



# Software Engineering Project A

## SEPA - SWE40001/EAT40003

Week 4 – Process and Quality

1 SEPA

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# What is today all about?

*(Related to Project Plan and SQAP)*

Process Models  
Quality Control  
Project Management

What's next for you...?

# So, what you have (ideally) accomplished so far...

- Had a few team meetings
- Met your Project Supervisor – a couple of times
- Had some coffee



So, what you have (ideally) accomplished so far...

- Got in touch & Met with your client,
  - Head is still spinning... ☹️
- Had some more coffee



So, what you have (ideally) accomplished so far...

- Started working on quality assurance plan, project plan, timelines, spikes, ... requirements ...
- Had something stronger (not recommended )



# So, what do you do now?

Develop a Software Development plan

Develop a Project Management plan

Yes, they are different but definitely connected ... all part of project plan

# Software Development...

**Software development is the collective processes involved in creating software programs, embodying all the stages throughout the system's development life cycle (SDLC).**

# Software Development...

SDLC methodologies support the design of software to meet a business need, the development of software to meet the specified design and the deployment of software to production.

A methodology should also support maintenance, although that option may or may not be chosen, depending on the project in question.

There are many different models to follow



# Software Development...

## PREDICTIVE MODELS

The waterfall and similar models are considered predictive methodologies,

## ADAPTIVE MODELS

- agile software development (ASD)
- rapid application development (RAD)
- joint application development (JAD)
- the fountain model
- the spiral model

# Software Development...

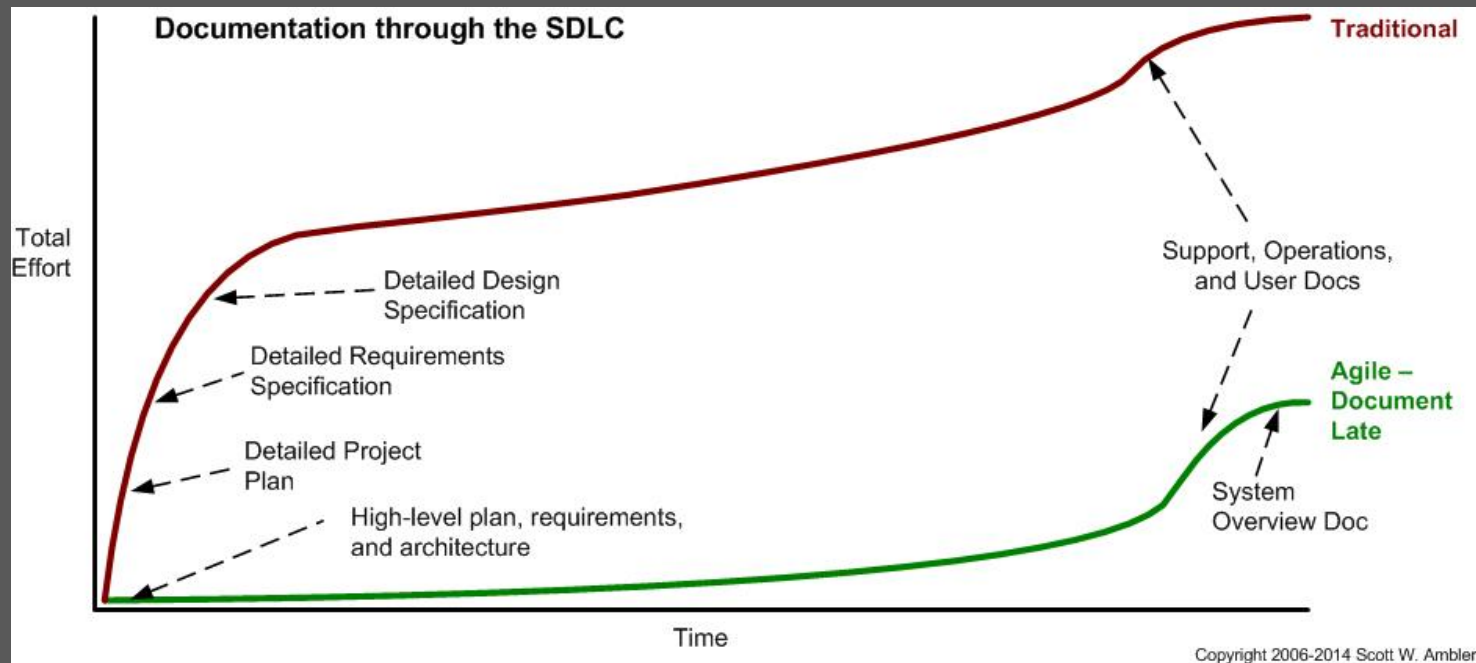
Frequently, several models are combined into some sort of hybrid methodology as is the case with open source software development (OSSD).

# Process... and how it is perceived

- Process → Negatively
- Process → Documentation
- Process → “boring work”
- Process → Waterfall, Spiral, SCRUM, etc

# Process... and how it is perceived

- Lets do agile since there is no documentation (not so )

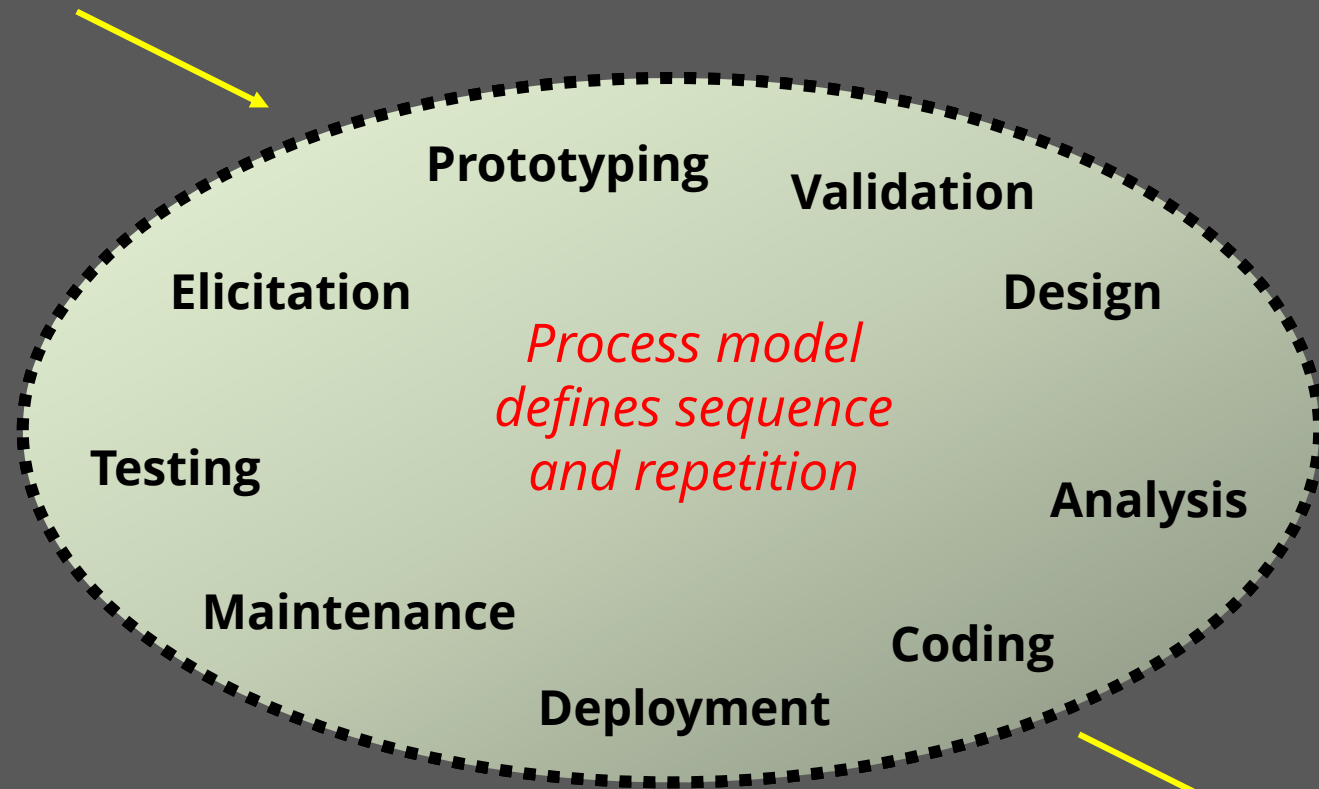


# Process... and how it is perceived

- Some other myths:
  - Process is for big projects (like Myki?)
  - Process is for professionals (not students?)
  - Process gets in the way of doing “real work” (yes, sometimes when it is overused)
  - Process will force me to communicate (we do not need this touchy-feely stuff...)

# What is a Process Model?

Project Inception



Phase Out

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# What does a Process Model do?

- Provides a framework for planning and thinking
  - What are the activities that need to be undertaken?
  - What order should they proceed in?
- Captures good practice
  - What works? What does not?
- Allows communication using a common vocabulary
  - Analysis, quality, design, architecture

# Will that be enough to complete your project?

Software is built by people (not processes)

Good people are needed to build good software

- Poor quality resources WILL build junk

A process does not build software

A good process will aim to reduce variability

- in other words will increase consistency



# Will that be enough to complete your project?

It's been said . . .

*"A bad team with a great process will consistently generate garbage"*

*"A good team with a good process is more likely to produce a good product"  
(but there is no guarantee...)*

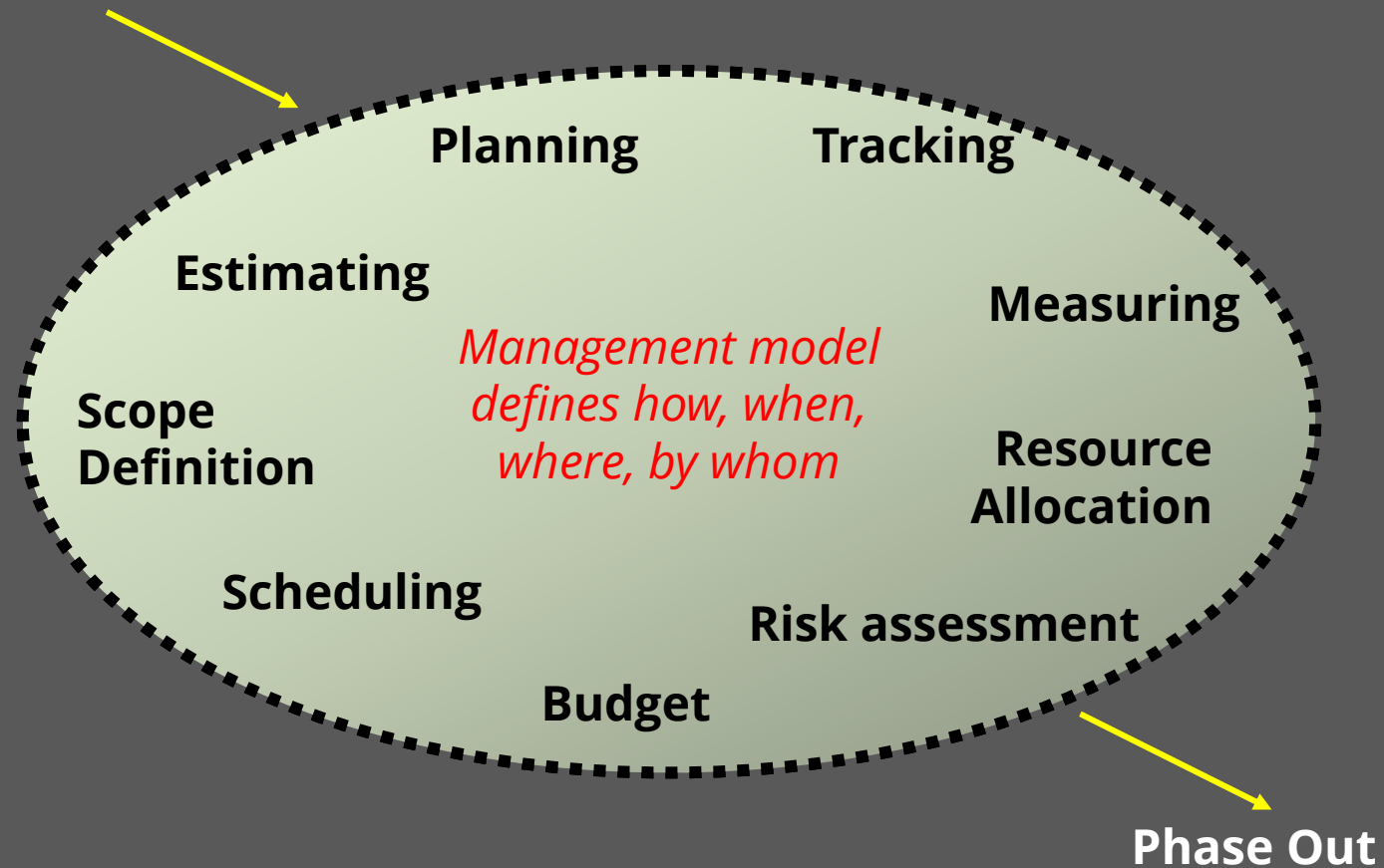
## Will that be enough to complete your project?

- Projects are usually undertaken to either solve a problem or take advantage of an opportunity. The probability that the project - even if precisely executed - will complete on time, on budget, and on performance is typically small. Project management is utilized to increase this probability. So in a sense, project management is risk management.

*Bruce Pittman*  
American Scientist

# What is a Management Model?

Project Inception



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# Project Management

- Scoping
  - what needs to be done
- Planning
  - what is to be done and by when
- Estimating
  - determining time/cost/quality
- Scheduling
  - allocating people to tasks, etc

# Project Management

- Tracking
  - checking on progress
- Risk assessment
  - determining “health” of project

Choose a Management Model that “aligns” with the Process Model.

**Regularly review your choices** and adjust (if required)

# Why do we need Planning?

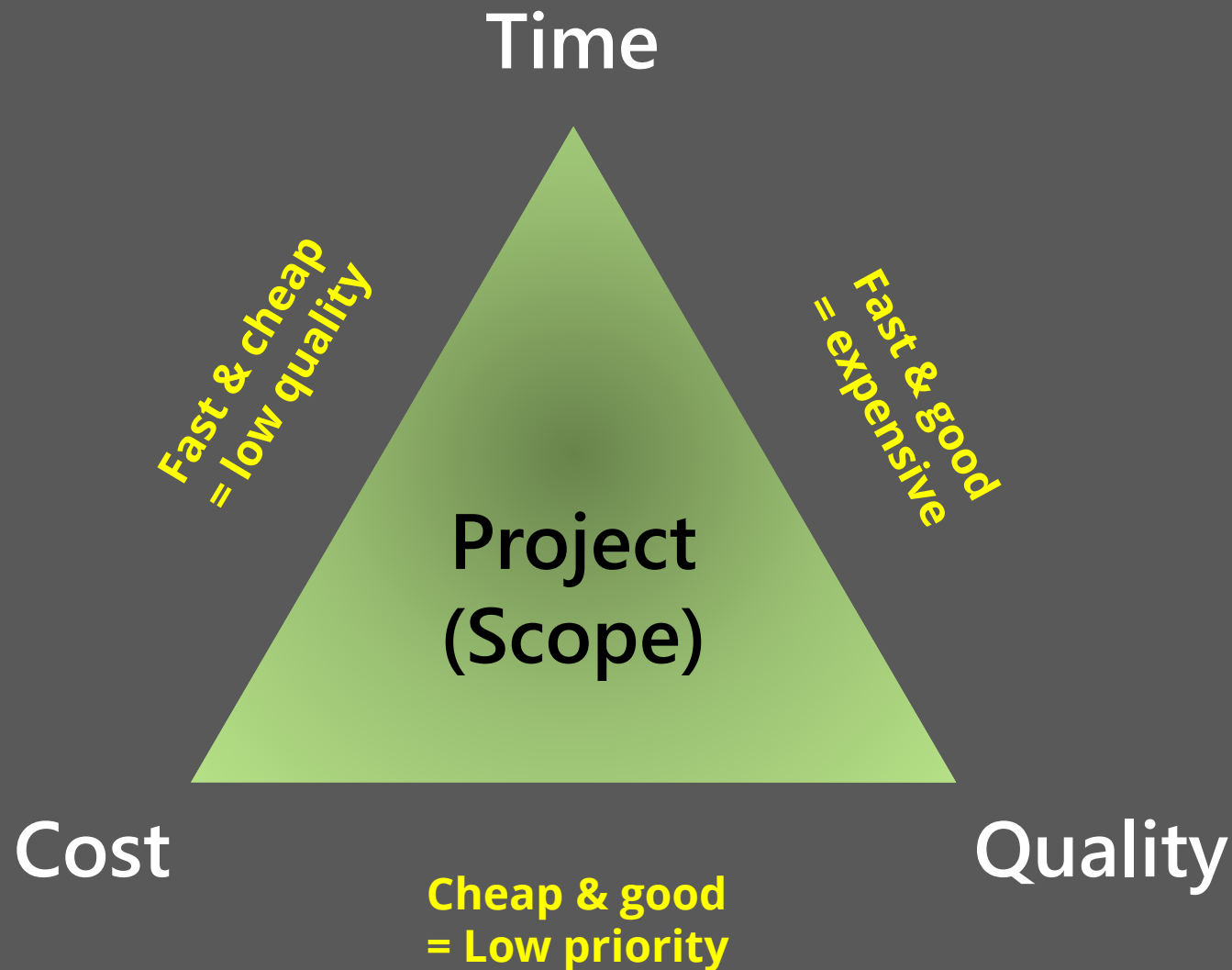
*“We plan to ensure that we are always doing the most important thing left to do, to coordinate effectively with other people, and to quickly respond to unexpected events.”*

(Source: K. Beck, M. Fowler, *Planning eXtreme Programming*, 2001)

👉 Often not easy to identify what “the most important thing left to do” is...

Break

# Scope Triangle or the Quality Triangle





# Scope Triangle" or the "Quality Triangle

The triangle illustrates the relationship between three primary forces in a project.

- Time is the available time to deliver the project
- cost represents the amount of money or resources available
- Scope is how much the project/system is to deliver
- quality represents the fit-to-purpose that the project must achieve to be a success

The normal situation is that one of these factors is fixed and the others will vary in inverse proportion to each other.

# Trade Offs...

- Remember
  - Scope, Quality, Time, Cost: ... pick three
- In your project: Time and Cost are “fixed”
- Hence your trade-off is: “Scope or Quality” – Choose to fit your project (and clients’ needs)
- if the scope starts to creep you are left with only one choice - cut functionality.
- *Does the client want lots of buggy features, or two things that work really well?*

# Balance of Power

Business decisions should be made  
by business people  
(and not technical people)

Technology decisions should be  
made by technical people  
(and not business people)

# Balance of Power

*Hence the need for experienced Project Managers ...*

# The role of Project Managers

Act as the “bridge’ between the Business expectations and the Technical interpretations

Somewhere in between there is a language and a meaning both stakeholders understand

# Software Quality

Software Quality is *conformance to*:

- explicitly stated *functional and performance (quality) requirements*,
- explicitly documented *development standards*,
- *implicit characteristics* that are expected of all professionally developed software.

# Problems with Software Quality

Software specifications are usually incomplete and often inconsistent.

There is tension between:

- customer quality requirements (efficiency, reliability, etc.)
- developer quality requirements (maintainability, reusability, etc.)

Some quality requirements are hard to specify in an unambiguous way

- directly measurable qualities (e.g., errors/KLOC),
- indirectly measurable qualities (e.g., usability).

*Quality management is not just about reducing defects!*

# Software Quality Assurance Plan

- Sets out desired product qualities and how these are assessed
  - define the most significant quality attributes
- Define the quality assessment process
  - i.e., the controls used to ensure quality
- Set out which organizational standards should be applied
  - may define new standards, i.e., if new tools or methods are used



# Risk Drivers

Principal risk drivers (KoST):

- ***Knowledge***
  - Gap (*don't know*)
- ***Skill Gap***
  - (inexperience)
- ***Technology Gap***
  - (unknown/young or unavailable)

Other risk drivers:

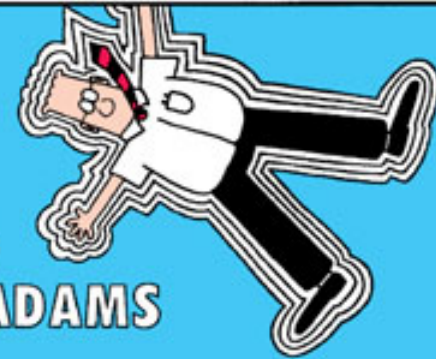
- Team Dynamics + Management
- Research & Development Component

# Software Quality Assurance Plan

- All teams will have to do a Software Quality Assurance Plan
- Separate document
  - Limited overlap, but more detailed/comprehensive
  - There is a sample document on Canvas, as reference
- Evolvable ...



# DILBERT®



BY  
SCOTT ADAMS



# What next...?

- Identify the strengths/weaknesses of your team
- Do a “KoST” analysis
  - Identify “gaps” and approaches to close these gaps
  - Skill gaps => *spikes* to improve your skills...
  - Repeat your risk assessment on a regular basis!
- Set up your Project Repository (check with client for constraints on location)

# What next...(cont.)?

- Think about suitable Process Model(s) for your project
- Select team-internal processes; documents these => adjust SQAP Template/Sample for your needs
- Start documenting your project aims and objectives
- Close off as many gaps in your Knowledge / Skill / Technology as possible (i.e. spikes)
- ... Project Plan & SQAP

# What next...over the coming weeks

- Create a software/system requirements Specification (SRS) for the project
  - Describe the “problem space” using models
  - ... to be further explored next

## What next...over the coming weeks (cont.)

- Software architecture Design and Research
  - Research design solutions: architectures, platforms, ...
  - Explore multiple solution directions via models: prototypes
  - Decide on technology stack and document it
  - Document architecture design with research & rationale
- Detailed design and implementation - staged

## What next...over the coming weeks (cont.)

- Develop a test strategy & validate it on prototype(s)
  - Based on SRS (from Acceptance Testing perspective, for now)
  - Extended as development (phase) progresses ...
    - High-level/architecture design ... integration testing
    - Module design ... module testing
  - Written BEFORE (without considering) implementation of that level



# Worklogs

The working week starts Monday at 0:00am or ...

Finishes on Sunday at 24:00pm or ...

7 days

Submit worklogs on Monday to your supervisor or ...

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Part 1



Part 2



Part 3



SWE40002 Software Engineering Projects

## Individual Work Log

PROJECT NAME:			
STUDENT NAME:			
STUDENT ID:		WEEK #:	

1.TASKS ACHIEVED DURING THE LAST WEEK	TIME SPENT
TOTAL WEEKLY TIME SPENT	
2.TASKS TO COME	EXPECTED COMPLETION
3.ISSUES/PROBLEMS	

# Worklogs

The Template is broken up into 3 sections

## **1.TASKS ACHIEVED DURING THE LAST WEEK**

*Summarise the tasks you completed the previous week and add up all the hours spent on these tasks to the nearest half hour.  
I expect at least 5+ lines of tasks for the weeks work.*

## **2.TASKS TO COME**

*Summarise the tasks you expect to be completed in the following weeks and when that will occur.  
This should resemble your deliverables and activity milestones as described in your Project Plan.*

## **3. ISSUES/PROBLEMS**

*Summarise the issues and/or problems you are facing and how they are affecting the team and project.  
Also what you are going to do about it*

