Comp 3120/8110

Software Development Management

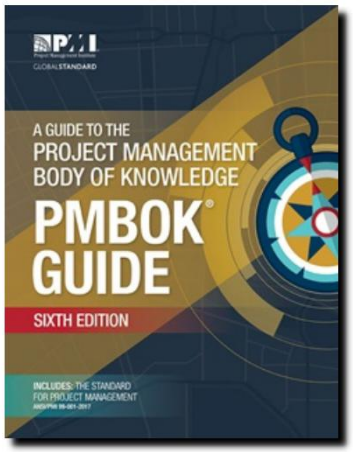
Week 1 Lecture 2

Thursday 25th February 2021

Today, we will cover:

Introduction to Project Management

- the basic definition of a project
- an introduction to project management fundamentals
- a preview of a range of project management approaches and lifecycles
- the Project Management Body of Knowledge (PMBoK)
- why organisations manage projects



Book image from https://www.pmi.org/pmbok-guide-standards

Workshops

Don’t forget to sign up for your workshop

194 out of 240 students
are signed up – how about you?

I will be putting everyone into assignment groups tomorrow morning.

If you haven’t signed up for your workshop I’ll have to randomly assign you to an open workshop to put you in your group!

Very important!

Let me know if you have any workshop issues ASAP

Workshops

~30 students in each workshop → ~6 groups of 5 students each → Separated into ~ 2 divisions, each with ~3 groups → Each division attends 1 hour of the two hour workshop

- Individually you will watch the instructional videos (a few short videos)
- As a group you will meet (online) and complete the activity worksheet
- One of your group will submit your activity worksheet on Mondays of workshop weeks

CECS Class Representatives

Want to be a Class Rep? Nominate today!

- To nominate yourself as a Class Representative, students are asked to nominate themselves via an eform by midday 1st March 2021 at:
- https://anu.au1.qualtrics.com/jfe/form/SV_8H50LYu50DbvXiR

You are free to nominate yourself whether you are on campus or off-shore.

You will be contacted by CECS Student Services, Employability and Experience by 5th March with the outcome of your self-nomination.

All course representative meetings will be held via Zoom in Semester One 2021. There will be three meetings this semester, meeting details will be provided to course representatives shortly.

For more information regarding roles and responsibilities, contact:

ANUSA CECS representatives Sandy Ma and Swatantra Roy: sa.cecs@anu.edu.au

ANUSA President Madhumitha Janagaraja: sa.president@anu.edu.au

What do you think a project is?

Goal driven?

Solution to a business problem?

Lifecycle?

What is a ‘project’ anyway?

Fixed End Point?

Change?

Adds value?

Unique?

Generally accepted definition of a project

A project is a sequence of unique, complex and connected activities that have one goal or purpose and that must be completed by a specific time, within budget, and according to specification. (Robert Wysocki, Effective Project Management)

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A better definition of a project?

A project is a sequence of finite dependent activities whose successful completion results in the delivery of the expected business value that validated doing the project. (Robert Wysocki)

What distinguishes a project from business
as usual?

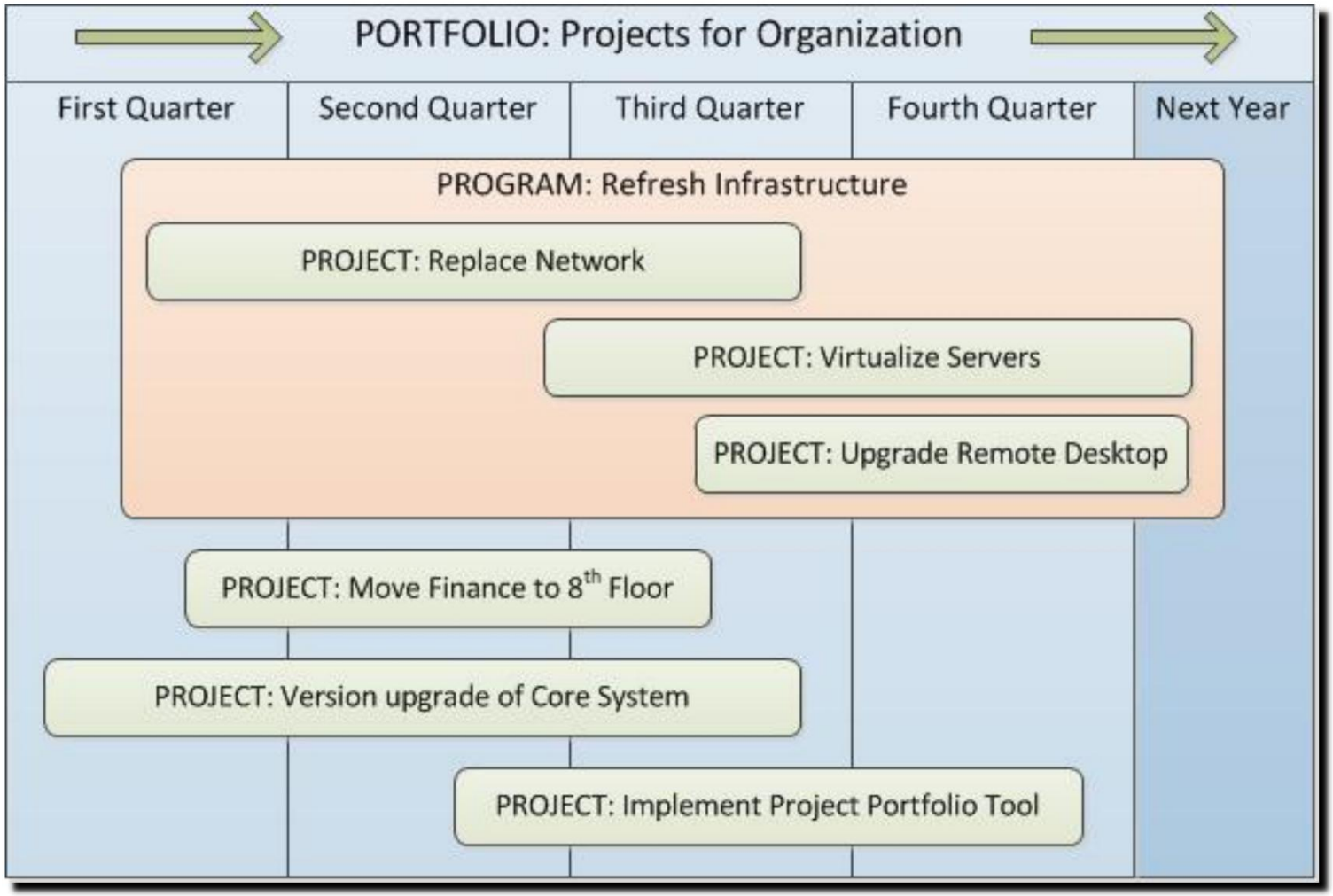
Project – Program - Portfolio

Project
A project is a sequence of finite dependent activities whose successful completion results in the delivery of the expected business value that validated doing the project. (Wysocki)

Program
A collection of related projects, which may need to be completed in a specific order for the program to be complete. Programs may have more than one goal.

Portfolio
A collection of projects that share a common link to one another.

Project – Program - Portfolio



Project *management* fundamentals

Definition from the Project Management Institute

Project management is the application of knowledge, skills, tools and techniques to project activities to meet the project requirements.

In other words … ***Project management is organised common sense***

What goes on in the mind of a project manager …

Classifying projects

Risk – (high, medium, low)

Business value (high, medium, low)

Length (3-6 months, 6-12 months, etc.)

Complexity (high, medium, low)

Technology used (well-established, used occasionally, rarely used)

Number of departments affected (all, most, several, few)

Cost

Classifying projects

Type A projects – high business value, high complexity
Type B projects – shorter but still significant business value
Type C projects – most common: short, using established technology
Type D projects – barely meets definition of a project

Table 1-1: Example of Project Classes and Definitions

CLASS	DURATION	RISK	COMPLEXITY	TECHNOLOGY	LIKELIHOOD OF PROBLEMS
Type A	> 18 months	High	High	Breakthrough	Certain
Type B	9–18 months	Medium	Medium	Current	Likely
Type C	3–9 months	Low	Low	Best of breed	Some
Type D	< 3 months	Very low	Very low	Practical	Few

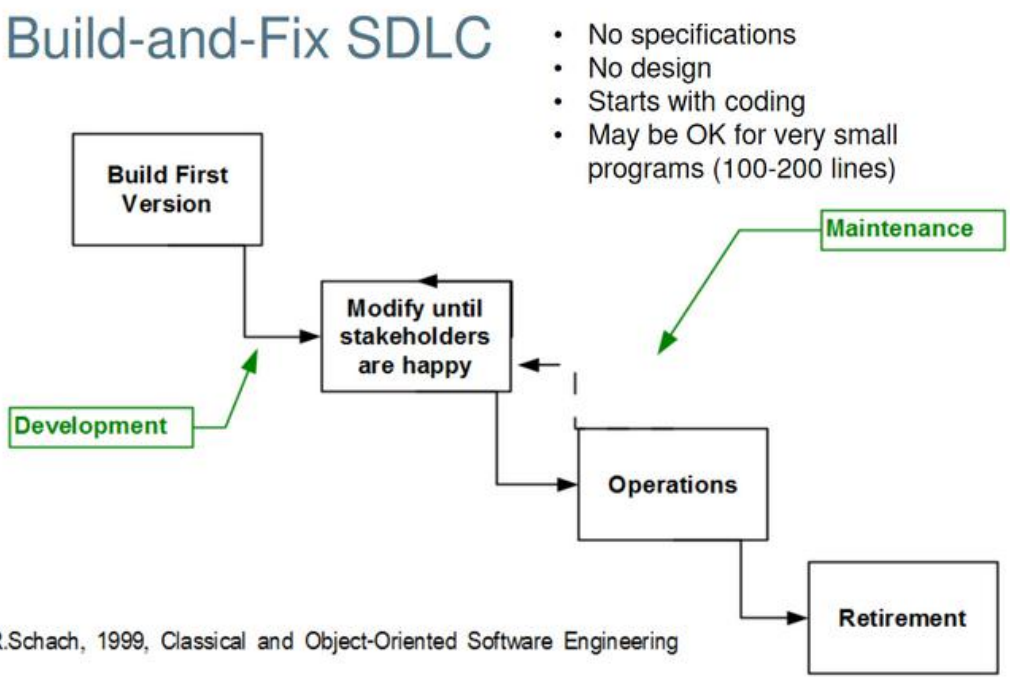
Project management approaches and lifecycles

Project Management Approaches and Lifecycles

Based on Robert Wysocki, Chapter 2, What is Project Management?

Example:

Consider the "Build and Fix" Software Development Life Cycle (SDLC). What is wrong with that?

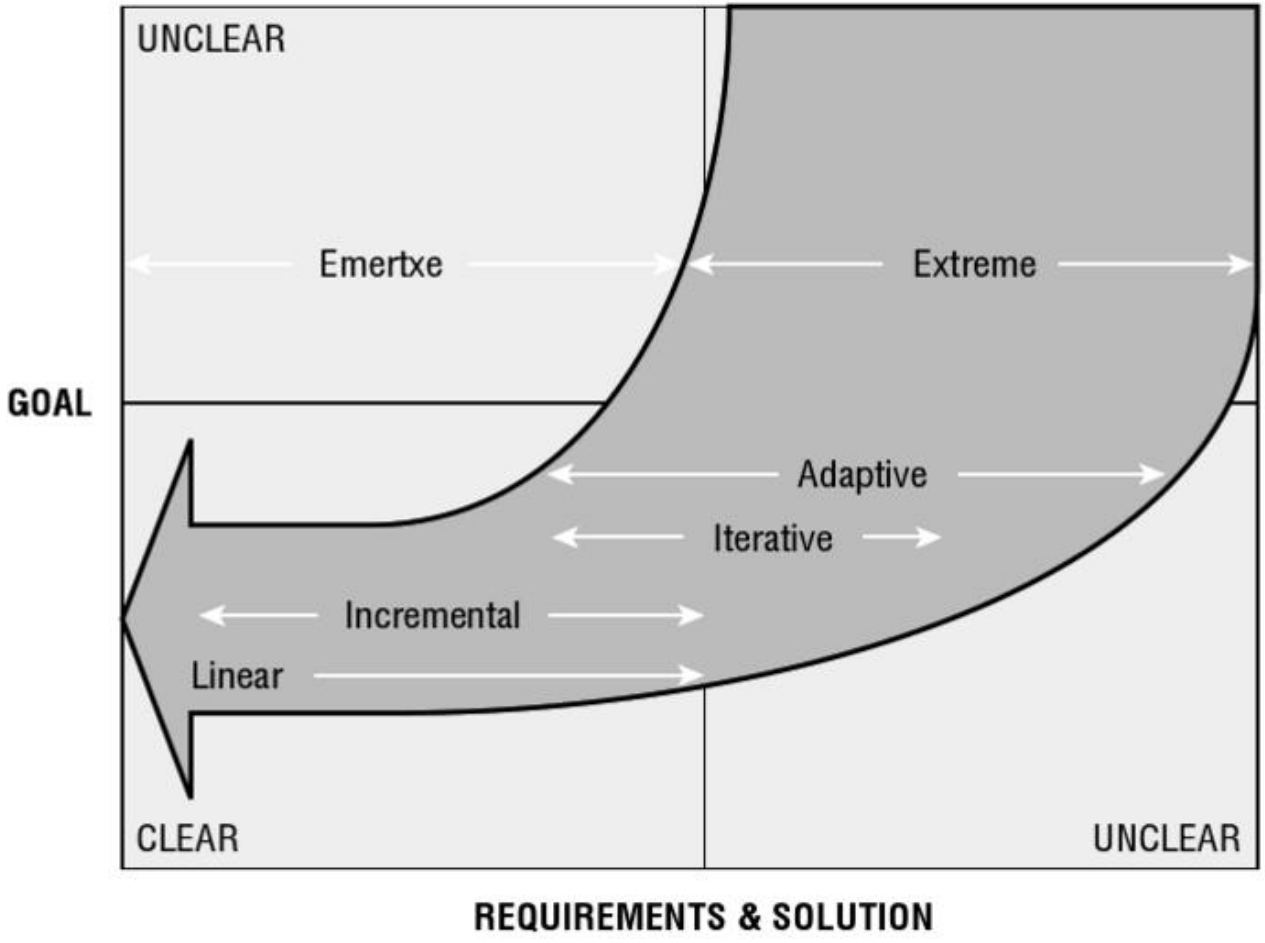


S.R.Schach, 1999, Classical and Object-Oriented Software Engineering

Other SLDCs

To determine an appropriate approach, the project manager must understand the certainty of the solution -- a continuum ranging from:

- high certainty -- both the goal and the solution are clearly defined OR
- some uncertainty -- the goal is clearly defined but the solution isn't
- major uncertainty -- neither goal nor solution are clearly defined.



Software development models

The waterfall model – This takes the fundamental process activities of specification, development, validation, and evolution and represents them as separate process phases such as requirements specification, software design, implementation, and testing.

Incremental development This approach interleaves the activities of specification, development and validation. The system is developed as a series of versions (increments), with each version adding functionality to the previous version.

Integration and configuration This approach relies on the availability of reusable components or systems. The system development process focuses on configuring these components for use in a new setting and integrating them into a system.

Is the project management lifecycle different from the software development lifecycle?

Why have different approaches to project management developed?

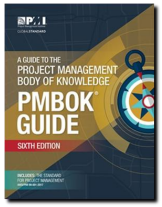
Project Management Body of Knowledge

Project Management Institute
Registered Education Provider

PMBOK V5

Five Process Groups

1. Initiating (or scoping) process group
2. Planning process group
3. Executing (or launching) process group
4. Monitoring and controlling process group
5. Closing process group



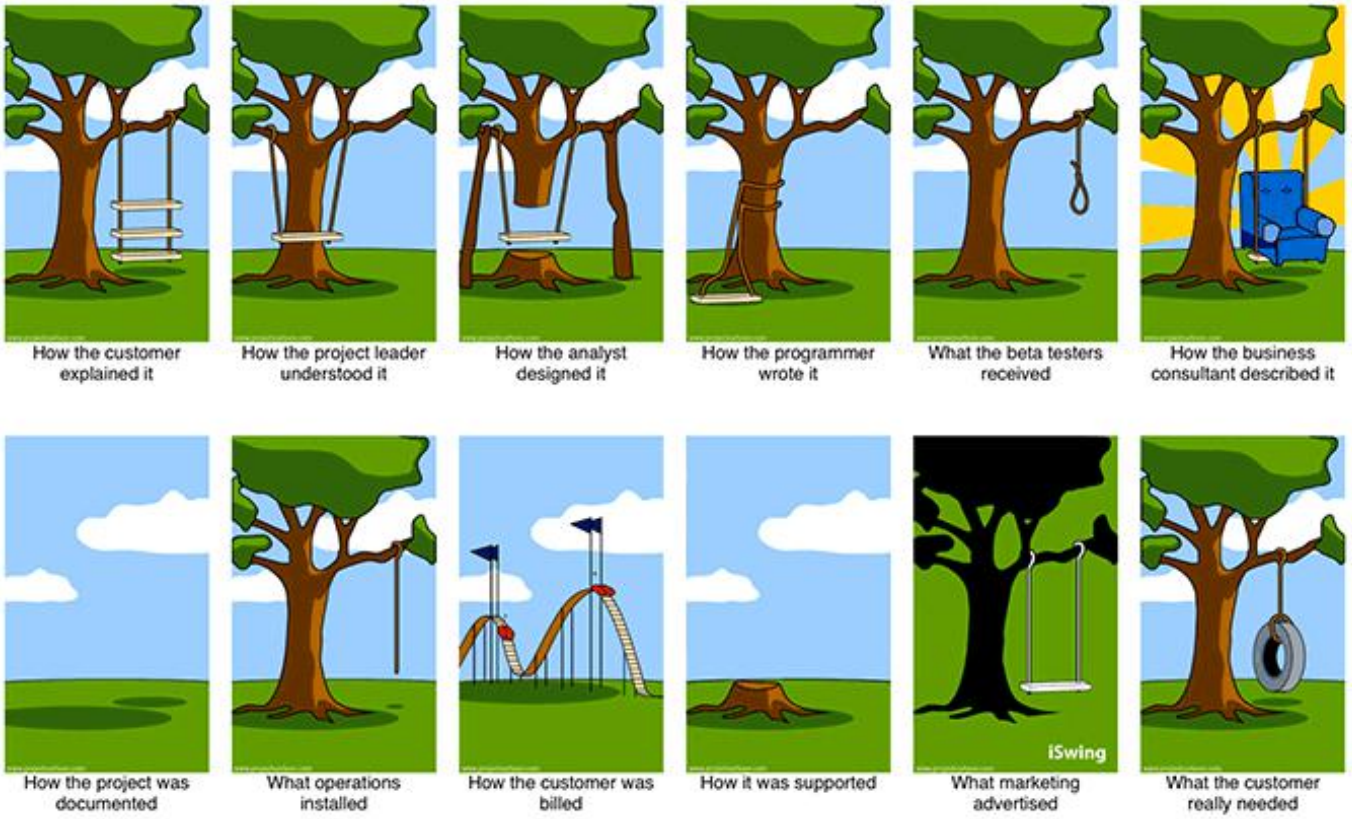
Ten Knowledge Areas

1.Project Integration Management
2.Project Scope Management
3.Project Time Management
4.Project Cost Management
5.Project Quality Management
6.Project Human Resource Management
7.Project Communications Management
8.Project Risk Management
9.Project Procurement Managment
10.Project Stakeholder Management

What is the PMBoK and where does it fit within the daily management of software development?

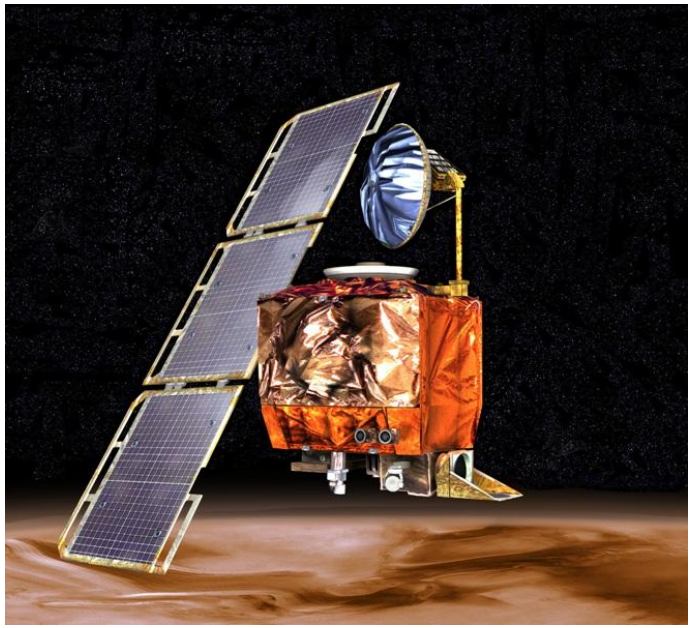
Fact or fiction: the PMBoK and agile approaches to project management are incompatible?

Why do organisations manage projects?



Remember this from Tuesday's lecture?

Why do projects fail? – Technical reasons



1999 NASA's Mars Climate Orbiter
$125 Million cost
10 month journey
Entered Mars atmosphere too low and fast and disintegrated

Software 1 computes thrust force needed in units of *pounds*
Software 2 accepts number from Software 1 in units of *newtons*

1 **newton** of force = .2249 **pounds** of force

(metric) (English)

Why do projects fail? Management reasons

CGI Federal

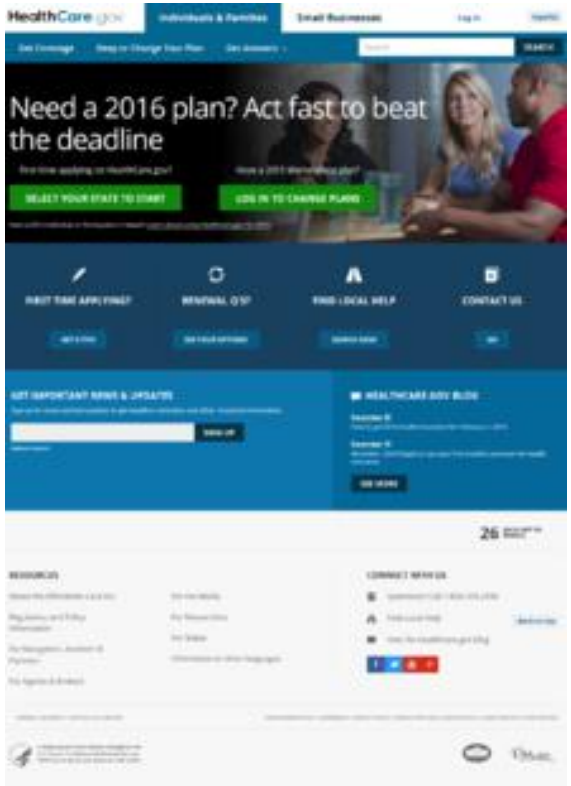
Paid $88M

Website < 1% successful

Serge Godin
Founder, Billionaire

What went wrong? “**sloppy software foundation** possibly due to the haste with which code was written.” and “with so **many contractors**, everyone could technically fulfill the requirements in their statement of work, and the thing can still not work in the end.” Washington Post, 2013[1]

‘ObamaCare’
US$1.5 Billion Government Project



1 https://www.washingtonpost.com/news/wonk/wp/2013/10/16/meet-cgi-federal-the-company-behind-the-botched-launch-of-healthcare-gov/?utm_term=.c938b4e4adf3

Why do projects fail? Not understanding requirements

1978

Roof fell in only *hours* after thousands of basketball spectators left the coliseum

What went wrong? Many things, including the use of computer science to work out the minimum required materials for the expected load, and a computer analysis that left out the torsional stress requirements.

Hartford Coliseum

Why we manage projects

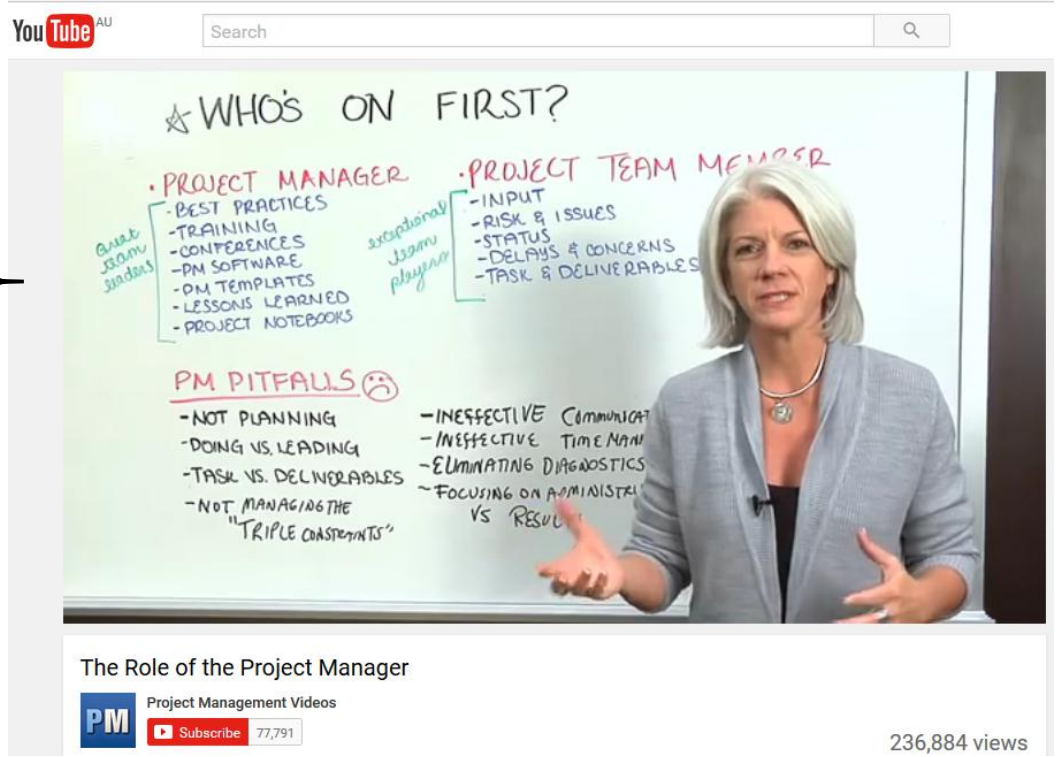
Software development is different. It is
- complex
- abstract
- usually requirements are incomplete
- technology changes rapidly
- technology is a vast domain
- technology experience is incomplete
- software development is akin to research
- software construction is really design
- change appears easy
- change is inevitable

Managing software development projects is difficult!

What are the key attributes of a good project manager and why are they important?

What are the key attributes of a good project manager and why are they important?

- Best practices
- Training
- Conferences
- PM software
- PM templates
- Lessons learned
- Project notebooks



Project management vs Project leadership

A Comparison of Managing or Leading a Project [6]

Managing = coping with complexity	Leading = coping with change
Formulate plans and objects	Recognise the need to change to keep the project on track
Monitor results	Initiate change
Take corrective action	Provide direction and motivation
Expedite activites	Innovate and adapt as necessary
Solve technical problems	Integrate assigned resources
Serve as a peacemaker	
Make tradeoffs among time, costs, and project scope	

Understanding teamwork

Understanding teamwork

Team formation

Developing your people skills

Personality and its impact

Emotional intelligence and performance

Australian National University

Understanding teamwork

What is a team?

A group of people formed to achieve a goal.

- May be temporary or indefinite.
- Individuals share responsibility
- Takes advantage of all of the collective talent, knowledge, and experience of each team member.

It is feeling part of something larger than yourself and all the team members understand the objectives of the team. A team is a group of people who have unified for a common outcome.

Team members feel they are valuable to project

Positive team behaviour

- Active listening
- Summarising
- Open body language, eye contact
- Encouragement
- Enhancing and maintaining the self-esteem of others

Negative team behaviour

- Interrupting
- Silence
- Whispering to other members
- Aggression
- Ridicule
- Withdrawal, either mentally or physically, from the group
- Personal attacks

Understanding teamwork

, not!

Understanding teamwork

Characteristics of successful teams [1]

Successful teams will demonstrate most, if not all, of the following characteristics:

- There is a clear specification and understanding of the purpose, objectives and goals to which they are working
- All team members work collaboratively
- Team members understand and agree on the role of each person
- Good chemistry is evident
- Individuals create connections that engender commitment, respect and responsibility

To be successful, teams also require:

- Good communication
- Courage to confront and resolve conflict
- Ability to give positive feedback
- Ability to empathise with other team members
- Willingness to put aside personal goals in order to achieve team goals

Understanding teamwork

Team types

Teams can be defined as traditional or self-directed

Traditional

These teams have a

- Shared understanding and purpose
- Mutually agreed operating principles
- Interdependent – all working for the good of the team
- Distinguish task from process

Self-directed

In these teams

- The team as a whole is responsible for whole product or process
- Team plans and performs work, including supervision and management
- A facilitator helps team get started and stay on track

What is Agile project management (APM)?