XP CONFERENCE INDIA 2016

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Introducing XP practices in Team
Vision & Its Challenges

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Background

- Part of Cisco Service Provider Business, working on Set Top Box devices.

- We develop solutions for enriching the viewing experience E2E

- Software Stack consists of legacy modules and new features keep getting added on top of it

STB Software Stack

Application Layer (Java)
User Experience & Interface
Middleware (C)
Core Functionality
Device Driver

Agile & XP

Who all are working in Agile teams ??

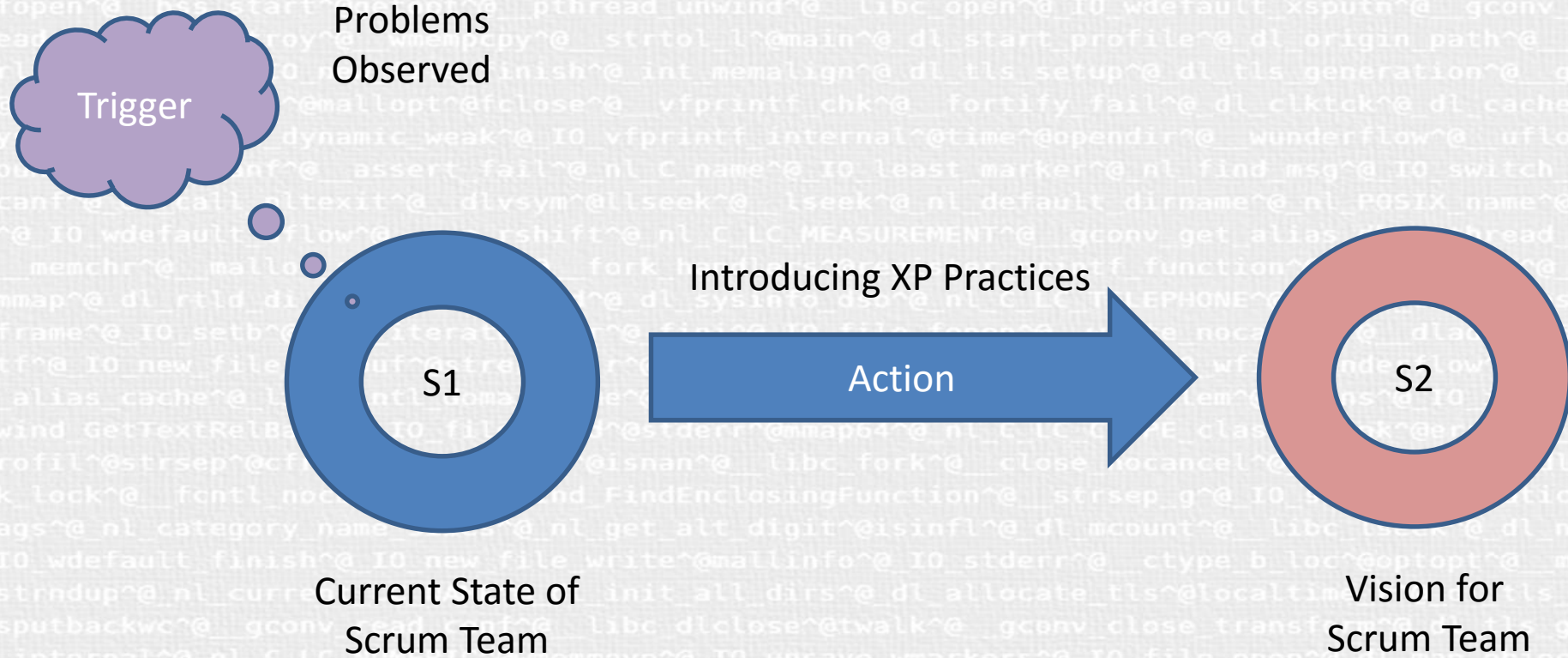Who all are working in teams which follow XP practices ??

Who all are following both ??

Is there any co-relation between them ??

Agile Transformation

- We started our agile transformation journey in first half of 2014
- Adopted Scrum framework
- Moved from Component based Team to Vertical Team. New roles got introduced
- Focus on automation to support continuous testing

State Transition

Trigger

Problems Observed

S1

Current State of Scrum Team

Introducing XP Practices

Action

S2

Vision for Scrum Team

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Team State

- Team has learned the agile practices; Standup, SPM, Retrospection..
- Were moving towards becoming self organizing teams
- Quality of software has improved (defect were caught in sprint & fixed)
- Automation tool was introduced
- CI was in place and automated test cases were added as part of CI
- Teams were expanding, new members joining team

Waterfall Project Management
Component Based Team
Existing Development &
Automation Practices
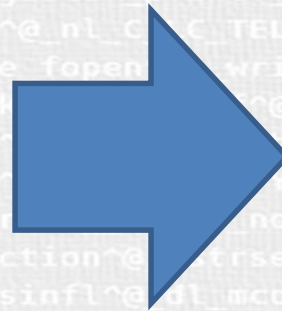
Existing
Development &
Automation
Practices

Standup Sprint Planning Meeting SCRUM Vertical Team Backlog Grooming Retrospection

Trigger

- Unreliable automated test cases
- Team members wondering about effectiveness of automation
- Quality of test code
- Continuous Integration stuck at Continuous Compilation
- Defects still coming up during testing (inside sprint boundary)
- Ramp up of new developer slower
- Started looking in to some of XP practices, better ways of automation

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Introduced to New Terms

- ## Test First Approach
  - To identify all test cases through brainstorming inside team
  - Using BDD as framework
- ## Pair Programming
  - Knowledge sharing
  - Real time code review
  - Ramp up
- ## Test Pyramid
  - What to Automate and at What Level
- ## Effective Use of CI
  - Building reliable continuous integration pipeline
- ## "Building Quality In" instead of "Checking Quality"

Communication of Vision

- Communication of Vision is one of the most important step
- Two type of stakeholders : Scrum Teams & Leadership
- Leadership (Project Manager, Engineering Leadership, PO etc)
  - Problem statement has to be explained clearly with expected output
  - Success Story from Industry
  - Credibility (from previous transformation & result)
- Scrum Team
  - It's mainly a cultural change, old habits (of domain expert) need to be changed
  - One of the key agile principle which is going to help the most is "Experiment for A Sprint"
  - With team already understanding agile practices, it helps

Right Team, Right Place, Right Pace

- Team
  - 2 out of 6 scrum teams
  - Open Mind & Credible Developers
- Place
  - System had log of legacy code
  - Introduce it in new Feature Development
  - Moderate to High Complexity Feature
- Pace
  - Pace it out, one practice per sprint
 - Retrospect and Tweak
- You need to put your heart & soul

Test First Approach

Given — Initial Context

When — Event Occurs

Then — Expected Outcome
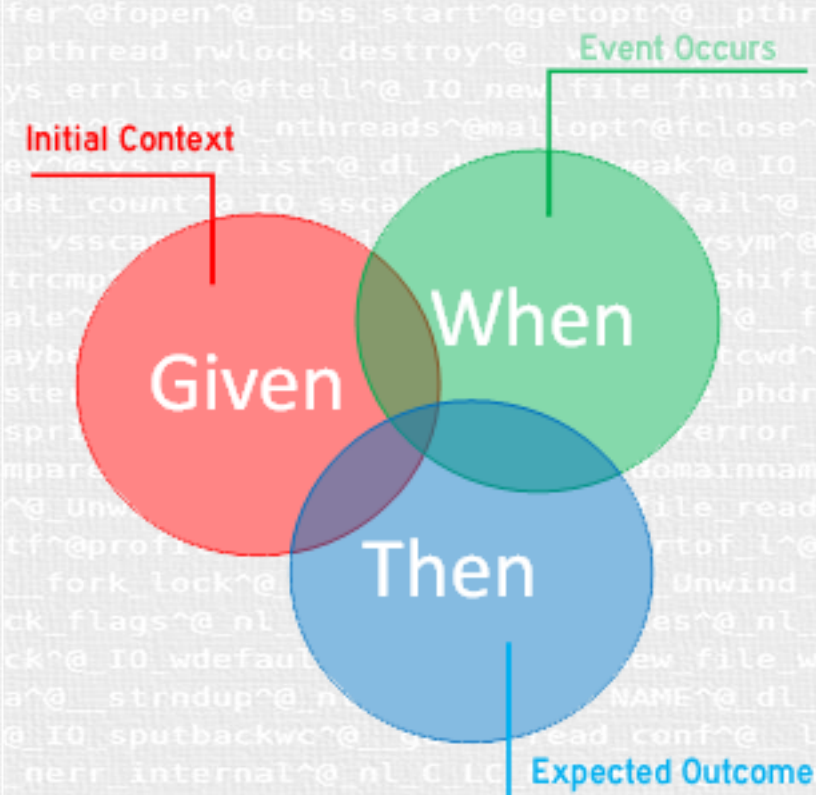
- Identifying all test scenarios before starting development
- Scrum Teams normally has members who were earlier part of QC teams
- Made them messenger for this practice
- Introduction of BDD was like adding new dimension to their learning
- Brings focus on Quality before any code is written
- Helped in making user stories smaller and frequent delivery of code

Test Pyramid

- Concept by Mike Cohn
- A critical step to streamline automation but also challenging one
  - Lot of Legacy Code
  - Middleware did not have any unit testing framework, only service level testing framework
  - Application layer used Junit , but quality of test code was a concern
 - UI Level Automation
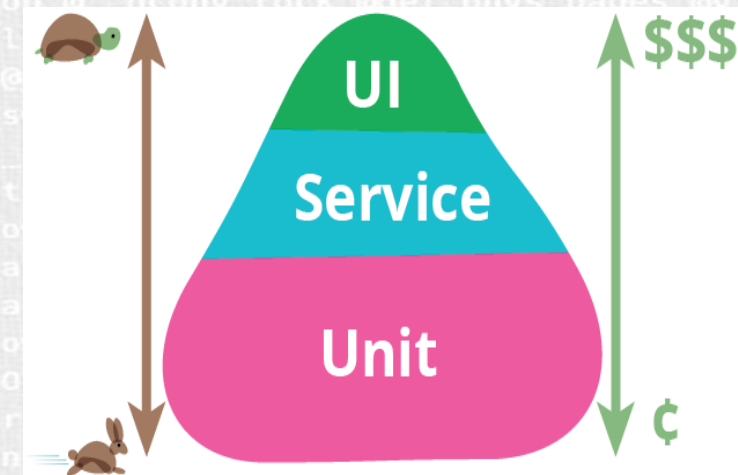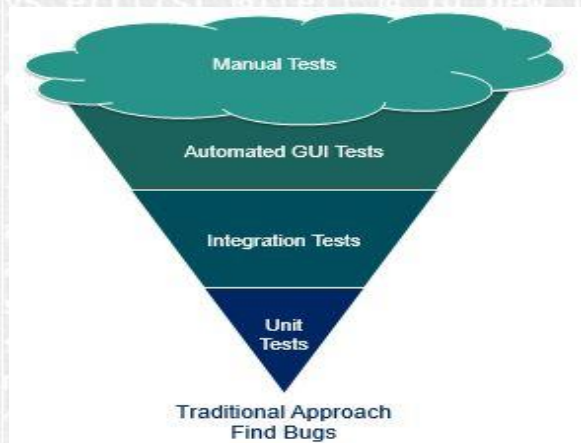
Test Pyramid

Identify BDD Scenarios

Map to Test Pyramid

Write Test Code & Feature code in Parallel

- Usage of NovaProva (UT framework for C) for Middleware
- Effective Usage of Service Level testing framework for Middleware
- Introduced Test Driven Development for writing JUnit
- Brought out need of refactoring

Write a Failing Unit Test

Make the Test Pass

Refactor
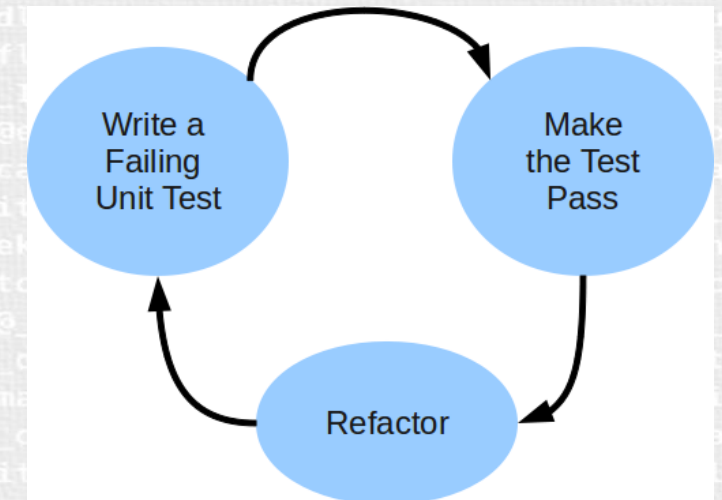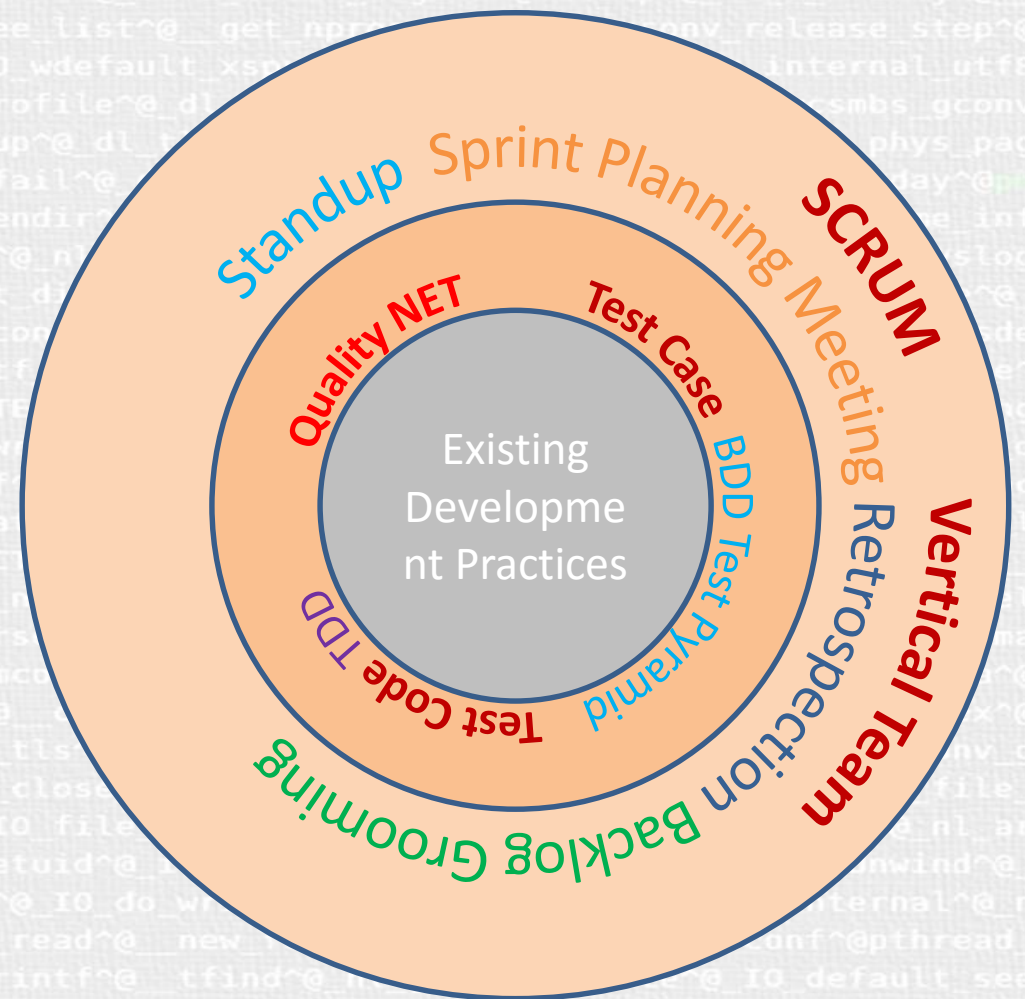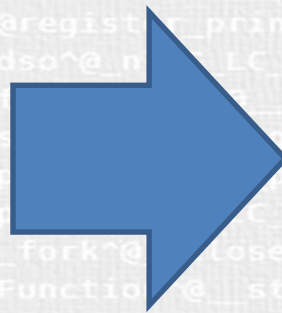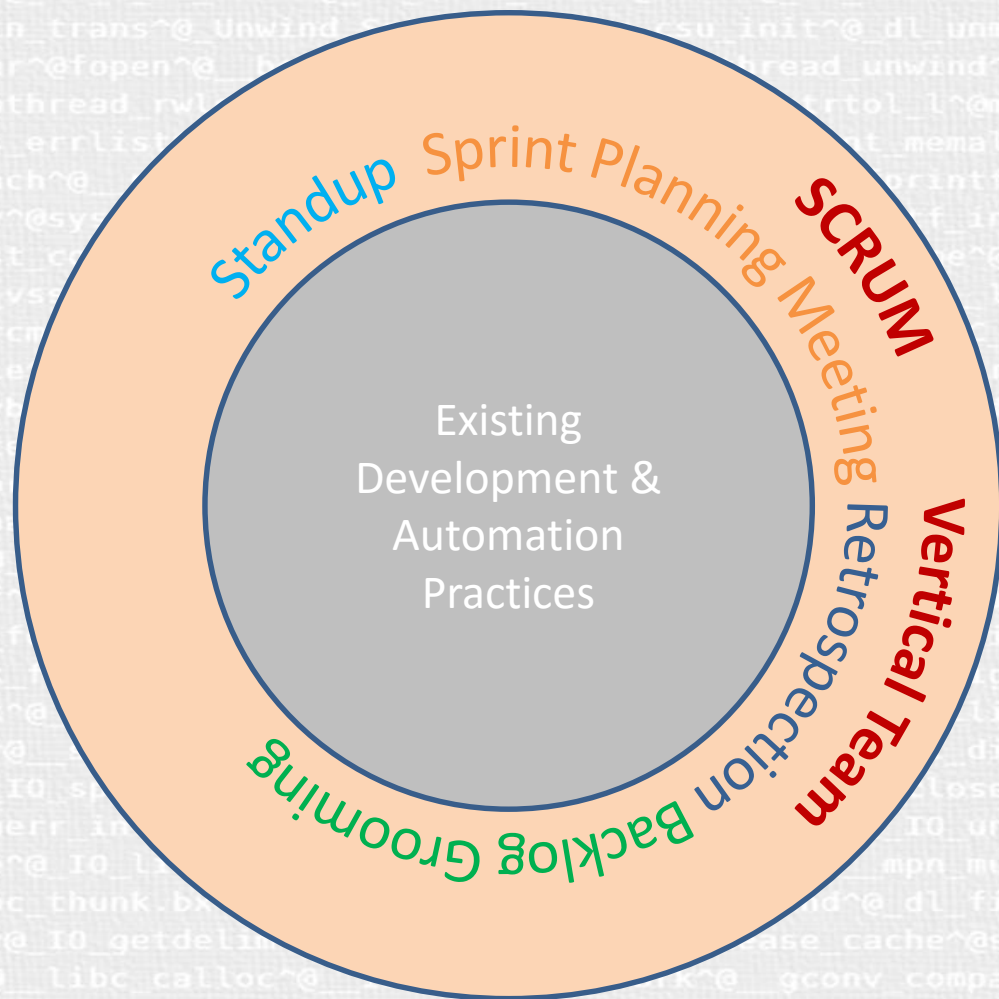
Pair Programming

- Explained Pair Programming, some Demo Session with coaches, Training Session
- Next sprint , team started feeling lost
- Challenges
  - Team consists of Java Dev, C Dev, QC, Experts, New team member
  - When to pair
  - Why are we pairing
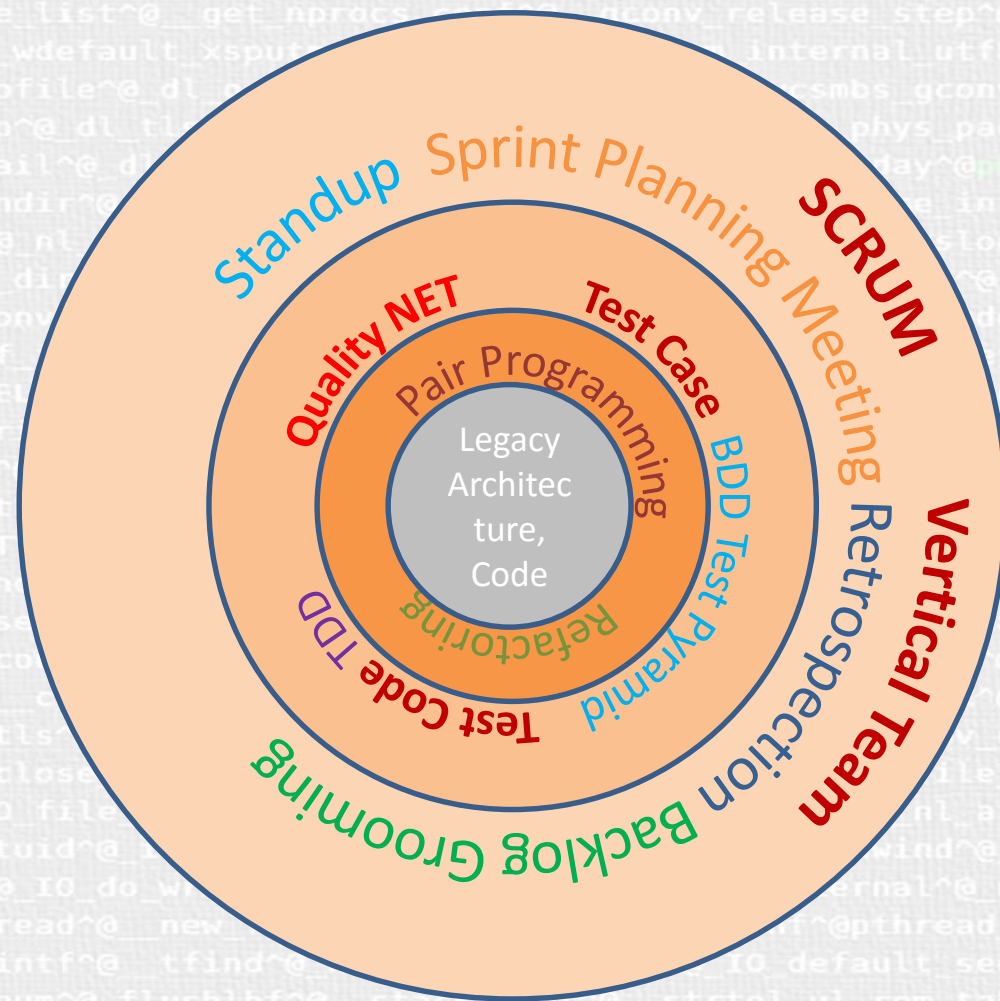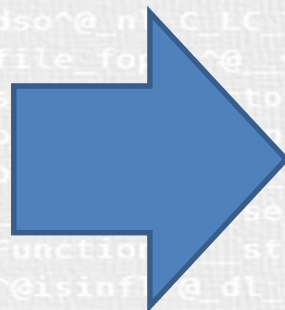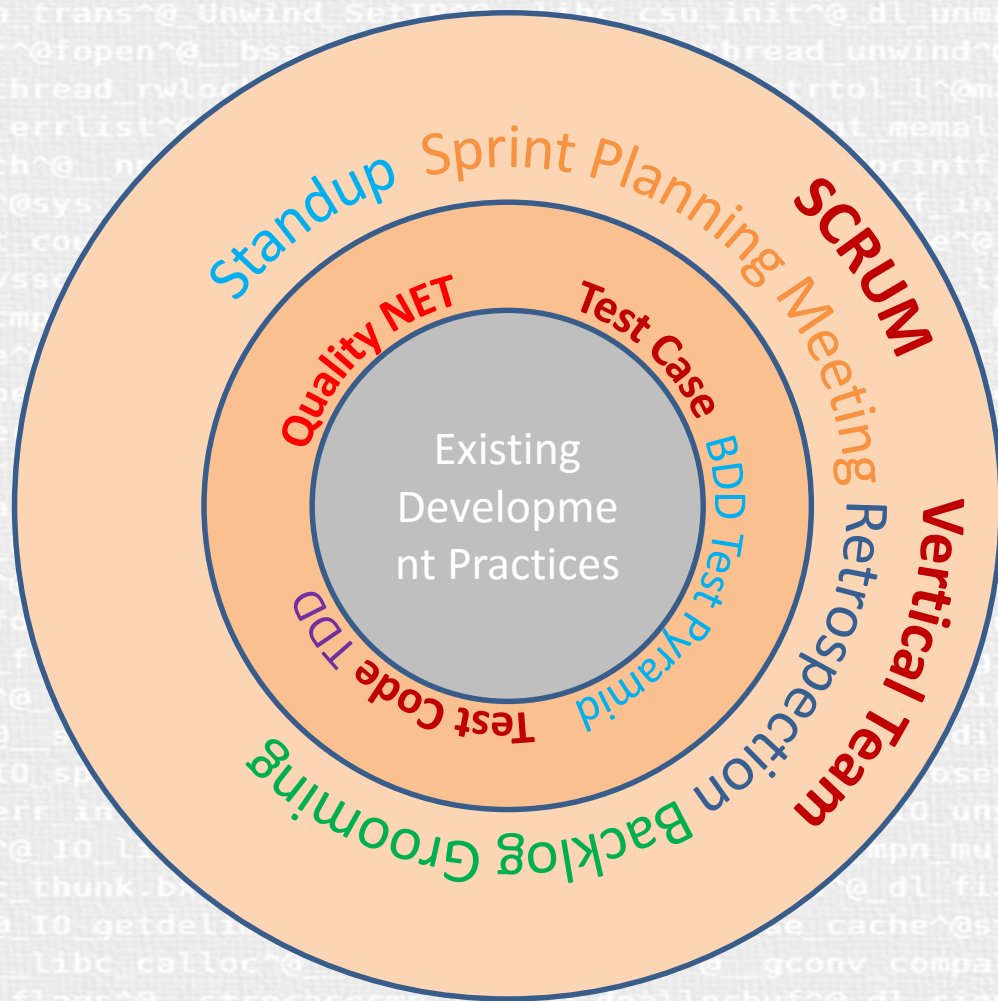 - Its not giving any advantage

Pair Programming

Task	Pair	Goal	Driver-Navigator Switch
Code Development	Developers with similar expertise	Quality of Code	Yes
Scenario Identification	Any two team members	Quality of scenarios	Yes
Script Development	Any two team members	Script Quality	Yes
Code Development	Developer of two different expertise	Quality of code: by identifying the gap in logical decision making or flows	No
Test Code development (Ex - Integration test, Unit test, scripts)	Developer & QC expert	Quality of code by identifying the gap in scenario handling	No

- Tweaked our approach to bring clarity
- At end of every standup, team identifies the task , with pair and its time
- Encouraged pairing with code reviewer itself

Refactoring

- Introduction of UT & TDD, brought focus on Clearly Defined function
- TDD & UT was difficult for poorly defined functions
- Key was team feeling the need for refactoring
- Creating safety net first using UT and then refactoring
- Challenges
  – Lot of Legacy Code
  – Cost- Benefit Analysis

Left circle (from outer to inner):
Standup · Sprint Planning Meeting · SCRUM · Vertical Team · Backlog Grooming · Quality NET · Test Case · BDD Test Pyramid · Test Code TDD

Existing Development Practices

Right circle (from outer to inner):
Standup · Sprint Planning Meeting · SCRUM · Vertical Team · Backlog Grooming · Quality NET · Test Case · BDD Test Pyramid · Test Code TDD · Pair Programming · Refactoring

Legacy Architecture, Code

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Next Steps

- Using two teams and key member as catalyst for introducing practices to remaining 3 teams in project
- Creation of Automated Test Suites, for streaming lining the Continuous Integration
  - Feature based Test Suite
  - Nightly Test Suite

Thank You

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