TEL2813/IS2820
Security Management

Security Planning

Lecture 2

Jan 13, 2005

Security Planning

> You got to be careful if you don't know where you're going, because you might not get there.
>
> **-- Yogi Berra**

Introduction

- Successful organizations utilize planning
- Planning involves:
  - Employees
  - Management
  - Stockholders
  - Other outside stakeholders
  - Physical environment
  - Political and legal environment
  - Competitive environment
  - Technological environment

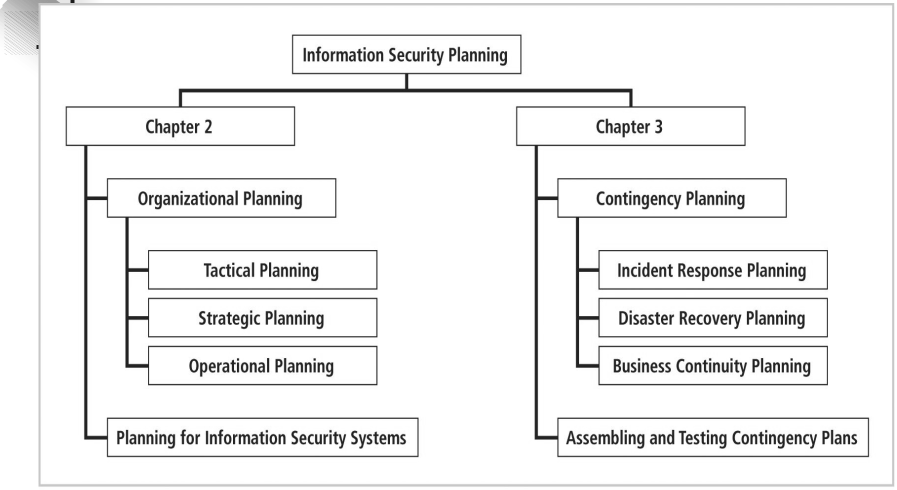
Introduction

- Strategic planning includes:
  - Vision statement
  - Mission statement
  - Strategy
  - Coordinated plans for sub units
- Knowing how the general organizational planning process works helps in the information security planning process

Introduction

- Planning:
  - Is creating action steps toward goals, and then controlling them
  - Provides direction for the organization's future
- Top-down method:
  - Organization's leaders choose the direction
  - Planning begins with the general and ends with the specific

Information Security Planning



Information Security Planning

Chapter 2

Organizational Planning

Tactical Planning

Strategic Planning

Operational Planning

Planning for Information Security Systems

Chapter 3

Contingency Planning

Incident Response Planning

Disaster Recovery Planning

Business Continuity Planning

Assembling and Testing Contingency Plans

FIGURE 2-1 Information Security Planning

Components Of Planning: The Mission Statement

- Mission statement:
  - Declares the business of the organization and its intended areas of operations
  - Explains what the organization does and for whom
  - Example: *Random Widget Works, Inc. designs and manufactures quality widgets, associated equipment and supplies for use in modern business environments*

Components Of Planning: Mission/Vision Statement

- Mission statement:
  - Declares the business of the organization and its intended areas of operations
  - Explains what the organization does and for whom
  - Example: *Random Widget Works, Inc. designs and manufactures quality widgets, associated equipment and supplies for use in modern business environments*
- Vision statement:
  - Expresses what the organization wants to become
  - Should be ambitious
  - Example: *Random Widget Works will be the preferred manufacturer of choice for every business's widget equipment needs, with an RWW widget in every machine they use*

Components Of Planning: Values

- By establishing organizational principles in a values statement, an organization makes its conduct standards clear
  - Example: *RWW values commitment, honesty, integrity and social responsibility among its employees, and is committed to providing its services in harmony with its corporate, social, legal and natural environments.*
- The mission, vision, and values statements together provide the foundation for planning

Components Of Planning: Strategy

- Strategy is the basis for long-term direction
- Strategic planning:
  - Guides organizational efforts
  - Focuses resources on clearly defined goals

"... strategic planning is a disciplined effort to produce fundamental decisions and actions that shape and guide what an organization is, what it does, and why it does it, with a focus on the future."

Strategic Planning

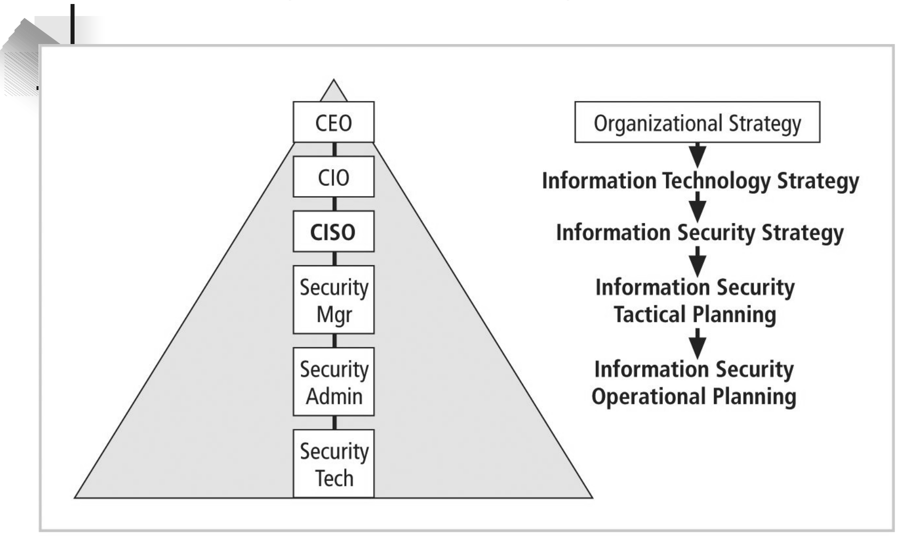

CEO
CIO
CISO
Security Mgr
Security Admin
Security Tech
Organizational Strategy
Information Technology Strategy
Information Security Strategy
Information Security Tactical Planning
Information Security Operational Planning

FIGURE 2-3 Top-Down Strategic Planning for Information Security

Strategic Planning

- Organization:
  - Develops a general strategy
  - Creates specific strategic plans for major divisions
- Each level of division translates those objectives into more specific objectives for the level below
- In order to execute this broad strategy, executives must define individual managerial responsibilities

Planning for the Organization

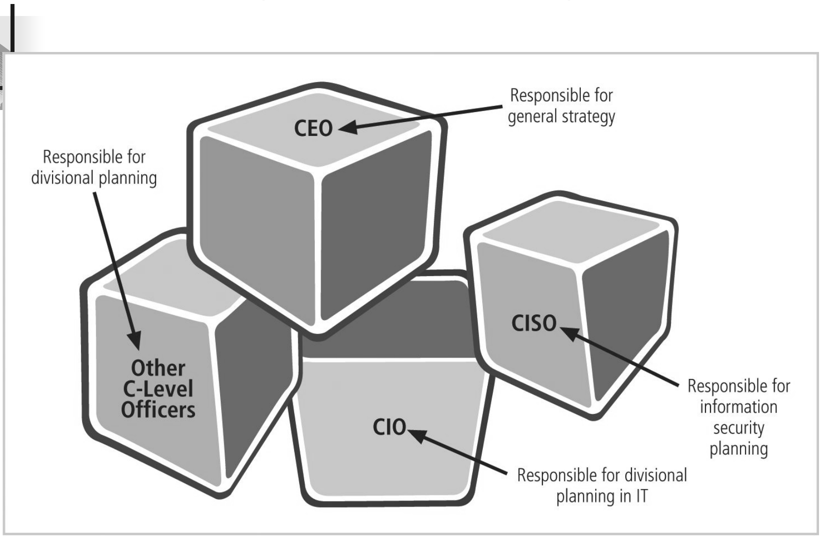

Responsible for general strategy
CEO
Responsible for divisional planning
Other C-Level Officers
CISO
Responsible for information security planning
CIO
Responsible for divisional planning in IT

FIGURE 2-4 Planning for the Organization

Strategic Planning

- Strategic goals are then translated into tasks with specific, measurable, achievable, reasonably high and time-bound objectives (SMART)
- Strategic planning then begins a transformation from general to specific objectives

Planning Levels

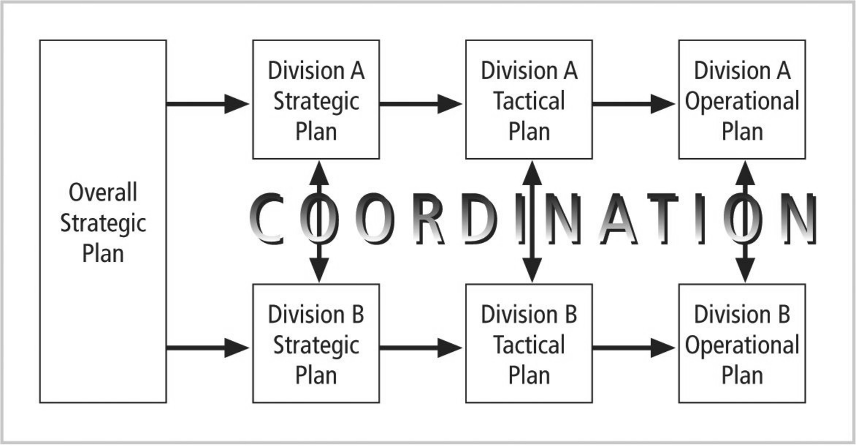

Overall Strategic Plan
Division A Strategic Plan
Division A Tactical Plan
Division A Operational Plan
COORDINATION
Division B Strategic Plan
Division B Tactical Plan
Division B Operational Plan

FIGURE 2-5 Planning Levels

Planning levels

- Tactical Planning
  - Shorter focus than strategic planning
  - Usually one to three years
  - Breaks applicable strategic goals into a series of incremental objectives
- Operational Planning
  - Used by managers and employees to organize the ongoing, day-to-day performance of tasks
  - Includes clearly identified coordination activities across department boundaries such as:
    - Communications requirements
    - Weekly meetings
    - Summaries
    - Progress reports

Typical Strategic Plan Elements

- Introduction by senior executive
- Executive Summary
- Mission Statement and Vision Statement
- Organizational Profile and History
- Strategic Issues and Core Values
- Program Goals and Objectives
- Management/Operations Goals and Objectives
- Appendices (optional)
  - Strengths, weaknesses, opportunities and threats (SWOT) analyses, surveys, budgets &etc

Tips For Planning

- Create a compelling vision statement that frames the evolving plan, and acts as a magnet for people who want to make a difference
- Embrace the use of balanced scorecard approach
- Deploy a draft high level plan early, and ask for input from stakeholders in the organization
- Make the evolving plan visible

Tips For Planning

- Make the process invigorating for everyone
- Be persistent
- Make the process continuous
- Provide meaning
- Be yourself
- Lighten up and have some fun

Planning For Information Security Implementation

- The CIO and CISO play important roles in translating overall strategic planning into tactical and operational information security plans/ information security
- CISO plays a more active role in the development of the planning details than does the CIO

CISO Job Description

- Creates strategic information security plan with a vision for the future of information security at Company X…
- Understands fundamental business activities performed by Company X
  - Based on this understanding, suggests appropriate information security solutions that uniquely protect these activities…
- Develops action plans, schedules, budgets, status reports and other top management communications intended to improve the status of information security at Company X…

Planning for InfoSec

- Once plan has been translated into IT and information security objectives and tactical and operational plans information security, implementation can begin
- Implementation of information security can be accomplished in two ways:
  - Bottom-up

    OR
  - Top-down

Approaches to Security Implementation

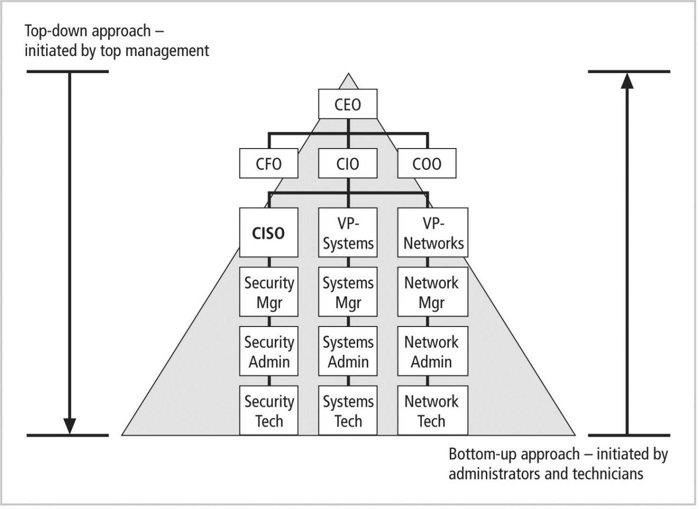


FIGURE 2-7 Approaches to Security Implementation

The Systems Development Life Cycle (SDLC)

- SDLC: methodology for the design and implementation of an information system
- SDLC-based projects may be initiated by events or planned
- At the end of each phase, a review occurs when reviewers determine if the project should be continued, discontinued, outsourced, or postponed

Feasibility

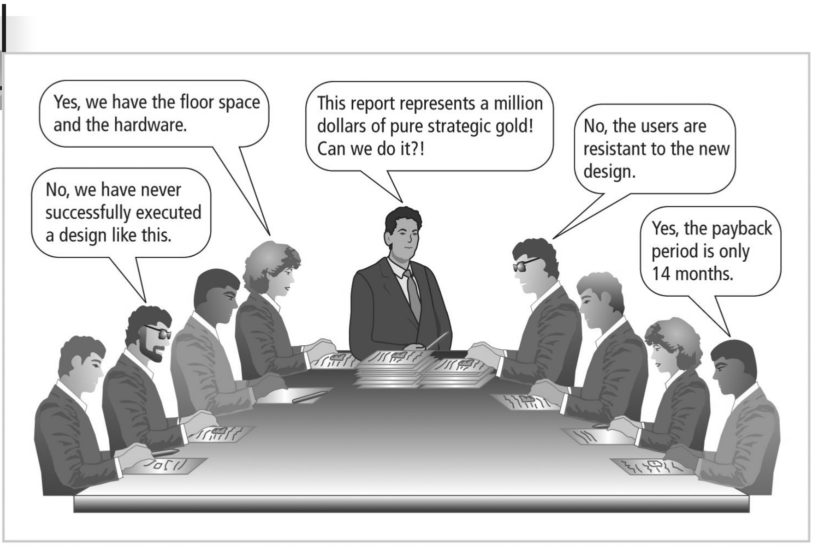
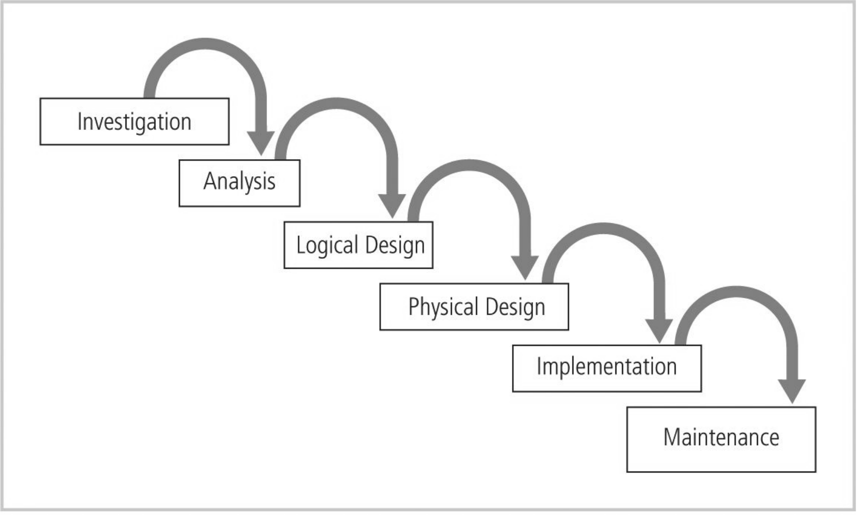
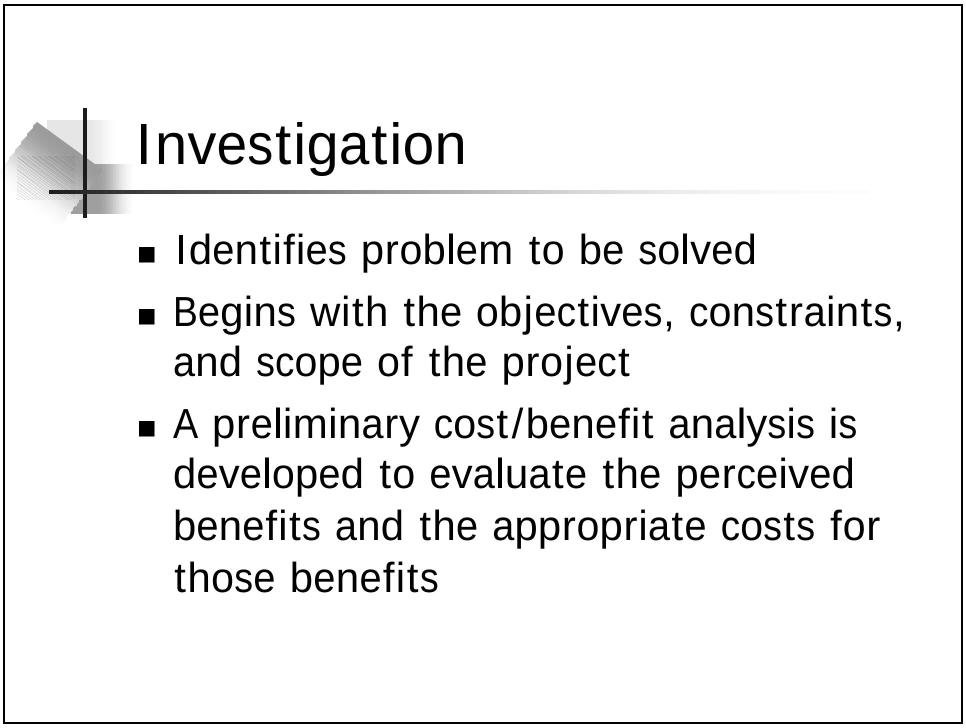

Yes, we have the floor space and the hardware.
No, we have never successfully executed a design like this.
This report represents a million dollars of pure strategic gold! Can we do it?!
No, the users are resistant to the new design.
Yes, the payback period is only 14 months.

FIGURE 2-8 Feasibility Analysis

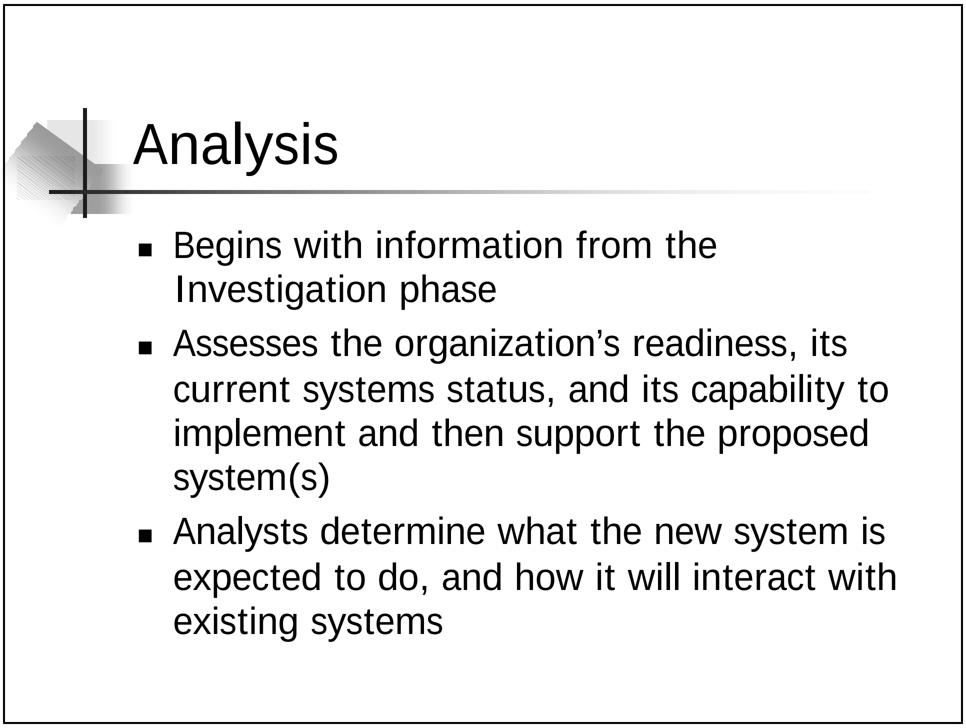
Phases of An SDLC





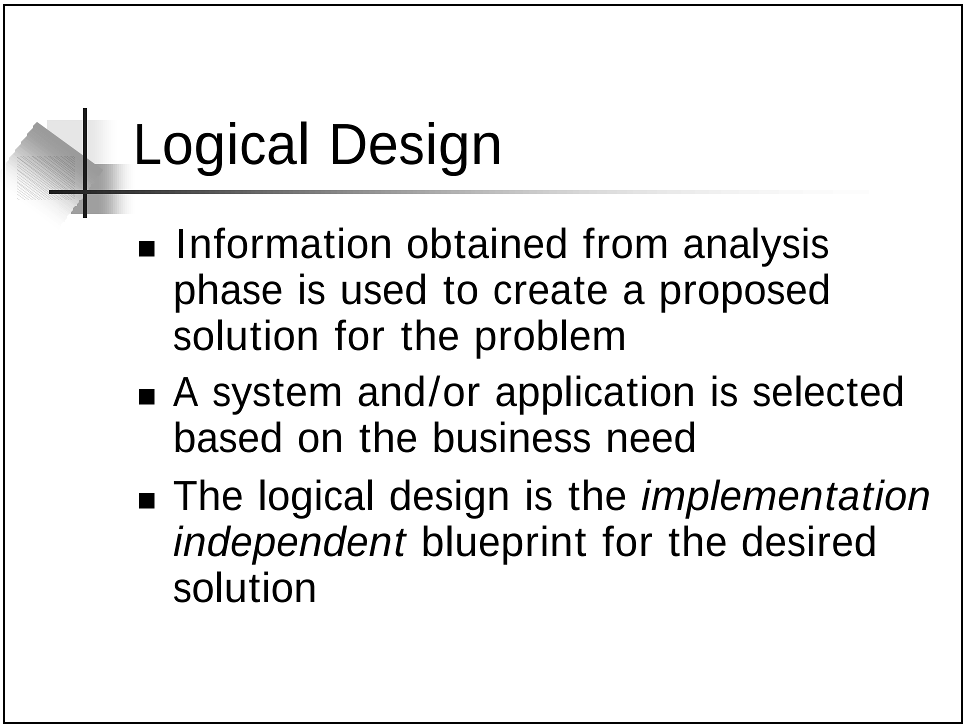
Investigation

- Identifies problem to be solved
- Begins with the objectives, constraints, and scope of the project
- A preliminary cost/benefit analysis is developed to evaluate the perceived benefits and the appropriate costs for those benefits



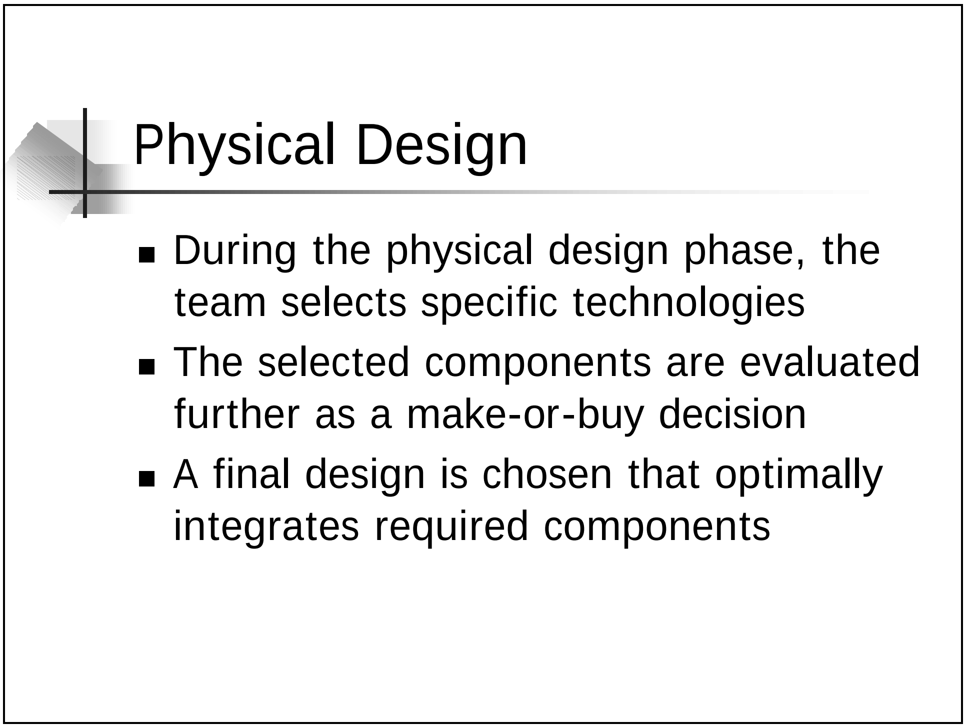
Analysis

- Begins with information from the Investigation phase
- Assesses the organization’s readiness, its current systems status, and its capability to implement and then support the proposed system(s)
- Analysts determine what the new system is expected to do, and how it will interact with existing systems



Logical Design

- Information obtained from analysis phase is used to create a proposed solution for the problem
- A system and/or application is selected based on the business need
- The logical design is the *implementation independent* blueprint for the desired solution



Physical Design

- During the physical design phase, the team selects specific technologies
- The selected components are evaluated further as a make-or-buy decision
- A final design is chosen that optimally integrates required components

Implementation

- Develop any software that is not purchased, and create integration capability
- Customized elements are tested and documented
- Users are trained and supporting documentation is created
- Once all components have been tested individually, they are installed and tested as a whole

Maintenance

- Tasks necessary to support and modify the system for the remainder of its useful life
- System is tested periodically for compliance with specifications
- Feasibility of continuance versus discontinuance is evaluated
- Upgrades, updates, and patches are managed
- When current system can no longer support the mission of the organization, it is terminated and a new systems development project is undertaken

The Security SDLC

- May differ in several specifics, but overall methodology is similar to the SDLC
- SecSDLC process involves:
  - Identification of specific threats and the risks that they represent
  - Subsequent design and implementation of specific controls to counter those threats and assist in the management of the risk those threats pose to the organization

Investigation in the SecSDLC

- Often begins as directive from management specifying the process, outcomes, and goals of the project and its budget
- Frequently begins with the affirmation or creation of security policies
- Teams assembled to analyze problems, define scope, specify goals and identify constraints
- Feasibility analysis determines whether the organization has resources and commitment to conduct a successful security analysis and design

Analysis in the SecSDLC

- A preliminary analysis of existing security policies or programs is prepared along with known threats and current controls
- Includes an analysis of relevant legal issues that could affect the design of the security solution
- Risk management begins in this stage

Risk Management

- Risk Management: process of identifying, assessing, and evaluating the levels of risk facing the organization
  - Specifically the threats to the information stored and processed by the organization
- To better understand the analysis phase of the SecSDLC, you should know something about the kinds of threats facing organizations
- In this context, a threat is an object, person, or other entity that represents a constant danger to an asset

Key Terms

- Attack: deliberate act that exploits a vulnerability to achieve the compromise of a controlled system
  - Accomplished by a threat agent that damages or steals an organization’s information or physical asset
- Exploit: technique or mechanism used to compromise a system
- Vulnerability: identified weakness of a controlled system in which necessary controls are not present or are no longer effective

Threats to Information Security

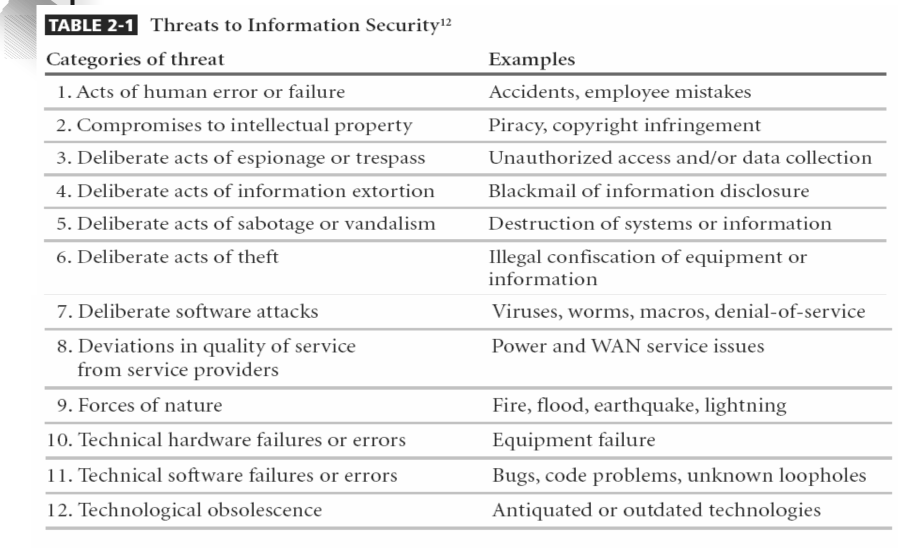


TABLE 2-1 Threats to Information Security[12]

Categories of threat	Examples
1. Acts of human error or failure	Accidents, employee mistakes
2. Compromises to intellectual property	Piracy, copyright infringement
3. Deliberate acts of espionage or trespass	Unauthorized access and/or data collection
4. Deliberate acts of information extortion	Blackmail of information disclosure
5. Deliberate acts of sabotage or vandalism	Destruction of systems or information
6. Deliberate acts of theft	Illegal confiscation of equipment or information
7. Deliberate software attacks	Viruses, worms, macros, denial-of-service
8. Deviations in quality of service from service providers	Power and WAN service issues
9. Forces of nature	Fire, flood, earthquake, lightning
10. Technical hardware failures or errors	Equipment failure
11. Technical software failures or errors	Bugs, code problems, unknown loopholes
12. Technological obsolescence	Antiquated or outdated technologies

Some Common Attacks

- Malicious code
- Hoaxes
- Back doors
- Password crack
- Brute force
- Dictionary
- Denial-of-service (DoS) and distributed denial-of-service (DDoS)
- Spoofing
- Man-in-the-middle
- Spam
- Mail bombing
- Sniffer
- Social engineering
- Buffer overflow
- Timing

Risk Management

- Use some method of prioritizing risk posed by each category of threat and its related methods of attack
- To manage risk, you must identify and assess the value of your information assets
- Risk assessment assigns comparative risk rating or score to each specific information asset
- Risk management identifies vulnerabilities in an organization’s information systems and takes carefully reasoned steps to assure the confidentiality, integrity, and availability of all the components in organization’s information system

Design in the SecSDLC

- Design phase actually consists of two distinct phases:
  - Logical design phase: team members create and develop a blueprint for security, and examine and implement key policies
  - Physical design phase: team members evaluate the technology needed to support the security blueprint, generate alternative solutions, and agree upon a final design

Security Models

- Security managers often use established security models to guide the design process
- Security models provide frameworks for ensuring that all areas of security are addressed
- Organizations can adapt or adopt a framework to meet their own information security needs

Policy

- A critical design element of the information security program is the information security policy
- Management must define three types of security policy:
  - General or security program policy
  - Issue-specific security policies
  - Systems-specific security policies

SETA

- Another integral part of the InfoSec program is the security education and training program
- SETA program consists of three elements: security education, security training, and security awareness
- Purpose of SETA is to enhance security by:
  - Improving awareness
  - Developing skills and knowledge
  - Building in-depth knowledge

Design

- Attention turns to the design of the controls and safeguards used to protect information from attacks by threats
- Three categories of controls:
  - Managerial
  - Operational
  - Technical

Managerial Controls

- Address the design and implementation of the security planning process and security program management
- Management controls also address:
  - Risk management
  - Security control reviews

Operational Controls

- Cover management functions and lower level planning including:
  - Disaster recovery
  - Incident response planning
- Operational controls also address:
  - Personnel security
  - Physical security
  - Protection of production inputs and outputs

Technical Controls

- Address those tactical and technical issues related to designing and implementing security in the organization
- Technologies necessary to protect information are examined and selected

Contingency Planning

- Essential preparedness documents provide contingency planning (CP) to prepare, react and recover from circumstances that threaten the organization:
  - Incident response planning (IRP)
  - Disaster recovery planning (DRP)
  - Business continuity planning (BCP)

Physical Security

- Physical Security: addresses the design, implementation, and maintenance of countermeasures that protect the physical resources of an organization
- Physical resources include:
  - People
  - Hardware
  - Supporting information system elements

Implementation in the SecSDLC

- Security solutions are acquired, tested, implemented, and tested again
- Personnel issues are evaluated and specific training and education programs conducted
- Perhaps most important element of implementation phase is management of project plan:
  - Planning the project
  - Supervising tasks and action steps within the project
  - Wrapping up the project

InfoSec Project Team

- Should consist of individuals experienced in one or multiple technical and non-technical areas including:
  - Champion
  - Team leader
  - Security policy developers
  - Risk assessment specialists
  - Security professionals
  - Systems administrators
  - End users

Staffing the InfoSec Function

- Each organization should examine the options for staffing of the information security function
  1. Decide how to position and name the security function
  2. Plan for proper staffing of information security function
  3. Understand impact of information security across every role in IT
  4. Integrate solid information security concepts into personnel management practices of the organization

InfoSec Professionals

- It takes a wide range of professionals to support a diverse information security program:
  - Chief Information Officer (CIO)
  - Chief Information Security Officer (CISO)
  - Security Managers
  - Security Technicians
  - Data Owners
  - Data Custodians
  - Data Users

Certifications

- Many organizations seek professional certification so that they can more easily identify the proficiency of job applicants:
  - CISSP
  - SSCP
  - GIAC
  - SCP
  - ICSA
  - Security +
  - CISM

Maintenance and Change in the SecSDLC

- Once information security program is implemented, it must be operated, properly managed, and kept up to date by means of established procedures
- If the program is not adjusting adequately to the changes in the internal or external environment, it may be necessary to begin the cycle again

Maintenance Model

- While a systems management model is designed to manage and operate systems, a maintenance model is intended to focus organizational effort on system maintenance:
  - External monitoring
  - Internal monitoring
  - Planning and risk assessment
  - Vulnerability assessment and remediation
  - Readiness and review
  - Vulnerability assessment

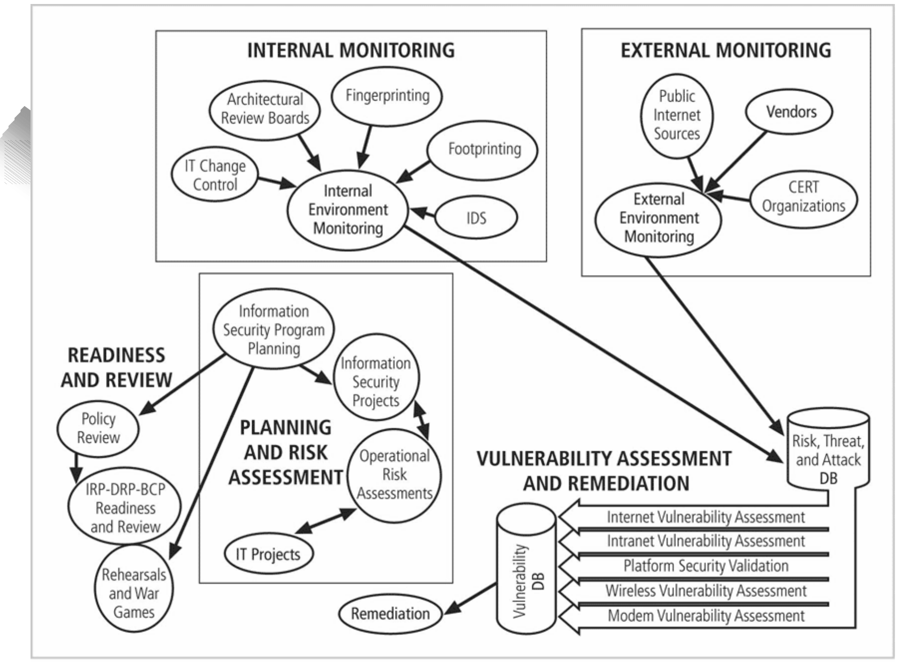

INTERNAL MONITORING
Architectural Review Boards
Fingerprinting
Footprinting
IT Change Control
Internal Environment Monitoring
IDS
EXTERNAL MONITORING
Public Internet Sources
Vendors
CERT Organizations
External Environment Monitoring
READINESS AND REVIEW
Policy Review
IRP-DRP-BCP Readiness and Review
Rehearsals and War Games
Information Security Program Planning
Information Security Projects
PLANNING AND RISK ASSESSMENT
Operational Risk Assessments
IT Projects
VULNERABILITY ASSESSMENT AND REMEDIATION
Risk, Threat, and Attack DB
Internet Vulnerability Assessment
Intranet Vulnerability Assessment
Platform Security Validation
Wireless Vulnerability Assessment
Modem Vulnerability Assessment
Vulnerability DB
Remediation

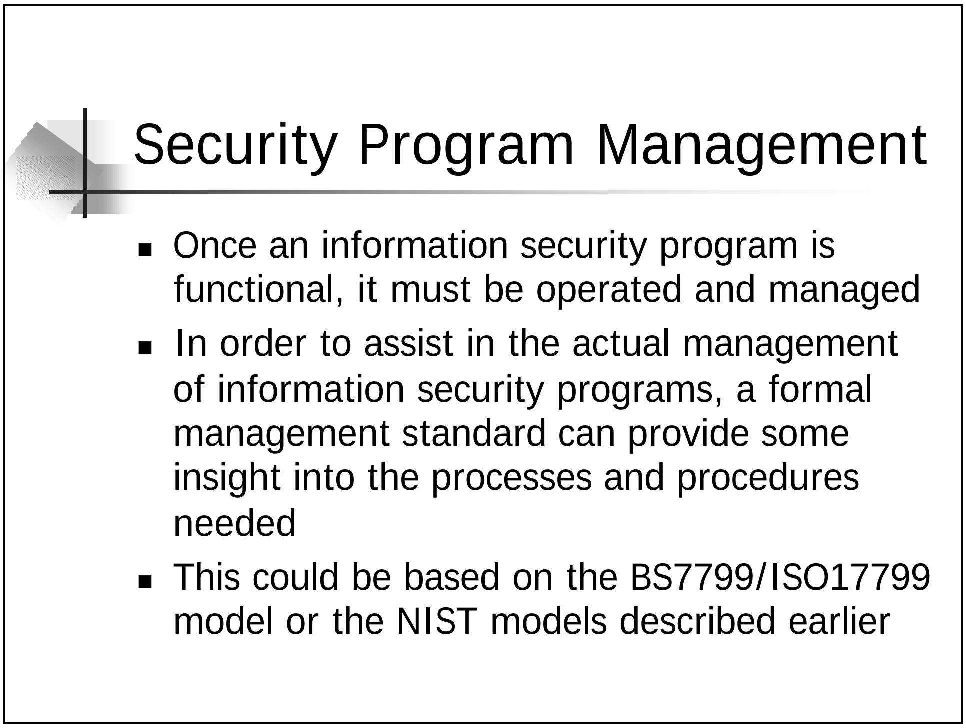
FIGURE 2-10 Maintenance Model

ISO Management Model

- One issue planned in the SecSDLC is the systems management model
- ISO management model contains five areas:
  - Fault management
  - Configuration and name management
  - Accounting management
  - Performance management
  - Security management

Security Management Model

- Fault Management involves identifying and addressing faults
- Configuration and Change Management involve administration of components involved in the security program and administration of changes
- Accounting and Auditing Management involves chargeback accounting and systems monitoring
- Performance Management determines if security systems are effectively doing the job for which they were implemented



Security Program Management

- Once an information security program is functional, it must be operated and managed
- In order to assist in the actual management of information security programs, a formal management standard can provide some insight into the processes and procedures needed
- This could be based on the BS7799/ISO17799 model or the NIST models described earlier