Project Planning and Activities

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Step 3: Analyse project characteristics

1. Distinguish the project as either objective or product driven
2. Analyse other project characteristics (e.g. safety critical?)
3. Identify high level project risks - e.g. acceptance from users
4. Take into account user requirements concerning implementation and methodologies
5. Select development methodology and life-cycle approach
6. Review overall resource estimates

Step 4: Identify project product and activities

1. Identify and describe project products (or deliverables)
   - work will produce intermediate products - documents, software, test suites, etc . . .
   - Product Breakdown Structure (PBS)
   - to each product should be described with a name, purpose, derivation, composition, form, standards, quality criteria to decide if it is acceptable
2. Document generic product flows - relations to be described with Product Flow Diagram (PFD)
3. Recognize product instances
4. Produce ideal activity network
5. Modify the ideal to take into account need for stages and checkpoints

Activity Planning

Detailed planning

A detailed project planning requires to precisely define start and end of activities. This will permit to:

- ensure that the appropriate resources are available when required
- avoiding activities competing for the same resources at the same time
- produce a detailed schedule showing which staff carry out each activity
- produce a detailed plan against which actual achievement may be measured
- produce a timed cash flow forecast
- replan the project in case of drift from the plan

Planning generally aims at shortening project duration. One strategy, when possible, is to put activities in parallel

Project schedules

Before the start of the project (project execution) the plan should define when each activity will start and end, and when and how much each resource will be required. Then the scheduling proceed in 4 consecutive steps:

- what activities need to be carried on, and build an ideal activity plan - infinite resources
- Consider for each activity the associated risks, and then revise the plan
- Now consider the real resources that will ba available to run the project, and put constraints related to their availability. The result constitute the scheduling of the project

Defining activities

General recommendations:

- Project can start when at least one activity is ready to start and finish when all activities are declared completed
- Activities start could depend on the availability of specific artefacts and/or dependencies from other activities

Three approaches to activity identification:

- Activity based
- Product based
- Hybrid

Network planning models

Activities and relations are modeled as a network – the "Critical Path Method" can then applied.

Network characteristics:

- one start and one end
- nodes have a duration
- links have no duration
- An arrows originating in A and ending in B affirm that B cannot start until A has not finisced
- no loop
- no dangling activities

Earliest Start	Duration	Earliest Finish
Activity label, activity description		
Latest Start	Float	Latest Finish

Project duration and definition of activities start/end

	Activity	Duration (weeks)	Precedents
A	Hardware selection	6	
B	System Configuration	4	
C	Install Hardware	4	A
D	Data Migration	4	B
E	Draft Office Procedures	3	B
F	Recruit Staff	10	
G	User Training	3	E,F
H	Install and Test System	2	C,D

In order you can apply:

- Forward pass

- Backward pass

- Critical path identification

- Activity float identification - free float and interferring float

- Shortening project duration and conflicts handling

Arrow based approaches

It is possible to use alternative representations where activities are used to mark arcs. Nodes are now representing start/end of activities. Similar analysis can be carried on

- carefully consider unnecessary constraints introduced by the representation and use dummy activities

Exercise CPM

Consider a project in which the foreseen activities and dependencies are the ones specified in the Table, where the duration is expressed in weeks, and the effort is expressed in terms of needed Senior Developers (SD) and Junior Developers (JD) respectively:

Task	Duration	Effort	Depends on
T1.1	10	20 SD/10 JD	
T1.2	12	24 SD/12 JD	
T1.3	6	6 SD/0 JD	T1.1
T1.4	2	2 SD/2 JD	
T2.1	2	4 SD/2 JD	
T2.2	6	12 SD/6 JD	T1.3,T2.3
T2.3	8	0 SD/8 JD	T2.1
T3.1	4	12 SD/8 JD	T1.2, T1.4
T3.2	16	0 SD/32 JD	T3.1
T4.1	6	12 SD/6 JD	T3.2
T4.2	4	8 SD/0 JD	T2.2

- Report the CPM network and derive the total duration of the project, as well as the various floats for each activity