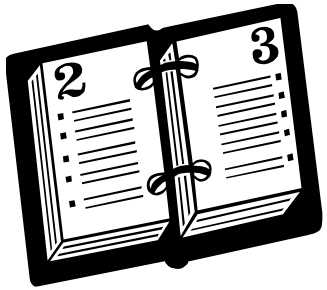
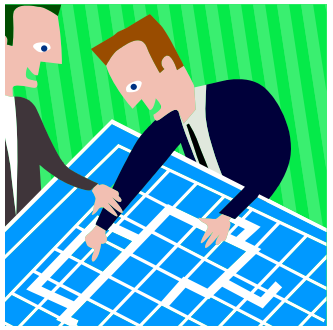
The University of Sydney

Info5990 Professional Practice in IT

Lecture 06 A & B





(Only) An introduction

to Project Management

You will learn a lot more on IT Project Management course

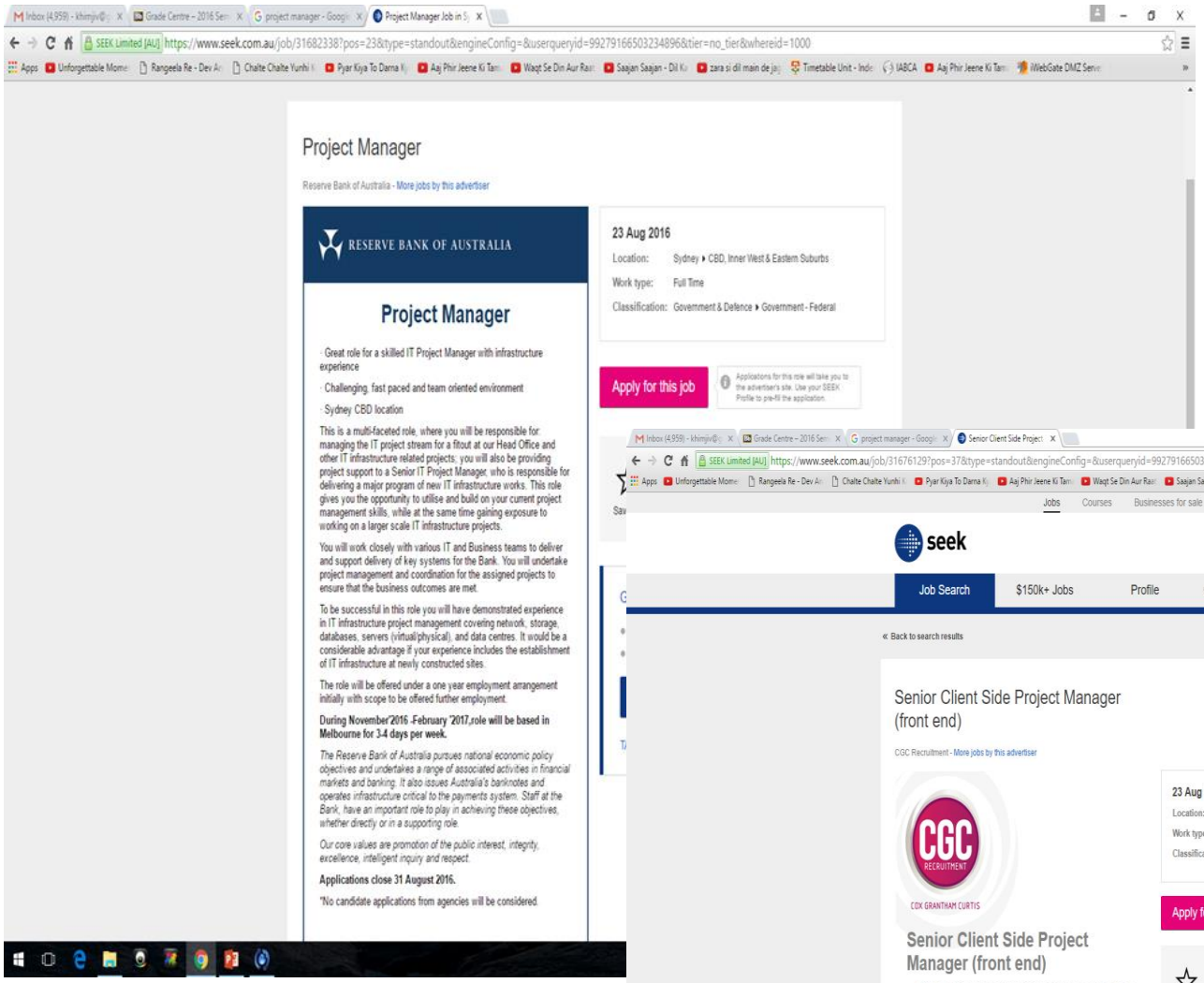
By the end of this lecture you will be able to:

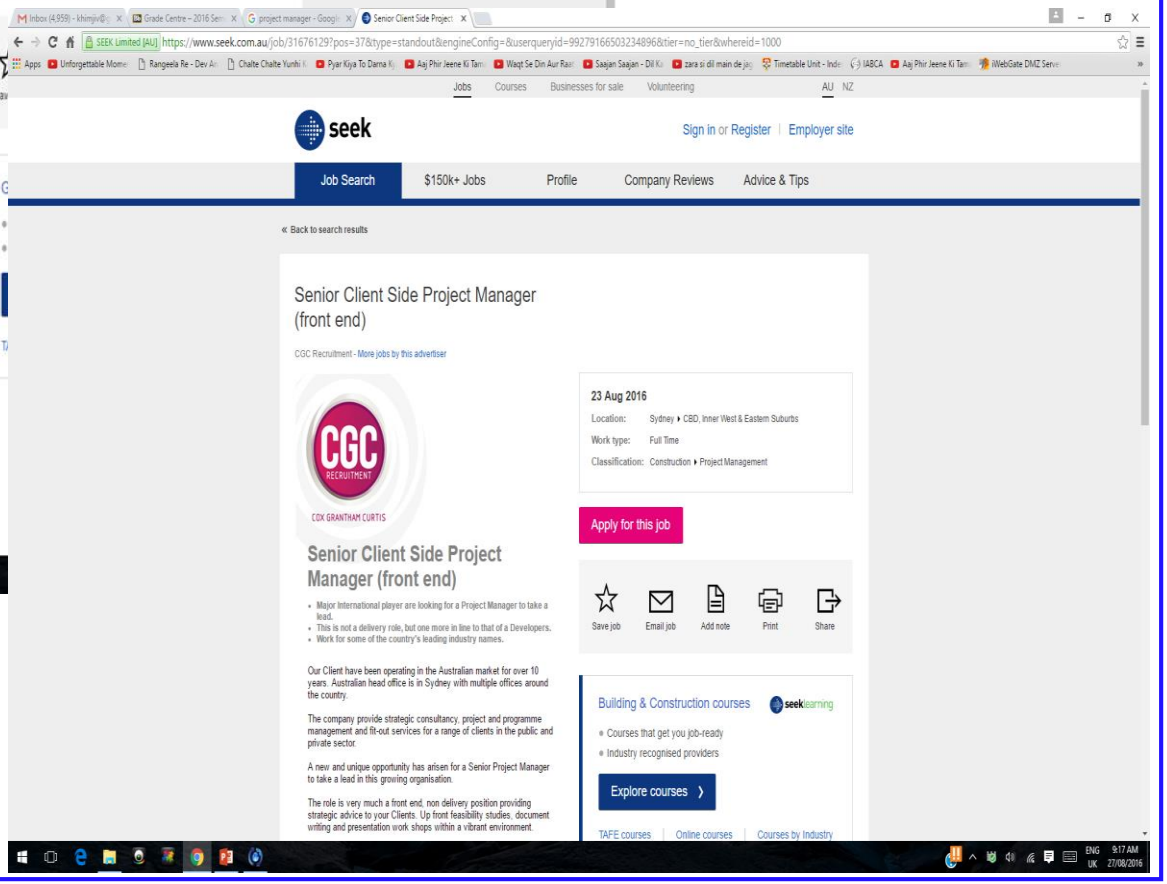
- Appreciate the need for project management in Information Technology
- Determine a work breakdown structure
- Describe some common approaches to estimating the effort required for IT projects
- Understand tools such as network diagrams, critical path,etc
- Understand what is meant by ‘crashing’ a project
- Case studies

I.T Project Managers

Depending on experience
Can earn between $70K - $200K Full time
Hourly rate on contract rates between $80/hr - $200hr
Or $600 - $1500 per day !

Anyone interested ? – then listen !


Project Manager
Reserve Bank of Australia - More jobs by this advertiser
RESERVE BANK OF AUSTRALIA
Project Manager
· Great role for a skilled IT Project Manager with infrastructure experience
· Challenging, fast paced and team oriented environment
· Sydney CBD location
This is a multi-faceted role, where you will be responsible for managing the IT project stream for a fitout at our Head Office and other IT infrastructure related projects; you will also be providing project support to a Senior IT Project Manager, who is responsible for delivering a major program of new IT infrastructure works. This role gives you the opportunity to utilise and build on your current project management skills, while at the same time gaining exposure to working on a larger scale IT infrastructure projects.
You will work closely with various IT and Business teams to deliver and support delivery of key systems for the Bank. You will undertake project management and coordination for the assigned projects to ensure that the business outcomes are met.
To be successful in this role you will have demonstrated experience in IT infrastructure project management covering network, storage, databases, servers (virtual/physical), and data centres. It would be a considerable advantage if your experience includes the establishment of IT infrastructure at newly constructed sites.
The role will be offered under a one year employment arrangement initially with scope to be offered further employment.
During November'2016 -February '2017,role will be based in Melbourne for 3-4 days per week.
The Reserve Bank of Australia pursues national economic policy objectives and undertakes a range of associated activities in financial markets and banking. It also issues Australia's banknotes and operates infrastructure critical to the payments system. Staff at the Bank, have an important role to play in achieving these objectives, whether directly or in a supporting role.
Our core values are promotion of the public interest, integrity, excellence, intelligent inquiry and respect.
Applications close 31 August 2016.
*No candidate applications from agencies will be considered.
23 Aug 2016
Location: Sydney ▸ CBD, Inner West & Eastern Suburbs
Work type: Full Time
Classification: Government & Defence ▸ Government - Federal
Apply for this job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Senior Client Side Project Manager (front end)
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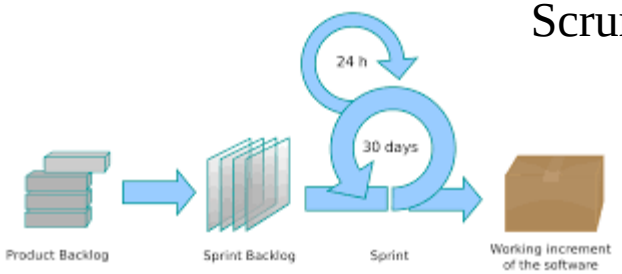
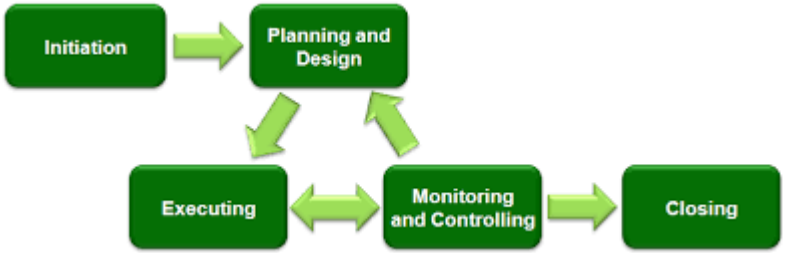
COX GRANTHAM CURTIS
23 Aug 2016
Location: Sydney ▸ CBD, Inner West & Eastern Suburbs
Work type: Full Time
Classification: Construction ▸ Project Management
Apply for this job
Senior Client Side Project Manager (front end)
Major International player are looking for a Project Manager to take a lead.
This is not a delivery role, but one more in line to that of a Developers.
Work for some of the country's leading industry names.
Our Client have been operating in the Australian market for over 10 years. Australian head office is in Sydney with multiple offices around the country.
The company provide strategic consultancy, project and programme management and fit-out services for a range of clients in the public and private sector.
A new and unique opportunity has arisen for a Senior Project Manager to take a lead in this growing organisation.
The role is very much a front end, non delivery position providing strategic advice to your Clients. Up front feasibility studies, document writing and presentation work shops within a vibrant environment.
Save job
Email job
Add note
Print
Share
Building & Construction courses
seeklearning
Courses that get you job-ready
Industry recognised providers
Explore courses
TAFE courses
Online courses
Courses by Industry

Basic PM

Scrum /Agile





More detailed coverage in the IT PM course

First a case study:

Thoughts for you Group Assignment !

The NZ Police 'INCIS'* project – 1

Gauld, Goldfinch and Dale, 2006

Does not matter if it is from 1990's ?

- **1993** Initial estimate $NZ30.1 Million (3 phases)
  Annual cost of crime to the nation $4.8 Billion
  Expected benefits $NZ5.3 Billion over its lifetime
- **1995** New user requirements
- **1996** Change in operating system from OS/2 to NT, change in network protocol from token ring to Ethernet, TCP/IP

*Integrated National Crime Investigation System

The NZ Police 'INCIS'* project – 2

Gauld, Goldfinch and Dale, 2006

- **1997** Project 12 months behind, project manager resigns
- **1998** Revised estimate $NZ118 Million (4 times original estimate)
- **1999** March: Phase 1 complete, cost estimate now $NZ126.7 Million

*Integrated National Crime Investigation System

The NZ Police ‘INCIS’* project – 3

Gauld, Goldfinch and Dale, 2006

- **1999** August: IBM the hardware supplier pulled out
- **2000** Project cancelled at a cost of over $NZ100 Million and with only phase one completed.

*Integrated National Crime Investigation System

What do you think went wrong?

Who was to blame?

1. _____

2. _____

3. _____

4. _____

Question

Any projects you have been involved in that look like this one ?

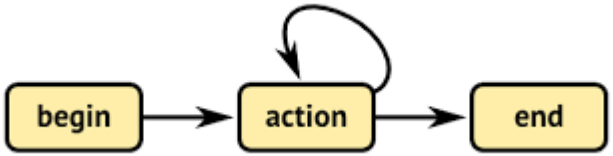
An introduction to project management

What is a project?

"A project is a *temporary* endeavour undertaken to create a *unique* product or service over a period of defined time."

A project has a clearly defined

beginning and end.



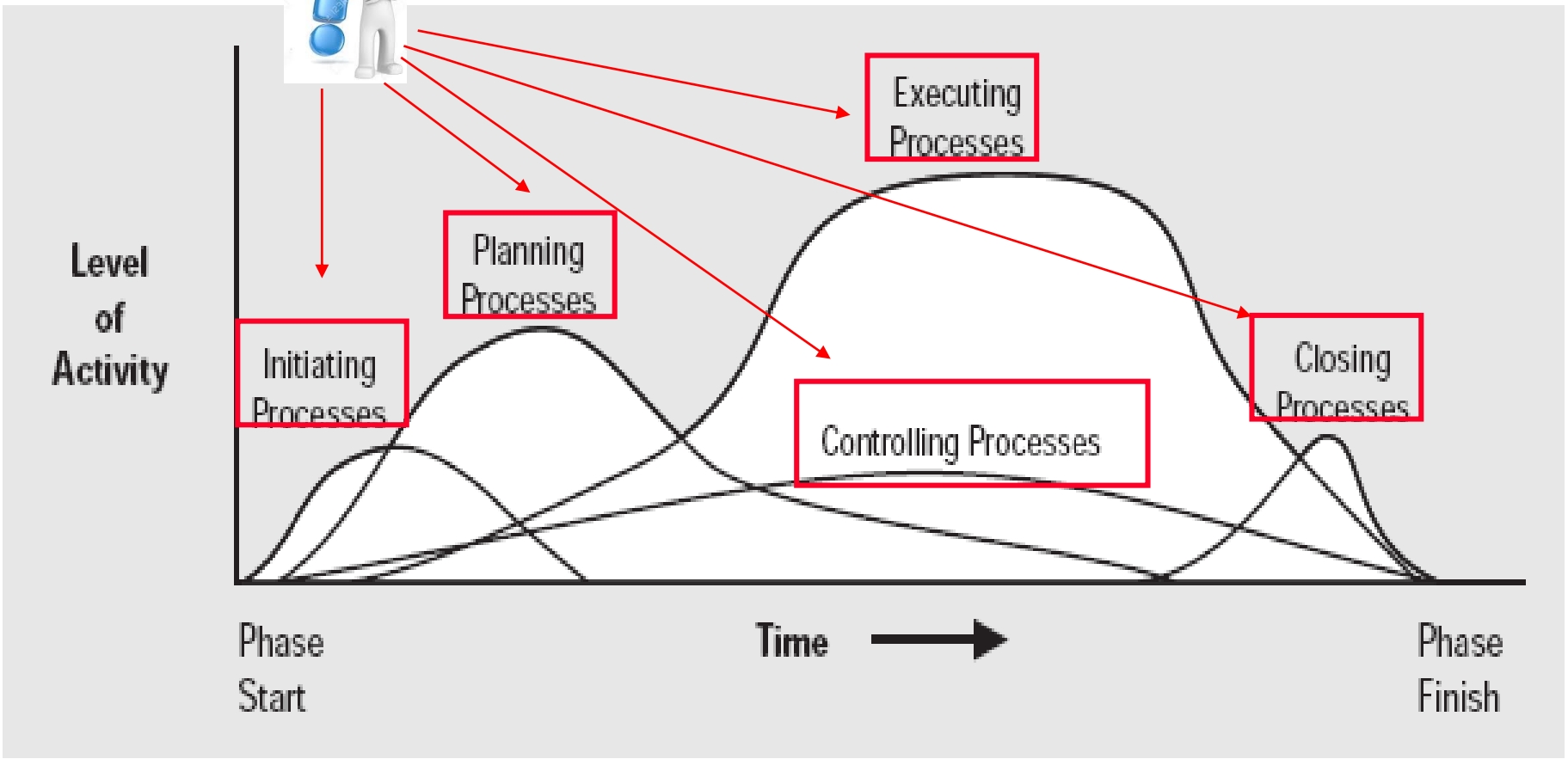
Standish Group's Chaos Report 1995

http://net.educause.edu/ir/library/pdf/NCP08083B.pdf

"31 percent of software projects will be cancelled before they ever get completed".

These are grim words, and the situation has not improved since then.

Project management challenges at every stage



In 2014 the cost of project failure across the European Union was €142 billion

"A study in project failure"

by John McManus and Trevor Wood-Harper

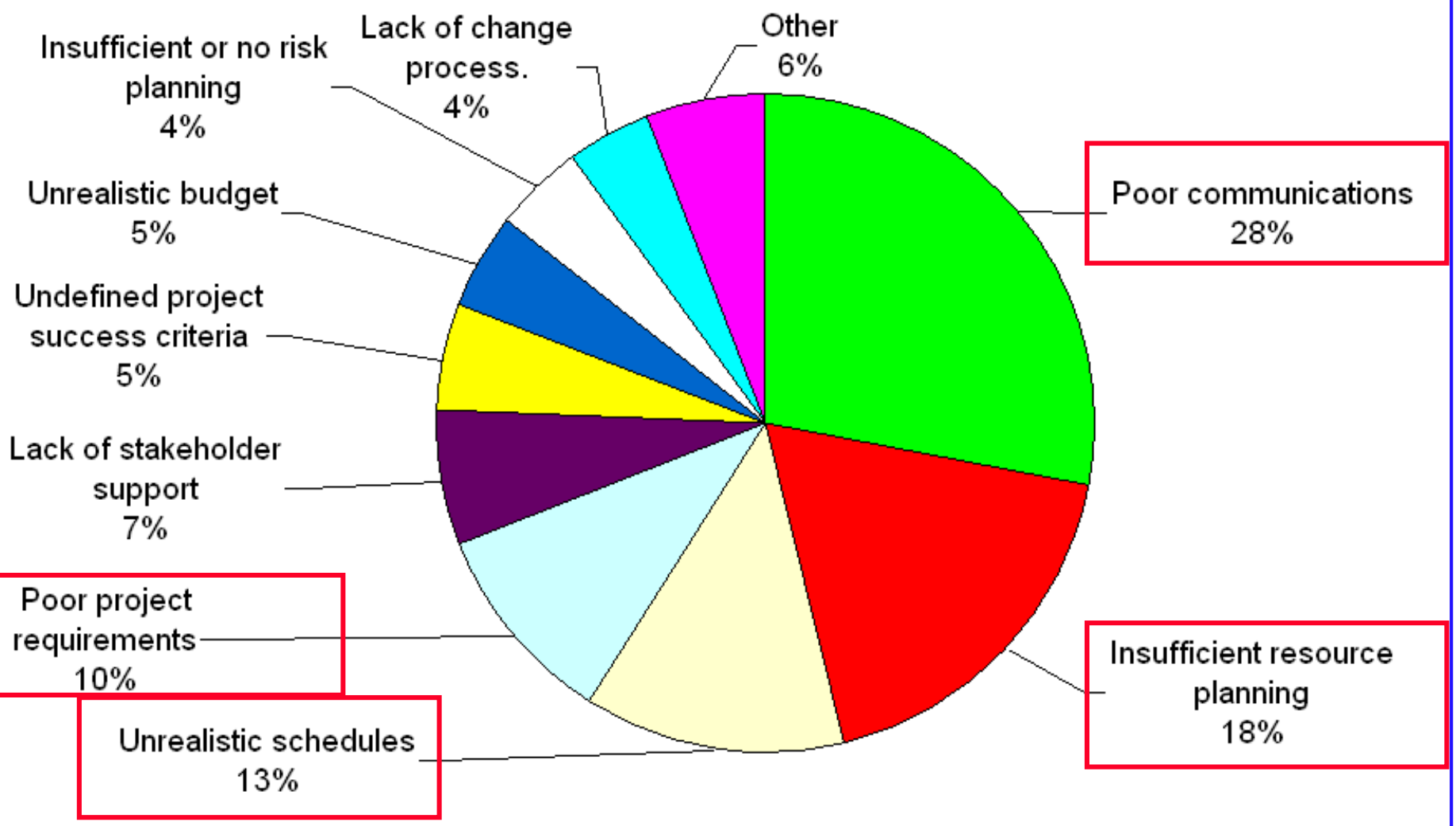
214 projects studied
Average duration of projects 26 months
Average budget €6 million

Number of projects completed	***163***	***76.2%***
Number of projects cancelled	***51***	***23.8%***
Off those cancelled : Number of projects over-run) (schedule and/or cost)	***69****	***32.4%***

* 37 of these projects were over 18 months late and more than €4 million over budget

Reported Reasons for Project IT Failure

Computing Technology Industry Association (CTIA) Survey of 1,000 respondents, 2007



Question

Why poor communications ?

Four most common reasons

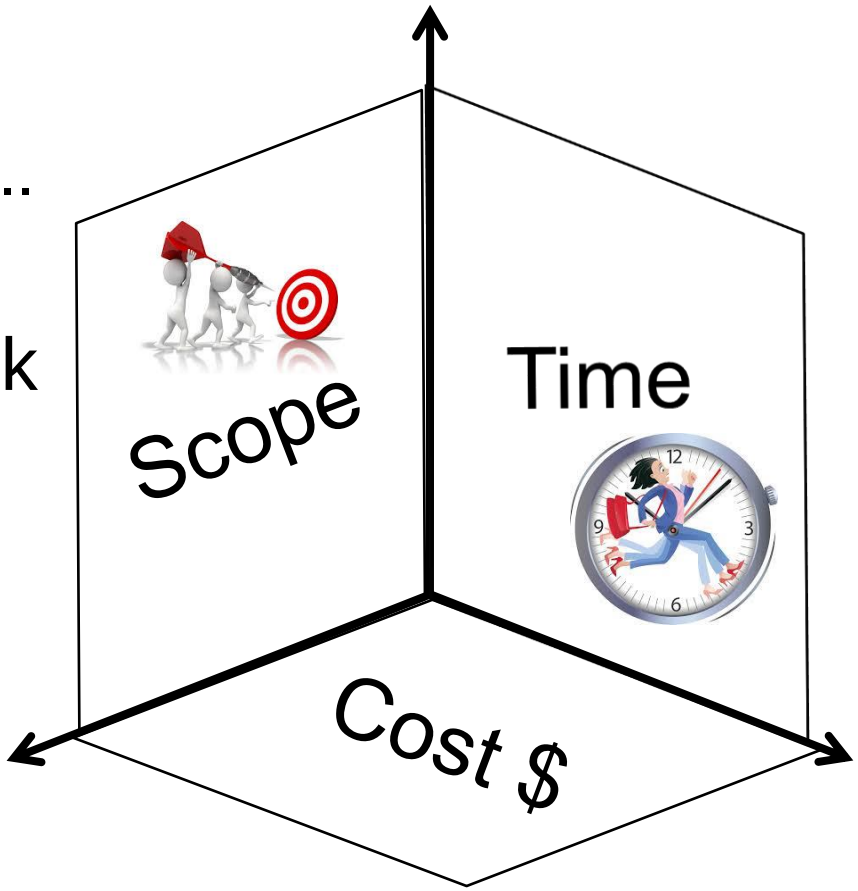
- *Incomplete project **requirements** (10%)*
- *Unrealistic **schedules** (13%)*
- *Insufficient resource **planning** (18%)*
- *Poor **communications** (28%)*

These are four areas are central to the practice of

“PROJECT MANAGEMENT”

The “Triple Constraint”

- The aim of the project manager is to
  - have the project completed *on time* and *within budget*, ...
  - ... whilst at the same time satisfying the *quality* of work required.
- The project manager is bound by the “Triple Constraint”:



Question

Which might be the predominant element in your group project ?

Question 1

Which of the following statements was a finding of the Standish Group's Chaos Report of 1995?

(A) 73% of software projects projects fail

(B) Management of IT projects is improving

(C) 25% of software projects come in under budget

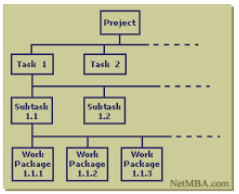
(D) 31% of software projects are never completed

(E) Software projects always take longer and cost more than expected

Question 1	Question 2	Question 3	Question 4	Question 5	Question 6	Score / 6
A B C D E	A B C D E	A B C D E	A B C D E	A B C D E	A B C D E	

Key Planning principle: four steps

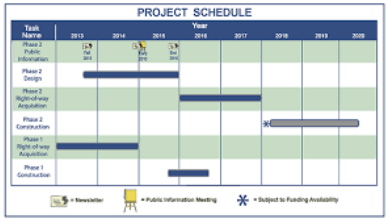
1. Determine work breakdown structure



2. Estimate amount of effort required

3. Determine dependencies between activities

4. Devise project schedule



Question 2

Which of the following was/were found by the CTIA 2007 Survey to be the predominant cause of IT project failure?

(A) Poor communications

(B) Insufficient resource planning

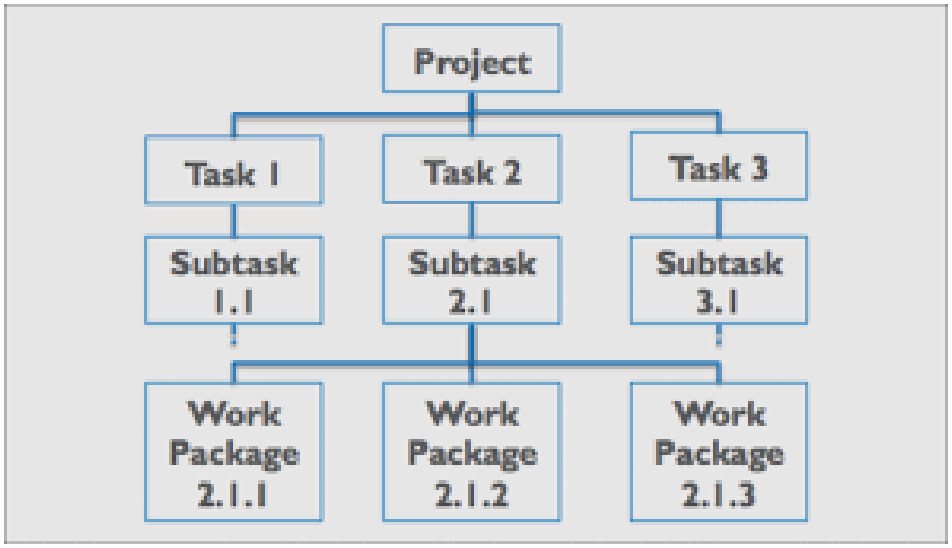
(C) Unrealistic schedules

(D) Poor project requirements

(E) ALL were equally prominent

Question 1	Question 2	Question 3	Question 4	Question 5	Question 6	Score / 6
A B C D E	A B C D E	A B C D E	A B C D E	A B C D E	A B C D E	

Determining the Work Breakdown Structure (WBS) (still a useful tool)



"A work breakdown structure is a deliverable-oriented grouping of project elements that organizes and defines the total scope of the project"

Project Management Book of Knowledge; Project Management Institute; 1996

Elements of work breakdown structure

- Deliverable
  - A unit of output that is to be delivered
- Activity
  - A major work category.
  - Usually lasts no less than one day and no longer than 30 days.
- Task
  - Small unit of work that makes up an activity

The granularity problem (1)

How much detail is enough?

Does this breakdown have enough detail?

Why not?

		Week							
Task	Hours	5	6	7	8	9	10	11	12
Source tools	1	<->							
Build software API	8		<----	----	----	----	--->		
Test API	2							<->	

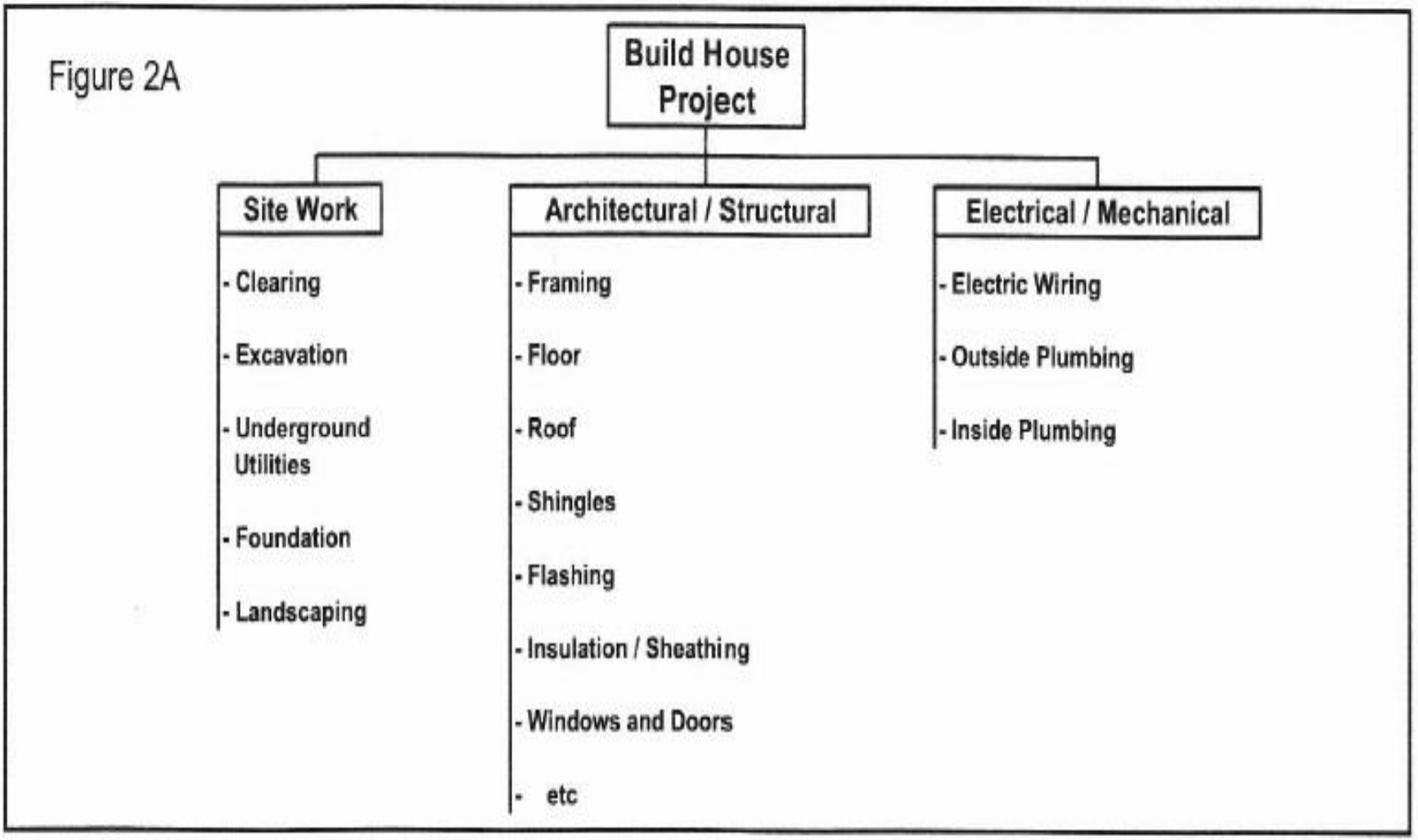
The granularity problem (2)

Is this enough?

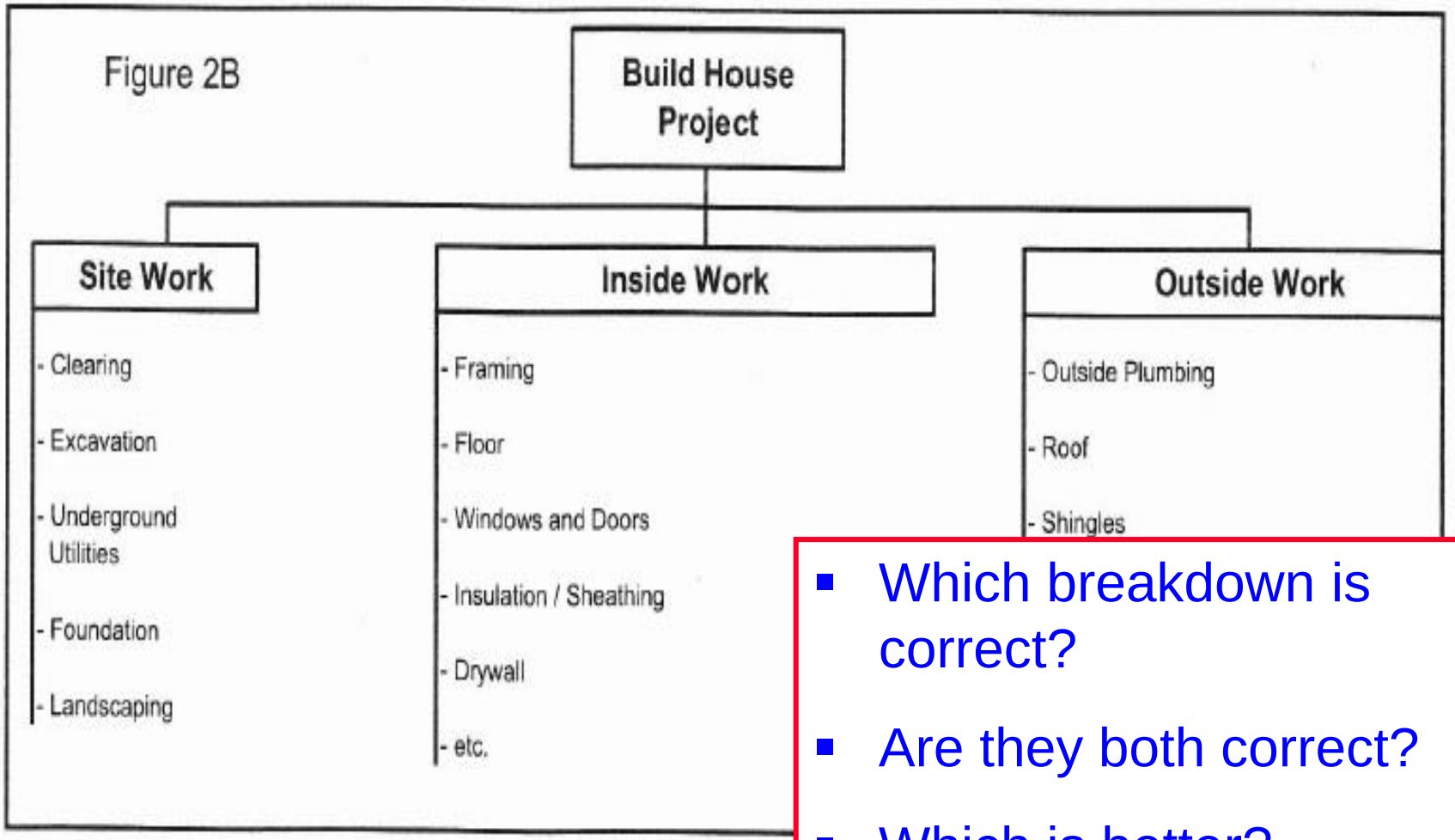
		Week							
Task	Hours	5	6	7	8	9	10	11	12
Research	1	----	----						
Draw plan	2		----						
Obtain tools	1		----						
Set-up work bench	0.5		----						
Buy balsa									
Testing equipmer									
Construct 'beams'	2				----				
Construct roadway	2					----			
Build structure	3						----		
Check clearances	0.5						--		
Complete structure	3							----	
Final test	1								----

How do you know?

Which view is right? This …

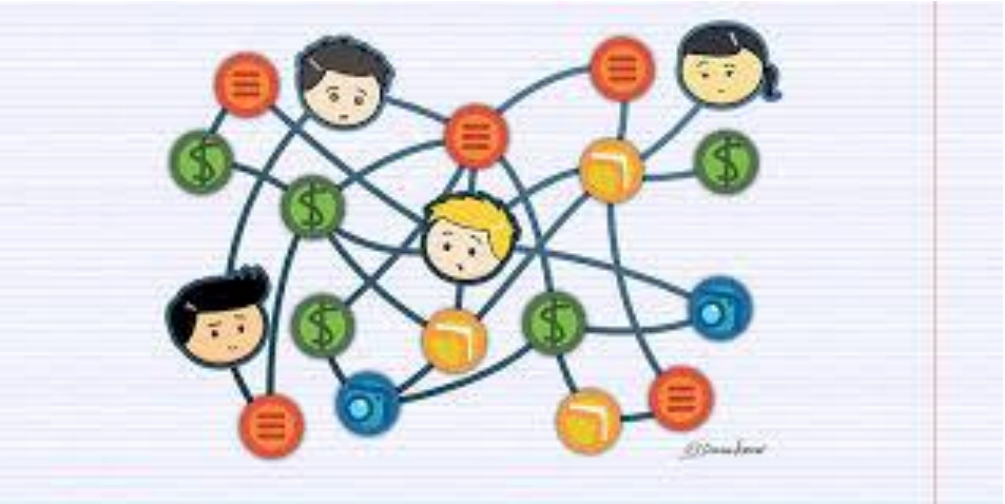


Or this …



- Which breakdown is correct?
- Are they both correct?
- Which is better?

Determining dependencies



Which task(s) must be completed before this activity or task can begin?

Question 5

Which of the following statements about project estimation is TRUE?

(A) Project estimation is a relatively exact science

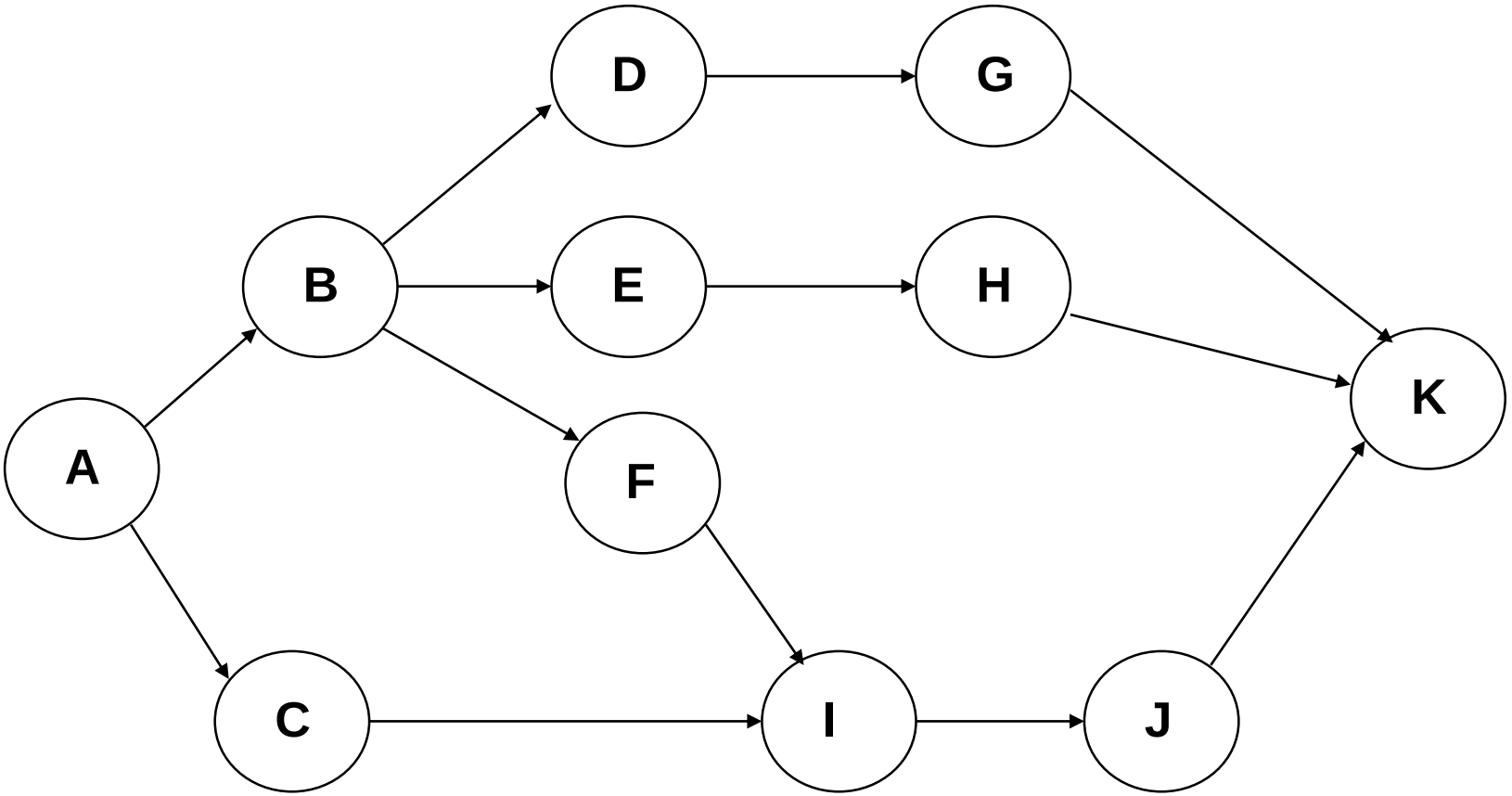
(B) Estimation by analogy is the most accurate method

(C) The function point method is the most accurate

(D) Reliable project estimation is a basic necessity for good project management

(E) NONE of the above is true

The resulting network

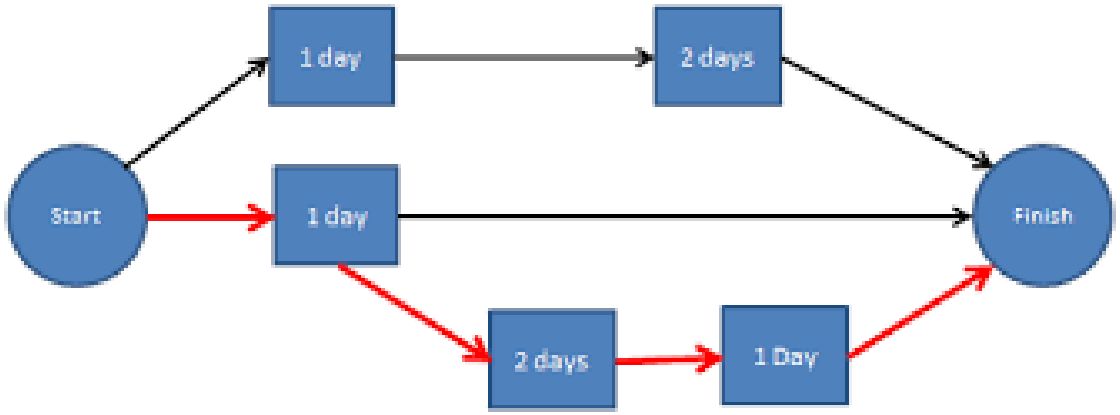


Is the network unique or are there multiple correct solutions?

Work breakdown, time estimates dependencies

Task ID	Task Description	Duration (in weeks)	Predecessors
A	Initiate project	0	--
B	R & D product design	6	A
C	Plan market research	2	A
D	Routing (engineering)	3	B
E	Build prototype	5	B
F	Prepare brochure	3	B
G	Prepare cost estimates	2	D
H	Product testing	3	E
I	Market survey	4	C, F
J	Pricing and demand forecast	2	I
K	Final report	2	G, H, J

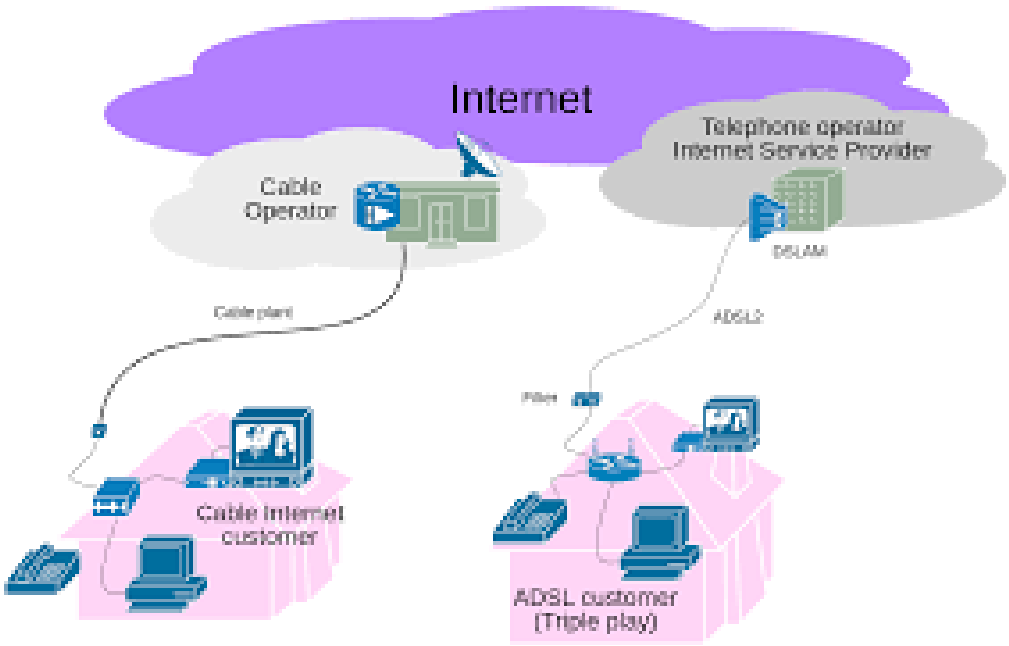
CPM – why is it important



Critical Path = 4 Days

In 1957 the Critical Path Method (CPM) was developed at DuPont Chemicals to assist with project management.

Case Study of CPM



SiteLight Project 1998 at Telstra

Question 6

Which statement best describes the task of identifying dependencies between activities in a work breakdown structure?

(A) Identifying dependencies is similar to estimation

(B) Dependencies are logical necessities of the network

(C) In order to determine dependencies you have to understand fully the nature of the project

(D) The method of analogies is a powerful tool in determining dependencies

(E) Dependencies are not essential for a network diagram but can sometimes be useful

Question

Why is slack in a project important ?

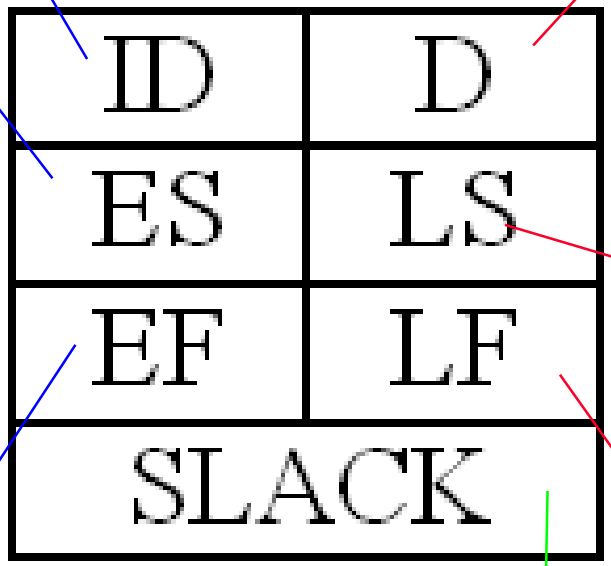
Briefly coming back to WBS

Activity parameters

Activity identifier

Earliest start

Earliest finish
= Earliest start +
Duration



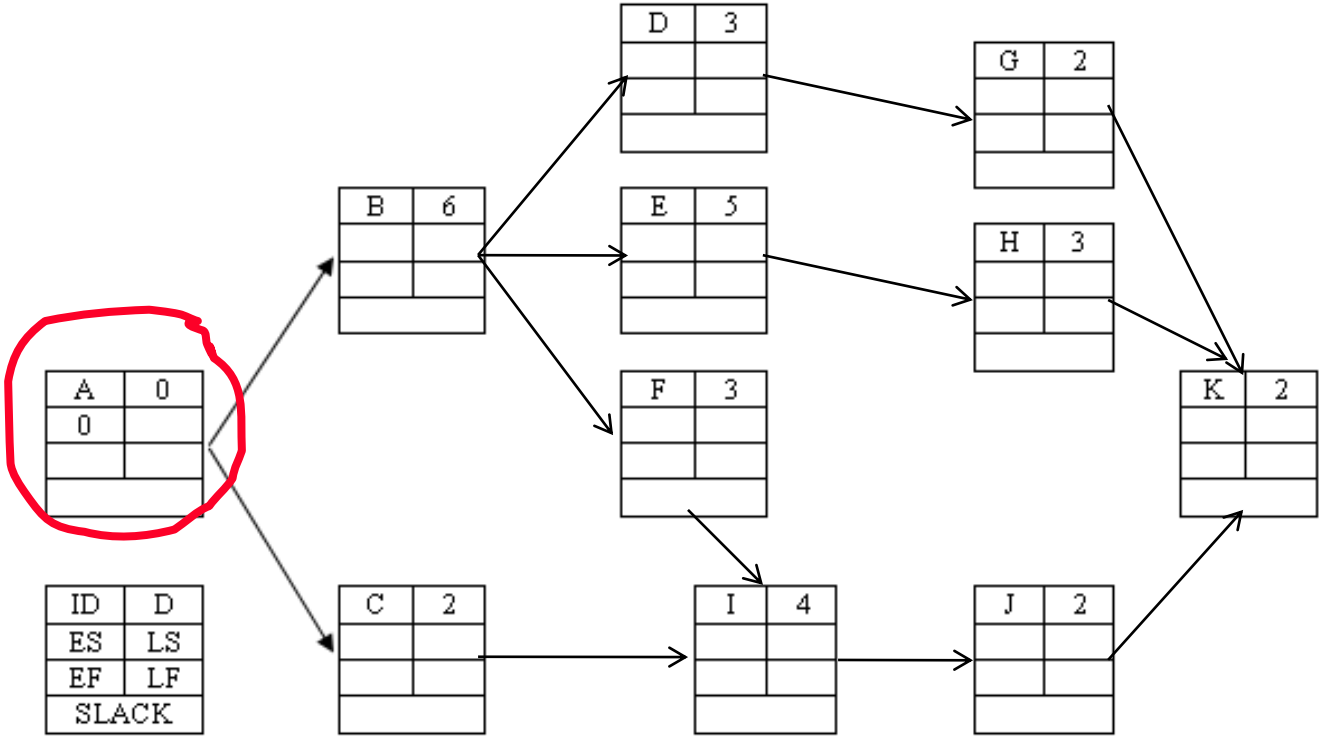
Duration

Latest start

Latest finish
= Latest start +
Duration

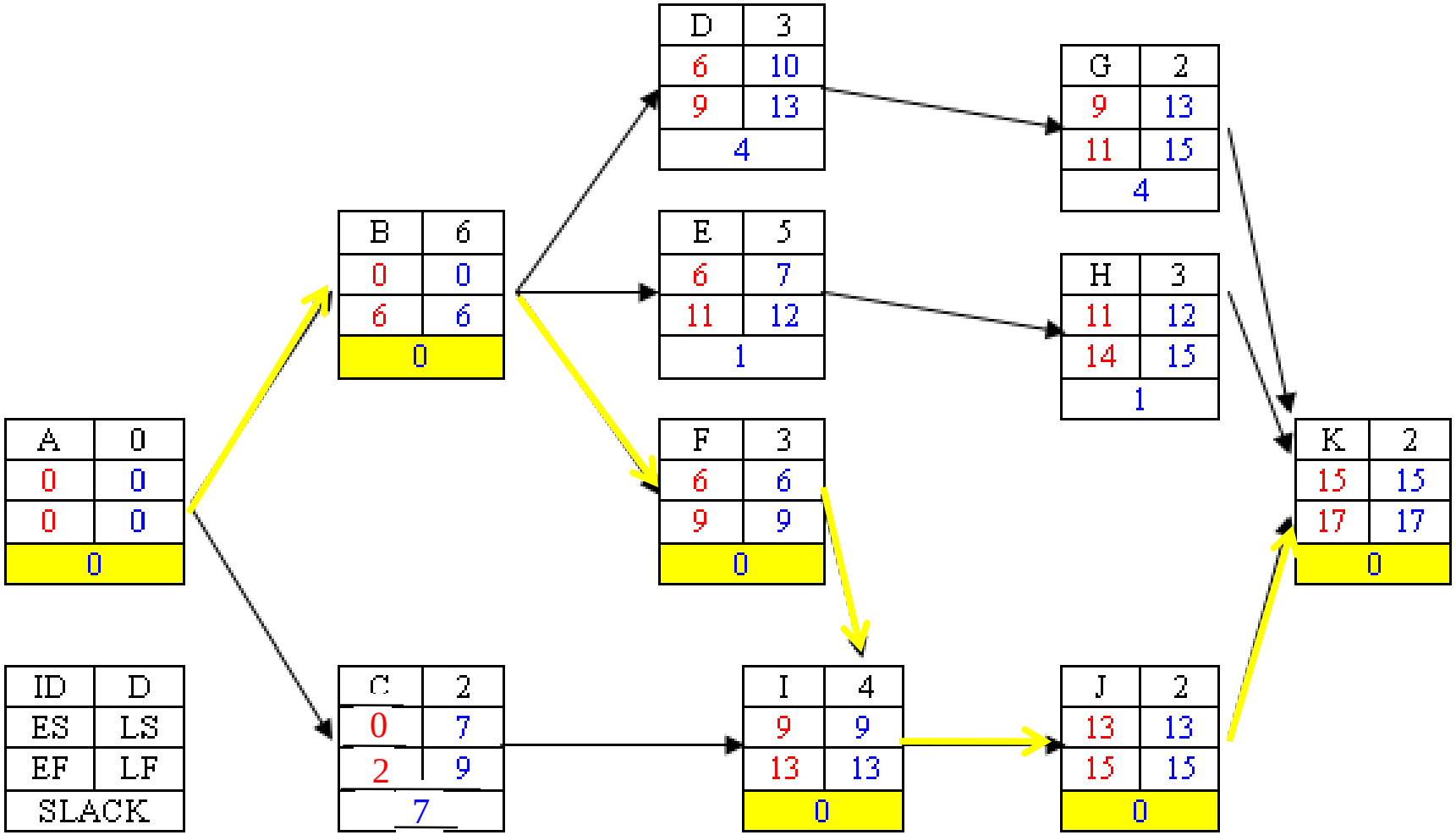
Slack =
Latest - Earliest

Calculating duration of project (1)



- Add lines to represent dependencies
- Determine earliest start times for activities B, C, D, E
- Determine earliest finish times for activities A, B, C, D, E

The critical path (zero slack)



Question

Why is CPA in a project important ?

Question 7

The meaning of ‘slack’ in a network diagram is

(A) The difference between the earliest and latest start times

(B) The difference between the earliest and latest finish times

(C) The difference between the earliest start time and the latest finish time

(D) The difference between the latest start time and the earliest finish time

(E) EITHER (A) or (B)

Cost of Crashing a Project (1)

(page 31 Table 4)

Task	Prede-cessors	Normal time (days)	Crash time (days)	Normal cost	Incremental cost per day
1	--	5	3	$500	$300
2	1	4	2	$600	$100
3	1	6	4	$1,000	$400
4	2, 3	3	2	$300	$200

Question 8

In project management, the term ‘crashing’ a project means

(A) That the project manager has seriously underestimated the effort required

(B) The action of bringing the project to an end

(C) Adding additional resources to complete the project by a certain date

(D) Making each activity on the critical path just a bit shorter in order to finish on time

(E) Moving key tasks onto

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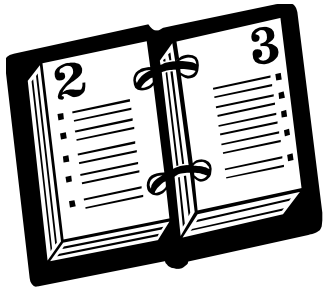
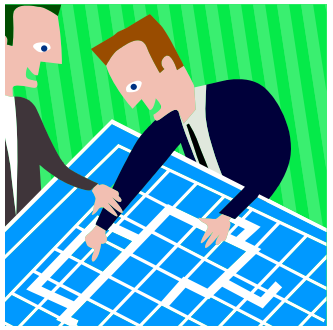
Lecture 06B





Time Management

How big, how long, how much effort?

Project estimation methods

The REALLY tricky part of project management

By the end of this lecture you will be able to:

- Appreciate several approaches for estimating project size and effort
- Explain their relative advantages and disadvantages
- Apply one or more of these approaches to your case study

Basic terminology

You will learn a lot more on IT Project Management course

Five steps in project estimation

1. Determine the SIZE of the project
   - software metrics: lines of code, function points
2. Determine the EFFORT required
   - Person hours, days, weeks or months
3. Decide on the RESOURCES needed
   - e.g. how many engineers or programmers
4. Calculate the DURATION
   - e.g. 20 person-hours, 3 people:
     ∴ DURATION = 20 / 3 = 6.3 hours
5. Calculate the COST
   - e.g. 20 person-hours at $70 per hour:
     ∴ COST = $1,400

Six approaches to project estimation

1. Expert judgement – will cover this
2. Sum of the parts – will cover this – will cover this
3. Estimation by analogy
4. Component matrix (not common)
5. Algorithmic cost models (not common)
6. Function point analysis (not common)

1. Expert judgement

An expert in software development as well as in the application domain makes an estimate based on previous experience of similar projects.

Expert judgement – pros & cons

- Advantages:
  - Relatively cheap estimation method.
  - Takes relatively little time and effort
  - Can be applied early in the development cycle
  - Can be successful if experts have direct experience of similar systems
- Disadvantages:
  - Rather subjective
  - Depends on experience and judgment
  - Cannot be used if no suitable experts available
  - Assumes experts have dealt with similar systems
  - Assumes they all have reliable data available

2. Sum of the parts

- Makes use of work breakdown structure
- Total effort estimate is the sum of estimates for individual tasks
- Appropriate level of detail (granularity) is important
  - too much detail takes too much time and introduces more error
  - insufficient detail means more difficult to assign tasks (see work breakdown structure, Lec 6A)
- Must make allowance for overheads and tasks such as testing and documentation

Determining
1. Work breakdown
2. Durations
3. Dependencies

art of project estimation

Task ID	Task Description	Duration (in weeks)	Predecessors
A	Initiate project	0	--
B	R & D product design	6	A
C	Plan market research	2	A
D	Routing (engineering)	3	B
E	Build prototype	5	B
F	Prepare brochure	3	B
G	Prepare cost estimates	2	D
H	Product testing	3	E
I	Market survey	4	C, F
J	Pricing and demand forecast	2	I
K	Final report	2	G, H, J

Sum of the parts example

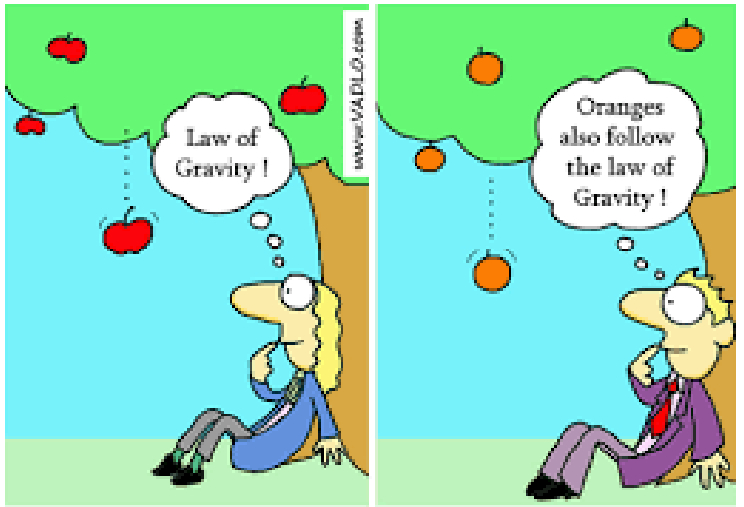
		Week							
Task	Hours	5	6	7	8	9	10	11	12
Research	1	----	----						
Draw plan	2		----						
Obtain tools	1		----						
Set-up work bench	0.5		----						
Buy balsa	1			--					
Testing equipment	0.5			--					
Construct 'beams'	2				----				
Construct roadway	2					----			
Build structure	3						----		
Check clearances	0.5						--		
Complete structure	3							----	
Final test	1								----
Total	17.5								

Sum of Parts – pros & cons

- Advantages:
  - Simple, fairly fast
  - Requires appropriate work breakdown structure
  - OK if breakdown is complete determined and reasonably good individual estimates
- Disadvantages:
  - Simplistic: the whole system is more than just the sum of its parts and parallel tasks are possible
  - Have to estimate effort for many individual components
  - Tendency to underestimate costs of system level activities such as integration, testing and documentation preparation
  - Requires reliable and detailed historical records

3. Estimation by analogy*

- Compare current project to similar project(s) already undertaken
- Estimate how many times bigger or smaller the current project is compared with others



High Impact Paper | Low Impact Paper

*See for example, Martin Shepperd, Chris Schofield and Barbara Kitchenham, *Effort Estimation Using Analogy*, Proceedings of ICSE-18, IEEE, 1996

Using analogy – pros & cons

- Advantages:
  - Systematic, fairly fast
  - OK if sufficient historical data available
  - Can be applied early in the development cycle
- Disadvantages:
  - Have to determine set of characteristics suitable for classifying systems
  - Requires a database containing systematically maintained historical size cost data.
  - Cannot be used if no comparable projects have ever been tackled, or if no suitable historical data is available

Choosing estimation methods

- Which is easiest to apply?
- Which can be applied earliest in the system development life cycle (SDLC)?
- What assumptions does each make?
- Do I have enough historic data?
- Will I need to re-calibrate for tool, developer experience, environment, etc.
- How many times will I use this method? Can I improve my estimates over time?

A case study

Because we learnt a lot last time !

You're ***proposal*** has won the design contract for the A380 In-flight Entertainment system!

Your proposal out of 10 others has been awarded the multi-million $ order !
Others were rejected because the did not have enough information,
low on technology innovativeness, skill of team, etc

What next !

What are the requirements!

How long do you have ! Remember

1. Determine the SIZE of the project
   - software metrics: lines of code, function points
2. Determine the EFFORT required
   - Person hours, days, weeks or months
3. Decide on the RESOURCES needed
   - e.g. how many engineers or programmers
4. Calculate the DURATION
   - e.g. 20 person-hours, 3 people:
     ∴ DURATION = 20 / 3 = 6.3 hours
5. Calculate the COST
   - e.g. 20 person-hours at $70 per hour:
     ∴ COST = $1,400

You are under tight time frames

Client has asked for earlier delivery !

What do you do ?!

In Final testing

The Flight route system does not work as planned

what do you do ?

How do you test the success !

Why did the A380 get delayed ?

Next Weeks Oral presentations

- 2 minutes only
- No presentations allowed
- Talk from the cuff !
- Strictly stopped at 2 minutes + 1/2 minute questions from the class
- Approx. about 10-12 students each week for the next 3 weeks as per surname in alphabetical order
- PLEASE READ THE ASSIGNMENT 1 - ORAL INSTRUCTIONS ON COURSE OUTLINE
- Need a time keeper for each tut for each week?

Just the start of PM

Remember this is a taster of PM

So much more to cover next week

Thank you !