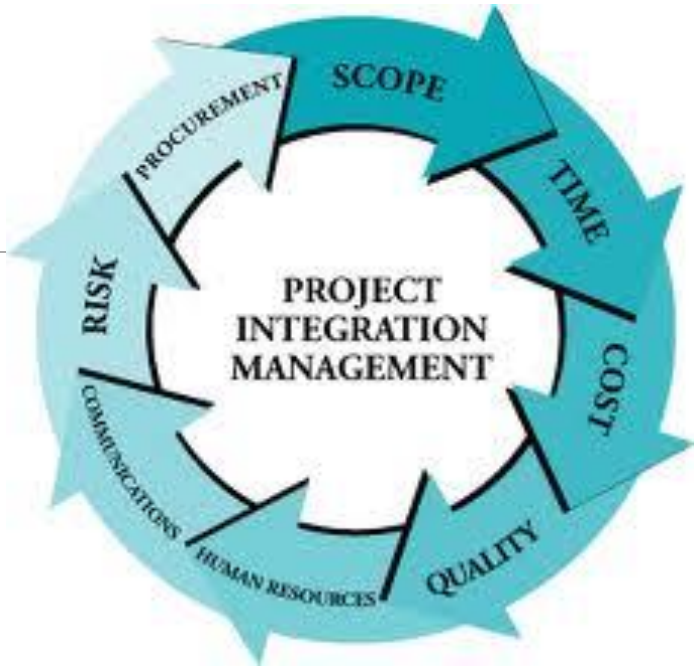
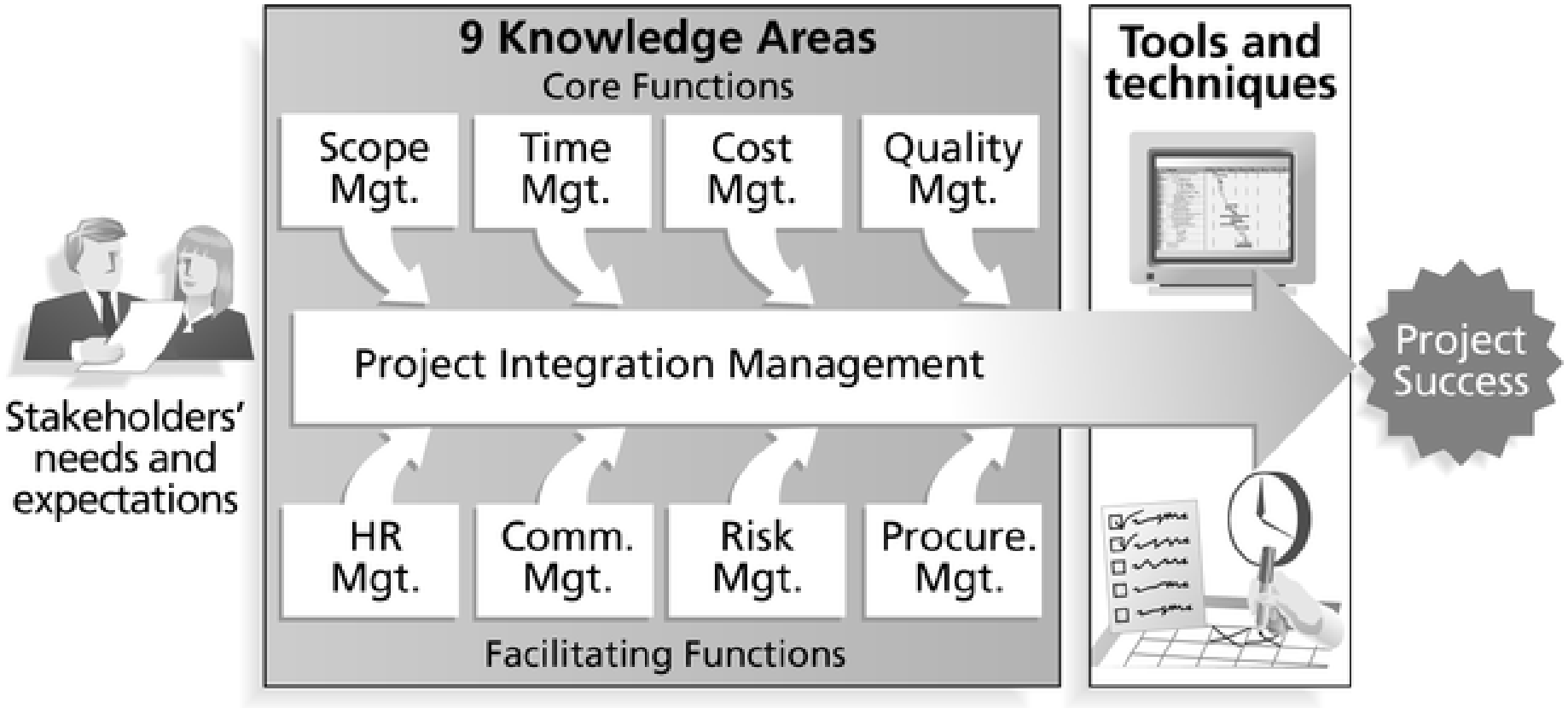
Project Planning & Integration Management




9 Knowledge Areas
Core Functions
Scope Mgt.
Time Mgt.
Cost Mgt.
Quality Mgt.
Project Integration Management
HR Mgt.
Comm. Mgt.
Risk Mgt.
Procure. Mgt.
Facilitating Functions
Tools and techniques
Stakeholders' needs and expectations
Project Success

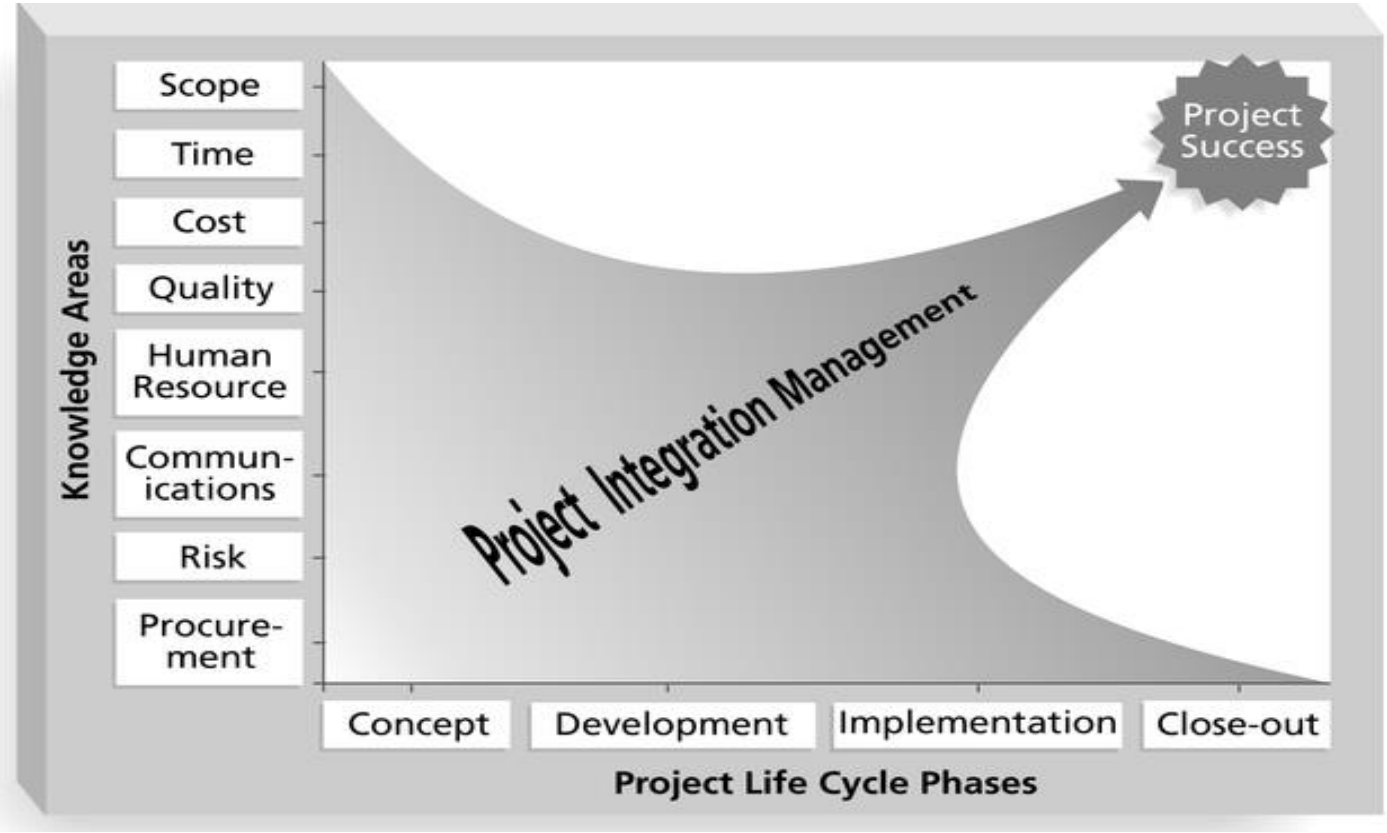
The Key to Overall Project Success: Good Project Integration Management

- Project managers must coordinate all of the other knowledge areas throughout a project's life cycle
- Many new project managers have trouble looking at the "big picture" and want to focus on too many details
- Project integration management is not the same thing as software integration

Project Integration Management Processes

1. **Project Plan Development**: taking the results of other planning processes and putting them into a consistent, coherent document—the project plan
2. **Project Plan Execution:** carrying out the project plan
3. **Integrated Change Control:** coordinating changes across the entire project

Framework for Project Integration Management



Focus on pulling everything together to reach project success!

Project Plan Development

- A project plan is a document used to coordinate all project planning documents
- Its main purpose is to *guide project execution*
- Project plans assist the project manager in leading the project team and assessing project status
- Project performance should be measured against a baseline project plan

Attributes of Project Plans

Just as projects are unique, so are project plans

- Plans should be dynamic
- Plans should be flexible
- Plans should be updated as changes occur
- Plans should first and foremost guide project execution

Common Elements of a Project Plan

- Introduction or overview of the project
- Description of how the project is organized
- Management and technical processes used on the project
- Work to be done, schedule, and budget information

Sample Outline for a Software Project Management Plan (SPMP)

Project Management Plan Sections					
	Introduction	Project Organization	Managerial Process	Technical Process	Work Packages, Schedule, and Budget
Section of Topics	Project overview; project deliverables; evolution of the SPMP; reference materials; definitions and acronyms	Process model; organizational structure; organizational boundaries and interfaces; project responsibilities	Management objectives and priorities; assumptions, dependencies, and constraints; risk management; monitoring and controlling mechanisms; and staffing plan	Methods, tools, and techniques; software documentation; and project support functions	Work packages; Dependencies; resource requirements; budget and resource allocation; and schedule

IEEE Std 10581-1987

Stakeholder Analysis

- A stakeholder analysis documents important (often sensitive) information about stakeholders such as
  - stakeholders' names and organizations
  - roles on the project
  - unique facts about stakeholders
  - level of influence and interest in the project
  - suggestions for managing relationships

Sample Stakeholder Analysis

Key Stakeholders					
	Ahmed	Susan	Erik	Mark	David
Organization	Internal senior management	Project team	Project team	Hardware vendor	Project manager for other internal project
Role on project	Sponsor of project and one of the company's founders	DNA sequencing expert	Lead programmer	Supplies some instrument hardware	Competing for company resources
Unique facts	Demanding, likes details, business focus, Stanford MBA	Very smart, Ph.D. in biology, easy to work with, has a toddler	Best programmer I know, weird sense of humor	Start-up company, he knows we can make him rich if this works	Nice guy, one of oldest people at company, has 3 kids in college
Level of interest	Very high	Very high	High	Very high	Low to medium
Level of influence	Very high; can call the shots	Subject matter expert; critical to success	High; hard to replace	Low; other vendors available	Low to medium
Suggestions on managing relationship	Keep informed, let him lead conversations ,do as he says and quickly	Make sure she reviews specifications and leads testing; can do some work from home	Keep him happy so he stays; emphasize stock options; likes Mexican food	Give him enough lead time to deliver hardware	He knows his project takes a back seat to this one, but I can learn from him

Project Plan Execution

- Project plan execution involves managing and performing the work described in the project plan
- The majority of time and money is usually spent on execution
- The application area or the project directly affects project execution because the products of the project are produced during execution

Important Skills for Project Execution

- General management skills like leadership, communication, and political skills
- Product skills and knowledge
- Use of specialized tools and techniques

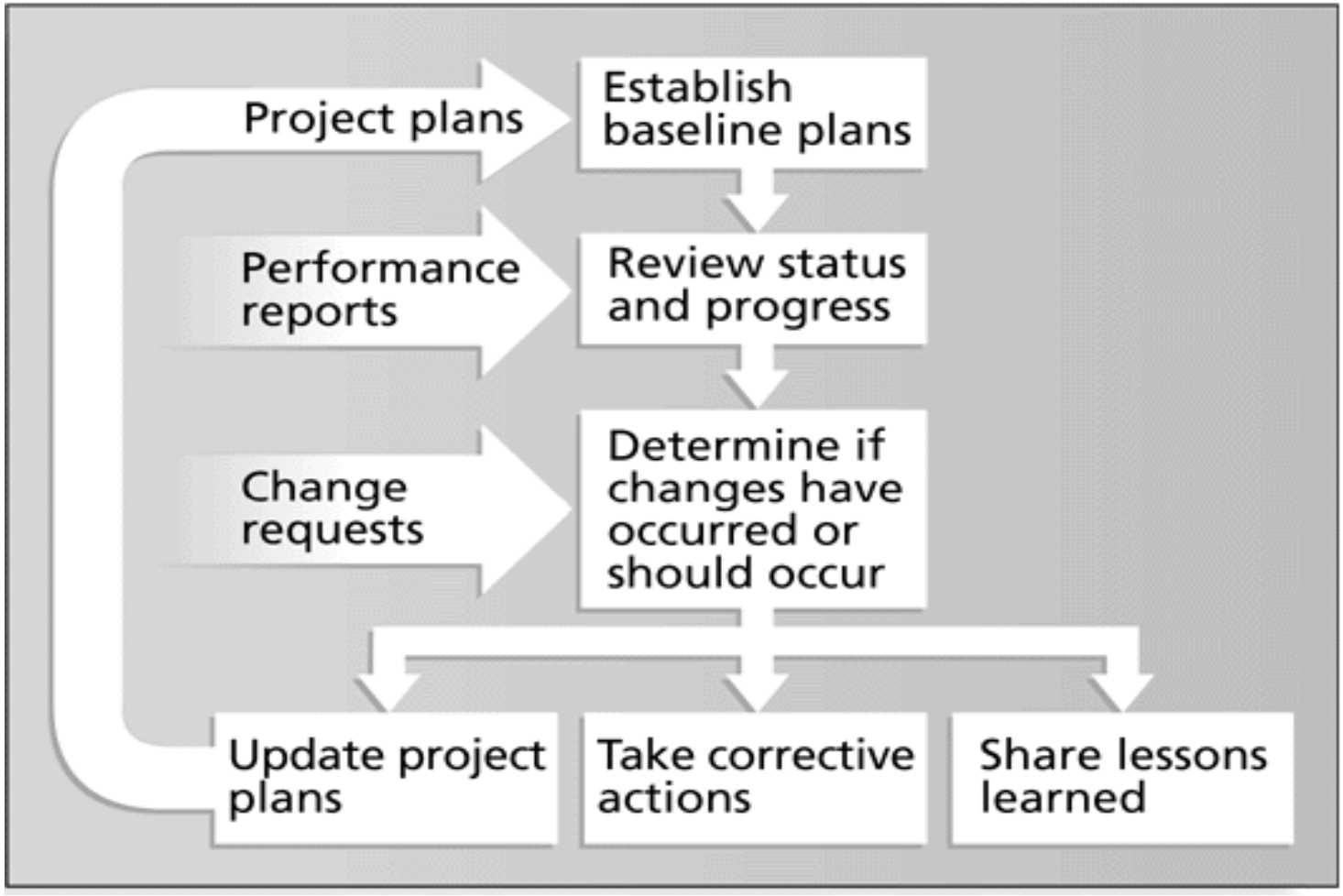
Tools and Techniques for Project Execution

- **Work Authorization System:** a method for ensuring that qualified people do work at the right time and in the proper sequence
- **Status Review Meetings:** regularly scheduled meetings used to exchange project information
- **Project Management Software:** special software to assist in managing projects

Integrated Change Control

- Integrated change control involves identifying, evaluating, and managing changes throughout the project life cycle (Note: 1996 PMBOK called this process “overall change control”)
- Three main objectives of change control:
  - Determine that a change has occurred
  - Influence the factors that create changes to ensure they are beneficial
  - Manage actual changes when and as they occur

Integrated Change Control Process



Change Control on Software Projects

- **Former view**: The project team should strive to do exactly what was planned on time and within budget
- **Problem**: Stakeholders rarely agreed up-front on the project scope, and time and cost estimates were inaccurate
- **Modern view**: Project management is a process of constant communication and negotiation
- **Solution**: Changes are often beneficial, and the project team should plan for them

Change Control System

- A formal, documented process that describes when and how official project documents and work may be changed
- Describes who is authorized to make changes and how to make them
- Often includes a Change Control Board (CCB), configuration management, and a process for communicating changes

Change Control Boards (CCBs)

- A formal group of people responsible for approving or rejecting changes on a project
- Provides guidelines for preparing change requests, evaluates them, and manages the implementation of approved changes
- Includes stakeholders from the entire organization

Making Timely Changes

- Some CCBs only meet occasionally, so it may take too long for changes to occur
- Some organizations have policies in place for time-sensitive changes
  - **"48 hour policy"** allowed project team members to make decisions, then they had 48 hours reverse the decision pending senior management approval
  - Delegate changes to the lowest level possible, but keep everyone informed of changes

Configuration Management

Ensures that the products and their descriptions are correct and complete

Concentrates on the management of technology by identifying and controlling the functional and physical design characteristics of products

Configuration management specialists identify and document configuration requirements, control changes, record and report changes, and audit the products to verify conformance to requirements

Suggestions for Managing Integrated Change Control

- View project management as a process of constant communications and negotiations
- Plan for change
- Establish a formal change control system, including a Change Control Board (CCB)
- Use good configuration management
- Define procedures for making timely decisions on smaller changes
- Use written and oral performance reports to help identify and manage change
- Use project management and other software to help manage and communicate changes

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
- Project scope management includes the processes involved in defining and controlling ***what is*** or ***is not*** included in the project
- The project team and stakeholders must have the same understanding of **what products will be produced** as a result of a project and **what processes will be used** in producing them

Project Scope Management Processes

1) **Initiation**: authorizing the project or phase
2) **Scope planning:** developing documents to provide the basis for future project decisions
3) **Scope definition:** subdividing the major project deliverables into smaller, more manageable components
4) **Scope verification:** formalizing acceptance of the project scope
5) **Scope change control:** controlling changes to project scope

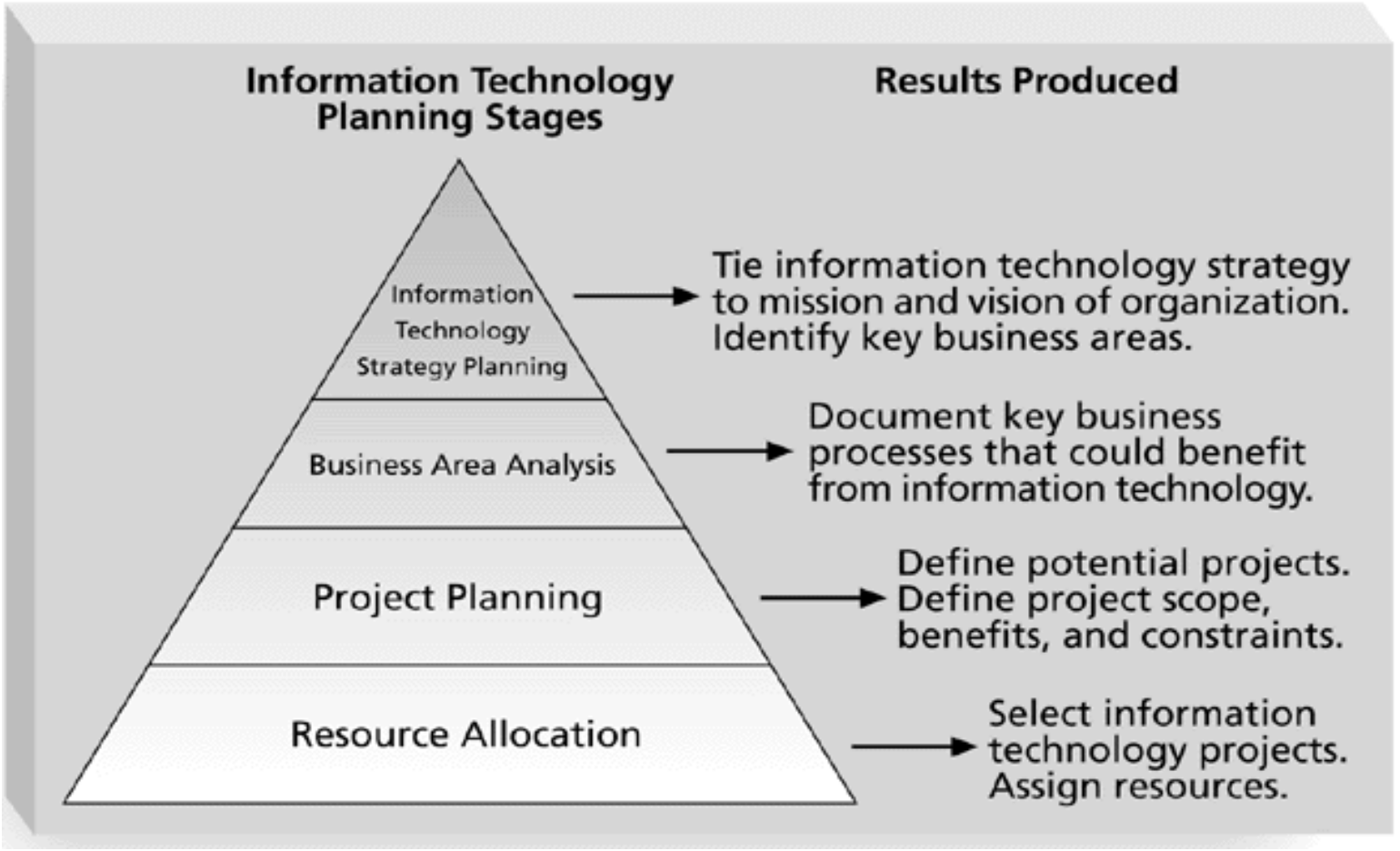
Project Initiation: Strategic Planning and Project Selection

- The first step in initiating projects is to look at the big picture or strategic plan of an organization
- Strategic planning involves determining long-term business objectives
- IT projects should support strategic and financial business objectives

Identifying Potential Projects

- Many organizations follow a planning process for selecting IT projects
- First ***develop an IT strategic plan*** based on the organization's overall strategic plan
- Then ***perform a business area analysis***
- Then ***define potential projects***
- Then ***select IT projects*** and ***assign resources***

Information Technology Planning Process



Methods for Selecting Projects

- There are usually more projects than available time and resources to implement them
- It is important to follow a logical process for selecting IT projects to work on
- Methods include focusing on ***broad needs***, ***categorizing projects***, ***financial methods***, and ***weighted scoring models***

Focusing on Broad Organizational Needs

- It is often difficult to provide strong justification for many IT projects, but everyone agrees they have a high value
- "It is better to measure gold roughly than to count pennies precisely"
- Three important criteria for projects:
  - There is a ***need*** for the project
  - There are ***funds*** available
  - There's a strong ***will*** to make the project succeed

Categorizing IT Projects

- One categorization is whether the project addresses
  - a problem
  - an opportunity, or
  - a directive
- Another categorization is how long it will take to do and when it is needed
- Another is the overall priority of the project

Financial Analysis of Projects

- Financial considerations are often an important consideration in selecting projects
- Three primary methods for determining the projected financial value of projects:
  - Net present value (NPV) analysis
  - Return on investment (ROI)
  - Payback analysis

Net Present Value Analysis

- **Net present value (NPV)** analysis is a method of calculating the expected net monetary gain or loss from a project by discounting all expected future cash inflows and outflows to the present point in time
- Projects with a positive NPV should be considered if financial value is a key criterion
- The higher the NPV, the better

- NPV can be computed using the following formula

$$NPV = \sum_{t=1}^{n} \frac{(Benefits - Costs)}{(1+r)^t}$$

Where:

r= discount rate

t= year

n= analysis horizon (in years)

** The annual percentage rate that an amount of money is discounted to bring it to a present value*

Net present value example

	A	B	C	D	E	F	G	H	I	J
2										
3	AN. INT. RATE -->	10%								
4										
5	**PROJECT 1**	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	TOTAL			
6	REVENUES	$0	$2,000	$3,000	$4,000	$5,000	$14,000			
7	COSTS	$5,000	$1,000	$1,000	$1,000	$1,000	$9,000			
8	CASH FLOW	($5,000)	$1,000	$2,000	$3,000	$4,000	**$5,000**			
9	NPV	**$2,316**								
10		Formula =npv(b3,b8:f8)								
11										
12	**PROJECT 2**	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	TOTAL			
13	REVENUES	$1,000	$2,000	$4,000	$4,000	$4,000	$15,000			
14	COSTS	$2,000	$2,000	$2,000	$2,000	$2,000	$10,000			
15	CASH FLOW	($1,000)	$0	$2,000	$2,000	$2,000	**$5,000**			
16	NPV	**$3,201**								
17		Formula =npv(b3,b15:f15)								
18										
19	RECOMMEND PROJECT 2 BECAUSE IT HAS THE HIGHER NPV.									
20										
21	IF STATEMENT -->	=IF(B9>B16,A5,A12)								
22	RESULT -->	PROJECT 2								

Note that totals are equal, but NPVs are not because of the time value of money.

Return on Investment

- Return on investment (ROI) is income divided by investment

$$RoI = \frac{Total\ Discounted\ Benefits\ - Total\ Discounted\ Costs}{Total\ Discounted\ Costs}$$

$$Discount\ Factor = \frac{1}{(1+r)^y}$$

Where r= rate

y=year

- The higher the ROI, the better
- Many organizations have a required rate of return or minimum acceptable rate of return on investment for projects

Payback Analysis

- Another important financial consideration is payback analysis
- The payback period is the amount of time it will take to recoup, in the form of net cash inflows, the net dollars invested in a project
- Payback occurs when the cumulative discounted benefits and costs are greater than zero
- Many organizations want IT projects to have a fairly short payback period

NPV, ROI, AND PAYBACK ANALYSIS FOR PROJECT 1

	A	B	C	D	E	F	G	H
1								
2	DISCOUNT RATE →	**10%**		**Years**				
3		**1**	**2**	**3**	**4**	**5**	**TOTAL**	
4	COSTS	($5,000)	($1,000)	($1,000)	($1,000)	($1,000)	-9,000	
5	DISCOUNT FACTOR	0.91	0.83	0.75	0.68	0.62		
6	**DISCOUNTED COSTS**	**-4,545**	**-826**	**-751**	**-683**	**-621**	**-7,427**	
7								
8	BENEFITS	$0	$2,000	$3,000	$4,000	$5,000	14,000	
9	DISCOUNT FACTOR	0.91	0.83	0.75	0.68	0.62		
10	**DISCOUNTED BENEFITS**	**0**	**1,653**	**2,254**	**2,732**	**3,105**	**9,743**	
11								
12	DISCOUNTED BENEFITS + COSTS	-4,545	826	1,503	2,049	2,484	**2,316** ←	**NPV**
13	CUMULATIVE BENEFITS + COSTS	-4,545	-3,719	-2,216	-167	2,316	4,633	
14						↑		
15	ROI	31%				Payback in this year		

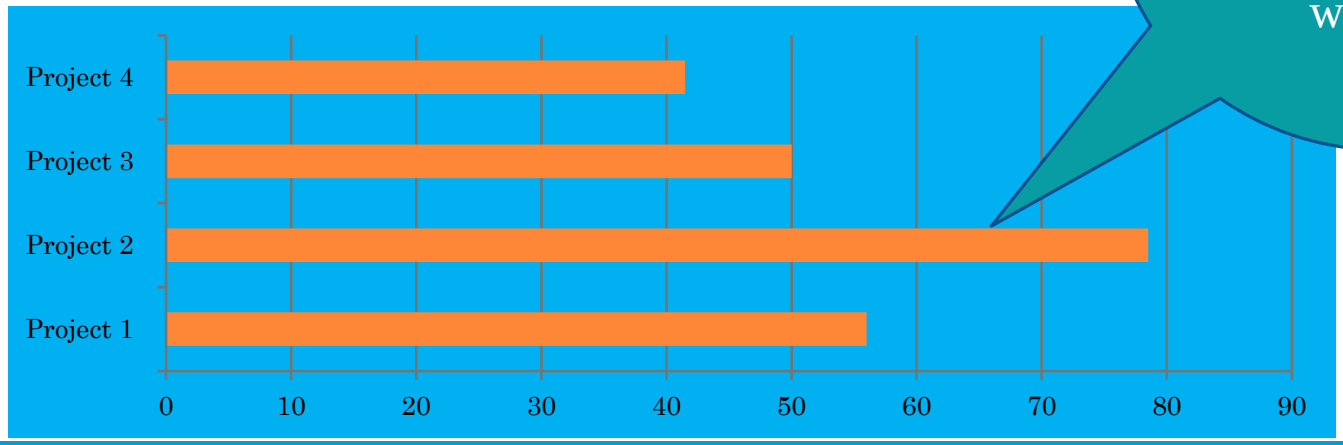
NPV, ROI, and Payback Analysis for Project 2

	A	B	C	D	E	F	G	H
1								
2	DISCOUNT RATE →	**10%**		**Years**				
3		**1**	**2**	**3**	**4**	**5**	**TOTAL**	
4	COSTS	($2,000)	($2,000)	($2,000)	($2,000)	($2,000)	-10,000	
5	DISCOUNT FACTOR	0.91	0.83	0.75	0.68	0.62		
6	**DISCOUNTED COSTS**	**-1,818**	**-1,653**	**-1,503**	**-1,366**	**-1,242**	**-7,582**	
7								
8	BENEFITS	$1,000	$2,000	$4,000	$4,000	$4,000	15,000	
9	DISCOUNT FACTOR	0.91	0.83	0.75	0.68	0.62		
10	**DISCOUNTED BENEFITS**	**909**	**1,653**	**3,005**	**2,732**	**2,484**	**10,783**	
11								
12	DISCOUNTED BENEFITS + COSTS	-909	0	1,503	1,366	1,242	**3,201**	← NPV
13	CUMULATIVE BENEFITS + COSTS	-909	-909	594	1,960	3,201	6,403	
14				↑				
15	ROI	42%		Payback in this year				

Weighted Scoring Model

- A weighted scoring model is a tool that provides a systematic process for selecting projects based on many criteria
  - First identify criteria important to the project selection process
  - Then assign weights (percentages) to each criterion so they add up to 100%
  - Then assign scores to each criterion for each project
  - Multiply the scores by the weights and get the total weighted scores
- The higher the weighted score, the better

No.	Criteria	Weight	Pro - ject 1	Pro - ject 2	Pro - ject 3	Pro - ject 4
1	Supports key business objectives	25%	90	90	50	20
2	Has strong internal sponsor	15%	70	90	50	20
3	Has strong customer support	15%	50	90	50	20
4	Realistic level of technology	10%	25	90	50	20
5	Can be implemented in one year or less	5%	20	20		
6	Provides positive NPV	20%	50			
7	Has low risk in managing cost, time and scope	10%	20			
	Weighted Project Score	100%	56			



Since Project 2 has the highest weighted project score, it is the winner!

Project Charters

- After deciding what project to work on, it is important to formalize projects
- A project charter is a document that formally recognizes the existence of a project and provides direction on the project's objectives and management
- Key project stakeholders should sign a project charter to acknowledge agreement on the **need and intent** of the project

Scope Planning and the Scope Statement

- A scope statement is a document used to develop and confirm a common understanding of the project scope. It should include
  - a project justification
  - a brief description of the project's products
  - a summary of all project deliverables
  - a statement of what determines project success

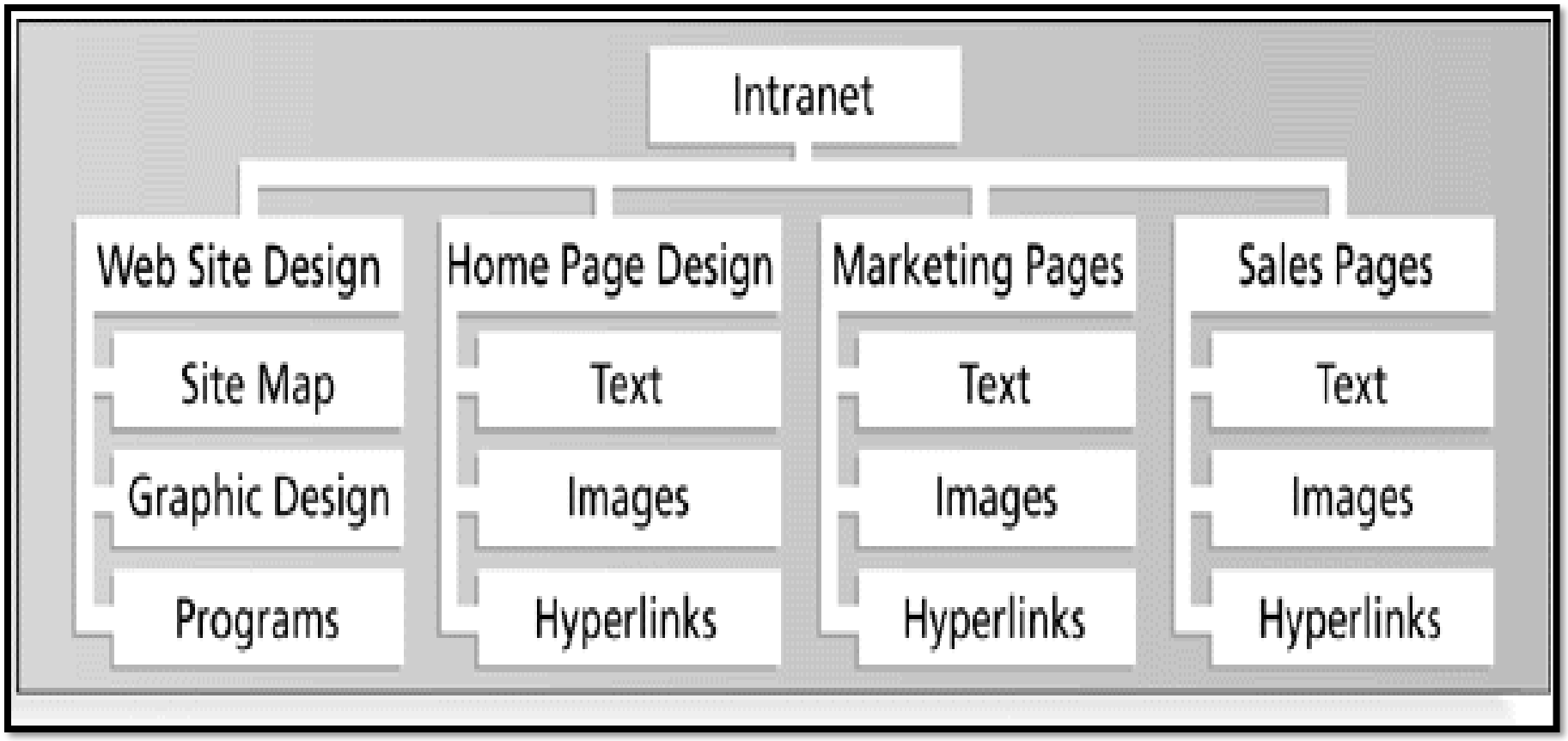
Scope Planning and the Work Breakdown Structure

- After completing scope planning, the next step is to further define the work by breaking it into manageable pieces
- Good scope definition
  - helps improve the accuracy of time, cost, and resource estimates
  - defines a baseline for performance measurement and project control
  - aids in communicating clear work responsibilities

The Work Breakdown Structure

- A work breakdown structure (WBS) is an outcome-oriented analysis of the work involved in a project that defines the total scope of the project
- It is a foundation document in project management because it provides the basis for planning and managing project schedules, costs, and changes

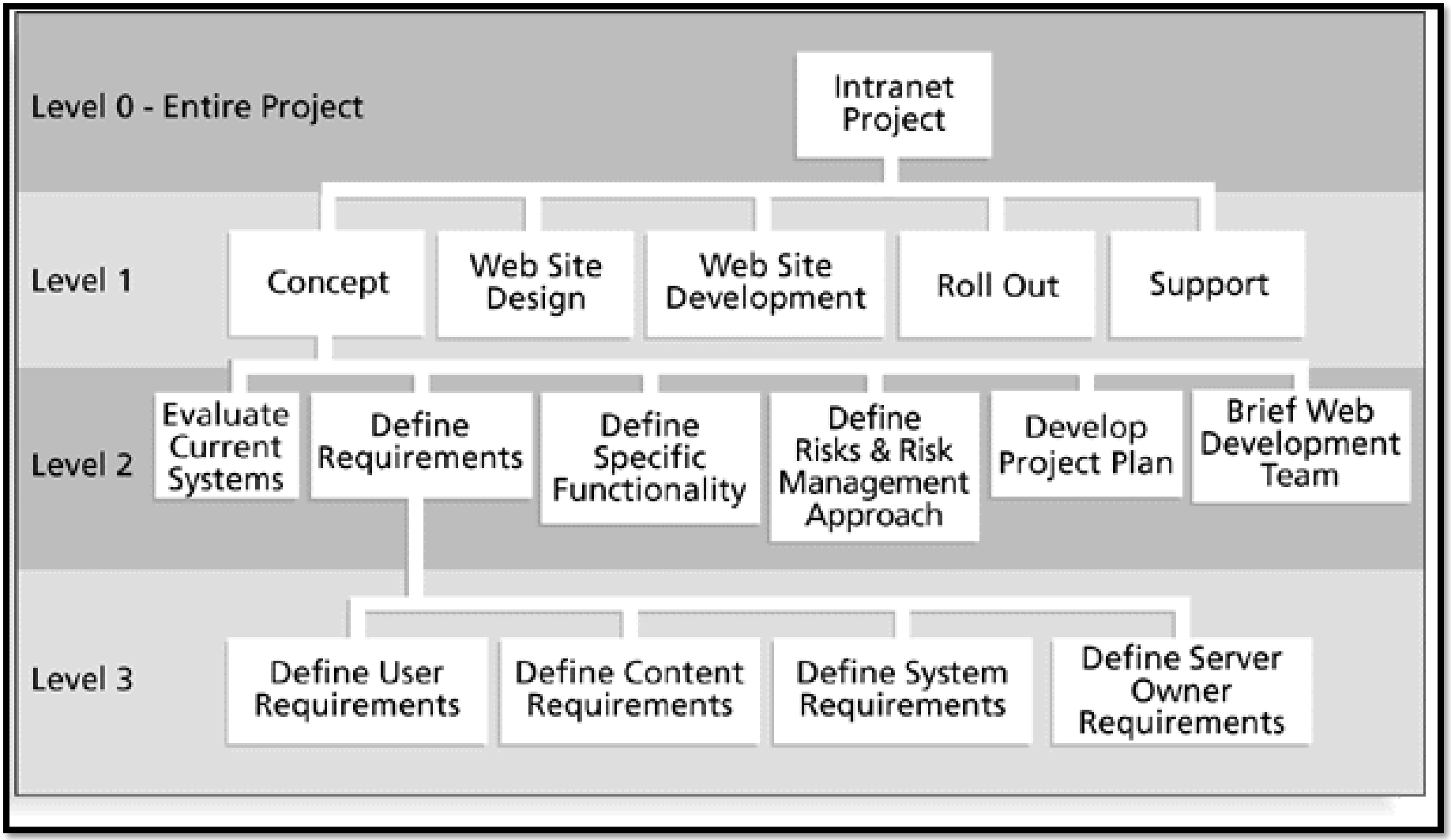
Sample Intranet WBS Organized by Product



Intranet Project … Level-2 WBS

1. Website design
    1.1. Site map
    1.2. graphic design
2. Home page design
    2.1. Text
    2.2. Images
    2.3. Hyperlinks
3. Marketing pages
4. Sales pages

Sample Intranet WBS Organized by Phase



Approaches to Developing WBSs

- **Using guidelines**: Some organizations, like the DoD, provide guidelines for preparing WBSs
- **The analogy approach:** It often helps to review WBSs of similar projects
- **The top-down approach:** Start with the largest items of the project and keep breaking them down
- **The bottom-up approach:** Start with the detailed tasks and roll them up

Scope Verification and Scope Change Control

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

Many Software projects suffer from scope creep and poor scope verification

- FoxMeyer Drug filed for bankruptcy after scope creep on a robotic warehouse
- Engineers at Grumman called a system “Naziware” and refused to use it

I thank you.