

Module 2 – Topic 2.2



Process Models

Topic Outline

- ▶ Linear models
- ▶ Spiral model
- ▶ Unified process
- ▶ Prototyping

We will NOT talk about technical details of these process models!

Objectives:

- Summarize key characteristics as well as pros and cons of these process models
- Choose from different process models and prototyping strategies, and customize them for your project



Which Method Will You Use?



OR



When you are building



OR





Linear Models

Waterfall, V-model, Sawtooth

Quick Question

Please choose how the linear process model works from the list

- A. Each phase happens sequentially and then loops back to the beginning when all the phases are complete
- B. Each phase happens in parallel with other phases, until the product is done with no repetition between or within phases
- C. Each phase happens sequentially and never loops or repeats
- D. Each phase can be repeated, until the product is complete



Linear Models

- ▶ They include phases, which happen **sequentially**, one after another
- ▶ They originate in the manufacturing and construction industries
 - ▶ The emphasis is on getting the requirements right, upfront, and **not changing** them afterwards
 - ▶ They did not favour having developers try small programming experiments to quickly test out their ideas



Reality check: developing a software product is a creative endeavour, which necessitates experimentation and constant rework

Waterfall Model



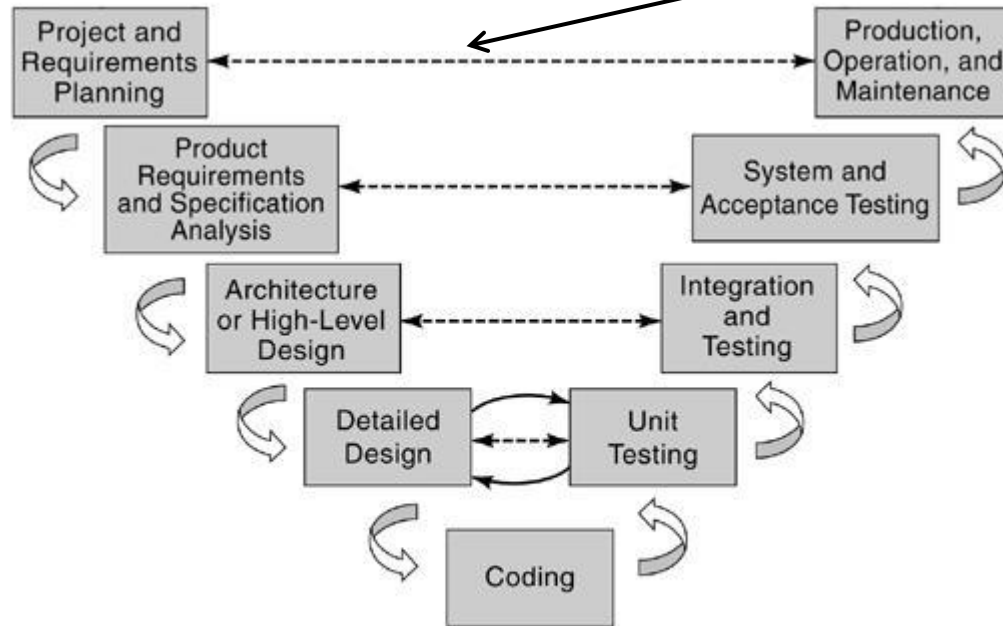
Shortcomings of Waterfall Model

- ▶ Not adaptable to changes
 - ▶ Difficult to change requirements
 - ▶ Does not allow the development team to review and improve upon their product
- ▶ Inability to ensure that the work being done is appropriately verified (V-model attempts to address this)
- ▶ The client doesn't get to see the product until the very end (Sawtooth model attempts to address this)



V Model

- ▶ It organizes each level of verification to appropriate phases, rather than all at once

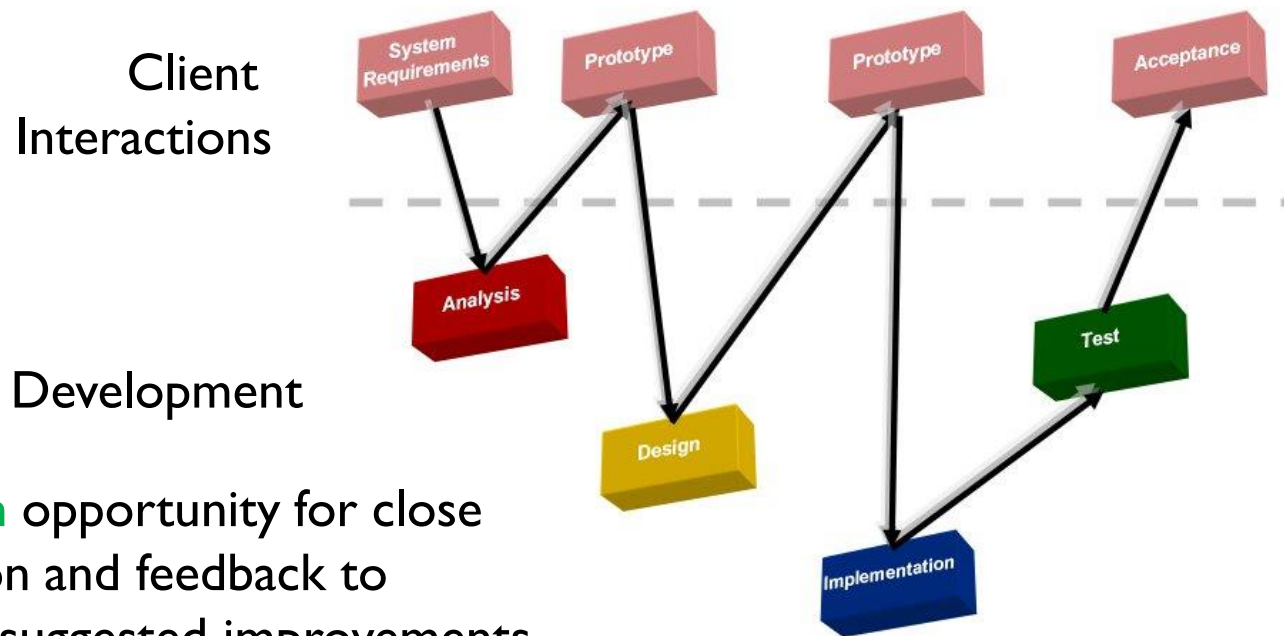


Like the waterfall model, V-model is also not very adaptable to changes

The V-Shaped Software Development Life Cycle Model

Sawtooth Model

- ▶ The client interactions are interspersed throughout the process, so that feedback can be gathered at meaningful times



Not enough opportunity for close collaboration and feedback to include the suggested improvements or changes to the product



Iterative Model

Spiral, Unified Process

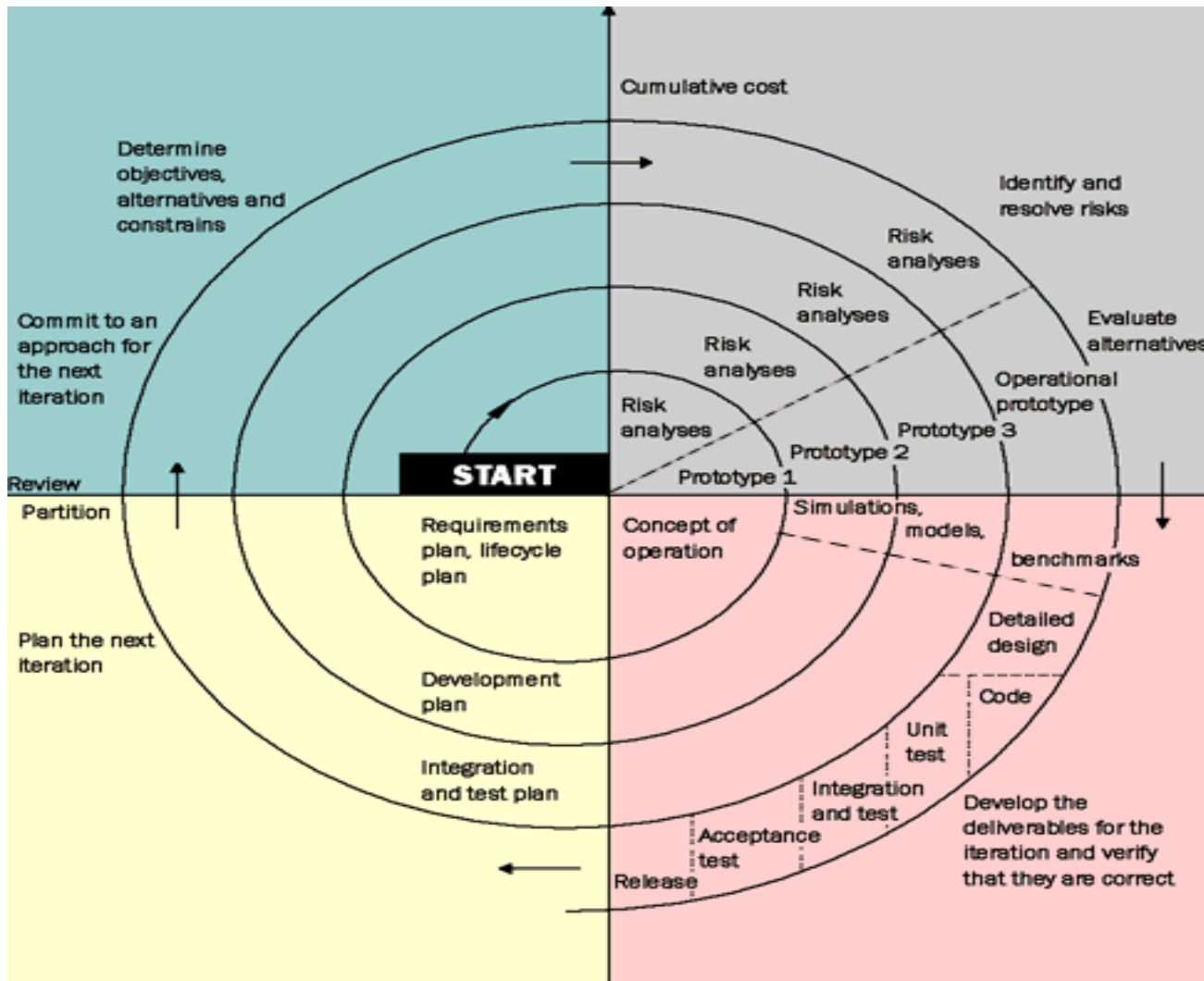
Iterative Models

- ▶ They are cyclical, which allow for repeating stages of the process
- ▶ They add the ability to loop back on previous steps

Iterations allow for **feedback** within the process. This is fundamentally what linear models lack.



Spiral Model



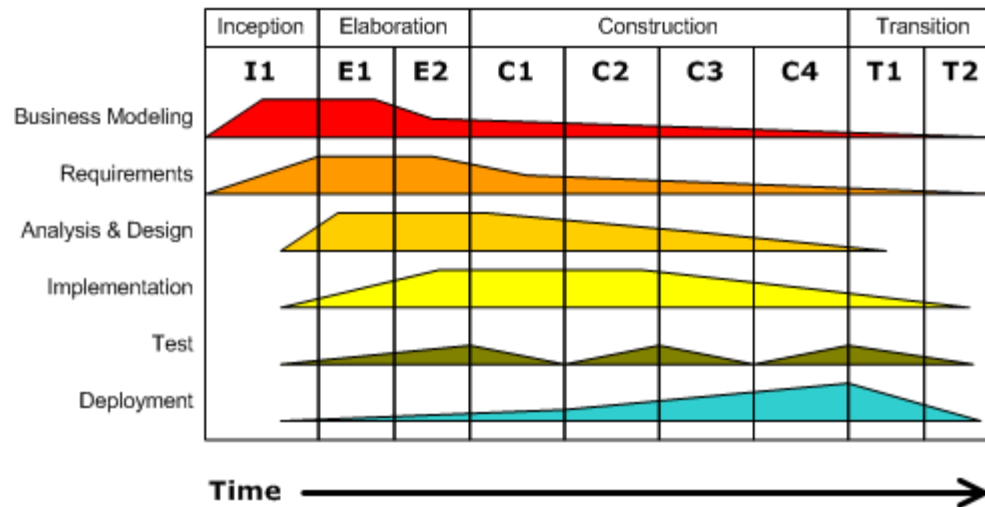
- It consists of four **quadrants**
- An **iteration** moves through four quadrants

Unified Process

► Iterative and Parallel

Iterative Development

Business value is delivered incrementally in time-boxed cross-discipline iterations.



Parallel: Activities related to requirements, design, and implementation, testing, deployment can happen at the same time.

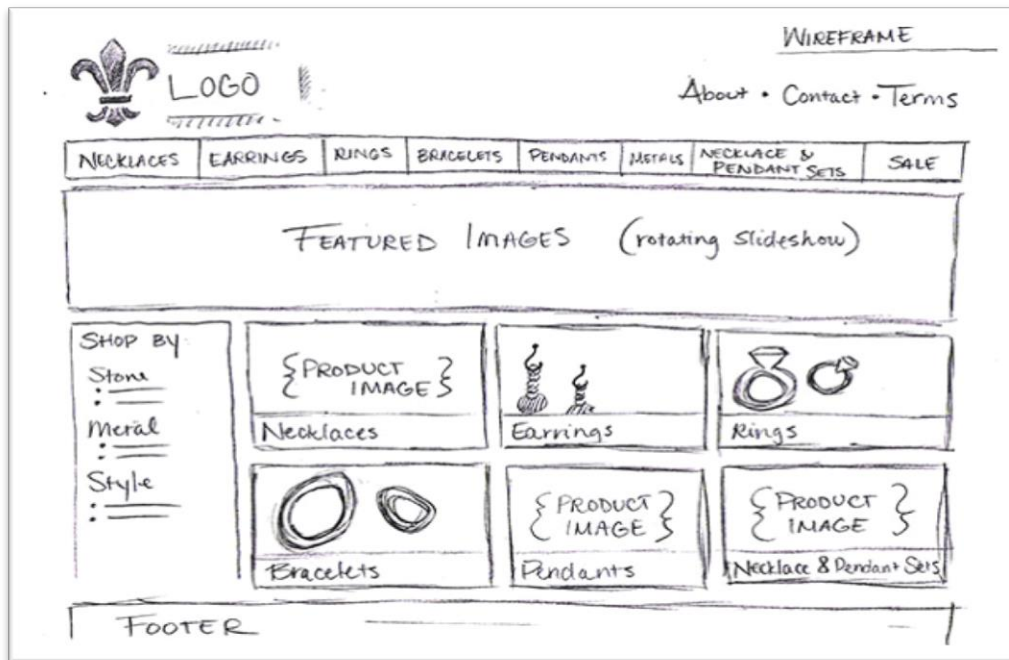


Prototyping

Illustrative, exploratory, throwaway, incremental, and
evolutionary prototypes

Illustrative Prototype

- ▶ Share an idea using a low fidelity, disposable image (learn more in [Module 3 – Lesson 3.2.5 Wireframes](#))



Exploratory Prototype

- ▶ Determine the effort it takes to build the product. Study how feasible some product idea is.



Bagel slicer
exploratory
prototypes

Throwaway Prototype

- ▶ Fully expecting to throw the work out after learning from the process

after building the first prototype, throw it away, don't insist on the first version



Incremental Prototype

- ▶ Assign priorities to a product's features based on
 - ▶ what **must** be done, **should** be done, and **could** be done
- ▶ Build and release your product in **increments** one at a time



Evolutionary Prototype

- ▶ Begin with a set of all the features in basic form, and refine or evolve them, over time
- ▶ E.g., the evolution of “add profile pictures” from 1 to 3
 1. Specify the path of the photo
 2. Choose the photo from a dropdown list
 3. Drag and drop a photo

Guest who did the best or the worst in
marshmallow challenge and why? Check
[Reading 2.2 Prototyping and Process](#)



Quick Question

You are developing a messaging app. What features you think have must-do priority?

- A. Sending and receiving message
- B. Searching message
- C. Adding profile pictures
- D. Text editing
- E. Changing message fonts

