Software Engineering Project II

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Introduction to Software Engineering Project II

Course Objective: experience of designing complex software in small groups

- **Typically, groups of 5 students *(6 in exceptionally rare cases)***

> **Groups will decide on their own composition in the first week**
>
> **All groups will implement a common class project as proposed by me**
>
> **Class project for 2016: *Stochastic Search Project Allocation System***

- **Overall, the software project is worth 50% of the course grade**
- **Other 50% is based on 3 weekly assignments**
- **No end-of-course examination, but attendance at classes is *recorded / graded***

Course Schedule

The Course is divided into two parts:

- **Part I: Lectures, 3 assignments, organisation of groups**
- **Interim Report: independent group-based design for your project**
- **Part II: independent group-based implementation for your project**

Schedule:

Part I:	***Monday, 6 June to Sunday, 26 June***
Interim Report:	***Due Wednesday 29 June***
Part II:	***29 June to 17 July (date of final submission)***

Development Schedule

- **Team formation: weeks 1 – 2**
- **Project design: weeks 2 - 3 (deliverable: interim project report)**
- **Project development: weeks 4 - 8 (deliverable: final project report + demo)**

Key dates for 2016:

Team formation:	**Decision by Wednesday, 15 June**
Interim Report:	**Submitted by Wednesday, 29 June**
Final Report:	**Submitted by Sunday, 17 July**
Project Submission:	**Sunday, 17 July (full code/doc via Moodle)**

Interim Project Report: Design and Project Plan

Interim report: project specifications, design and schedule

- **About 12 – 15 pages**
- **Equal contribution from all group members**
- **State the specifications of the project (*what is to be achieved, features, etc.*)**
- **Detailed design (*functional description, flowcharts, etc.*)**
- **Schedule and work breakdown (*who does what, when, in what order*)**
- **Reporting structure: *how is communication maintained, progress measured?***

Team Structure: Who Does What?

When Choosing your team, decide on key role of each individual member:

- **Project leader:** Who will be reponsible for *pushing*, *organising*, *cajoling*
- **Technical skills:** Who is capable of doing which part of the project?
- **Reporting:** Everyone should contribute equally to reports, BUT: someone should *own* the document in each case.

Identify key skills required for the project, and who can provide them

After initial design, create a Work Breakdown Structure (WBS)

Assign individuals to elements of the WBS, ensure equal workloads

Team Structure: Getting Started

Start putting together your team now. Submit to me the following information

- **Team Name:** Give yourself a convenient handle, for listing etc.
- **Team Leader:** Identify contact person for team (provide email etc.)
- **Team members:** Provide names and student ids for all team members
  Remember: 5 members is ideal, 4 or 6 in rare cases only

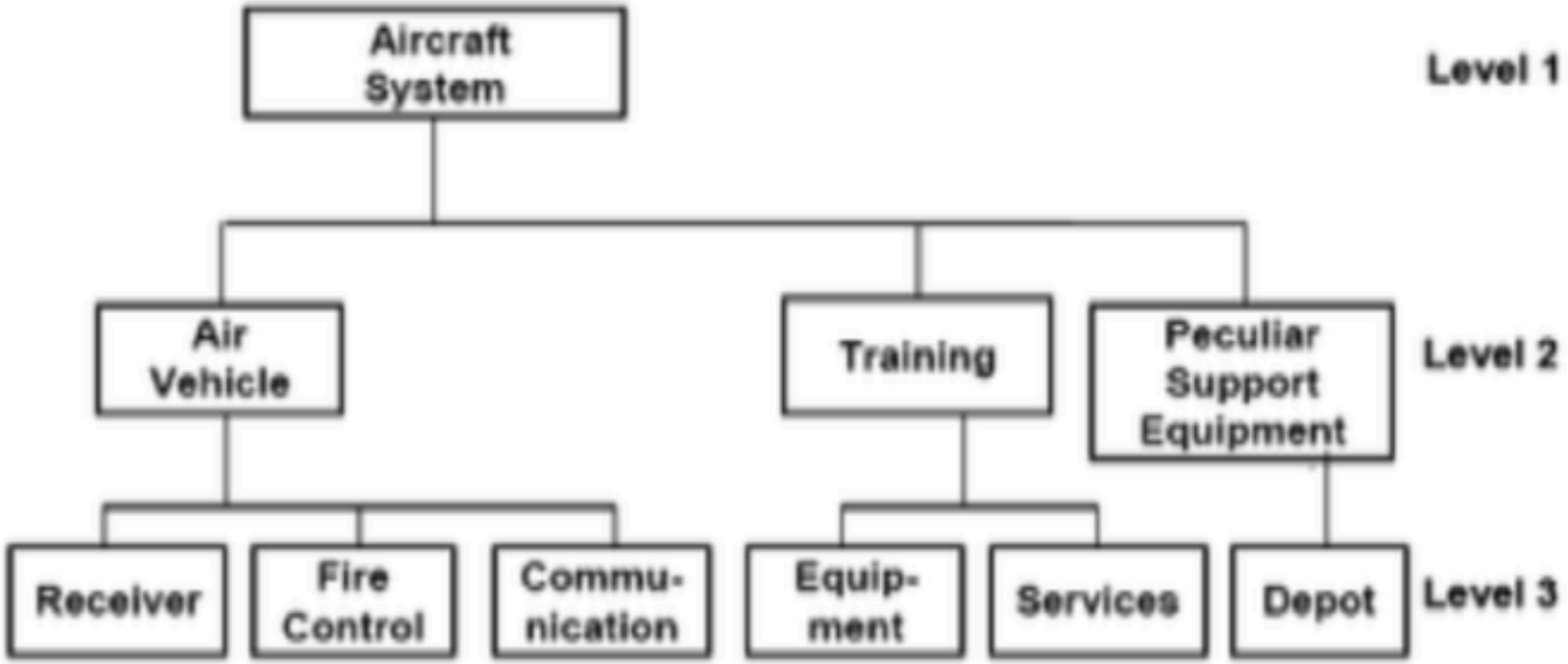
Make sure your team includes a balanced set of skills

Try to identify *weak links* early on, and put support structures in place

Establish internal communication routines *(e.g., weekly discussions)*

Work Breakdown Structures (WBS)

Identify key functions/components/behaviour in top-down fashion:



Creating your own Work Breakdown Structures (WBS)

- **Start with the end objective(s)**
- **Then successively subdivide these into manageable components**
- **Manageable work packages with deliverables and milestones, with:**

  - ***size,***
  - ***duration,***
  - ***responsibility***

  (e.g., systems, subsystems, components, tasks, work packages)

- **Ensure you include all steps necessary to achieve the objective.**

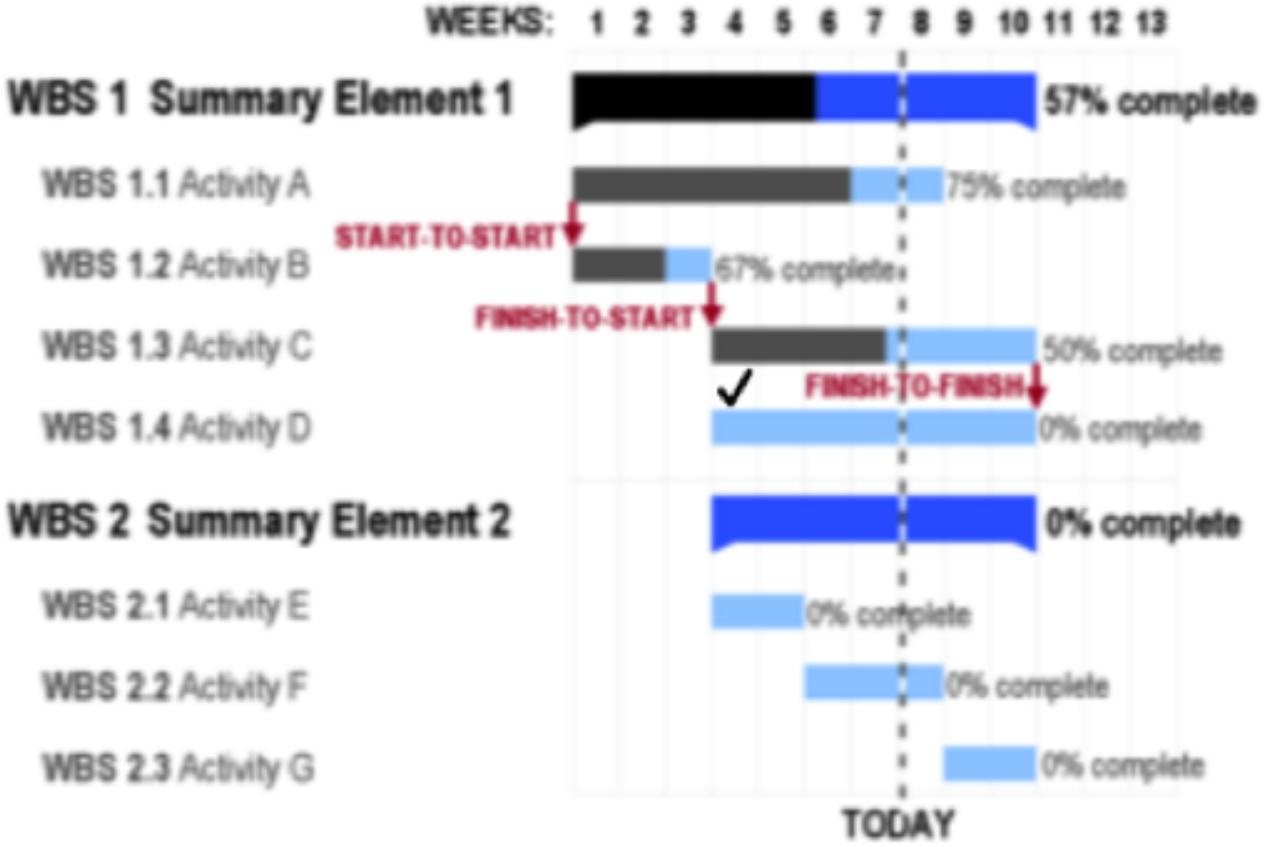
The 100% Rule in WBS Construction

An Obvious Piece of Common-Sense, yet one that is often overlooked:

- **The Total amount of project work should sum to exactly 100%**
  - **Not less than 100% (i.e., some work not identified or reported)**
  - **Not more than 100% (i.e., some work doubly counted or reported)**
- **In the Work Breakdown Structure, each task is listed just once**
- **Do not include the same task/feature in two or more parts of the WBS**
- **The work content of all children of a WBS node should sum to 100%**
- **Each WBS node should be fully exhausted by its child nodes.**

Scheduling with Gantt Charts

We use a special bar-chart to indicate start & duration of work-pages:



X-Axis is timescale. Dotted line indicates <u>Today</u>; Bars indicate duration

Interim Project Report: What to Include

Your Interim report should state the following:

- **Name of Team, *and* Names of team members**
- **Project description (requirements and specifications as you see them)**
- **Project Design (discussion of key issues, your approach to be taken)**
- **A detailed WBS/Work-Breakdown-Structure (with workpages, deliverables)**
- **Assignment of team members to work-packages in the WBS**
- **A Gantt chart describing the schedule of development on the WBS**

Final Project Report: What to Submit

Your Final report should state the following:

- **Specification of Project, with work-package overview**
- **Implementation Description (class diagrams, etc.)**
- **Analysis of Success / Failure (why you did/didn't implement, and why)**
- **Discussion of additional features (draw attention to extra/clever elements)**
- **Team analysis: who did what, and how much (breakdown of effort)**
- **Overall, about 20 pages**