

Chapter 1

Introduction to Project Management

What Is a Project?

- ▶ A **project** is “a temporary endeavor(effort) undertaken to create a unique product, service, or result” (PMBOK® Guide, Fifth Edition, 2013) *A Guide to the Project Management Body of Knowledge (PMBOK® Guide)*
- ▶ Projects end when their objectives have been reached or the project has been terminated.
- ▶ Projects can be large or small and take a short or long time to complete.

Examples of IT Projects

- ▶ A team of students creates a smartphone application and sells it online.
- ▶ A company develops a driverless car.
- ▶ A government group develops a systems to track child immunizations.
- ▶ A global bank acquires other financial institutions and needs to consolidate systems and procedures.
- ▶ A college upgrades its technology infrastructure to provide wireless Internet access across the whole campus.

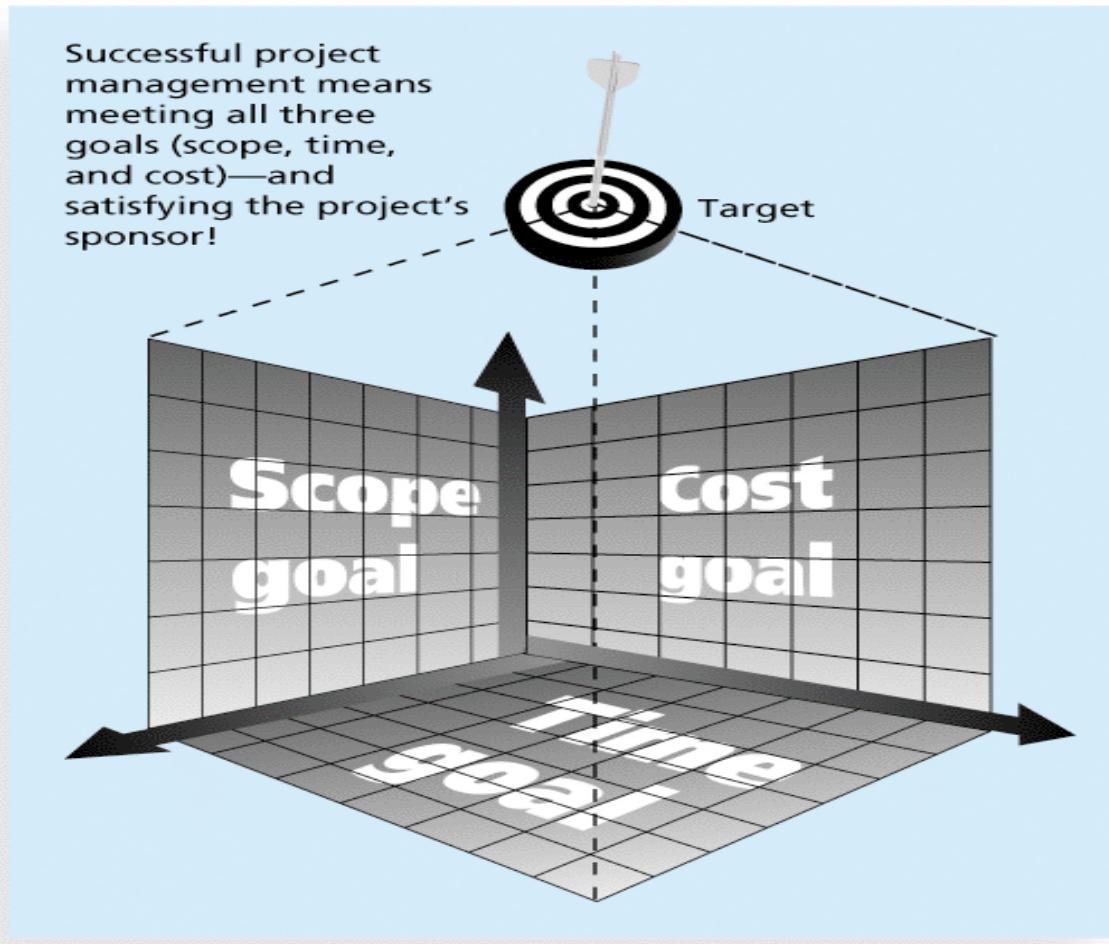
Project Attributes

- ▶ A project
 - has a unique purpose
 - is temporary
 - is developed using progressive elaboration
 - requires resources, often from various areas.
 - should have a primary customer or sponsor.
 - The **project sponsor** usually provides the direction and funding for the project.
 - involves uncertainty

Project and Program Managers

- ▶ **Project managers** work with project sponsors, project team, and other people involved in a project to meet project goals.
- ▶ **Program**: group of related projects managed in a coordinated way to obtain benefits .
- ▶ Program managers oversee programs; often act as bosses for project managers.

The Triple Constraint of Project Management



What is Project Management?

- ▶ **Project management** is “the application of knowledge, skills, tools and techniques to project activities to meet project requirements” (PMBOK® Guide, Fourth Edition, 2013)
- ▶ Project managers attempt to meet the **triple constraint** (project scope, time, and cost goals) and also facilitate the entire process to meet the needs and expectations of project stakeholders.

Project Stakeholders

- ▶ **Stakeholders** are the people involved in or affected by project activities.
- ▶ Stakeholders include
 - the project sponsor
 - the project manager
 - the project team
 - support staff
 - customers
 - users
 - suppliers

10 Project Management Knowledge Areas

- ▶ **Knowledge areas** describe the key competencies that project managers must develop.
- ▶ Project managers must have knowledge and skills in all 10 knowledge areas (**project integration, scope, time, cost, quality, human resource, communications, risk, procurement, and stakeholder management**)

Project Management Tools and Techniques

- ▶ **Project management tools and techniques** assist project managers and their teams in various aspects of project management
- ▶ Some specific ones include
 - Project charter, scope statement, and WBS (scope)
 - Gantt charts, network diagrams, critical path analysis, critical chain scheduling (time)
 - Cost estimates and earned value management (cost)

Project Success

- ▶ There are several ways to define project success:-
 - The project met scope, time, and cost goals
 - The project satisfied the customer/sponsor.
 - The results of the project met its main objective, such as making or saving a certain amount of money, providing a good return on investment, or simply making the sponsors happy.

What Helps Projects Succeed?*

1. Executive support
2. User involvement
3. Clear business objectives
4. Emotional maturity
5. Optimizing scope
6. Agile process
7. Project management expertise
8. Skilled resources
9. Execution
10. Tools and infrastructure

*The Standish Group, “CHAOS Manifesto 2013: Think Big, Act Small” (2013).

The Role of the Project Manager

- ▶ Planning, scheduling, coordinating, and working with people to achieve project goals.
- ▶ Remember that 97% of successful projects were led by experienced project managers.

Suggested Skills for Project Managers

- ▶ The Project Management Body of Knowledge.
- ▶ Application area knowledge, standards, and regulations.
- ▶ Project environment knowledge.
- ▶ General management knowledge and skills.
- ▶ Soft skills or human relations skills.

Ten Most Important Skills and Competencies for Project Managers

1. People skills
2. Leadership
3. Listening
4. Integrity, ethical behavior, consistent
5. Strong at building trust
6. Verbal communication
7. Strong at building teams
8. Conflict resolution, conflict management
9. problem solving
10. Understands, balances priorities

Different Skills Needed in Different Situations

- ▶ **Large projects:** Leadership, relevant prior experience, planning, people skills, verbal communication, and team-building skills were most important.
- ▶ **High uncertainty projects:** Risk management, expectation management, leadership, people skills, and planning skills were most important
- ▶ **Very novel projects:** Leadership, people skills, having vision and goals, self confidence, expectations management, and listening skills were most important

THANK YOU!

CHAPTER 2

Project Scope Management

What is Project Scope Management?

- ▶ **Scope** refers to *all* the work involved in creating the products of the project and the processes used to create them
- ▶ A **deliverable** is a product produced as part of a project, such as hardware or software, planning documents, or meeting minutes
- ▶ **Project scope management** includes the processes involved in **defining and controlling what is or is not included in a project**

Project Scope Management Processes

- ▶ **Collecting requirements:** defining and documenting stakeholders' needs to meet the project objectives.
- ▶ **Defining scope:** The process of developing a detailed description of the project and product.
- ▶ **Creating the WBS:** subdividing the major project deliverables into smaller, more manageable components
- ▶ **Verifying scope:** formalizing acceptance of the completed project deliverables
- ▶ **Controlling scope:** controlling changes to project scope throughout the life of the project

Collecting Requirements

- ▶ A **requirement** is “a condition or capability that must be met or possessed by a system, product, service, result, or component to satisfy a contract, standard, specification, or other formal document”
- ▶ For some IT projects, it is helpful to divide requirements development into categories called **elicitation, analysis, specification, and validation**
- ▶ It is important to use an iterative approach to defining requirements since they are often unclear early in a project

Methods for Collecting Requirements

- ▶ Interviewing
- ▶ Focus groups and facilitated workshops
- ▶ Using group creativity and decision-making techniques
- ▶ Questionnaires and surveys
- ▶ Observation
- ▶ Prototyping
- ▶ Software tools

Defining Scope

- ▶ Key inputs for preparing the project scope statement include the project charter, requirements documentation, and organizational process assets such as policies and procedures related to scope statements as well as project files and lessons learned from previous, similar projects
- ▶ As time progresses, the scope of a project should become more clear and specific

Creating the Work Breakdown Structure (WBS)

- ▶ A **WBS** is a deliverable-oriented grouping of the work involved in a project that defines the total scope of the project
- ▶ **Decomposition** is subdividing project deliverables into smaller pieces
- ▶ A **work package** is a task at the lowest level of the WBS.

Verifying Scope

- ▶ It is very difficult to create a good scope statement and WBS for a project
- ▶ It is even more difficult to verify project scope and minimize scope changes
- ▶ **Scope verification:** focuses on formal acceptance of the completed project scope by the stakeholders.
- ▶ **Quality control:** concerned with correctness of the deliverables and meeting the quality requirements specified for the deliverables.

controlling changes to the
Controlling Scope
project scope

► **Goals of scope control are to:**

- Influence the factors that cause scope changes
- Assure changes are processed according to procedures developed as part of integrated change control
- Manage changes when they occur

- ▶ Project scope management
 - Chapter Summary
 - Includes the processes required to ensure that the project addresses all the work required, and only the work required, to complete the project successfully
 - Collect requirements
 - Define scope
 - Create WBS
 - Verify scope
 - Control scope
- ▶ Main processes include:

Project Time management

Importance of Project Schedules

- ▶ Delivering projects on time is one of their biggest challenges.
- ▶ Time has the least amount of flexibility; it passes no matter what happens on a project.
- ▶ Schedule issues are the main reason for conflicts on projects.

Project Time Management Processes

- ▶ **Defining activities:** identifying the specific activities that the project team members and stakeholders must perform to produce the project deliverables
- ▶ **Sequencing activities:** identifying and documenting the relationships between project activities
- ▶ **Estimating activity resources:** estimating how many **resources** a project team should use to perform project activities.
- ▶ **Estimating activity durations:** estimating the number of work periods that are needed to complete individual activities.
- ▶ **Developing the schedule:** analyzing activity sequences, activity resource estimates, and activity duration estimates to create the project schedule.
- ▶ **Controlling the schedule:** controlling and managing changes to the project schedule.

Defining Activities

- ▶ An **activity or task** is an element of work normally found on the work breakdown structure (WBS) that has an expected duration, a cost, and resource requirements.
- ▶ Activity definition involves developing a more detailed WBS and supporting to understand all the work to be done. so you can develop realistic cost and duration estimates.

Sequencing Activities

- ▶ Involves reviewing activities and determining dependencies
- ▶ A **dependency** or **relationship** is the sequencing of project activities or tasks.
- ▶ You *must* determine dependencies in order to use critical path analysis.

**durations, you must have a
Estimating Activity Resources
good idea of the quantity and
type of resources that will be
assigned to each activity;
resources are people,
equipment, and materials.**

▶ **Consider important issues in
estimating resources**

Activity Duration Estimating

- ▶ **Duration** includes the actual amount of time worked on an activity *plus* elapsed time
- ▶ **Effort** is the number of workdays or work hours required to complete a task
- ▶ Effort does not normally equal duration
- ▶ People doing the work should help create estimates, and an expert should review them

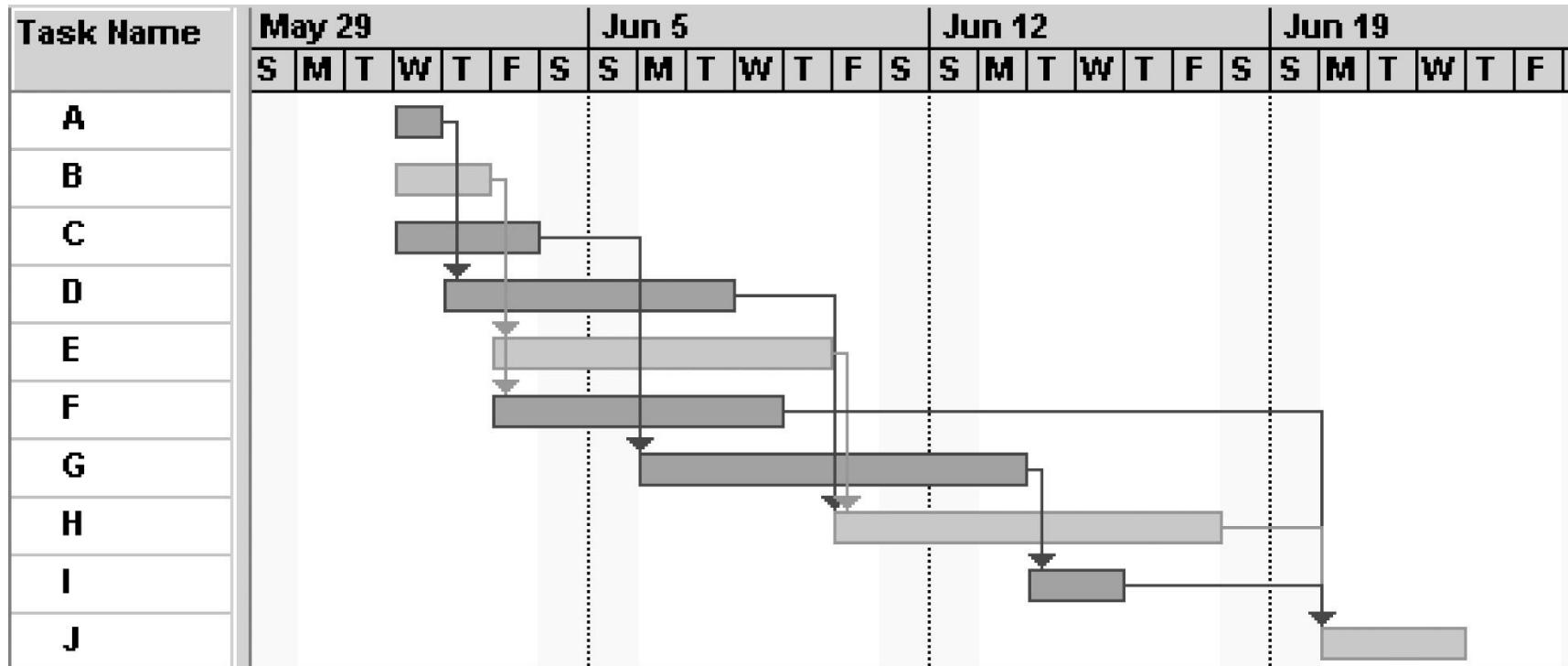
Developing the Schedule

- ▶ Uses results of the other time management processes to determine the start and end date of the project
- ▶ Ultimate goal is to create a realistic project schedule that provides a basis for monitoring project progress for the time dimension of the project
- ▶ Important tools and techniques include Gantt charts, critical path analysis, and critical chain scheduling

Gantt Charts

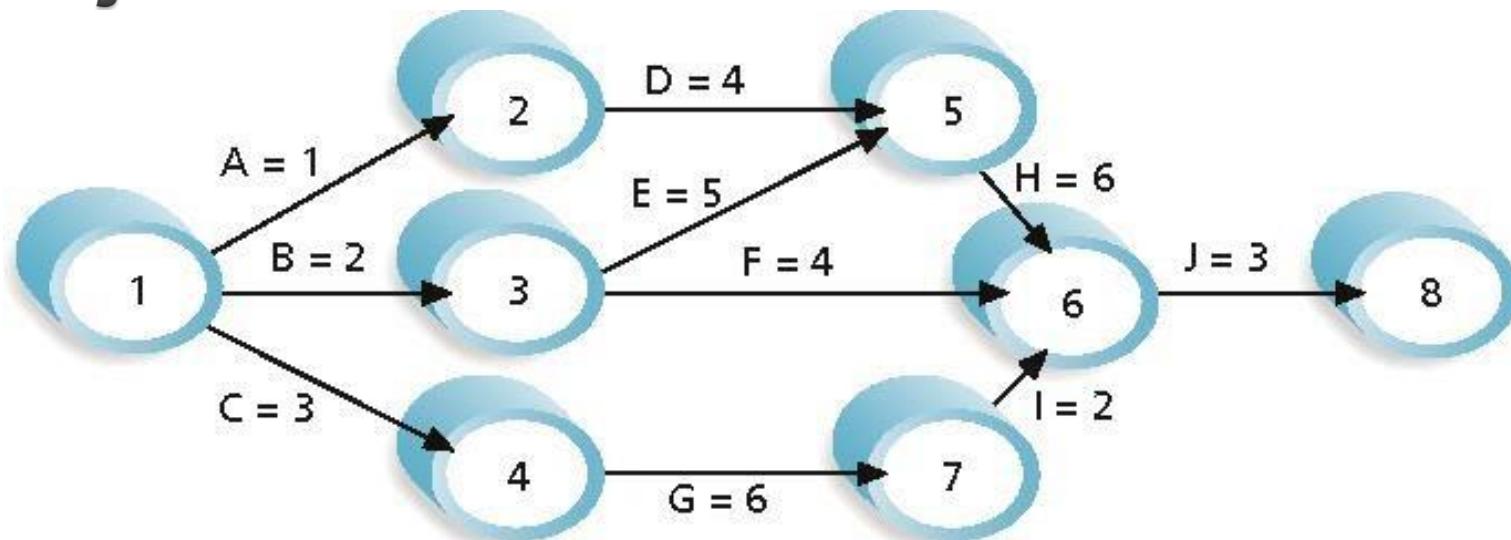
- ▶ **Gantt charts** provide a standard format for displaying project schedule information by listing project activities and their corresponding start and finish dates in a calendar format
- ▶ The **critical path** is the *longest path* through the network diagram and has the least amount of slack(delay) or float

Figure 6-5. Gantt Chart for Project X



Note: Darker bars would be red in Project 2007 to represent critical tasks.

Figure 6. Determining the Critical Path for Project X



Note: Assume all durations are in days.

Path 1: A-D-H-J Length = $1+4+6+3 = 14$ days

Path 2: B-E-H-J Length = $2+5+6+3 = 16$ days

Path 3: B-F-J Length = $2+4+3 = 9$ days

Path 4: C-G-I-J Length = $3+6+2+3 = 14$ days

Since the critical path is the longest path through the network diagram, Path 2, B-E-H-J, is the critical path for Project X.

Schedule Control Suggestions

- ▶ Perform reality checks on schedules
- ▶ Allow for contingencies
- ▶ Don't plan for everyone to work at 100% capacity all the time
- ▶ Hold progress meetings with stakeholders and be clear and honest in communicating schedule issues

► Goals are to know the status of the schedule, influence factors that cause schedule changes, determine that the schedule has changed, and manage changes when they occur

- Tools and techniques include:
- Progress reports
 - A schedule change control system
 - Project management software, including schedule comparison charts like the tracking Gantt chart
 - Variance analysis, such as analyzing float or slack
 - Performance management, such as earned value

~~Project Summary~~ management is often cited as the main source of conflict on projects, and most IT projects exceed time estimates

- Define activities
- Sequence activities
- ▶ Main processes include:
 - Estimate activity resources
 - Estimate activity durations
 - Develop schedule
 - Control schedule

Project cost management

What is Cost and Project Cost Management?

- ▶ **Cost** is a resource sacrificed or foregone to achieve a specific objective or something given up in exchange.
- ▶ Costs are usually measured in monetary units like dollars
- ▶ **Project cost management** includes the processes required to ensure that the project is completed within an approved budget.

Project Cost Management Processes

- ▶ **Estimating costs:** developing an approximation or estimate of the costs of the resources needed to complete a project.
- ▶ **Determining the budget:** allocating the overall cost estimate to individual work items to establish a baseline for measuring performance.
- ▶ **Controlling costs:** controlling changes to the project budget.

Estimating Costs

- ▶ Project managers must take cost estimates seriously if they want to complete projects within budget constraints.
- ▶ It's important to know the types of cost estimates, how to prepare cost estimates, and typical problems associated with cost estimates

Expressed in units of some Estimate Cost currency (i.e., dollars, euro, yen, birr etc.)

- ▶ In some instances other units of measure, such as **hours or days**, are used to eliminate the effects of currency fluctuations.
- ▶ Costs are estimated for all resources that will be charged to the project. labor, materials, equipment, services, and facilities, as well as special categories such as an inflation allowance or contingency costs

- ▶ Cost budgeting involves Determining the Budget allocating the project cost estimate to individual work items over time.
- ▶ **Important goal is to produce a cost baseline**
 - A time-phased budget that project managers use to measure and monitor cost performance.
 - This baseline includes all authorized budgets, but excludes management reserves.

Controlling Costs

▶ Project cost

control includes:

- Monitoring cost performance
- Ensuring that only appropriate project changes are included in a revised cost baseline.
- Informing project stakeholders of authorized changes to the project that will affect costs.
- ▶ Many organizations around the globe have problems with cost control.

- ▶ Project cost management is Chapter Summary a traditionally weak area of IT projects, and project managers must work to improve their ability to deliver projects within approved budgets.
 - Estimate costs
 - Determine the budget
 - Control costs
- ▶ Main processes include:

Project Risk Management

The Importance of Project Risk Management

- ▶ Project risk management is the art and science of identifying, analyzing, and responding to risk throughout the life of a project and in the best interests of meeting project objectives.
- ▶ It can help improve project success by helping select good projects, determining project scope, and developing realistic estimates.

Negative Risk

- ▶ A dictionary definition of risk is “**the possibility of loss or injury**”
- ▶ Negative risk involves understanding potential problems that might occur in the project and how they might impede project success
- ▶ *Negative risk management is like a form of insurance; it is an investment*



Risk Can Be Positive

- ▶ *Positive risks are risks that result in good things happening; sometimes called opportunities*
- ▶ A general definition of project **risk** *is an uncertainty that can have a negative or positive effect on meeting project objectives.*
- ▶ The goal of project risk management is *to minimize potential negative risks while maximizing potential positive risks.*

Project Risk Management Processes

- ▶ **Planning risk management:** Process of defining how to conduct risk management activities for a project.
- ▶ **Identifying risks:** *Determining which risks are likely to affect a project and documenting the characteristics.*
- ▶ **Performing qualitative risk analysis:** *prioritizing risks based on their probability and impact of occurrence.*

Project Risk Management Processes (continued)

- ▶ **Performing quantitative risk analysis:** *Numerically estimating the effects of risks on project objectives.*
- ▶ **Planning risk responses:** *To enhance opportunities and reduce threats to meeting project objectives.*
- ▶ **Monitoring and controlling risks:** *Monitoring identified risks, identifying new risks, carrying out risk response plans, and evaluating the effectiveness of risk strategies throughout the life of the project*

Risk Management Planning

- ▶ The main output of risk management planning is a **risk management plan**, a plan that documents the procedures for managing risk throughout a project
- ▶ The project team should review project documents and understand the organization's and the sponsor's approaches to risk.
- ▶ **Contingency plans** :are predefined actions that the project team will take if an identified risk event occurs

Identifying Risks is the process of understanding what potential events might hurt or enhance a particular

- ▶ Risk identification tools and techniques include:
project
 - Brainstorming
 - Interviewing
 - SWOT analysis

Risk Register

The main output of the risk identification process is a list of identified risks and other information needed to begin creating a risk register

A risk register is:

A document that contains the results of various risk management processes and that is often displayed in a table or spreadsheet format.

A tool for documenting potential risk events and related information.

Risk events refer to **specific, uncertain events** that may occur to the detriment or enhancement of the project

Risk Register Contents

- ✓ An identification number for each risk event
- ✓ A rank for each risk event
- ✓ The name of each risk event
- ✓ A description of each risk event
- ✓ The category under which each risk event falls
- ✓ The root cause of each risk

Risk Register Contents (cont'd)

- ✓ Triggers for each risk; **triggers** are indicators or symptoms of actual risk events
- ✓ Potential responses to each risk
- ✓ The **risk owner** or person who will own or take responsibility for each risk
- ✓ The probability and impact of each risk occurring.
- ✓ The status of each risk

Performing Qualitative Risk

Analysis

► **Assess the likelihood and impact of identified risks to determine their magnitude and priority.**

tools and techniques include:

- Probability/impact matrixes
- Expert judgment

Performing Quantitative Risk Analysis

- ▶ Often follows qualitative risk analysis, but both can be done together
- ▶ Large and complex projects often require extensive quantitative risk analysis.
- ▶ Used to assign a numerical rating.
- ▶ *To determine if the overall project risk has been satisfactorily decreased.*

After identifying and
Planning Risk Responses
quantifying risks, you must
decide how to respond to
them

Four main response
strategies for negative risks

- Risk avoidance
- Risk acceptance
- Risk transference
- Risk mitigation

Monitoring and Controlling Risks
► **Involves executing the risk management process to respond to risk events.**

Project Risk management is the art and science of identifying, analyzing, and responding to risk throughout the life of a project and in the best interests of meeting project objectives

- Plan risk management

► **Main processes include:**

- Identify risks
- Perform qualitative risk analysis
- Perform quantitative risk analysis
- Plan risk responses
- Monitor and control risks

Thank you!