Project Management - Outline

- **Defining the Project Manager Role**
  - **The Project Manager**
  - **The Project Artifacts and Milestones**

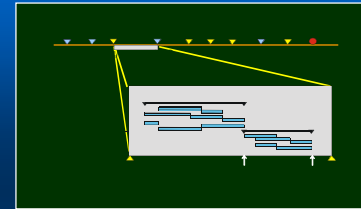- **Planning Projects**

- **Managing Iterations**

- **Managing Risks**

Plans and Controls

Planning

Controlling
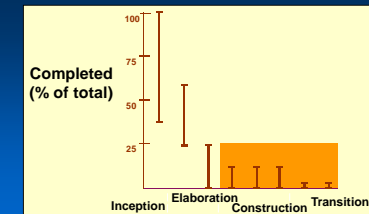
Completed (% of total)

Inception Elaboration Construction Transition

Managing Expectations

Why manage expectations?
1. People are not perfect.
2. People are not logical.
3. People perceive things differently.
4. Software engineers are people too.
5. Things happen.
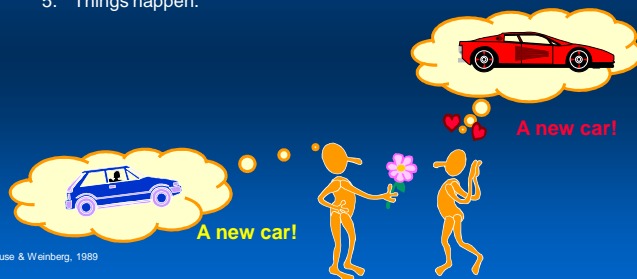
A new car!

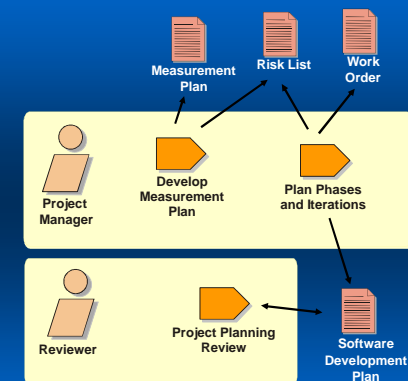A new car!

Gause & Weinberg, 1989

Project Management Discipline

Measurement Plan   Risk List   Work Order

Project Manager

Develop Measurement Plan

Plan Phases and Iterations

Reviewer

Project Planning Review

Software Development Plan

Software Development Plan

Project Manager → Software Development Plan → Risk List | Project Plan | Measurement Plan

UPEDU GUIDELINE: Project Plan
UPEDU GUIDELINE: Risk list

Major Milestones

Commit resources for the elaboration phase

Commit resources for construction

Product sufficiently mature for customers

Customer acceptance or end of life

| Inception | Elaboration | Construction | Transition |

time

Lifecycle Objective Milestone — **Lifecycle Architecture Milestone** — **Initial Operational Capability Milestone** — **Product Release**

Project Management - Outline

- ◆ **Defining the Project Manager Role**

- ◆ **Planning Projects**
  - ▪ **Project Organization**
  - ▪ **The Planning strategies**
  - ▪ **The Project Plan Artifact**

- ◆ **Managing Iterations**

- ◆ **Managing Risks**

Influenced by Many Factors

- ◆ **The Size of the Software Development Effort**
  - ▪ Formality, Standards, Process Rigidity.

- ◆ **The Degree of Novelty**
  - ▪ First of its Kind, Evolution Cycle, Maintenance

- ◆ **Type of Application**
  - ▪ Mission-critical, Performance,Memory constraints,

- ◆ **The Current Development Process**
  - ▪ Process Maturity, Experience of the Developers and Managers

- ◆ **Organizational Factors**
  - ▪ Team attitudes toward changes, Team enthusiasm toward the project

- ◆ **Technical and Managerial Complexity**
  - ▪ Size of the team vs size of the project

Top-down and Bottom-up Planning

Project Plan

Iteration Plan

Next

Current

Phases and major milestones
What and when

Iterations for each phase
Number of iterations
Objectives
Duration
Staffing profile

Tasks
Allocation to individuals/teams
Major builds
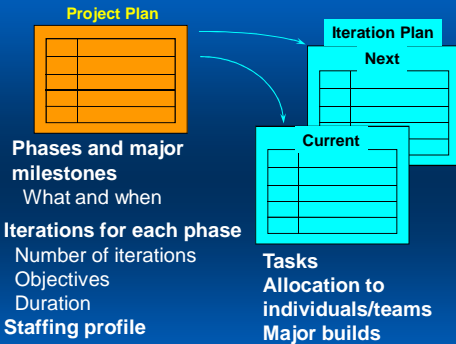
Coarse-Grained Plan
Inter iteration

Fine-Grained Plans
Intra iteration

Project Plan

Project Plan

Project Planning

Architecture Review

ß1   ß2   Product Release

IT1   IT2 IT3 IT4   IT5

Start 1/02   LCO 3/02   4/02   LCA 7/02   IOC 12/02   2/03

Iteration Plan

4/02   5/02

Design Review   Build #1   Build #2
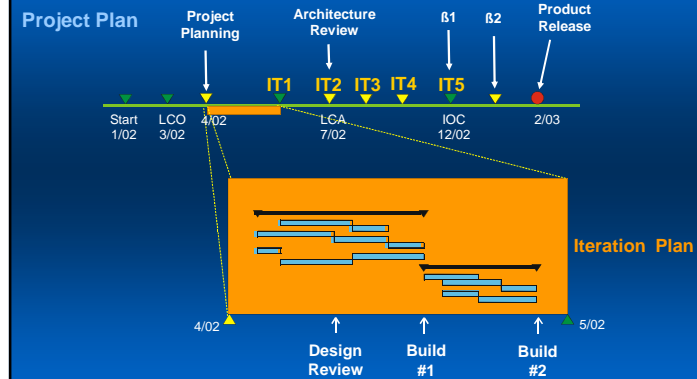
Work Structure, Schedule, & Budget

Resource	Role	Activities
Paul	Designer	Define Operations
Mary	Use-Case Specifier	Detail a Use Case
Joe	System Analyst	Find Actors and Use Cases
Sylvia	Implementer	Perform Unit Tests
Stefan	Architect	Identify Design Mechanisms
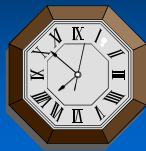
$$$

Project Management - Outline

◆ **Defining the Project Manager Role**

◆ **Planning Projects**

◆ **Managing Iterations**

  ▪ **The Definition of an Iteration**
  ▪ **Scope on an Iteration**
  ▪ **Iteration assessment**

◆ **Managing Risks**

An iteration

Process Disciplines   Inception   Elaboration   Construction   Transition

Engineering Workflow

- Requirements
- Analysis & Design
- Implementation
- Test

Supporting Workflows

- Config. & Change Mgmt
- Project Management
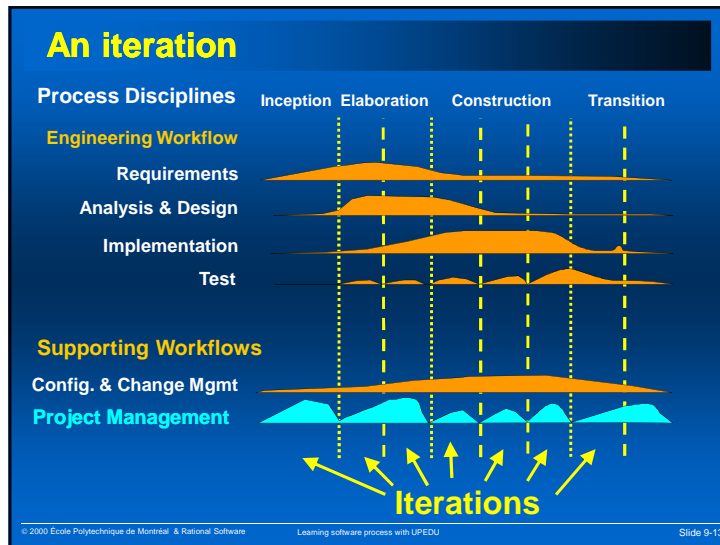
Iterations

Scope of an Iteration depends on Factors

- How many iterations should be included in the project plan?

	Total	I	E	C	T
Low	3	0	1	1	1
Typical	6	1	2	2	1
High	9	1	3	3	2

- How long should each iteration take?
  - Depends on a number of factors:
    - Size of the system being built: The larger the system, the longer the duration.
    - Number of people: The larger the number of people, the longer the duration.

UPEDU Concept: ITERATION

Based on Metrics

Metric	Meaning
Progress	Size and complexity
Stability	Rate of change in the project's complexity or size
Modularity	Scope of change
Quality	Number of errors
Maturity	Frequency of errors
Expenditures	Project expenditures against plan

Project Management - Outline

- Defining the Project Manager Role
- Planning Projects
- Managing Iterations

- Managing Risks
  - Risk Definition
  - Risk Strategies
  - Risk Assessments

Concepts Associated with Defining Risk

- ◆ **Risk:**
  - ▪ **Information missing on a given subject**

- ◆ **Indirect risk:**
  - ▪ **Project has little or no control**

- ◆ **Direct risk**
  - ▪ **Project has a large degree of control**

- ◆ **Risk attributes:**
  - ▪ **Probability of occurrence**

- ◆ **Risk magnitude indicator:**
  - ▪ **High, Significant, Moderate, Minor, Low**

UPEDU Concept: RISK

Risk Strategies

Risk acceptance
live with it

Risk avoidance
reorganize to eliminate the risk

Risk mitigation
reduce the probability or impact

Risk contingency
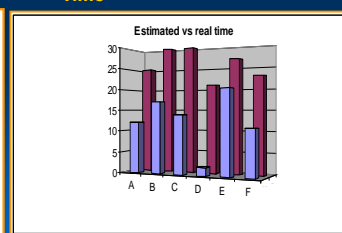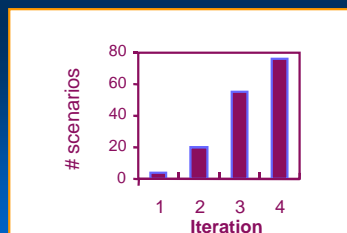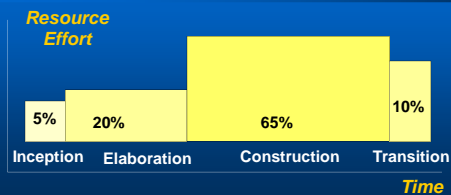plan "Plan B"

Risk transfer
sub-contract the risk

Measurements and Metrics

Resource Effort

5%   20%   65%   10%

Inception Elaboration Construction Transition

Time

scenarios — Iteration

Estimated vs real time