



Basics of Security Project Management

Planning

Part IV to Planning,
Organizing, & Controlling
Resources during a Project



GOAL

1

Ensure that the necessary preventative, detective, and corrective measures will be implemented following a risk assessment.

2

Project Plan will improve the protection of company assets.

3

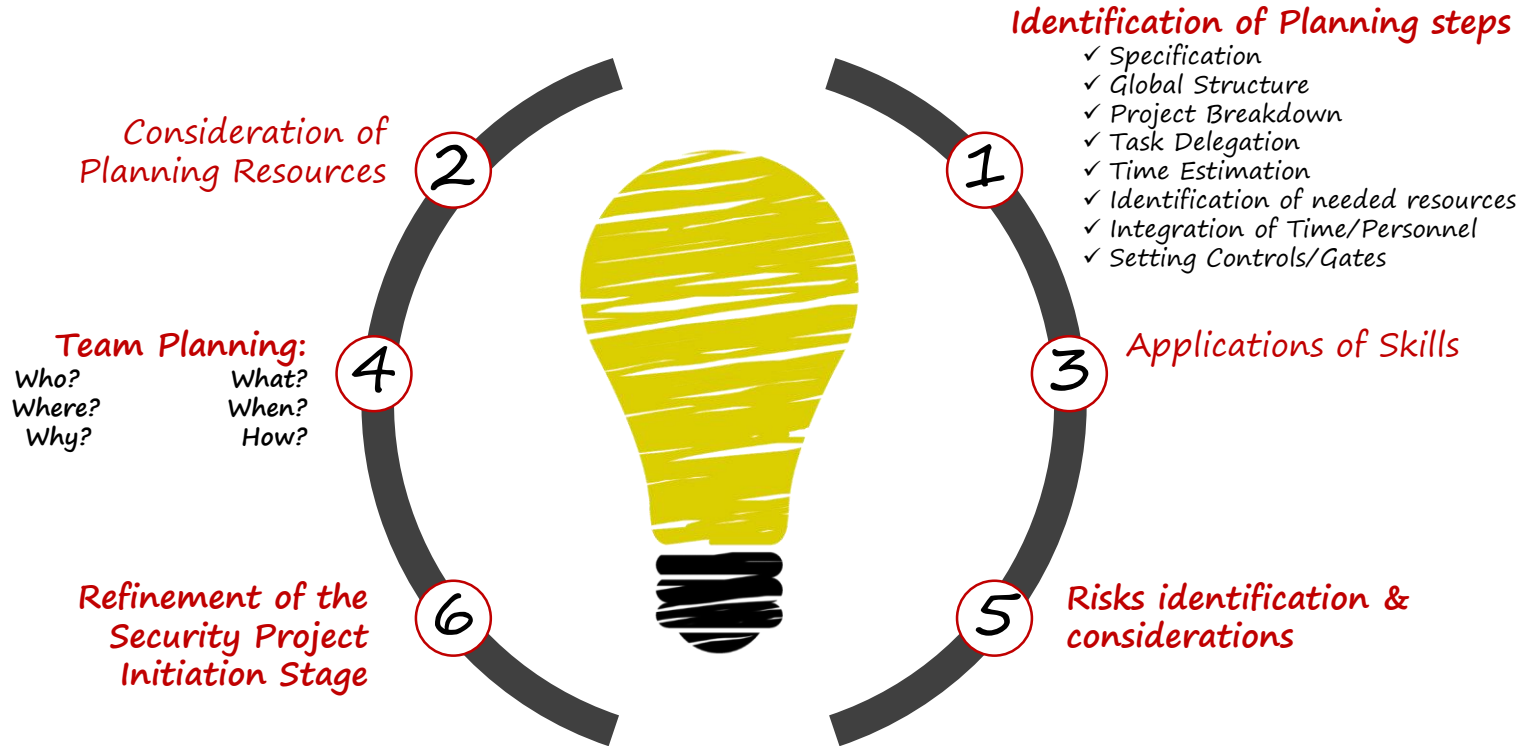
Time and attention to detail

4

Repeatable, stable, and thorough process that can be applied

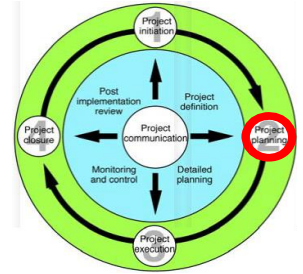


Learning Objectives

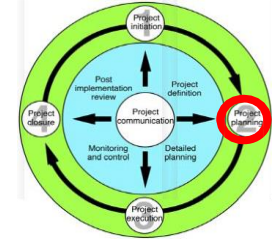




Project Planning Activities

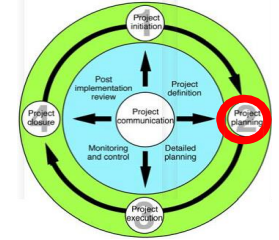


“Fail to Plan, Plan to Fail.”



Risk, Threat, & Vulnerability Assessment	Recommended Safeguards	PPS Requirements Document	Project Scope Document	Procurement Approach
Sole Source Justification	Business Objectives	Design Criteria & Requirements	Performance requirements	Capacity Requirements

Essential Project Planning Steps



Define Project Goals & Objectives

Develop & Finalize Budget

Define Scope of Work

Define Resources Needed

**Obtain Necessary Reviews
Authorizations**

Define Project Execution Plan

Develop Communications Plan

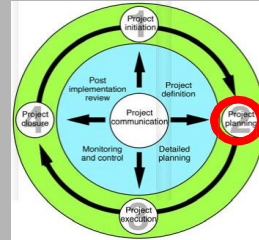
**Consider Permits, Bonding, Additional
Insurances, Travel Requirements**

Set Time Parameters

**Develop Project Purchasing
Billing, & Cash Flow Plan**

Prepare Risk Management Plan

Questions to Answer During Planning



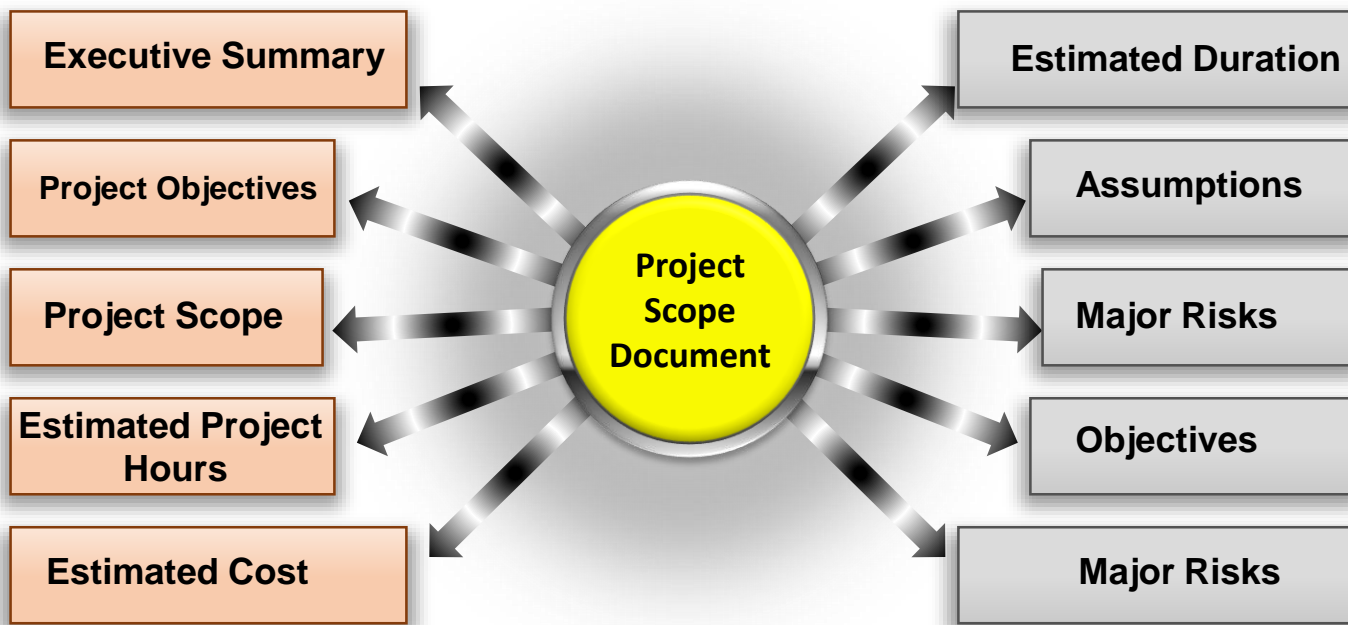
Point 1 What is the real purpose of this project?

Point 2 What methods, processes, or actions were used to define the project?

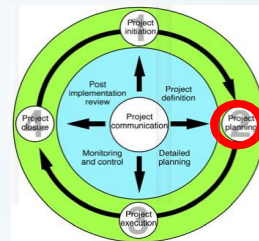
Point 3 What will the results of this project do for the stakeholders?

Point 4 What is the priority of this project, how was that priority determined, and how does it compare with that of other current projects?

NOTE: The documentation prepared during the planning stage is called the project scope document.

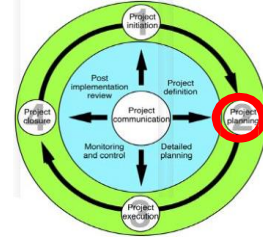


Project Team



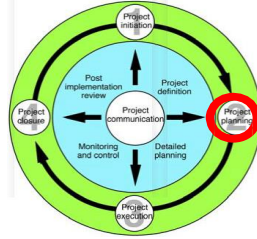
- ✓ Should contain a representative from each functional area.
- ✓ Varying skillsets on the team
- ✓ If no skills available, the client should supplement with outside consultants
- ✓ Be wary of bringing in a large team. It may prevent a team from coalescing
- ✓ Project team understands how their tasks fit into the overall project and their impact upon the project.

Types of Information the Team will Gather



- 1** Organizational Charts
- 2** Maps showing work areas, buildings, security posts, vital equipment areas, and material storage areas.
- 3** Facility Protection Plans
- 4** Security plans for new areas under construction and temporary material storage area.
- 5** Plans for decommissioning existing systems.
- 6** Past security survey reports

Types of Information the Team will Gather



- 1 Facility Asset Lists
- 2 Facility prioritization
- 3 Identification of preferred methods of attack on the facility.
- 4 Identification of security measures (prevention, detection, correction) that are most critical in providing protection for assets.
- 5 Identification of the last possible point at which an adversary must be detected to allow adequate response.
- 6 Defense-in-Depth measures

Planning Pieces

Amount of **PLANNING** contingent on **SCOPE** of project

✓ Core Planning

- **Scope Planning** – written statement
- **Scope Definition** – subdividing major deliverables into more manageable units
- **Activity Definition** – determine specific tasks needed to produce project deliverables
- **Activity Sequencing** – plotting dependencies

Planning Pieces

✓ Core Planning (Cont.)

- **Activity Duration Estimating** – determine amount of work needed to complete the activities
- **Schedule Development** – analyze activity sequences, duration, and resource requirements
- **Resource Planning** – identify what and how many resources are needed to perform the activities
- **Cost Estimating** – develop resource and total project costs
- **Cost Budgeting** – allocating project estimates to individual work items
- **Project Plan Development** – taking results from other planning processes into a collective document

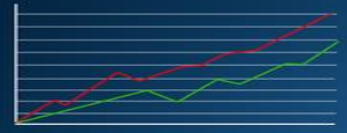
Planning/Facilitating Processes

- ✓ **Quality Planning** – standards that are relevant to the project and determining how to meet standards
- ✓ **Organizational Planning** – identify, document, and assigning project roles and responsibilities
- ✓ **Staff Acquisition** – obtaining the human resources
- ✓ **Communications Planning** – determining rules and reporting methods to stakeholders

Planning/Facilitating Processes

- ✓ **Risk Identification** – determining what is likely to affect the project and documenting these risks
- ✓ **Risk Quantification** – evaluating risks and interactions to access the possible project outcomes
- ✓ **Risk Response Development** – defining enhancement steps and change control measures
- ✓ **Procurement Planning** – determining what to buy and when
- ✓ **Solicitation Planning** – documenting product requirements and identifying possible sources

Project Risk Management



SWOT Analysis

S	W
O	T

Investment
\$\$\$\$??



SUCCESS

Business Plan

- Marketing Plan
- Sales Plan

- Online marketing
- E-Commerce
 - social Network
 - Google search
 - website
 - mobile Apps

- Financial Plan
- Production Plan



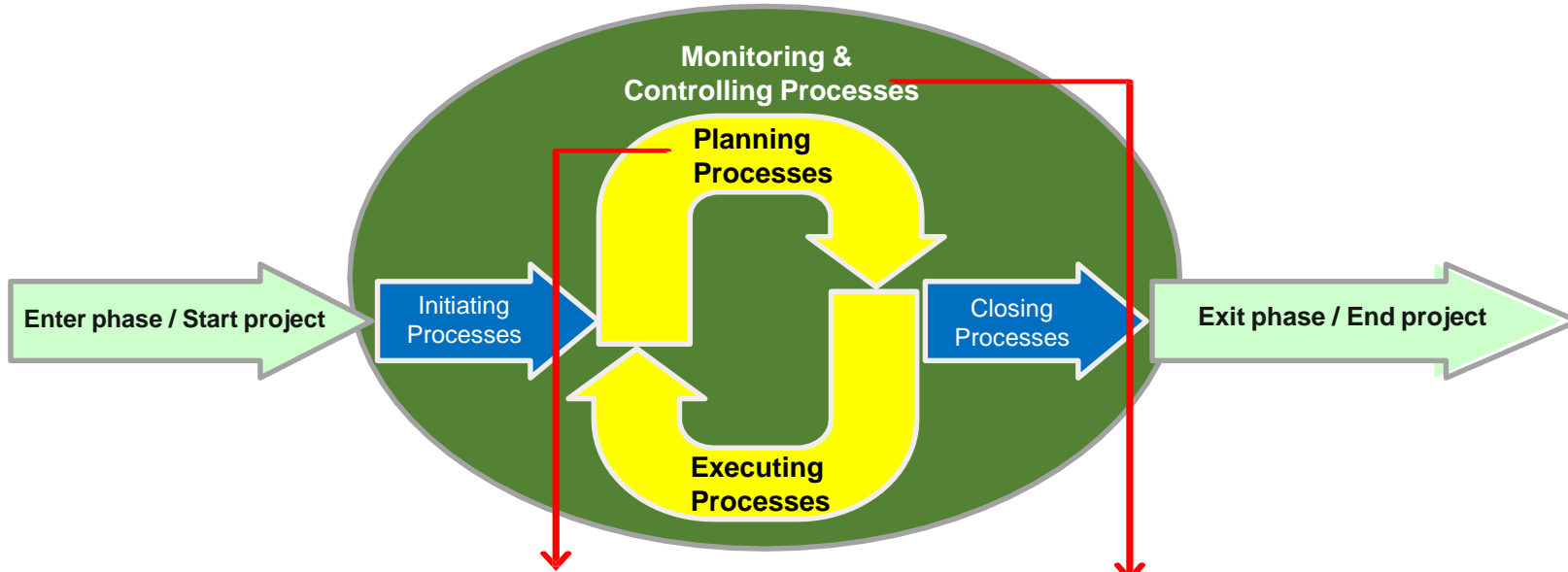
Learning Objectives

- ✓ Understand risk and the importance of good project risk management
- ✓ Discuss the elements of planning risk management and the contents of a risk management plan
- ✓ Common sources of risks on a security project
- ✓ Describe the process of identifying risks and create a risk register
- ✓ Discuss the elements involved in risk management planning and the contents of a risk management plan

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
- Risk management is often overlooked in projects, but it can help improve project success by helping select good projects, determining project scope, and developing realistic estimates.

Project Risk Management



Knowledge Area	Process				
	Initiating	Planning	Executing	Monitoring & Contol	Closing
Risk		Plan Risk Management Identify Risk Perform Qualitative Risk Analysis Perform Quantitative Risk Analysis Plan Risk Response		Monitor and Control Risks	

Project Risk Management

- ✓ Risk is an **uncertain** event or condition that, if occurs, **has an effect** on at least one project objective.
- ✓ Risk management objectives:
 - ✓ increase the probability and impact of **positive events (opportunities)**.
 - ✓ decrease the probability and impact of **negative events (threat)**.
- ✓ Terms & concepts:
 - ✓ **Uncertainty**: a lack of knowledge about an event that reduces confidence
 - ✓ **Risk averse**: someone who does not want to take risks.
 - ✓ **Risk tolerances**: area of risk that are acceptable/unacceptable.
 - ✓ **Risk thresholds**: the point at which a risk become unacceptable



✓ Remember that in this area there is no activity in executing process group

Project Risk Management Summary

Planning

Process: **Plan risk management**

Outputs: Risk management plan

Process: **Identify risks**

Outputs: Risk register

Process: **Perform qualitative risk analysis**

Outputs: Project documents updates

Process: **Perform quantitative risk analysis**

Outputs: Project documents updates

Process: **Plan risk responses**

Outputs: Project management plan updates, project documents updates

Monitoring and Controlling

Process: **Control risks**

Outputs: Work performance information, change requests, project management plan updates, project documents updates, organizational process assets updates

Project Start

Project Finish

Negative Risks

- ✓ 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
- ✓ If Security Projects are so risky, why do companies pursue them?

Positive Risk



- ✓ 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

Broad Categories of RISK

1

Market Risk

2

Financial Risk

3

Technology Risk

4

People Risk

5

Structure / Process Risk

PROJECT
MANAGEMENT

Risk Factors



The Probability
that it will occur



Range of
possible
outcome
(Impact)



Expected
Timing
(When)
in the project
life cycle



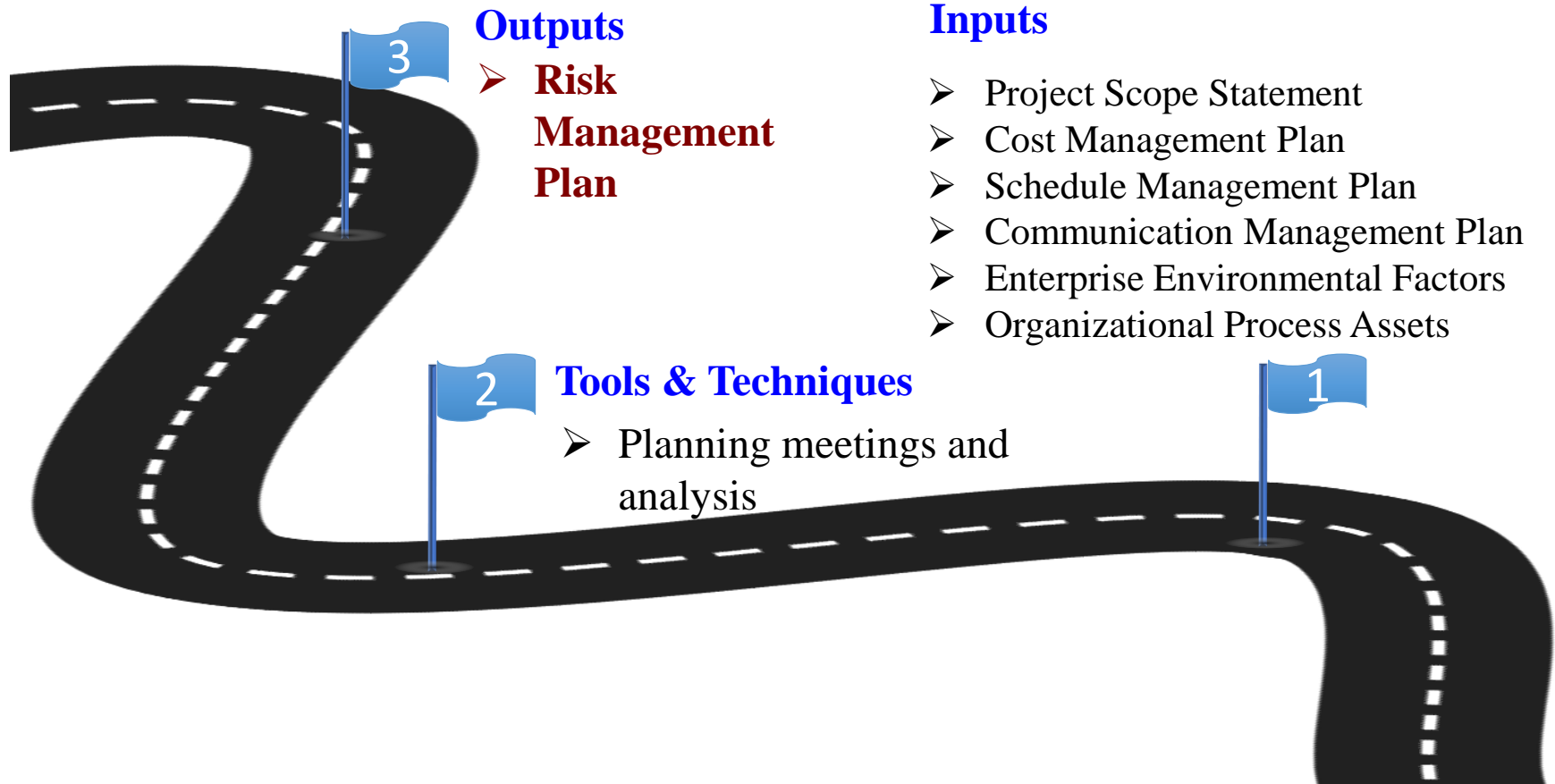
The anticipated
frequency of
risk event
(How Often)

(Impact)
outcome

the cycle
in the project
(When)

(How Often)
risk event

Plan Risk Management



Plan Risk Management

Plan Risk Mgmt.

Importance

- ✓ Ensure that the degree, type, and visibility of risk management are commensurate
- ✓ Provide sufficient resource and time for risk management activities
- ✓ Establish an agreed-upon basis for evaluating risk

Risk Categories

- ✓ A standard list of risk categories can help to make sure areas of risk are not forgotten.
- ✓ Companies and PMO should have standard list of risk categories to help identify risk.

Two Main Types of Risk

- ✓ Business – Risk of gain or loss
- ✓ Pure (insurable) risk – Only a risk of loss (i.e. fire, theft, personal injury, etc)

Planning Risk Management

- ✓ The main output of this process 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.
- ✓ The level of detail will vary with the needs of the project.

Risk Management Plan

- ✓ Risk management plan describe how risk management will be structured and performed on the project.
- ✓ Subset of project management plan.
- ✓ May includes:
 - Methodology
 - Roles & responsibilities
 - Budgeting
 - Timing
 - Risk categories.
 - Definition of probability and impact
 - Stakeholder tolerances
 - Reporting formats
 - Tracking
 - Probability and impact matrix (?)

Test Your Knowledge

Project managers document the possible project risks in the:

- Risk Register
- Project Charter
- Risk Management Plan
- Project Scope Statement

Test Your Knowledge

Project managers document the possible project risks in the:

- Risk Register

Answer:

An effective project manager reviews past project reports, documents and other information to generate a comprehensive Risk Register. The project manager typically starts by meeting with the stakeholders to identify all project risks. He also gathers input from all the project team members.

Test Your Knowledge

Qualitative risk analysis typically involves examining historical information to make informed decisions while for each possible outcome, quantitative risk analysis identifies the:

- Cost and time**
- Type and category**
- Formal and informal**
- Magnitude and probability**

Test Your Knowledge

Qualitative risk analysis typically involves examining historical information to make informed decisions while for each possible outcome, quantitative risk analysis identifies the:

- Magnitude and probability**

Answer:

Quantitative risk analysis results in identifying the magnitude or severity of negative outcomes and the likelihood or probability for all outcomes. To analyze project risk effectively, successful project managers examine each risk to determine its probability and impact to the project. They translate this into numerical values that represent the risk to the project in terms of cost, time and resources factors.

Test Your Knowledge

During risk management planning, team members identify the triggers associated with each risk. These warning signs represent the:

- Budget allocated to managing the risk
- Resources assigned to handling the risk
- Events that result in the risk actually occurring
- Actions the team should take when the risk actually occurs

Test Your Knowledge

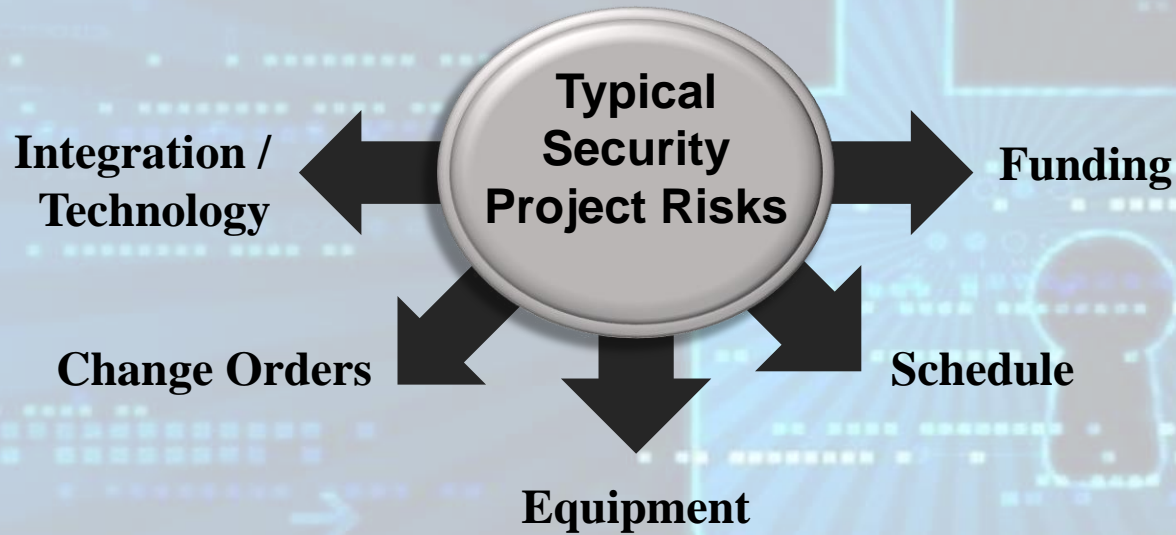
During risk management planning, team members identify the triggers associated with each risk. These warning signs represent the:

- Events that result in the risk actually occurring

Answer:

Effective project managers document all triggers, or warning signs, for each possible risk. These events result in the risk occurring.

Risks in a Security Project



Risk Management Plan (cont.)

- ✓ **Identify/understand Risks for each Project**
- ✓ **Prepare ahead for high risk areas**
- ✓ **Common Project Risks:**
 - Time /Costs estimates overly optimistic
 - Unexpected budget revisions
 - Scope changes
- ✓ **Develop a mitigation plan for identified Risks**
- ✓ **Review regularly**

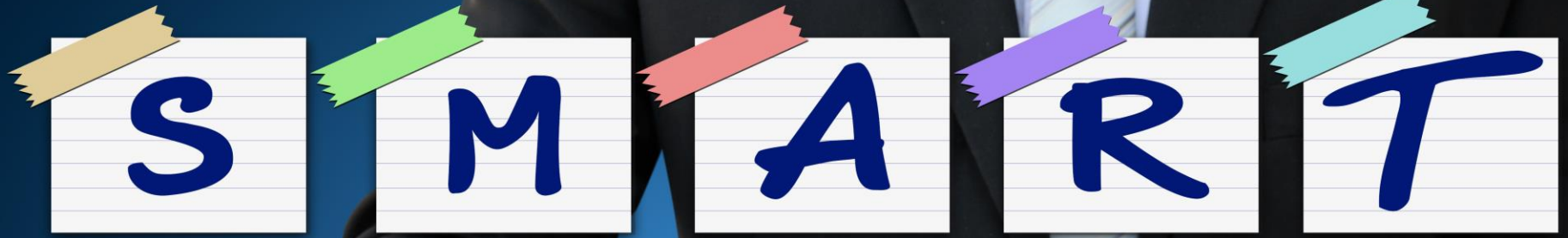
Problem



Who?
What?
When?
Where?
Why?
How?



Solution



specific

Measurable

Attainable

Relevant

Time-Bound

GOAL SETTING

Planning -Take Offs & Specifications

✓ Developing an Estimate

- ✓ Plan & Specification Review:
- ✓ Device Take-Offs/Counts
- ✓ Wire Runs, Types
- ✓ Conduit
- ✓ Considerations: ceilings, wall types, lighting, in/out doors

✓ Documentation:

- ✓ Door / Hardware Schedules
- ✓ Mark Ups, Notes, Dates
- ✓ Engineered Drawings
- ✓ Pricing Presentation Breakouts
- ✓ Technical Specification Response

Always Plan & Think the Job

- ✓ Why?
- ✓ How?
- ✓ Refine
- ✓ Go Backs
- ✓ Cause & Affect



Why have a Plan?

- ✓ A defined plan is key to successful project management
- ✓ A documented Project plan provides:
 - ✓ Team guidance
 - ✓ Project goals
 - ✓ Contingency planning
 - ✓ Creates Value:



Failing to Plan = Planning to Fail

Test Your Knowledge

Project managers identify preventive actions for risks that represent threats. They also need to prepare for events that represent:

- Strengths
- Weakness
- Opportunities
- Contingencies

Test Your Knowledge

Project managers identify preventive actions for risks that represent threats. They also need to prepare for events that represent:

- Opportunities

Answer:

Successful project managers look for opportunities because they need to define both positive and negative events that can impact the project. Organizations should not overlook the chance to exploit opportunities for the company's benefit.

Test Your Knowledge

Effective project managers resolve project risks with a high P-I value on which basis?

- Utmost urgency
- Budget allocation
- When scheduled
- Resource availability

Test Your Knowledge

Effective project managers resolve project risks with a high P-I value on which basis?

- Utmost urgency

Answer:

Successful project managers handle risks with a high P-I value first, with utmost urgency. Project managers still monitor those risks with the least probability or impact.

Knowledge Area	Risk Conditions
<i>Integration</i>	Inadequate planning; poor resource allocation; poor integration management; lack of post-project review
<i>Scope</i>	Poor definition of scope or work packages; incomplete definition
<i>Time</i>	Errors in estimating time or resource availability; errors in determining the critical path; poor allocation and management of float; early release of competitive products
<i>Cost</i>	Estimating errors; inadequate productivity, cost, change, or contingency
<i>Quality</i>	Poor attitude toward quality; substandard design, materials, and workmanship; inadequate quality assurance program
<i>Human resource</i>	Poor conflict management; poor project organization and definition of responsibilities; absence of leadership
<i>Communications</i>	Carelessness in planning or communicating
<i>Risk</i>	Ignoring risk; unclear analysis of risk; poor insurance management
<i>Procurement</i>	Unenforceable conditions or contract clauses; adversarial relations
<i>Stakeholders</i>	Lack of consultation with key stakeholder

Contingency & Fallback Plans

- In addition to a risk management plan, many projects also include:
 - ✓ **Contingency plans** – predefined actions that the project team will take if an identified risk event occurs
 - Expecting new release of a s/w package, must plan to use older version if delayed
 - ✓ **Fallback plans** - developed for risks that have a high impact on meeting project objectives, and are put into effect if attempts to reduce the risk are not effective
 - ✓ **Contingency reserves or allowances** - provisions held by the project sponsor or organization to reduce the risk of cost or schedule overruns to an acceptable level
 - Project falling behind schedule due to inexperience with new technology, use these funds to hire outside trainer

Review

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.

- ✓ **Planning Risk Management**
- ✓ **Identifying Risks**
- ✓ **Performing Qualitative Risk Analysis**
- ✓ **Performing Quantitative Risk Analysis**
- ✓ **Planning Risk Responses**
- ✓ **Controlling and Managing Risk**

Scope Management



"Expect the best, plan for the worst, and prepare to be surprised."

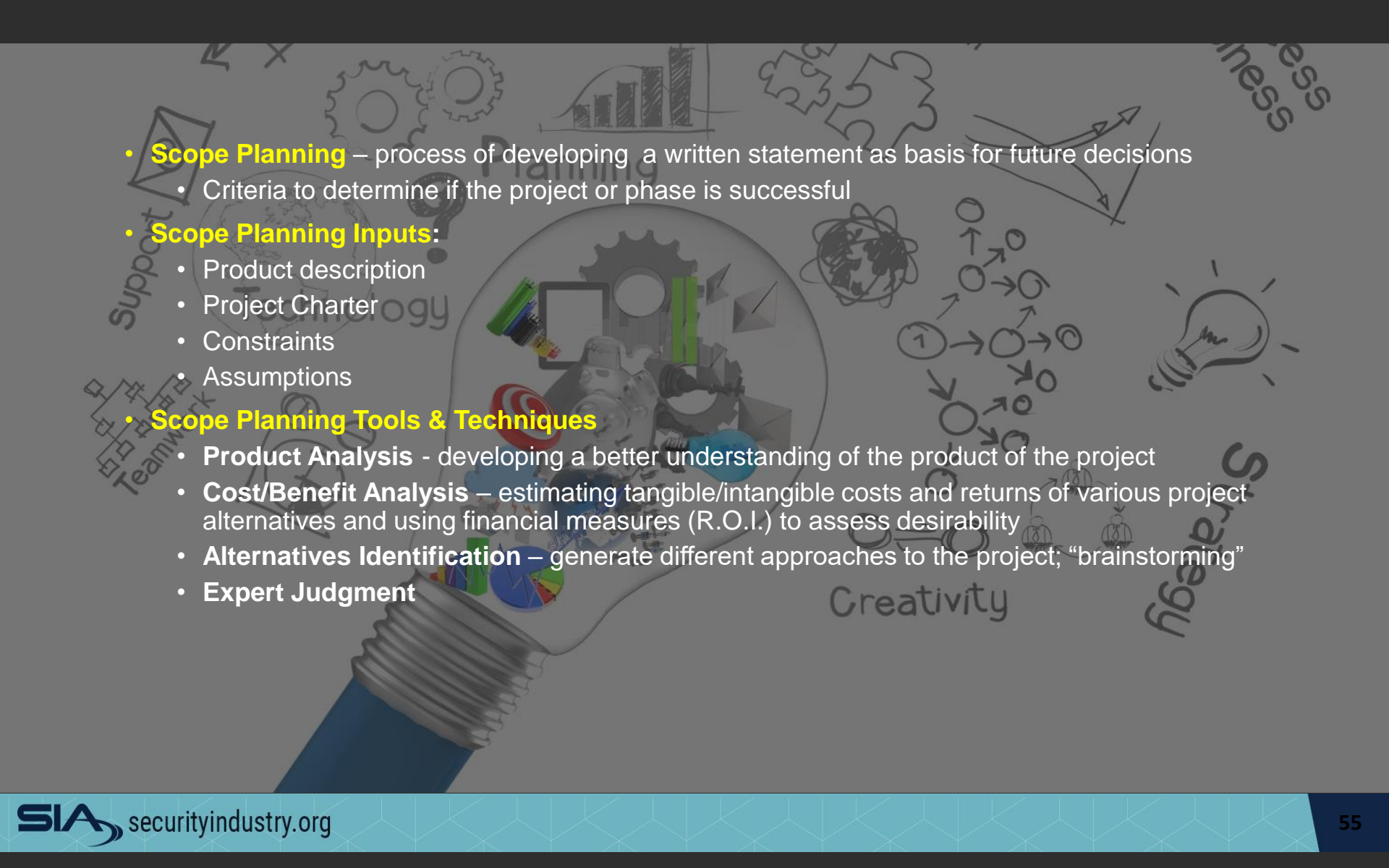
- Denis Waitley

Security Project Scope Management

- Processes required to ensure that the project includes all, and only, work required
- Defining what “is/is not” included in the project
- **Project scope** – work that must be done – measured against project plan
- **Product scope** – features and functions included in the product or service – measured against requirements

Scope Management (Initiation to Planning)

- **Outputs from Initiation:**
 - **Project Charter** – formally recognizes project, created by senior manager, includes:
 - Business need/Business Case
 - Product description & title
 - Signed contract
 - Project Manager Identification & Authority level
 - Senior Management approval
 - Project's Goals and Objectives -
 - Constraints – factors that limit project management team's options
 - Assumptions – factors that are considered true for planning purposes. Involve a degree of risk

- 
- **Scope Planning** – process of developing a written statement as basis for future decisions
 - Criteria to determine if the project or phase is successful
 - **Scope Planning Inputs:**
 - Product description
 - Project Charter
 - Constraints
 - Assumptions
 - **Scope Planning Tools & Techniques**
 - **Product Analysis** - developing a better understanding of the product of the project
 - **Cost/Benefit Analysis** – estimating tangible/intangible costs and returns of various project alternatives and using financial measures (R.O.I.) to assess desirability
 - **Alternatives Identification** – generate different approaches to the project; “brainstorming”
 - **Expert Judgment**

Scope Planning Outputs

- ✓ **Scope Statement** – documented basis for making project decisions and confirming understanding among stakeholders. Includes:
 - **Project justification** – business need, evaluating future trade-offs
 - **Project Product** – summary of project description
 - **Project Deliverables** – list of summary of delivery items marking completion of the project
 - **Project Objectives** – quantifiable criteria met for success. Addresses cost, schedule and metrics – unqualified objectives indicate high risk (customer satisfaction)
- ✓ **Supporting detail** – includes documentation of all assumptions and constraints
- ✓ **Scope Management Plan** – how project scope is managed, change control procedure, expected stability, change identification and classification
 - Control what is/is not in the project; prevents delivering “extra” benefits to the customer that were not specified/required

31415926535 8979323840
5028841971 6939937510
5923078164 0628620899
3421170679 8214808651
0938446095

Scope Definition

Subdividing major deliverables into smaller, manageable components

- ✓ Improve accuracy of cost, time, and resource estimates
- ✓ Define a baseline for performance measurement
- ✓ Clear responsibility assignments
- ✓ Critical to project success – reduces risk of higher cost, redundancy, time delays, and poor productivity
- ✓ Defines “what” you are doing; WBS is the tool

Scope Definition Inputs:

- ✓ Scope Statement
- ✓ Constraints – consider contractual provisions
- ✓ Assumptions
- ✓ Other Planning Outputs
- ✓ Historical Information



Scope Definition Tools & Techniques

- ✓ **Work Breakdown Structure** – templates from previous projects

- ✓ **Decomposition** – subdividing major deliverables into manageable components:
 - Major elements – project deliverables and project management approach
 - Decide cost and duration estimates are appropriate at level of detail
 - Constituent elements – tangible verifiable results to enable performance management, how the work will be accomplished
 - Verify correctness of decomposition
 - All items necessary and sufficient?
 - Clearly and completely defined?
 - Appropriately scheduled, budgeted, assigned?

Scope Definition Outputs

Work Breakdown Structure (WBS) – a deliverable-oriented grouping of project assignments that organizes and defines the scope of the project

- ✓ Each descending level represents further detail; smaller and more manageable pieces
- ✓ Each item is assigned a unique identifier collectively known as “code of accounts”
- ✓ Work element descriptions included in a WBS dictionary (work, schedule and planning information)
- ✓ Other formats:
 - **Contractual WBS** – seller provides the buyer
 - **Organizational (OBS)** – work elements to specific org. units
 - **Resource (RBS)** – work elements to individuals
 - **Bill of Materials (BOM)** – hierarchical view of physical resources
 - **Project (PBS)** – similar to WBS



Scope Definition Outputs

Work Breakdown Structure (WBS)

- ✓ First Level is commonly the same at the Project Life Cycle (requirements, design, coding, testing, conversion and operation)
- ✓ First level is completed before the project is broken down further
- ✓ Each level of the WBS is a smaller segment of level above
- ✓ Work toward the project deliverables
- ✓ Break down project into tasks that
 - Are realistically and confidently estimable
 - Cannot be logically divided further
 - Can be completed quickly (under 80 hours rule of thumb)
 - Have a meaningful conclusion and deliverable
 - Can be completed without interruption
- ✓ Provides foundation for all project planning and control

Scope Definition Outputs

Work Breakdown Structure (WBS) - Benefits

- ✓ Prevent work slippage
- ✓ Project team understands how their tasks fit into the overall project and their impact upon the project
- ✓ Facilitates communication and cooperation between project team and stakeholders
- ✓ Helps prevent changes
- ✓ Focuses team experience into what needs to be done – results in higher quality
- ✓ Basis and proof for estimating staff, cost and time
- ✓ Gets team buy-in, role identification
- ✓ Graphical picture of the project hierarchy
- ✓ Identifies all tasks, project foundation

Project Time Management



"Better three hours too soon than a minute too late."

- William Shakespeare

Learning Objectives

- ✓ Understand the importance of project schedules and good project time management
- ✓ Define activities as the basis for developing project schedules
- ✓ Describe how project managers use network diagrams and dependencies to assist in activity sequencing
- ✓ Explain how various tools and techniques help project managers perform activity duration estimating and schedule development
- ✓ Use a Gantt chart for schedule planning and tracking schedule information





Learning Objectives



Understand and use critical path analysis



Describe how to use several techniques for shortening project schedules



Explain the basic concepts behind critical chain scheduling and Program Evaluation and Review Technique (PERT)



Discuss how reality checks and people issues are involved in controlling and managing changes to the project schedule



Describe how software can assist in project time management



THE CHANNEL TUNNEL

Cost overrun: \$21.1billion (45%)
Delay: 1 year (20%)
Country: UK



THREE GORGES DAM

Cost overrun: \$16.1billion (163%)
Delay: Ahead of schedule
Country: China



BOSTON'S BIG DIG

Cost overrun: \$13.4 billion (421%)
Delay: 9 years (128%)
Country: US



JUBILEE LINE EXTENSION

Cost overrun: \$4 billion (84%)
Delay: 2 years (50%)
Country: UK

Photo: Andrew Probyn. The Jubilee Line platform of Westminster tube station, London, England. Wikipedia, https://commons.wikimedia.org/wiki/File:Westminster_tube_station_jubilee_02.jpg

DENVER INTERNATIONAL AIRPORT

Cost overrun: \$3.1 billion (167%)
Delay: 16 months (100%)
Country: US



MONTREAL OLYMPIC STADIUM

Cost overrun: \$3 billion** (1990%)
Delay: On time
Country: Canada

**adjusted for inflation



BRAZIL WORLD CUP STADIUMS

Cost overrun: \$2.5 billion (227%)
Delay: On time
Country: Brazil

Photo: Reuters/Corbis/Bettmann, Manaus Stadium on June 2013
© Reuters. All rights reserved. <http://www.gettyimages.com/photos/458148>, World Cup, soccer/football/Monaco, Stadium, June 2013.jpg



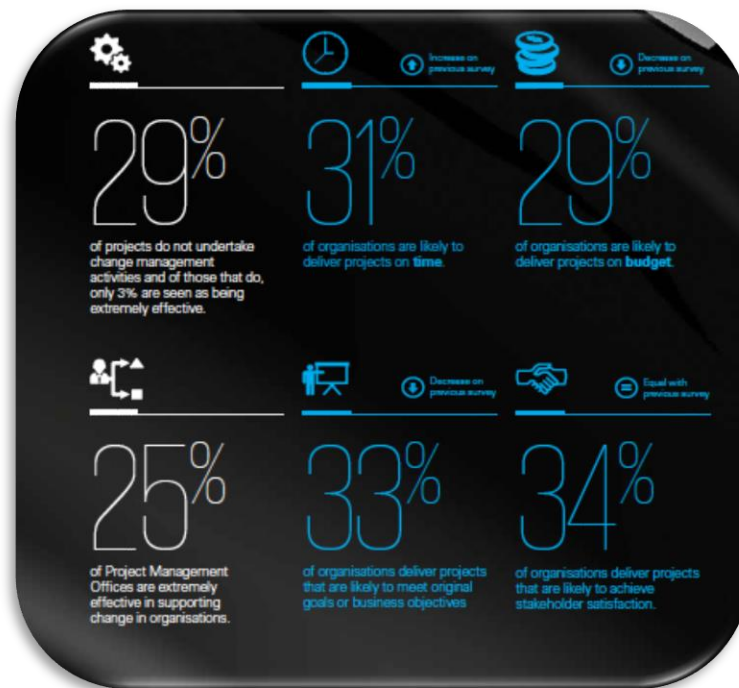
WORLD TRADE CENTER TRANSPORTATION HUB

Cost overrun: \$2 billion (100%)
Delay: 4 years (140%)
Country: US



Importance of Project Schedules

- ✓ Managers often cite delivering projects on time as one of their biggest challenges.
- ✓ Time has the least amount of flexibility; it passes no matter what
- ✓ Schedule issues are the main reason for conflicts on projects, especially during the second half of projects.





Project time management involves the processes required to ensure timely completion of a project. Processes include:

- Activity definition
- Activity sequencing
- Activity duration estimating
- Schedule development
- Schedule control

Project Time Management Processes

Activity Definition

- ✓ Project schedules grow out of the basic document that initiate a project
 - Project charter includes start and end dates and budget information
 - Scope statement and WBS help define what will be done
- ✓ Activity definition involves developing a more detailed WBS and supporting explanations to understand all the work to be done so you can develop realistic duration estimates

Activity Duration Estimating

- ✓ After defining activities and determining their sequence, the next step in time management is 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 equal duration
- ✓ People doing the work should help create estimates, and an expert should review them

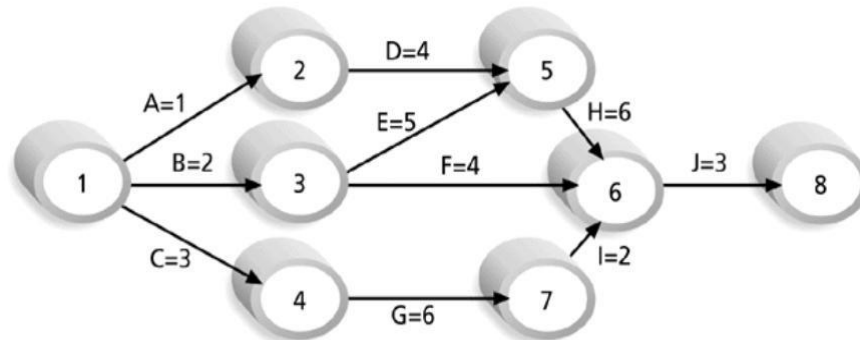
Activity Sequencing

- ✓ Involves reviewing activities and determining dependencies
 - **Mandatory dependencies: inherent in the nature of the work; hard logic**
 - **Discretionary dependencies: defined by the project team; soft logic**
 - **External dependencies: involve relationships between project and non-project activities**
- ✓ You *must* determine dependencies in order to use critical path analysis

Schedule Development

- ✓ Schedule development uses results of the other time management processes to determine the start and end date of the project and its activities
- ✓ 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, PERT analysis, critical path analysis, and critical chain scheduling

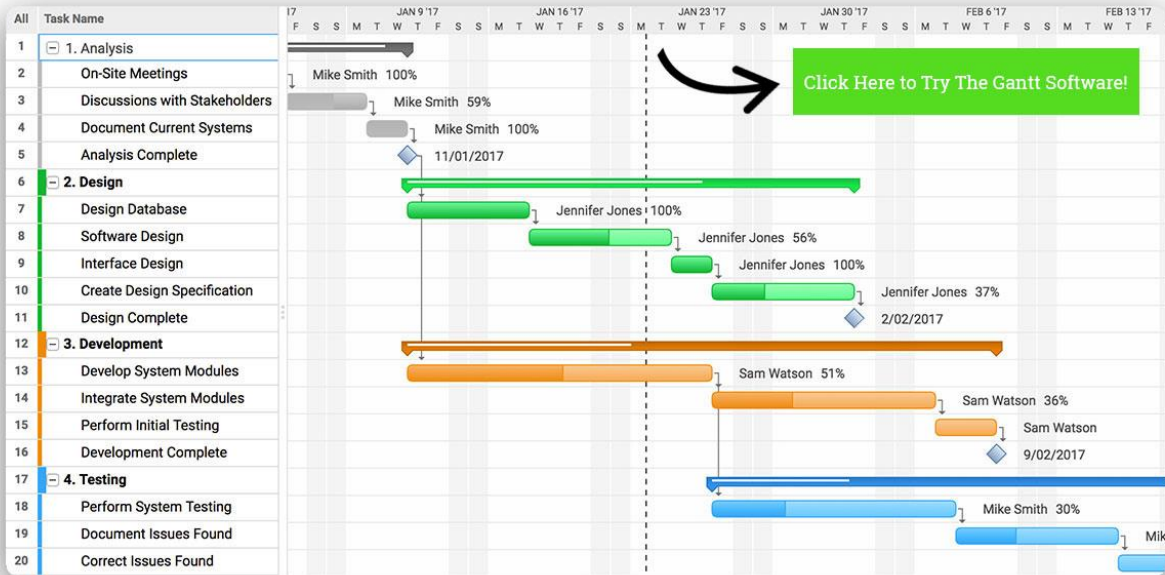
Project Network Diagrams



Note: Assume all durations are in days; A=1 means Activity A has a duration of 1 day.

- ✓ Project network diagrams are the preferred technique for showing activity sequencing
- ✓ A project network diagram is a schematic display of the logical relationships among, or sequencing of, project activities
- ✓ Also called activity-on-arrow (AOA) project network diagrams
- ✓ Activities are represented by arrows
- ✓ Nodes or circles are the starting and ending points of activities
- ✓ Can only show finish-to-start dependencies

Other Project Scheduling/ Time/Cost Tools



✓ 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

- ✓ Symbols include:
- A black diamond: milestones or significant events on a project with zero duration
 - Thick black bars: summary tasks
 - Lighter horizontal bars: tasks
 - Arrows: dependencies between tasks

- ✓ You can follow the SMART criteria in developing milestones that are:
- Specific
 - Measurable
 - Assignable
 - Realistic
 - Time-framed

✓ Milestones are significant events on a project that normally have zero duration

Critical Path Method

- ✓ CPM is a project network analysis technique used to predict total project duration.
- ✓ A critical path for a project is the series of activities that determines the *earliest time* by which the project can be completed.
- ✓ The critical path is the *longest path* through the network diagram and has the least amount of slack or float.

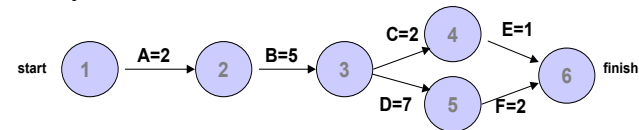
Importance of Updating Critical Path Data

- ✓ It is important to update project schedule information
- ✓ The critical path may change as you enter actual start and finish dates
- ✓ If you know the project completion date will slip, negotiate with the project sponsor

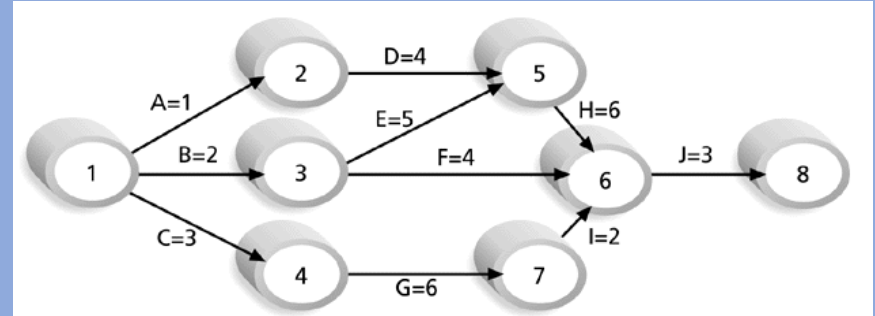
Finding the Critical Path

- ✓ First develop a good project network diagram
- ✓ Add the durations for all activities on each path through the project network diagram
- ✓ The longest path is the critical path

- Consider the following project network diagram. Assume all times are in days.



- How many paths are on this network diagram?
- How long is each path?
- Which is the critical path?
- What is the shortest amount of time needed to complete this project?



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.

Determining the Critical Path

More on the Critical Path

- ✓ If one or more activities on the critical path takes longer than planned, the whole project schedule will slip *unless* corrective action is taken
- ✓ Misconceptions:
 - The critical path is not the one with all the critical activities; it only accounts for time. Remember the example of **growing grass** being on the critical path for Disney's Animal Kingdom Park
 - There can be more than one critical path if the lengths of two or more paths are the same
 - The critical path can change as the project progresses

Using Critical Path Analysis to Make Schedule Trade-offs

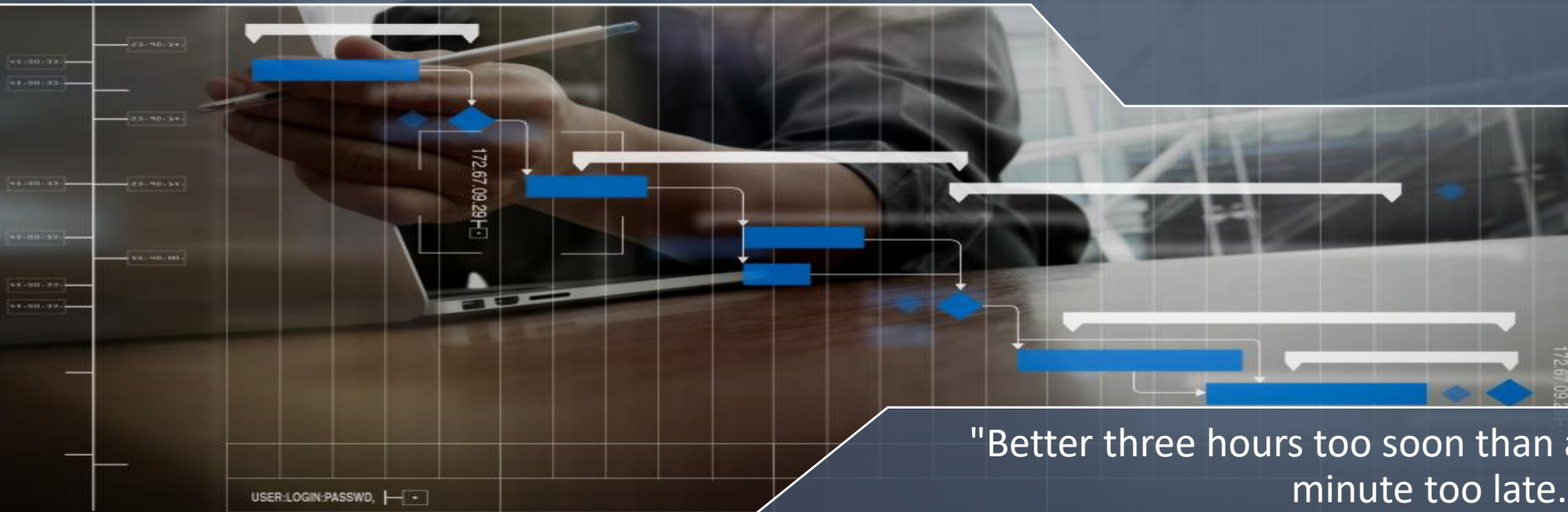
- ✓ Knowing the critical path helps you make schedule trade-offs
- ✓ *Free slack or free float* is the amount of time an activity can be delayed without delaying the early start of any immediately following activities
- ✓ *Total slack or total float* is the amount of time an activity may be delayed from its early start without delaying the planned project finish date
- ✓ A *forward pass* through the network diagram determines the early start and finish dates
- ✓ A *backward pass* determines the late start and finish dates



Why do you think schedule issues often cause the most conflicts on projects?

DISCUSSION QUESTION

Project Cost Management



"Better three hours too soon than a minute too late."

- William Shakespeare

Project Cost Management

- ✓ Ensure that the project is completed within budget
- ✓ Concerned with cost of resources needed to complete activities; consider effect of project decisions on cost of using product “life-cycle costing”
- ✓ Most prospective financial impact of using the product is outside the project scope
- ✓ Consider information needs of stakeholders, controllable and uncontrollable costs (budget separately for reward and recognition systems)
- ✓ Estimating should be based on WBS to improve accuracy
- ✓ Estimating should be done by the person performing the work





- ✓ Estimating should be based on WBS to improve accuracy
- ✓ Estimating should be done by the person performing the work
- ✓ Having historical records is key to improving estimates
- ✓ Costs (schedule, scope, resources) should be managed to estimates
- ✓ A cost (schedule, scope, baseline) should be kept and not changed
- ✓ Plans should be revised as necessary during completion of work
- ✓ Corrective action should be taken when cost problems (schedule, scope and resources) occur.

Project Cost Management

Type of Cost Estimates for Security Projects

Estimate Type	Description
Budgetary Estimates	<ul style="list-style-type: none">✓ Budgetary estimates are prepared during the initial planning phase for a new PPS.✓ The goal in preparing this estimate is to arrive at a cost figure that can be used for getting new PPS systems into an operating budget cycle.✓ Estimates are used for budgetary purposes they have a large contingency, such as plus or minus 10 to 20 percent.
Preliminary Design Estimates	<ul style="list-style-type: none">✓ If the PPS project is part of a larger construction project, the process should require a preliminary design estimate.✓ This estimate should be developed at the 50 percent design review stage and will normally have a contingency of plus or minus 10 percent.
Final Design Estimates	<ul style="list-style-type: none">✓ The estimate is refined as the project advances to the 100% completion.✓ Estimate is developed using the completed documents, drawings, and schedules.



Type of Cost Estimates for Security Projects

Life-Cycle Cost	Description
<ul style="list-style-type: none"> ✓ A very important estimate that should be developed during the design phase is a life cycle cost estimate (LCCE). ✓ If the new PPS is a replacement for an existing system, an LCCE is prepared for the existing system first, then the team prepares an LCCE for the new system. ✓ A comparison of the two estimates will help the project team justify the project to management. 	
<u>Components of a Life Cycle Cost Estimate</u>	<u>Detailed Estimating Procedures</u>
Engineering & Design Costs	Identify PPS subsystems
- Hardware & Software	Fence & Barriers
Installation Costs	Security Control Center Monitoring Subsystem
Operating Costs	Access Control Subsystem
Maintenance Costs	CCTV Subsystem
Miscellaneous Costs	Intrusion detection interior and exterior subsystems
Service Interruption Costs	Lighting
End of Life Costs	Power, control, and data distribution
	Communications, Search Equipment

High-Quality Cost Estimating Process for Security Projects

Step	Description	Associated Tasks
1	Define estimate's purpose	<ul style="list-style-type: none"> ✓ Determine estimate's purpose, required level of detail, and overall scope; ✓ Determine who will receive the estimate
2	Develop Estimating Plan	<ul style="list-style-type: none"> ✓ Determine the composition of the cost estimating team and develop the master schedule; ✓ Determine who will do the independent cost estimate; ✓ Outline the cost estimating approach; ✓ Develop the estimate timeline
3	Define Program Characteristics	<ul style="list-style-type: none"> ✓ In a technical baseline description document, identify the program's purpose and its system and performance characteristics as well as all system configurations; ✓ Identify any technology implications; ✓ Develop the program acquisition schedule and acquisition strategy; ✓ Determine the relationship to other existing systems, including predecessor or similar legacy systems; ✓ Identify support (manpower, training, etc.) and security needs and risk items; ✓ Determine system quantities for development, test, and production; ✓ Develop deployment and maintenance plans

High-Quality Cost Estimating Process for Security Projects

Step	Description	Associated Tasks
4	Determine Estimating Structure	<ul style="list-style-type: none"> ✓ Define a work breakdown structure (WBS) and describe each element in a WBS dictionary (a major automated information system may have only a cost element structure); ✓ Choose the best estimating method for each WBS element; ✓ Identify potential cross-checks for likely cost and schedule drivers; ✓ Develop a cost estimating checklist
5	Identify Ground Rules & Assumptions	<ul style="list-style-type: none"> ✓ Clearly define what the estimate includes and excludes; ✓ Identify global and program-specific assumptions, such as the estimate's base year, including time-phasing and life cycle; ✓ Identify program schedule information by phase and program acquisition strategy; ✓ Identify any schedule or budget constraints, inflation assumptions, and travel costs; ✓ Specify equipment the government is to furnish as well as the use of existing facilities or new modification or development; ✓ Identify prime contractor and major subcontractors; ✓ Determine technology refresh cycles, technology assumptions, and new technology to be developed; ✓ Define commonality with legacy systems and assumed heritage savings; ✓ Describe effects of new ways of doing business

High-Quality Cost Estimating Process for Security Projects

Step	Description	Associated Tasks
6	Obtain Data	<ul style="list-style-type: none"> ✓ Create a data collection plan with emphasis on collecting current and relevant technical, programmatic, cost, and risk data; ✓ Investigate possible data sources; ✓ Collect data and normalize them for cost accounting, inflation, learning, and quantity adjustments; ✓ Analyze the data for cost drivers, trends, and outliers and compare results against rules of thumb and standard factors derived from historical data; ✓ Interview data sources and document all pertinent information, including an assessment of data reliability and accuracy; ✓ Store data for future estimates.
7	Develop a Point Estimate and Compare it to an independent Cost Estimate	<ul style="list-style-type: none"> ✓ Develop the cost model, estimating each WBS element, using the best methodology from the data collected, and including all estimating assumptions; ✓ Express costs in constant year dollars; ✓ Time-phase the results by spreading costs in the years they are expected to occur, based on the program schedule; ✓ Sum the WBS elements to develop the overall point estimate; ✓ Validate the estimate by looking for errors like double counting and omitted costs; ✓ Compare estimate against the independent cost estimate and examine where and why there are differences; ✓ Perform cross-checks on cost drivers to see if results are similar; ✓ Update the model as more data become available or as changes occur and compare results against previous estimates

High-Quality Cost Estimating Process for Security Projects

Step	Description	Associated Tasks
8	Conduct Sensitivity Analysis	<ul style="list-style-type: none"> ✓ Test the sensitivity of cost elements to changes in estimating input values and key assumptions; ✓ Identify effects on the overall estimate of changing the program schedule or quantities; ✓ Determine which assumptions are key cost drivers and which cost elements are most affected by changes.
9	Conduct Risk & Uncertainty Analysis	<ul style="list-style-type: none"> ✓ Determine and discuss with technical experts the level of cost, schedule, and technical risk associated with each WBS element; ✓ Analyze each risk for its severity and probability; ✓ Develop minimum, most likely, and maximum ranges for each risk element; ✓ Determine type of risk distributions and reason for their use; ✓ Ensure that risks are correlated; ✓ Use an acceptable statistical analysis method (e.g., Monte Carlo simulation) to develop a confidence interval around the point estimate; ✓ Identify the confidence level of the point estimate; ✓ Identify the amount of contingency funding and add this to the point estimate to determine the risk-adjusted cost estimate; ✓ Recommend that the project or program office develop a risk management plan to track and mitigate risks.

High-Quality Cost Estimating Process for Security Projects

Step	Description	Associated Tasks
10	Document the Estimate	<ul style="list-style-type: none"> ✓ Document all steps used to develop the estimate so that a cost analyst unfamiliar with the program can recreate it quickly and produce the same result; ✓ Document the purpose of the estimate, the team that prepared it, and who approved the estimate and on what date; ✓ Describe the program, its schedule, and the technical baseline used to create the estimate; ✓ Present the program's time-phased life-cycle cost; ✓ Discuss all ground rules and assumptions; ✓ Include auditable and traceable data sources for each cost element and document for all data sources how the data were normalized; ✓ Describe in detail the estimating methodology and rationale used to derive each WBS element's cost (prefer more detail over less); ✓ Describe the results of the risk, uncertainty, and sensitivity analyses and whether any contingency funds were identified; ✓ Document how the estimate compares to the funding profile; ✓ Track how this estimate compares to any previous estimates .

High-Quality Cost Estimating Process for Security Projects

Step	Description	Associated Tasks
11	<p>Present the Estimate for Management Approval</p>	<ul style="list-style-type: none"> ✓ Develop a briefing that presents the documented life-cycle cost estimate; ✓ Include an explanation of the technical and programmatic baseline and any uncertainties; ✓ Compare the estimate to an independent cost estimate (ICE) and explain any differences; ✓ Compare the estimate (life-cycle cost estimate (LCCE)) or independent cost estimate to the budget with enough detail to easily defend it by showing how it is accurate, complete, and high in quality; ✓ Focus in a logical manner on the largest cost elements and cost drivers; ✓ Make the content clear and complete so that those who are unfamiliar with it can easily comprehend the basis for the estimate results; ✓ Make backup slides available for more probing questions; ✓ Act on and document feedback from management; ✓ Seek acceptance of the estimate.
12	<p>Update the estimate to reflect actual costs and changes</p>	<ul style="list-style-type: none"> ✓ Update the estimate to reflect changes in technical or program assumptions to keep it current as the program passes through new phases and milestones; ✓ Replace estimates with EVM EAC and independent estimate at completion (EAC) from the integrated EVM system; ✓ Report progress on meeting cost and schedule estimates; ✓ Perform a post mortem and document lessons learned for those elements whose actual costs or schedules differ from the estimate; ✓ Document all changes to the program and how they affect the cost estimate.

Project Quality Management



"First, have a definite, clear practical ideal; a goal, an objective. Second, have the necessary means to achieve your ends; wisdom, money, materials, and methods. Third, adjust all your means to that end." - Aristotle

Project Quality Management

- ✓ Processes required to ensure that the project will satisfy the needs for which it was designed
- ✓ Includes all activities of the overall management function that determine the quality policy, objectives, and responsibilities. These are implemented by quality planning, quality control, quality assurance, and quality improvement.

3 major processes:

- ✓ **Quality Planning** – identifying quality standards that are relevant to the project (Plan); Project Manager, Project Owner
- ✓ **Quality Assurance** – evaluating overall project performance to provide confidence that project will satisfy relevant quality standards (Implement or Execution); Project Team
- ✓ **Quality Control** – monitoring specific results to comply with quality standards and eliminating unsatisfactory performance causes (Check or Control); Project Manager, Project Team
 - Compatible with ISO 9000 and 10000 series
 - Proprietary and non-proprietary approaches (total quality management)
 - Must address the management of the project and the product of the project



Quality

The totality of characteristics of an entity that bear on its ability to satisfy stated or implied needs

- ✓ Critical aspect is to turn implied needs into stated needs through project scope management
- ✓ **Do not confuse with grade** – category or rank given to entities having the same functional use but different requirements for quality
- ✓ **Customer satisfaction** – conformance to specifications (must produce what is stated) and fitness for use (must satisfy real needs)
- ✓ **Prevention** – avoid mistakes vs. cost of correction
- ✓ **Management responsibility** – requires participation of team; responsibility of management to provide resources
- ✓ **Processes within phases** – plan-do-check-act cycle
 - Recognize that the investment in product quality improvements may be borne by the performing organization since the project may not last long enough to reap reward



Quality Planning

- Identify quality standards are relevant and how to satisfy

✓ Inputs to Quality Planning

- **Quality Policy** – the overall intentions and direction of an organization with regard to quality as expressed by management
- Scope Statement
- Product Description
- Standards and Regulations
- **Other Process Outputs** – processes from other knowledge areas (procurement planning)

✓ Outputs from Quality Planning

- **Quality Management Plan** – describes how team will implement its quality policy; describes the project quality system – organizational structures, responsibilities, procedures, processes and resources needed to implement quality management
- **Operational Definitions** – defines how an item is measured by the quality control process. Also known as Metrics.
- **Checklists** – structured tool used to verify that a set of required steps has been performed
- **Inputs to other processes** – may identify a need for further activity in another area
- **Quality Assurance**
 - All planned and systematic activities implemented within the quality system to provide confidence that the project will satisfy quality standards

Tools & Techniques for Quality Planning

- ✓ **Benefit/Cost Analysis** – consider trade-offs, benefit is less rework; cost is expense of project management activities
- ✓ **Benchmarking** – comparing actual or planned practices to those of other projects
- ✓ **Flowcharting**
 - Cause and effect diagramming (Ishikawa or fishbone diagrams) illustrate how causes relate to potential problems or effects
 - System or Process flowcharts – show how various elements of the system interrelate
 - Helps anticipation of what and where quality problems may occur
- ✓ **Design of Experiments** – analytical technique which defines what variables have most influence of the overall outcome
 - Cost and schedule tradeoffs

Quality Control

- ✓ Monitoring specific results to determine if they comply with quality standards and identifying ways to eliminate causes of unsatisfactory results
 - Includes project (deliverables) and management (cost and schedule performance) results
 - Awareness of statistical quality control
 - Prevention (keep errors out of process) and inspection (keep errors from customers)
 - Attribute sampling (result conforms) and variable sampling
 - Special Causes (unusual events) and random causes
 - Tolerances (acceptable range) and control limits (result falls within range)





✓ Inputs to Quality Control

- **Work results** – include process and product results
- Quality Management Plan
- Operational Definitions
- Checklists

✓ Outputs from Quality Control

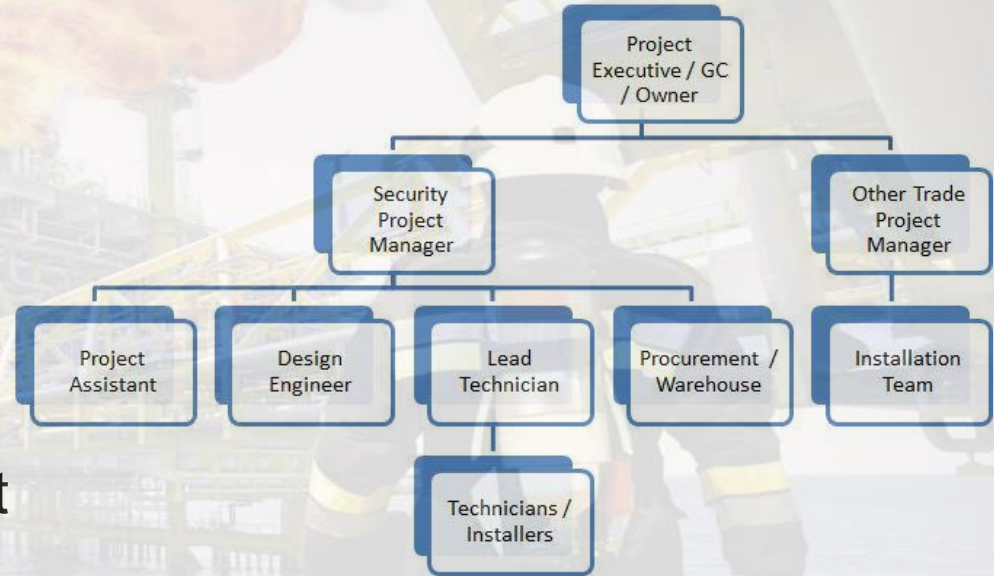
- Quality Improvement
- Acceptance Decisions (accept/reject)
- **Rework** – action to bring defective item into compliance
 - Frequent cause of project overruns
- Completed checklists
- **Process Adjustments** – immediate corrective/preventive actions
 - Most likely involves change control

✓ Tools & Techniques for Quality Control

- **Inspection** – activities such as testing to determine if results comply with requirements
- **Control Charts** – plot results over time
- **Pareto diagrams** – frequency of occurrence that identifies type or category of result (80/20 rule) – guides corrective action
- **Statistical sampling** – select population of interest for inspection
- **Flowcharting**
- **Trend Analysis** – forecast future outcomes based on historical results
 - Technical performance (# of errors identified; # of errors that remain)
 - Cost and Schedule performance (activities per period with significant variances)

Planning: Internal, External Team Assignments

- ✓ Skill sets & resources needed
- ✓ Individuals identified
- ✓ When each is needed
- ✓ Where are they?
- ✓ Certifications Required
- ✓ Training needs complete
- ✓ Interpersonal compatibility



Internal Team Members

- ✓ Executives / Project Executive
- ✓ Project Manager
- ✓ Project Superintendent
- ✓ Lead Technician / Installation Technicians
- ✓ Project Administrator
- ✓ IT Technicians
- ✓ System Engineers & CAD Designers
- ✓ Procurement / Accounts Payable/Receivable
- ✓ Customer Service





External Project Team

- ✓ Architects
- ✓ Engineers
- ✓ Construction Manager
- ✓ General Contractor
- ✓ Security Consultants
- ✓ Subcontractors
- ✓ Property Management Services
- ✓ Authority Having Jurisdiction (AHJ)
- ✓ Manufacturer Reps

End User Personnel & Stakeholders

One Group to be Considered

- ✓ Management – approvals, decisions, payments
- ✓ System Administrators & Operators
 - System control
 - Daily system operation, onboarding, changes
 - Requires training & ongoing communication
- ✓ Maintenance and Engineering
 - Enable site access
 - Site “eyes & ears”
 - Operational SOPs

Human Factors – Your Project Team

- Background Checks
- Drug-Free Workplace
- Credit Worthiness
- Appearance & Cleanliness
- Attitude
- Skill Sets / Abilities
- **Training Requirements**

23:35:60
Business Strategy

23:35:60

Meetings Types

- ✓ Design Meetings
- ✓ Construction Meetings
- ✓ Staff Meetings
- ✓ Continuing education meetings
- ✓ Training Sessions

A Security Project Manager wears a lot of hats and is involved on many levels with different skill sets

Communication & Coordination Meetings

- ✓ Internal & external team meetings
 - ✓ Meeting cadence & agendas
- ✓ Relationships: Owner, End User, Investors “Stakeholders”
 - ✓ Security Consultant
 - ✓ General Contractor
 - ✓ IP / IT Groups

Training

- ✓ Trainers – system certifications & knowledge
- ✓ Schedule training sessions on Project Schedule
- ✓ Provide appropriate training materials
- ✓ Consider videotaping training sessions
- ✓ User participation, hands-on, demonstrate understanding
- ✓ Ask reinforcing questions
- ✓ Hold QA session

Coordination

- ✓ General Contractor / Project Executive
- ✓ End-user: Management, Security, Facilities
- ✓ Subcontractor(s)
- ✓ Door / hardware contractors
- ✓ Electricians
- ✓ Manufacturers and distributors
- ✓ Network contractors
- ✓ Site security personnel
- ✓ Local authorities

