WSU Girls Who Code College Loops

PROFESSOR MEET & GREET

Join us for food, games, and getting to know your Computer Science professors!

When: Wednesday, August 31st
6:00 - 7:30 PM

Where: Spark G10

Lect. #3: Project Management
Project Scope 2

dilbert.com/strip/2012-01-04

Announcements

- PM1 available today; due Tuesday, 9.6.22, by 11:59 pm

- Majors, names, and email addresses for everyone have been posted in Canvas in the Useful Information module

- A google doc is available at majors (this link is in Canvas Announcements)

- 75 CptS, 13 EE, 10 CptE, 6 SE, 4 CptA majors = 12 CptS teams, 2 EE teams, 1 CptE team, 1 SE team, and 2 mixed teams: (4 CptA + 2 CptS) & (4 CptE + 1 EE + 1 CptS)

- Deadline for forming groups is Thursday, 9.15.22, @11:59 pm

Agenda for Today

1. Scoping a Project: Work Breakdown Structure (WBS), Responsibility Assignment Matrix (RAM), Augmented RAM, Dependencies, and Network Diagram

2. PM Example: Speedgolf

Poll

Are you interested in becoming a project manager right after you graduate?

A. Yes, definitely

B. No, I'm not at all interested

C. I might look around to see if anything appeals to me

D. Not after I graduate but maybe in the future
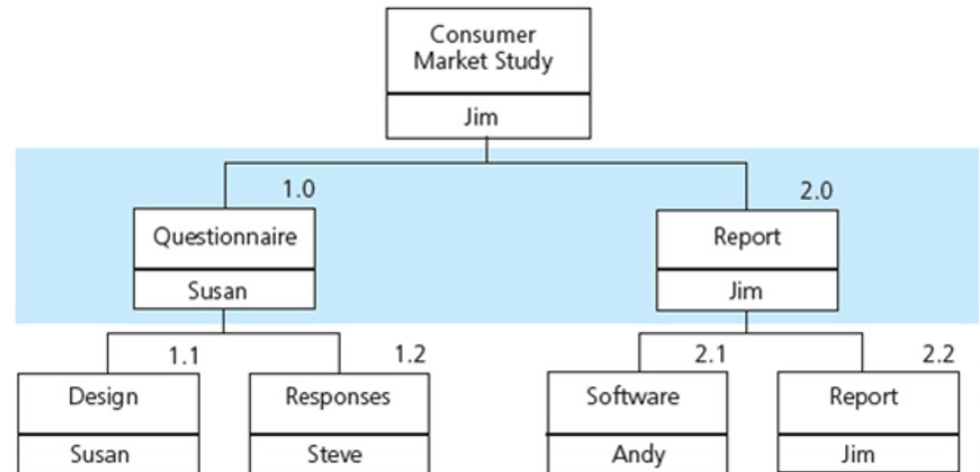
PM: Speedgolf Example
1. Project Objective Redux

Create and install a scoring system at Palouse Ridge Golf Club that enables a speedgolf tournament to be automatically scored, with real-time (hole-by-hole) results displayed on a website. The project requires delivery of a wireless hardware infrastructure and a software application. It must be started on Jan. 2, 2023, and be completed by Jun. 30, 2023.

Last week, we discussed 1) project requirements, 2) statement of work, 3) deliverables, and 4) acceptance criteria.
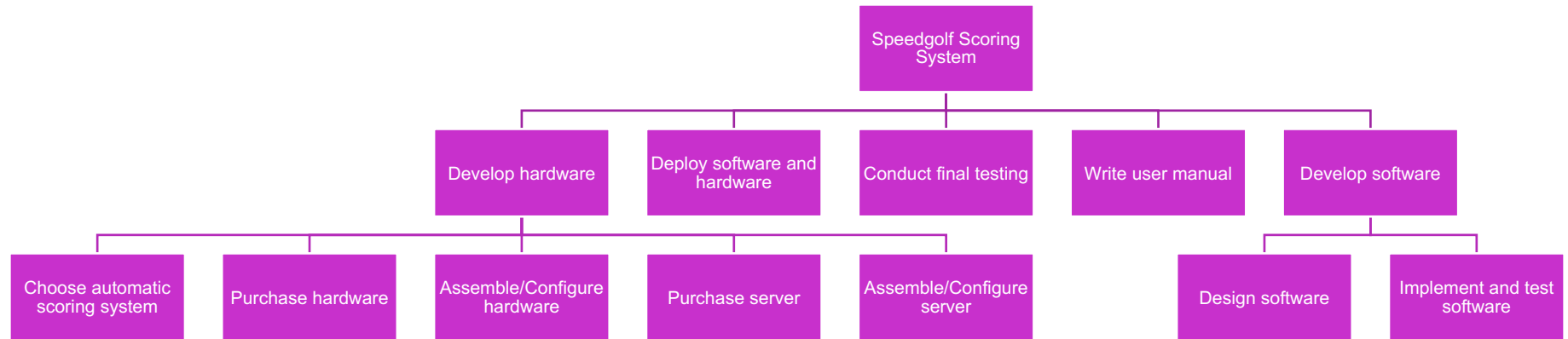
PM: Work Breakdown Structure (WBS)

- Hierarchical tree of project scope
- WBS divides project into pieces called work items
- Lowest level on branch, i.e., leaf, is work package associated with tasks needed to produce deliverable
- Each work package represents one deliverable
- WBS isn't detailed

PM: Speedgolf Example
5. Work Breakdown Structure (WBS)

- The WBS is the *framework* for how the work will get done to produce the project deliverables.

- Note that the project deliverables include more than the major deliverables, i.e., hardware, software, and user manual; they include other deliverables which lead to the major deliverables.

- Note also that work packages (leaves) don't necessarily all occur at the same level in the WBS

PM: Speedgolf Example
5. Work Breakdown Structure (table form), partial

WBS #	Description	Responsible	Deliverable for Each Work Package
1	Develop hardware	Dave	
1.1	Choose automatic scoring system	Dave	Technical memo stating choice and rationale
1.2	Purchase hardware	Jill	Hardware
1.3	Assemble/configure hardware	Dave	Hardware assembled and configured
1.4	Purchase server	Dave	Server
1.5	Assemble/configure server	Jill	Server assembled and configured
2	Develop software	Chris	
3	Deploy software and hardware	Chris	Hardware and software in place
4	Conduct final testing	Chris	System meeting acceptance criteria
5	Write user manual	Chris	User manual

- The person responsible will be the primary resource in the RAM.

Poll

Do you know how to golf?

A. Yes

B. No

C. Kind of

D. Other

PM: Responsibility Assignment Matrix (RAM)

- Matrix indicating who is responsible for completing a work package

- Different kinds of RAMs exist; common one based on RACI

- We'll work with a much simpler RAM which is from our textbook

Responsibility Assignment MATRIX

R	A	C	I
Responsible	Accountable	Consulted	Informed

RESPONSIBILITY ASSIGNMENT MATRIX

	PERSON 1	PERSON 2	PERSON 3	PERSON 4	PERSON 5	PERSON 6	PERSON 7	PERSON 8
Work package 1	R		C		A	I		
Work package 2		A	I				A	R
Work package 3		C		R		A	I	
Work package 4	I		A		C	R		

PM: Speedgolf Example
6. Responsibility Assignment Matrix (RAM), partial

Item #	Description	Chris	Dave	Jill
1	Develop hardware		**P**	S
1.1	Choose automatic scoring system		**P**	S
1.2	Purchase hardware		S	**P**
1.3	Assemble/configure hardware		**P**	S
1.4	Purchase server			**P**
1.5	Assemble/configure server		**P**	S
2	Develop software	**P**		S
3	Deploy software/hardware	**P**	S	S

- The RAM is like the table form of the WBS, i.e., it contains all work items including work packages

- Rather than deliverables for work packages, however, it shows the person with primary responsibility (**P**) and person or persons with support responsibility (S)

PM: Work Package Tasks

- WBS is high-level; doesn't include how a work package will be completed

- Next step is to break work packages into tasks

- Tasks should be scheduled so that the time they typically take shouldn't be longer than the period between monitoring the progress of the project.

- Tasks are also known as activities.

PM: Speedgolf Example
5. Work Breakdown Structure
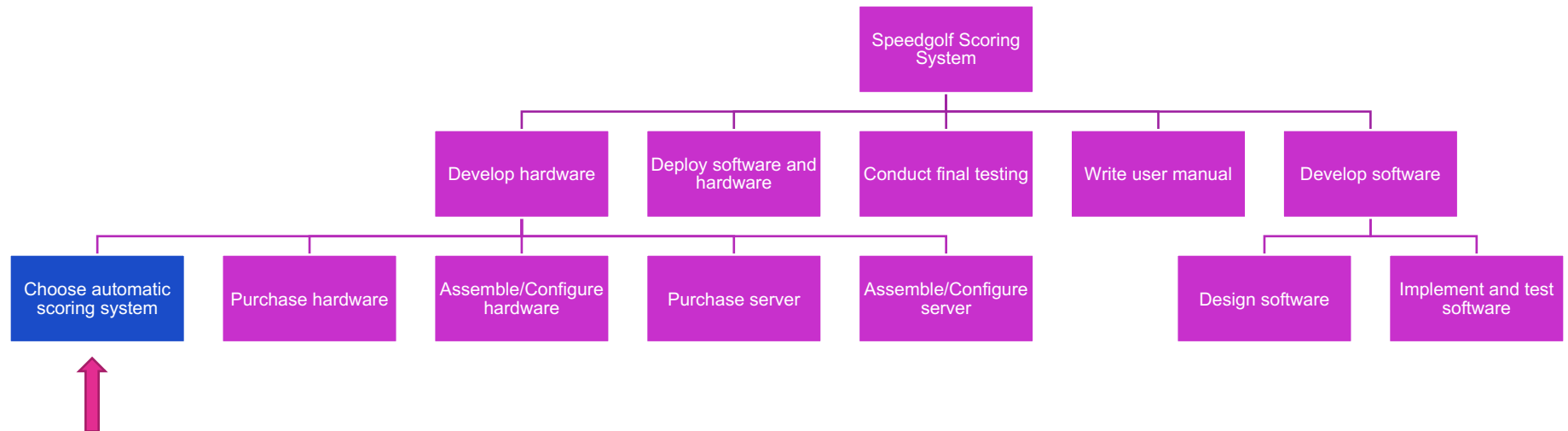
PM: Speedgolf Example
7. Work Package Tasks

Work package: Choose automatic scoring system

Tasks:

- Research hardware alternatives

- Meet with client to discuss alternatives and to choose viable candidates

- Purchase hardware samples

- Build and test prototypes

- Choose best solution in consultation with client

PM: Speedgolf Example
8. Augmented RAM (ARAM), very partial

Item #	Description	Chris	Dave	Jill
1	Develop hardware		**P**	S
1.1	Choose automatic scoring system		**P**	S
1.1.1	Research hardware alternatives			**P**
1.1.2	Meet with client to discuss alternatives and to choose viable candidates	**P**		
1.1.3	Purchase hardware samples			**P**
1.1.4	Build and test prototypes			**P**
1.1.5	Choose best solution in consultation with client	**P**		

- The ARAM includes all work items, including work packages, as well as all the tasks needed to complete a work package.

- Note how items are numbered. The work item is 1, the work package is 1.1, and the tasks to complete a work package are 1.1.1-1.1.5.

PM: Speedgolf Example
5. Work Breakdown Structure
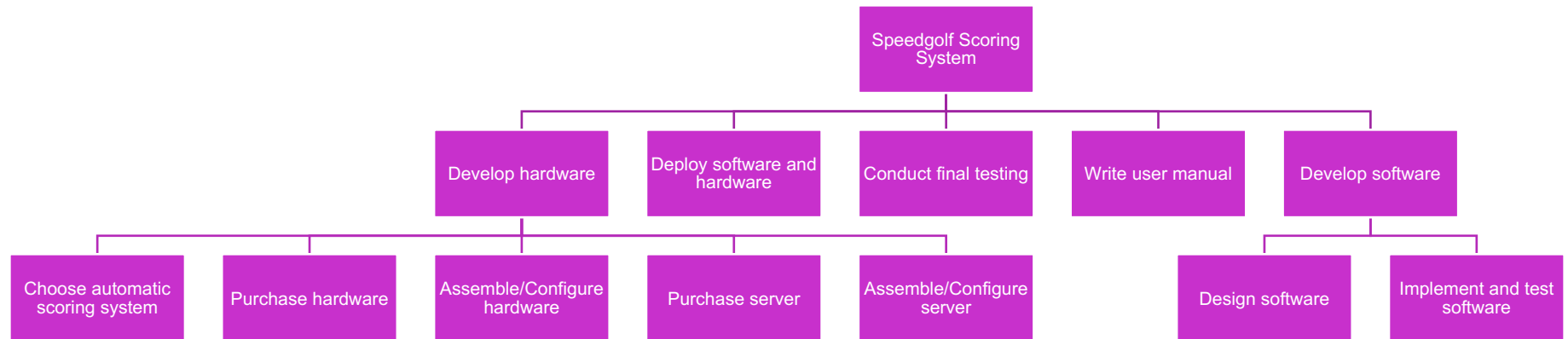
- Work packages are the lowest leaves on the tree.

- How many work packages are there in this tree?

- 10!

Breakout Discussion (<mark>5 min</mark>)

Break down "Design software" work package into tasks

- Task 1
- Task 2
- Task 3
- Task 4
- …
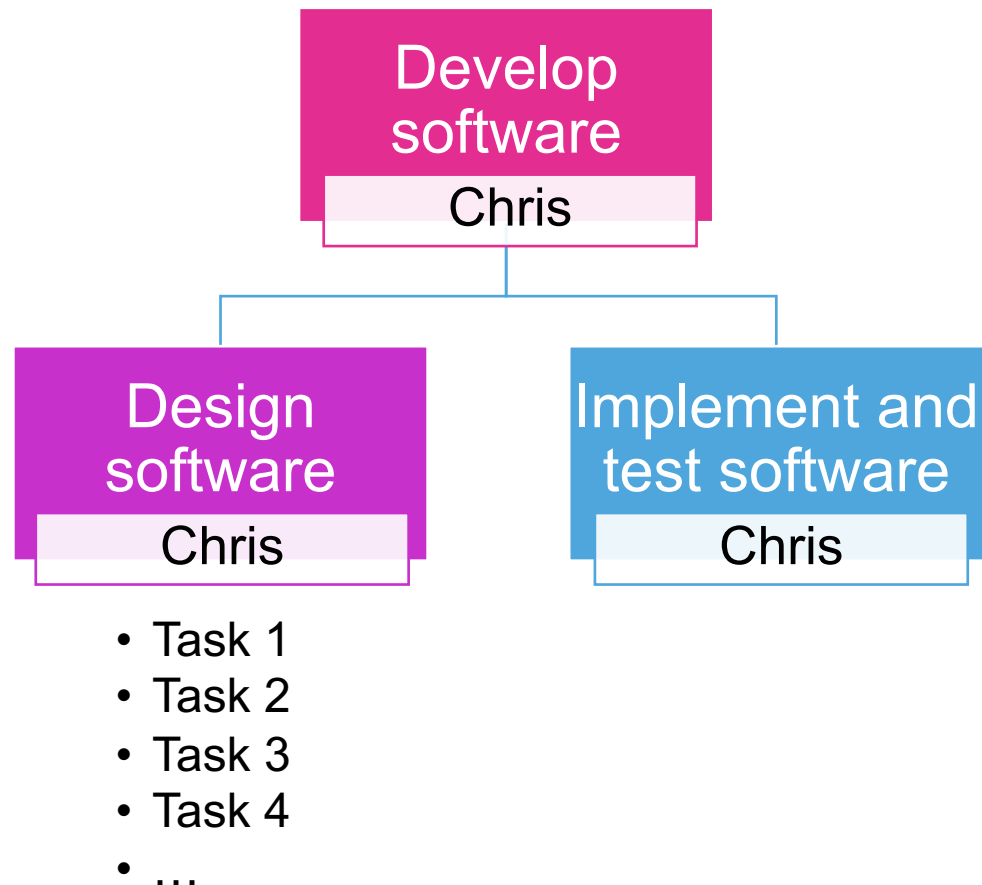
PM: Speedgolf Example
2. Project Requirements (from Lect. #2)

1. Tournament set-up (tournament director)
   a. Entry of name, date, and other tournament details
   b. Entry of competitor names and tee times
2. Tournament scoring
   a. Competitor's round clock must start automatically at designated tee times with the ability for manual override
   b. Competitor's time for each hole must be automatically logged when the ball is holed
   c. Competitor's score for each hole must be automatically recorded
   d. Scoring system must determine when a player has passed another player
   e. Tournament director must be able to correct scoring manually
3. Tournament reporting
   a. Real-time tournament results must be displayed on a live leaderboard which automatically refreshes while tournament is in progress
   b. Leaderboard results must be searchable and readable

Note 1. Because the scoring is web-based, some latency is expected. However, this latency should be minimized using a clock synchronization scheme.
Note 2. The system should be able to function in windy and rainy weather conditions.

PM: Speedgolf Example
7. Work Package Tasks for Design Software

Design software

Chris

- Construct prototype of tournament director interface
- Construct prototype of scorer interface
- Construct prototype of leaderboard interface
- Write test protocol
- Recruit and schedule participants
- Run study
- Analyze study results and refine

PM: Rules for Network Diagram Creation

- Each task represented as a box; unique activity number in lower left

- Arrows used to show precedence relationships, i.e., dependencies
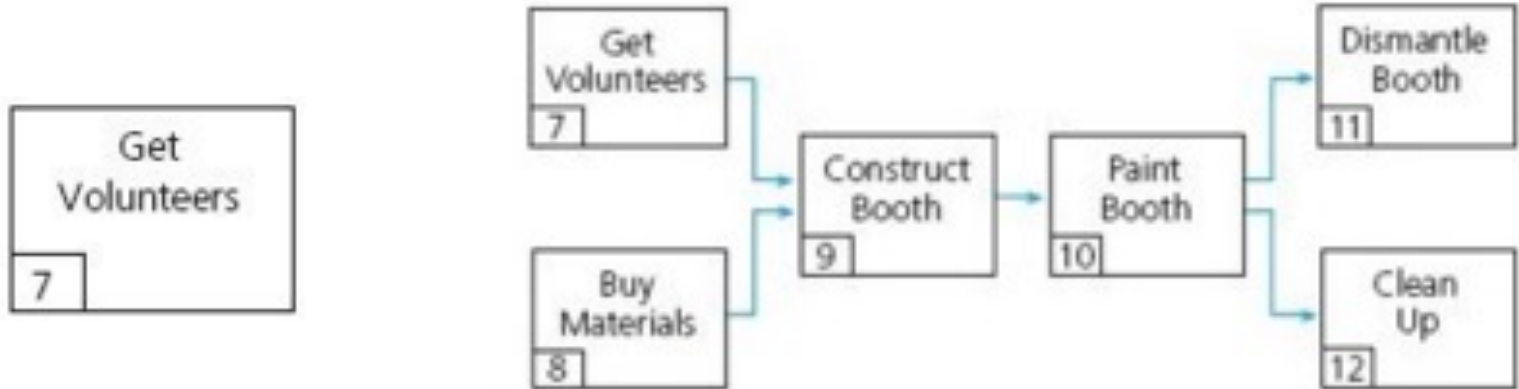
PM: Speedgolf Example
8. High-Level Dependencies

- Need to choose hardware solution *before* we purchase, assemble, configure, install, or test it

- Some of the software development can proceed prior to completion of hardware

- Can't implement features until they're designed

- Can't test features until they're implemented

- User manual can be developed incrementally or all at end of project

PM: Speedgolf Example
9. Network Diagram
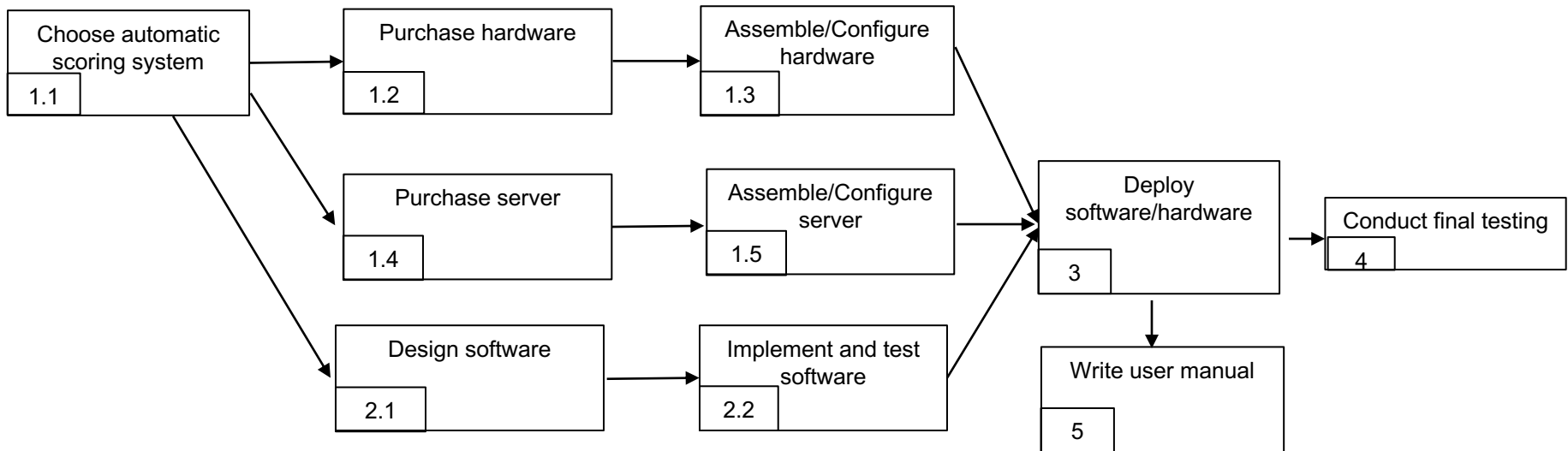
Notes:
- This is a high-level network diagram
- A complete network diagram requires all the tasks that comprise the work packages, e.g., for "Design software" we've identified 7 tasks

Poll

Have you used Project Libre before?

A. Yes, a little

B. Yes, a lot (I'm very familiar with it)

C. No; I didn't even know it existed

D. No, but I have heard of it