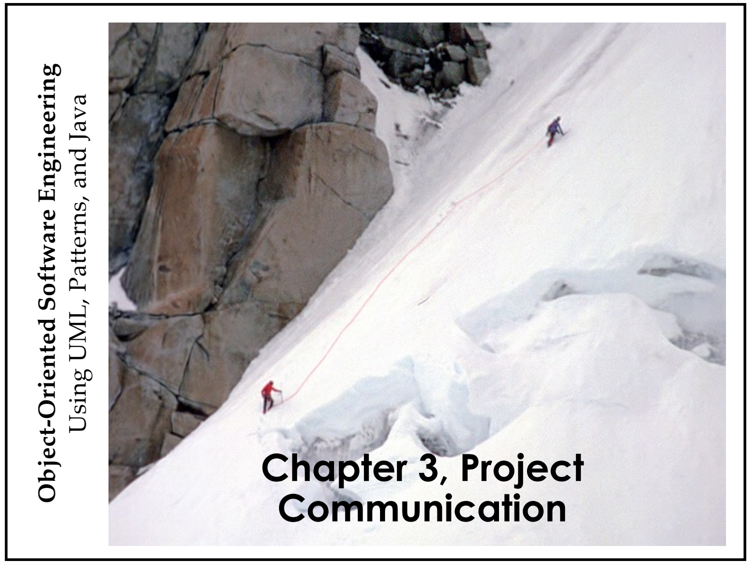
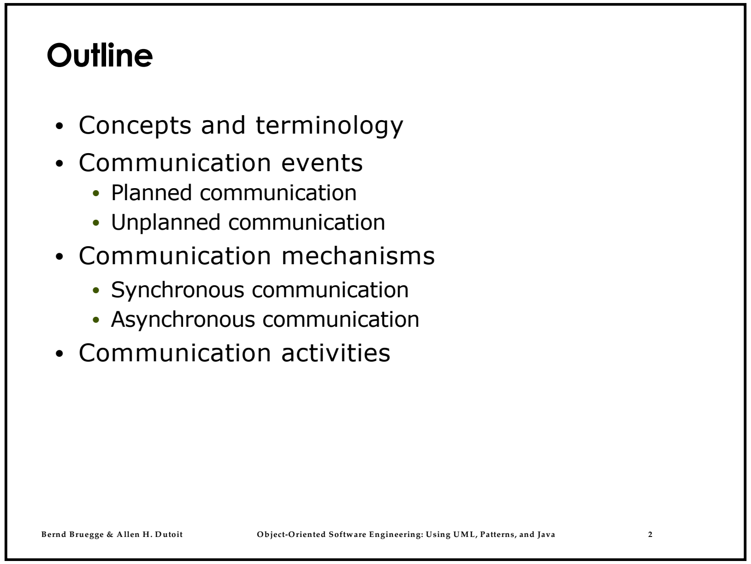


Object-Oriented Software Engineering
Using UML, Patterns, and Java

Chapter 3, Project Communication

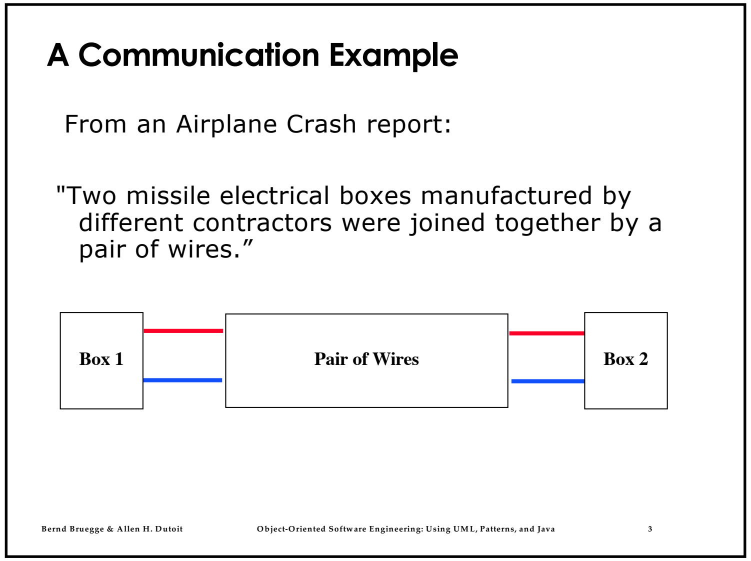
1



Outline

- Concepts and terminology
- Communication events
  - Planned communication
  - Unplanned communication
- Communication mechanisms
  - Synchronous communication
  - Asynchronous communication
- Communication activities

2

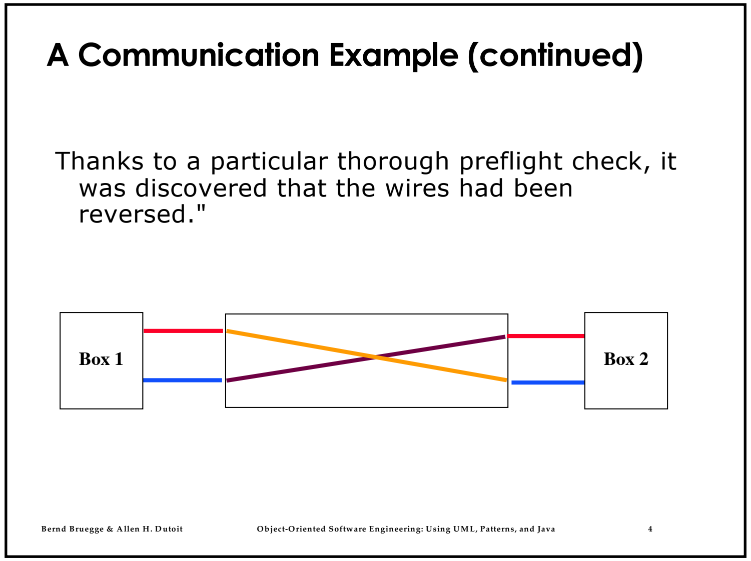


A Communication Example

From an Airplane Crash report:

"Two missile electrical boxes manufactured by different contractors were joined together by a pair of wires.”

3



A Communication Example (continued)

Thanks to a particular thorough preflight check, it was discovered that the wires had been reversed."

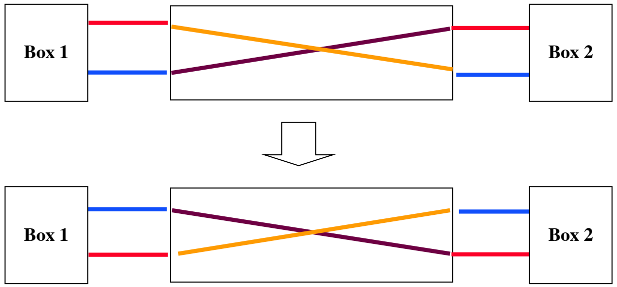
4

After the Crash...

...

"The postflight analysis revealed that the contractors had indeed corrected the reversed wires as instructed."

"In fact, both of them had."



Communication is critical

- In large system development efforts, you will spend more time communicating than coding
- A software engineer needs to learn the so-called soft skills:
  - Collaboration
    - Negotiate requirements with the client and with members from your team and other teams
  - Presentation
    - Present a major part of the system during a review
  - Management
    - Facilitate a team meeting
  - Technical writing
    - Write part of the project documentation.

Communication Event vs. Mechanism

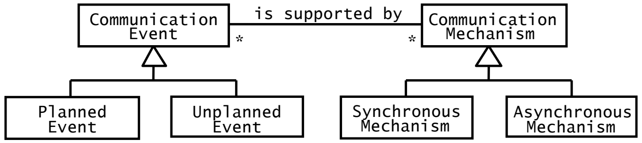
Communication event

- Information exchange with defined objectives and scope
- *Scheduled*: Planned communication
  - Examples: weekly team meeting, review
- *Unscheduled*:Event-driven communication
  - Examples: problem report, request for change, clarification

Communication mechanism

- Tool or procedure that can be used to transmit information
- *Synchronous*: Sender and receiver are communicating at the same time
- *Asynchronous*: Sender and receiver are not communicating at the same time.

Modeling Communication



Planned Communication Events

Problem Definition

- Objective:Present goals, requirements and constraints
- Example: Client presentation
- Usually scheduled at the beginning of a project

Project Review: Focus on system models

- Objective: Assess status and review the system model
- Examples: Analysis review, system design review
- Scheduled around project milestones and deliverables

Client Review: Focus on requirements

- Objective: Brief the client, agree on requirements changes
- The *first client review is usually scheduled after analysis phase*.

Planned Communication Events (cont'd)

Walkthrough (Informal)

- Objective: Increase quality of subsystem
- Example
  - Developer informally presents subsystem to team members ("peer-to-peer")
- Scheduled by each team

Inspection (Formal)

- Objective: Compliance with requirements
- Example
  - Demonstration of final system to customer (Client acceptance test)
- Scheduled by project management

Planned Communication Events (cont'd)

Status Review

- Objective: Find deviations from schedule and correct them or identify new issues
- Example
  - Status section in regular weekly team meeting

Brainstorming

- Objective: Generate and evaluate large number of solutions for a problem
- Example
  - Discussion section in regular weekly team meeting.

Planned Communication Events (cont'd)

Release

- Objective: Baseline the result of each software development activity
- Examples:
  - Software Project Management Plan
  - Requirements Analysis Document
  - System Design Document
  - Beta version of software
  - Final version of software
  - User Manual
- Usually scheduled after corresponding activity ("phase")

Postmortem Review

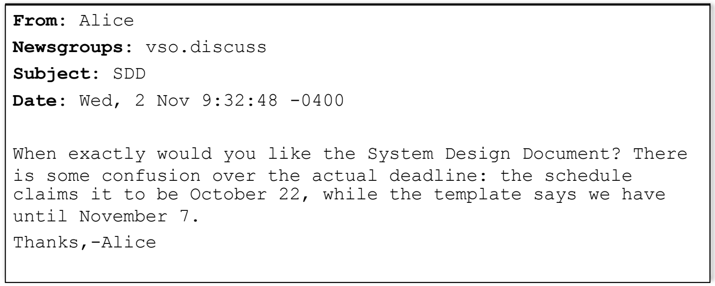
- Objective: Describe Lessons Learned
- Scheduled at the end of the project

13

Unplanned Communication Events

Request for clarification

- The bulk of communication among developers, clients and users
- Example: A developer may request a clarification about an ambiguous sentence in the problem statement.



From: Alice
Newsgroups: vso.discuss
Subject: SDD
Date: Wed, 2 Nov 9:32:48 -0400

When exactly would you like the System Design Document? There is some confusion over the actual deadline: the schedule claims it to be October 22, while the template says we have until November 7.

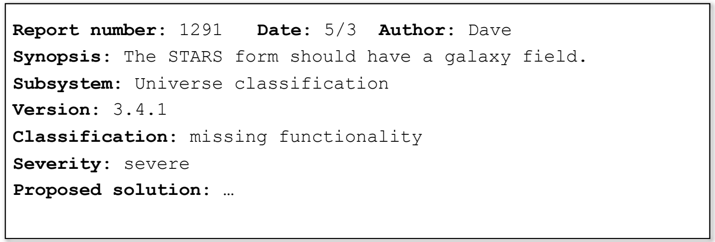
Thanks,-Alice

14

Unplanned Communication Events

Request for change

- A participant reports a problem and proposes a solution
- Change requests are often formalized when the project size is substantial
- Example: Request for additional functionality



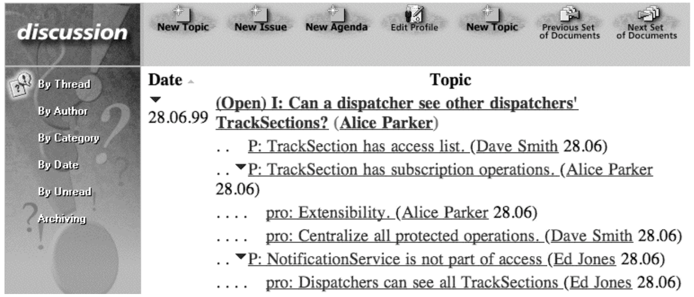
Report number: 1291 **Date:** 5/3 **Author:** Dave
Synopsis: The STARS form should have a galaxy field.
Subsystem: Universe classification
Version: 3.4.1
Classification: missing functionality
Severity: severe
Proposed solution: …

15

Unplanned Communication Events

Issue resolution

- Selects a single solution to a problem for which several solutions have been proposed
- Uses issue base to collect problems and proposals.



28.06.99 (Open) I: Can a dispatcher see other dispatchers' TrackSections? (Alice Parker)

. .   P: TrackSection has access list. (Dave Smith 28.06)

. . P: TrackSection has subscription operations. (Alice Parker 28.06)

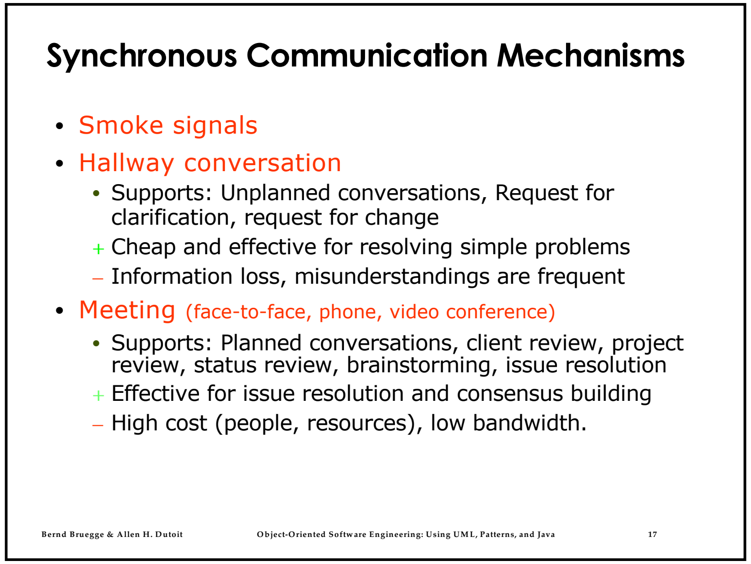
. . . .   pro: Extensibility. (Alice Parker 28.06)

. . . .   pro: Centralize all protected operations. (Dave Smith 28.06)

. . P: NotificationService is not part of access (Ed Jones 28.06)

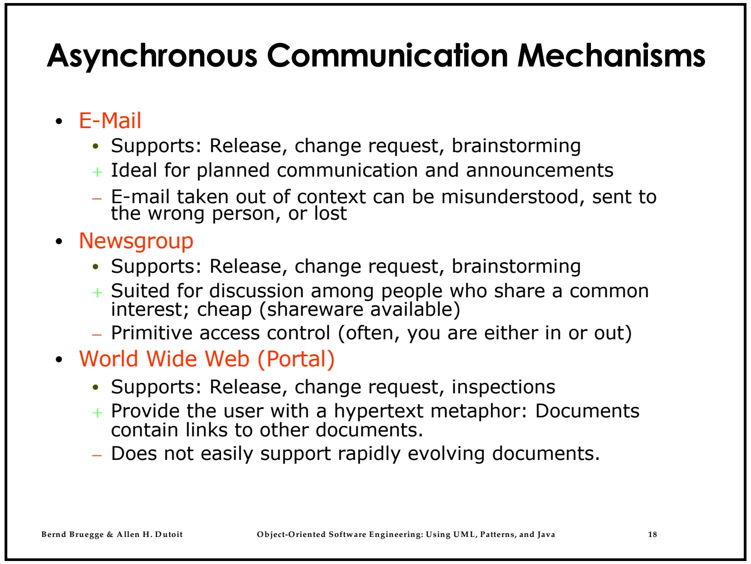
. . . .   pro: Dispatchers can see all TrackSections (Ed Jones 28.06)

16



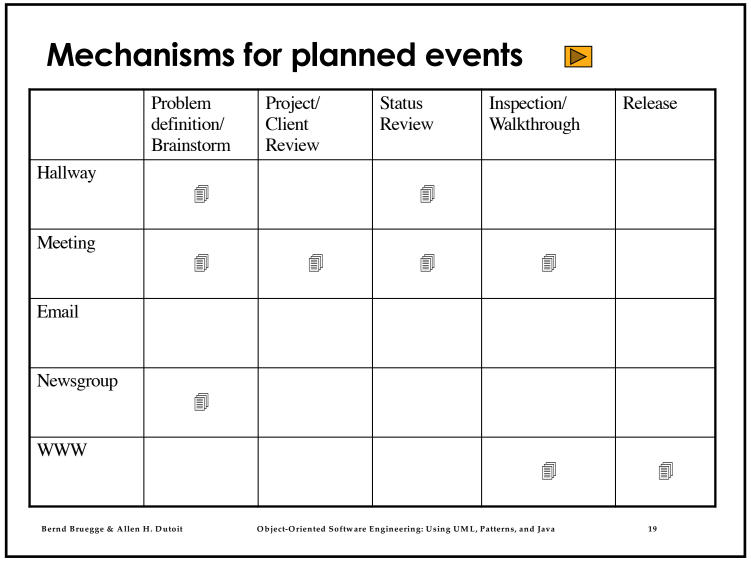
Synchronous Communication Mechanisms

- Smoke signals
- Hallway conversation
  - Supports: Unplanned conversations, Request for clarification, request for change
  - + Cheap and effective for resolving simple problems
  - – Information loss, misunderstandings are frequent
- Meeting (face-to-face, phone, video conference)
  - Supports: Planned conversations, client review, project review, status review, brainstorming, issue resolution
  - + Effective for issue resolution and consensus building
  - – High cost (people, resources), low bandwidth.



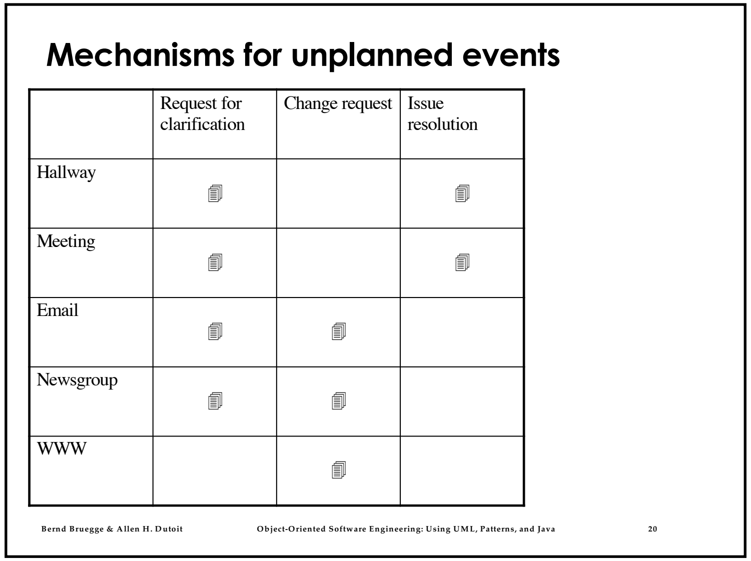
Asynchronous Communication Mechanisms

- E-Mail
  - Supports: Release, change request, brainstorming
  - + Ideal for planned communication and announcements
  - – E-mail taken out of context can be misunderstood, sent to the wrong person, or lost
- Newsgroup
  - Supports: Release, change request, brainstorming
  - + Suited for discussion among people who share a common interest; cheap (shareware available)
  - – Primitive access control (often, you are either in or out)
- World Wide Web (Portal)
  - Supports: Release, change request, inspections
  - + Provide the user with a hypertext metaphor: Documents contain links to other documents.
  - – Does not easily support rapidly evolving documents.



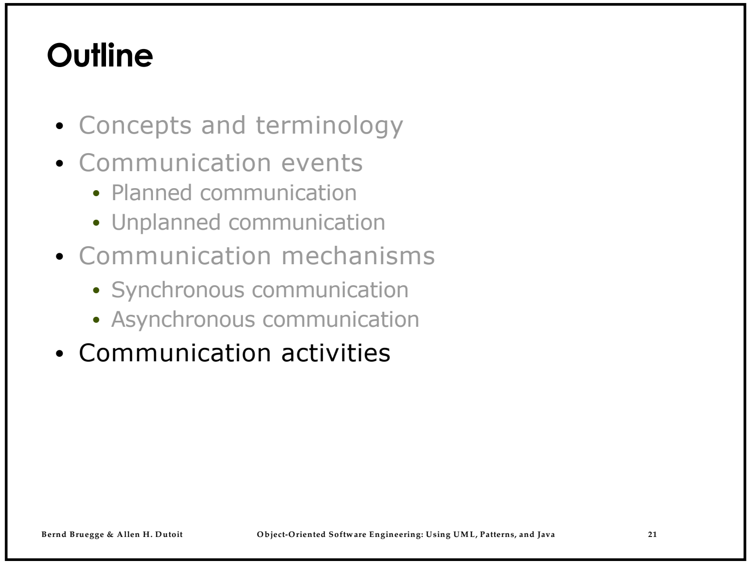
Mechanisms for planned events

	Problem definition/ Brainstorm	Project/ Client Review	Status Review	Inspection/ Walkthrough	Release
Hallway	🗐		🗐		
Meeting	🗐	🗐	🗐	🗐	
Email					
Newsgroup	🗐				
WWW				🗐	🗐



Mechanisms for unplanned events

	Request for clarification	Change request	Issue resolution
Hallway	🗐		🗐
Meeting	🗐		🗐
Email	🗐	🗐	
Newsgroup	🗐	🗐	
WWW		🗐	



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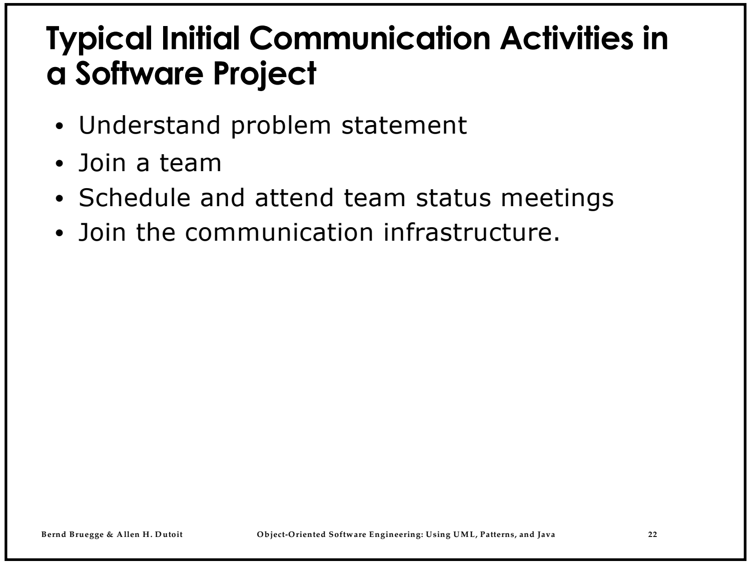
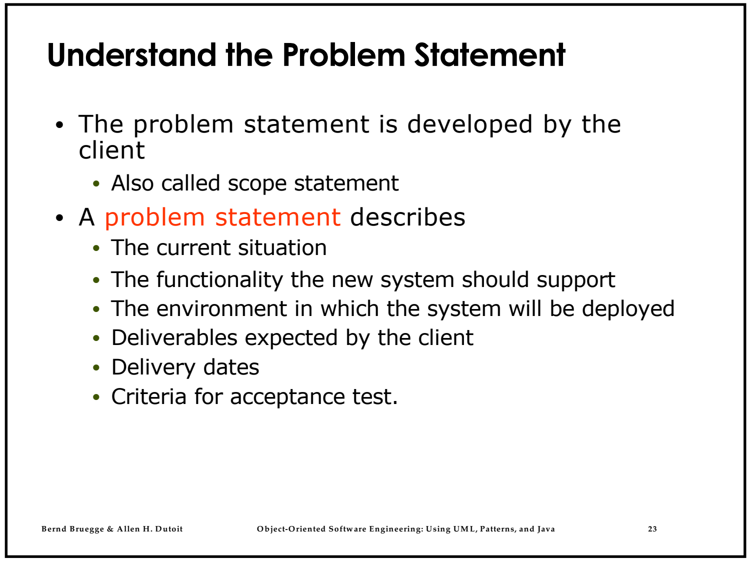
21



Typical Initial Communication Activities in a Software Project

- Understand problem statement
- Join a team
- Schedule and attend team status meetings
- Join the communication infrastructure.

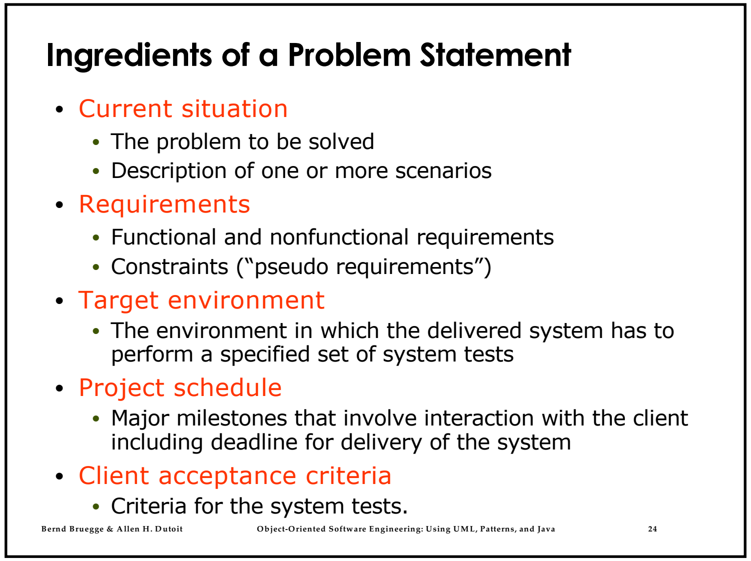
22



Understand the Problem Statement

- The problem statement is developed by the client
  - Also called scope statement
- A problem statement describes
  - The current situation
  - The functionality the new system should support
  - The environment in which the system will be deployed
  - Deliverables expected by the client
  - Delivery dates
  - Criteria for acceptance test.

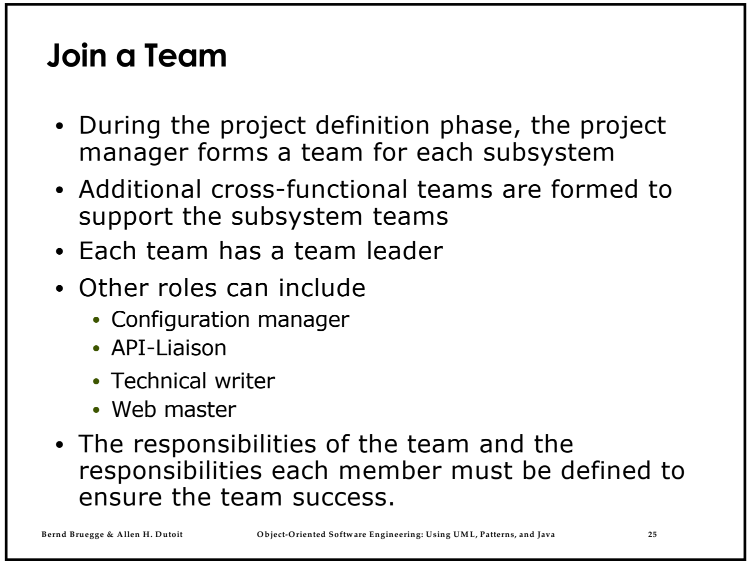
23



Ingredients of a Problem Statement

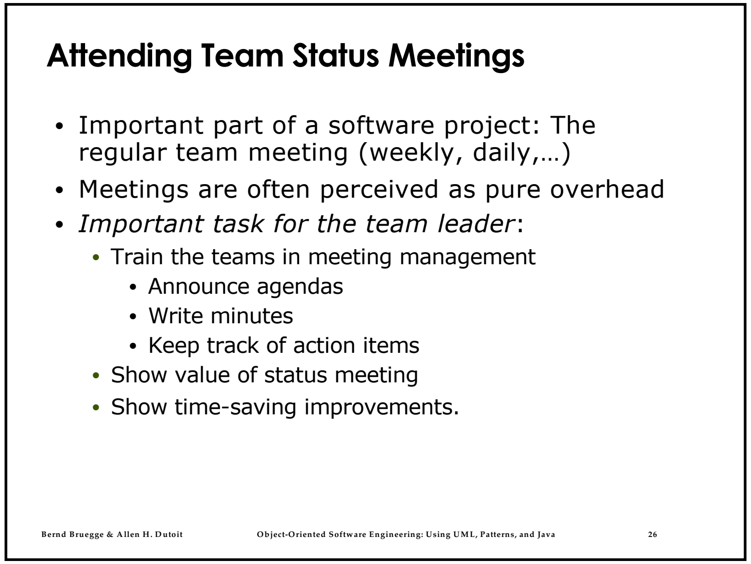
- Current situation
  - The problem to be solved
  - Description of one or more scenarios
- Requirements
  - Functional and nonfunctional requirements
  - Constraints (“pseudo requirements”)
- Target environment
  - The environment in which the delivered system has to perform a specified set of system tests
- Project schedule
  - Major milestones that involve interaction with the client including deadline for delivery of the system
- Client acceptance criteria
  - Criteria for the system tests.

24



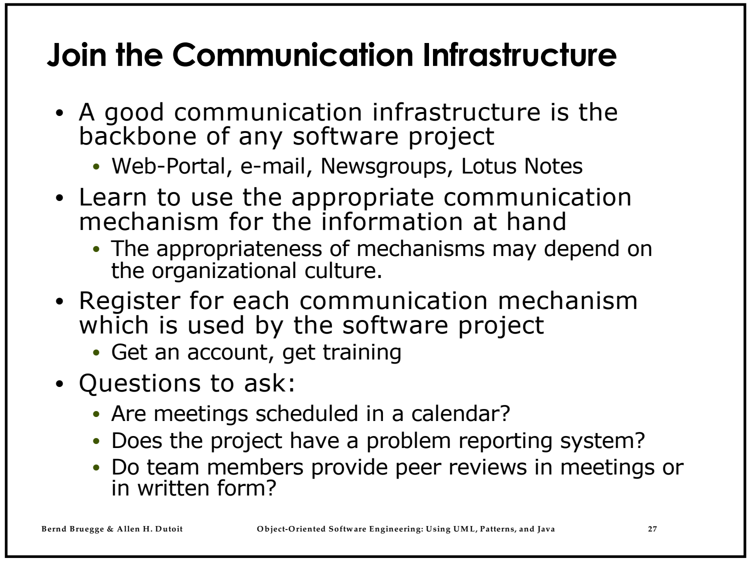
Join a Team

- During the project definition phase, the project manager forms a team for each subsystem
- Additional cross-functional teams are formed to support the subsystem teams
- Each team has a team leader
- Other roles can include
  - Configuration manager
  - API-Liaison
  - Technical writer
  - Web master
- The responsibilities of the team and the responsibilities each member must be defined to ensure the team success.



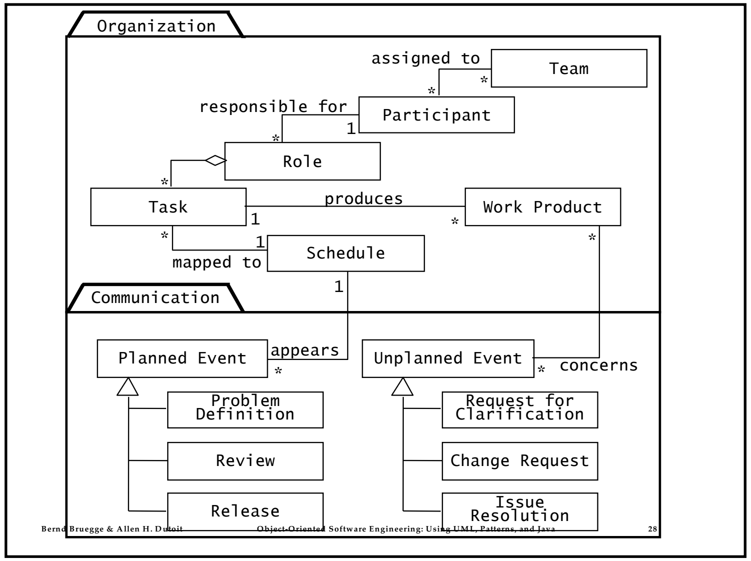
Attending Team Status Meetings

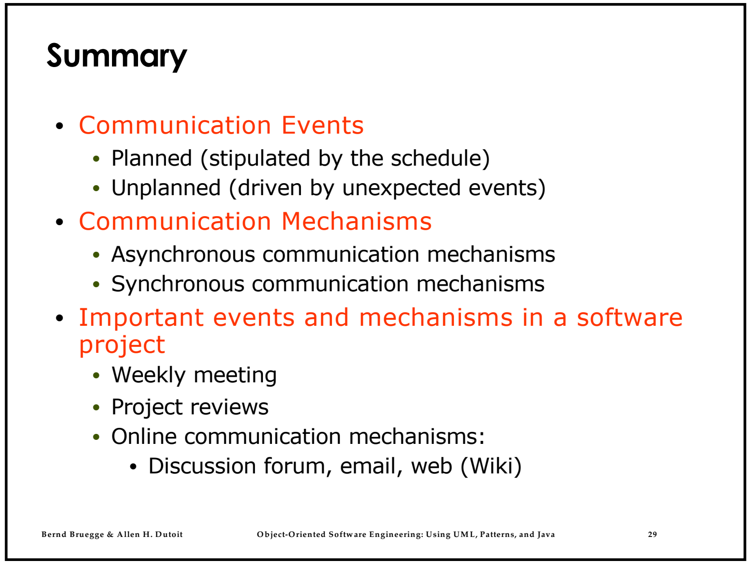
- Important part of a software project: The regular team meeting (weekly, daily,…)
- Meetings are often perceived as pure overhead
- *Important task for the team leader*:
  - Train the teams in meeting management
    - Announce agendas
    - Write minutes
    - Keep track of action items
  - Show value of status meeting
  - Show time-saving improvements.



Join the Communication Infrastructure

- A good communication infrastructure is the backbone of any software project
  - Web-Portal, e-mail, Newsgroups, Lotus Notes
- Learn to use the appropriate communication mechanism for the information at hand
  - The appropriateness of mechanisms may depend on the organizational culture.
- Register for each communication mechanism which is used by the software project
  - Get an account, get training
- Questions to ask:
  - Are meetings scheduled in a calendar?
  - Does the project have a problem reporting system?
  - Do team members provide peer reviews in meetings or in written form?





Summary

- Communication Events
  - Planned (stipulated by the schedule)
  - Unplanned (driven by unexpected events)
- Communication Mechanisms
  - Asynchronous communication mechanisms
  - Synchronous communication mechanisms
- Important events and mechanisms in a software project
  - Weekly meeting
  - Project reviews
  - Online communication mechanisms:
    - Discussion forum, email, web (Wiki)

29