

# Project Management

ENGG5001

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Australian Centre for Innovation

# What is A Project?

## **A project:**

- **has a beginning and an end**
- **is not business as usual**
- **requires the dedication of special resources**

# Key Features of a Project

- Definable purpose with established goals
- Cost, schedule and performance requirements
- Multiple resources across organisation
- One-time, temporary activity
- Element of risk
- Involves phases in the project life-cycle

(Johnston, p.75)

# Overdue and Over Budget and Unwanted

- George Stephenson
- Isambard Kingdom Brunel – Great Eastern
- Panama Canal
- Channel tunnel
- Wembley stadium
- Cross-City Tunnel
- Millenium Bridge
- Every major IT project

# Surveys of Project Management Effectiveness

## Program Management Institute - 2004

- 50% of project started were never finished
- 30% took twice as long as planned
- 10% took five times as long
- Only 10% were finished on time

## Standish Group on IT projects - 2004

- 29% of projects finished
- Cost-over-runs averaged 56%
- On average, projects took 84% longer than planned

# Characteristic phrases in project management

- The project is 90% complete =?
- The project will produce a profit of 10% =
- The project is on time against all parameters =?
- Conservative estimates indicate completion on-time and under budget =?
- Quality is guaranteed at every stage =?

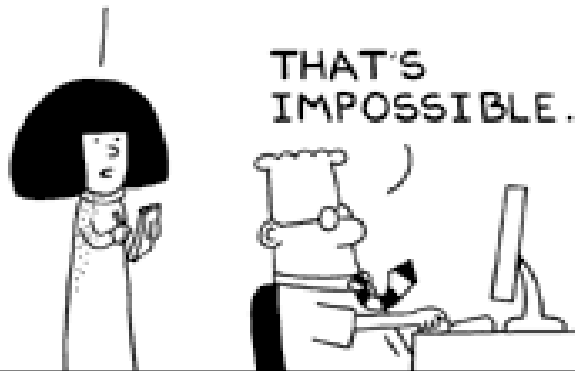
# What is Project Management?

**PM brings together, manages and optimises resources to meet pre-established goals within the key requirements of:**

- **Cost**
- **Time**
- **Quality**

# The Dilemmas of Project Management

I NEED A DESCRIPTION OF YOUR PROJECT AND ITS PROJECTED COST.

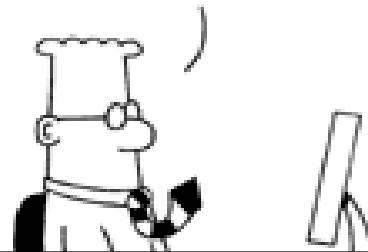


THAT'S IMPOSSIBLE.

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scottadams@aol.com

THE PROJECT UNCERTAINTY PRINCIPLE SAYS THAT IF YOU UNDERSTAND A PROJECT, YOU WON'T KNOW ITS COST, AND VICE VERSA.

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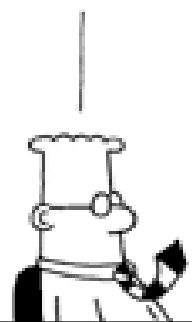


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YOU JUST MADE THAT UP.



THAT DOESN'T MAKE IT WRONG.



# Evolution of Project Management

- Scheduling (1970s) - simple/certain eg train timetable
- Teamwork/integration (1980s) – complex/certain eg conducting an orchestra
- Flexibility (1990s) – complex/uncertain eg exploration
- Simultaneity (2000s) – complex/uncertain/fast eg directing a three-ring circus

# Getting Under Way

- Study, discuss, analyse
- Write a project definition
- Determine the objective
- Agree imperatives and desirables
- Generate alternative strategies
- Evaluate alternatives
- Choose a course of action

# Good Objectives are SMART!

- **S**pecific
- **M**easurable
- **A**chievable
- **R**ealistic
- **T**imely

# Planning for Quality

- The **Work Breakdown Structure** (WBS)
  - the systematic division of a project into steps, or units of work, to be completed in a sequence
- Precise **specification** of each step in the project

# Planning for Cost

## Typical costs

- Labour
- Overheads
- Materials
- Supplies
- Equipment hire
- General, administrative
- Profit

# Planning for Time

## Identify:

- the duration of each step
- the earliest time a step may be started
- the latest time a step must be started

## Tools

- The Gantt Chart – horizontal bar chart displaying time relationships of steps in a project
- PERT Diagrams – charts events, activities and their time relationship

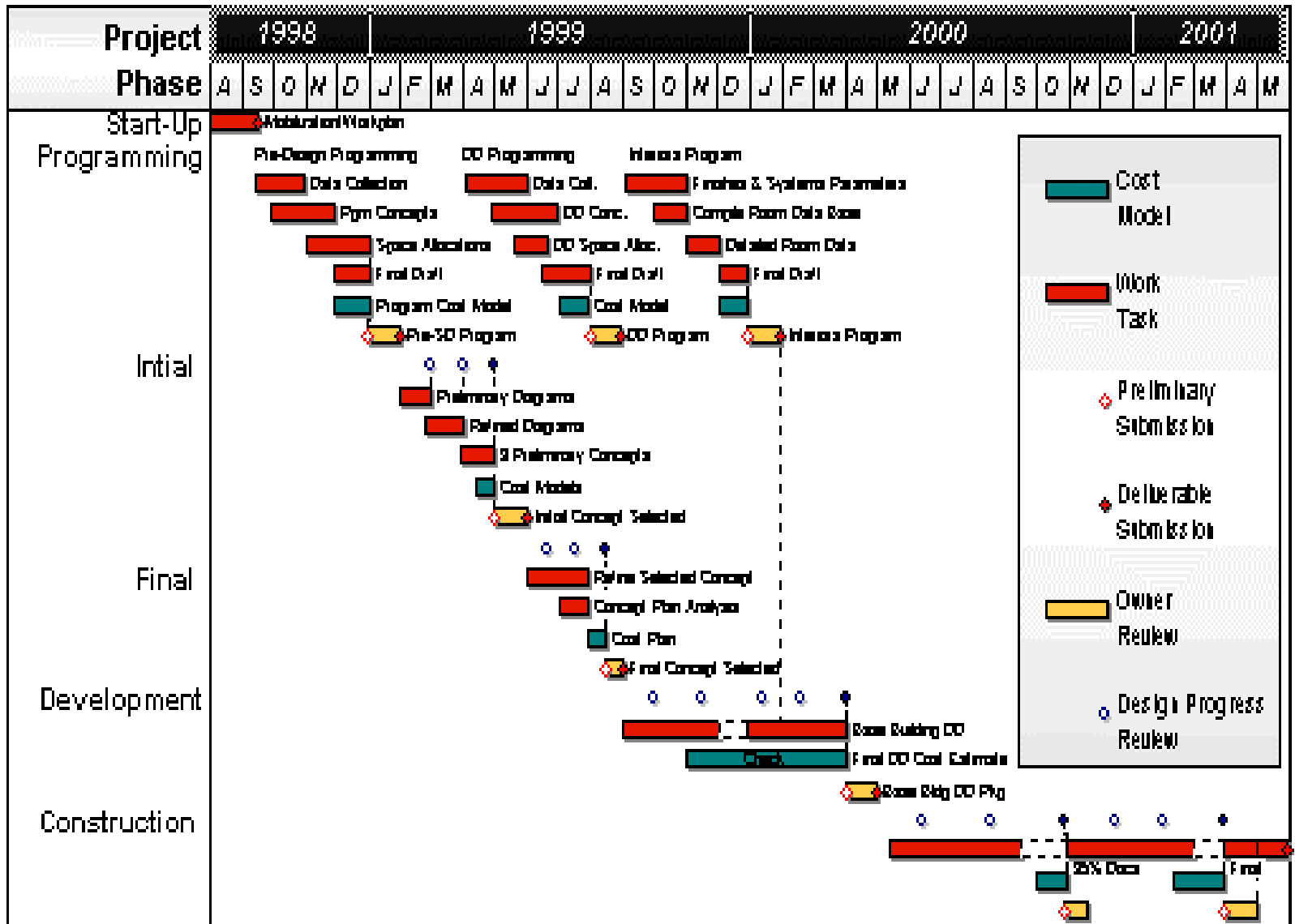
# Ronald Reagan Washington National Airport

Created Using Milestones Professional

TERMINAL A REHAB AND EXPANSION PROJECT

Preliminary Project Workplan - Design Phases

[www.KIDASA.com](http://www.KIDASA.com)



## Resource Chart: Single Resource

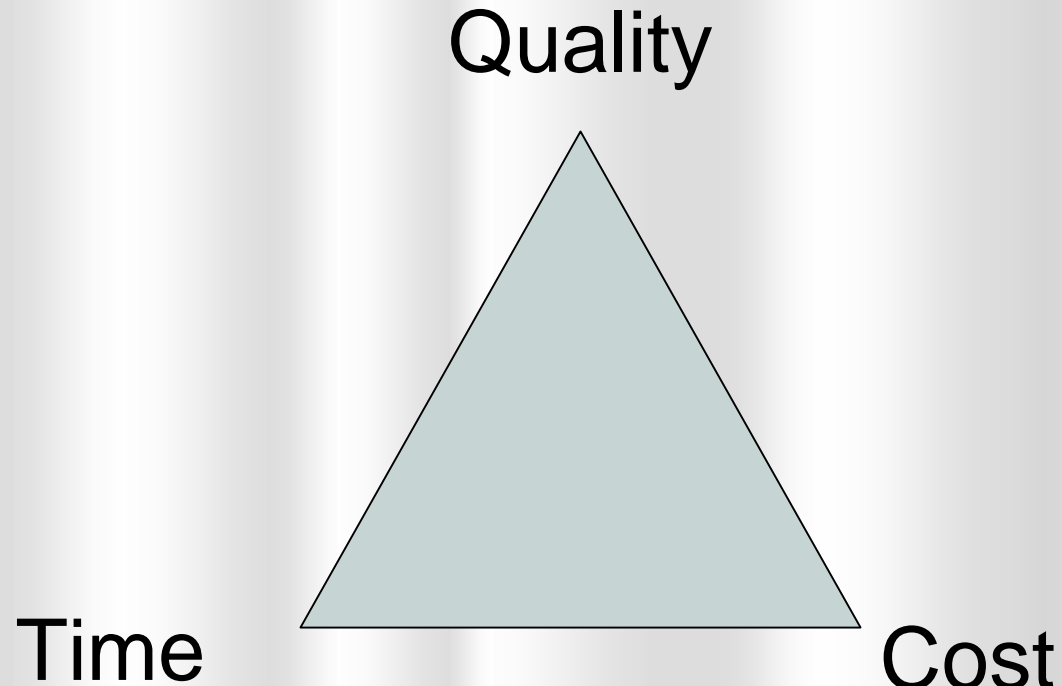
### Resource Report for: Bill

WBS	Tasks by Resource	'98				'99				'00				'01		Cost (\$)	Work																									
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2																											
	<b>Bill</b>															\$304,600	19696 h																									
1.1	PLANNING															\$27,000	1080 h																									
2.1	REQUIREMENTS															\$26,000	1040 h																									
2.2	ANALYSIS															\$8,000	320 h																									
2.3	INTEGRATION															\$9,000	360 h																									
2.4	MISSION OPERATIONS															\$6,000	240 h																									
2.5	SYSTEM TEST PLANNING															\$12,000	480 h																									
2.6	System Engineering Complete															\$0	0 h																									
3.1	COMMAND AND CONTROL															\$100,000	4000 h																									
3.2	ATTITUDE CONTROL															\$26,400	1056 h																									
3.3	POWER															\$18,000	720 h																									
3.4	THERMAL															\$35,000	1400 h																									
3.5	ORBIT ADJUST PROPULSION															\$200	8 h																									
3.6	TANK															\$4,000	160 h																									
3.7	VALVES															\$6,000	240 h																									
3.8	THRUSTER															\$7,000	280 h																									
3.9	DESIGN															\$4,000	160 h																									
3.10	FABRICATE															\$8,000	320 h																									
3.11	ASSEMBLE															\$4,000	160 h																									
3.12	TEST															\$4,000	160 h																									
<b>Work</b>		<table border="1"> <tr><th>Year</th><th>Q1</th><th>Q2</th><th>Q3</th><th>Q4</th></tr> <tr><td>'98</td><td>1560</td><td>1040</td><td>1040</td><td>520</td></tr> <tr><td>'99</td><td>520</td><td>520</td><td>520</td><td>520</td></tr> <tr><td>'00</td><td>520</td><td>520</td><td>520</td><td>520</td></tr> <tr><td>'01</td><td>520</td><td>520</td><td>520</td><td>520</td></tr> </table>														Year	Q1	Q2	Q3	Q4	'98	1560	1040	1040	520	'99	520	520	520	520	'00	520	520	520	520	'01	520	520	520	520		
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Summary

Planned

# But you have to operate within the PM's Decision Triangle



# Some Project Management Heuristics

- Plan carefully – it is easier and cheaper to experiment in the first 20% of a project than the last 20%
- Allocate resources to the weak link
- Freeze the design no later than 75% into project
- Ask yourselves reflective questions: “What are we really trying to do?”, “Why are we doing this?” “How will it help”

# Summary of Critical Path Method

- Develop the WBS
- Determine scheduling
- Perform CPA analysis
- Create graphical representation
- Check progress against plan
- Revise plan as required when circumstances change

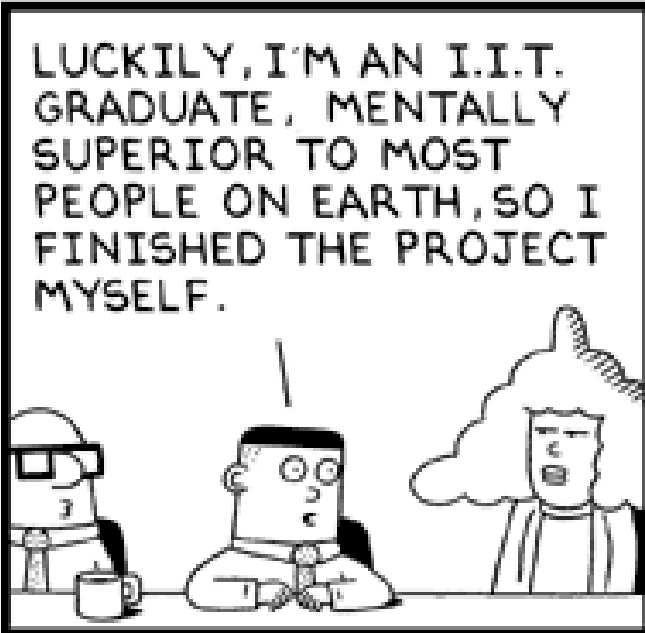
# Implementation

- Controlling work in progress (project control charts)
- Providing feedback
- Negotiating for materials, supplies, services
- Resolving differences

# What Not To Do!



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