Activity Planning & Risk Management

Objectives of Activity Planning:

We looked at methods for forecasting the effort required for a project - both for the project as a whole and for individual activities. A detailed plan for the project, however, must also include a schedule indicating the start and completion times for each activity. This will enable us to:

- ensure that the appropriate resources will be available precisely when required;
- \circ avoid different activities competing for the same resources at the same time;
- o produce a detailed schedule showing which staff carry out each activity;
- o produce a detailed plan against which actual achievement may be measured;
- produce a timed cash flow forecast;
- replan the project during its life to correct drift from the target.

To be effective, a plan must be stated as a set of targets, the achievement or non- Project monitoring is achievement of which can be unambiguously measured. The activity plan does discussed in more detail in this by providing a target start and completion date for each activity. within which each activity may be carried out). The starts and completions of activities must be clearly visible and this is one of the reasons why it is advisable to ensure that each and every project activity produces some tangible product or 'deliverable'. Monitoring the project's progress is then, at least in part, a case of ensuring that the products of each activity are delivered on time.



As a project progresses it is unlikely that everything will go according to plan. Much of the job of <u>project management</u> concerns recognizing when something has gone wrong, identifying its causes and revising the plan to mitigate its effects. The activity plan should provide a means of

evaluating the consequences of not meeting any of the activity target dates and guidance as to how the plan might most effectively be modified to bring the project back to target. We shall see that the activity plan may well also offer guidance as to which components of a project should be most closely monitored.

This co-ordination will normally form part of Programme Management.

In addition to providing project and resource schedules, activity planning aims to achieve a number of other objectives which may be summarized as follows.

- Feasibility assessment Is the project possible within required timescales and resource constraints? It is not until we have constructed a detailed plan that we can forecast a completion date with any reasonable knowledge of its achievability. The fact that a project may have been estimated as requiring two work-years effort might not mean that it would be feasible to complete it within, say, three months were eight people to work on it that will depend upon the availability of staff and the degree to which activities may be undertaken in parallel.
- Resource allocation What are the most effective ways of allocating resources to the project and when should they be available? The project plan allows us to investigate the relationship between timescales and resource availability (in general, allocating additional resources to a project shortens its duration) and the efficacy of additional spending on resource procurement.
- Detailed costing How much will the project cost and when is that expenditure likely to take place? After producing an activity plan and allocating specific resources, we can obtain more detailed estimates of costs and their timing.
- Motivation Providing targets and being seen to monitor achievement against targets is an effective way of motivating staff, particularly where they have been involved in setting those targets in the first place.
- Co-ordination When do the staff in different departments need to be available to work on a particular project and when do staff need to be transferred between projects? The project plan, particularly with large projects involving more than a single project team, provides an effective vehicle for communication and coordination among teams. In situations where staff may need to be transferred between project teams (or work concurrently on more than one project), a set of integrated <u>project schedules</u> should ensure that such staff are available when required and do not suffer periods of enforced idleness.

Activity planning and <u>scheduling techniques</u> place an emphasis on completing the project in a minimum time at an acceptable cost or, alternatively, meeting an arbitrarily set target date at minimum cost. These are not, in themselves, concerned with meeting quality targets, which generally impose constraints on the scheduling process.

One effective way of shortening project durations is to carry out activities in parallel. Clearly we cannot undertake all the activities at the same time - some require the completion of others before they can start and there are likely to be resource constraints limiting how much may be done simultaneously. Activity scheduling will, however, give us an indication of the cost of these constraints in terms of lengthening timescales and provide us with an indication of how timescales may be shortened by relaxing those constraints. It is up to us, if we try relaxing precedence constraints by, for example, allowing a program coding task to commence before the design has been completed, to ensure that we are clear about the potential effects on product quality.

When to plan

Planning is an ongoing process of refinement, each iteration becoming more detailed and more accurate than the last. Over successive iterations, the emphasis and purpose of planning will shift.

During the feasibility study and project start-up, the main purpose of planning will be to estimate timescales and the risks of not achieving target completion dates or keeping within budget. As the project proceeds beyond the feasibility study, the emphasis will be placed upon the production of activity plans for ensuring resource availability and cash flow control.

Throughout the project, until the final deliverable has reached the customer, monitoring and <u>replann</u>ing must continue to correct any drift that might prevent meeting time or cost targets.

Project schedules

Before work commences on a project or, possibly, a stage of a larger project, the project plan must be developed to the level of showing dates when each activity should start and finish and when and how much of each resource will be required. Once the plan has been refined to this level of detail we call it a project schedule. <u>Creating a project schedule</u> comprises four main stages.

The first step in producing the plan is to decide what activities need to be carried out and in what order they are to be done. From this we can construct an ideal activity plan - that is, a plan of when each activity would ideally be undertaken were resources not a constraint. It is the creation of the ideal activity plan that we shall discuss in this chapter. This activity plan is generated by Steps 4 and 5 of Step Wise.

On a large project, detailed plans for the later stages will be delayed until information about the work required has emerged from the earlier stages.

Activity planning is carried out in Steps 4 and 5



The ideal activity plan will then be the subject of an activity risk analysis, aimed at identifying potential problems. This might suggest alterations to the ideal activity plan and will almost certainly have implications for resource allocation.

The third step is resource allocation. The expected availability of resources might place constraints on when certain activities can be carried out, and our ideal plan might need to be adapted to take account of this.

The final step is schedule production. Once resources have been allocated to each activity, we will be in a position to draw up and publish a project schedule, which indicates planned start and completion dates and a resource requirements statement for each activity.

Project Schedule:

A schedule in your project's time table actually consists of sequenced activities and milestones that are needed to be delivered under a given period of time.

Project schedule simply means a mechanism that is used to communicate and know about that tasks are needed and has to be done or performed and which organizational resources will be given or allocated to these tasks and in what time duration or time frame work is needed to be performed. Effective project scheduling leads to success of project, reduced cost, and increased customer satisfaction. Scheduling in project management means to list out activities, deliverables, and milestones within a project that are delivered. It contains more notes than your average weekly planner notes. The most common and important form of project schedule is Gantt chart.



Project Scheduling Process

Process :

The manager needs to estimate time and resources of project while scheduling project. All activities in project must be arranged in a coherent sequence that means activities should be arranged in a logical and well-organized manner for easy to understand. Initial estimates of project can be made optimistically which means estimates can be made when all favorable things will happen and no threats or problems take place.

The total work is separated or divided into various small activities or tasks during project schedule. Then, Project manager will decide time required for each activity or task to get completed. Even some activities are conducted and performed in parallel for efficient performance. The project manager should be aware of fact that each stage of project is not problem-free.

Problems arise during Project Development Stage :

- People may leave or remain absent during particular stage of development.
- Hardware may get failed while performing.
- Software resource that is required may not be available at present, etc.

The project schedule is represented as set of chart in which work-breakdown structure and dependencies within various activities are represented. To accomplish and complete project within a given schedule, required resources must be available when they are needed. Therefore, resource estimation should be done before starting development.

Resources required for Development of Project :

- Human effort
- Sufficient disk space on server
- Specialized hardware
- Software technology
- Travel allowance required by project staff, etc.

Advantages of Project Scheduling :

There are several advantages provided by project schedule in our project management:

- It simply ensures that everyone remains on same page as far as tasks get completed, dependencies, and deadlines.
- It helps in identifying issues early and concerns such as lack or unavailability of resources.
- It also helps to identify relationships and to monitor process.
- It provides effective budget management and risk mitigation.

Project and Activities:

Activities

Software Project Management consists of many activities, that includes planning of the project, deciding the scope of product, estimation of cost in different terms, scheduling of tasks, etc.

The list of activities are as follows:

- 1. Project planning and Tracking
- 2. Project Resource Management
- 3. Scope Management
- 4. Estimation Management
- 5. Project Risk Management
- 6. Scheduling Management
- 7. Project Communication Management
- 8. Configuration Management

Now we will discuss all these activities -

1. Project Planning: It is a set of multiple processes, or we can say that it a task that performed before the construction of the product starts.



2. Scope Management: It describes the scope of the project. Scope management is important because it clearly defines what would do and what would not. Scope Management create the project to contain restricted and quantitative tasks, which may merely be documented and successively avoids price and time overrun.

3. Estimation management: This is not only about cost estimation because whenever we start to develop software, but we also figure out their size(line of code), efforts, time as well as cost.

If we talk about the size, then Line of code depends upon user or software requirement.

If we talk about effort, we should know about the size of the software, because based on the size we can quickly estimate how big team required to produce the software.

If we talk about time, when size and efforts are estimated, the time required to develop the software can easily determine.

And if we talk about cost, it includes all the elements such as:

- Size of software
- Quality
- Hardware
- \circ Communication
- \circ Training
- Additional Software and tools
- o Skilled manpower

4. Scheduling Management: Scheduling Management in software refers to all the activities to complete in the specified order and within time slotted to each activity. Project managers define multiple tasks and arrange them keeping various factors in mind.

For scheduling, it is compulsory -

- Find out multiple tasks and correlate them.
- Divide time into units.
- Assign the respective number of work-units for every job.
- Calculate the total time from start to finish.
- Break down the project into modules.

5. Project Resource Management: In software Development, all the elements are referred to as resources for the project. It can be a human resource, productive tools, and libraries.

Resource management includes:

- Create a project team and assign responsibilities to every team member
- Developing a resource plan is derived from the project plan.
- Adjustment of resources.

6. **Project Risk Management:** Risk management consists of all the activities like identification, analyzing and preparing the plan for predictable and unpredictable risk in the project.

Several points show the risks in the project:

- The Experienced team leaves the project, and the new team joins it.
- Changes in requirement.
- Change in technologies and the environment.
- Market competition.

7. **Project Communication Management:** Communication is an essential factor in the success of the project. It is a bridge between client, organization, team members and as well as other stakeholders of the project such as hardware suppliers.

From the planning to closure, communication plays a vital role. In all the phases, communication must be clear and understood. Miscommunication can create a big blunder in the project.

8. Project Configuration Management: Configuration management is about to control the changes in software like requirements, design, and development of the product.

The Primary goal is to increase productivity with fewer errors.

Some reasons show the need for configuration management:

- Several people work on software that is continually update.
- Help to build coordination among suppliers.
- Changes in requirement, budget, schedule need to accommodate.
- Software should run on multiple systems.

Tasks perform in Configuration management:

- Identification
- Baseline
- Change Control
- Configuration Status Accounting
- Configuration Audits and Reviews

People involved in Configuration Management:



Sequencing and Scheduling Activities:

A project manager is liable for the complete development of the project. By incorporating planning and aligning the objectives of the project, the process functions smoothly. Consequently, the reason for a project failure is when the project managers can create the work analysis structure, yet can't execute it. As project managers, it is necessary to consider a plan for your project that includes all the <u>Project Management skills</u>, knowledge, and tools & techniques. This article discusses the sequence activities in a project and its process, the

importance of sequence activities, and the necessity to determine activity sequencing on projects.

Defining the Sequence Activities

The strategy of distinguishing and authenticating affiliates amidst the project activities, and sequence activities illustrates the consistent planning of work to get the highest effectiveness of the project constraints. Throughout the project, the process of the execution plan is for better performance.



The sequence activities are designed to fall under <u>Project Management process groups</u> and knowledge areas. By using the results from the procedures, the project schedule development defines sequence activities, estimates activity resources, and estimates activity durations in combination with the scheduling tool to produce the schedule model. The <u>schedule</u> <u>management plan</u> recognizes what scheduling method and device to use for the task, which will manage the activities to be sequenced.

How to Sequence Activities in a Project?

Sequencing can be performed by utilizing <u>Project Management software</u> or by using manual or mechanized procedures. The sequence activities process concentrates on converting the project activities from a list to a diagram to act as a first step to publishing the schedule baseline.

The below chart portrays the data flow diagram of sequence activities on how every activity except the first and last should connect to at least one predecessor and at least one successor activity with an appropriate logical affiliation.



Process of Sequence Activities in Project Management

Sequence activities are the process of identifying and documenting relationships among the project activities. So the fundamental reason for the sequence activities process is finalizing the interrelationship of activities to finish the project scope and achieve the task objectives.

The critical consequence of the sequence activities process is a Network Diagram. The network diagram of a project represents the activities in boxes with activity ID and demonstrates the interrelationship of activities with bolts.

Each activity excluding the first and last ought to be associated with at least one predecessor and at least one successor activity with a proper logical relationship. A realistic project schedule ought to be apt by creating logical relationships. It might be essential to utilize lead or lag time between exercises to help a sensible and reachable undertaking plan. Sequencing can be performed by using software that is built for Project Management, manual or computerized procedures. The sequence activities process focuses on changing the project activities from a list to a diagram to go about as an initial step to distribute the schedule baseline.

Network Diagram Example for Sequence Activities Process

- Process of identifying and documenting relationships among the project activities
- Key results of this process are Network Diagram
- If activity durations are added, the network diagram shows the critical path

This figure shows a sample network diagram as a result of the sequence activities process.



As you see, after the start of the project,

- Activity #1 must start first.
- After Activity #1 finishes, Activity #2 and Activity #3 will begin.
- Activity #4 can start only after Activity #2 finishes.
- Activity #5 depends on Activity #2 and Activity #3. Therefore, it will start only after these two activities are completed.
- And the last Activity, activity #6 can start only if Activity #4 and Activity #5 is completed.
- After activity #6 completion, the project will end.

Note that this is just a simple and sample network diagram to show you how a network diagram is. In real-life projects, there will be lots of project activities, so the network diagram and also sequence activities process will be much more complicated than this.

Tools Used in Project Management Sequence Process

In the process of sequencing activities in Project Management, the project manager identifies and records relationships among the various project activities so that he/she can define the best logical sequence that can produce the highest efficiency. In the end, the project manager can develop a Project Management sequence process.

There are three tools and techniques used in the Project Management sequence process:

- Precedence Diagramming Method (PDM)
- Dependency Determination
- Leads and Lags

Why is it Important to Determine Activity Sequencing on Projects?

It is important to focus on planning and determining activity sequencing on projects. Otherwise, you will find yourself exhausting your resources in the initial activities only to find out bigger and more crucial activities making them obsolete without a concrete plan.

You cannot determine the hard way for a project unless you sequence activities. Several different diagrams are the same to project network diagrams. In transportation modeling, for example, you try to find the shortest way between two points. As clearly seen in the diagrams,

you only need to take one path. In a project network diagram, all activities must be completed to complete the project.

Precedence Diagramming Method

The Precedence Diagramming Method is a technique that is utilized to develop a schedule model where activities are signified by nodes that are connected to one or more affiliates to its successors by a projectile.

Precedence Diagramming Method incorporates four kinds of dependencies or logical predecessor-successor relationships:

- 1. **Finish-to-Start:** Until the predecessor activity is complete, the successor activity cannot start.
- 2. **Finish-to-Finish:** The successor activity can't be completed until the point that a predecessor activity is complete.
- 3. **Start-to-Start:** Unless the predecessor activity has not started a successor activity cannot start.
- 4. **Start-to-Finish:** Until the predecessor activity has not begun, a successor activity cannot finish.

Once the derivation of the connections among the activities of the projects is done, you will receive a sequence that sets up activities interlinked with each other given their affiliation. This setup is known as the network diagram of the project.



The Necessity to Determine Activity Sequencing on Projects

You can't decide the most challenging way possible for a project unless you sequence activities. Numerous illustrations are similar to the project network diagrams, and hence you strive to track down the most accessible route between two points. You need to take only one point from the illustrations. In a project network diagram, you need to complete all the activities in the project.

Leads and Lags in Sequence Activities

Leads and Lags are essential tools for Sequencing Project Activities.

• Successor activity is allowed to start early, and it is pertinent to Finish-to-Start type support, which is the most basic connection between activities. A Lead enables successor activity to begin soon.