SWEN90016

Software Processes & Project Management

Harry Drakos

Department of Computing and Information Systems

The University of Melbourne
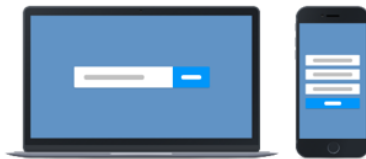
harry.drakos@unimelb.edu.au

2019 – Semester 2

Lecture 1

Lecture Quizzes

1. Feed back from previous semester.

2. Not marked.

3. Majority of exam multiple choice questions will be selected from these.

Join by Web

1. Go to **PollEv.com**
2. Enter **HARRYDRAKOS482**
3. Respond to activity

Join by Text

1. Text **HARRYDRAKOS482** to **+61 427 541 357**
2. Text in your message

IT ALL STARTS HERE

THE UNIVERSITY OF MELBOURNE

Your Subject Support Staff

Lecturer: Shanika Karuansekera
(Subject Coordinator)
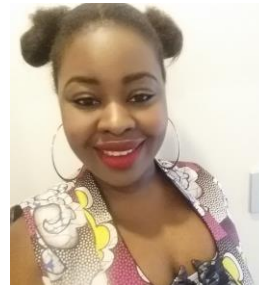
Lecturer: Harry Drakos

Tutors

Marion Zalk Head Tutor

Rajesh Sundaram

Doc Wallace

Esther Rotimi

Saksham Agrawal

Eileen O'Callaghan

Subramaniam Ramasubramanian

My Lectures and Tutors look like they:

Are highly Educated
and knowledgeable

Are a great buch of
people

Would like a few drinks
on a Friday night

All of the above

Start the presentation to see live content. Still no live content? Install the app or get help at **PollEv.com/app**

Harry Drakos

Academic – Melbourne lecturer

Professional Experience

- Independent Consultant – Commercial & Project Management
  - Industries & Clients: Commonwealth Government, Large Banks, Telco's, Pharmaceutical, Superannuation and Not for Profits

- 15 Years at NAB
  - Senior roles across: Program Management, Project Management, Procurement, Technology Transformation / Strategy and Applications / Infrastructure delivery

- 15 Years prior experience including:
  - CIO roles, Large and Small scale IT projects, IT Management and many years ago software development

Learning Outcomes and Skills

AIM

The aim of this subject is to introduce students to the software engineering principles, processes, tools and techniques for analysing and managing complex software projects.

INTENDED LEARNING OUTCOMES

- Select appropriate software engineering processes and practices projects

- Manage team dynamics and professional communication

- Plan and manage projects

- Identify risks and modify project activities to mitigate these risks

- Manage software project activities to ensure a quality product

- Describe human and organisational implications of change and explain the organisational change process.

GENERIC SKILS

- In-depth knowledge project management areas of knowledge

- Reach a high level of achievement in writing, research or project activities problem-solving and communication through the writing of project analyses

- Ability to function effectively as an individual and in a multidisciplinary and multi-cultural team as a leader, manager or effective team-member

- Understand and respect ethics and intellectual integrity

- Writing and communication skills.

General Expectations

LECTURES

- attend
- available via LMS

TUTORIALS / WORKSHOPS

- Student are expected to attend one one-hour workshop/tutorial each week.
- Workshops are intended to take concepts and principles discussed in lectures and to apply them to realistic examples.
- Students are expected to actively engage in workshops and show initiative, ask questions, conduct workshop exercises and in engage in the discussions

PLAGERISM AND COLLUSSION

- submissions must be own independent work or group project work.
- faculty policy: mechanisms for establishing contributions of individuals to group work
- university policy: see http://academichonesty.unimelb.edu.au/policy.html
- if plagiarism or collusion is detected, harsh penalties must and will be applied

- **Subject feedback has been mostly positive, with a few suggestions for improvement.**

- **Following are some of the changes applied this year based on the students feedback.**

  1. **Lectures**
     - A better lecture theatre
     - Make the lectures more interactive
     - Continue regular practice problems / quiz to test our understanding

  2. **Tutorials**
     - Make the tutorials more activity based

  3. **Assignments**
     - Assignment 1 was too hard and marking was inconsistent across tutors

Assignments

Assignment	Due Date	Weighting
Assignment One - Individual Available 9th Aug	11.59pm Friday 30th August (Week 5)	20%
Assignment Two – Group Available 23rd Aug	Part 1: 11.59pm Wednesday 18th September Part 2: 11.59pm Saturday 5th October (Non-teaching Week) Part 3: 11.59pm Saturday 12th October (Week 10) Part 4 FINAL:11.59pm Saturday 19th October (Week 11) Demonstration: During Week 12 Tutorials	30%

- Week 4 tutorial (week starting 19th August) - Groups for Assignment 2 will be allocated
  - *attendance is mandatory*
- 50% hurdle on the assignments one and two combined

Exam
- 2 hour written closed book end of semester – Weighting 50%
- 50% hurdle on the final exam

Assignment 1 - Learning Outcomes:

Analysis of an IT project case study that will demonstrate the ability to:

– identify the goals of the project;

– identify the key characteristics for the project;

– identify the risks in the project as identified at the start of the project; and

– justify the choice of a suitable software development lifecycle (SDLC) model to manage the project.

Assignment 1:

- Assignment specification will be given out by the end of week 2 – due Friday week 5
- You are expected to spend ~20-30 hours
- You will answer a set of questions related to a given case study
- Will be based on the material covered in weeks 1-4

Assignment 2 - Learning Outcomes:

A web-based IT system development project that will demonstrate the ability to:

– 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; and

– work effectively in a team.

Assignment 2

- Teams:
  - We will organise teams of 3-4 members during week 4 – *teams will not be self-selected*
  - Week 4 workshop attendance is mandatory as we will be selecting teams
  - Each student is expected to spend 30-40 hours on the project

- As a team you will be developing a web-based software system, which you will plan and manage:
  - You can choose any technology or framework including third party hosted systems such as Wix or simple web development frameworks such as WordPress
  - If you have not done the foundation subjects in your degree (or have received credit for them) please consider doing this subject next semester, after you complete the foundation subjects

Week #	Lecture Date	Old Arts Public Lecture Theatre Friday 3.15pm to 5.15pm	Assignment
1	**29/07/19**	**Subject Introduction, Introduction to Projects & Project Management**	
2	05/08/19	Project Management Plan & SDLC's	Assignment 1 Spec available on LMS Friday 09/08
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*	*University Holiday*	
	30/09/19	***Non Teaching Week – Mid semester break***	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

1. ~~Get to know your teaching staff, subject learning objectives, subject content and semester structure.~~

2. <mark>Understand key elements of a Project and why organisations use them.</mark>

3. Understand the foundational components of Project Management.

4. Understand key skills and responsibilities / activities of a Project Manager.

5. An initial look at (some) Project Management Methodologies / Standards.

L1.2 – What is a Project

A temporary endeavour to create a unique product, service or outcome.

Key characteristics:

- Introduce **CHANGE** to the organisation

- **TEMPORARY**, it has a defined beginning and end

- **CROSS-FUNCTIONAL**, cuts across organisational boundaries

- Deals with the **UNKNOWN**

- **UNIQUE**

- They all vary in **SIZE** – 👤 / 👤 , $'s and 🕐

L1.2 – Why do organisations use Projects

- Provides strategic alignment of key activities and visibility at the appropriate levels

- Mechanism to prioritise activities (Benefits, Regulatory, HW Refresh)

- Allows organisations to deliver change in a structured and formal manner outside of BAU

- Effective and efficient management of organisations limited resources (people & $'s)

- Establish ownership and accountability – Process and the Benefits

- Provide clarity, buy-in and agreement across what will be done, when, who, why and the outcomes

www.pmi.org/about/learn-about-pmi/what-is-project-management

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L1.3 – What is Project Management

Project Management is the planning, delegating, monitoring and controlling of all aspects of a project, and motivating those involved to achieve the project objectives within the expected targets 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

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L1.4 – Project Manager Skills / Attributes

Project managers are highly skilled knowledge workers and change agents. They take accountability, make project goals their own and use their skills and expertise to inspire a sense of shared purpose across the project team. They enjoy the organised adrenaline of new challenges and the responsibility of driving business results.

Core Skills / Attributes:

- Work well under pressure
- Comfortable with change and complexity in changing environments
- Use / have the right people skills
- Adapt, resolve issues and deal with problems
- Effective communicators regardless of hierarchy
- Action orientated and leave nothing for tomorrow
- Command & Control
- ***Good ones are in demand, hard to find and get paid a lot***

www.pmi.org/about/learn-about-pmi/who-are-project-managers

L1.4 – Project Manager Key Activities (traditional)

Planning

- Define and clarify project scope
- Develop the project management plan
- Develop the project schedule
- Develop policies and procedures to support the achievement of the project objectives

Organising

- Determine the project team structure
- Identify roles and responsibilities
- Identify services to be provided by external companies
- Staff all project positions and on-going management

Leading

- Setting team direction
- Owning & coordinating activities across different organisational functions
- Motivating team members
- Assigning work

Controlling

- Defining project baselines
- Tracking project progress
- Project status reporting
- Determining and taking corrective actions

L1.4 – Agile - Scrum Master Key Activities
"a *change is occurring*"

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

In pure 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 between a Scrum Master and a Project Manager
- Move from Command and Control to Servant Leadership
    - Coaches and facilitates teams to deliver
    - Emphasises objectives
    - Is invested in the program's overall performance
    - Asks the teams for answers
    - Allows the teams to self-organise and hit their stride
    - Assists others with fixing issues

www.pmi.org/learning/library/pm-role-lean-agile-world-9350

www.greenleaf.org/what-is-servant-leadership/

https://www.mountaingoatsoftware.com/agile/agile-project-management

L1.4 – Project Manager Key Activities - Market wants it all!

Project Manager Job Ad - Skills and experience

- Minimum 8+ years of experience as a Project Manager managing large, complex projects with multi-functional teams

- Strong stakeholder and relationship management skills

- Experience in managing multi-vendor teams

- Experience and qualifications in Prince2

- Can deal with complexity with very solid Project Management technical skills such as ability to develop and manage schedules, financial workbooks

- Strong stakeholder partnership skills, ability to work with teams at varying levels of project experience

- Key requirement is knowledge of multiple models of technical project delivery such as agile and running sprints but equally able to build confidence with the steering committee with formal project management approaches such as setting and achieving deadlines on timing and scope

L1 – Intended Learning Objectives

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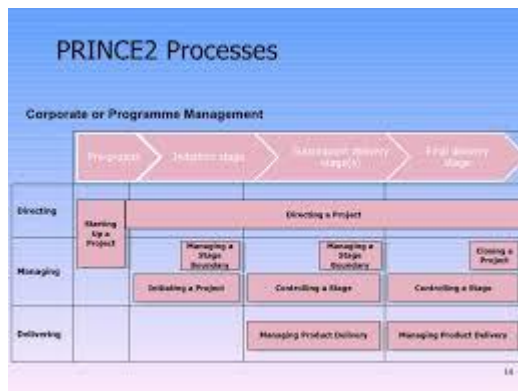## L1.5 – Project Management Methodologies / Standards
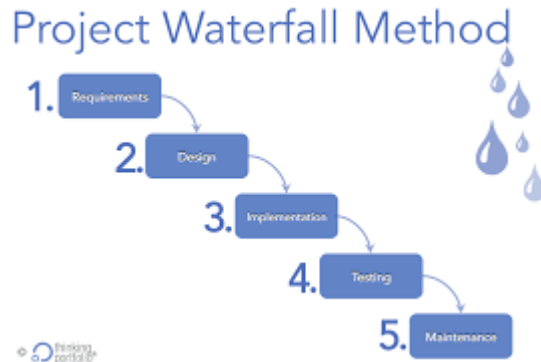
Waterfall

SCRUM
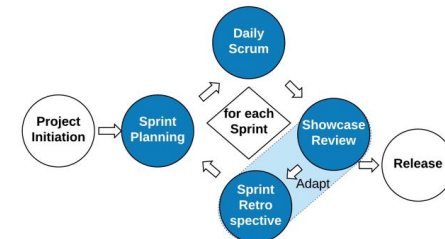
Agile

Prince2

L1.5 – Key Elements of Project Management Methodologies / Standards

Waterfall
- Traditional approach used for over 40 years
- Requirements must be defined at the start
- Little / no alternations
- Sequential - Complete 1 task and then the next
- Used in large scale SW development where thorough planning and predictability is required

Pros
- Extensive planning, this thoroughness often results in more accurate timelines and budgets

Cons
- Difficult to apply changes or modify / correct previous steps (water can't run backwards), need to be proactive in anticipating problems

L1.5 – Key Elements of Project Management Methodologies / Standards

Agile

- Focuses on adapting to changing situations
- Reliant on constant and regular feedback
- Focuses on iterative outcomes delivering value as quickly as possible & collaboratively
- Small manageable actions and activities
- Involvement & ownership across the team – Team members self select work
- Customer focus over formalised sign-offs

Pros

- Retains flexibility while continually producing outcomes – less rework
- Greater communication & engagement – increased buy in across the team of the end outcome

Cons

- Difficult to do without experience – especially an experienced Scrum Master
- Large projects co-location a problem
- Difficult to contract suppliers

L1.5 – Key Elements of Project Management Methodologies / Standards

Structured Project Management Methodologies e.g. PRICNE 2 etc

- Widely used and accepted - Consulting, Private and Government
- Process orientated approach
- Divides projects into multiple stages
- Detailed and thorough
- Must have a clear need, a target customer, realistic benefits, and a thorough cost analysis

Pros

- Extensive documentation is helpful with corporate planning & tracking

Cons

- Difficult and untimely to adapt changes and apply these to all documentation

L1.5 – Project Methodologies – Which one is the right one?

- They all have a place and all can be appropriate

- It is like selecting the best recipe – *it all depends on your ingredients*

- Items (ingredients) to consider include:

  - Clarity and stability of scope

  - Timelines

  - Tools to support / drive the process

  - People / knowledge

  - Organisational maturity

  - Stakeholder buy-in

  - Experience in the various approaches

Key project characteristics include:

Introduce change

They are temporary - they have a start and end date

Cross functional

Vary in size

All of the above

The value of Project Management lies in:

Organising and structuring scare resources and managing risk

Not needing to worry about costs or timeframes

They are totally unstructured

Anyone in an organisation can start or stop one

BREAK

Please return promptly as the

Lecture will re-start in *10 mins*

L1 – Intended Learning Objectives

6. Explore the key drivers of why projects fail / succeed.

7. Understand how organisations select the best / right projects (Project Screening).

8. Understand the Project Initialization process, Business Case structure and why organisations use them.

9. Explore various investment techniques and financial models.

10. Understand what a Project Charter is and how it is used.

L1.6 – Project Success / Failure – You decide

Failure or Success?

- Original estimate
    - $1.2m
    - 12 months
- Final outcomes
    - $2m (60% increase)
    - 18 months (50% longer)

L1.6 – Project Success / Failure – You decide

Failure or Success?

- Original estimate
  - $742m
  - 2 years
- Final outcomes
  - $1.5bn (more than double)
  - 8+ years and still going….

L1.6 – Project Success / Failure – You decide

Failure or Success?

- Original estimate
  - $7m
  - 6 years
- Final outcomes
  - $102m (1,357% more)
  - 16 years (10 years longer)

L1.6 – Software Projects

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%

- *Successful:* project is completed on-time and on-budget, with all features and functions as initially specified.

- *Challenged:* completed and operational but over-budget, over the time estimate or offers fewer features and functions than planned.

- *Failed:* project is cancelled at some point during the development cycle.

Standish Group Chaos Reports: Source: Standish Group 2015 Chaos Report www.projectsmart.co.uk/white-papers/chaos-report.pdf

L1.6 – Software Projects. What determines success?

Success Factors	%
1. Executive Sponsorship	15%
2. Emotional Maturity	15%
3. User Involvement	15%
4. Optimisation – Statement of Requirements	15%
5. Skilled Resources	10%
6. Standard Architecture	8%
7. Agile Process	7%
8. Modest Execution	6%
9. Project Management Expertise	5%
10. Clear Business Objectives	4%

- Factors have remained relatively constant

- If we know the reasons why can't we fix / improve it?

- 60% (first 4) are non technical items and difficult to change

- Broader organisational context and system at play

Standish Group Chaos Reports: www.projectsmart.co.uk/white-papers/chaos-report.pdf
www.infoq.com/articles/standish-chaos-2015

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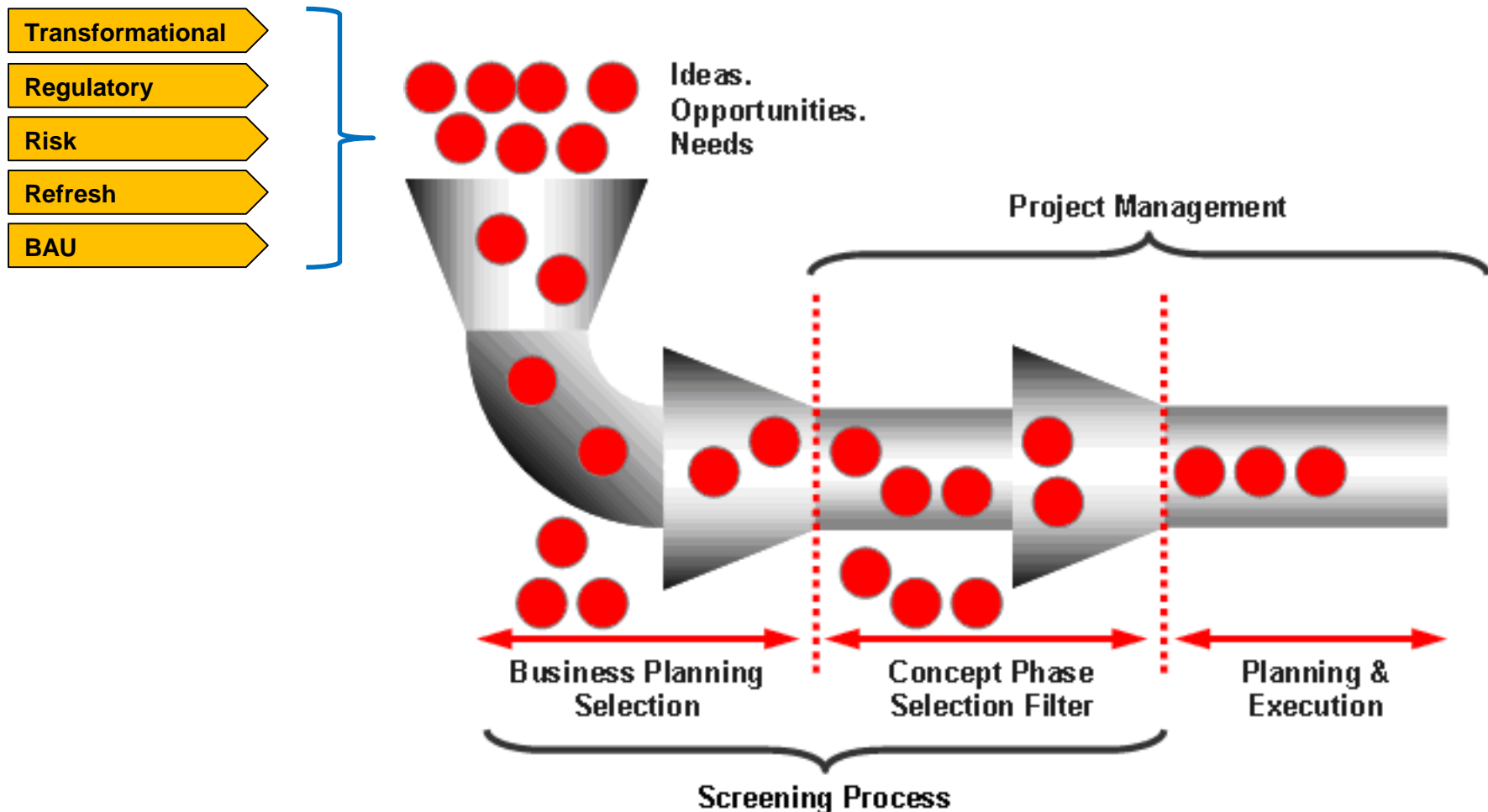10. Understand what a Project Charter is and how it is used.

L1.7 – Project Screening and where to start

"*If you don't know where your going any road will take you there*".   *Any Road by George Harrison – The Beatles*

- The place to start is at the beginning!
- Organisations need a formal, structured approach to:
  - Select;
  - Prioritise;
  - Have oversight; and
  - Drive accountability across all projects.

L1.7 – Project Screening and where to start

Transformational
Regulatory
Risk
Refresh
BAU

Ideas.
Opportunities.
Needs

Project Management

Business Planning Selection

Concept Phase Selection Filter

Planning & Execution

Screening Process

L1 – Intended Learning Objectives

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L1.8 – Project Initialization

There are many approaches and methodologies that are widely used across industry with organisations favoring standard industry ones (PRINCE2, PMBOK, Agile etc) or usually a modified version of these they make their own.

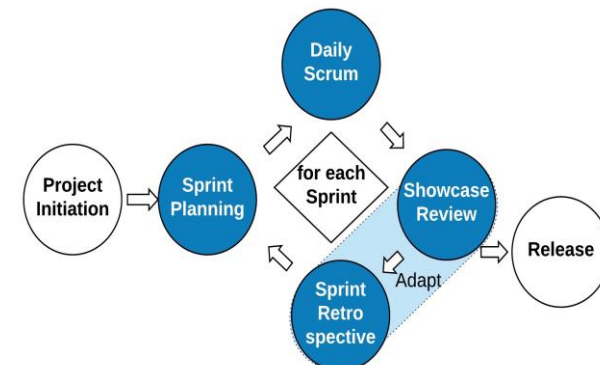They all have Pro's & Con's.

Software PM Activities

http://blog.zilicus.com/software-project-management-activities-roles/

Prince2

AGILE

L1.8 – Setting up a project for success. A Business Case is the key.

The purpose of the Business Case is to establish mechanisms to judge whether the project is (and remains) desirable, viable and achievable as a means to support decision making in its initial and continued investment.

- Provides a factual base for key decisions makers to decide if the project should be undertaken

- Demonstrates how the project adds value to the organisation

- Has a set of pre-defined standard organisational characteristics (costs, benefits, risk, etc.)

- It is not all about size - size depends on the cost / benefit

- It is a living document throughout the project that should be reviewed and signed off at key stages

L1.8 – Setting up a project for success. The Business case is key

Business case contains:

- Executive summary
- Reasons / explanation of why it is required
- Business options
- Expected benefits
- Expected dis-benefits
- Timescale
- Costs
- Investment appraisal
- Major risks

Source: www.prince2.com

L1.8 - Business Case. Who's is responsible for what?

Role	Responsibilities
Corporate	1. Provides Mandate / The go ahead. 2. Holds Senior Users accountable for benefits realisation. 3. Responsible for conducting post projects benefits validation.
Executive / Sponsor	1. Owns the Business Case. 2. Responsible for reviewing the benefits throughout the project.
Senior Users	1. Responsible for accepting the benefits and delivering them. 2. Responsible for ensuring the delivered products are to the appropriate quality standard. 3. Provides on-going actual V forecasted benefit realisation.
Project Manager	1. Prepares the Business Case. 2. Conducts Risk assessment and impact analysis. 3. Assess and updates the Business Case at each defined stage.
Project Assurance / QA	1. Assists in developing the Business Case. 2. Ensure value for money and risks are continuously managed. 3. Monitors change to the Business Case and validates it.
Project Support	1. Responsible for capturing data and preparing management reports. 2. Key support point for all project stakeholders – schedules, cost analysis, minutes, actions, supplier liaison etc.

L1 – Intended Learning Objectives

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L1.9 – It is all about the money!

- For non mandatory projects, the primary benefit is financial

- Multiple investment techniques are used to analyse the investment required / financial benefit

- Some (there are many more) techniques include:

  - Return On Investment

  - Net Present Value

  - Payback period

  - Rough Order of Magnitude

- However, it is not always about the best return – organisations need to invest in all parts of their business

L1.9 – Investment Techniques – Return On Investment (ROI)

- ROI is income divided by investment
  - ROI = (total discounted benefits – total discounted costs) / total discounted costs
- The higher the ROI % or higher the ratio of benefits to costs, the better it is
- Many organisations have a required rate of return or minimum acceptable rate of return on investment for projects (11% to 14%)

L1.9 – Investment Techniques –
Net Present Value (NPV)

- NPV is one of the most often used quantitative/financial models for project selection

- NPV is a method of calculating the expected net monetary gain or loss from an investment (project) by discounting all future costs and benefits to the present time

- Projects with a positive NPV should be considered if financial value is a key criterion

- Generally, the higher the NPV, the more favourable a project is

L1.9 – Investment Techniques – Payback period

- The payback period is the amount of time it takes a project before the accrued benefits surpass accrued costs or how much time an investment takes to recover its *initial cost*

- Based on tracking the net cash flow across each year to determine the year that net benefits overtake net costs (not discounted cash flows)

- Many organizations want IT projects to have a fairly short payback period (< 1 year) due to the changing nature of technology
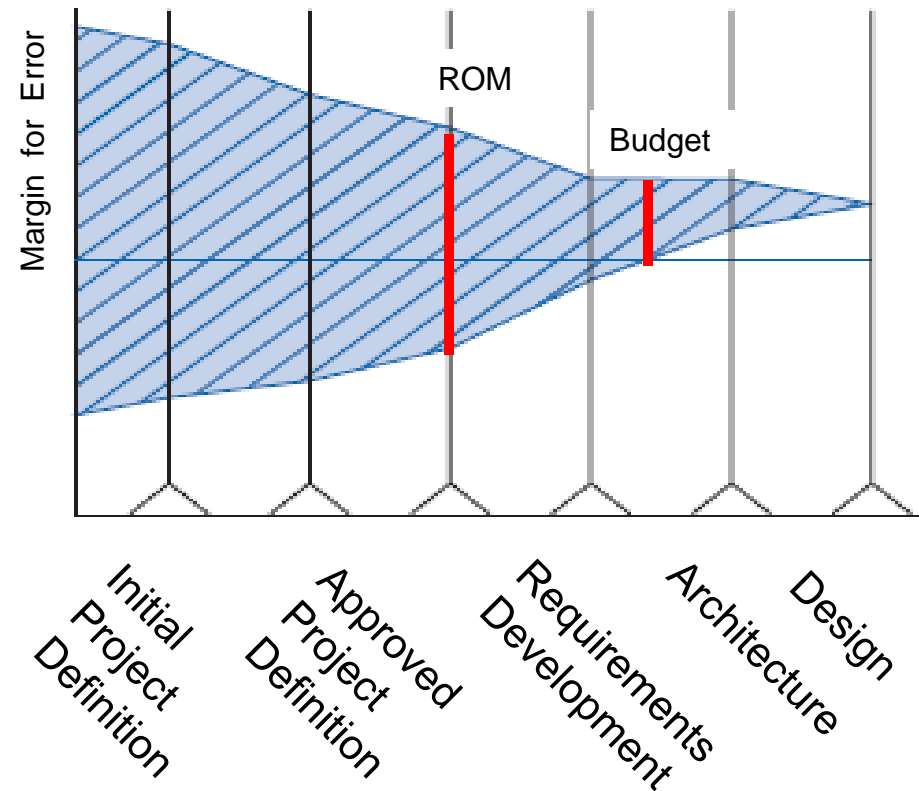
L1.9 – Investment Techniques – Project Estimation Rough Order of Magnitude (ROM)

The **Cone of Uncertainty** for cost estimates

Limited accuracy

- ROM: -25% … +75%
- Budget: -10% … +25%

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L1.10 – It all begins with a Project Charter

http://blog.zilicus.com/software-project-management-activities-roles/

Project Name

Target Date: [Date]

Project Description

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

Costs

Item	Quantity	Rate	Total
Resources			
Equipment			
Budget			
Total			

Gains

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

The #1 factor (according to Standish Group Research) that contributes to Project Failure is:

Technology

Lack of skilled resources

Poor planning

Executive sponsorship

Poor Project Management

All of the above

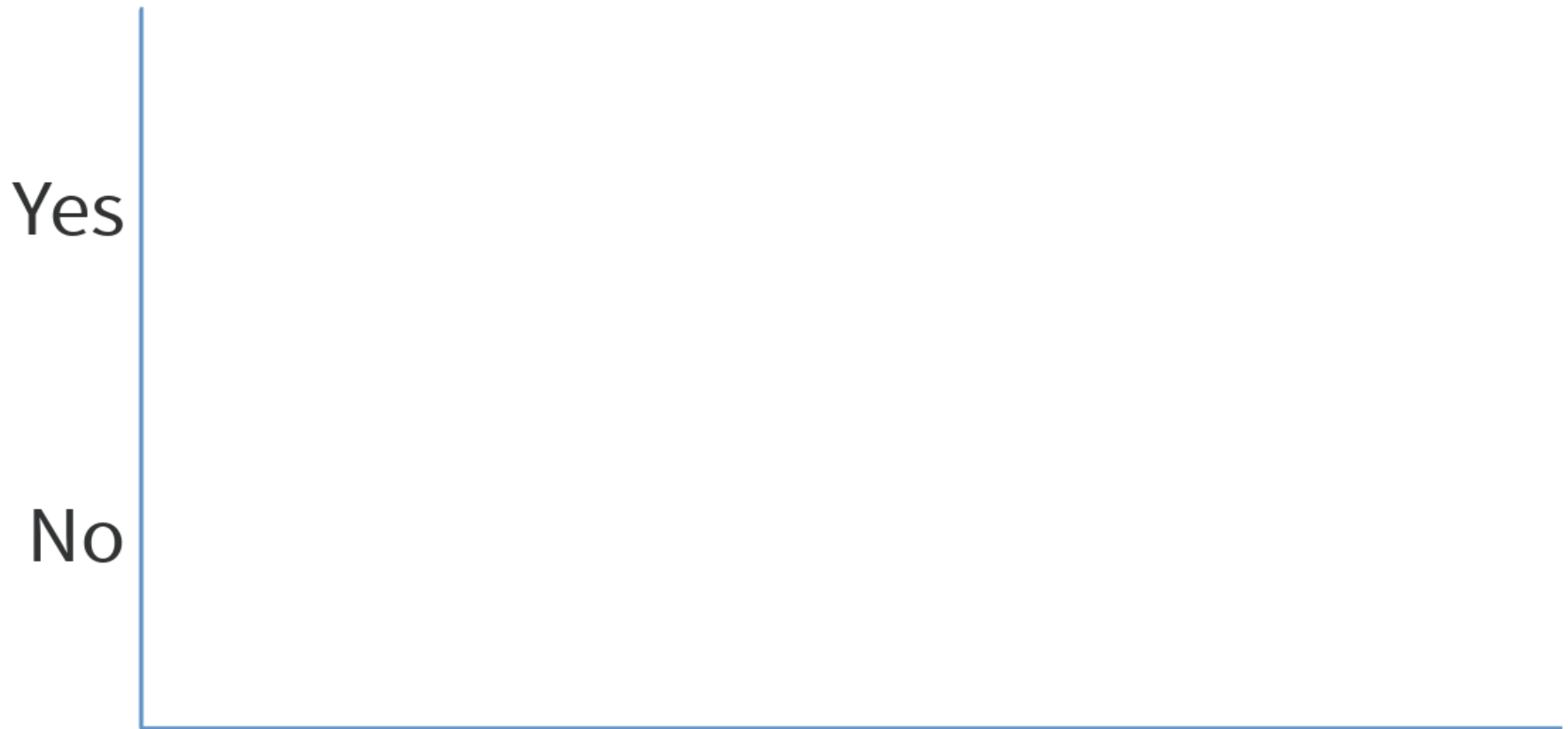# The best methodology / approach to use for projects is:

Software PM Activities

Prince 2

Agile

It depends on the organisation and what best suites the project you are undertaking

A Project Charter should be created for every project.

Yes

No

IT ALL STARTS HERE

Week 8 – I have plenty of time and don't need to start any time soon **A**

Week 2 – I can't believe these lecturers **B**

Week 5 – I have a bit of time but I better start this week so I don't fall behind **C**

Are you serious, we have 2 assignments **D**

2019 - Semester 2 Structure

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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*	*University Holiday*	
	30/09/19	*Non Teaching Week – Mid semester break*	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