



THE UNIVERSITY OF
MELBOURNE

SWEN90016
Software Processes & Project Management

Revision and Exam

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2019 – Semester 2



WANT TO

HELP IMPROVE

SUBJECTS?



Complete the Subject Experience Survey
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2019 - Semester 2 Structure

Week #	Lecture w/b Date	Old Arts Public Lecture Theatre Friday 3.15pm to 5.15pm	Assignment
1	29/07/19	Subject Introduction, Introduction to Projects and Project Management	
2	05/08/19	Project Management Plan & SDLC's	Assignment 1 Spec available on LMS Friday 09/08/19
3	12/08/19	SDLC - Agile Scrum – continued Individuals, Motivation and Teams	
4	19/08/19	Stakeholder Management Communication Management	Assignment 2 available & Groups created during the workshops / tutorials – attendance mandatory
5	26/08/19	Project Planning and Scheduling Assignment 1 & 2 open forum / discussion	Assignment 1 (Individual) due Fri 30/08 @ 11.59 pm
6	02/09/19	Cost Estimation	
7	09/09/19	Risk Management	
8	16/09/19	Quality Management/Configuration Management	Assignment 2 (Part 1) due Wed 18/09 @ 11.59 pm
9	23/09/19	<i>University Holiday</i>	
	30/09/19	<i>Non Teaching Week – Mid semester break</i>	Assignment 2 (Part 2) due Sat 05/10 @ 11.59 pm
10	07/10/19	Ethics, Outsourcing & Procurement	Assignment 2 (Part 3) due Sat 12/10 @ 11.59 pm
11	14/10/19	Guest Lecture	Assignment 2 (Final) due Sat 19/10 @ 11.59 pm
12	21/10/19	Subject Revision and Exam Prep	Assignment 2 Project Demonstration during tutorials



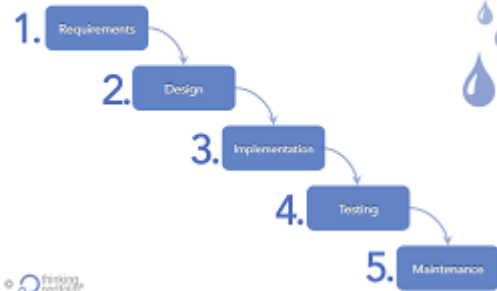
L1 - Intended Learning Objectives

- Understand key elements of a Project and why organisations use them
- Understand the foundational components of Project Management
- Understand key skills and responsibilities / activities of a Project Manager
- Understand key elements of how to manage Projects
- An initial look at (some) Project Management Methodologies / Standards

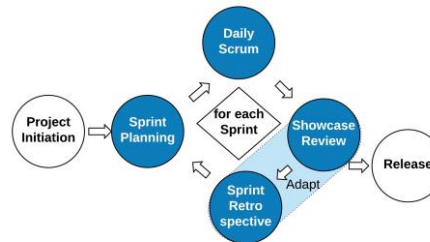
L1 – Project Management Methodologies / Standards

Waterfall

Project Waterfall Method

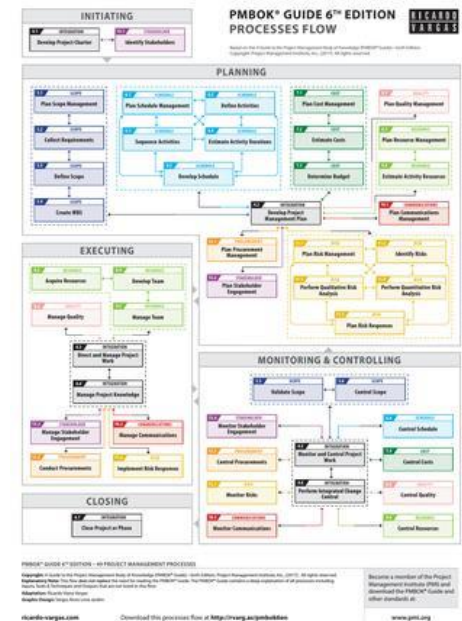


SCRUM

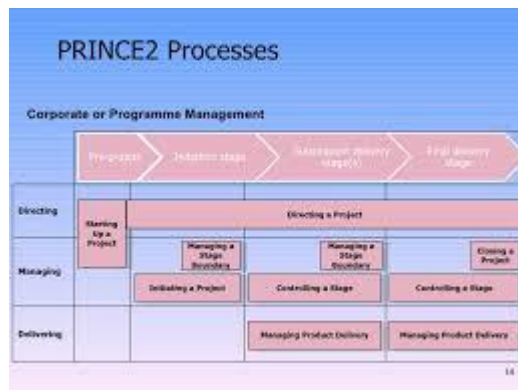


Agile

PMBOK



Prince2





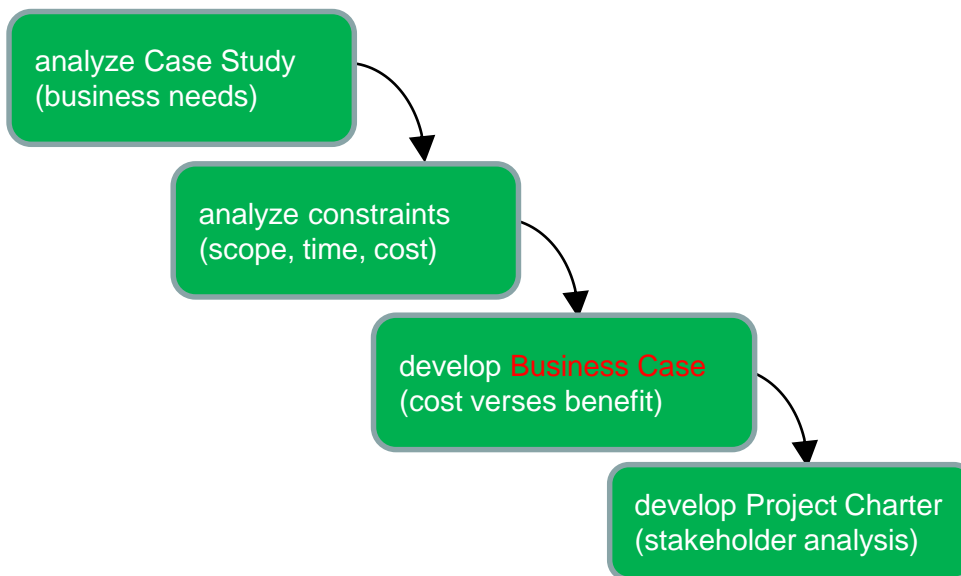
L1 - Intended Learning Objectives

- Explore key drivers in why projects fail / succeed
- Understand how organisations select the best / right projects
- Understand the Project Initialization process, Business Case structure and why organisations use them
- Explore various Investment techniques and financial models
- Understand responsibilities associated with building a Business Case and the accountable group / individual
- Understand what a Project Charter is and how it is used

History tells us we have failed.

ALL IT PROJECTS					
	2011	2012	2013	2014	2015
Successful	29%	27%	31%	28%	29%
Challenged	49%	56%	50%	55%	52%
Failed	22%	17%	19%	17%	19%

Project Initialization



Project Management Process



Project Charter

Project Name Target Date: [Date]

Write out the project description here. Write out the project description here. Write out the project description here. Write out the project description here. Write out the project description here.

Item	Quantity	Rate	Total
Resources			
Equipment			
Budget			
Total			

Project Team

- Person 1 – Project Manager
- Person 2 – Team Lead
- Person 3 – Analyst
- Person 4 – Developer
- Person 5 – Quality
- Person 6 – Trainer
- Person 7 – Other
- Person 8 – Other
- Person 9 – Other
- Person 10 – Other

Milestone 1
[Date]
[Description of what will be accomplished on this milestone]

Milestone 2
[Date]
[Description of what will be accomplished on this milestone]

Milestone 3
[Date]
[Description of what will be accomplished on this milestone]

Item	Quantity	Rate	Total
Cost Savings			
Time Savings			
Revenue Gain			
Net Total			



L2 - Intended Learning Objectives

- Understand what a Process is and its relevance to Project Management
- Understand what a Project Management Plan (PMP) is and when it should be used
- Understand the components of a Project Management Plan
- Understand what a Software Development Lifecycle (SDLC) is and the advantages / disadvantages of various models

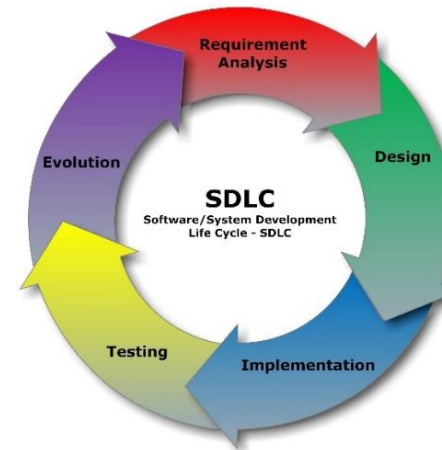
L2 – Project Management Plan (Formal)

A typical PMP consists of all / or most of the following categories.

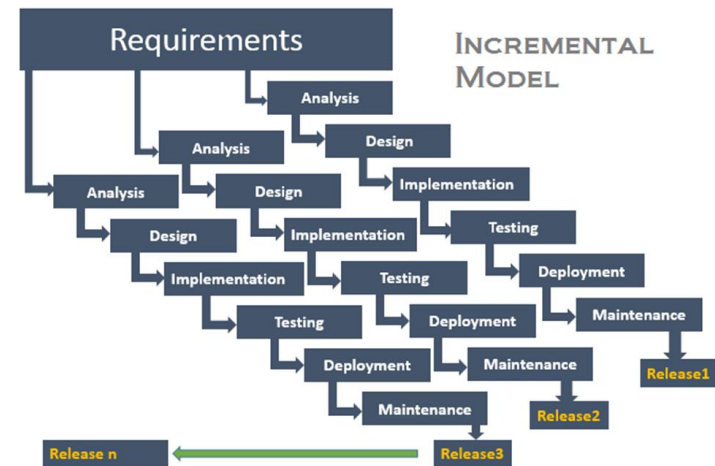
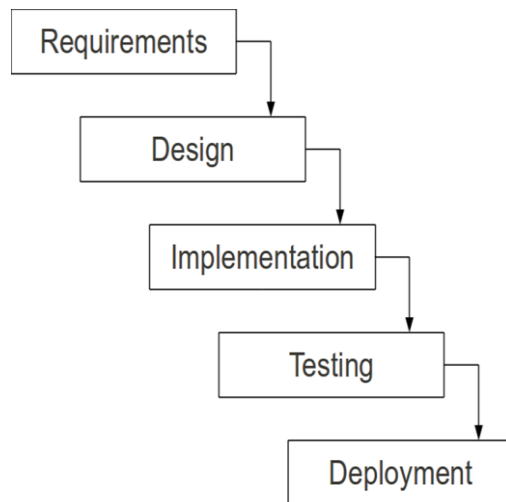
- *Project Information*
 - Executive Summary
 - Financial Authority to proceed
 - Key Stakeholders
 - Scope
 - Delivery approach / SDLC - Waterfall or Agile
 - Resources / People
 - Key Milestones
 - Project Budget
 - Business Value (Financial & Non-Financial Benefits)
 - Lessons learned applied to this project
 - Constraints

Formal Processes

- Waterfall
- Incremental

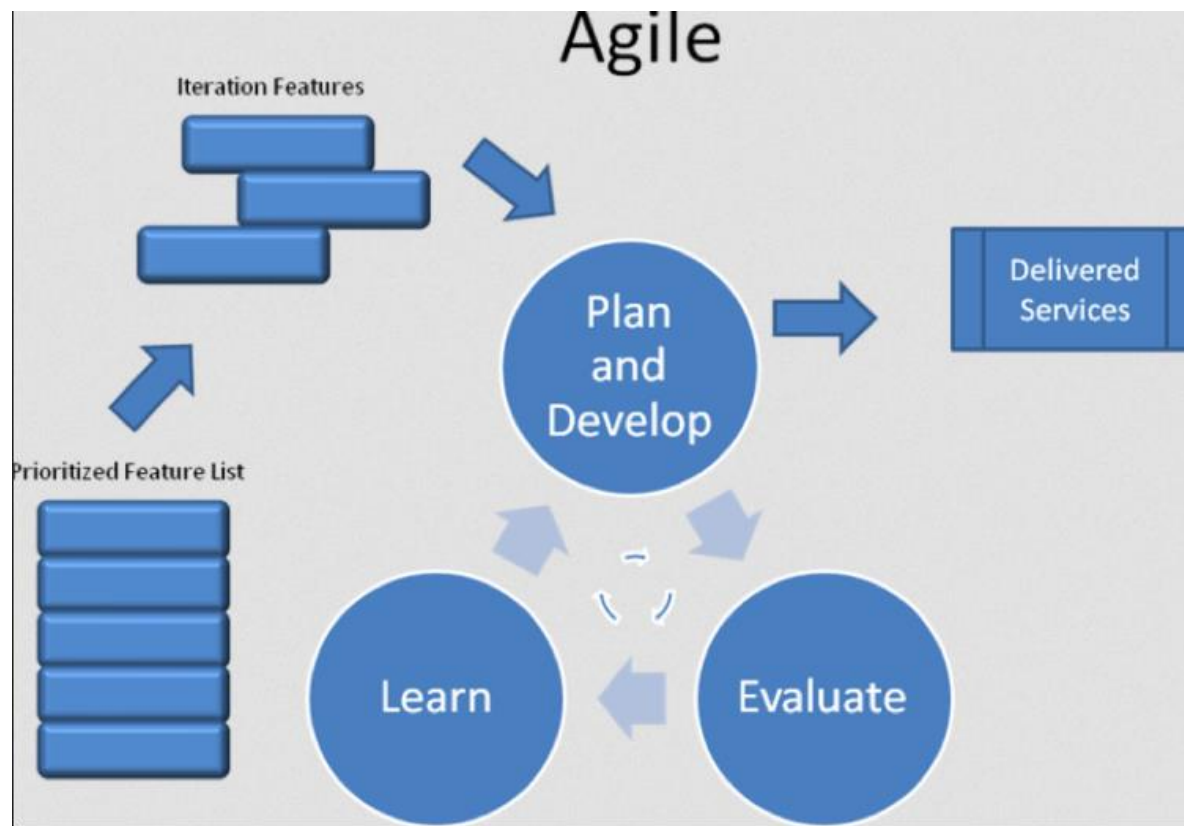


Waterfall Model



L2 - Agile

There are many SDLCs around with organisations typically favouring a blend of Formal and Agile approaches.



Scrum in 100 words

- Scrum is an agile process that allows us to focus on delivering the highest business value in the shortest time.
- It allows us to rapidly and repeatedly inspect actual working software (every two to four weeks).
- The business sets the priorities. Teams self-organise to determine the best way to deliver the highest priority features.
- Every two to four weeks, you can see real working software and decide to release it as is or continue to enhance it for another sprint.

WILLIAM GARRARD



Widely used across industry – not always in its original form.

	TO DO	DOING	DONE
User Story #1	Manual Testing ⁵ Define Test Cases ⁴	Create New Screen ³ Implement Business Logic ²	Design Solution ² John
User Story #2	Write Unit Tests ² Create Automated Tests ⁶	Modify Existing Screen ³ Implement Business Logic ⁴	Design Solution ² John
User Story #3	Create Automated Tests ⁶	Create New Screen ³ Implement Database Changes ⁴	Design Solution ² John

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Lecture 4

L4.3 – Scrum Framework - Sprints

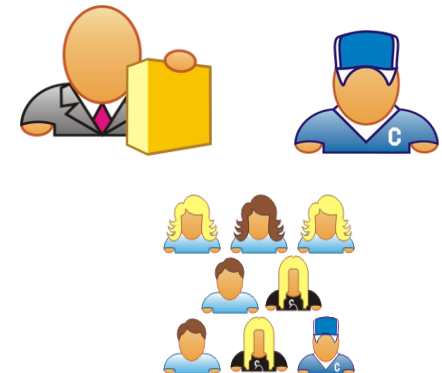
Requirements Design Code Test

Rather than doing one thing at a time...

...Scrum teams do a little of everything all the time

Source: "The New Product Development Game" by Takeuchi and Nonaka, Harvard Business Review, January 1986.

SWEN90016 Software Processes and Project Management - 29 - IT ALL STARTS HERE



Scrum Overview



Roles

- Product owner
- ScrumMaster
- Team

Ceremonies

- Sprint planning
- Sprint review
- Sprint retrospective
- Daily stand-ups

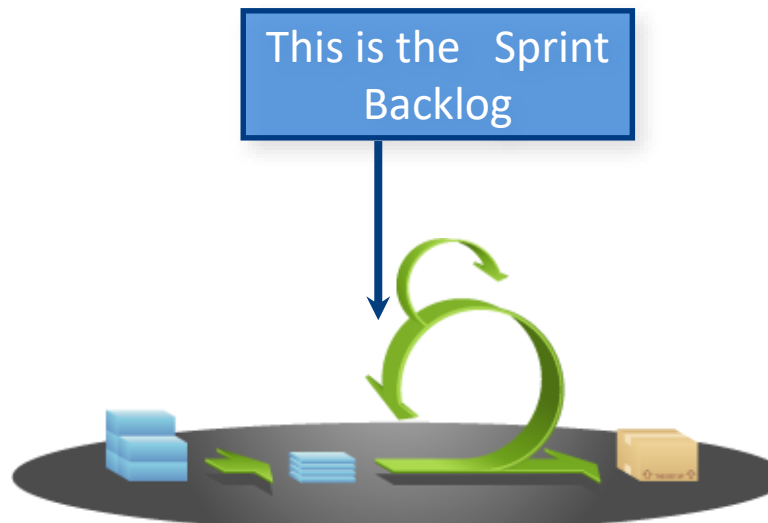
Artifacts

- Product backlog
- Sprint backlog
- Burndown charts

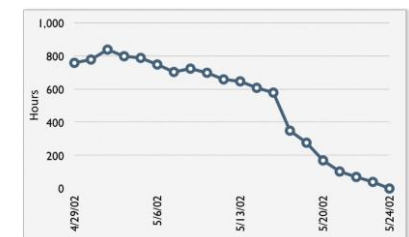
This is the Product Backlog



This is the Sprint Backlog



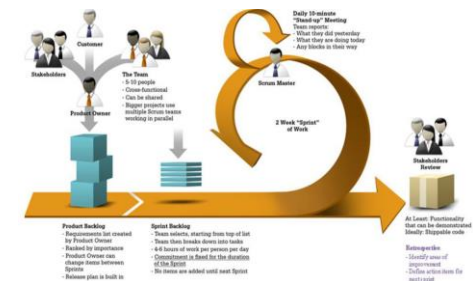
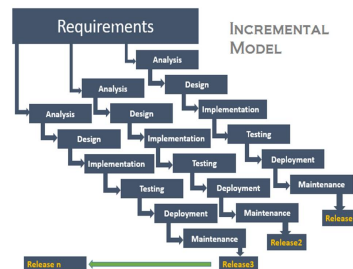
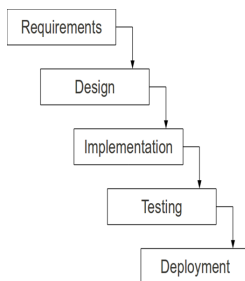
Burn Down Chart



Formal or Agile which one Should I use???

There is no one right answer. The following questions can assist deciding:

- How Stable Are the Requirements?
- Do the end users need to collaborate?
- Is the Timeline Aggressive or Conservative
- What Is the Size of the Project
- Where Are the Project Teams Located
- What Are the Critical Resources?



L3 - Intended Learning Objectives

- Understand motivation.
- Understand organisational theory and how people are motivated.
- Understand how leaders lead and managers manage.
- Understand how to manage the most important project resource.
- Understand why we use teams and their value.
- Understand how teams form and perform.
- Understand team roles and structures.
- Understand the advantages & disadvantages of teams



Lecture 3

L3.1 – Teams, Individuals and Motivation

So why is this important to Project Management?

Lecture 1

L1.3 – What is Project Management

Project Management is the planning, delegating, monitoring and controlling of all aspects of the project, and **coordinating those involved to achieve the project objectives within the constraints** for time, costs, quality, scope, benefits and risks.

Value lies in:

- Organising and structuring scarce resources
- Managing risk
- Identifying and clearing issues
- Managing and implementing change
- Retaining and re-using knowledge
- Organisational wide learning from past success and failures

Lecture 1

L1.5b – Project Manager Key Activities "a change is occurring"

Agile is redefining the way we execute projects and the role of the PM. In Agile:

- No defined PM role
- Key activities are spread / shared across team members
- Key project activities are still undertaken formally with appropriate documentation
- Some alignment to activities of a Scrum Master
- Move from **Command and Control** to **Support Leadership**
- Coaches and facilitates teams to deliver**
- Empowered responsibility
- Is involved in the project's overall performance
- Asks the teams for answers
- Allows the teams to self-organise and take full control
- Assists others with facing issues

Individuals and what motivates them



Leaders and Leadership Styles

Motivational Theories

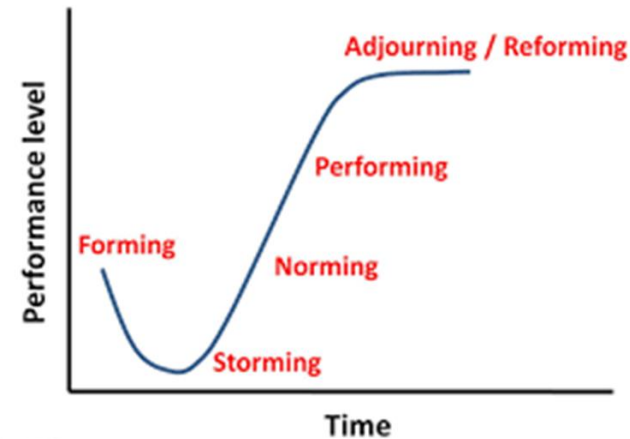
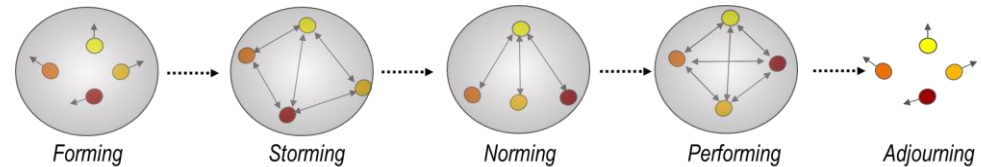


Nine Influence Factors [Thamhain & Wilemon]

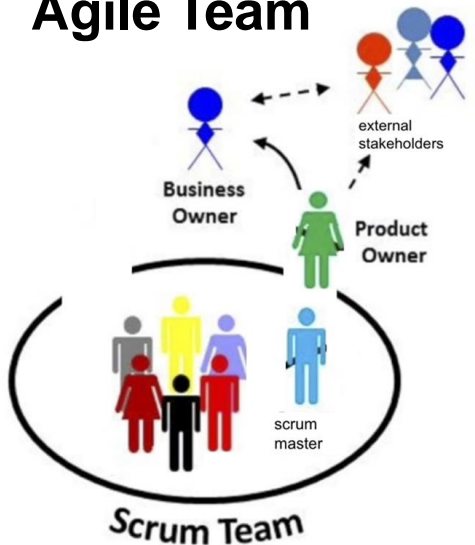
- Authority:** Legitimate hierarchical.
- Assignment:** Perceived ability to influence future work assignments.
- Budget:** Perceived ability to authorise use of funds.
- Promotion:** Ability to improve workers position
- Money:** Ability to increase a workers pay & benefits
- Penalty:** Ability to cause punishment.
- Work Challenges:** Ability to assign work to individuals.
- Expertise:** Perceived special knowledge that others deem / think is important.
- Friendship:** Ability to establish friendly personal relationships.



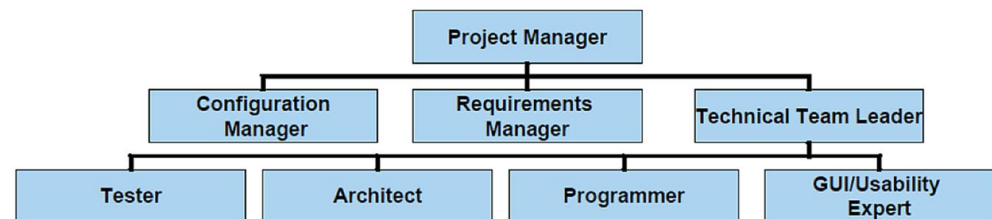
Team Stages



Agile Team



Team Structures



L4 - Intended Learning Objectives

- Understand the communication challenge
- Understand the importance of listening & Active listening
- Understand the importance of communicating effectively & key skills
- Understand a communications plan and how it is used
- Understand the Stakeholder Management Process
- Identifying Stakeholders & the Stakeholder Register
- Understand Stakeholder Engagement and Planning

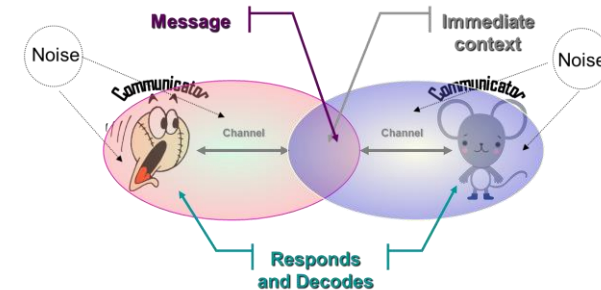


WILLIAM GUNN



Various types of Listening

- Passive Listening
- Active Listening
- Critical Listening



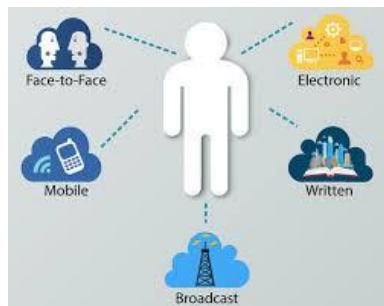
The Act of Listening
Demands Real Effort



Truly Effective
Listeners are Rare

Listening is An
Essential Life Skill

Few People Practice
Listening and Even Fewer
Have Been Trained to Listen



Running Meetings



Communication Channels

How well medium is Suited to:	Hard Copy	Telephone Call	Voice Mail	eMail	Meeting	Web Site
Confirming commitments	1	3	3	1	2	1
Building consensus	3	2	3	3	1	3
Mediating conflict	3	2	3	3	1	3
Resolving misunderstanding	3	1	3	3	1	3
Addressing negative behaviour	3	2	3	3	1	3
Expressing support/appreciation	1	2	3	3	1	3
Encouraging creative thinking	2	3	3	3	1	3

Stakeholder Register

Name	Position	Internal/ External	Project Role	Contact Information
Stephen	VP of Operations	Internal	Project Sponsor	stephen@globaloil.com
Betsy	CFO	Internal	Senior Manager. Approves Funds	betsy@globaloil.com
			Senior Manager. PM's Boss	chien@globaloil.com
			Team Member	ryan@globaloil.com
			Senior Manager	lori@globaloil.com
			Senior Manager of Largest Refinery	sanjay@globaloil.com
			Project Manager	debra@globaloil.com
			Software Supplier	suppliers@gmail.com



Name	Power / Influence	Current Engagem	
Brian	High/High	Champion	but he has a great personality and sense of humour. y and knows what he wants. Manage closely and ask frequent updates in person.
Mary	High/Medium	Resistant	Mary is very organised yet hardhead. She has been pushing corporate IT standards, and the system the PM and sponsors like best goes against those standards, even though it's the best solution for this project and the company as a whole. Need to convince her that it is ok and that people still respect her work and position.
Finance Team	Medium/High	Resistant	The Finance Team is resistant to the Project. They believe the funds can be better used elsewhere in the organisations. They also believe the Benefits are not achievable in the defined pay back period. Key stakeholder as they control the funding which the project is dependant on. Need to convince them of the costs & benefits and ensure they understand the detail. Get them involved in a detailed review of all \$'s.

Stakeholder Register

Name	Position	Internal/ External	Project Role	Contact Information
Stephen	VP of Operations	Internal	Project Sponsor	stephen@globaloil.com
Betsy	CFO	Internal	Senior Manager. Approves Funds	betsy@globaloil.com
Chien	CIO	Internal	Senior Manager. PM's Boss	chien@globaloil.com
Ryan	IT Analyst	Internal	Team Member	ryan@globaloil.com
Lori	Director Accounting	Internal	Senior Manager	lori@globaloil.com
Sanjay	Director Refineries	Internal	Senior Manager of Largest Refinery	sanjay@globaloil.com
Debra	Consultant	External	Project Manager	debra@globaloil.com
Suppliers	Suppliers	External	Software Supplier	suppliers@gmail.com

Communication Channels

How well medium is Suited to:	Hard Copy	Telep hone Call	Voic e Mail	eMail	Meeti ng	Web Site
Confirming commitments	1	3	3	1	2	1
Building consensus	3	2	3	3	1	3
Mediating conflict	3	2	3	3	1	3
Resolving misunderstanding	3	1	3	3	2	3
Addressing negative behaviour	3	2	3	2	1	3
Expressing support/appreciation	1	2	3	1	2	1
Encouraging creative thinking	2	3	3	2	1	3

Stakeholder Analysis

Name	Power / Influence	Current Engagement	Potential Management Strategies
Brian	High/High	Champion / Leading	Brian can seem intimidating due to his physical stature and deep voice, but he has a great personality and sense of humour. He previously led a similar software upgrade project at another company and knows what he wants. Manage closely and ask for his advice as required. He likes to be kept in touch with short, frequent updates in person.
Mary	High/Medium	Resistant	Mary is very organised yet hardhead. She has been pushing corporate IT standards, and the system the PM and sponsors like best goes against those standards, even though it's the best solution for this project and the company as a whole. Need to convince her that it is ok and that people still respect her work and position.
Finance Team	Medium/High	Resistant	The Finance Team is resistant to the Project. They believe the funds can be better used elsewhere in the organisations. They also believe the Benefits are not achievable in the defined pay back period. Key stakeholder as they control the funding which the project is dependant on. Need to convince them of the costs & benefits and ensure they understand the detail. Get them involved in a detailed review of all \$'s.



L10 - Intended Learning Objectives

- Understand how and why Ethics are important
- Australian Computer Society Code of Ethics
- Understand the Procurement Management Process
- Understand what Outsourcing is and why it is used
- Understand the types of contracts, when you would use them and key contractual clauses

Revision and Exam

L5 - Intended Learning Objectives

- Understand the role of a project schedule
- Understand how to develop a project schedule
- Understand how to use a project schedule to monitor and track project progress
- Understand agile planning principles



Work Breakdown Structure

Redecorate Room

Prepare materials

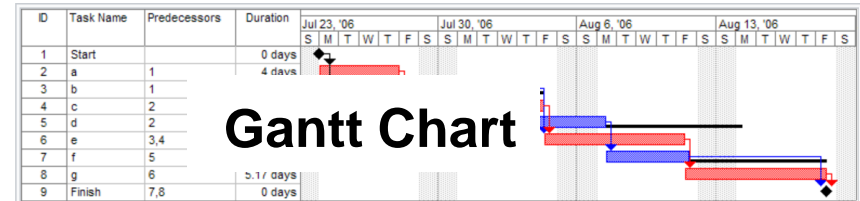
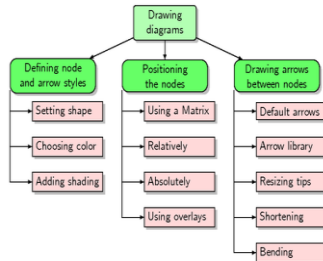
- Buy paint
- Buy a ladder
- Buy brushes/rollers
- Buy wallpaper remover

Prepare room

- Remove old wallpaper
- Remove detachable decorations
- Cover floor with old newspapers
- Cover electrical outlets/switches with tape
- Cover furniture with sheets

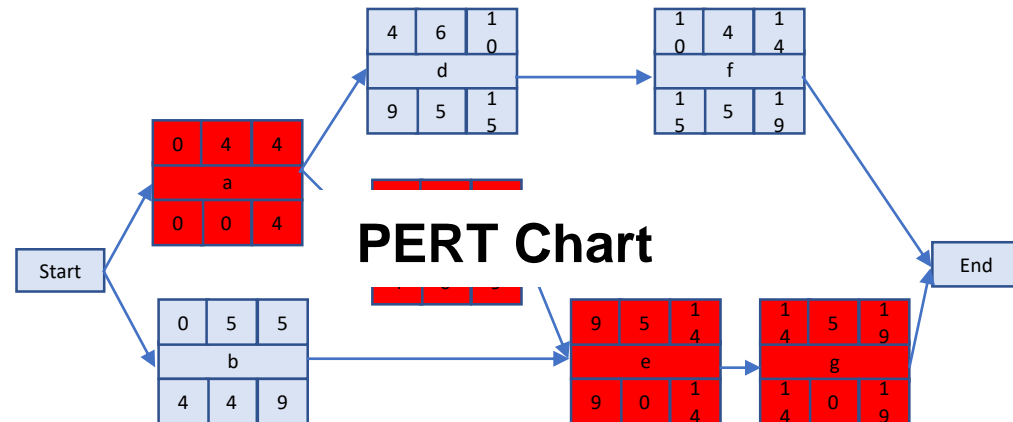
Paint the room

- Clean up the room
- Dispose or store leftover paint
- Clean brushes/rollers
- Dispose of old newspapers
- Remove covers



Gantt Chart

A Gantt chart created using Microsoft Project (MSP). Note (1) the critical path is in red, (2) the black lines connected to non-critical activities, (3) since Saturday and Sunday are not work days and are thus excluded from the schedule, some bars on the Gantt chart are longer if they cut through a weekend.

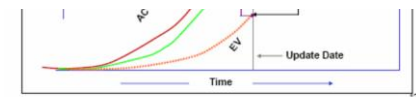


PERT Chart

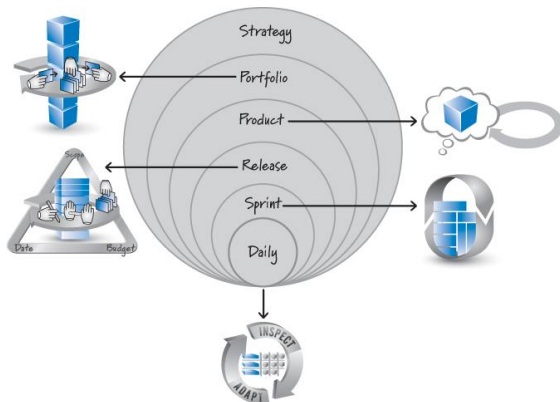
Graphic Performance Report



Earned Value Analysis



Scrum Planning Levels



L6 - Intended Learning Objectives

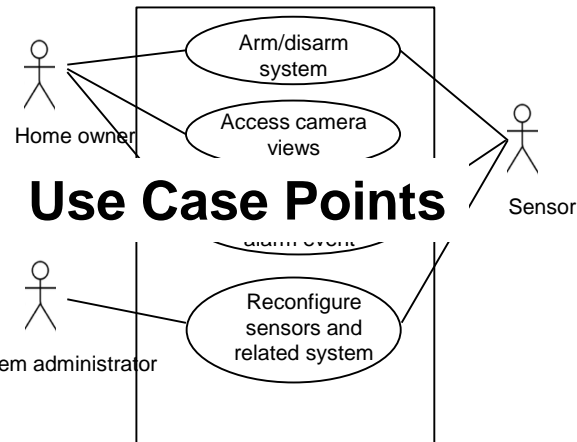
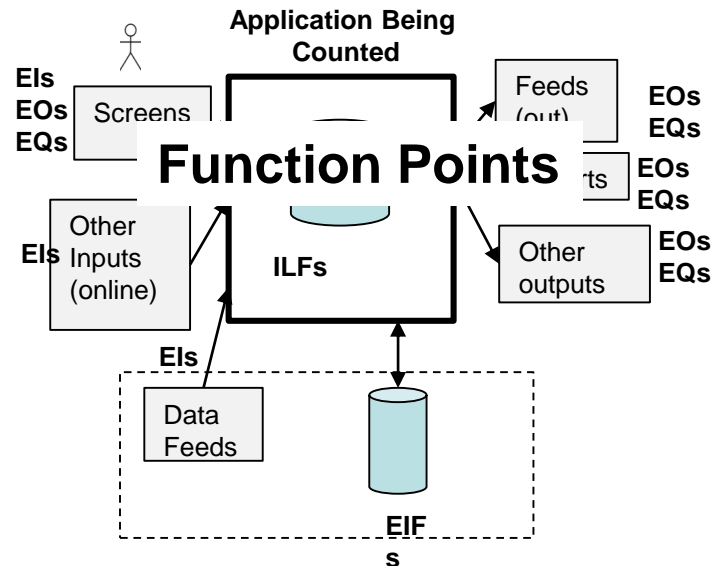
- Understand the importance of cost estimation and the challenges involved
- Understand the cost estimation techniques
- Understand software size estimation techniques
- Understand the principles of the COCOMO II model for algorithmic cost estimation
- Understand cost estimation techniques used in Agile software development lifecycles



FUNCTION POINTS

C	COBOL
<pre># inc: int pi }</pre>	<pre>identification division. program-id. ID" with program-name.</pre>
Lines of code: 4 (excluding whitespace)	Lines of code: 6 (excluding whitespace)

Lines of Code



Use Case Points

Parametric Estimation
COCOMO II
$$Effort = A \times Size^B \times M$$

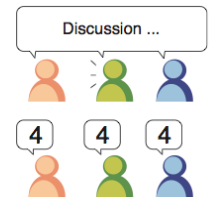
1. Customer reads story.



2. Agile Estimation



3. Team discusses.



4. Team estimates again.
Repeat until consensus reached.

L7 - Intended Learning Objectives

- Understand the fundamentals of risk management
- Understand the Risk Management Process
- Understand how to:
 - plan risk management activities
 - identify risks
 - analyze and assess risks
 - respond to risks (risk strategies)
 - monitor and control risks





Risk Planning ➔ **Risk Management Plan**

Risk Analysis and Assessment:

Risk ID	Risk	Probability (0 – 100%)	Impact	Exposure	Rank
1	XXX	40%	4	1.6	4

Risk Impact Analysis Table

Risk Identification:

Kinds of Risks:

Project, Product, Business

Identification Techniques:

Pondering	Interviewing
Brainstorming	Checklists
Delphi	SWOT Analysis

Risk Response

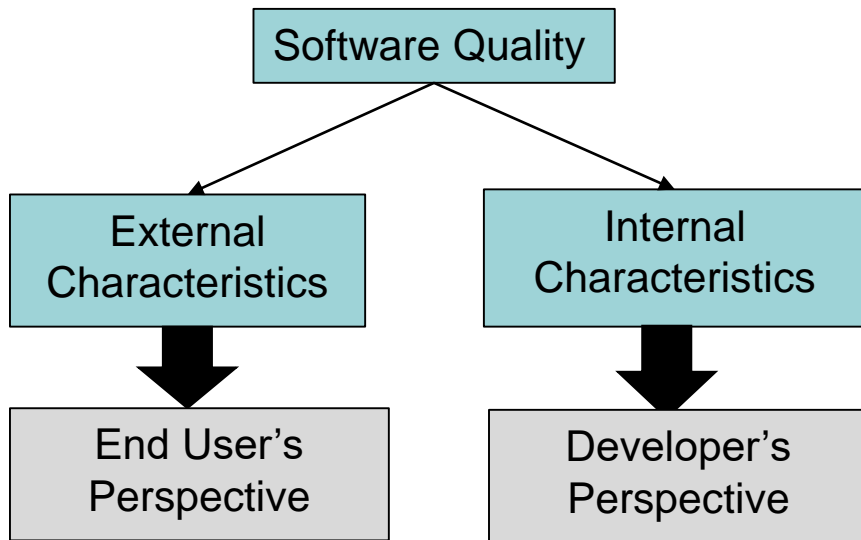
Risk ID	Trigger	Owner	Response	Resources Required

Risk Register

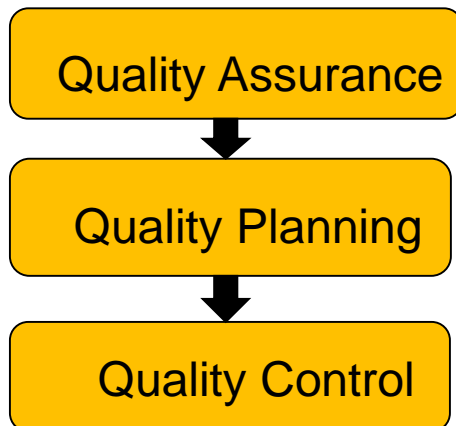
L8 - Intended Learning Objectives

- Understand the fundamentals of quality management
- Understand the quality management process
- Understand the following quality management activities:
 - Quality Assurance
 - Quality Planning
 - Quality Control and Monitoring

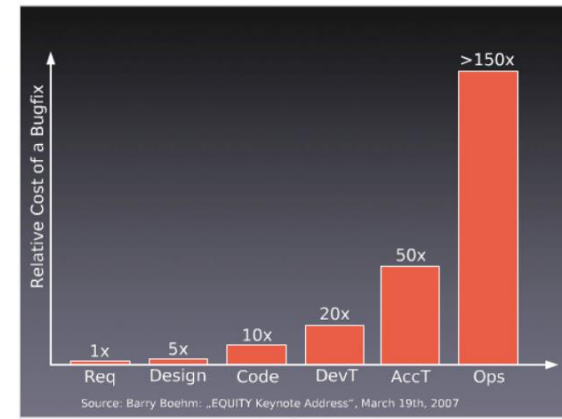




Quality Management Process



Cost of Quality



Quality Planning

- **Quality Goals**
- **Verification vs Validation**

Verification Activities

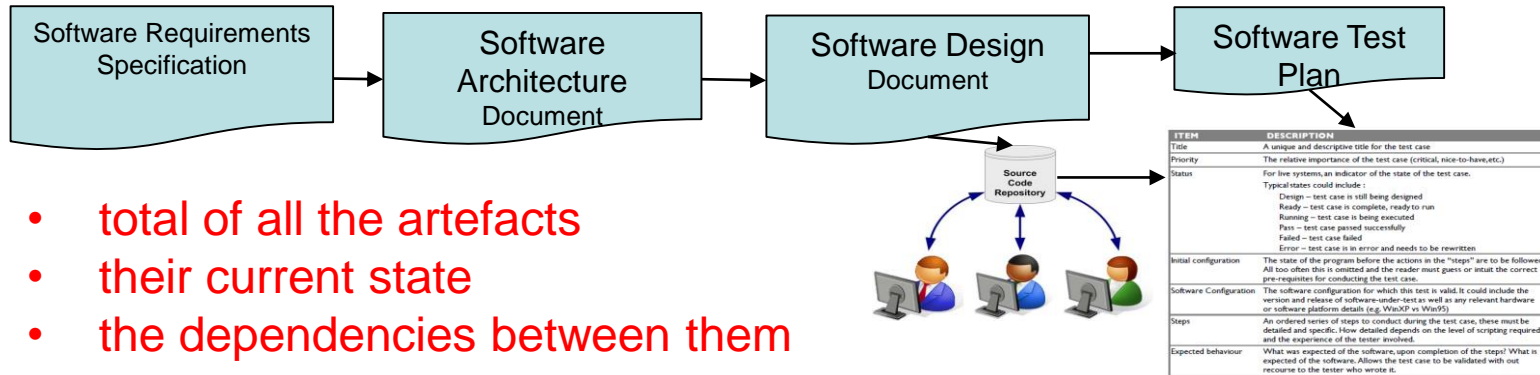
- **Technical Reviews**
- **Business Reviews**
- **Management Reviews**
- **Audits**

L8 - Intended Learning Objectives

- Understand the role of configuration management
- Understand the configuration management process
- Understand the tasks associated with configuration management

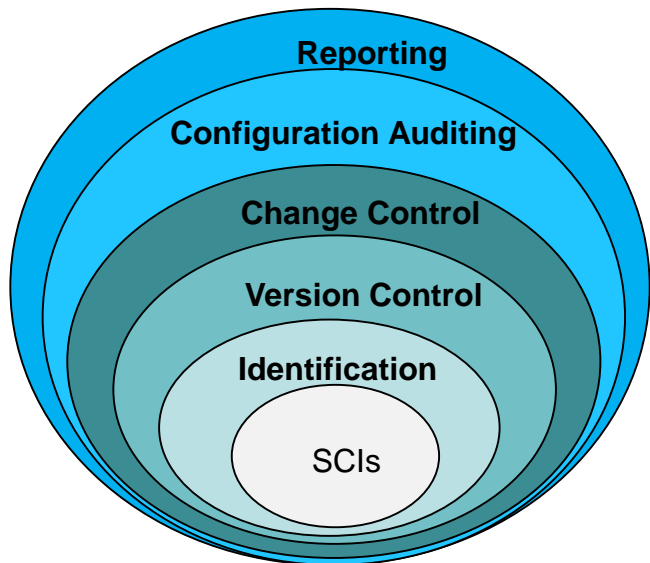


Software Configuration

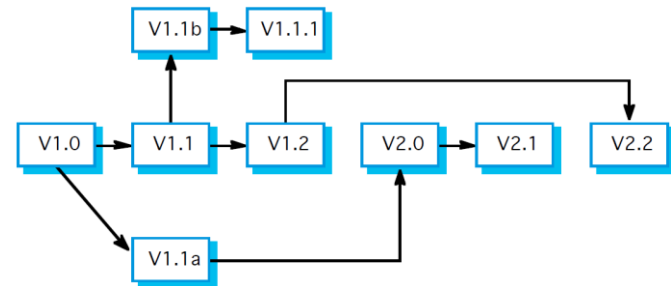


- total of all the artefacts
- their current state
- the dependencies between them

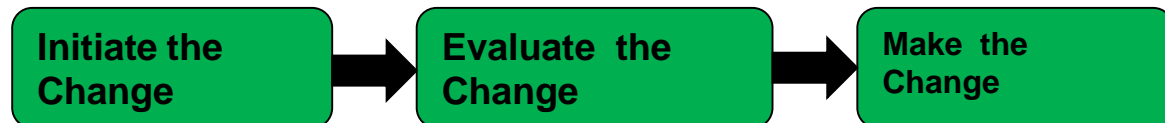
CM Tasks



Version Control



Change Control



IT Project Management

Alex Marzella – Director IDEE Group



- Ten workshops during the semester
 - supporting activities to get a deeper understanding of the concepts covered in the lectures
- Final workshop in week 12 (this week)
 - a recap of the material and project demonstrations



Assignment 1 - Intended Learning Objectives

- Identify the key characteristics, features and requirements for a project
- Identify the unknowns and risks in a project as identified at the start of the project
- Identify the goals of a project and the intended scope/deliverables

Assignment 2 - Intended Learning Objectives

- Develop a Project Management Plan (PMP) for a given project brief
- Plan the activities involved in the chosen process
- Execute, monitor and control processes to achieve an outcome
- Work effectively in a team. Each member is expected to spend 30-40 hours on this assignment (as per handbook)





- Total duration - 2 hours plus 15 minutes reading time
- Total marks - 50% (hurdle of 50% - 25 out of 50)
- The exam contains:
 - 10 multiple choice questions (10 marks)
 - 3 short answer questions (16 marks)
 - 2 long answer questions (24 marks)
- Follows the same pattern as the practice exam
- All topics covered during the semester are examinable!

- Revise all topics and attempt the practice exam (solutions will not be available for the practice exam)
- My consultation hours starting from **Wednesday 30th October**:
 - **Wednesday's 1.00pm to 2.00pm**
 - **Thursday's 11.00am to 12.00 pm**

From all of us:

Lecturer: Shanika Karuanssekera
(Subject Coordinator)



Lecturer: Harry Drakos



Tutors



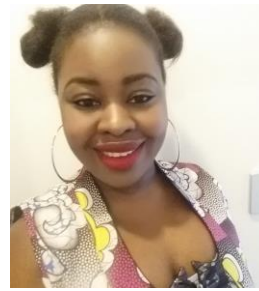
Marion Zalk
Head Tutor



Rajesh Sundaram



Doc Wallace



Esther Rotimi



Saksham Agrawal



Eileen O'Callaghan



Subramaniam Ramasubramanian