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Introduction to DevOps

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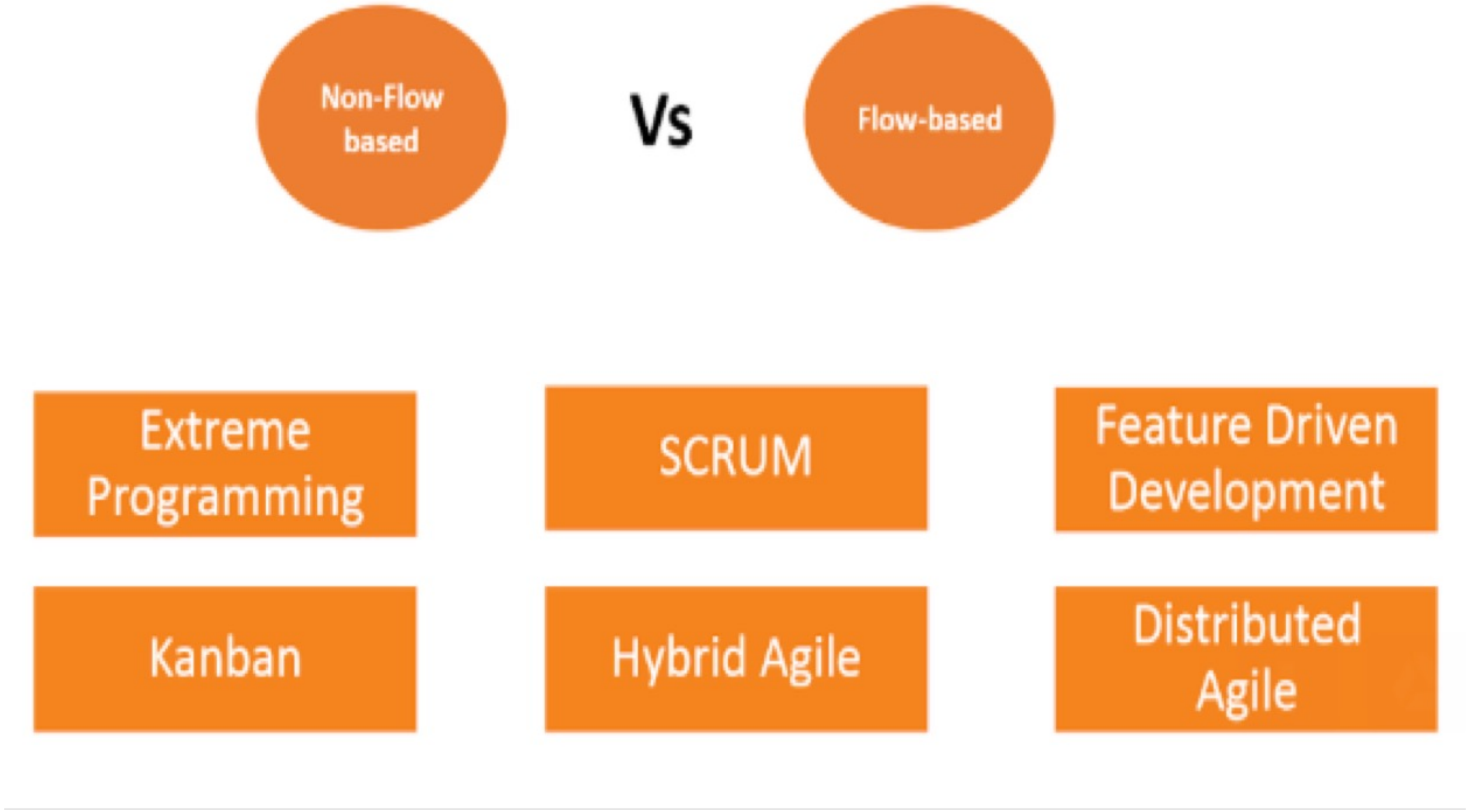
Agenda

DevOps : Process Dimension

- DevOps and Agile
- Team Structure
- Agile Methodology
  - TDD
  - BDD
  - FDD

DevOps – Process

Process



Non-Flow based

Vs

Flow-based

Extreme Programming

SCRUM

Feature Driven Development

Kanban

Hybrid Agile

Distributed Agile

DevOps – Process

Team Structure

- Choosing appropriate team structure (Resource planning)

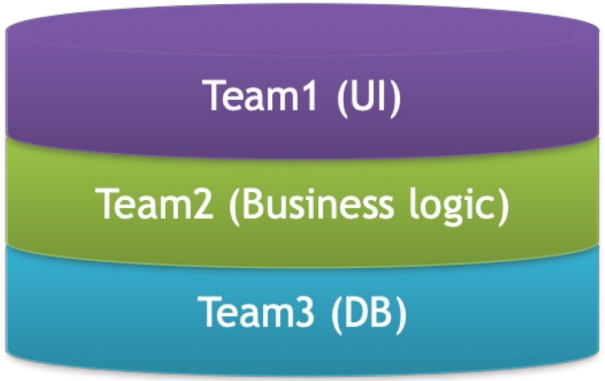
Component Team Structure

Featured Team Structure

DevOps – Process

Component teams

- Made up of experts that specialize in a specific domain
- Architecture diagram can be represented as layer of the system
- Advantages:
  - work is always done by people specifically qualified to do the work
  - work is done efficiently with a low defect density
- Disadvantages
  - Working as Component Teams increases the amount of time it takes to deliver
  - working in Component Teams will have a negative effect on productivity that cannot be over emphasized

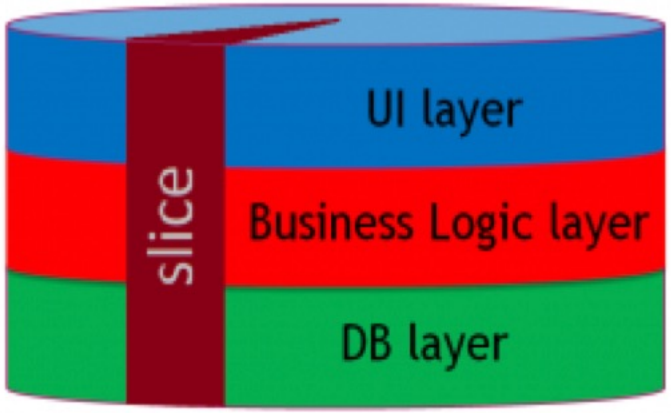


Architecture diagram

DevOps – Process

Feature teams

- Feature Teams contain multi-disciplined individuals that have the ability and freedom to work in any area of the system
- Feature Team usually has at least one member with specialist knowledge for each layer of the system
- This allows Feature Teams to work on what are known as ‘vertical slices’ of the architecture



DevOps – Process

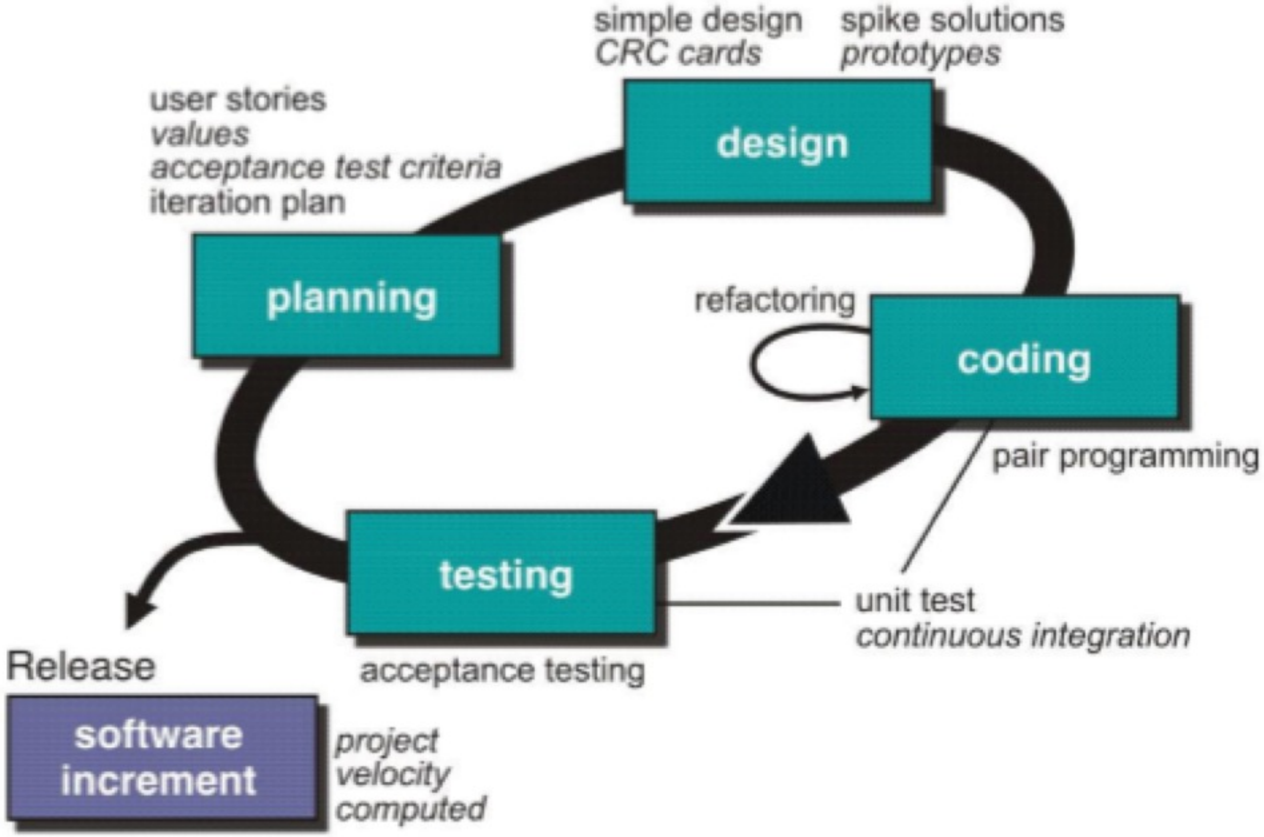
Feature teams

- The characteristics of a feature team are listed below:
  - long-lived—the team stays together so that they can ‘jell’ for higher performance; they take on new features over time
  - co-located
  - work on a complete customer-centric feature, across all components and disciplines (analysis, programming, testing, …)
  - composed of generalizing specialists
  - in Scrum, typically 7 ± 2 people
- Disadvantages
  - untrained or inexperienced employee to deliver a poorly designed piece of work into a live environment
  - Where do you get the personnel (‘generalizing specialists’)?

DevOps: Process

TDD

- Prerequisite :: XP



TDD

Understanding

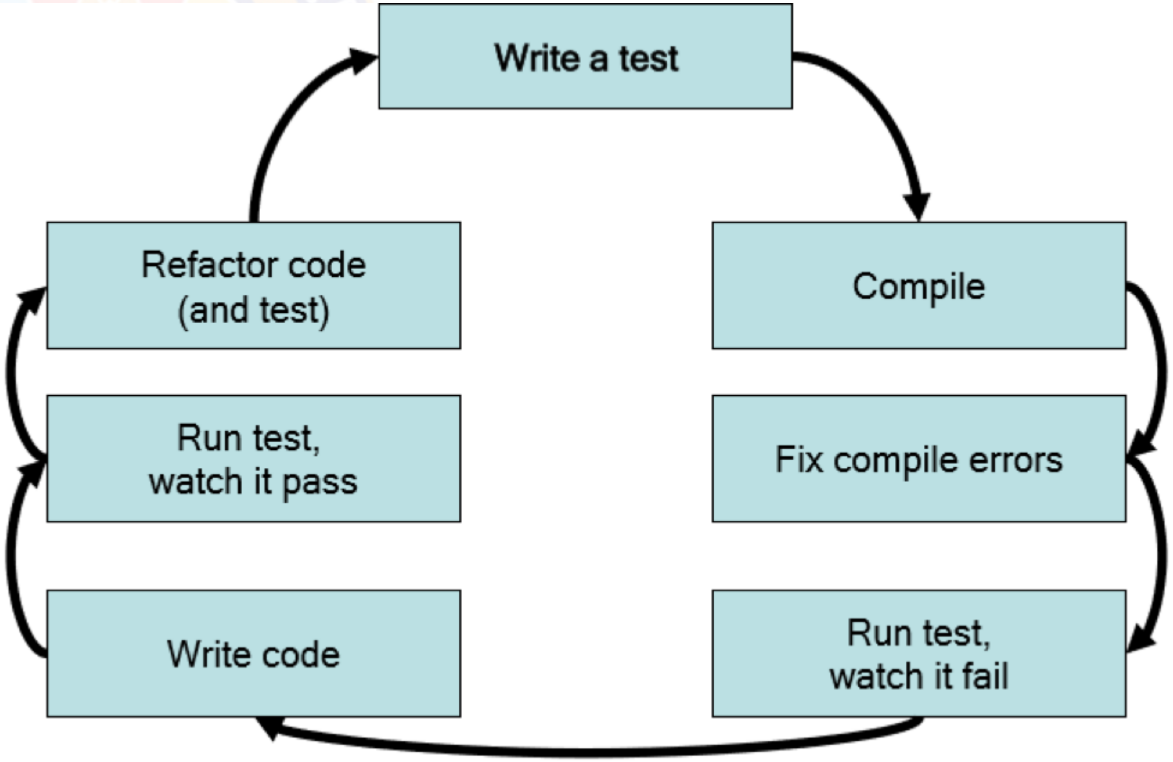
- Many Names
  - Test driven development
  - Test drive design
  - Emergent design
  - Test first development

- TDD Quotes
  - Kent Beck said “Test-first code tends to be more cohesive and less coupled than code in which testing isn’t a part of the intimate coding cycle”
  - “If you can’t write a test for what you are about to code, then you shouldn’t even be thinking about coding”

TDD

TDD Three steps

- RED
  - Write a new TEST which fails
- GREEN
  - Write simplest possible code to make it succeed
- REFACTOR
  - Refactor the code (including test code)



Write a test

Compile

Fix compile errors

Run test, watch it fail

Write code

Run test, watch it pass

Refactor code (and test)

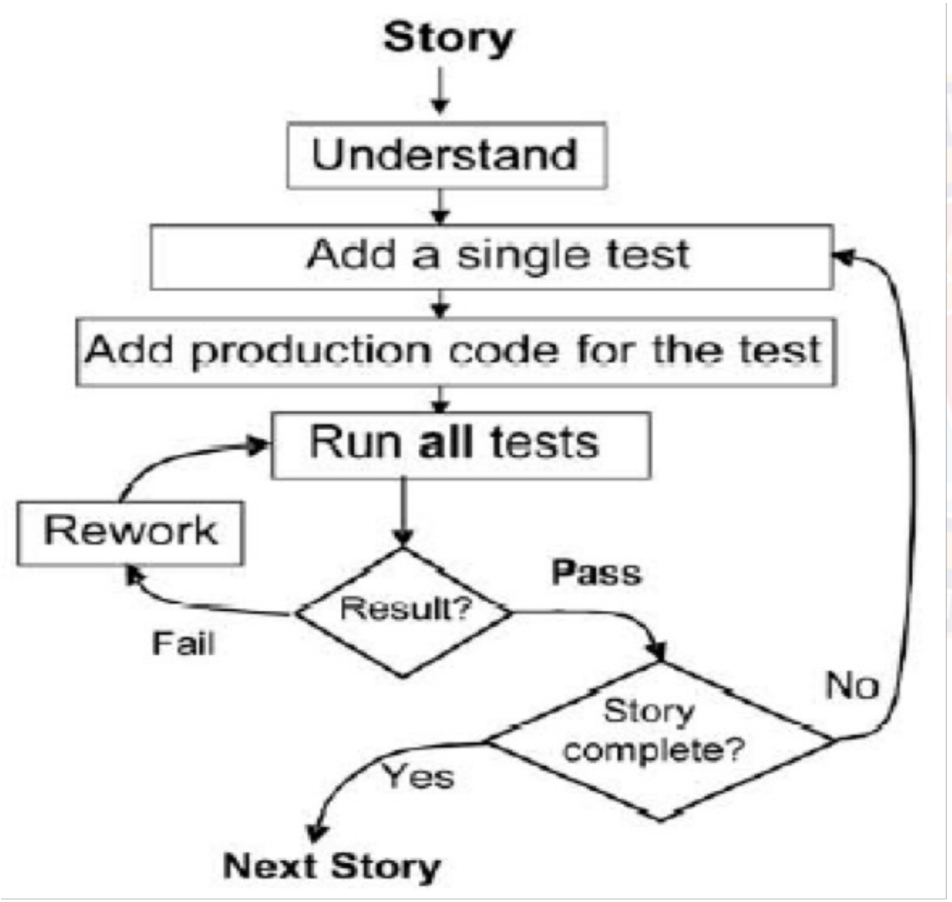
TDD

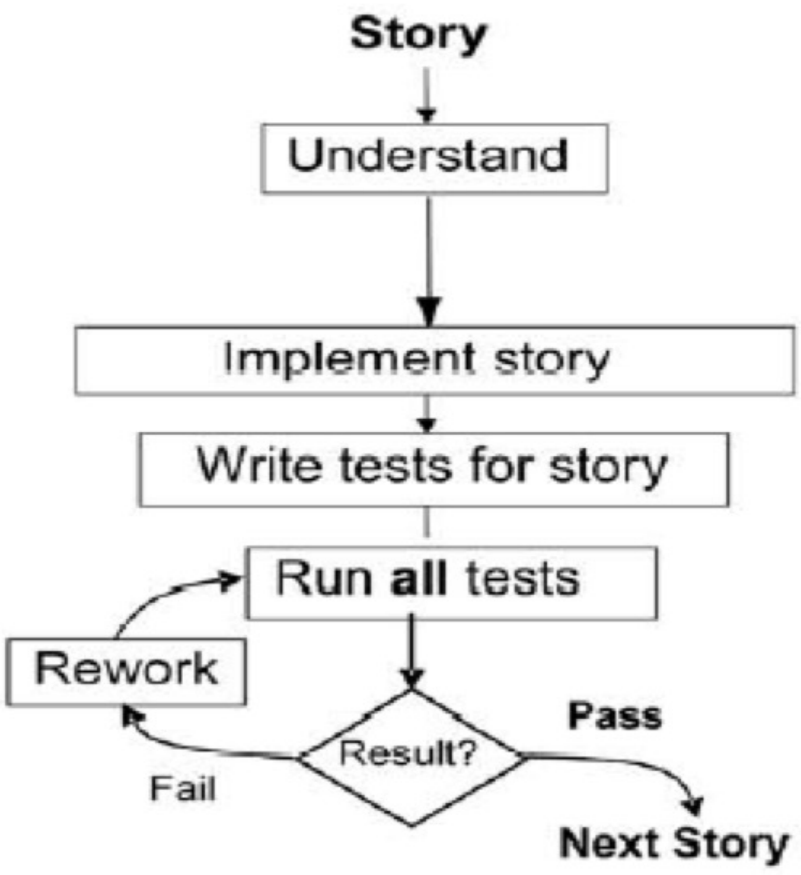
Why TDD

- TDD can lead to more modularized, flexible, and extensible code
- Clean code
- Better code documentation
- More productive
- Good design

TDD

Test First vs. Test Last





TDD Cycle

Red, Green and Refactor

- Example (payment gateway task)

1. Choose a small task
2. Write a failing test (RED Test)
3. Write simplest code to make the test pass (GREEN Test)
4. REFACTOR
5. Repeat

Implementation Code

```
payment_gateway = function () {
    credit_card ();
    netbanking ();
    upi_payment ();  →  all_upi_payment ();
}
```

Run all test

Tests

```
.......
.......
.......
```

✓ 🚫

```
new_test= function () {
    payment_gateway_includes_upi_option ();
}
```

TDD

Lets Have TDD Overview

https://www.youtube.com/watch?v=uGaNkTahrIw&t=132s

DevOps: Process

FDD

- What is a Feature?
  - Definition: small function expressed in client-valued terms
  - FDD’s form of a customer requirement

FDD

FDD Primary Roles

- Project Manager
- Chief Architect
- Development Manager
- Domain Experts
- Class Owners
  - This concept differs FDD over XP
  - Benefits
    - Someone responsible for integrity of each class
    - Each class will have an expert available
    - Class owners can make changes much quicker, if needed anytime
    - Easily lends to notion of code ownership
    - Assists in FDD scaling to larger teams, as we have one person available for complete ownership of feature.
- Chief Programmers

FDD

FDD Primary Roles

- Release Manager
- Language Guru
- Build Engineer
- Toolsmith
- System Administrator
- Tester
- Deployers
- Technical Writer

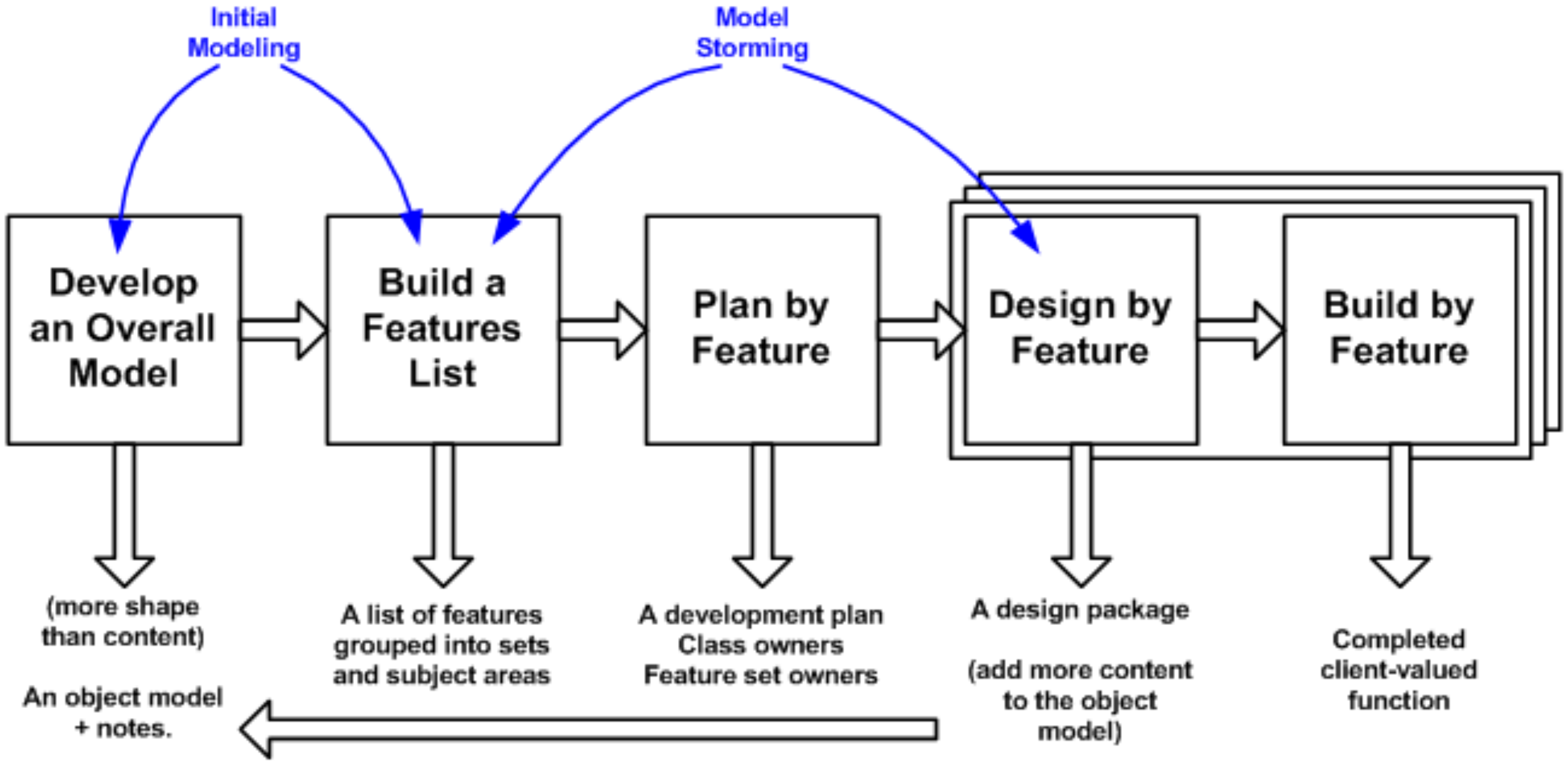
FDD

Feature Driven Development Process

- Process #1: Develop an Overall Model
- Process #2: Build a Features List
- Process #3: Plan By Feature
  - Constructing the initial schedule, Forming level of individual features, Prioritizing by business value , As we work on above factors we do consider dependencies, difficulty, and risks.
  - These factors will help us on Assigning responsibilities to team members, Determining Class Owners , Assigning feature sets to chief programmers
- Process #4: Design By Feature
  - Goal: not to design the system in its entirety but instead is to do just enough initial design that you are able to build on
  - This is more about Form Feature Teams: Where team members collaborate on the full low level analysis and design.
- Process #5: Build By Feature
  - Goal: Deliver real, completed, client-valued function as often as possible

FDD

Feature Driven Development Process



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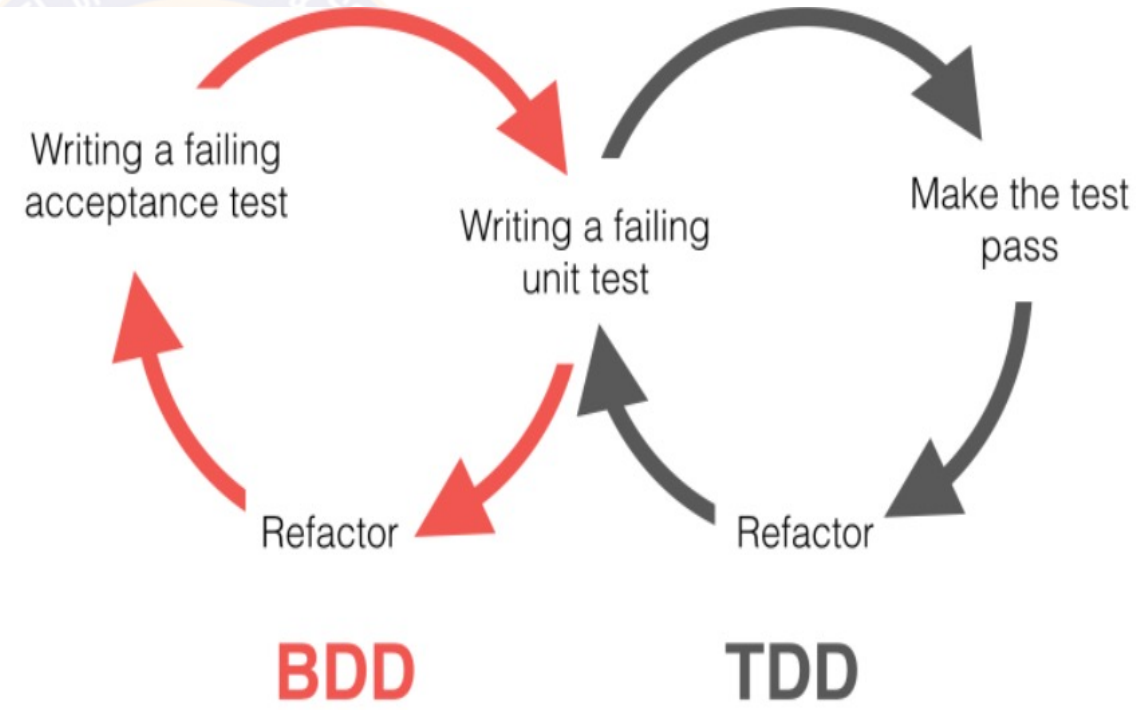
DevOps: Process

BDD

- What is BDD?:
  - General Technique of TDD
  - Follows same principle as TDD
  - Shared tools
  - Shared Process


Writing a failing acceptance test
Writing a failing unit test
Make the test pass
Refactor
Refactor
BDD
TDD

https://www.youtube.com/watch?v=4QFYTQy47yA

BDD

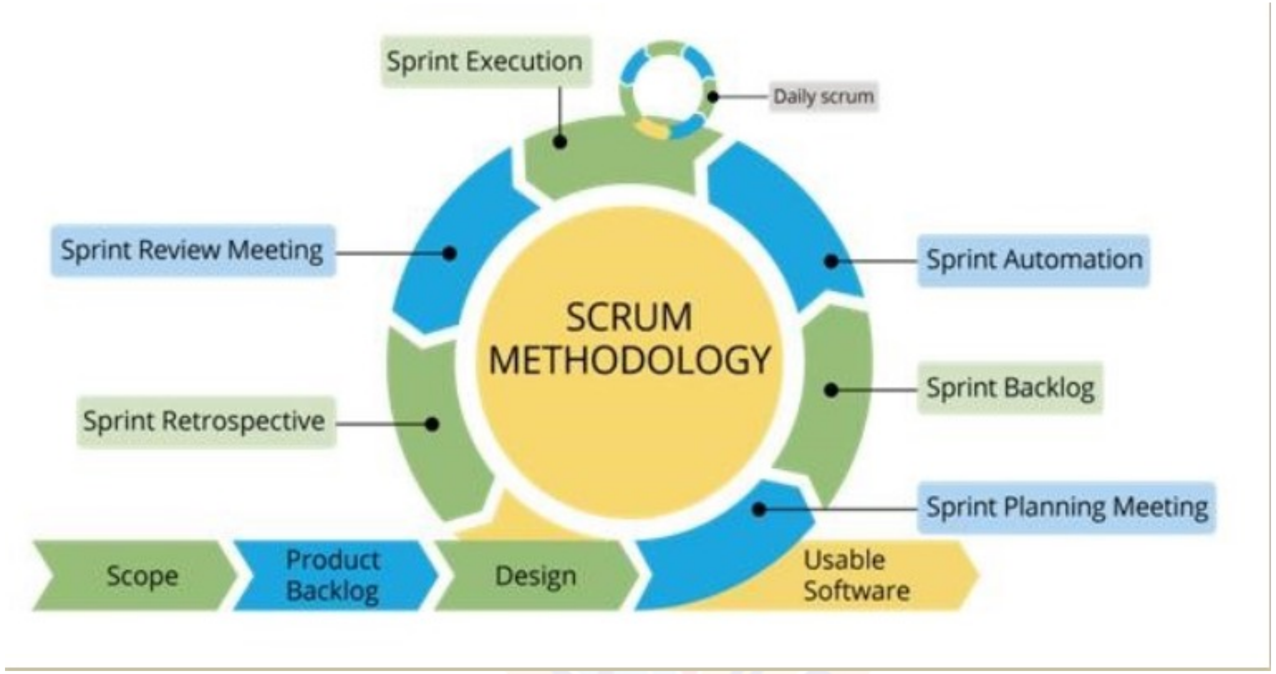
BDD Basic structure : Example

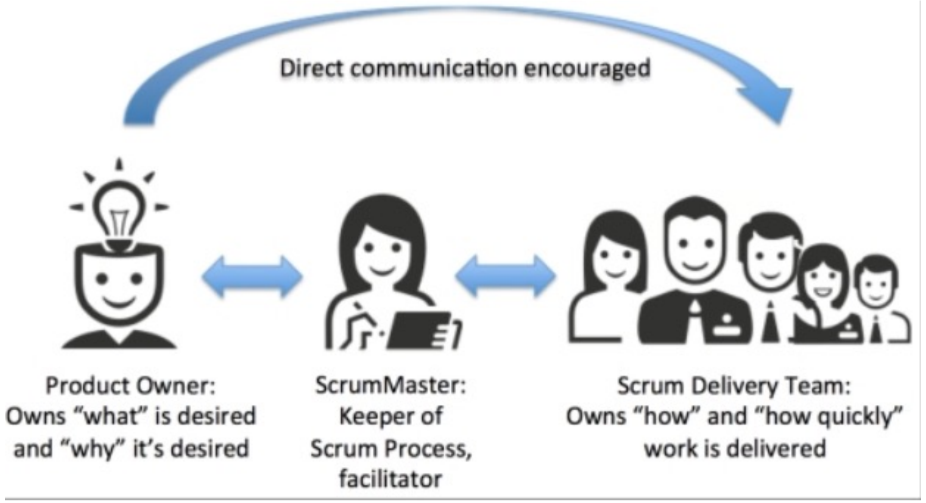
- User story:
  - As someone interested in using the Mobile app, I want to sign up in from the app so that I can enjoy my membership.

- Mobile App Signup:
- Scenario 1:
  - Given that I am on the app's "Create new account" screen
  - Then I should see a "Sign up using Facebook" button
  - And I should see a "Sign up using Twitter" button
  - And I should see a "Sign up with email" form field
  - Then I should see a new screen that asks permission to use my Facebook account data to create my new Mobile app account

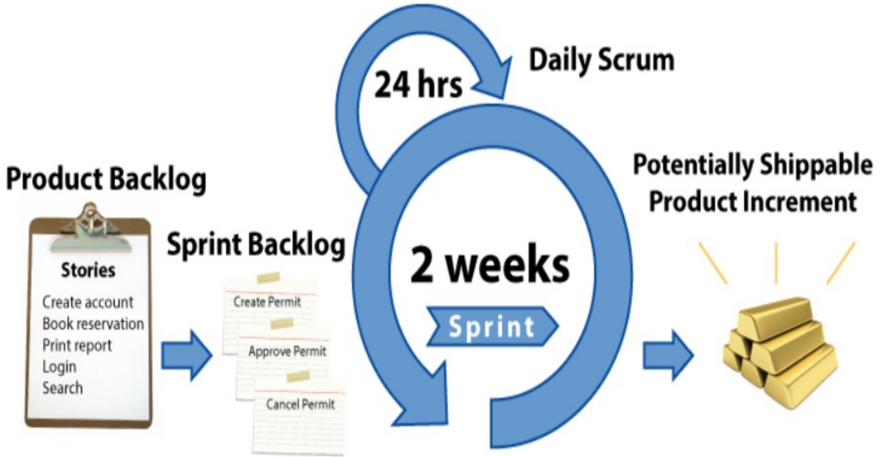
DevOps: Process

SCRUM





Direct communication encouraged
Product Owner: Owns “what” is desired and “why” it’s desired
ScrumMaster: Keeper of Scrum Process, facilitator
Scrum Delivery Team: Owns “how” and “how quickly” work is delivered



SCRUM

SCRUM Overview

- You can refer below YouTube video for understanding the structure of organization to be agile.
- This Video is of First Bank in world to adopt Agile Scrum
- https://www.youtube.com/watch?v=uXg6hG6FrG0

References

CS 2 & 3

- Chapter 5 from Effective DevOps Building a Culture of Collaboration, Affinity, and Tooling at Scale by Jennifer Davis and Katherine Daniels
-
- For BDD and FDD: https://www.agilealliance.org

Thank You!

In our next session: