SOFTWARE ENGINEERING

Chapter 4: Software Development Methodologies

MOTIVATION...

Success cannot come from standstill men. Methods change and men must change with them.

James Cash Penney

REMEMBER!!

Software Processes

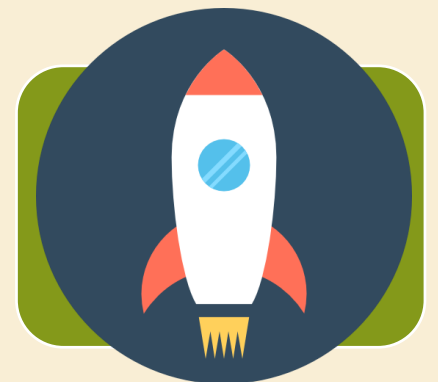- Do you remember all of them?

Requirements · Design · Implementation · Testing · Deployment

A PROCESS MODEL..

- Well, it's how you manage to organize and prioritize activities...

- It's what we normally call software development methodologies
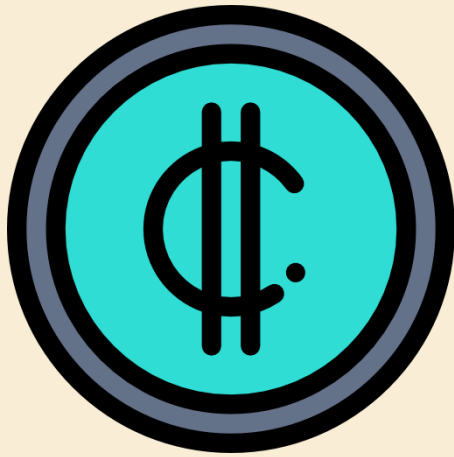
PROCESS MODELS

Predictive

- Waterfall
- Waterfall with feedback
- Sashimi
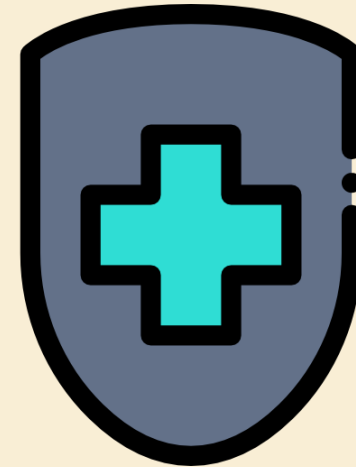- Incremental Waterfall

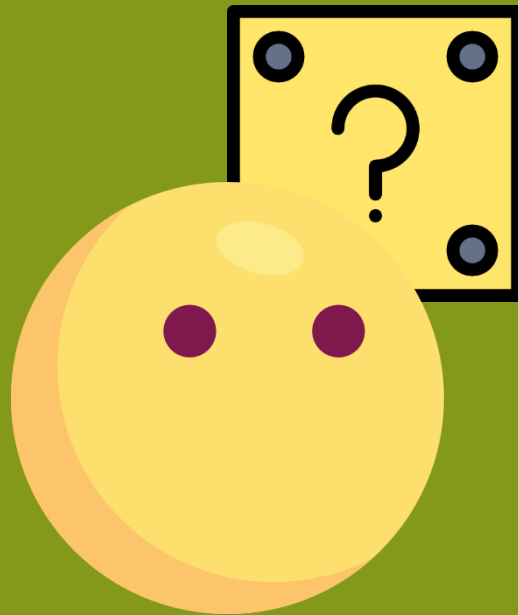Iterative:
Spiral
UP
RUP

PROCESS MODELS

Agile
- XP
- Lean
- Crystal
- FDD
- AUP
- DAD
- Kanban

What is a Methodology then?

Formal definition

A software development methodology is a set of rules and guidelines that are used in the process of researching, planning, designing, developing, testing, setup and maintaining a software product

DESPA (2014)

1) Waterfall Model

In this methodology each software process is a phase and the software is developed sequentially

Waterfall Model

1) Requirements

2) Design

3) Implementation

4) Testing

5) Deployment
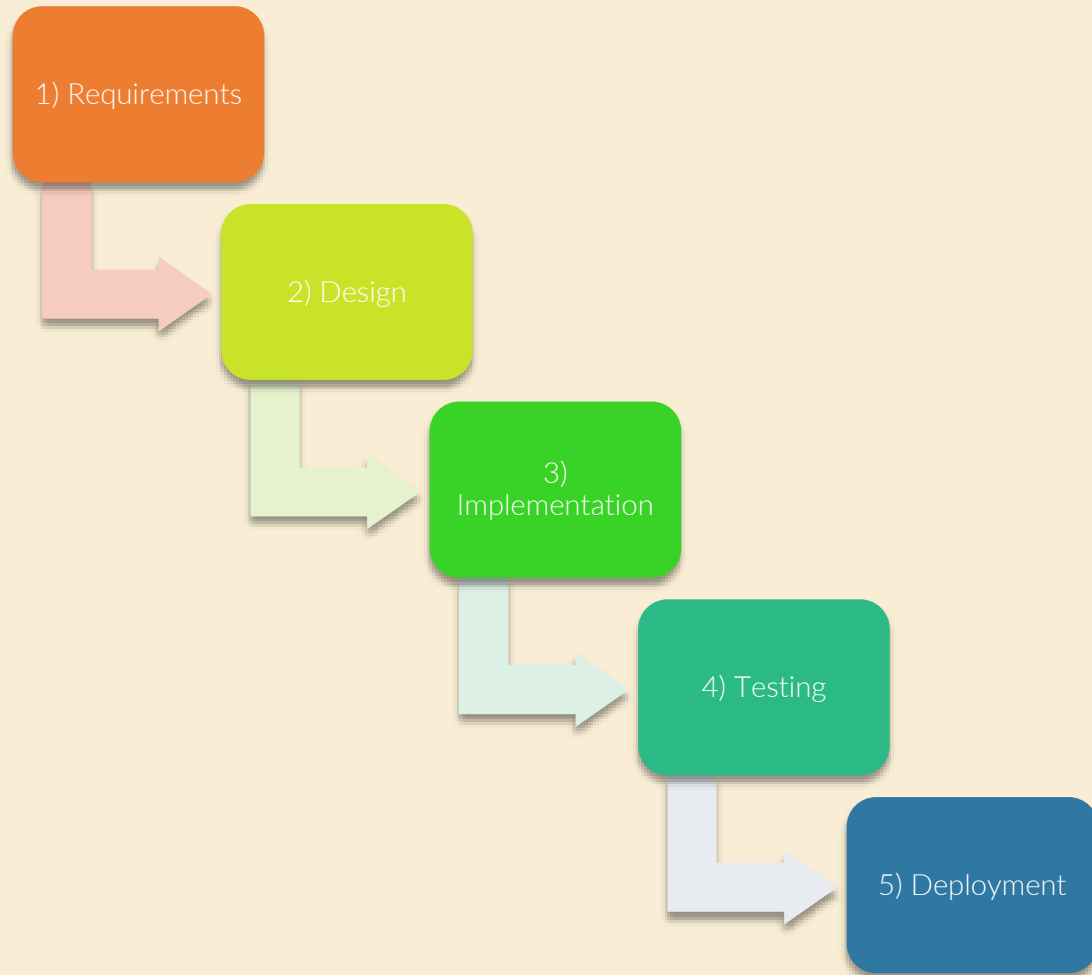
- The output from each phase acts as input in the upcoming one.

- This was the first reaction to the software crisis back in the 80's…

- The implementation is done in small parts called units

When would I use it?
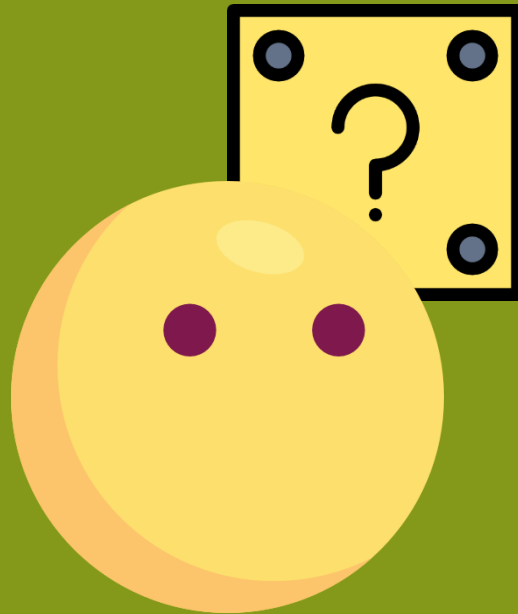
Almost never!!

😅

Let's see the reasons why!

Waterfall usages

- When requirements are *fixed*, and extremely well documented.
- When product definition doesn't ever change.
- Short projects
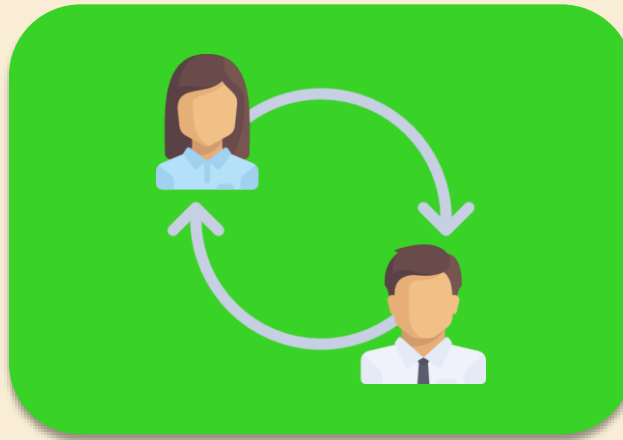- When the technologies won't change

It's almost unusable
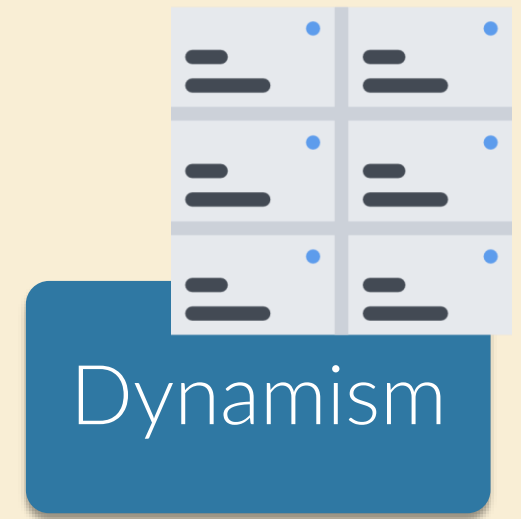
Waterfall Advantages

Documentation
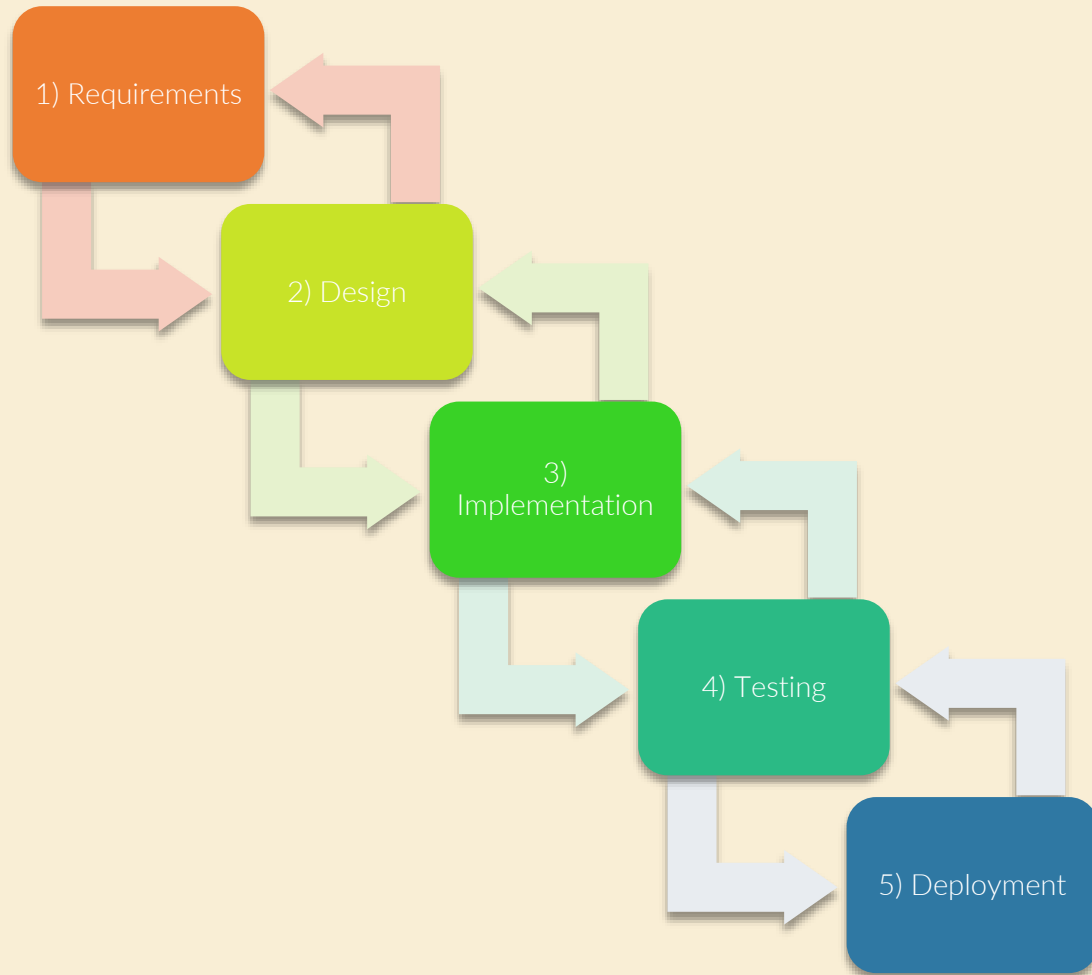
Management

Simplicity

Waterfall Disadvantages

Risks

Uncertainty

Validation

Dynamism

Waterfall Model

Same thing, but with a little bit more of flexibility

With feedback

Waterfall Model

1) Requirements

2) Design

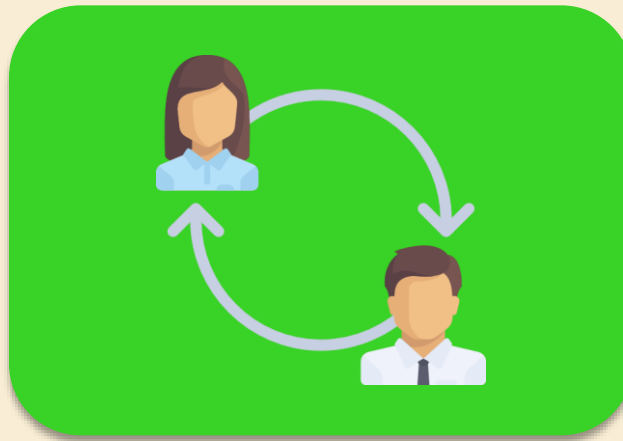3) Implementation

4) Testing

5) Deployment

- Now phases can return to an earlier state if necessary

- Same 5 phases as waterfall

- This feedback means that documentation can be improved back and forth.

Waterfall With Feedback Advantages
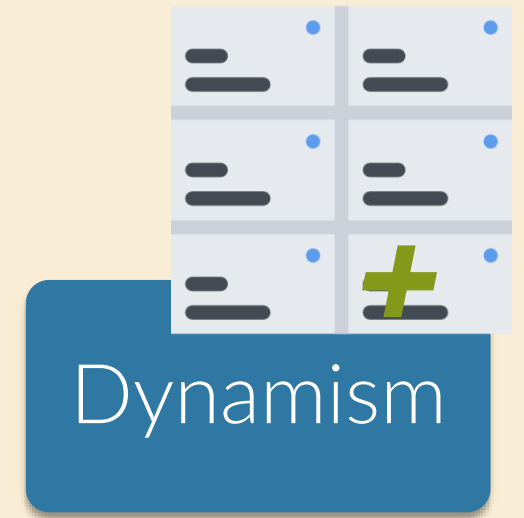

Documentation

Management

Simplicity

Add more flexibility and accuracy in the delivered product!

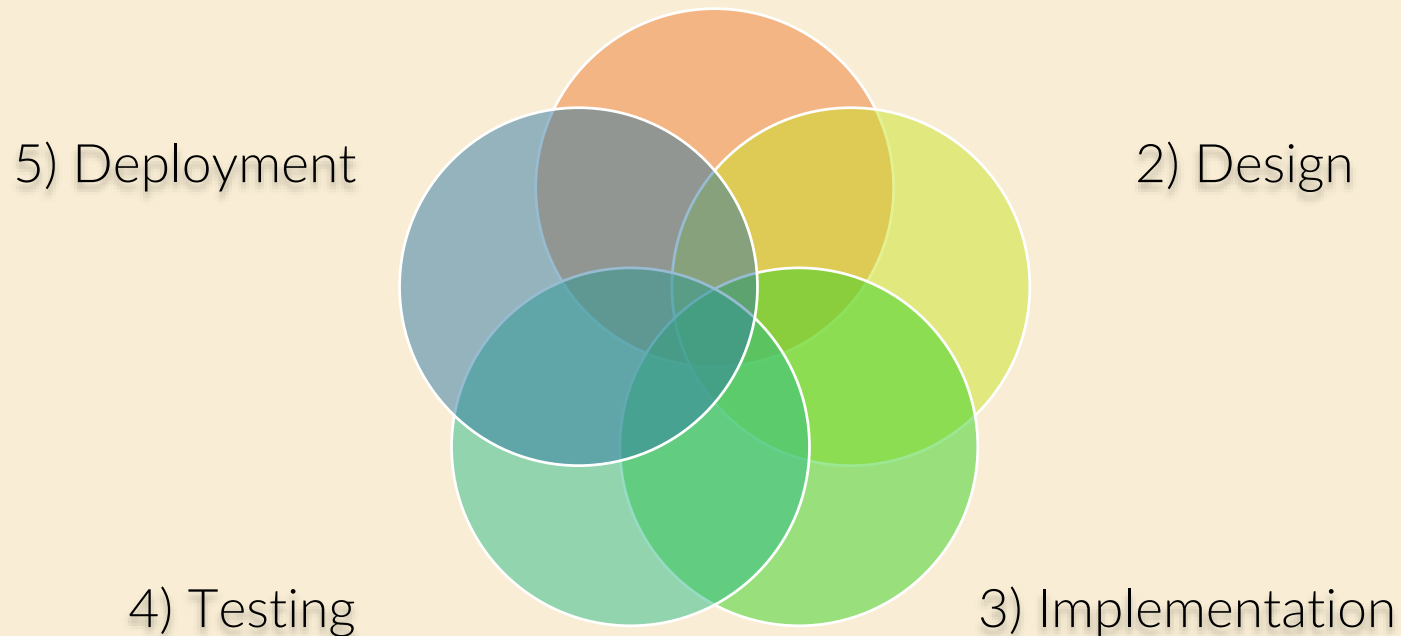# Waterfall With Feedback Disadvantages

Risks

Uncertainty

Validation

Dynamism

Sashimi Model

Same thing, but with a little bit more of flexibility

Sashimi - Waterfall

1) Requirements

5) Deployment

2) Design

4) Testing

3) Implementation

- Phases can overlap

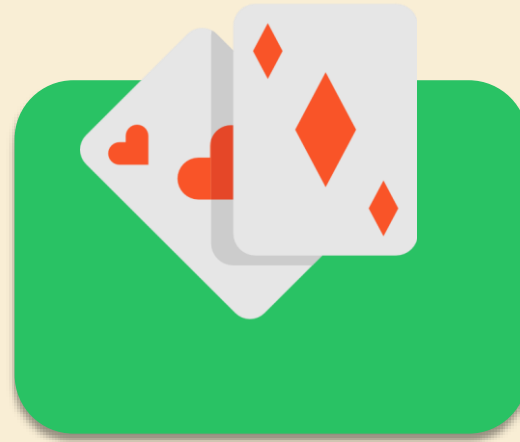- Work burden can be treated with simultaneous work packages

Disadvantages

Schedule

Control

Uncertainty

Timing

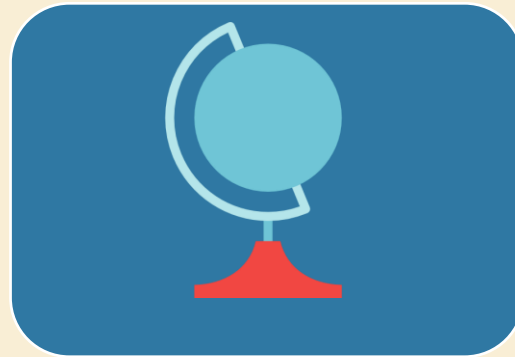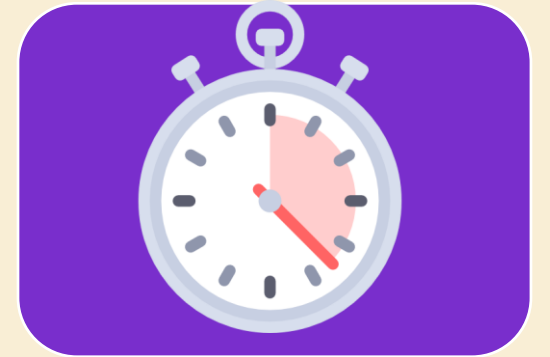# Advantages

Reduced Risks

Improved Scope

Documentation

Timing

Question Time!

Why do you think these methodologies are called predictive?

Predictive Conclusion

- These methodologies tend to be more focused on structure

- They are not appropriated for small teams

- Resources such as money and time can be optimal depending on the variability of the requirements

One Shot Review

Review!

- Explain the waterfall methodology
- What is the difference between waterfall, waterfall with feedback and sashimi?
- Why are those methodologies called predictive?
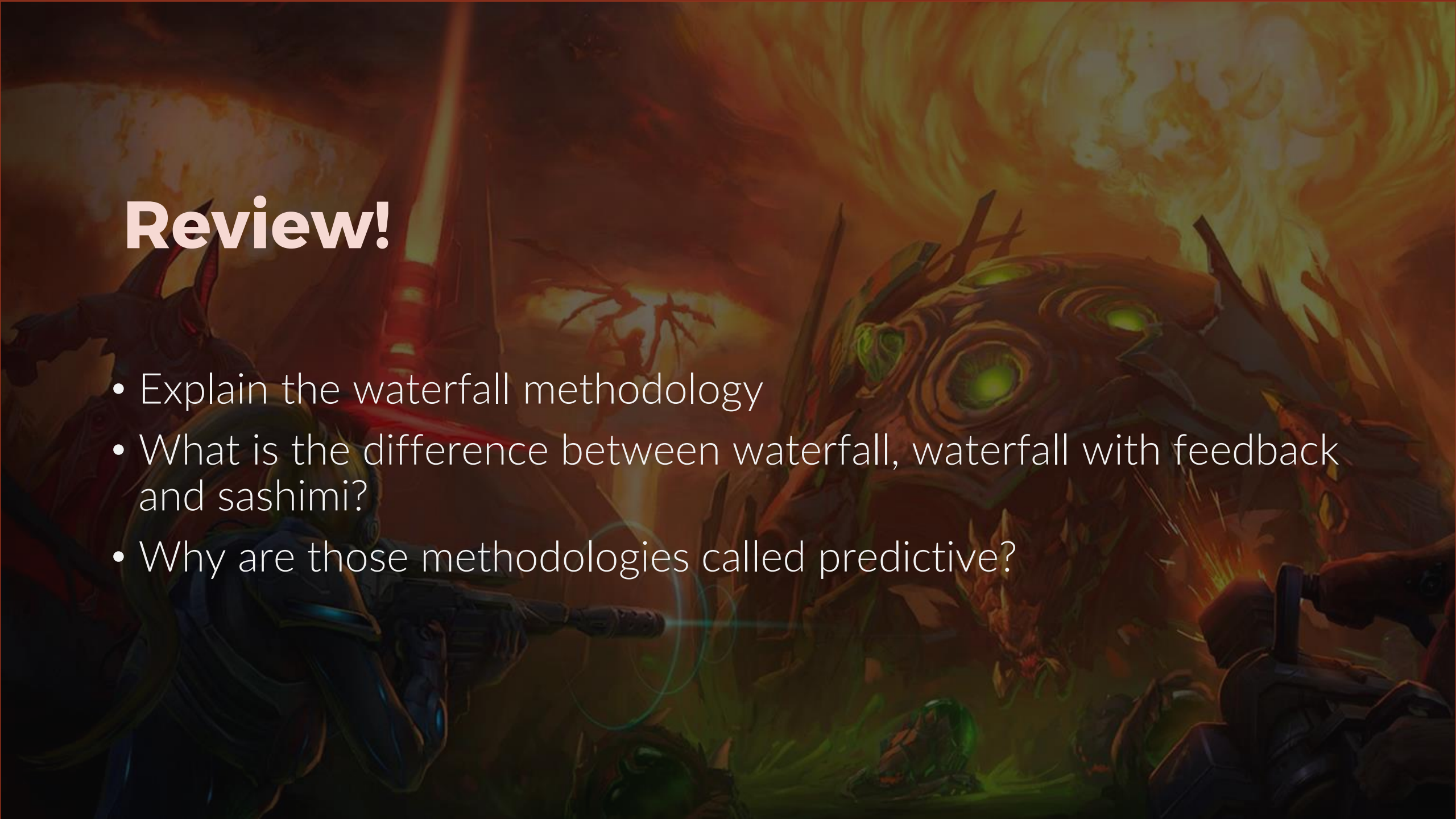
References

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- [SCHMIDT] Richard Schmidt. *Software Development Architecture-Driven Software Development*

- [KUMARAN] Why Software Engineering is complex?

- [STEPHENS] Beginning Software Engineering. 2015

- [CROOKSHANKS] Software Development Techniques. 2015

- DESPA (2014), Comparative study on software development methodologies Mihai Liviu DESPA. Bucharest University of Economic Studies

Class has died... for today!