

Work Breakdown Structure and Activities for the Cell Phone Design Project

MAJOR SUBPROJECTS/ACTIVITIES	ACTIVITY IDENTIFICATION	DEPENDENCY	DURATION (WEEKS)
Product specifications (P) Overall product specifications	Market research	P1	2
	Hardware	P2	4
	Software	P3	5
	Software	P4	5
Supplier specifications (S)	Hardware	S1	5
	Software	S2	6
Product design (D)	Battery	D1	1
	Display	D2	2
	Camera	D3	1
	Outer cover	D4	4
		D1, D2, D3	
Product integration (I)	Hardware	I1	3
	User interface	I2	4
	Software coding	I3	4
	Prototype Testing	I4	4
Subcontracting (V)	Suppliers selection	V1	10
	Contract negotiation	V2	2
		S1, S2 I4, V1	

activity must be fully completed before work on the following activity can be started.

Your project is divided into five major subprojects. Subproject "P" involves developing specifications for the new cell phone. Here decisions related to such things as battery life, size of the phone, and features need to be made. These details are based on how a customer uses the cell phone. These user specifications are redefined in terms that have meaning to the subcontractors that will actually make the new cell phone in subproject "S" supplier specifications. These involve engineering details for how the product will perform.

The individual components that make up the product are the focus of subproject "D." Subproject "I" brings all the components together, and a working prototype is built and tested.

Finally in subproject "V," suppliers are selected and contracts are negotiated.

1. Draw a project network that includes all the activities.
2. Calculate the start and finish times for each activity and determine the minimum number of weeks for completing the project. Find the activities that are on the critical path for completing the project in the shortest time.

3. Identify slack in the activities not on the project critical path.

4. Your boss would like you to study the impact of making two changes to how the project is organized. The first change involves using dedicated teams that would work strictly in parallel on the activities in each subproject. For example, in subproject P (product specifications) the team would work on P1, P2, P3, and P4 all in parallel. In other words, there would be no precedence relationships within a subproject—all tasks within a subproject would be worked on at the same time and each would take the same amount of time as originally specified. With this new design, all the subprojects would be done sequentially with P done first, then S, D, I, and finally V. What would be the expected impact on how long it would take to complete the project if this change were made?

5. The second change your boss would like you to consider would be to select the suppliers during subproject P and have them work directly with the dedicated teams as described in 4. This would involve adding an additional activity to subproject P called supplier selection and contract negotiation (P5) with a duration of 12 weeks. This new activity would be done in