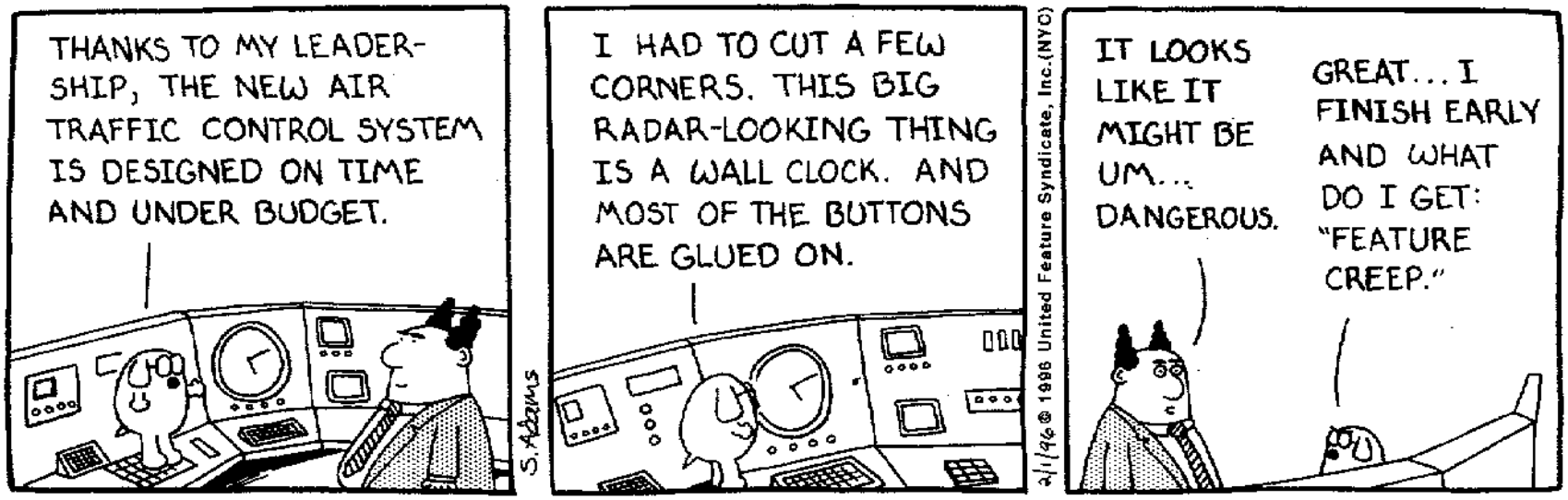
Info6007
Project Management in IT

Week 2 – Scope

Dr Steven Sommer



Week 2 – Readings and References

- Required Readings
  - Schwalbe 2015 (or 7e): Chapter 5
- Practice Questions:
  - 8e: Chapter 5: Discussion Question 1, Exercise 4 and 6.
  - 7e: Chapter 5: Discussion Question 1, Exercise 3 and 5.
- References
  - Schwalbe, K. 2015, *Information Technology Project Management (8e)* Cengage Learning
  - Schwalbe, K. 2012, *An Introduction to Project Management (Fourth Edition)*
  - Schwalbe, K. 2011, *Information Technology Project Management (Revised 6e)* Cengage Learning

Learning Objectives

- Create and Evaluate Project Objectives
- Understand the importance of scope management for project success
- Explain and apply the project scope management planning processes
- Create, interpret and evaluate: a scope and a requirements management plan; a requirements traceability matrix; a project scope statement; a work breakdown structure (WBS); a WBS dictionary; and a scope baseline

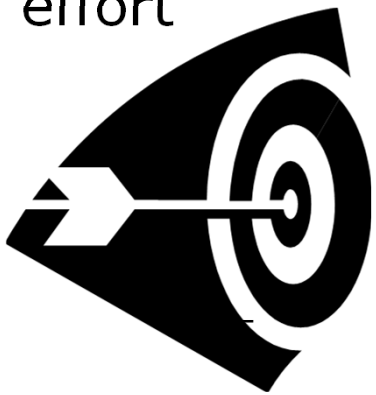
Agenda

- Project Objectives
- Scope Management
  - Scope
  - Scope Statement
  - Scope Management
  - Requirements
  - Work Breakdown Structure
  - Scope Baseline

Project Objectives

- Project Objectives
  - High level goals of the project
  - Defined in the conceptualisation and justified in the business case.
  - Many project failures trace back to here: Unclear, Incomplete, Unrealistic, or Incorrect (not needed or not wanted)
- Can apply SMART criteria
  - **S**pecific - not open to interpretation
  - **M**easurable
  - **A**greed
  - **R**ealistic - should not require super human effort
  - **T**ime bound - agreed upon timeline

"You can not manage what you do not measure"



Exercise - Project Objectives

- In groups, evaluate the following objective against the SMART criteria:
  - Increase profit by creating a new product next year which will:
    1. Make our customers happy
    2. Increase the number of customers we serve
    3. Eliminate quality problems
- 7 mins

Project Objective Example

- Implement a new web based CRM system and processes for managing support that will:
  - Allow customers (and support engineers) to access and modify their cases globally
  - Reduce average initial response time to 30 seconds or less
  - Improve reported customer satisfaction based on the transactional feedback surveys from 3.5 to 3.8 within 6 months of the system going live.
- The system should cost no more that $500,000 to implement with no increase in ongoing running costs and should complete by June 30, 2016.

Project On A Page Data Vault Project

Business Case	Problem Statement
The Data Vault Project will deliver a quality, consistent and accurate data environment. The project will be phased, with the first phase supporting retention data requirements. This will enable benefits to be delivered by retention initiatives as per the Retention Project Business Case. Following phases will support compliance and other business data imperatives. The project objective is to build a robust data warehouse capability and as such benefits include improved strategic decision making, data accuracy and more timely and efficient fulfillment of reporting/data requests.	• CLIENT X has an organically grown data warehouse environment consisting of multiple reporting solutions • These reporting solutions include differing hard definitions of key dimensional groupings, such as product and branch, leading to difficulties in maintenance and incorrect results • The data environment is not logically organised leading to increased maintenance issues • Business users do not trust warehouse data • Lack of historical data prevents business from making strategic decisions backed by accurate data
Project Scope	**Goal Statement**

• Deliver the foundational aspects of a new data warehouse environment including:
  • Logical separation of the warehouse layers allowing for consistent implementation of ETL processes
  • Implementation of data auditability to satisfy current and future regulatory needs
  • Implementation of business rules in a common layer
  • Implementation of common business dimensions (branch, product, etc.)
• Deliver data to support retention initiatives which includes home loan, securities and interaction data
• Limited to BaNCS data in the first phase
	By 30 June 2014 the project will provide quality, consistent and accurate data in support of "CLIENT X' current retention initiatives.

Project Team	Resources Required	Milestones
• C Young, Business Analyst • Christy H, Marketing information analyst • Nidhi G, Business Analyst (p/t) • Alan T Information Manager • Leonard S, Developer • Phil P Project manager • Chau – Report analyst and developer	Budget • Opex $233k • $15k ongoing for data storage	• Project Initiation • Business Requirements • Technical Architecture and Design • ETL Build • Testing • Deployment

Agenda

- Project Objectives
- **Scope Management**
  - **Scope**
  - **Scope Statement**
  - Scope Management
  - Requirements
  - Work Breakdown Structure
  - Scope Baseline

Project Scope

- **Project scope** defines exactly what work is or is not included in a project
  - I.e. what is 'In scope' & what is 'Out of scope'
- Good scope definition is essential
  - Required for accurate time, cost, and resource estimates
  - Defines the baseline for performance measurement and project control
  - Allows the project team and stakeholders to have the same understanding of what products will be produced
- Dimensions of Project Scope include:
  - Functional (Business rules and processes)
  - Technical
  - Organisational
  - Geographic
  - Resource Constraints
  - **Deliverables** to be produced
  - …

What are Deliverables?

- A **deliverable** is a product or service provided as part of the project. E.g.:
  - Technical Report, Training Session, Documentation, Software, Hardware, Report, Event, Processes, Project Planning Documents (Monthly Reports,…).
- Supports the project objectives

Sample List of Deliverables

Deliverable	Expected completion	Progress	Notes
Data requirements	100%	100%	• Completed, minor work required on meaning of data fields, data now managed under a baseline, requirements updated • Minor updates required due to campaign build
Reporting requirements	100%	90%	• Reporting requirements still require final sign off from the business • Reporting migration (reports / timing) still to be finalised
MA / campaign requirements	100%	100%	• Requirements are finalized and signed off • Development of campaigns underway
Technical Requirements	100%	100%	
Infrastructure build	90%	90%	• DV / DM and ETL all in production • Only remaining activity is SQL migration, time TBD
Development (ETL, DV, DM)	90%	95%	• DV / DM and ETL migrated into production • Minor refinement in parallel with campaign development and reporting finalization
Reporting development	65%	TBA	• Report progress TBD
MA campaign development	50%	50%	• Campaign development on schedule

Levels of Project Scope

- Scope Objective
  - Part of the Project Objective / Charter
- **Scope Statement**
  - Part of Statement of Work
- Work Breakdown Structure

Scope Statement

- Inputs into Scope Statement:
  - Project charter,
  - Requirements documentation, and
  - Organizational process assets (i.e. policies and procedures)
- Contents of a scope statement vary, but it should include: [Schwalbe 2012]
  - A product scope description,
  - Product user acceptance criteria,
  - Detailed information on all project deliverables
- Also helpful to contain related information such as: project boundaries, constraints, and assumptions

Sample Scope Statement

Scope Statement, Version 1.0

August 1

Project Title: Just-In-Time Training Project

Product Characteristics and Requirements:

This project will produce three levels of courses, executive, introductory, and advanced, in the following subject areas: supplier management, negotiating skills, project management, and software applications (spreadsheets and Web development). Details on each course are provided below:

1. Supplier management training: The Supplier Management Director estimates the need to train at least 200 employees each year. There should be three levels of courses: an executive course, an introductory course, and an advanced course. Course materials should be developed as a joint effort with internal experts, outside training experts, if needed, and key suppliers.

A partnership might be developed to maximize the effectiveness of the training and minimize development costs. Different delivery methods should be explored, including instructor-led, CD/ROM, and Web-based training. About half of employees would prefer an instructor-led approach, and about half would prefer a self-paced course they could take at their convenience.

Product User Acceptance Criteria

The courses produced as part of this project will be considered successful if they are all available within one year and the average course evaluations for each course are at least 3.0 on a 5.0 scale.

Schwalbe 2012, Fig. 4-6

Sample Scope Statement (continued)

Deliverables

Project Management-Related Deliverables

Project charter, project management plan, scope statement, WBS, etc.

Product-Related Deliverables:

1. Supplier management training:

1.1. Needs assessment: A survey will be conducted to determine the learning objectives for the executive, introductory, and advanced courses. The corporate online survey software will be used and coordinated with IT and HR. Results will be documented in a detailed report (8-10 pages) and presentation (15-20 minutes long).

1.2 Research of existing training: A study will be done to identify current training courses and materials available. Results will be documented in a detailed report and presentation.

1.3. Partnerships: Partnership agreements will be explored to get outside training organizations and suppliers to work on developing and providing training.

1.4. Course development: Appropriate materials will be developed for each course. Materials could take various formats, including written, video, CD/ROM, or Web-based. Materials should include interactivity to keep learners engaged.

1.5. Pilot course: A pilot course will be provided for the introductory supplier management course. Feedback from the pilot course will be incorporated into following courses.

Schwalbe 2012, Fig. 4-6

Project Scope Management

- **Project scope management** includes the processes involved in defining and controlling what is or is not included in a project
- The main processes include
  - **Planning scope**: determining how the project's scope and requirements will be managed
  - **Collecting requirements**: defining and documenting the features and functions of the deliverables
  - **Defining scope**: reviewing the project charter, requirements documents, and organizational process assets to create a scope statement
  - **Creating the WBS**: subdividing the major project deliverables into smaller, more manageable components
  - **Validating scope**: formalizing acceptance of the project deliverables
  - **Controlling scope**: controlling changes to project scope throughout the life of the project
- Steve: Poor Scope (and scope control) is (one of the) #1 evils of projects

Project Scope Management

- The main documents/outputs produced are:
  - Scope management plan - how will the project scope be defined, validated, and controlled
  - Requirements management plan- how will the project requirements be defined, validated, and controlled
  - Requirements documentation
  - Requirements traceability matrix
  - Scope baseline, which is composed of an:
    - Approved scope statement,
    - A WBS, and
    - A WBS dictionary.

Collecting Requirements

- **Requirements** are "conditions or capabilities that must be met by the project or present in the product, service, or result to satisfy an agreement or other formally imposed specification" [PMBOK® Guide, Fifth Edition]
- A project's size, complexity, importance, as well as other factors affect how much effort is spent on collecting requirements
- Requirements must be documented in enough detail so that they can be measured during project execution
- Requirements documents can range from a single-page checklist to a room full of notebooks with text, diagrams, images, etc.
- Note: Requirements are only what must be there – they do not include all functionality nor design decisions made as part of implementing the solution. Testing covers a lot more than the requirements. Requirement become scope – not the other way around.
  - Eg., "flowers", "red flowers", or "red roses" are only requirements at the wedding if they are specified by the customer as being required – otherwise they are simply implementation choices

Sample *Requirements* Management Plan

Requirements Management Plan Version 1.0
September 30

Project Name: Just-In-Time Training Project

Planning, tracking, and reporting requirements:

Information from the Phase I project, the business case, and the project charter will provide valuable information in determining requirements for this project, as will many existing corporate standards and processes. A survey will also be used to gather requirements. All requirements will be documented where appropriate. For example, requirements related to course prerequisites will be documented in course descriptions. Requirements related to facilities, class size, etc. will be documented in the scope statement. Requirements will be tracked by the person in charge of each related deliverable and reported as part of our normal reporting processes (i.e. weekly status reports, monthly review meetings, etc.)

Performing configuration management activities:

Requirements can be introduced by several means, such as existing written requirements, suggestions provided from our survey, or direct suggestions from stakeholders. Appropriate project stakeholders will analyze, authorize, track, and report changes to requirements. The project manager must be informed in advance of potential changes to requirements and be involved in the decision process to approve those changes. Any change that will impact the project's cost or schedule significantly must be approved by the project steering committee.

Prioritizing requirements:

All requirements will be designated as 1, 2 or 3, for mandatory, desirable, or nice-to-have, respectively. Emphasis will be placed on meeting all mandatory requirements, followed by desirable and then nice-to-have requirements.

Using product metrics:

Several product metrics will be used to help in managing requirements. For example, each training class will be compared to similar classes to evaluate its content, length, and quality with similar classes. Course evaluations will be used as the main metric in evaluating the course and instructor.

Tracing requirements:

All mandatory requirements will be included in the requirements traceability matrix. Desirable and nice-to-have requirements will be documented in a separate matrix and be addressed only as time and resources allow. The matrix will be created using the company's template file for this document.

Schwalbe 2012, Fig. 4-4

Requirements Traceability Matrix

- A **Requirements Traceability Matrix** shows the source of each requirement.

Require-ment no.	Requirement	Category	Source	Status
54	Password must follow company standard (see manual)	Security	Login Policy Manual	Complete. Regression Test Case: TC-1067
55	A Web Interface must be provided	User Interface	Project Charter	In Progress
56	Case notes to allow graphical attachments	Case Management	Project steering committee minutes: 1/6/16	Not Started

Wedding Exercise

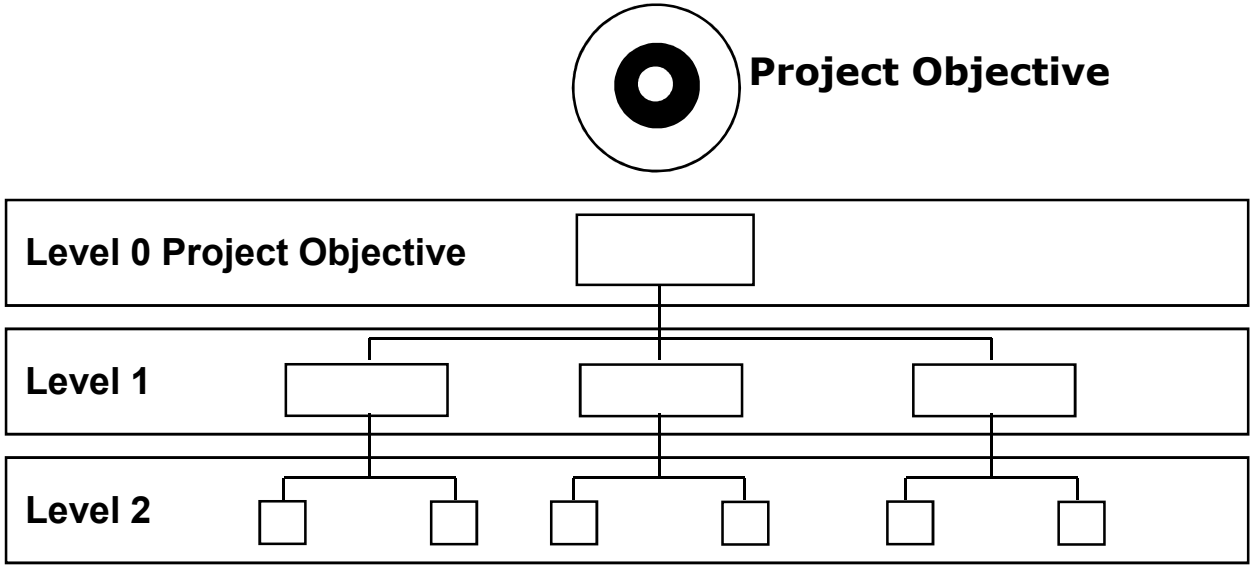
- In groups of ~5 people
  - Appoint 2 people to play the roles of a couple who are to be married (one extravert and one introvert)
  - As a group of 5, you will project manage their *wedding party*.
  - Create the following documents:
    - Project Objective (10 mins)
    - Requirements Management Plan (5 mins)
    - Requirements inside a requirements traceability matrix (15 mins)
    - Scope Statement (15 mins)

Agenda

- Project Objectives
- **Scope Management**
  - Scope
  - Scope Statement
  - Scope Management
  - Requirements
  - **Work Breakdown Structure**
  - **Scope Baseline**

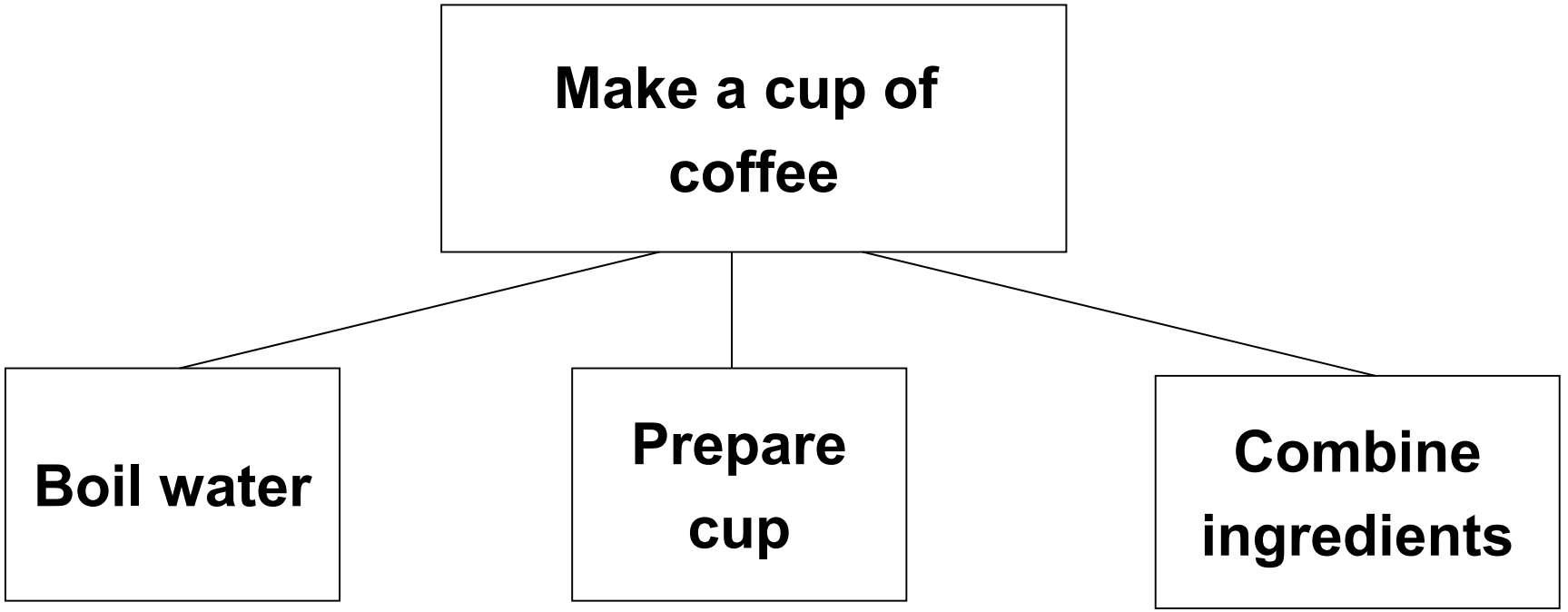
Work Breakdown Structures

- A **Work Breakdown Structure** (WBS) is a deliverable-oriented hierarchical diagram of the project scope.
- Scope is broken down from highest level to the most detailed level
- The lowest level items are called **work packages** or **tasks.**



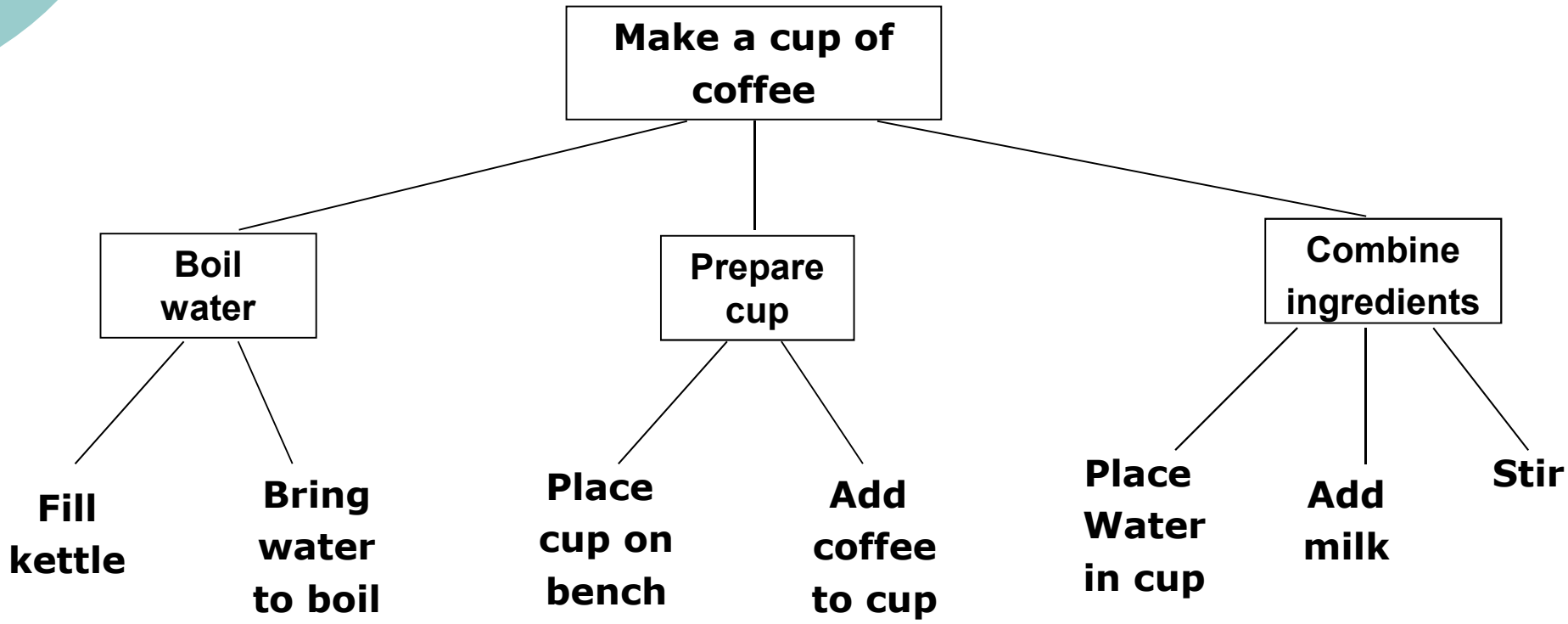
Sample: WBS for coffee

- Step 1: List all major activities in the general order you think they will occur.



WBS for instant coffee

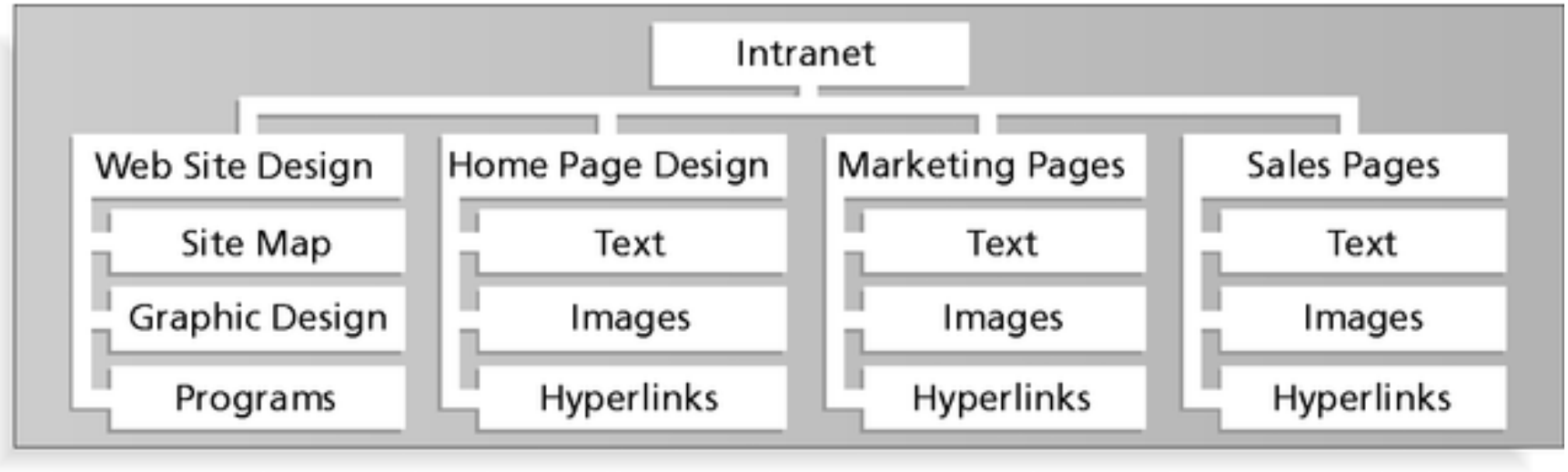
- Step 2: Break each of the activities down. Repeat until sufficient detail reached.



Two types of WBS

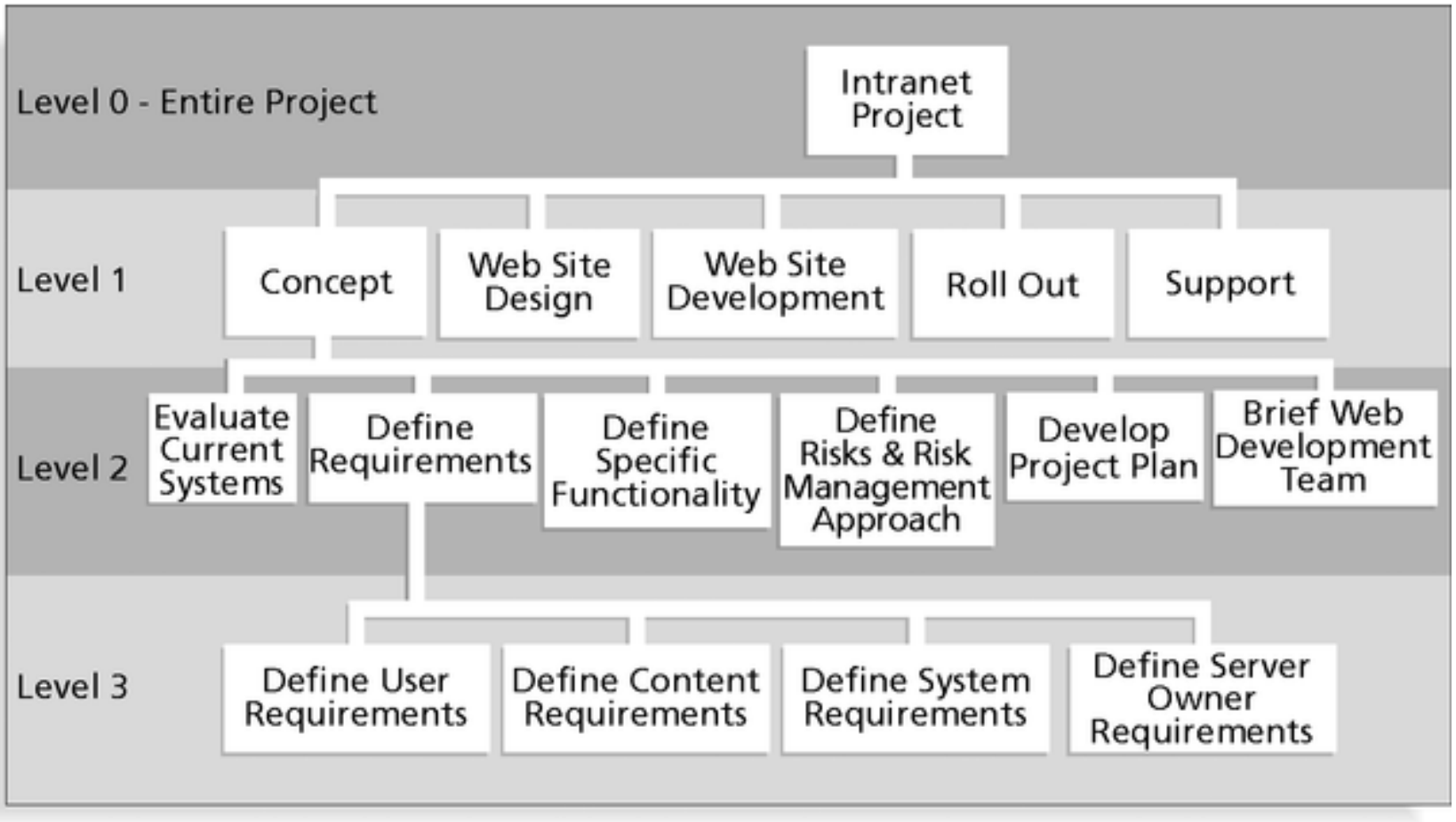
- Product Focus
  - Focus on the outcomes the project needs to produce
- Process / Task / Phase Focus
  - Focus on the steps required to complete the outcomes

WBS organized by Product



Schwalbe 2011, Fig. 5-3

WBS organized by Phase



Schwalbe 2011, Fig. 5-4 (part)

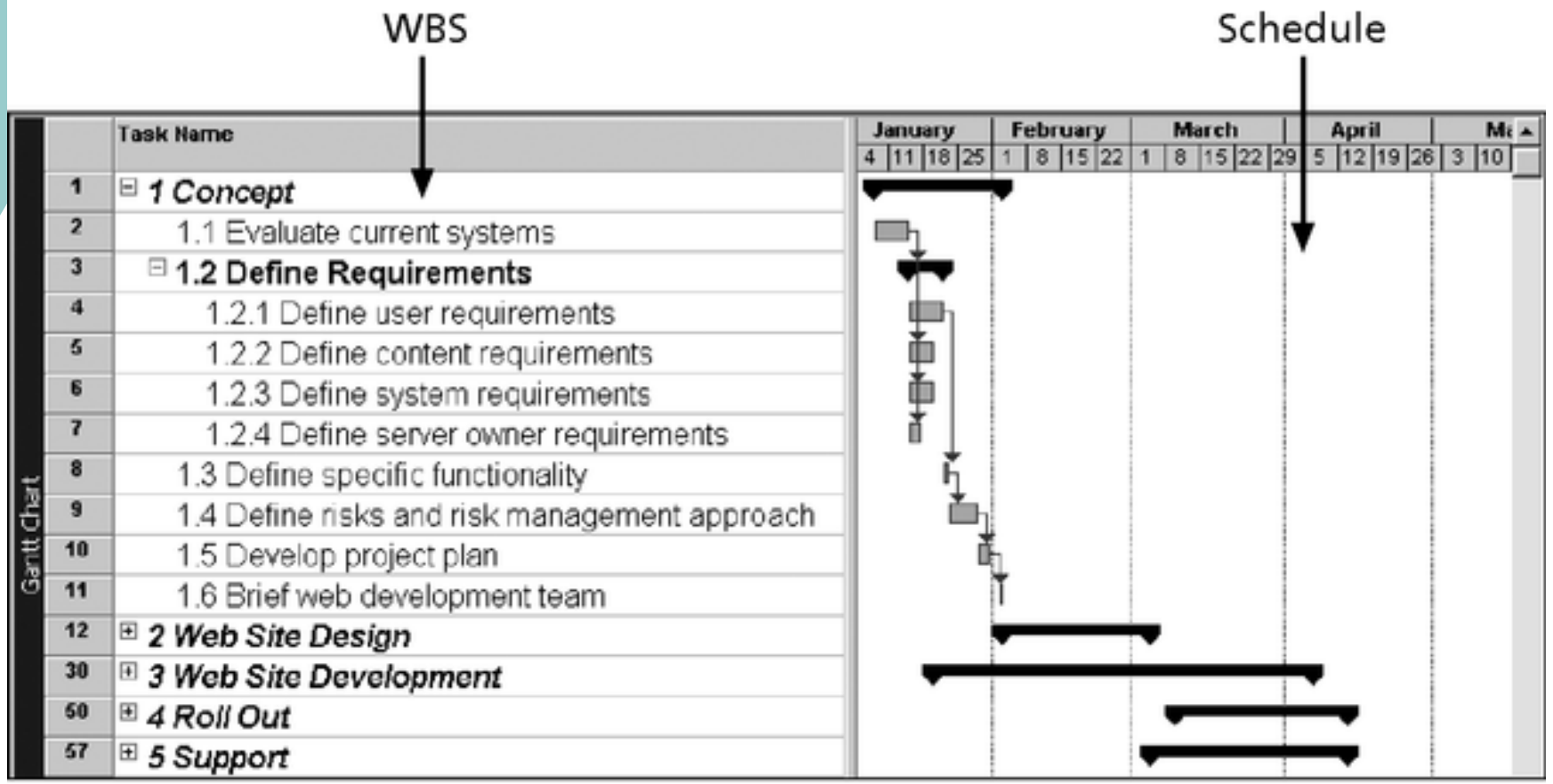
WBS in Tabular Form

Intranet
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 development team

2.0 Web Site Design
3.0 Web Site Development
4.0 Roll Out
5.0 Support

Schwalbe 2011, Fig. 5-4 (part)

WBS & Gantt Chart in MS Project



Schwalbe 2011, Fig. 5-5

Guide for creating a WBS

- WBS should include all the work to be done
- Each unit of work should appear at only one place in the WBS.
- The work content of a WBS item is the sum of the WBS items below it
- Ideally, there should be approximately 2-20 activities per level
- Ideally, tasks should be broken down until they are 1-3 days; however the level of detail should be limited to the level of control you require
- Each element:
  - Should be measurable with a well understood completion criteria
  - Should allow for realistic estimating
  - Should have a single, identifiable owner
- Possible approaches:
  - Analogy approach: Review WBSs of similar projects and tailor to your project
  - Top-down approach
  - Bottom-up approach (but avoid being distracted by the detail)
- Do not confuse tasks on a WBS with specifications or think it can only be a sequential list of steps

WBS Dictionary

- A **WBS dictionary** is a document that describes each WBS task in detail
- The format can vary based on project needs.
  - It might be appropriate to have just a short paragraph describing each work package
  - For a more complex project, an entire page or more might be needed for the work-package descriptions
  - It might require describing the responsible person or organization, resource requirements, estimated costs, and other information

Sample WBS Dictionary Entry

Project Title: Just-In-Time Training Project
WBS Item Number:3.1.1.1.2
WBS Item Name: Administer survey
Description: The purpose of the survey for the supplier management training is to determine the learning objectives for the executive, introductory, and advanced supplier management courses (see WBS item 3.1.1.1.1 for additional information on the survey itself). The survey will be administered online using the standard corporate survey software. After the project steering committee approves the survey, the IT department will send it to all employees of grade level 52 or higher in the purchasing, accounting, engineering, information technology, sales, marketing, manufacturing, and human resource departments. The project champion, Mike Sundby, VP of Human Resources, will write an introductory paragraph for the survey. Department heads will mention the importance of responding to this survey in their department meetings and will send an e-mail to all affected employees to encourage their inputs. If the response rate is less than 30% one week after the survey is sent out, additional work may be required.

Schwalbe 2012, Fig. 4-13

Quiz

- Estimate how long a piece of string is.
- It is made of platinum thread at $1000/m. How much will it cost?

Work Breakdown Structure

- The WBS is a critical document for
  - Creating accurate time, cost, and resource estimates
  - Communicating clear work responsibilities
  - Keeping the project and team on target

- It is a living document reflecting the current scope throughout the project's life.

Scope Baseline

- The approved project scope statement and its associated WBS and WBS dictionary form the scope baseline
- Performance in meeting project scope goals is evaluated against the scope baseline

Activity – Wedding WBS

- In the same groups:
  - Create a 3 (or more) level WBS for the wedding.
- Time for exercise: 25 minutes

Review

- Project Objectives
- Scope Management
  - Scope
  - Scope Statement
  - Scope Management
  - Requirements
  - Work Breakdown Structure
  - Scope Baseline