

Project Management

Lecture notes

Lec#4 Basic scheduling

Checking consistency and remove redundancy in project Networks

- A project network should not contain any loop
- In a large networks finding inconsistencies is difficult

Methods:

1- Topological ordering of activities(no activity appear until all its predecessors are appeared)

2- Fulkerson's numbering rule (numbering the nodes such that for any activities going from node i to node j , i should be less than j).

3- squaring adjacency Matrix (another way of representing project networks)

Topological ordering

- Step#1 job with no predecessors are located on the top of the list (source)
- Step#2 delete the jobs that placed from the predecessors list of all remaining jobs
- Step#3 identify any new source so generated for placement on the list and do step 2
- Step#4 continue until :
 - a) no more source in the remaining job
 - b) all job are placed in the list

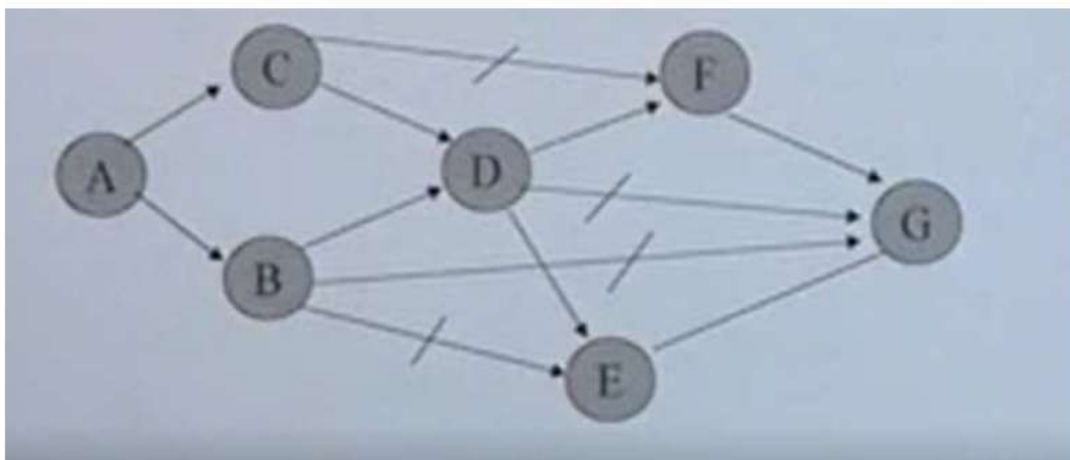
Example (class activity)

Redundancy check- Example

- Redundancy is the present of unnecessary information

- Example:

Job	Predecessor
A	---
B	A
C	A
D	B,C
E	B,D
F	C,D
G	B,D,E,F



Basic scheduling in A-O-A Networks

- Activities Duration

1- Deterministic (based on previous experience. i.e constructing new solar park) it can be taken from a expert who has prior knowledge in those activities)

2- Probabilistic (optimistic, most likely or pessimistic estimation)

Example

Job	Predecessors	Duration (days)
A	--	2
B	--	3
C	A	1
D	A,B	4
E	D	5
F	D	8
G	C,E	6
H	C,E	4
I	F,G,H	3

Critical path

- The longest path in the network
- Lower bound on the project duration (project cannot be implemented in the time less than critical path duration) or Minimum possible duration of the project.
- How to find critical path:
count all paths in the network

Critical path identification

- Forward path
- Backward path
- Early start early finish
- Late start late finish
- Total number of floats
- Critical path

Note: Follow the example that we will solve during the class time

Planning Overview

Planning is iterative

- Planning is a continues task
- Much of planning is up front
- Iteration of the planning is happen through the project

Planning by phases:

- Phases are logical groupings of the project work
- The phases are usually sequential

Planning creates documents

Project management is the collection of several plans i.e. (scope, time, cost, quality, HR, communication, procurement, stakeholders,...)

Planning the project

- Planning is ongoing
- Progressive elaboration (as more information become available we can plan with more detail)
- Rolling wave planning (planning by phases)
- Checkpoints (at the end of the phase we can plan for next phase)



Writing the project scope statement

What is the project scope

- What is the project will create
- Everything that's expected
- Define what is excluded

Define Scope

- Detail description of the project or product
- Project boundaries
- Project scope statement (document of the project requirements)

Project Charter vs Project Scope

◦ Project Charter

- Project purpose or justification
- Measurable project objectives
- High-level requirements
- High-level project description
- High-level risks
- Summary milestone schedule
- Summary budget
- Stakeholder list
- Project approval requirements
- Assigned project manager, responsibility, and authority level
- Name and authority of the sponsor

◦ Project Scope

- Project scope description
- Acceptance criteria
- Project deliverables
- Project exclusions
- Project constraints
- Project assumptions

Creating the project schedule

- When activities are going to happen
- Availabilities of the resources

Logic in scheduling

Hard logic (must happen in particular order, critical path)

Soft logic (when we have flexibility to schedule the activities)

Calendaring

Project calendar (when the work can happen)

Resource calendar (when the resources are available)

Project cost estimation

- Budget is the amount to create the project
- The estimate what the project should cost based on the requirements we have
- Budget may be amount available
- Cost estimate normally come first

Factor in cost estimation

Labor

Things (equipment's, SW, materials,...)

Cost of vendors

Life cycle costing (operation and maintenance cost)

Three estimate types

- Rough estimate (quick and unreliable)
- Budget estimate (base on scope statement, moderate reliable)
- Definitive estimate (accurate, take time to create)

All have a range of variance

Planning for project quality

- What's Quality:
- Conformance to requirements
- Fitness to use
- Delivering exactly what is promised, nothing more or less.

Quality and Grade

- Quality is the conformance to requirements
- Grade is ranking of product or service (i.e. gold, silver, Bronze)
- Use more appropriate grade for the projects

Quality control

- Inspection of work for quality
- Inspection of work for adherence
- What to do with defects (doing corrective actions to enhance the quality according the project scope)

Risk management plan

Threats and opportunities are risks

- How to identifying the risks
- How risks will be tracked
- How risk will be managed
- How risk will be analyzed

Risk Definition

- Risk are uncertain
 - Risks are negative or positive
 - Risks threaten project objectives
 - Risk and reward
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- The idea of the risk analysis is that to identify the probability of risk happening and if it does happened what's the impact to the project.

Negative risk Planning

- Avoidance (change the work to avoid the risk)
- Transference (hire someone to manage the risk)
- Mitigation (lower the probability/impact)
- Acceptance (accept the risk)

Positive Risk planning

- Enhance (make the risk happen)
- Exploit (take advantage for the risk)
- Sharing (partner for the opportunity)
- Acceptance (Accept the risk)