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Project Management

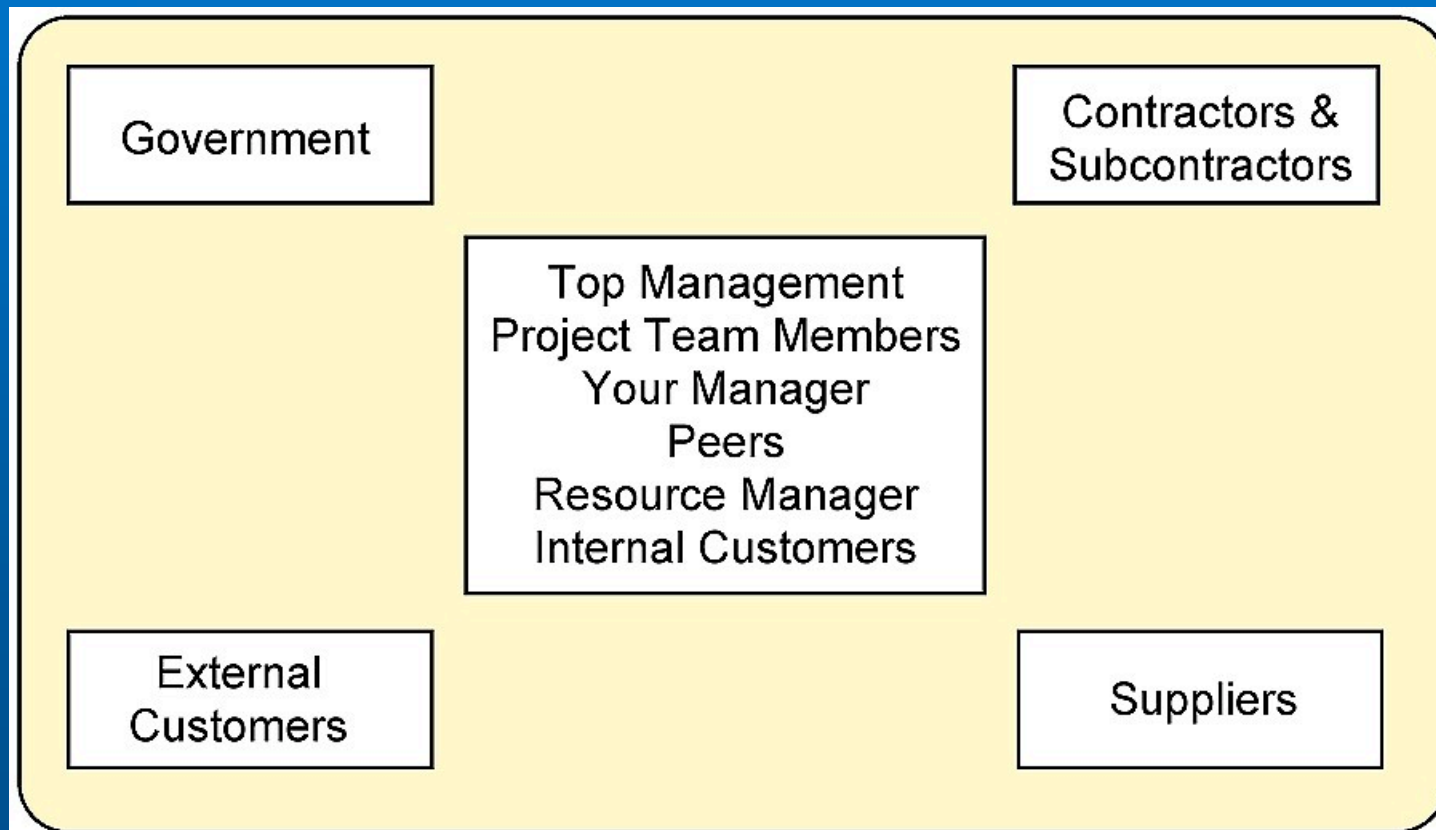
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What is a Project Manager?

100% responsible for the processes needed to manage a project to a successful conclusion.

- Managing the overall schedule to ensure work is assigned and completed on time and within budget and in scope.
- Identifying, tracking, managing and resolving project issues
- Identifying, responding to and managing project risk.
- *Proactively* communicating project information to all stakeholders

Who are the stakeholders?



What is a Project Manager? (contd.)

Process Responsibilities

- Ensuring that the solution is of acceptable quality.
- Proactively managing scope to ensure that only what was agreed to is delivered, unless changes are approved through scope management
- Defining and collecting metrics to give a sense for how the project is progressing and whether the deliverables produced are acceptable.

What is a Project Manager?

People Responsibilities

- General management skills needed to establish processes and make sure that people follow them
- Leadership skills to get the team to willingly follow your direction (team building, motivational)
- Sets reasonable, challenging and clear expectations of people (proactive verbal and written communication)
- Hold team members accountable for meeting the expectations (performance feedback)

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Project Management Areas of Responsibility

- Establish objectives that can be achieved
- Identify the requirements for the project
- Satisfy everyone's needs
- Balance scope, time and cost (*Triple Constraint*)

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The Triple Constraint

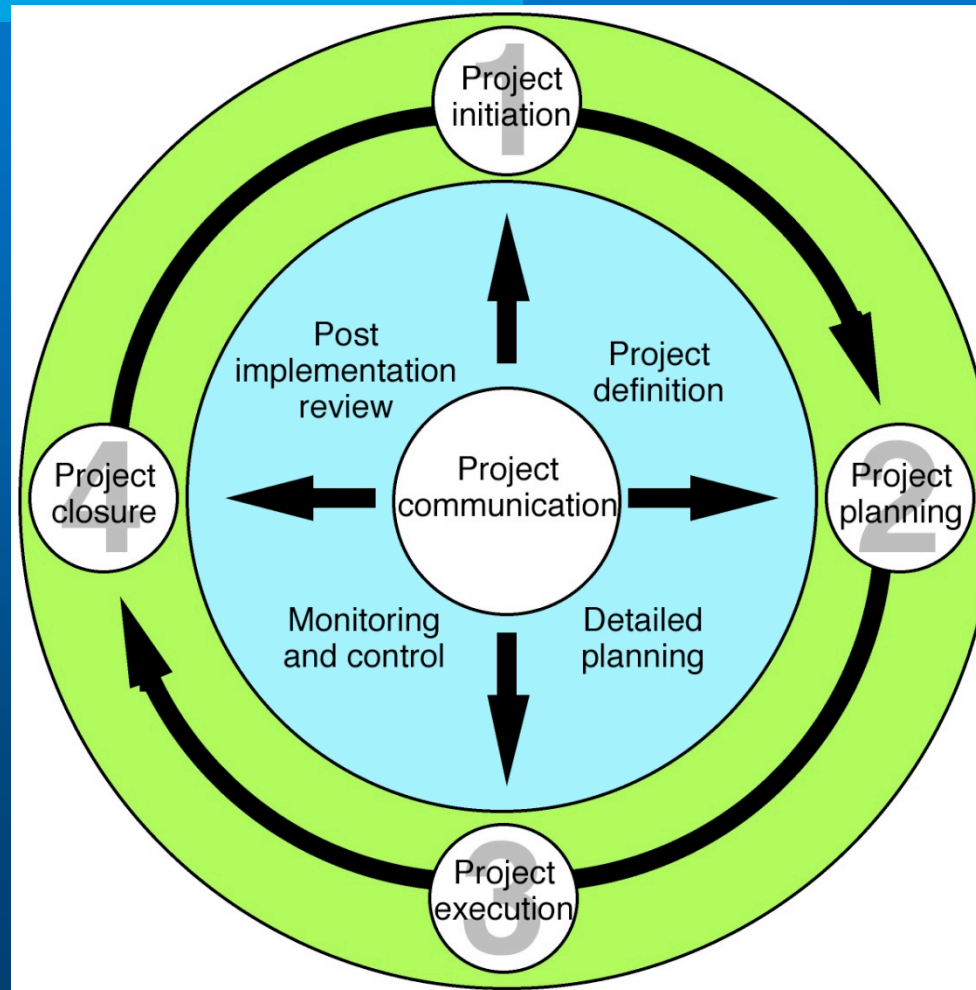


Scope Creep

- **Add Time-** *delay the project to give you more time to add the functionality (\$)*
- **Add Cost-** *recruit, hire or acquire more people to do the extra work (\$)*
- **Cut Quality-** *trade off some non-essential requirements for the new requirements (\$)*

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Project Life Cycle



Initiating a Project

A business case is created to define the problem or opportunity in detail and identify a preferred solution for implementation

- A detailed description of the problem or opportunity
- A list of alternative solutions available
- An analysis of the business benefits, costs, risks and issues
- A description of the preferred solution
- A summarized plan for implementation

Define the project objectives

Establish clear and realistic objectives

Good objectives are “clearly stated” and contain a “measure” of how to assess whether they have been achieved.

To be realistic, objectives must be “determined jointly” by managers and those who perform the work.

SMART Objectives

- **Specific** (get into the details)
- **Measurable** (use quantitative language so that you know when you are finished)
- **Acceptable** (to Stakeholders)
- **Realistic** (given project constraints)
- **Time Based** (deadlines, not durations)

Project objective statement

- State the objective of your project; what is the business benefit?
- The objectives should be concisely written so they can be evaluated after the completion of the project to see whether they were achieved
- The objectives should be specific, measurable, attainable, realistic and time bound. (SMART)

Project Planning

- Scope Planning; Specifies the Requirements for the project
- Preparing the Work Breakdown Structure
- Project Schedule Development
- Resource, Budget, Procurement, Quality and Communication plans are created

Scope Planning

How do you define Scope?

- What are the deliverables you and your team will produce for the project?
- What will your project deliver?

Scope Statement

The project scope statement may include:

- **Product Scope**
- **Project Scope**
- **Deliverables**
- **Product/ Project acceptance criteria**
- **What is not part of the project**
- **Constraints or Assumptions**

Project Requirements

- Requirements answer the following questions regarding the AS IS and TO BE states of the business
(who, what, where, when, how much, how does a business process work)

Types of Requirements

- **Regulatory:** Internal and external; usually non negotiable
- **Business:** needs of the sponsoring organization; always from a management perspective
- **User:** What the users need to do with the system or product
- **Functional and Non Functional :** What the system needs to be able to do to satisfy the business and user needs in terms of function and functionality
- **Technical:** How the system needs to be designed and implemented to provide required functionality and fulfill required operational characteristics.

Work Breakdown Structure (WBS)

- Provides a framework for organizing and managing the approved project scope
- Helps ensure you have defined all the work that makes up the project
- Provides a framework for planning and controlling costs and schedule information

Sequence the Activities

- What comes first, second, third, etc.
- Look for relationships between activities
- What can be done in parallel?
- What activities must wait for others to complete?
- Begin to identify the milestones

Network Diagram

- One Start and One End
- Collection of any set of related tasks is a path.
- All tasks have at least one predecessor (except the beginning)
- All tasks at have at least one successor (except the end)

Assign Resources

- Assign specific resources if known
- Assign generic resource roles
 - “programmer 1”, “technical writer 1”
- Check for resource over-allocation or under allocation

Estimate Duration

- Factor in productive hours per day
- Factor in available workdays
- Determine how many resources on each activity
- Take into account any part-time resources
- Calculate delays and lag times

Estimate the Duration

Bottom Up Estimating

- Break down the work
- Estimate all work at the detailed level
- Add up the estimates for all detailed activities
- Apply estimating techniques at the activity level

Estimation Techniques

Expert Opinion

- Individual who has done it many times
- Internal or External to the organization
- Industry expert
- Utilize for new technology or unfamiliar with the subject

Estimation Techniques

Published Estimating Data

- Articles
- Books
- Journals
- periodicals

Estimating Techniques

- Previous history (actual hours tracked)
- Analogy (similar, not exact)
 - Look for similar projects from the past

**Example: Chicago project is 500 hours.
Atlanta is similar size**

Estimating Techniques

- **Ratio**

- Characteristics of project allow comparison
- Projects are similar but different scale
- The main factors that drive the effort are similar

Example- Chicago project is 500 hours. Orlando is half as big. New York is twice as big

Estimate the Effort

Parametric Modeling

- Characteristics of project allows use of a model
- Use statistics, formulae, spreadsheets

Example- Highway is \$1 million per lane per mile. How much for 10 miles of four lane highway?

Critical Path

- Provides a graphical view of the project
- Predicts the time required to complete the project
- Shows which activities are critical to maintaining the schedule and which are not.
- Demonstrates the longest path of the project
- Drives the project completion date
- Any delay will cause the entire project to be delayed

Calculating Critical Path

- Calculated automatically by project management tool
- Can calculate manually by understanding early start, early finish, late start and late finish

Manage to the Critical Path

If a critical path activity will not meet its end date:

- **“Fast Track”-Overlap tasks or run in parallel**
- **“Crash”-Additional resources to complete activities more quickly**
- **Swap resources with more experienced resources**

Estimate Cost

Now you estimate the costs

- Determine the cost of labor, internal and external
- Include all non-labor costs including:
 - Hardware and software
 - Travel expenses
 - Training
 - Team building
 - Facilities
 - Maintenance/support costs

Planned value and actual cost

These are measures of the budgeted costs of work scheduled (PV) and actual cost of work performed (AC)

Planned value = total cost of the work scheduled

$$PV = \text{Hourly rate} \times \text{total hours planned (scheduled)}$$

Actual costs = earned value / planned value

$$AC = \text{Hourly rate} \times \text{total hours spent}$$

Earned value (EV)

This is also described as the budgeted cost of work performed (BCWP). This is the total cost of the work completed (performed) as of the reporting date.

Earned value = baseline cost x % work actually completed

% work actually completed = AC/EAC

EAC = Estimated at completion = estimated cost of the project at the end of the project

Schedule variance and schedule performance indicator

These are measures of how close the work is to being accomplished on schedule (SV) and the efficiency of utilization of time (SPI)

Schedule variance = earned value – planned value

$$SV = EV - PV$$

If SV is negative then the project is behind schedule

If SV is positive then the project is ahead of schedule

Schedule performance indicator = earned value / planned value

$$SPI = EV / PV$$

If SPI is > 1 then the project is efficient in utilizing time

If SPI is < 1 then the project is inefficient in utilizing time

Cost variance and cost performance indicator

These are measures of how close the work is to being accomplished on budget (CV) and the efficiency of utilization of resources (CPI)

Cost variance = earned value – actual cost

$$CV = EV - AC$$

If CV is negative then the project is over budget

If CV is positive then the project is under budget

Cost performance indicator = earned value / actual cost

$$CPI = EV / AC$$

If CPI is > 1 then the project is efficient in utilizing resources

If CPI is < 1 then the project is inefficient in utilizing resources

Project Close

- **End of Project**
 - Gain final approvals
 - Close the project
 - Final performance reviews
 - Gather final project metrics
 - End of Project meeting
 - Reallocate project staff
 - Turnover deliverables to support/operations
 - Close all contracts

Project Closeout

At project closeout, the project should
be evaluated, and all lessons learned
formally documented