

# BASICS OF PROJECT PLANNING

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# The Basics of Project Planning

## Introduction

Before commencement of any project, the first thing that we need to do is project planning. Any reasonable project manager\* certainly understands importance of planning a project well. Carefully planned project takes into account necessary aspects of a project (e.g. tasks, milestone, schedule, risks, communication, quality, etc.) and provide a plan which project team can refer during execution.

## What is Project Planning?

The project planning is commonly perceived as creating 'Gantt Chart' alone, which is incorrect. Gantt chart is merely visual representation of project schedule. In fact project plan is quite broader concept.

A project plan expresses the objectives & requirements of the project in terms of

- Project Scope
- Project Schedule
- Resource Requirement
- project cost estimation
- Project Quality and
- Project Risk Management

A project planning enables project manager to translate project requirement into Work breakdown structure (WBS), tasks list, Gantt charts, resource assignment and risk register, etc.

Once project charter is approved, the project is formally initiated. Project planning activity can begin based on the project charter document, project requirement document.

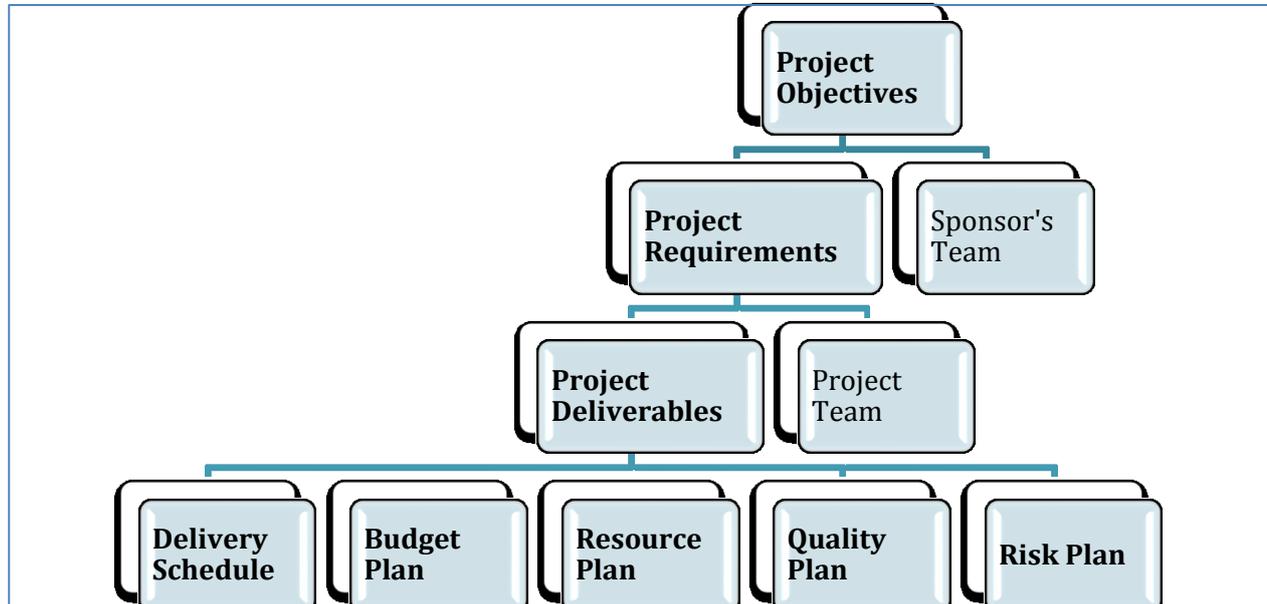


Figure 1: Project Planning Approach

## Why do we need project planning?

You see, careful & detailed planning help us to reduce risk and in turn uncertainty in any given project. In meticulously planned project, project planner attempts to make a provision for potential

\* PMBoK® 4<sup>th</sup> Edition – Page number 13

occurrences of uncertainties in advance.

It is true that project plan in advance, cannot take care of all unforeseen events, risks, and deviations nevertheless; we still, are in a better position than having no planning. Why? – We know what needs to be done, we can organize our work and also, with well-planned project we can better equip ourselves to respond aptly to potential risks, slippages, etc. Hence the bottom line is, we are able to save on time, on resources and as a result we can save on cost too.

## Elements of project plan



Figure 2: Elements of Project Planning

### 1. Project Scope Planning

Any project is expected to provide its stakeholders with certain outcome, which is commonly termed as *project deliverables*. These project deliverables depends on the *scope of the project*. Analogically, **defining a project scope is like drawing a map**. In the map, the boundaries are drawn to indicate stretch/ extent of a given territory; similarly project scope outlines the extent of project deliverables.

Essentially, project scope is the definition of what the project is expected to achieve and specify the budget of both time and cost that needs to be provisioned to create the project deliverables before the project gets closed. For the best result, one needs to take care of clearly carving out project definition & the budgetary requirements. More detailing & precision during project planning definitely help the team organize their work efficiently & deliver the project more effectively. Without a project scope, project execution can go haywire.

#### Project Deliverables

To define project scope, one needs to refer project requirements. The project planner needs to list down project deliverable items unambiguously stating whether they are '**In Scope**' or '**Not in Scope**'. So, project scope is about outlining the project deliverables. Based on project scope, project planner(s) create(s) work break down structure (WBS).

#### 1.1. Work Breakdown Structure (WBS)

The WBS is a breakdown/ decomposition of project work into distinct work items at higher level. These work items are aligned with the project objective and can help the project team to create expected deliverables. Generally the project team can refer to this work item hierarchy to decide whether any given task is included in WBS or not.

Essentially, WBS is decomposition of project work in a hierarchical fashion wherein with each descending level, it gives details of project deliverable required from project team.

## Triangular Constraints (TQR)

The project scope is generally constrained, with respect to following aspects

1. Time
2. Quality
3. Resources

If you stretch any corner of the triangle in *Figure 3: Elements of Project Planning*: the triangle gets distorted; similarly any change in the scope of the project has direct effect on (either any or all) of time, quality and resources of given project. Vice versa, any change in time or cost or resource can make the project scope altered.

And each corner of this triangle in turn has cost implication e.g. any addition of resource to project can increase cost of project, any delay in delivery can increase cost of project, any compromise on quality can have further effect on cost of the project. Hence cost of the project is directly dependent on project scope & project scope in turn is dependent on project delivery time, quality parameters & resources assignment.

## 2. Delivery Schedule Planning

Once project scope is determined and work breakdown structure (WBS) is created, the next step is to create delivery timeline. For each of the deliverable work item identified in the work breakdown structure (WBS), project planner needs to identify **list of activities** need to perform.

### Activities/Tasks

Activities as mentioned above, become a basis for estimation, scheduling, execution, and monitoring and controlling of the project work. For each of these activities he/she needs to figure out

- How long will it take to complete each activity (days, weeks)?
- What kind of resource(s) – required for its completion (skill set, experience, etc.)?

Based on the estimate of efforts required to carry out each activity, one can sum up to get duration required for each deliverable. Thus working backward, project delivery timeline can be tweaked further to provide better estimates.

### Milestones

A milestone marks a significant event in the project. Generally, project sponsors would refer to list of milestones to trace project delivery in respect of timeline & cost overrun.

### Gantt chart

The visual representation of project schedule can be viewed through a Gantt chart. Many portfolio managers & project sponsors find it easy to work with Gantt chart. Since referring the Gantt chart for a given project, project manager/ project planner & other stakeholder can optimize/ change the schedule further.

Generally, this is where project sponsors start pushing for aggressive project deadline which might have been indicated/ agreed earlier and sometimes it becomes a real problem. In such case, the reasonable way out is to consult the project sponsor team & provide the details of project schedule. If there are differences, highly detailed project schedule can help you – to make your point. Based on the discussion, you may agree to following options:

1. Reschedule project delivery timeline [Time Implication]
2. Deploy additional resources [Resource Implication]
3. Change the scope of project [Scope Implication]
4. Enforce additional/ lesser Quality checks [Quality Implication]

As project team can manage timely completion of project activities based on project delivery schedule, it is quite imperative to perform detailed estimation work on project schedule. To estimate delivery timeline, generally, it involves performing following processes.

#### Five steps to create delivery schedule

<b>2.1</b>	<b>Define Tasks/ Activities</b>
	Identification of individual & specific tasks to be performed to create the project deliverables
<b>2.2</b>	<b>Tasks/ Activities Sequencing</b>
	It is to take care of identification & establishing relationships among the project activities e.g. Product filling activity to start after package labelling activity.
<b>2.3</b>	<b>Resources Requirement Estimation</b>
	This process carry out estimation of the type (skill set/ experience, etc.) and quantities of material, people, equipment, etc. required to perform any given activity.
<b>2.4</b>	<b>Task Durations Estimation</b>
	<p>The process of approximating the number of work periods needed to complete individual activities with estimated resources. One can arrive at these estimates based on either of</p> <ul style="list-style-type: none"> <li>▪ <i>Expert's judgement</i> (consulting Subject Matter Expert)</li> <li>▪ <i>Three Point Estimate</i> (Most likely, Optimist, Less Likely)</li> <li>▪ <i>Parametric Estimation</i> (length &amp; height of compound wall, number of lines of code)</li> </ul> <p>Sometimes, it's a good idea to add tolerance for duration of activity if you are unsure of exact duration (e.g. 3 weeks +/- 2 days).</p>
<b>2.5</b>	<b>Schedule Development</b>
	This is a critical process wherein project planner analyses sequences of activities, for each activity what are the: durations required, resource required, and constraints arising due to scheduling. The outcome from this exercise is a project schedule. Once project schedule is agreed by important stakeholders, it becomes a baseline for the given project.

Table 1: 5 steps to create project delivery schedule

These five steps will help us create project schedule and it would become a baseline for a given project. The project schedule may change as project progress; this change can be attributed to change in scope, deliverables, quality and risk aspects of the project.

### 3. Project Resources Planning

It is the people who make the project work hence it is critical to plan for project team. But project resource is not just about the people to be involved in the project, rather materials, equipment required for successful completion of the project. Having mentioned this, generally resource planning tends to revolve about people/staffing management.

## Human Resource Plan

This plan tries to answer following questions but rather precise details:

1. What kinds of people are required to complete the project – necessary qty, competencies?
2. What should they do – roles & responsibilities?
3. Whom will they report to?

Thus human resource plan identifies and document the staffing requirements – skillset, roles, responsibilities and also establish the reporting structure of the project resources. It also provides the staffing plan which specifies timeline of acquisition & release of staff.

The staffing plan in last decade has become quite important for services based companies where these companies struggle with the pool of resource in terms of their availability, utilization; especially of the scarce resource having special knowledge/skill sets.

To arrive at human resource plan, project planner need to refer organization structure & figure out necessary changes and compliances required for project requirement. Companies may have following organization structure:

1. Hierarchical Organization
2. Matrix Based Organization
3. Flat organization

### What can we expect from human resource plan?

Sr No	Item	Description
<b>A</b>	<b>Roles &amp; responsibilities</b>	This section of the plan broadly describes how resources should be & how they are expected to perform in order to deliver the project outcome.
<b>A.1</b>	<b>Role</b>	For set of activities & work area, Roles are identified to make resource accountable e.g. business analyst to assess & process business requirements
<b>A.2</b>	<b>Responsibility</b>	This section documents clearly describes the work a project team member is expected to carry out to perform project activities
<b>A.3</b>	<b>Competency</b>	If project team does not have necessary competencies, project outcome remains uncertain. To assess competency requirement – this section describes the skill set, experience & capacity requirement concerned about the completion of project activities. Based on resource competency requirements; company can undertake hiring or training activities.
<b>A.4</b>	<b>Authority</b>	Authority is what marks the difference between steering committee and working committee. This section of the document, describes who has what kind of authority to perform/approve/reject, etc. e.g authority to approve resource movement, the right/authority to approve project schedule, quality gate checklist, etc. Widely known secrete - Team members operate best when their individual levels of authority match their individual responsibilities
<b>B</b>	<b>Organogram for project</b>	This can be formal or informal chart to indicate team members involved in the project with reporting/working relationship. It may help project sponsors to take into account organization designs already in place.
<b>C</b>	<b>Staffing management plan</b>	

	This is an important section which if implemented can have cost implication to the organization. This section describes staffing & training requirement, resource calendars, release plan, rewards & recognitions, etc.	
C.1	<b>Resource acquisition</b>	This section tries to answer following questions: <ol style="list-style-type: none"> <li>1. Do we have resources of specified competencies &amp; experience?</li> <li>2. Should we move internal resource to given project or hire new ones?</li> <li>3. If new resource is to be hired, should he be on the co. roll or contract?</li> <li>4. Will team work in a co-location or discrete places across geographies?</li> <li>5. What is the cost-benefit analysis for decisions made for above aspects?</li> <li>6. How staffing activities will be synchronized with HR department?</li> </ol>
C.2	<b>Resource calendars</b>	This section talks about following points <ul style="list-style-type: none"> <li>▪ The duration of each kind of team members required for project</li> <li>▪ Timeline for hiring (internal/external) – when should these be started</li> <li>▪ Depicting resource requirement in calendar of the project team during the entire lifecycle of the project</li> </ul>
C.3	<b>Staff Training &amp; release plan</b>	This plan provides details of the training to be provided for project team so as to make them competent to perform project activities. These could be in house training, external trainings, and certifications as necessary for sponsors' compliance requirements.  The project resources need to be released based on project activities & progress made. This section describes the approach to be taken in releasing resources underlining the cost, quality & timeline implications.
C.5	<b>Incentive Program</b>	This section to document clear objectives & unambiguous conditions for nominations & reward process underlining the cost-benefit analysis.

Table 2: Project Human Resource Plan

#### 4. Project Cost Planning

Cost planning exercise helps to baseline the overall project budget in terms of money so that project sponsors & project steering committee can agree on project delivery schedule as well as the payment schedule. It tries to identify cost elements to be consumed during the project lifecycles such as

- Monetary resources requirement (people, machinery, material, equipment, space, etc.)
- Provisions for risk management (people, machinery, material, equipment, space, etc.)

Quite commonly, cost planning is observed to be an iterative process wherein project planner update the cost of project based on information updates available with him/her. As you would have seen, in initial phase, the ROM estimates are within a broad range of  $\pm 50\%$  of the proposed estimate and as project progresses, the estimate may get updated to the tune of  $\pm 20\%$  or less.

##### What can we expect from Project Cost plan?

- **Cost estimates per activity**

Since activity/task form the basis for estimation of effort, duration required; project cost is generally is summed up based on cost estimates of the activities involved. Just like effort/duration estimate of an activity/task, cost estimate of an activity provides quantifiable assessment expressed in terms of currency like Euro, USD, SD, etc.

It is expected to capture cost implication of

- People, equipment, facilities, etc. required to complete given activity

- Inflation, exchange rates applicable for context of the activity

- **Factors considered for estimates**

This section will document how cost is determined/ what elements formed the basis of cost estimation – such as

- What all assumptions are made? <current vendor will supply at 10% discounted rate>
- What all constraints are applied? <max number of seats, min electricity requirement>
- What all parameters formed as a basis of estimate <number of lines of code, per square feet of wood, number of seats, etc.>
- What is the confidence level of estimate? And Why? <80%?>

## 5. Project Quality Planning

There are various known approaches to ensure project quality – some of these are

1. Six Sigma (6  $\sigma$ )
2. Cost of Quality (CoQ)
3. Total Quality Management (TQM)
4. Failure Mode and Effect Analysis (FMEA)
5. International Organization for Standardization 9001, etc.

All of these approaches essentially align with principles of project management such as careful planning in advance save a lot later, hence this section becomes necessary.

### What does project quality planning involves?

To create project quality plan, project planner need to identify what are the quality requirements of the project, which all standards are we supposed to comply with and in what manner. Surely project quality plans undergoes changes just as the master project plan.

### What can we expect project quality plan to highlight?

Sr. No	Item	Description
1	<b>Quality Process &amp; Policies</b>	The policies about quality assurance process to be followed, quality controls to be in place, process improvement being adopted are detailed
2	<b>Cost-Benefit Analysis</b>	Project planner need to build the business cases to present cost-benefit analysis of quality assurance & control process to demonstrate benefits of :: <ul style="list-style-type: none"> <li>• Significant avoidance of rework</li> <li>• Increase in productivity</li> <li>• Quality &amp; Reliability of deliverables,</li> </ul> etc. factors which would satisfy quality expectations and accompanying cost implication.
3	<b>Cost of Quality</b>	This section gives stakeholders details of estimated cost to be incurred

		during the project lifecycle by virtue of quality control & quality process: bifurcating/highlighting the cost projection in terms of <ul style="list-style-type: none"> <li>▪ Conformance cost (Prevention costs, appraisal cost)</li> <li>▪ Non-Conformance cost (internal failure cost, external fail. cost)</li> </ul>
4	<b>Quality Metrics</b>	This section will establish the metrics based on which quality controls can be applied. Establishing quality metrics is very important to ensure stability and performance of the project. The parameters & permissible values such as availability (acceptable: 98.95%), failure rate (0.02%) & frequency, budget control (cost overrun <4%), etc all these essentially governs & indicate health of the project to the stakeholders.
5	<b>Quality Checklist</b>	Based on the best practices, the project quality planner may provide quality checklist to ensure specific set of project activities are performed in standardized manner. Such checklists are quite useful in quality controls.
6	<b>Control Charts</b>	This is chart representation to visualize process stability & performance. The project planner needs to specify the boundary & threshold limits to indicate when project stability or performance is getting compromised. At what levels who's intervention is expected etc is being charted out.

Table 3: Project Quality Plan

## 6. Supporting Plans

### 6.1 Risk Management Plan

Assuming you are responsible for setting up of a power plant and in the wake of recent mishaps occurred in some other country, government has enforced stringent compliance requirement of fail-safe mechanisms at every possible stages of power generation & disposal management. And this compliance requirement will get applicable to all existing as well as new power plants. You would be stranded if you have not thought of occurrence of this event. What would you do? Wouldn't you be better off, if you have had risk mitigation plan to face such event?

The project risk is futuristic uncertainty that may occur during life of a project and can affect project deliverables. The risk can be recorded through cause-effect analysis. The cause of risk could be some hypothesis, limitation, requirement, etc. and the effect could be slippage of timeline, cost overrun/save, performance degradation/improvement, etc. of the project for example – new regulatory compliance may be enforced on power projects, economic uncertainty may lead to higher cost of labour, etc.

Project risk management is about assessing future uncertainties which can have potential impact on project objectives and the exercise of creating risk management plan, prepares team for effectively managing those uncertainties.

#### What can we expect from project risk management plan?

Sr. No	Item	Description
1	<b>Risk Identification</b>	
1.1	Identification process	The success of the risk management depends on the pro-activeness exhibited by project team in identifying & reducing effect of risks on project. This can be facilitated if risk identification process is well

		documented & is easy to understand for team members. It also
1.2	Risk Categories	The project risk planner specifies categories of the risks based on the potential impact on the project objective e.g. catastrophic, severe, low, etc.
2	<b>Risk Assessment</b>	
2.1	Risk probability and impact	Well established criteria to help team members to assess risk probability & impact.
2.2	Risk Tolerance	The plan to indicate what could be risk tolerance level that would be acceptable to stakeholders and what strategy to be adopted if risk level crosses the tolerance level.
3	<b>Risk Responses</b> The risk planner must define under what conditions response should be to avoid, accept, mitigate or transfer the risk.	
4	<b>Risk Management</b>	
4.1	Mechanism	It outlines what approach to take, whom to consult, what utility to use, etc.
4.2	Roles and responsibilities	This section specifies who should do what if risk occurs. It is not uncommon to find armies world over have defined personnel to command and own specific responsibility.
4.3	Budget Provisioning	This section marks budget provisioning for known & unknown risks and provide justification of doing so.
4.4	Risk Tracking	It details who would track risk, in what frequency, with what inputs, etc

## 6.2 Communication Plan

Projects get successfully delivery only when people work together. Project team can work together only when they know what they should do and they would know this, only when they are informed about it. That's the precise reason why organizations should have communication plan. Communication plan is about establishing appropriate channels to let correct information flow top-down as well as bottom-up manner.

### Identifying Project Stakeholders

The first thing that needs to be done at the time of creating communication plan for a project is, to identify stakeholders of the project and their information relevance (extent of information & time of receiving/sharing information). Stakeholders could be customers (internal/external), vendors, employees, partners, etc. and of course at different levels in the project organization with differential interest, importance & influence over project.

### Planning project communication:

It is important for project manager to categorize project stakeholders & identify apt communication channels as per stakeholders' category. Such arrangement will save project managers' time during project execution while dealing with amount of information he/she receives & has to communicate.

Just for example, some stakeholders necessarily have to receive certain information (e.g. project sponsors to know about achievement/failure to achieve milestones in respect of specific timeline) similarly; project planner can identify categories of project stakeholders such as follows

For each of the identified stakeholder category, there has to be modes of communication that we need to establish as appropriate to the context of the project.

Project manager need to be clear about how information would be gathered & shared-

- Receiving information: should it be through meeting (e.g. User Acceptance Test meeting with customer) or over email (collect status of activities/issues over email or s/w tool from team members )or some other means
- Sharing Information: should it be done through meeting (e.g. stakeholder meeting) & then sharing MoM mail or over email (project activities are to be completed by team members)

**What can we expect from communication plan?**

Sr. No	To distribute/share	To receive
1.1	Must Inform	Must get response/update from
1.2	Should Inform	Should get response/update from
1.3	Could Possibly Inform	Could Possibly get update from
1.4	Need not inform	Need not get update from
Sr. No	Importance	Other Factors
2.1	Critical   Information/action	Immediate (time, frequency)
2.2	Mandatory   Information/action	As per schedule (time, frequency)
2.3	Information only	Email/press release/Language, format
2.4	For action & updates	Authority to share/ receive/ commit
2.5	Can Ignore   Confidential	Escalation Matrix for reference

Table 4: Categorization of project stakeholders & information

### 6.3 Procurement Plan

Project procurement plan documents purchase policy illustrating purchase process, buy/lease/rent decisions, vendor selection, negotiation, financial concurrence, duration, legal concurrence, etc. Also it should chalk out roles authorized to make tendering process, financial & legal concurrence, and approval/rejection decision.

**What can we expect in procurement plan?**

Apart from above factons project planner needs to specify how procurement statement of work (SoW) or RFQ/RFT to be organized or tracked, sourcing criterion, vendor selection criterions as well document the make-buy decision approach & escalation matrix for the same.

### Conclusion:

One of the critical factors to succeed in project management is to have **comprehensive & detailed project plan**; yet have the **flexibility to adapt** appropriately based on the uncertain circumstances

References:

1. PMBoK® Guide 4<sup>th</sup> Edition