed the budget, details about further investments and future cost should be known.

Next is resource management. Minimum number of manpower with effective working and no idleness of equipment are the two main goals of resource management. Such kind of planning can be done using computers.

Next is recording field data electronically. Data like number of labourers employed, materials used, history of the project and the actual cost spent are recorded and can be monitored electronically. The company's casual analysis, say, the month-wise spending for the remaining period of the project, can be estimated and shown to the client for arranging finance.

Managing project change orders- A project plan cannot be executed as it is as some changes are bound to happen due to design changes, statutory application or due to the end user. The changes that we incorporate can be recorded in the system along with the cost implication and kept as evidence.

Types of software:

Project management software is categorized into 4 major types -- desktop software, client server software, integrated software and internet-based software. In desktop software, a single user will key in the details, understand the resources for the particular project and communicate to team members who are required to know the details.

A small group of people use client server software in a closed network. For instance, 4 or 5 people from a particular department alone use the software or it can even be that it is accessed by a single person from all departments like a finance department person taking care of the project's finance, HR department person keying in inputs about manpower, etc. and then the planning manager assesses it overall.

Integrated software not only plans all the relevant activities, but also includes customer interaction.

Web-based software enables anybody who has the authority and access to view the project details from anywhere using internet or ethernet or any kind of system. These applications are developing fast due to its flexibility and accessibility from any part of the world.

There are a lot of software available in project management, including the commonly used Microsoft Project, Project Kickstart, Basecamp, etc. All the software does the preliminary work of planning, scheduling, monitoring and controlling a project, besides taking care of the cost and resources. However, every software has a few limitations too.

Case Study

Now, we will go into a case study. Let us see the project management process of a company, EB Galaxy, and we will find out about the type of project management software they are using. The construction firm was trying a lot of project management software, but they were not able to find a complete solution to their company. So, they have divided their company into a lot of segments like purchase, scheduling, documentation and coordination. They had different software for each segment, but they wanted to integrate everything into a single

system with access from outside to the top management people or anybody who has the authority to access the information.

In purchase management, they were dividing the project into different packages like structural works, electrical works, plumbing works, concrete and steel. That particular package will be retrieved for keying in inputs regarding manpower involved, materials purchased, its actual cost, budgeted cost and future cost, so that from the procurement part of it the whole project details have been covered. Then comes cost control. In cost control, they will look into the cost part. The purchase department will be keying in only the direct cost, but the cost department will be keying in indirect cost and also loan interest, if any. Next is the document manager, wherein project related documents and other documents like reports submitted to client, inspection reports and material testing reports will be digitally formatted and uploaded for reference.

Then comes the project control development and coordination. All the design issues and communications will be stored in that particular software. The Interactive Management Information System, a net-based system, interlinks all the information and through a web browser, in which all the departments key in their details, all the details about the particular project comes into a common platform. This stored information can be accessed by certain people with an username and password. To avoid malpractices, information like who is accessing the web page can be recorded.

If a company does 10 projects, all the projects will be having separate datasheets and all these datasheets will be uploaded on to their website and whoever has access can view it from anywhere. Their website includes the executive summary page for each and every project, its status, so that the end user can access it from the internet itself.