AMETHYST

Advanced Methods, Education and Training in Hyperspectral Science and Technology

Primer on Project Management Workshop

February 14, 2012

U of L

ON TARGET

"Planning is not an event. It is the continuous process of strengthening what works and abandoning what does not, of making risk-taking decisions with the greatest knowledge of their potential effect, of setting objectives, appraising performance and results through systematic feedback, and making ongoing adjustments as conditions change.“

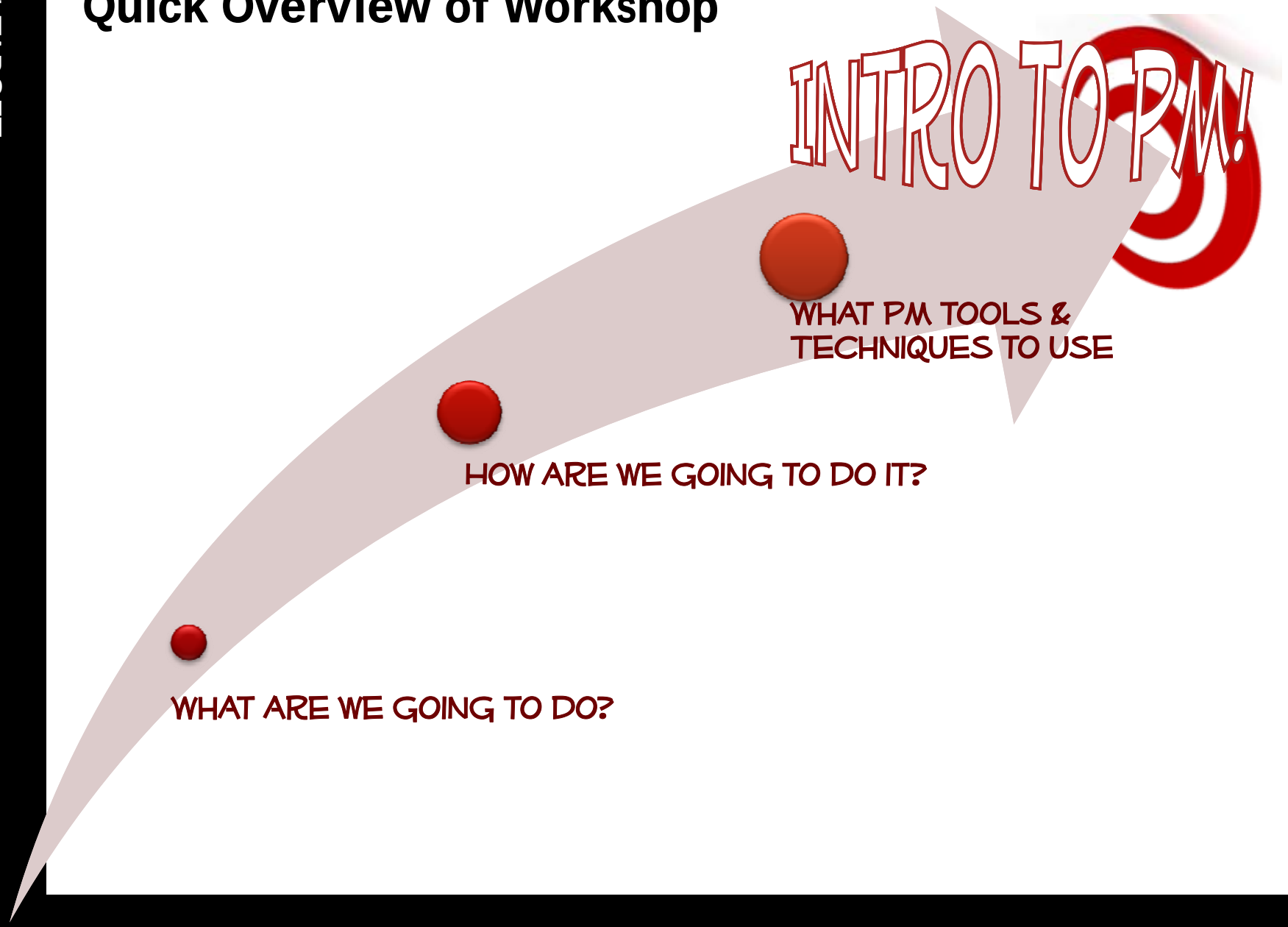
Peter Drucker

Summary Agenda

1. What PM is not and What it is!
2. Four Core Knowledge Areas
3. Project Management Tools
4. Lego Simulation and Debrief
5. Working Breaks to integrate learning

ON TARGET

Quick Overview of Workshop



ON TARGET

For those who need more detail - Today's Agenda

- INTRODUCTIONS – I WILL KEEP IT MERCIFULLY SHORT!
- WHAT IS PROJECT MANAGEMENT
- OVERVIEW OF PMBOK , PMI, WBS (AND OTHER ACRONYMS YOU WILL LIKELY FORGET!)
- KEY CONCEPTS – INTEGRATION & TRIPLE CONSTRAINT
- BREAK – 10:30 TO 10:45 AM
- CORE KNOWLEDGE AREAS & RISK MANAGEMENT
- LUNCH – 12:00 TO 13:00 HOURS
- PM TOOLS
- BREAK – 15:00 TO 15:15
- PM TOOLS AND INTRO TO LEGO SIMULATION

ON TARGET

IT IS A SYSTEMATIC APPROACH!

AT ITS SIMPLEST IT IS FORM OF RISK MANAGEMENT

Plan, Implement, Monitor!

PROJECT MANAGEMENT

It is NOT a shortcut to getting things done!

It is NOT a silver bullet!

ON TARGET

WHAT A PROJECT ISN'T

- Indefinite in duration
- Creating the same thing over and over
- No constraints on time, cost or performance

PROJECTS DO HAVE A COMMON SET OF CHARACTERISTICS WHICH CAN BE DEFINED AS THE OPPOSITE OF WHAT A PROJECT IS NOT...

A PROJECT HAS A...

- Defined beginning and end
- Unique product or service
- Time, cost, performance requirements

ON TARGET

A Project is defined by the Project Management institute as...

"A TEMPORARY ENDEAVOUR UNDERTAKEN TO CREATE A UNIQUE PRODUCT, SERVICE OR RESULT!

Is it all hot air?

- A 1995 Standish Group study ("The CHAOS Report") found that only 16.2 percent of information technology (IT) application development projects were successful in meeting scope, time, and cost goals. Over 31 percent of the projects were canceled before completion, costing over $81 billion in the U.S. alone.

- A 2004 PricewaterhouseCoopers study of 200 companies from 30 different countries found that over half of **all** projects fail.

ON TARGET

What Went Right? Improved Project Performance*

The Standish Group's CHAOS studies show improvements in IT projects in the past decade

Measure	1994 Data	2006 Data	Result
Successful Projects	16%	35%	More than doubled
Failed Projects	31%	19%	Almost halved
Money wasted on failed and challenged projects	$140B out of $250B or 56%	$53B out of $346B or 15%	Well more than halved

Johnson, "CHAOS 2006 Research Project," *CHAOS Activity News*, vol. 2: issue 1, (2007).

ON TARGET

However Project Management is not the savior….

- PM has not found a way to repeal Murphy's Law……*if anything can go wrong it will*!!

- 80/20 Rule - Pareto Principle - by the numbers it suggests that 80 percent of your outcomes come from 20 percent of your inputs. The take away is that the smallest efforts can result in the greatest outcomes.

- Finally, a stupid idea is still a stupid idea even if the project is executed flawlessly!

Acronym Soup

- PMI = PROJECT MANAGEMENT INSTITUTE
- PMBOK = PROJECT MANAGEMENT BODY OF KNOWLEDGE
- PM = PROJECT MANAGEMENT OR PROJECT MANGER (JUST TO CONFUSE YOU!)
- WBS = WORK BREAKDOWN STRUCTURE

ON TARGET

PMBOK Overview

PMBOK

- SCOPE 5
- TIME 6
- COST 3
- QUALITY 3
- H/R 4
- COMM. 4
- PROJECT INT. 7
- RISK 6
- PROC. 6

Project Management Knowledge Areas: 9

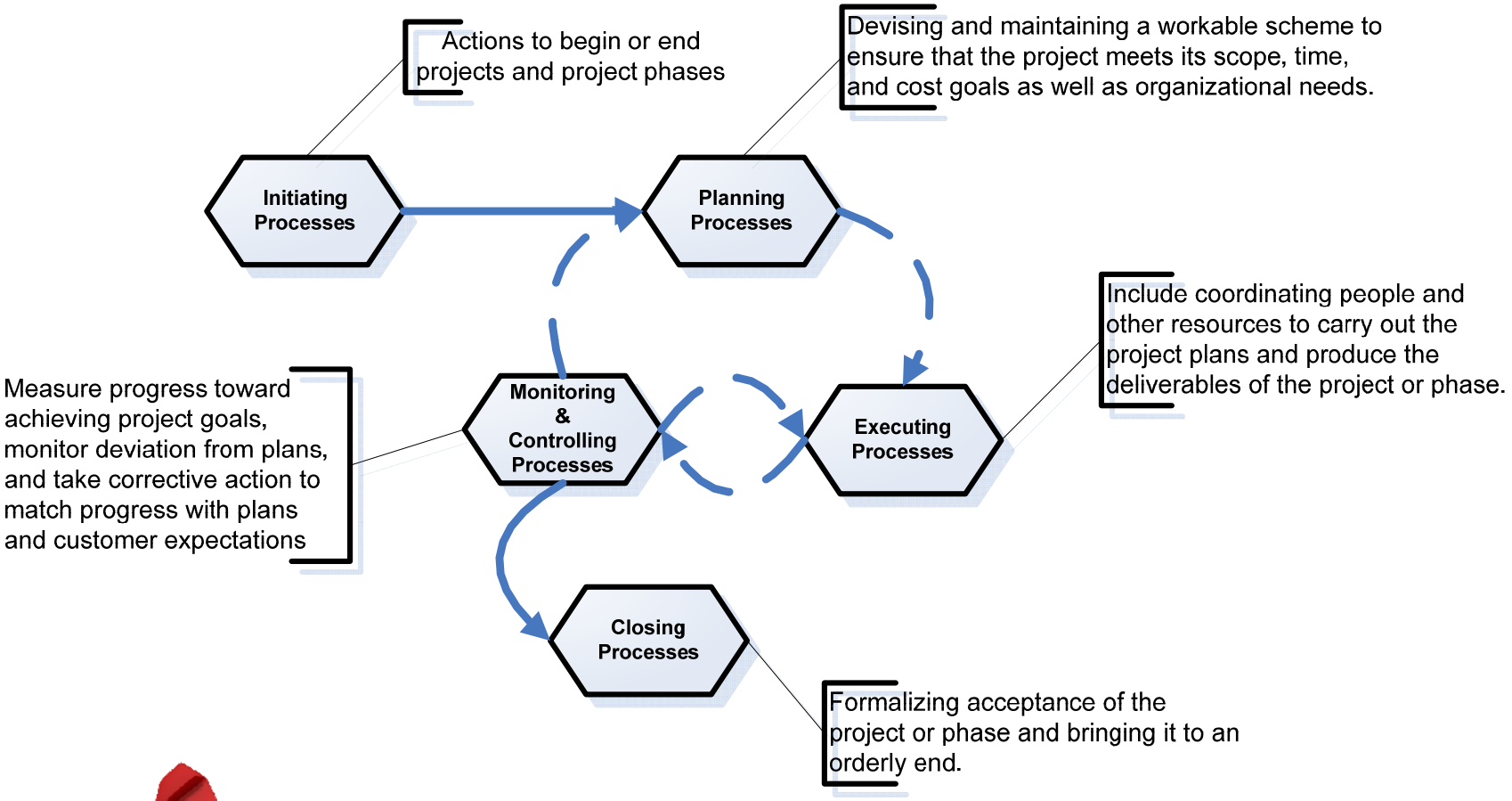
Project Management Process: 44

- Initiating
- Planning
- Executing
- Monitoring & Controlling
- Closing

Process Groups: 5

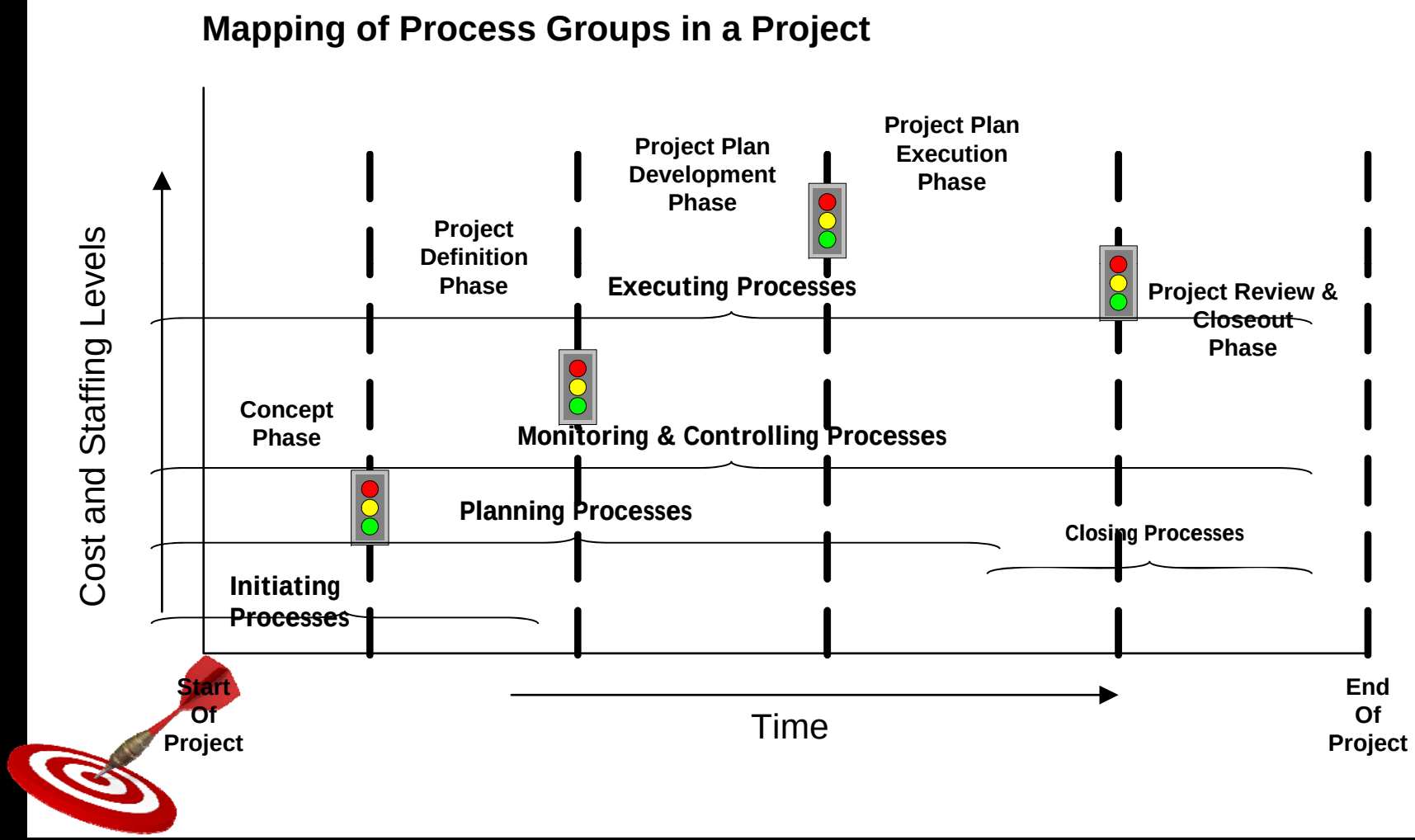
ON TARGET

PMBOK Process Groups



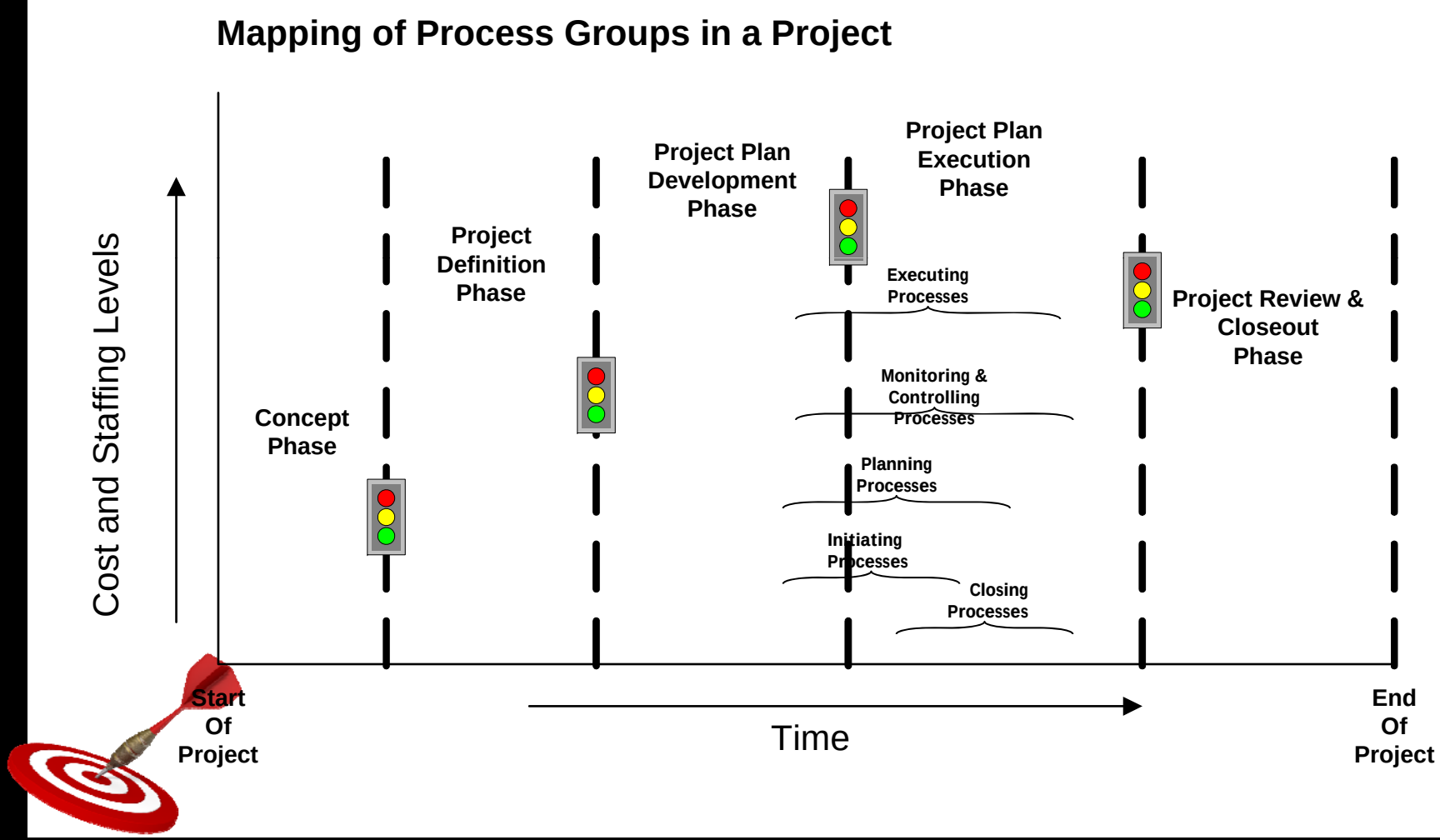
ON TARGET

Process Groups in a PM Methodology



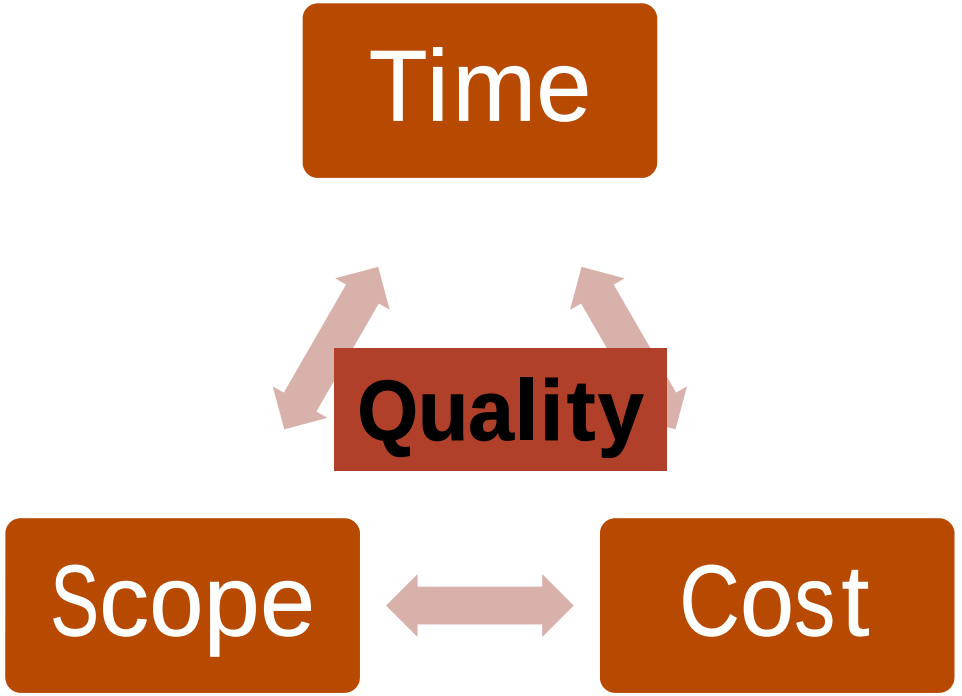
ON TARGET

Process Groups in a Phase of a Project



Before we go much further….

INTRODUCING THE TRIPLE CONSTRAINT



ON TARGET

Key Concept - The Triple Constraint

Every project is constrained in different ways by its:

Scope: What work will be done as part of the project? What unique product, service, or result does the customer or sponsor expect from the project?

Time: How long should it take to complete the project? What is the project's schedule?

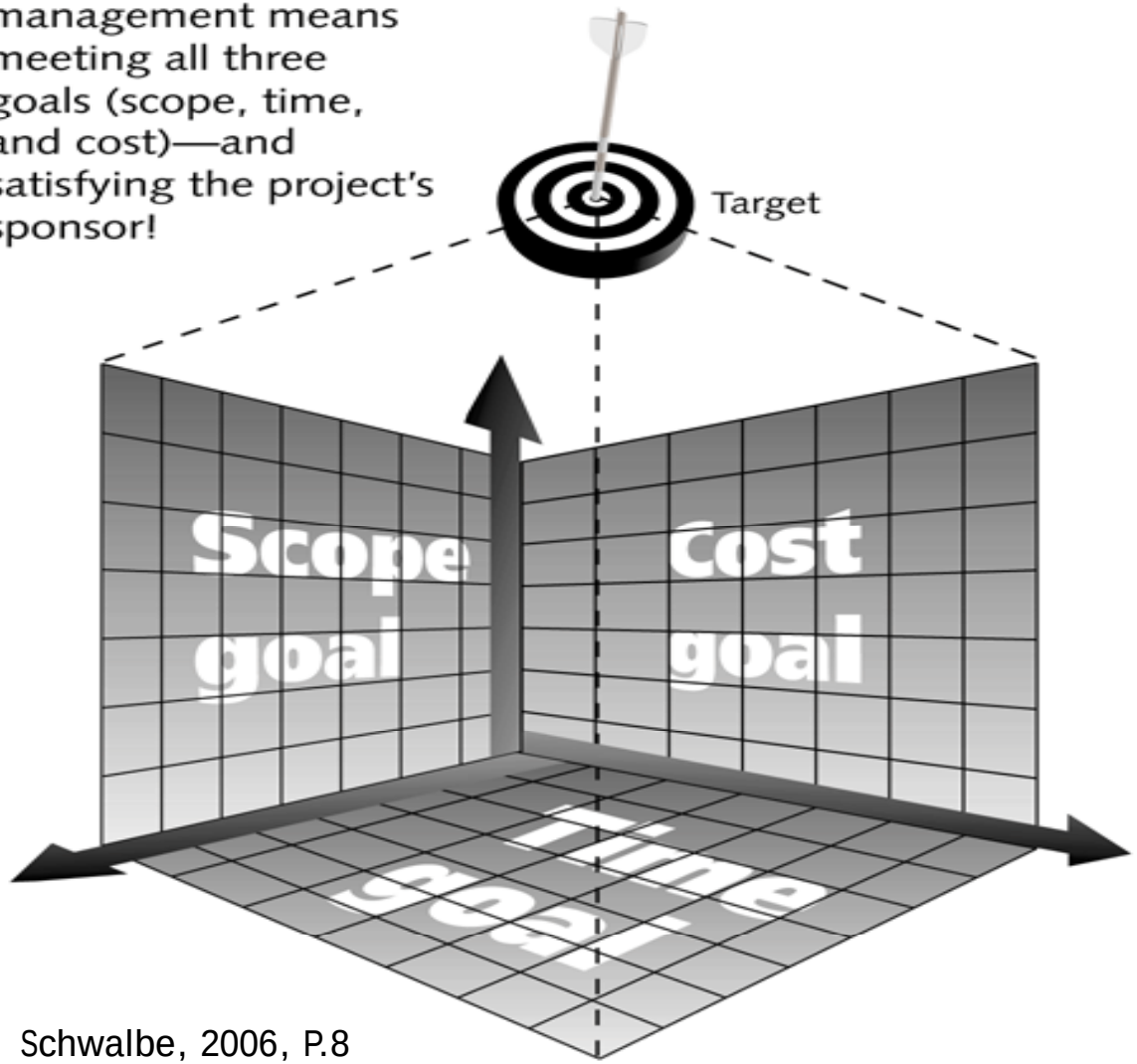
Cost: What should it cost to complete the project? What is the project's budget?

It is the project manager's duty to balance these three often competing goals.

ON TARGET

The Triple Constraint of Project Management

Successful project management means meeting all three goals (scope, time, and cost)—and satisfying the project's sponsor!



Schwalbe, 2006, P.8

The Triple Constraint and Project Success

There are different ways to define project success:

- The project met scope, time, and cost goals.
- The project satisfied the customer/sponsor.
- The project produced the anticipated results.

Of the three which one might be the MOST important??!?

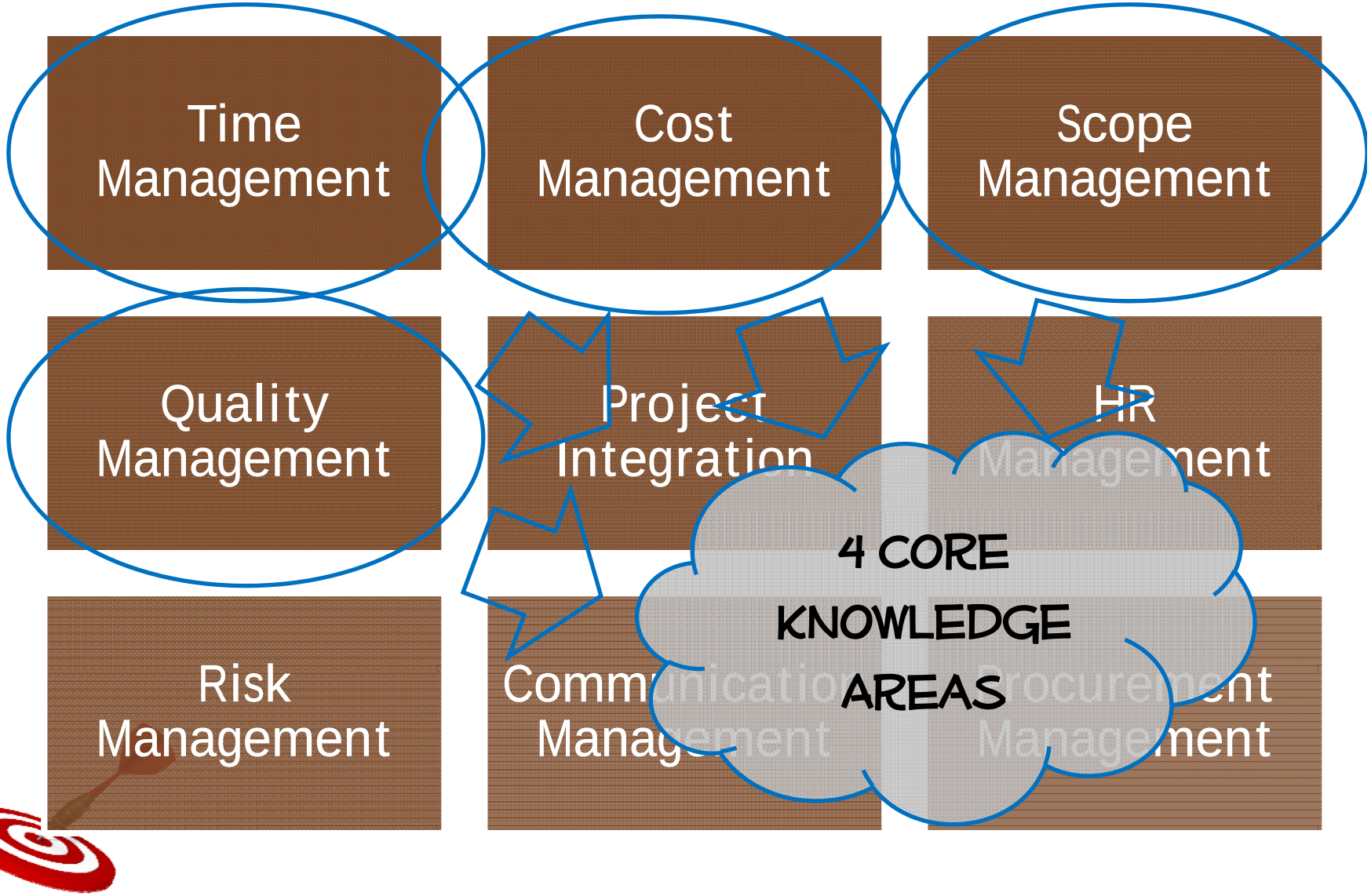
ON TARGET

9 PMBOK Knowledge Areas

Time Management	Cost Management	Scope Management
Quality Management	Project Integration	HR Management
Risk Management	Communication Management	Procurement Management

ON TARGET

9 PMBOK Knowledge Areas



ON TARGET

Key Concept – Project Integration

WHAT IF THE FRAMEWORK WAS NOT *INTEGRATED*?

Time Management

Procurement Management

Quality Management

Scope Management

Project Integration

Cost Management

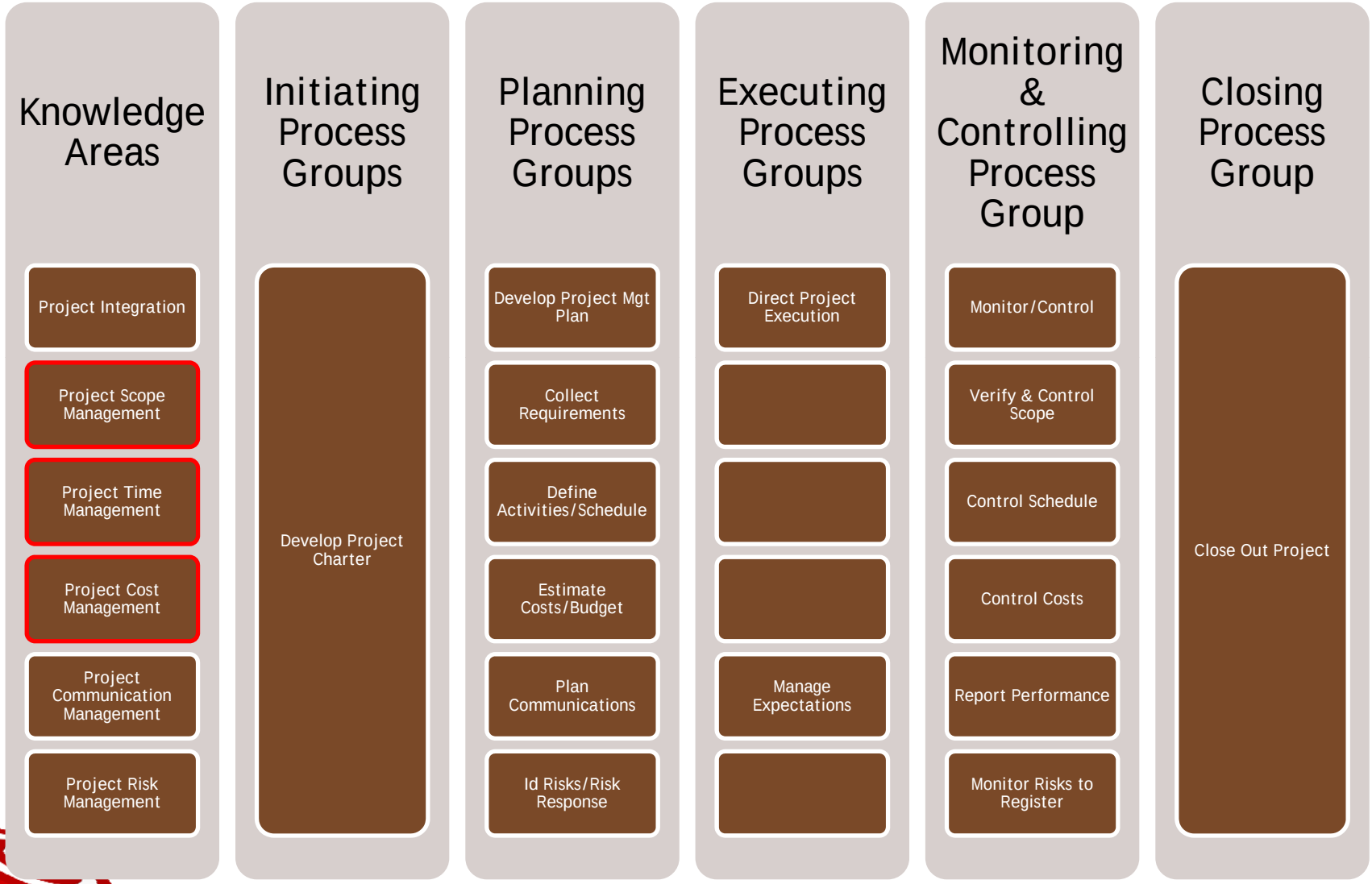
Risk Management

Communication Management

HR Management

ON TARGET

Project Management Process Groups mapped to Knowledge Areas



ON TARGET

BREAK! RETURN AT 10:15

ON TARGET

Quick argument to support the need to Plan

Most common response I hear for the requirement to plan is that….

I don't have time to plan!!!

DO YOU HAVE TIME TO DO IT AGAIN??!!?

ON TARGET

THOUGHTS ON PLANNING

IF YOU FAIL TO PLAN, YOU PLAN TO FAIL

IF YOU DON'T KNOW WHERE YOU ARE GOING, ANY ROAD WILL TAKE YOU THERE!

WHAT GETS MEASURED GETS MANAGED.

- Successful project managers know how important it is to develop, refine, and follow plans to meet project goals.
- People are more likely to perform well if they know what they are supposed to do and when.

ON TARGET

Project Planning Should Guide Project Execution

- Planning is often the most difficult and unappreciated process in project management.
- Often, people do not want to take the time to plan well, but theory and practice show that good planning is crucial to good execution.
- *The main purpose of project planning is to guide project execution,* so project plans must be realistic and useful.

ON TARGET

Final Thoughts on Planning

"At its best, planning is tortuous. It is an iterative process yielding better plans from not-so-good plans, and the iterative process of improvement seems to take place in fits and starts."

Author Unknown

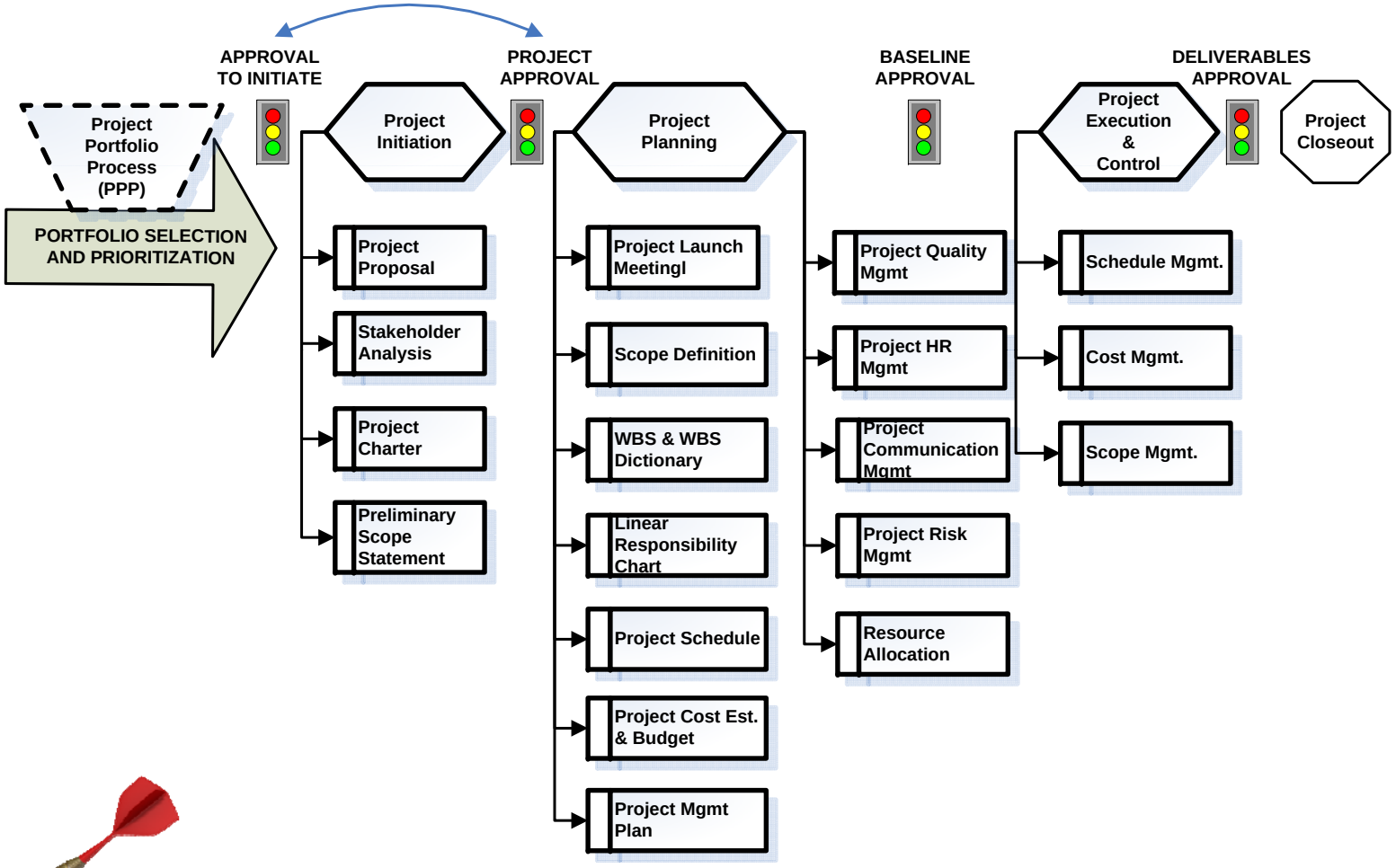
"With all these considerations in merely the "planning" stage of a project, it is perhaps surprising that projects get done at all. **In fact projects do get done, but seldom in the predicted manner and often as much by brute force as by careful planning**. The point, however, is that this method is non-optimal…

…with planning, projects can run on time and interact effectively with both customers and suppliers. Everyone involved understands what is wanted and **emerging problems are seen (and dealt with) long before they cause damage**. If you want your projects to run this way - then you must invest time in planning."

http://www.see.ed.ac.uk/~gerard/Management/art8.html?http://oldeee.see.ed.ac.uk/~gerard/Management/art8.html

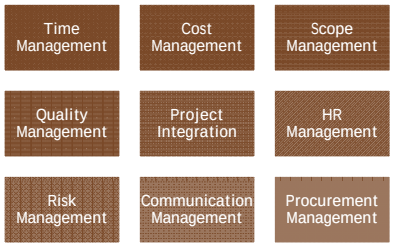
ON TARGET

PROJECT PLANNING & EXECUTION ROADMAP



Scope Management

Inputs	Tools & Techniques	Outputs
1. Project Charter 2. Statement of Work 3. Business Case 4. Environmental Factors 5. Other Documents?	1. Stakeholder Register 2. Expert Judgement	1. Preliminary Scope Statement 2. WBS 3. Stakeholder Register



ON TARGET

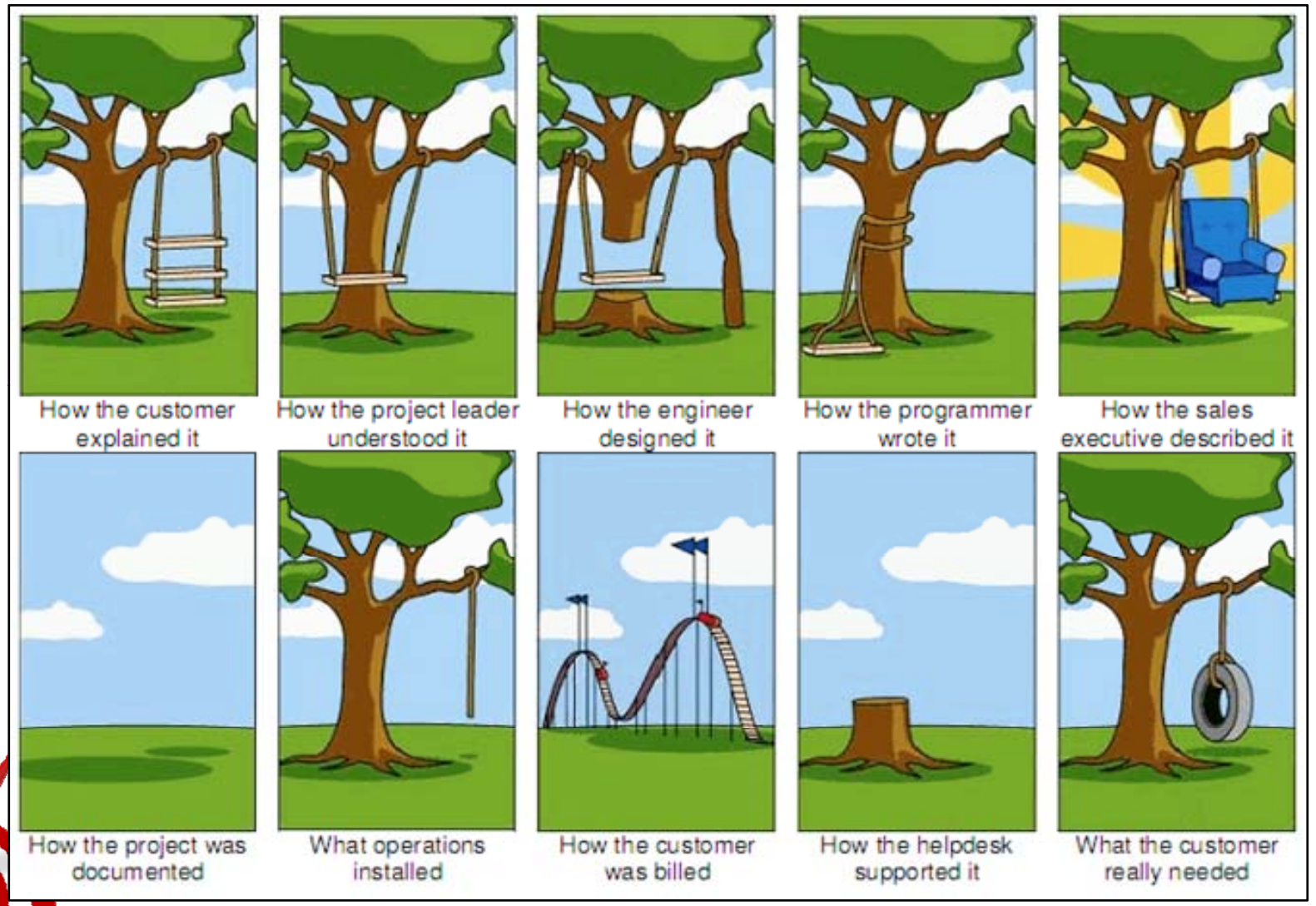
Step 1: Defining the Project Scope

Purpose of the Scope Statement

- To clearly define the deliverable(s) for the end user.
- To focus the project on successful completion of its goals.
- To be used by the project owner and participants as a planning tool and for measuring project success.

ON TARGET

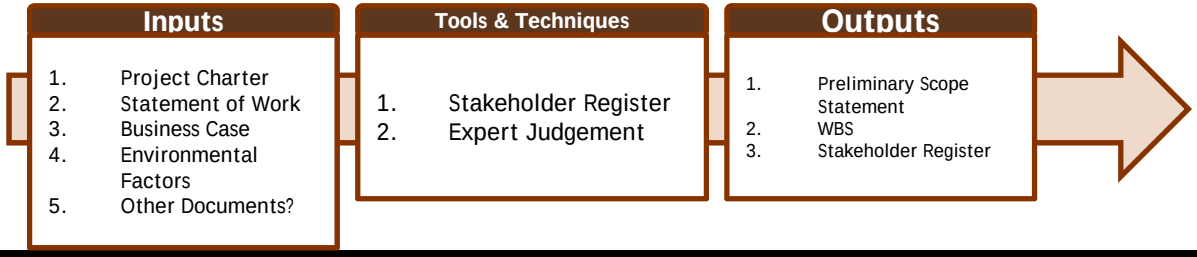
A Swing is a Swing is a Swing?



ON TARGET

Developing a Preliminary Scope Statement

- It describes in detail the work to be accomplished and is an important tool for preventing **scope creep**—the tendency for project scope to continually increase.
- It is helpful to create a *preliminary,* or initial, scope statement during project initiation so that the entire project team can start important discussions and work related to the project scope.
- **There are usually several versions**, and each one becomes more detailed as the project progresses and more information becomes available.



ON TARGET

Introduction to Workshop Case

- In a management class you, and your team of 3 other classmates, have been asked to do a report and a presentation on the growth of the Apple's Ipod Nano market share.

- Presentation is due November 31st and the paper is due December 5th.

- The report must follow a prescribed format and is limited to 5 pages.

- Your presentation is to be a maximum of 15 minutes and 30% of your mark is based on an innovative presentation format.

ON TARGET

Workshop Case – Preliminary Scope Statement

- In a management class you, and your team of 3 other classmates, have been asked to do a report and a presentation on the growth of the Apple's Ipod Nano market share.
- Presentation is due November 31st and the paper is due December 5th.
- The report must follow a prescribed format and is limited to 5 pages.
- Your presentation is to be a maximum of 15 minutes and 30% of your mark is based on an innovative presentation format.

What might your preliminary scope statement look like?

Requirements?

Deliverables?

Requirements for Success?

Scope Management – Work Breakdown Structure

Inputs	Tools & Techniques	Outputs
1. Project Scope Statement 2. Project Charter	1. Decomposition	1. WBS 2. WBS Dictionary 3. Scope Baseline 4. Project Updates

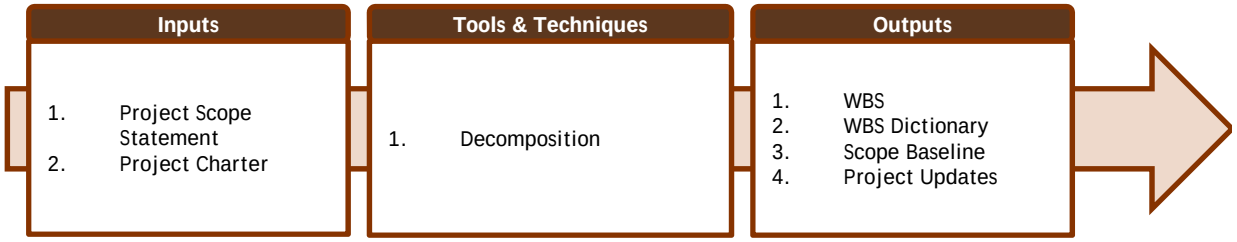
Inputs	Tools & Techniques	Outputs
1. Project Charter 2. Statement of Work 3. Business Case 4. Environmental Factors 5. Other Documents?	1. Stakeholder Register 2. Expert Judgement	1. Preliminary Scope Statement 2. WBS 3. Stakeholder Register

ON TARGET

WBS – Overview & Perspective

- In planning a project, it is normal to find oneself momentarily overwhelmed and confused, when one begins to grasp the details and scope of even a modest size project. This results from one person trying to understand the details of work that will be performed by a number of people over a period of time.
- **The way to get beyond being overwhelmed and confused is to to break the project into pieces**, organize the pieces in a logical way using a WBS, and then get help from the rest of your project team.

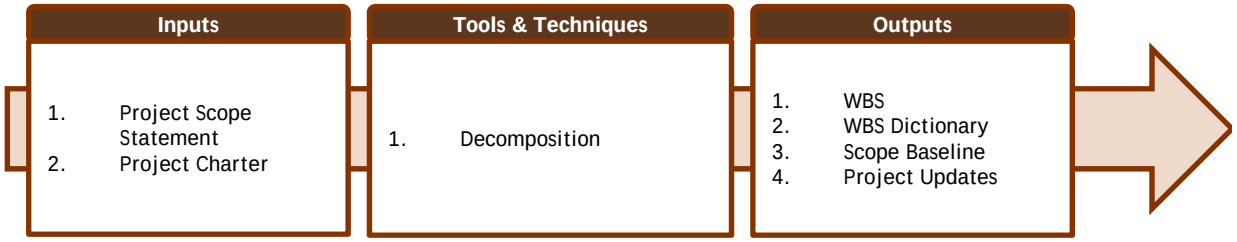
Introduction to WBS - http://www.hyperthot.com/pm_wbs.htm



ON TARGET

WBS Overview (continued)

- The psychologists say our brains can normally comprehend around 7-9 items simultaneously. A project with thousands or even dozens of tasks goes way over our ability to grasp all at once.
- **The solution is to divide and conquer**. The WBS helps break thousands of tasks into chunks that we can understand and assimilate.

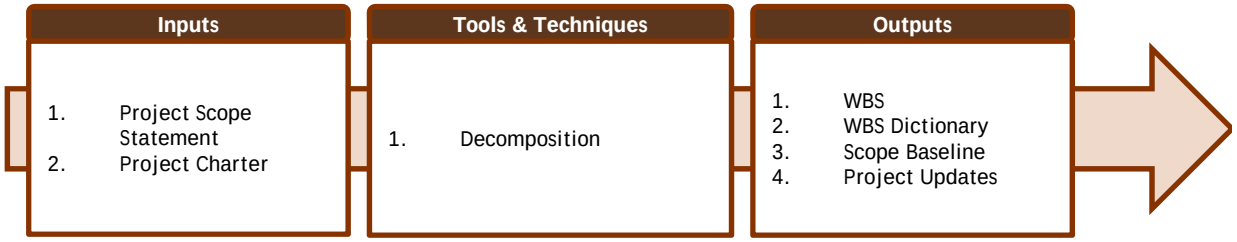


ON TARGET

WBS Overview (continued)

- Large, complex projects are organized and comprehended by breaking them into progressively smaller pieces until they are a collection of defined "work packages" that may include a number of tasks. A $1,000,000,000 project is simply a lot of $50,000 projects joined together.
- Preparing and understanding a WBS for your project is a big step towards managing and mastering its inherent complexity.

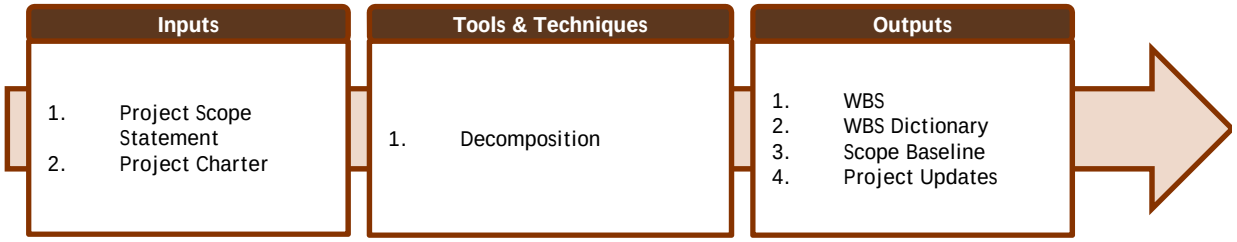
Introduction to WBS - http://www.hyperthot.com/pm_wbs.htm



ON TARGET

WBS Overview (continued)

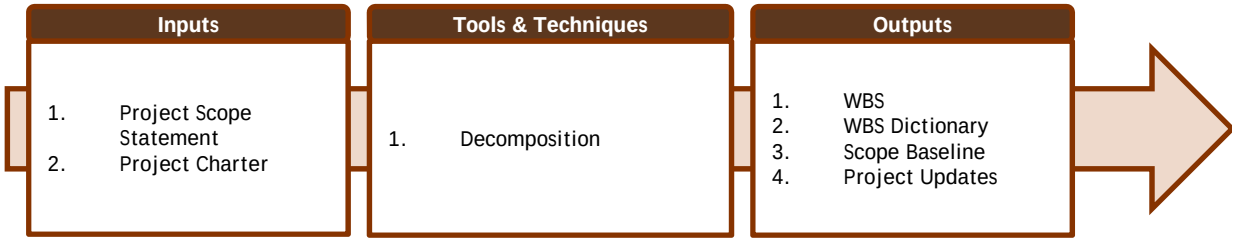
- WBS is an extremely valuable tool to the project management methodology. **It can make or break a project.**
- It sets the foundation for the rest of the project planning.
- A solid WBS helps ensure proper project baselines, estimating, resource use, scheduling, risk analysis, and procurement.



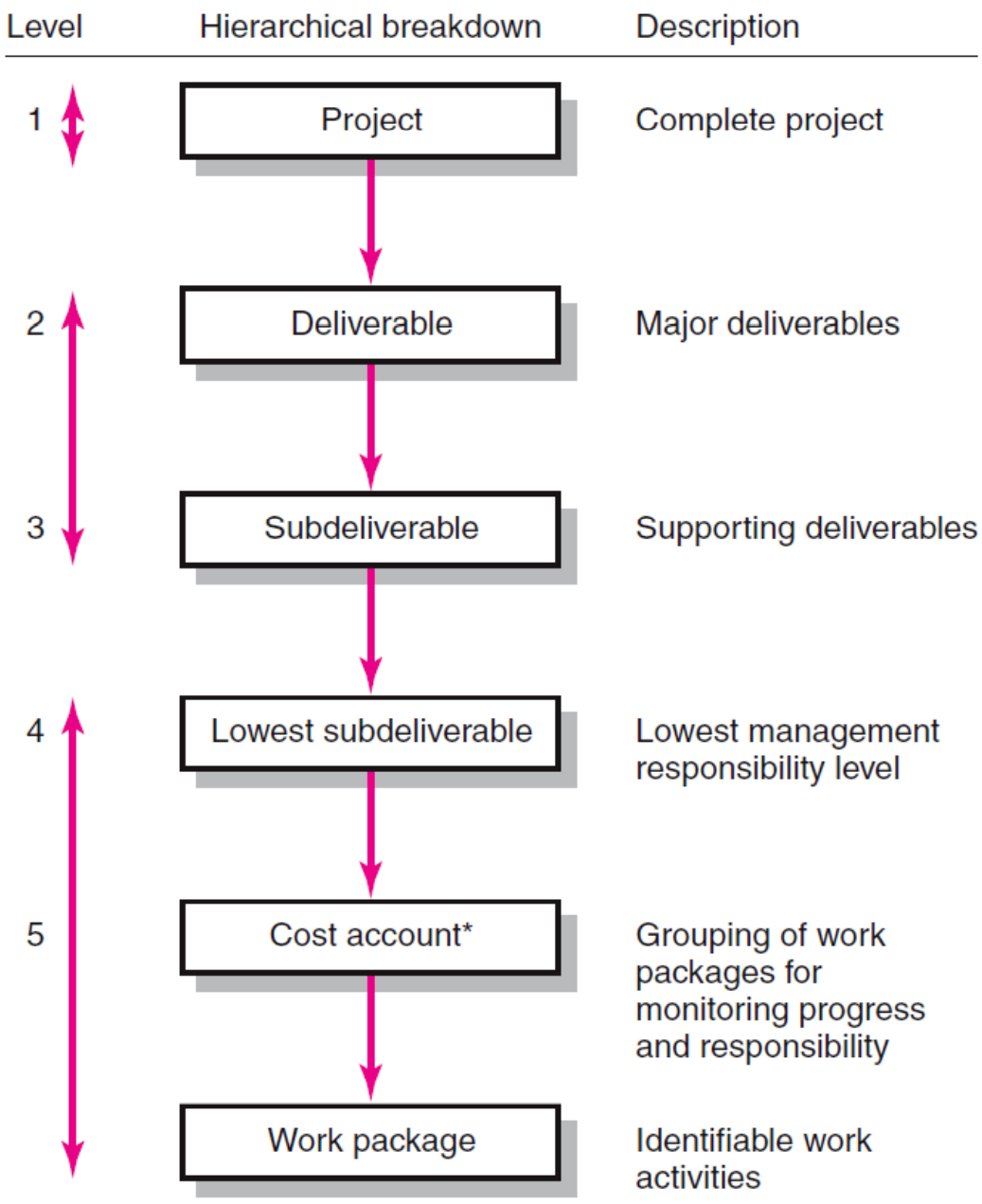
ON TARGET

Creating the Work Breakdown Structure

- An hierarchical outline (map) that identifies the products and work elements involved in a project.
- Defines the relationship of the final deliverable (the project) to its sub-deliverables, and in turn, their relationships to work packages.



ON TARGET



Hierarchical Breakdown of the WBS

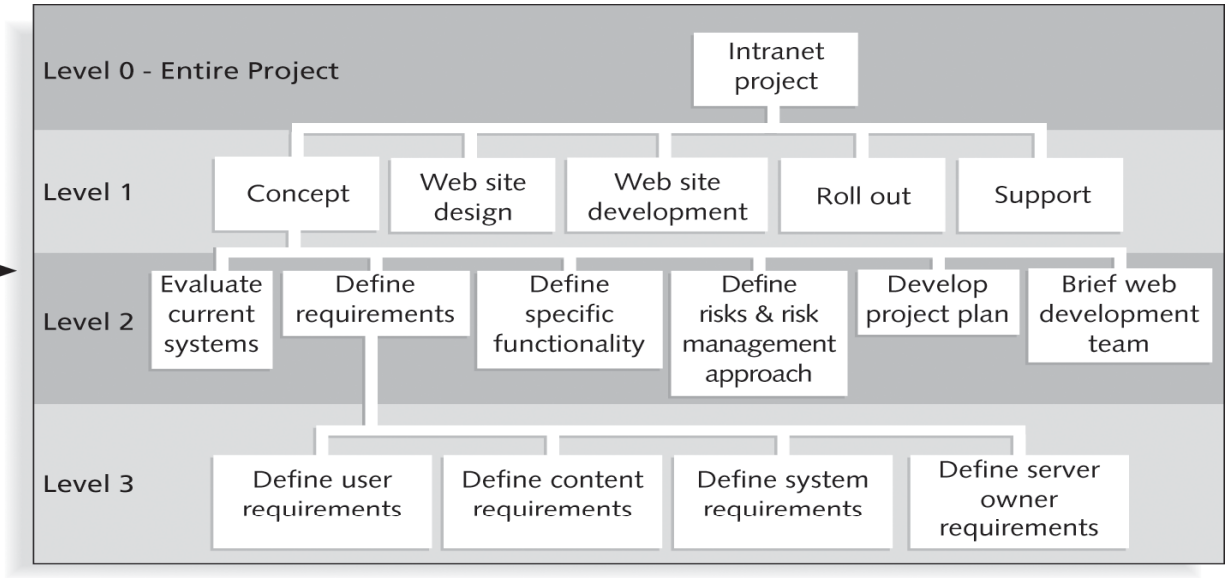
* This breakdown groups work packages by type of work within a deliverable and allows assignment of responsibility to an organizational unit. This extra step facilitates a system for monitoring project progress.

FIGURE 4.3

ON TARGET

WBS in Chart and Tabular Form

Chart form →



Tabular form →

1.0 Concept
- 1.1 Evaluate current systems
- 1.2 Define requirements
  - 1.2.1 Define user requirements
  - 1.2.2 Define content requirements
  - 1.2.3 Define system requirements
  - 1.2.4 Define server owner requirements
- 1.3 Define specific functionality
- 1.4 Define risks and risk management approach
- 1.5 Develop project plan
- 1.6 Brief Web developement team

2.0 Web site design
3.0 Web site development
4.0 Roll out
5.0 Support

ON TARGET

Work Breakdown Structure

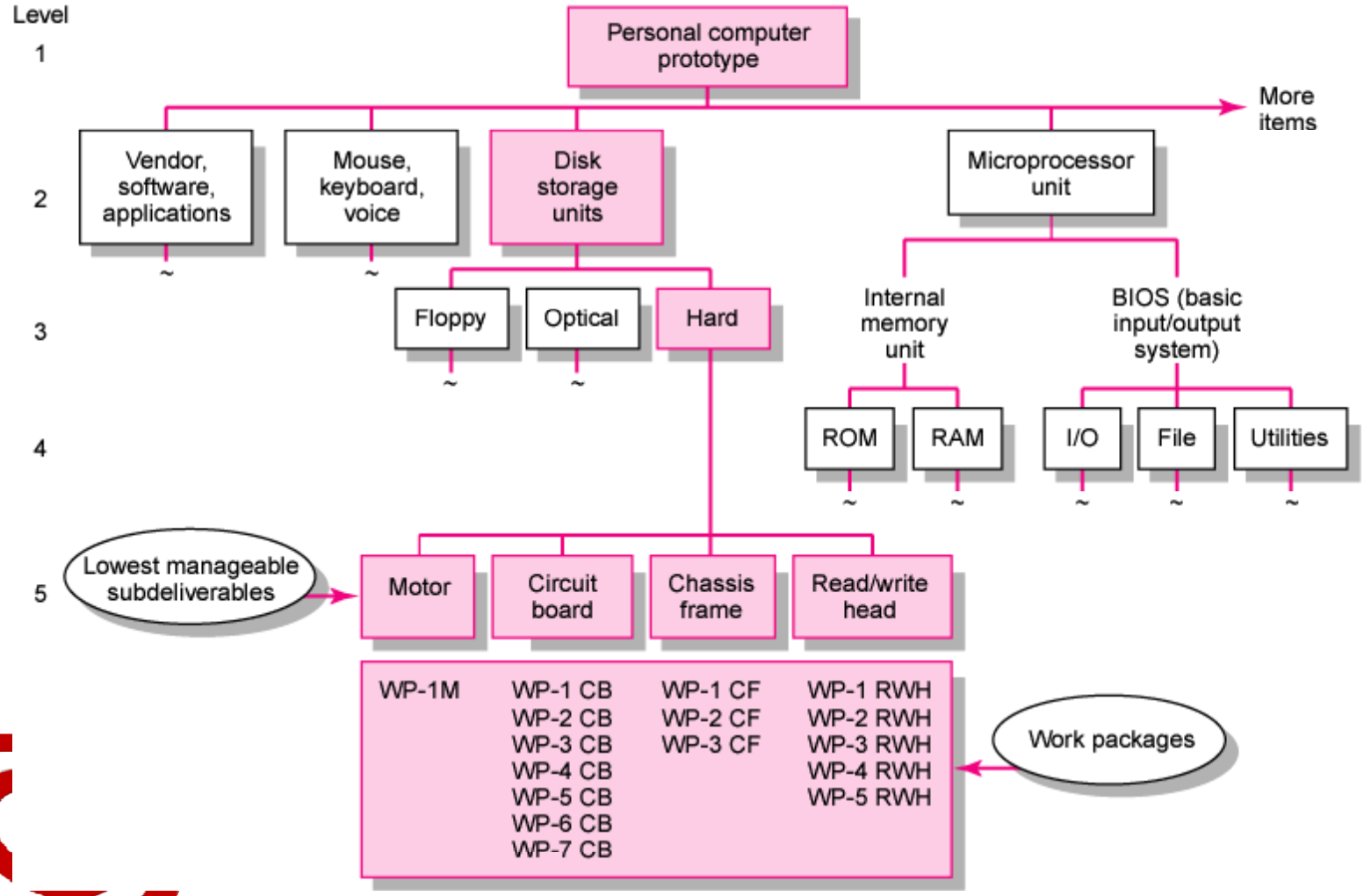
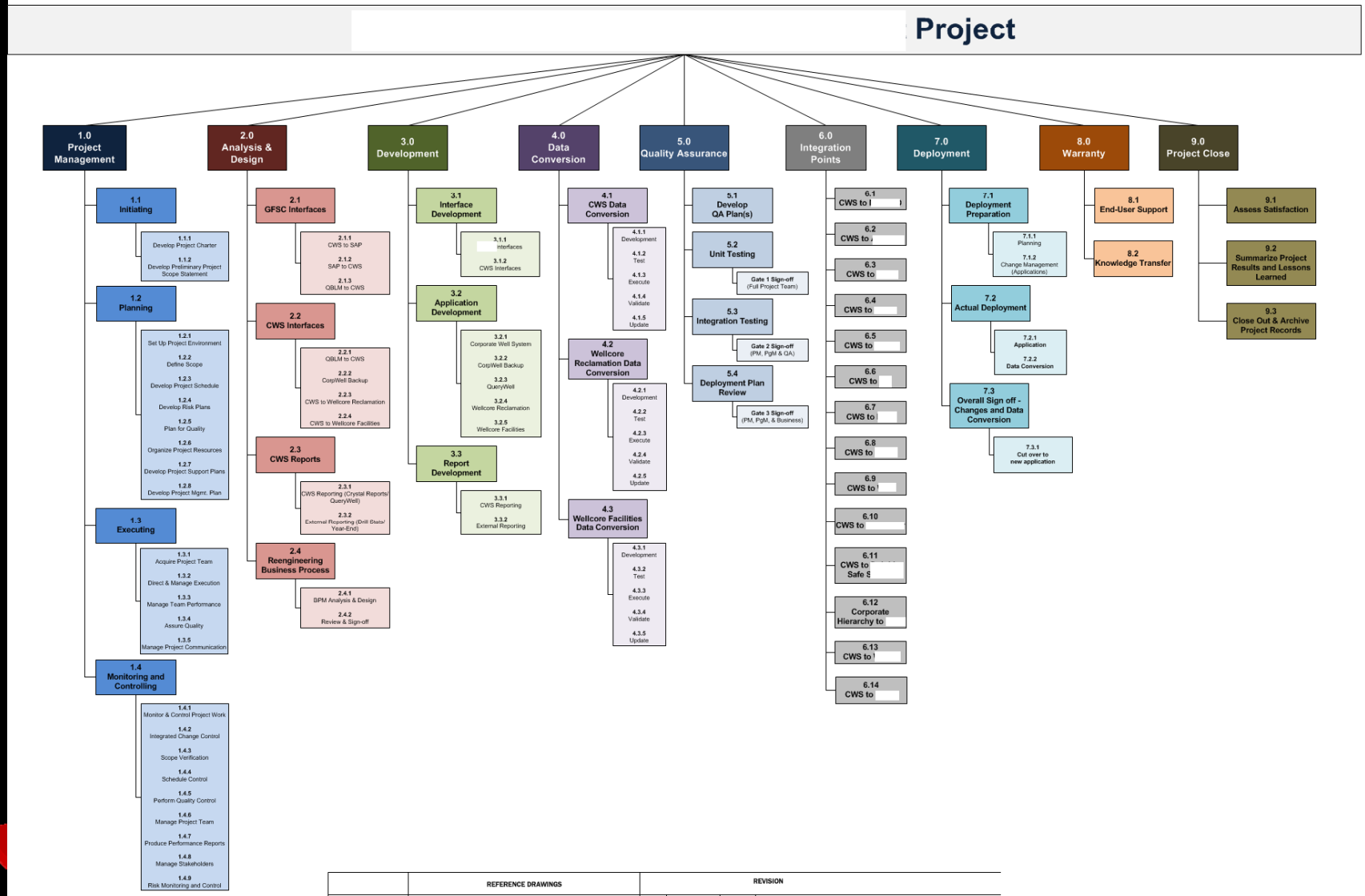


FIGURE 4.4

ON TARGET

Sample WBS from Learning Management System



REFERENCE DRAWINGS		REVISION			
DRAWING NUMBER	DRAWING TITLE	REV. NO.	DATE	BY	DESCRIPTION
	Work Breakdown Structure Project	1 2	2011-09-02 2011-09-13	BPS BPS	First Draft Issue of Drawing Updated List of Data Conversion Apps; Added IWMS to Interface List; Support Added to 8.0

ON TARGET

Criteria for Successful WBS

1. WBS must be broken down by starting at the top.

2. Work packages must add up to the summary task.

3. Each summary task and work package must be named as an activity that produces a product (i.e. use ‘nouns’).
   1. e.g. Open-ended tasks – “Research”
   2. e.g. Open-ended activities – “Database”

ON TARGET

Scope Mgt – WBS - Work Packages

A work package is the lowest level of the WBS.

It is output-oriented in that it:

1. Defines work (what).
2. Identifies time to complete a work package (how long).
3. Identifies a time-phased budget to complete a work package (cost).
4. Identifies resources needed to complete a work package (how much).
5. Identifies a person responsible for units of work (who).
6. Identifies monitoring points (milestones) for measuring success.

ON TARGET

Scope Mgt – WBS - Work Packages

You can think of work packages in terms of accountability and reporting.

- If a project has a relatively short time frame and requires weekly progress reports, a work package might represent work completed in one week or less.
- If a project has a very long time frame and requires quarterly progress reports, a work package might represent work completed in one month or more.
- A work package might also be the procurement of a specific product or products, such as an item purchased from an outside source.

ON TARGET

Scope Mgt – WBS - Work Packages

1. The 8/80 rule
   i. No task should be smaller than 8 labour hours or greater than 80 labour hours (1 to 10 days)

2. The Reporting Period Rule
   i. No task should be longer than the distance between two status, or reporting, points.

3. The "if it's useful" Rule
   i. Three reason to break down a task further.
      1. The task is easier to estimate
      2. The task is easier to assign
      3. The task is easier to track

ON TARGET

Scope Mgt – WBS - Work Packages

1. A **work package** is a task at the lowest level of the WBS.

2. It represents the level of work that the **project manager monitors and controls**.

3. **IT IS NOT A TO-DO LIST!!**

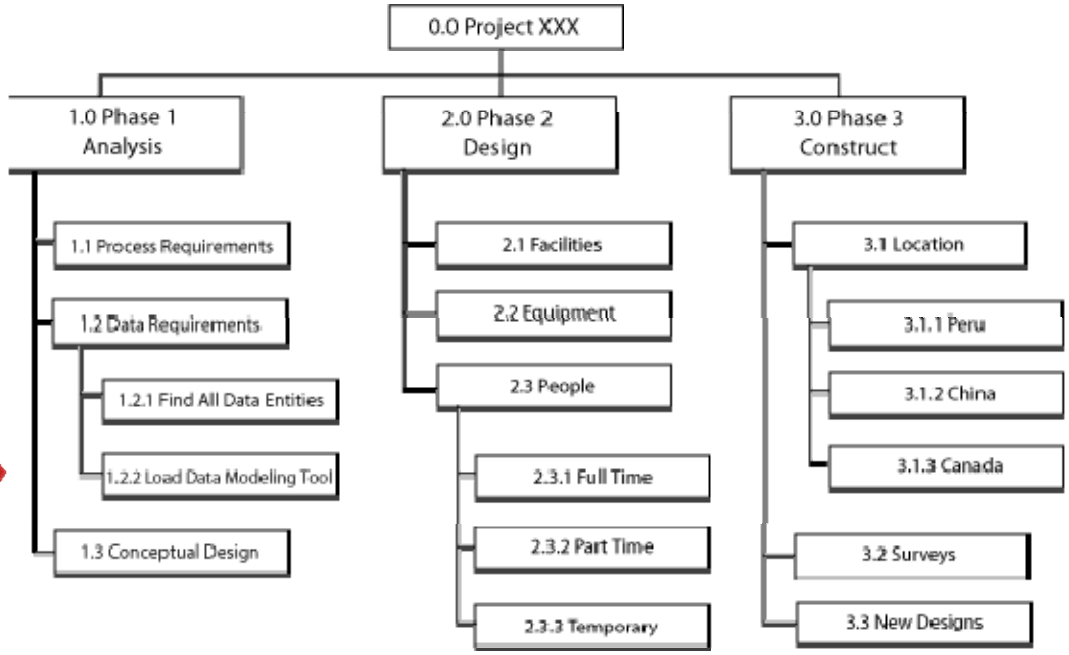
Creating a Good WBS

- It is difficult to create a good WBS.
- The project manager and the project team must decide as a group how to organize the work and how many levels to include in the WBS.
- It is often better to focus on getting the top levels of the WBS done well to avoid being distracted by too much detail.
- Many people confuse tasks on a WBS with specifications or think it must reflect a sequential list of steps.

ON TARGET

WBS by Major Project Phase or Stage

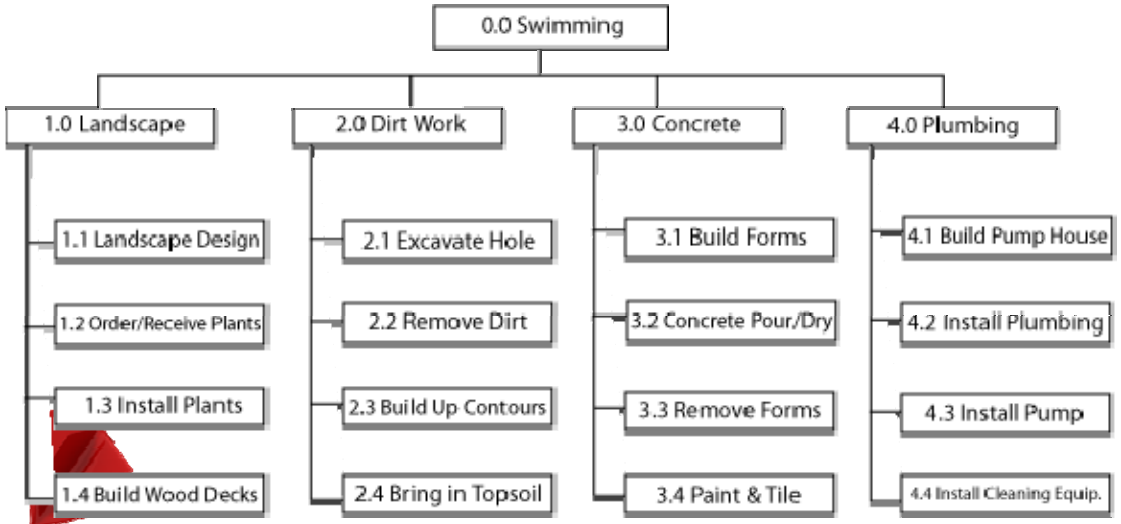
This example shows the major phases required for a project. They do not have to be in the correct time-sequence. Just determine what the major pieces of work are and break each one down further. (Many of these boxes will be broken down much further into the activities required to execute the work.)



ON TARGET

WBS by Timeline

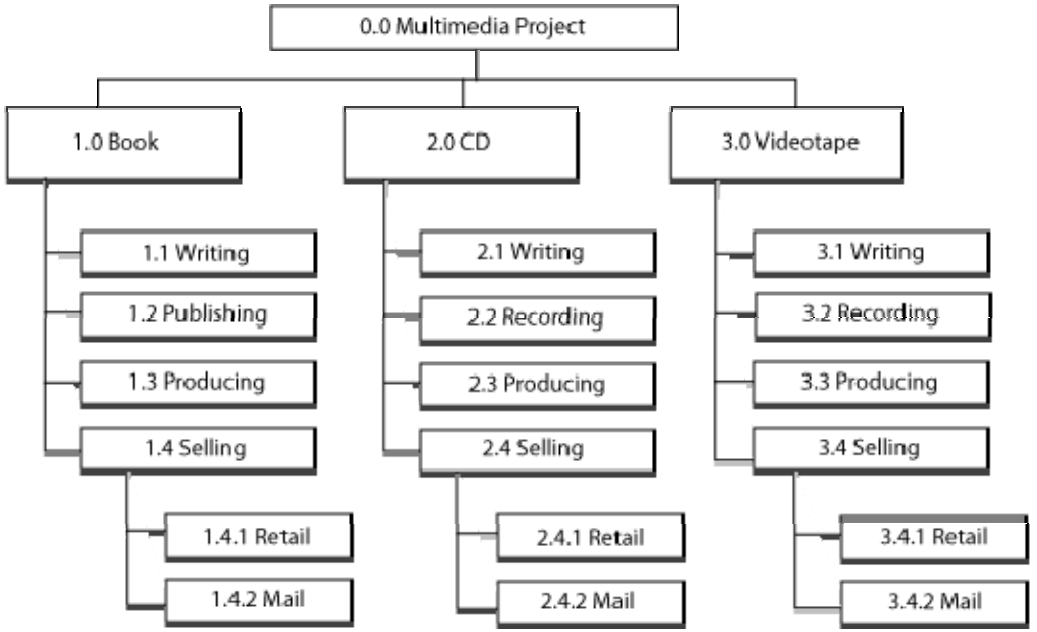
In this example, the WBS is based on the order the major work components should be performed. This may be easier to think through in some projects where there is some experience in knowing how the timeline will lay out.



ON TARGET

WBS by Deliverable

First determine all the deliverables that the project will produce, and then break them down into the work required. Again, this does not imply sequencing. Many of these activities may end up being executed in parallel.



ON TARGET

Is this a properly formatted WBS?

Writing a Paper and Presentation for Class

- Task 1 = Refine Topic
- Task 2 = Assign library research responsibilities
- Task 3 = Develop preliminary outline for deliverables
- Task 4 = Assign team member to begin putting presentation together
- Task 5 = Begin producing drafts of paper
- Task 6 = Proofread and correct draft
- Task 7 = Refine Class Presentation
- Task 8 = Turn in paper and make class presentation

ON TARGET

Workshop Case

In a management class you, and your team of 3 other classmates, have been asked to do a report and a presentation on the growth of the Apple's Ipod Nano market share.

Presentation is due November 31st and the paper is due December 5th.

The report must follow a prescribed format and is limited to 5 pages.

Your presentation is to be a maximum of 15 minutes and 30% of your mark is based on an innovative presentation format.

What might your WBS look like for our Inclass Case?

Remember what the outcome is from our scope statement!

- Requirements?
- Deliverables?
- Requirements for Success?

ON TARGET

Another Example?

1. How about a WBS for a Wedding?

2. What are the Level 1 deliverables?

3. What might be some Level 2 deliverables?

ON TARGET

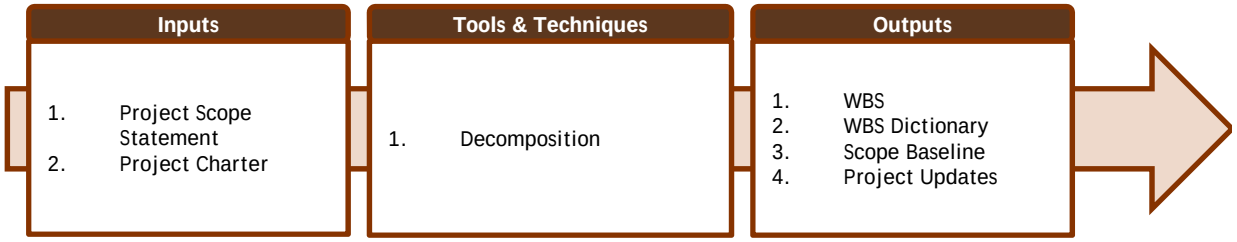
WBS – Final Thoughts

At the **beginning of a project**, the WBS can serve as a coordinating medium to secure buy-in from stakeholders, supervisors and team members.

As the **project progresses**, the WBS can give visibility to important efforts and foster clear ownership by managers and supervisors.

At **project completion**, the WBS can provide data for performance measurement. That's more than a To Do list can do!

Creating a quality WBS can take a substantial amount of time, but is usually worth the effort because of the additional clarity it provides for the project manager.



Five things you have always wanted to know about PM but were afraid to ask...

1. What is Project Management and what is a project
2. The Triple Constraint
3. Project Management Framework and PM process
4. Four Core Knowledge Areas and their Outputs
5. Integrated Approach

ON TARGET

LUNCH! RETURN AT 1:00

Scope Management – Stakeholder Register

Inputs	Tools & Techniques	Outputs
1. Project Charter 2. Business Case 3. Environmental Factors	1. Stakeholder Analysis 2. Expert Judgement	1. Stakeholder Register 2. Stakeholder management strategy

ON TARGET

Identifying and Understanding Project Stakeholders

- **Project stakeholders** are the people involved in or affected by project activities.
  - Internal project stakeholders
  - External project stakeholders

- **It is important to note in your stakeholder analysis those who support your project and those who do not!!!**

ON TARGET

Scope Management – Stakeholder Analysis

Step 1: identify all potential stakeholders, relevant information, such as their roles, departments, interests, knowledge levels, expectations, and influence levels

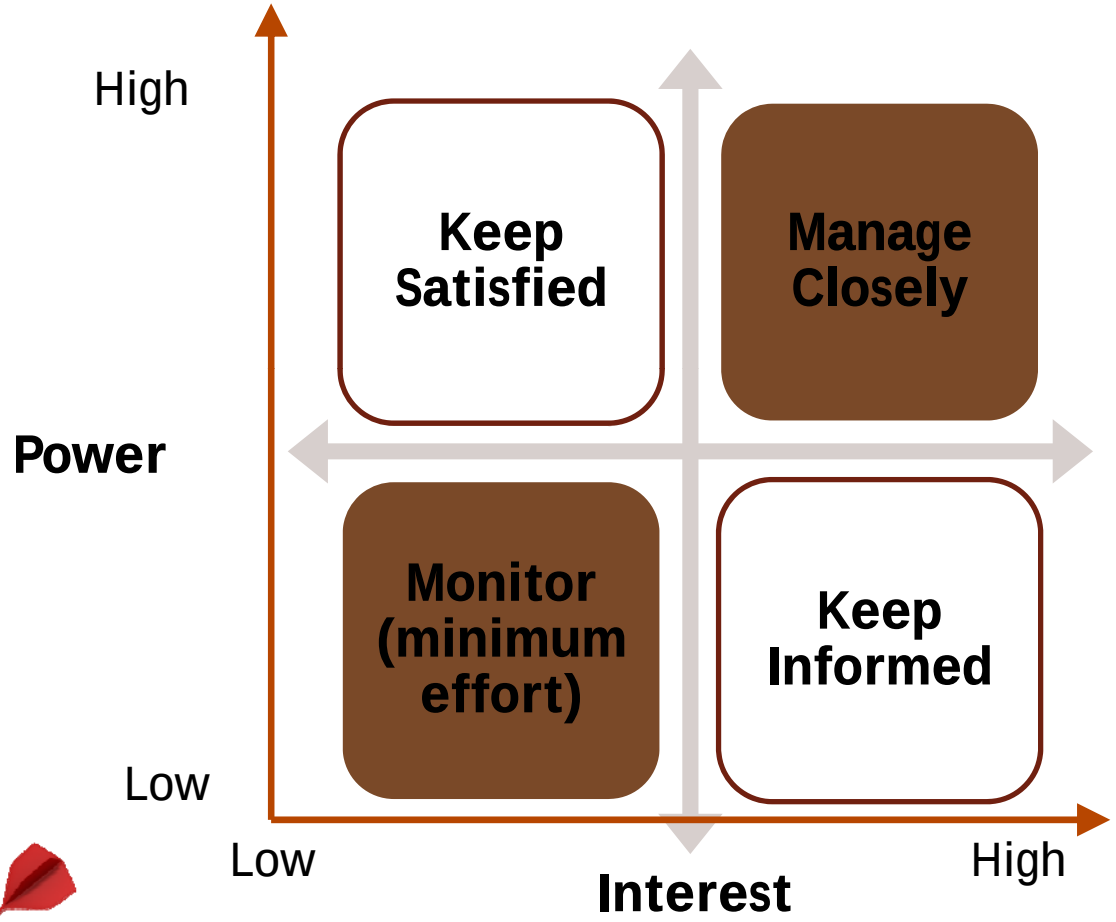
Step 2: identifying their potential impact or support, classifying them to define an approach strategy. Some classification models include:

- Power/interest (concern) grid
- Power/influence (involvement) grid
- Influence/impact (ability to effect change) grid
- Salience model: power/urgency/legitimacy (how appropriate is their involvement) grid

Step 3: assessing how they may react/respond in various situations to influence them, to enhance their support, mitigate their potential negative impact

ON TARGET

Sample Tool that I like to use



ON TARGET

Scope Management – Stakeholder Analysis Example

Stakeholder Analysis
July 3, 2007

Project Name: Just-In-Time Training Project

	KEY STAKEHOLDERS				
	Mike Sundby	**Lucy Camarena**	**Ron Ryan**	**Mohamed Abdul**	**Julia Portman**
Organization	VP of HR	Training director	Senior HR staff member	Senior programmer/ analyst	VP of IT
Role on project	Project champion	Project sponsor	Led the Phase I project	Project team member	Project steering committee member
Unique facts	Outgoing, demanding, focuses on the big picture; MBA with emphasis on organizational design	Very professional, easy to work with but can stretch out discussions; Ph.D. in education	Old-timer; jealous that he wasn't asked to lead Phase II project	Excellent technical skills, English his second language, weak people skills, not excited about a training project	Thinks the company is way behind in applying IT, especially for training; wary of many suppliers
Level of interest	Very high	Very high	High	Medium	High
Level of influence	Very high; can call the shots	Very high; subject matter expert	Medium; he could sabotage the project	High; needs strong IT support for project to succeed	High; people listen to her at steering committee meetings
Suggestions on managing relationship	Keep informed, ask for advice as often as needed	Make sure she reviews work before showing to managers	Ask Lucy to talk to him to avoid problems, ask him to be available for advice	Help him see the project's importance, encourage his creativity	Compliment her a lot, ask for additional IT support as needed

ON TARGET

Workshop Case – Stakeholder Analysis

Who would be your stakeholders?

What might be the level of interest of each stakeholder?

Level of influence for each stakeholder?

Suggestions on managing the relationship?

- In a management class you, and your team of 3 other classmates, have been asked to do a report and a presentation on the growth of the Apple's Ipod Nano market share.
- Presentation is due November 31st and the paper is due December 5th.
- The report must follow a prescribed format and is limited to 5 pages.
- Your presentation is to be a maximum of 15 minutes and 30% of your mark is based on an innovative presentation format.

ON TARGET

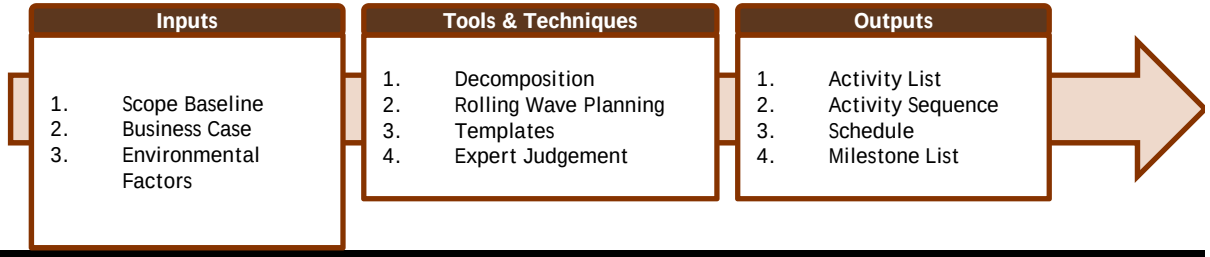
Core Knowledge Area – Time Management

Inputs	Tools & Techniques	Outputs
1. Scope Baseline 2. Business Case 3. Environmental Factors	1. Decomposition 2. Rolling Wave Planning 3. Templates 4. Expert Judgement	1. Activity List 2. Activity Sequence 3. Schedule (network) 4. Milestone List

ON TARGET

Project Time Management Planning Tasks

- **Project time management** involves the processes required to ensure timely completion of a project.
- The main documents produced are an activity list and attributes, a milestone list, a network diagram, the activity resource requirements, the activity duration estimates, and a **project schedule**.

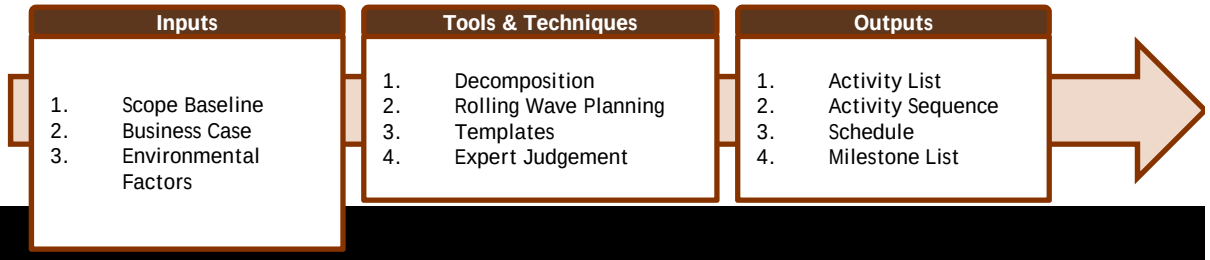


ON TARGET

Time Management - Scheduling Defined*

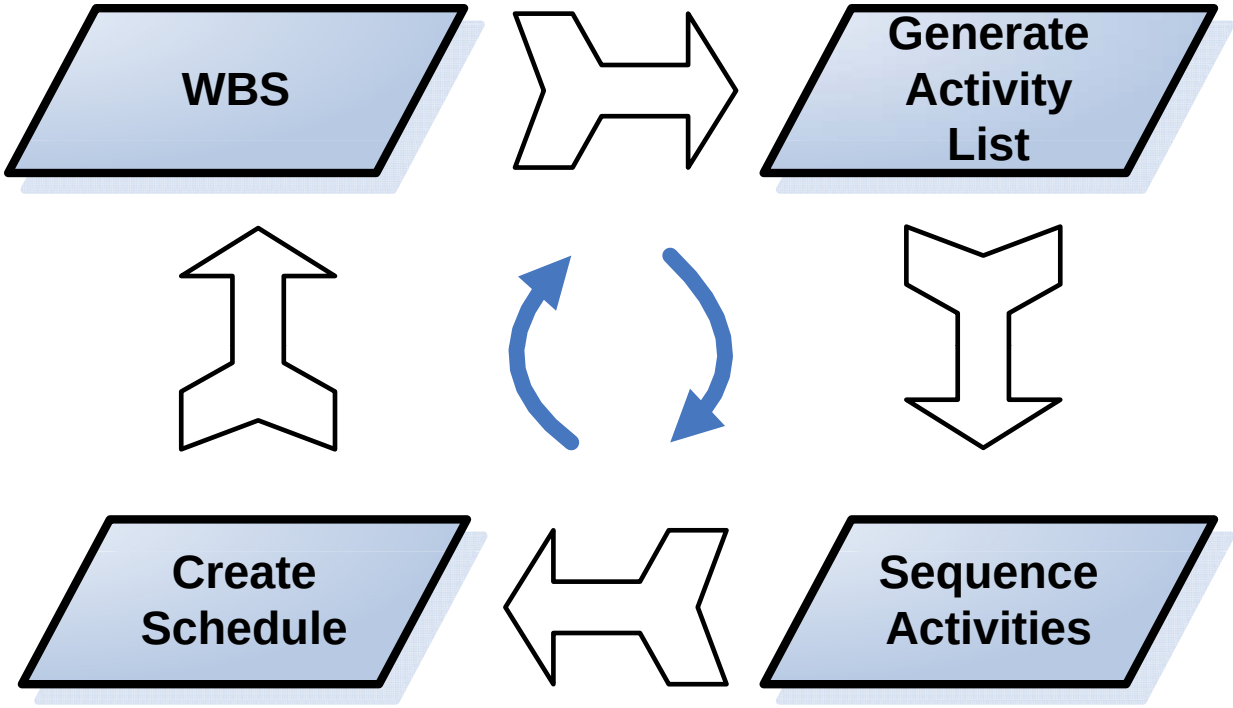
- The conversion of a project action plan into an operating timetable
  - Serves as the basis for monitoring and controlling the project
  - A major tool for the management of projects
- WBS is usually serves as basis for other schedules.

* Important to realize there may be several layers of schedules (master schedule, testing schedule, assembly schedule, etc.)



ON TARGET

Time Management Output - Schedule Creation Cycle



Inputs	Tools & Techniques	Outputs
1. Scope Baseline 2. Business Case 3. Environmental Factors	1. Decomposition 2. Rolling Wave Planning 3. Templates 4. Expert Judgement	1. Activity List 2. Activity Sequence 3. Schedule 4. Milestone List

ON TARGET

Schedule Creation – Thoughts on Estimating in Projects

Estimating

The process of forecasting or approximating the time and cost of completing project deliverables.

The task of balancing expectations of stakeholders and need for control while the project is implemented.

Types of Estimates

Top-down (macro) estimates: analogy, group consensus, or mathematical relationships

Bottom-up (micro) estimates: estimates of elements
of the work breakdown structure

ON TARGET

Schedule Creation – Estimating Guidelines for Times, Costs, and Resources

1. Have people familiar with the tasks make the estimate.
2. Use several people to make estimates.
3. Base estimates on normal conditions, efficient methods, and a normal level of resources.
4. Use consistent time units in estimating task times.
5. Treat each task as independent, don't aggregate.
6. Don't make allowances for contingencies.
7. Adding a risk assessment helps avoid surprises to stakeholders.

ON TARGET

Schedule Creation – Thoughts on Estimating in Projects - Level of Detail

- Level of detail is different for different levels of management.
- Level of detail in the WBS varies with the complexity of the project.
- Excessive detail is costly.
  - Fosters a focus on departmental outcomes
  - Creates unproductive paperwork
- Insufficient detail is costly.
  - Lack of focus on goals
  - Wasted effort on nonessential activities

ON TARGET

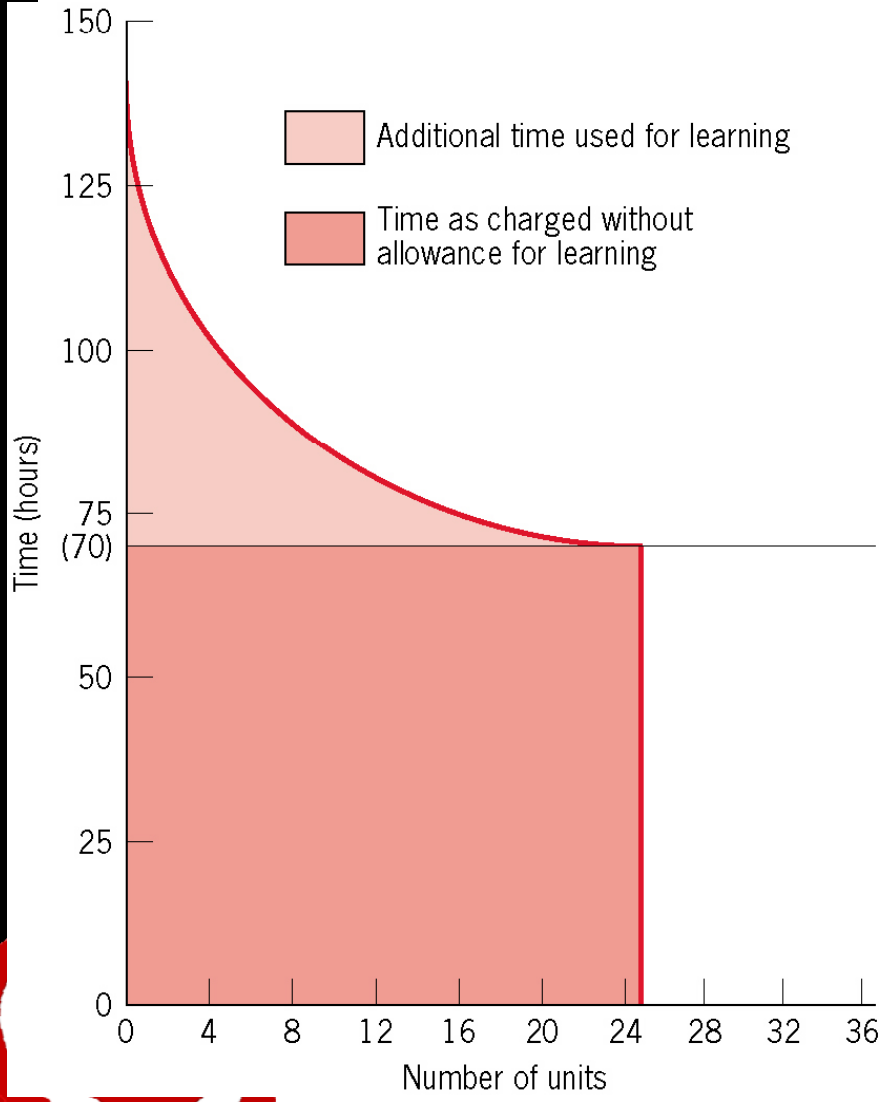
Schedule Creation – Thoughts on Estimating in Projects - Learning Rate

- As output doubles, labor hours per unit decrease by a fixed percentage
- For example, the first unit of output takes 1,000 hours, and the learning rate is 80%

Unit	Labor hours req'd for that unit
1	1000
2	800
4	640
8	512

ON TARGET

Effects of Ignoring the Learning Curve

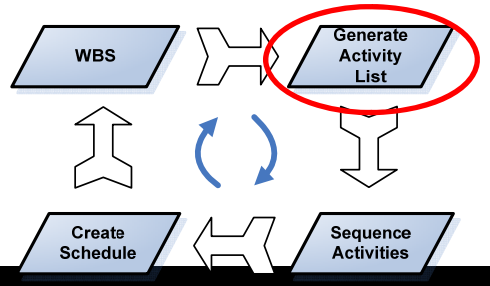


Therefore, for any task where labour is a significant cost factor and the production run is reasonably short, the PM should take the learning curve into account when estimating costs.

ON TARGET

Creating the Activity List and Attributes

- The **activity list** is a tabulation of activities to be included on a project schedule.
- It should include the activity name, an activity identifier or number, and a brief description of the activity.
- The **activity attributes** provide schedule-related information about each activity, such as predecessors, successors, logical relationships, leads and lags, resource requirements, constraints, imposed dates, and assumptions related to the activity.
- Both should be in agreement with the WBS and WBS dictionary and be reviewed by key project stakeholders.



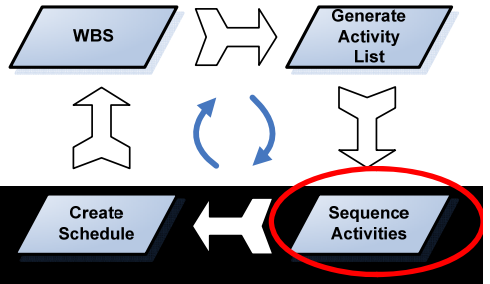
ON TARGET

Activity Sequencing

- Activity sequencing involves reviewing the activity list and attributes, project scope statement, and milestone list to determine the relationships or dependencies between activities.

- A **dependency** or **relationship** relates to the sequencing of project activities or tasks.
  - For example, does a certain activity have to be finished before another one can start?
  - Can the project team do several activities in parallel?
  - Can some overlap?

- **Activity sequencing has a significant impact on developing and managing a project schedule.**



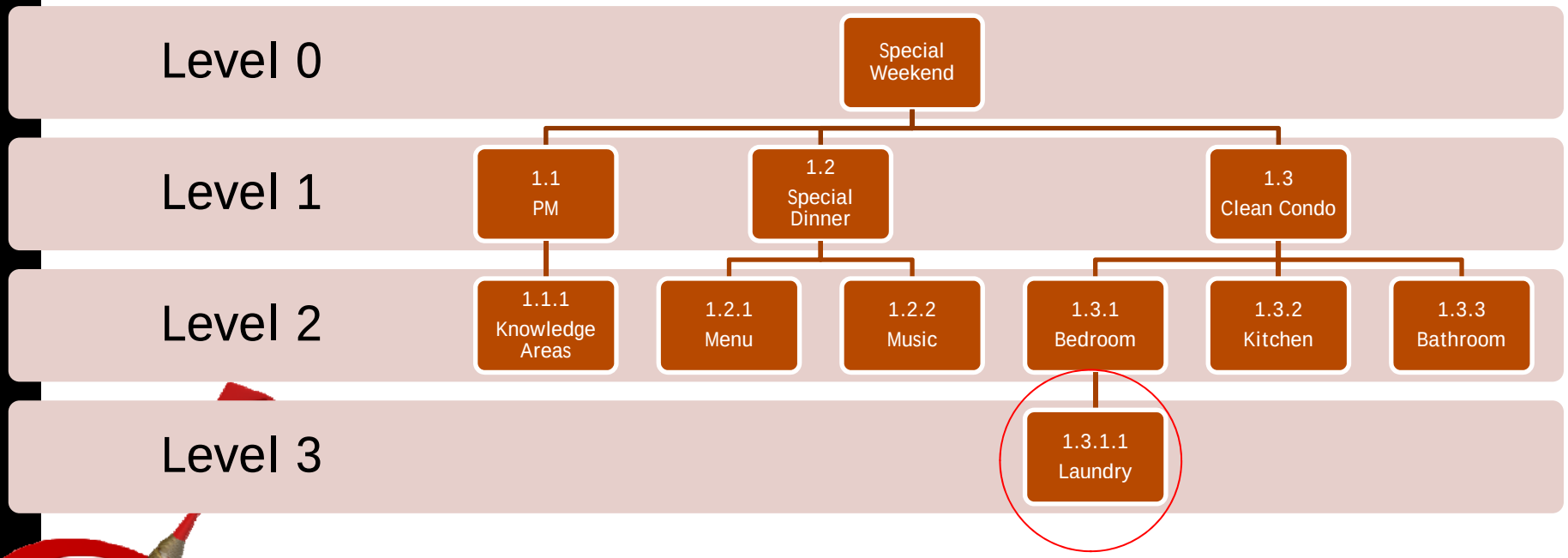
Reasons for Creating Dependencies

- **Mandatory dependencies** are inherent in the nature of the work being performed on a project.
  - You cannot hold training classes until the training materials are ready.
- **Discretionary dependencies** are defined by the project team.
  - A project team might follow good practice and not start detailed design work until key stakeholders sign off on all of the analysis work.
- **External dependencies** involve relationships between project and non-project activities.
  - The installation of new software might depend on delivery of new hardware from an external supplier. Even though the delivery of the new hardware might not be in the scope of the project, it should have an external dependency added to it because late delivery will affect the project schedule.

ON TARGET

Workshop Case

You are expecting a special guest this long weekend so you have created a Project for you and your two roommates to clean the condo.



Creating a Milestone List

- A **milestone** is a significant event in a project.
- It often takes several activities and a lot of work to complete a milestone, but the milestone itself is like a marker to help identify necessary activities.
- There is usually no cost or duration for a milestone.
- Project sponsors and senior managers often focus on major milestones when reviewing projects.
- Sample milestones for many projects include:
  - Sign-off of key documents
  - Completion of specific products
  - Completion of important process-related work, such as awarding a contract to a supplier

ON TARGET

Sample Milestone List

Milestone List
August 1, 2007

Project Name: Just-In-Time Training Project

Milestone	**Estimated Completion Date***
Draft survey completed	8/3/07
Survey comments submitted	8/8/07
Survey sent out by IT	8/10/07
Percentage of survey respondents reviewed	8/17/07
Survey report completed	8/22/07
Survey results reported to steering committee	8/24/07

*Note: Dates are in U.S. format. 8/3/07 means August 3, 2007.

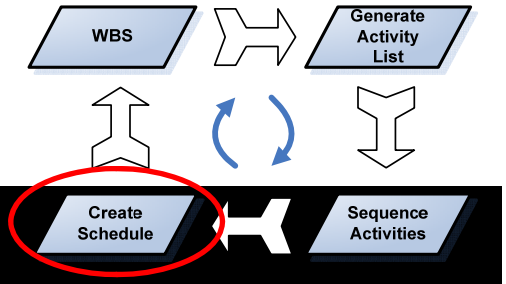
ON TARGET

Schedule Development

- Schedule development uses the results of all the preceding project time management processes to determine the start and end dates of project activities and of the entire project.

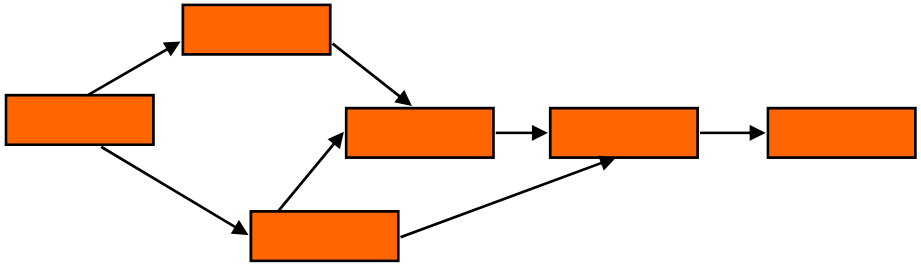
- The resulting project schedule is often shown on a **Gantt chart**, a standard format for displaying project schedule information by listing project activities and their corresponding start and finish dates in a calendar format.

- The *ULTIMATE GOAL* of schedule development is to create a realistic project schedule that provides a basis for monitoring project progress for the time dimension of the project.



ON TARGET

PERT/CPM Network Charts

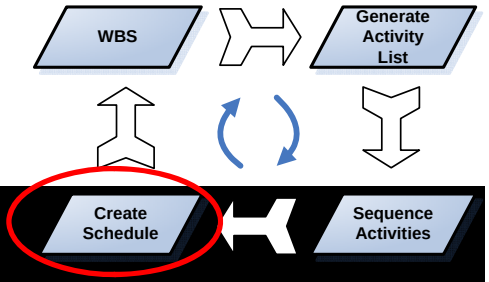


Advantages

- Allows visualization of task relationships
- Facilitates calculation of critical path
- Clarifies impact of decisions on downstream activities

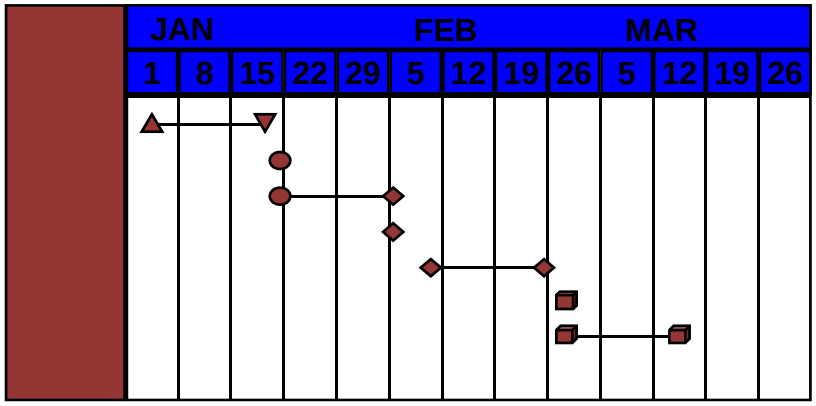
Disadvantages

- Complex, not easy to comprehend at a glance
- Charts don't readily depict durations, dates, progress



ON TARGET

Gantt Charts

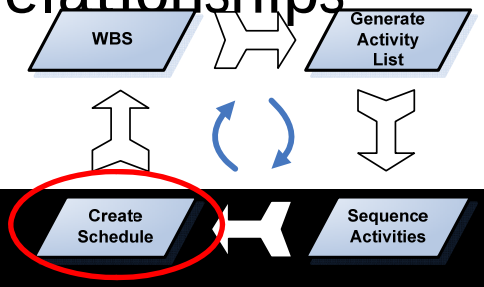


Advantages

- Easy to understand
- Easy to show progress and status
- Easy to maintain
- Most popular view to communicate project status to client and/or senior management

Disadvantages

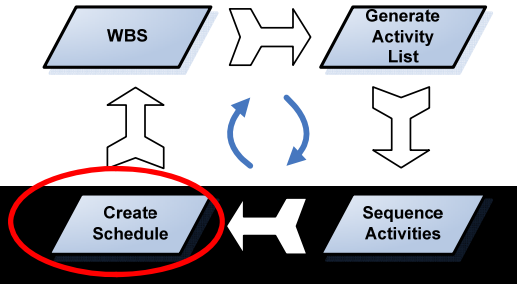
- Can be superficial
- Not always easy to see precedence, relationships



ON TARGET

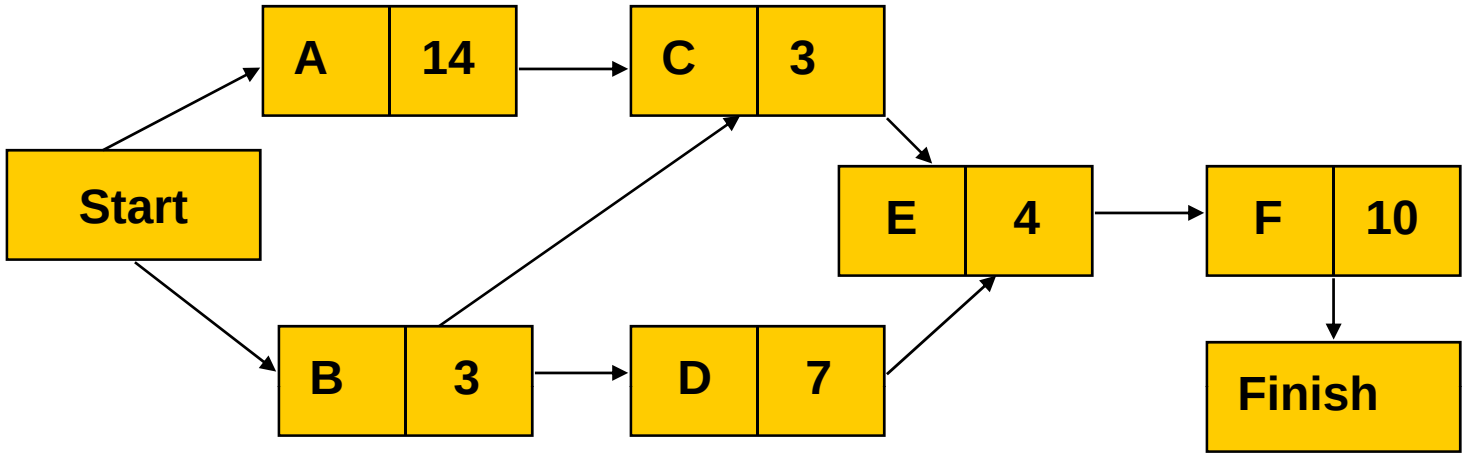
Critical Path Analysis

- **Critical path method (CPM)**—also called **critical path analysis**—is a network diagramming technique used to predict total project duration.
- A **critical path** for a project is the series of activities that determine the *earliest* time by which the project can be completed. It is the *longest* path through the network diagram and has the least amount of slack or float.
- **Slack** or **float** is the amount of time an activity may be delayed without delaying a succeeding activity or the project finish date.
- The longest path or the path containing the critical tasks is what is driving the completion date for the project.



ON TARGET

A Simple Network (AON)



Activity	Duration (weeks)	Predecessor
A	14	Start
B	3	Start
C	3	A,B
D	7	B
E	4	C,D
F	10	E

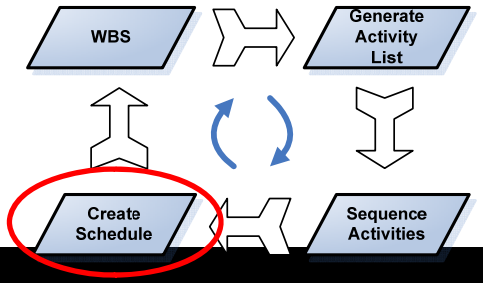
Calculate:
Project Duration

Critical Path

ON TARGET

What Does the Critical Path Really Mean?

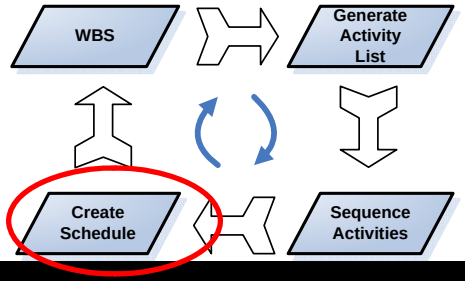
- *The critical path shows the shortest time in which a project can be completed*.
- If one or more of the activities on the critical path takes longer than planned, the whole project schedule will slip *unless* the project manager takes corrective action.



ON TARGET

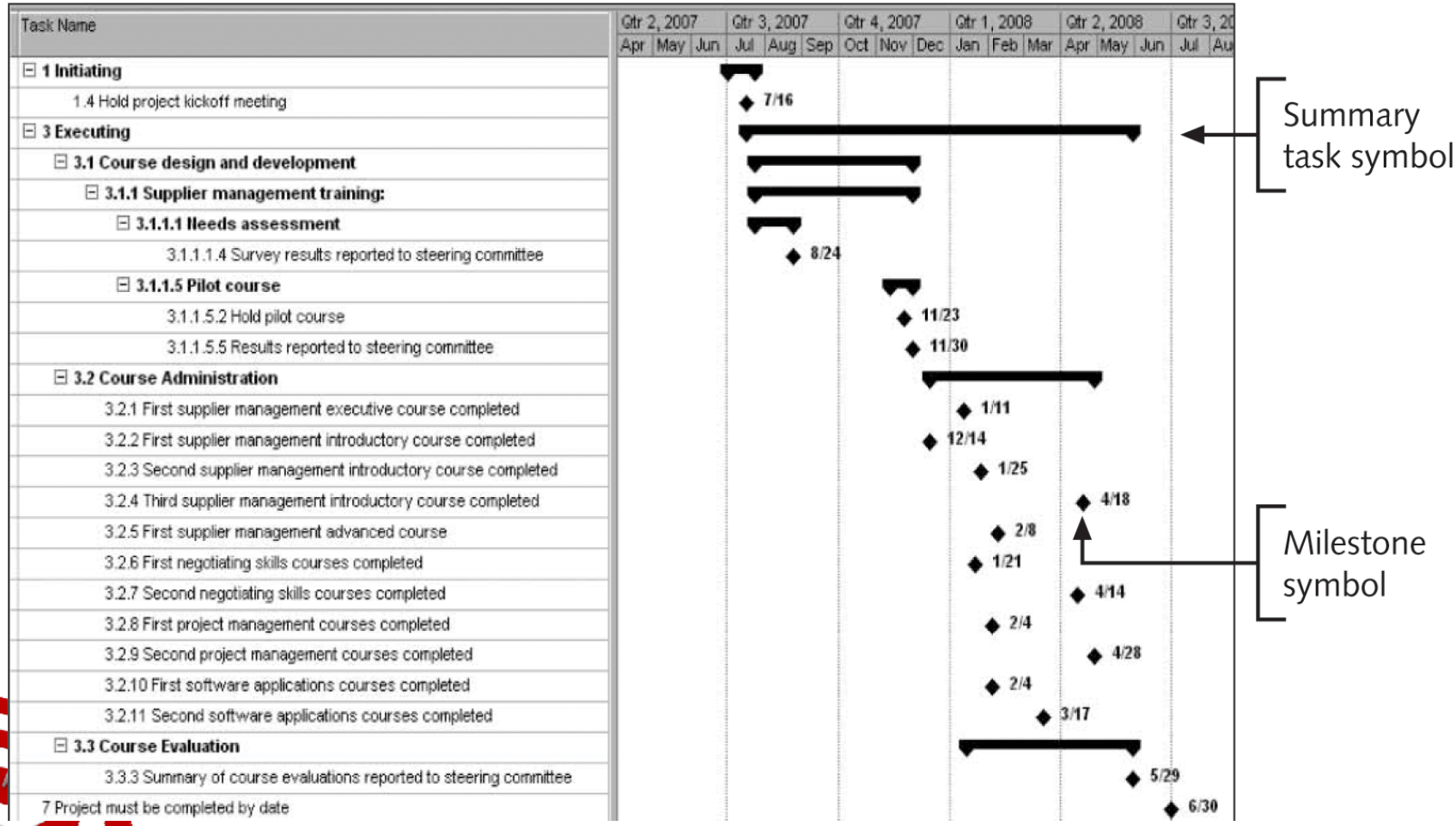
Growing Grass Can Be on the Critical Path

- The fact that its name includes the word “critical” does *not* mean that the critical path includes all critical activities.
- Frank Addeman, executive project director at Walt Disney Imagineering, explained in a keynote address at the May 2000 PMI-ISSIG Professional Development Seminar that growing grass was on the critical path for building Disney’s Animal Kingdom theme park.
- This 500-acre park required special grass for its animal inhabitants, and some of the grass took years to grow.
- So, growing grass was driving the completion date of the theme park; not what most people would think of as a critical activity.



ON TARGET

Sample Gantt Chart Showing Summary Tasks & Milestones



ON TARGET

BREAK! RETURN AT 3:15

ON TARGET

Great Tool for Managing Project Teams - Responsibility Matrices

Responsibility Matrix (RM)

- Also called a **linear responsibility chart**.
- Summarizes the tasks to be accomplished and who is responsible for what on the project.
- Lists project activities and participants.
- Clarifies critical interfaces between units and individuals that need coordination.
- Provide an means for all participants to view their responsibilities and agree on their assignments.
- Clarifies the extent or type of authority that can be exercised by each participant.

Responsibility Matrix for a Market Research Project

	Project Team				
Task	Richard	Dan	Dave	Linda	Elizabeth
Identify target customers	R	S		S	
Develop draft questionnaire	R	S	S		
Pilot-test questionnaire		R		S	
Finalize questionnaire	R	S	S	S	
Print questionnaire					R
Prepare mailing labels					R
Mail questionnaires					R
Receive and monitor returned questionnaires				R	S
Input response data			R		
Analyze results		R	S	S	
Prepare draft of report	S	R	S	S	
Prepare final report	R		S		

R = Responsible
S = Supports/assists

FIGURE 4.6

ON TARGET

Responsibility Matrix for the Conveyor Belt Project

	Organization							
Deliverables	Design	Development	Documentation	Assembly	Testing	Purchasing	Quality Assur.	Manufacturing
Architectural designs	1	2			2		3	3
Hardware specifications	2	1				2	3	
Kernel specifications	1	3						3
Utilities specifications	2	1			3			
Hardware design	1			3		3		3
Disk drivers	3	1	2					
Memory management	1	3			3			
Operating system documentation	2	2	1					3
Prototypes	5		4	1	3	3	3	4
Integrated acceptance test	5	2	2		1		5	5

1 Responsible
2 Support
3 Consult
4 Notification
5 Approval

FIGURE 4.7

Risk Management

Inputs	Tools & Techniques	Outputs
1. Project Scope statement 2. Cost Management 3. Schedule Management 4. Communications plan 5. Environment	1. Risk Analysis Process 2. Expert Judgement	1. Risk Management Plan

ON TARGET

Risk Management's Benefits

- A proactive rather than reactive approach.
- Reduces surprises and negative consequences.
- **Prepares the project manager to take advantage of appropriate risks.**
- Provides better control over the future.
- Improves chances of reaching project performance objectives within budget and on time.

Project Uncertainty

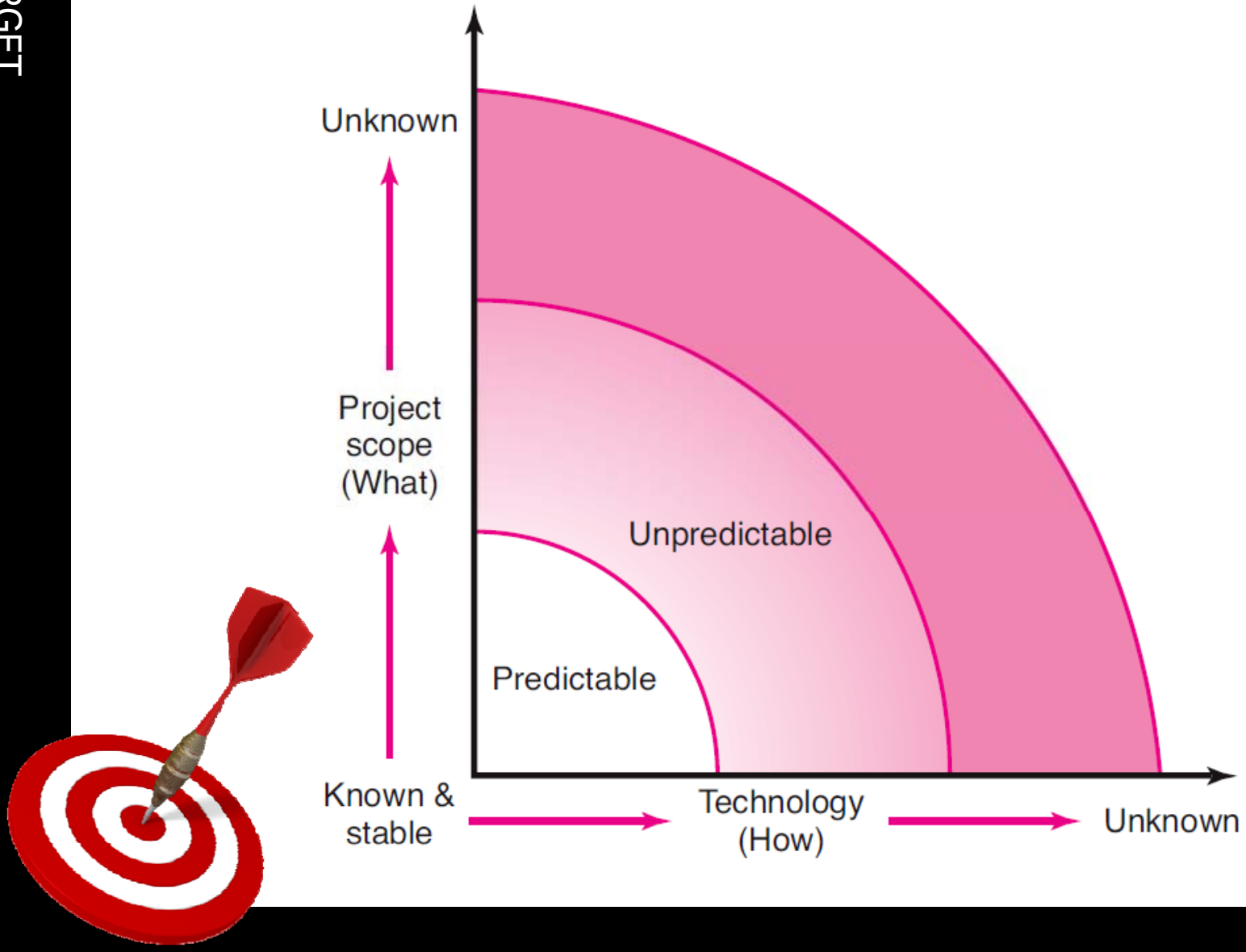


FIGURE 17.1

ON TARGET

Risk Management Process

ON TARGET

Risk Management Process

- Risk
  - Uncertain or chance events that planning can not overcome or control.
- Risk Management
  - A proactive attempt to recognize and manage internal events and external threats that affect the likelihood of a project's success.

    What can go wrong (risk event).

    How to minimize the risk event's impact (consequences).

    What can be done before an event occurs (anticipation).

    What to do when an event occurs (contingency plans).

ON TARGET

What is Risk?

- **Risk:** Decision based on complete information about the probability of each possible outcome.
- **Uncertainty:** Decision based on incomplete or insufficient data.

> " A risk is not a problem….
> A problem is a risk whose time has come!"

- Project Risk: an uncertain event or condition that, if it occurs, has a positive or negative impact on a project objective. (PMI)
- Key outputs of project risk management planning include a risk management plan, a probability/impact matrix, a risk register, and risk-related contractual agreements.

ON TARGET

Risk Management Plans

- A risk management plan documents the procedures for managing risk *throughout the life of a project*.
- The general topics that a risk management plan should address include the methodology for risk management, roles and responsibilities, budget and schedule estimates for risk-related activities, risk categories, probability and impact matrices, and risk documentation.

ON TARGET

Risk Management - Risk Triggers

- Indication that a risk has occurred or is about to occur.
- Triggers may be discovered in the risk identification process.
- Triggers are watched in the risk monitoring and controlling process.

ON TARGET

Risk Factors

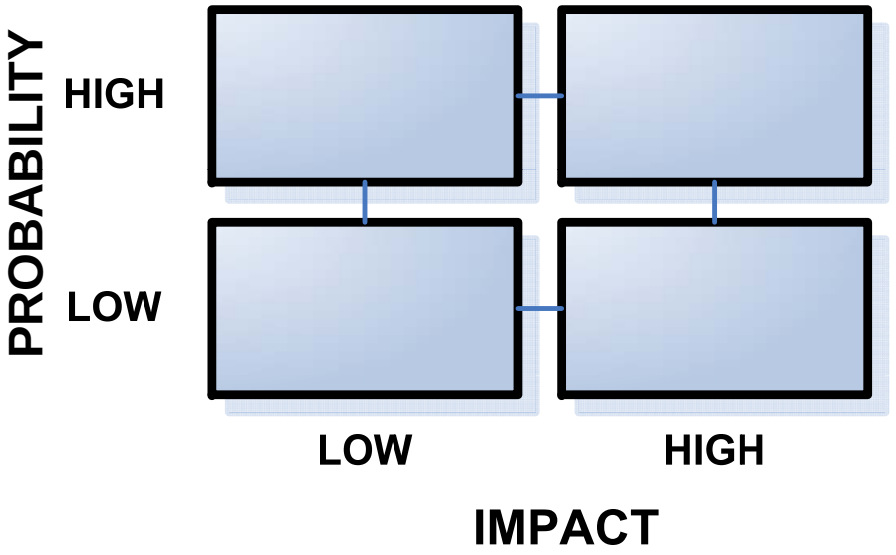
Risk Event

Risk Probability

Impact

Urgency

Tolerance



Sample Probability/Impact Matrix

Probability	Low	Medium	High
High	risk 6	**risk 9**	**risk 1** **risk 4**
Medium	risk 3 risk 7	risk 2 risk 5 risk 11	
Low		risk 8 risk 10	risk 12

Impact

Sample Risk Register

Risk Register
September 3, 2009

Project Name: Just-In-Time Training Project

ID No.	Rank	Risk	Description	Category	Root Cause	Triggers	Potential Responses	Risk Owner	Probability	Impact	Status
R15	1										
R21	2										
R7	3										

To understand the risk register more fully, imagine that the following data is entered for the first risk in the register.

- ID No.: R15
- Rank: 1
- Risk: Poor survey response.
- Description: Many people dislike surveys and avoid filling them out, or if they do, they don't offer good or honest feedback.
- Category: Organizational/user support risk
- Root cause: People don't want to take the time and think their inputs aren't important.
- Triggers: Low survey response rate the first few days; incomplete surveys.
- Potential Responses: Make sure senior management emphasizes the importance of this project and the survey for designing good courses. Have the functional managers personally mention the survey to their people and stress its importance. Offer a reward to the department with the most responses. Ensure that the survey instructions say it will take 10 minutes or less to complete. Extend the deadline for survey responses.
- Risk owner: Mike Sundby, project champion
- Probability: Medium
- Impact: High
- Status: PM will set up a meeting within a week with a project steering committee to decide which response strategies to implement if the survey response is low.

ON TARGET

Workshop Case

In a management class you, and your team of 3 other classmates, have been asked to do a report and a presentation on the growth of the Apple Nano Ipod's market share.

Presentation is due November 31st and the paper is due December 5th.

The report must follow a prescribed format and is limited to 5 pages.

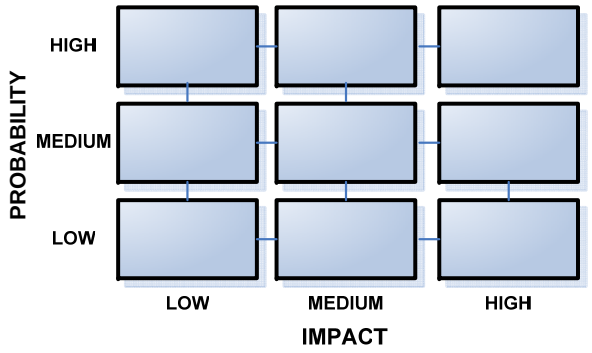
Your presentation is to be a maximum of 15 minutes and 30% of your mark is based on an innovative presentation format.

What are some possible risks associated with this project?

Write a risk statement for each risk identified.

What is the probability/impact for each risk you identified?

"As a result of a <*definite cause*>, an <*uncertain event*> may occur, which could lead to an <*effect on the objective*>."



ON TARGET

Project Risk

- Project Risk always exists!
- But….particularly in cases where:
  - Scope ill-defined
  - Cost and schedule targets not well planned & communicated
  - Skills/accountability/authority is inadequate
  - Performance targets ill-defined
  - Project environment is complex

ON TARGET

Simulation Exercise

- A simulation to utilize some of the core concepts we have worked on today.
- Teams of Four that have been prepared in advance.
- Project document contains the necessary background material to complete the exercise.
- Tomorrow from 9:00 to 9:30 there will be a Bidders Conference that provides each team with a chance to ask questions related to the project documents.

ON TARGET

TUESDAY WRAP UP