

# Welcome!





# Agile Software Engineering



# Software Engineering Careers

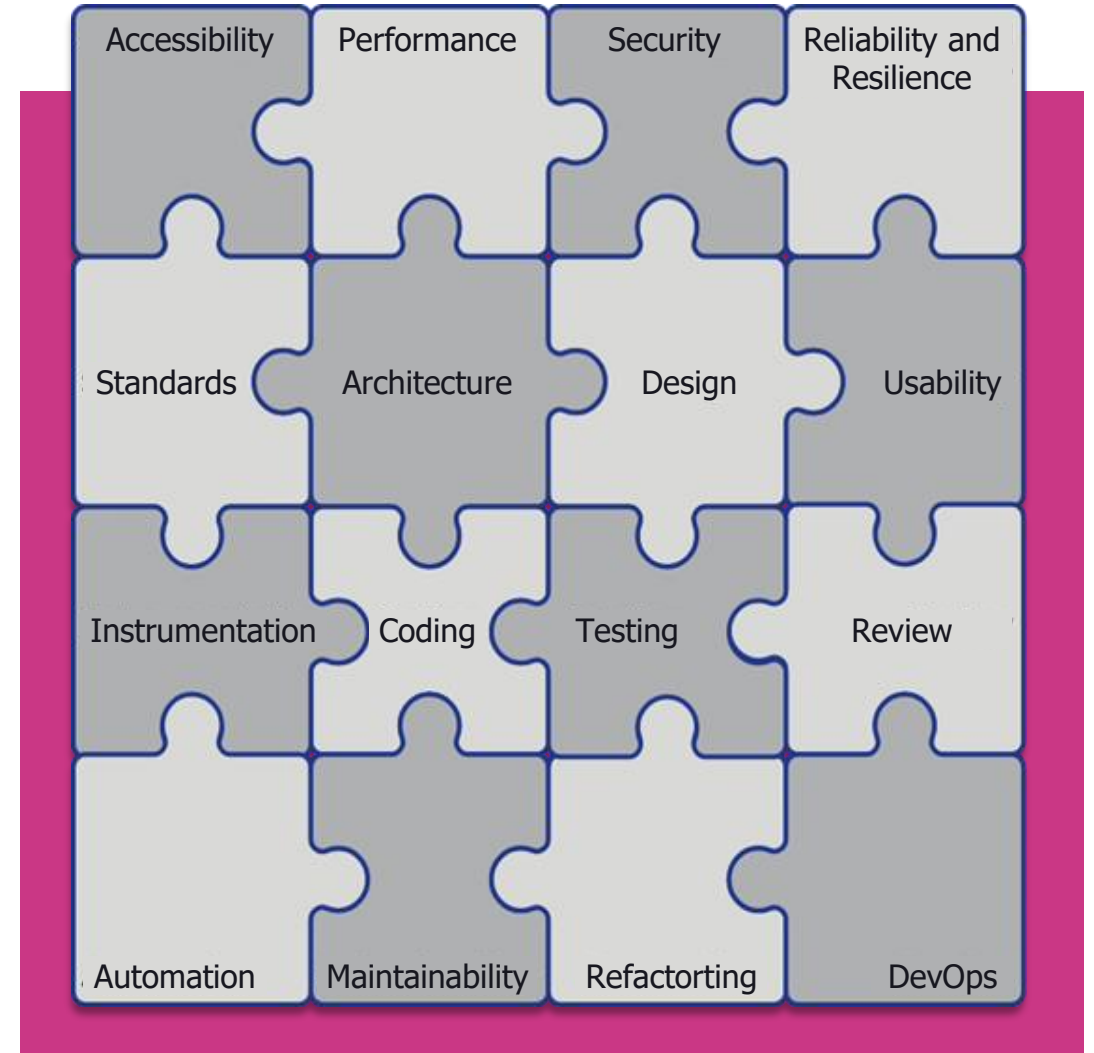
- + Internship / First job
- + Configurations Manager (Chapter 10)
- + Project Manager (Chapter 1 and 2)

## Project Management

The process of leading the work of a team to achieve all project goals within the given constraints

## Project Manager

Responsible for planning, organizing, and directing the completion of specific projects for an organization while ensuring these projects are on time, on budget, and within scope



(Adapted from Bystrostrone, 2021)



# Agile Methods, Scrum Framework, and the Kanban Board (Scrumban)



- + 3 types of software engineering processes models:
  - Plan driven model
  - Incremental model
  - Integration and configuration model
- + Agile methods and principles and the Scrum Framework
- + The need for rapid software development and processes really took off in the late 1990s with the development of the idea of “agile methods”.

# Agile Methods, Scrum Framework, and the Kanban Board (Scrumban)



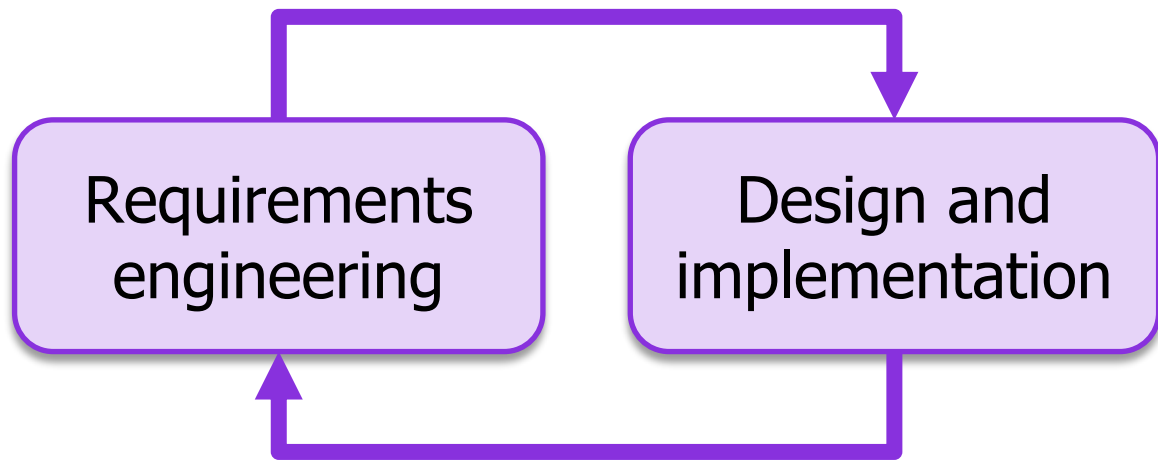
## Agile Method

An iterative and incremental tactic for software design that utilizes constant planning, understanding, upgrading, team partnership, development, and delivery

- + Software is part of almost all business operations.
- + Rapid software development and delivery is the most critical requirement for most business systems.
- + The Agile method focuses on:
  - Delivering functionality quickly
  - Responding to changing product specifications
  - Minimizing development overheads



# Agile Development



# Agile Manifesto (2001)

We are uncovering better ways of developing software by doing it and helping others to do it. Through this work, we have come to value:

|                              |      |                             |
|------------------------------|------|-----------------------------|
| Individuals and interactions | Over | Process and tools           |
| Working software             | Over | Comprehensive documentation |
| Customer collaboration       | Over | Contract negotiation        |
| Responding to change         | Over | Following a plan            |

That is, while there is value in the items on the right, we value the items on the left more.

# Agile Methods

## Extreme Programming (XP)

- The most influential work that has changed software development
- The approach was developed by pushing recognized good practice, such as iterative development, to 'extreme' levels.

## Scrum

- A framework that helps teams work together
- Scrum encourages teams to learn through experiences, self-organize while working on a problem, and reflect on their wins and losses to continuously improve.

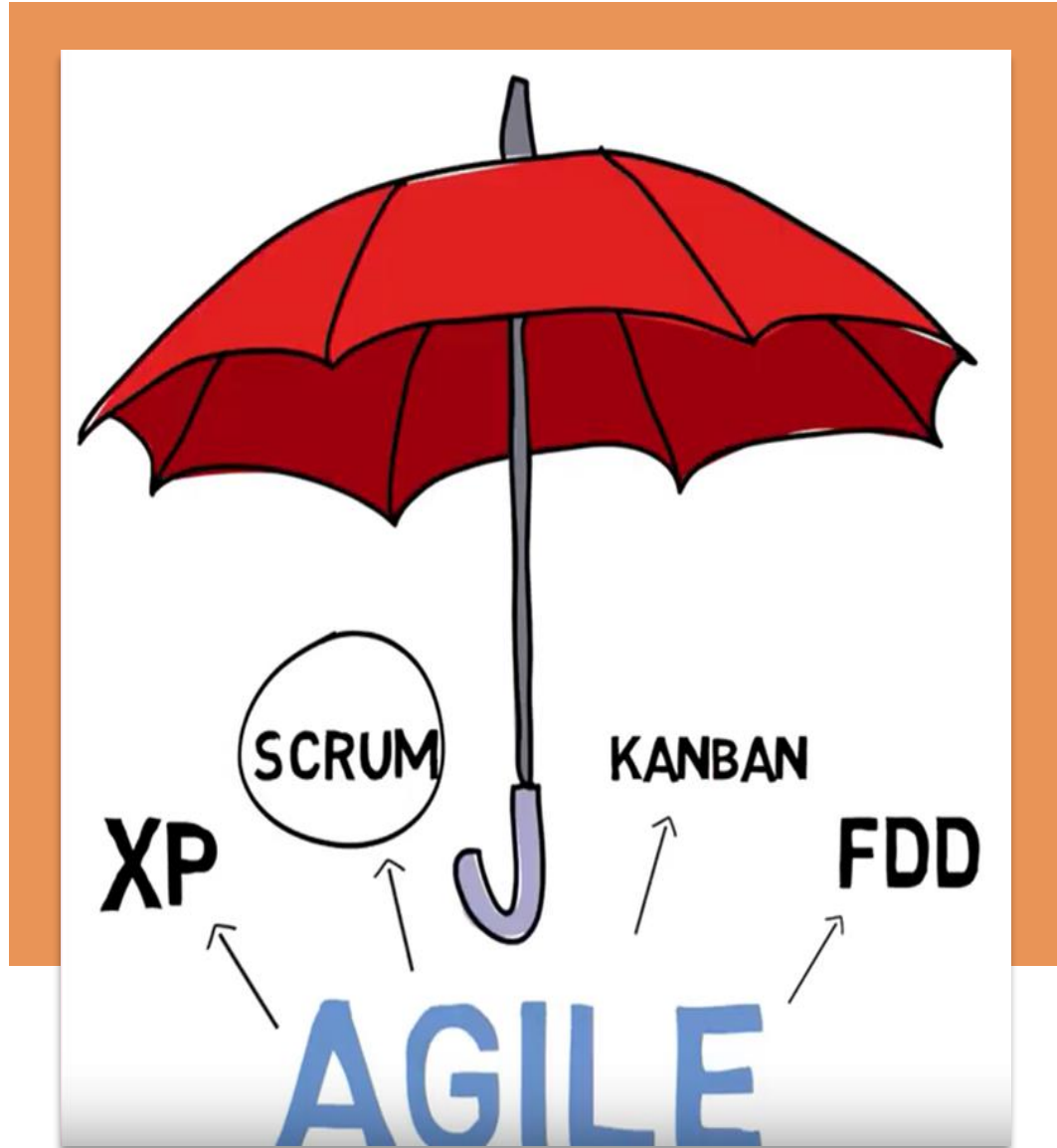
## Kanban (カンバン)

- "Kanban" is the Japanese word for "visual signal."
- A Kanban board helps make your work visible so you can show it to others and keep everyone on the same page.

## Feature Driven Development (FDD)

- Customer-centric, iterative, and incremental, with the goal of delivering tangible software results often and efficiently
- Encourages status reporting at all levels, which helps to track progress and results

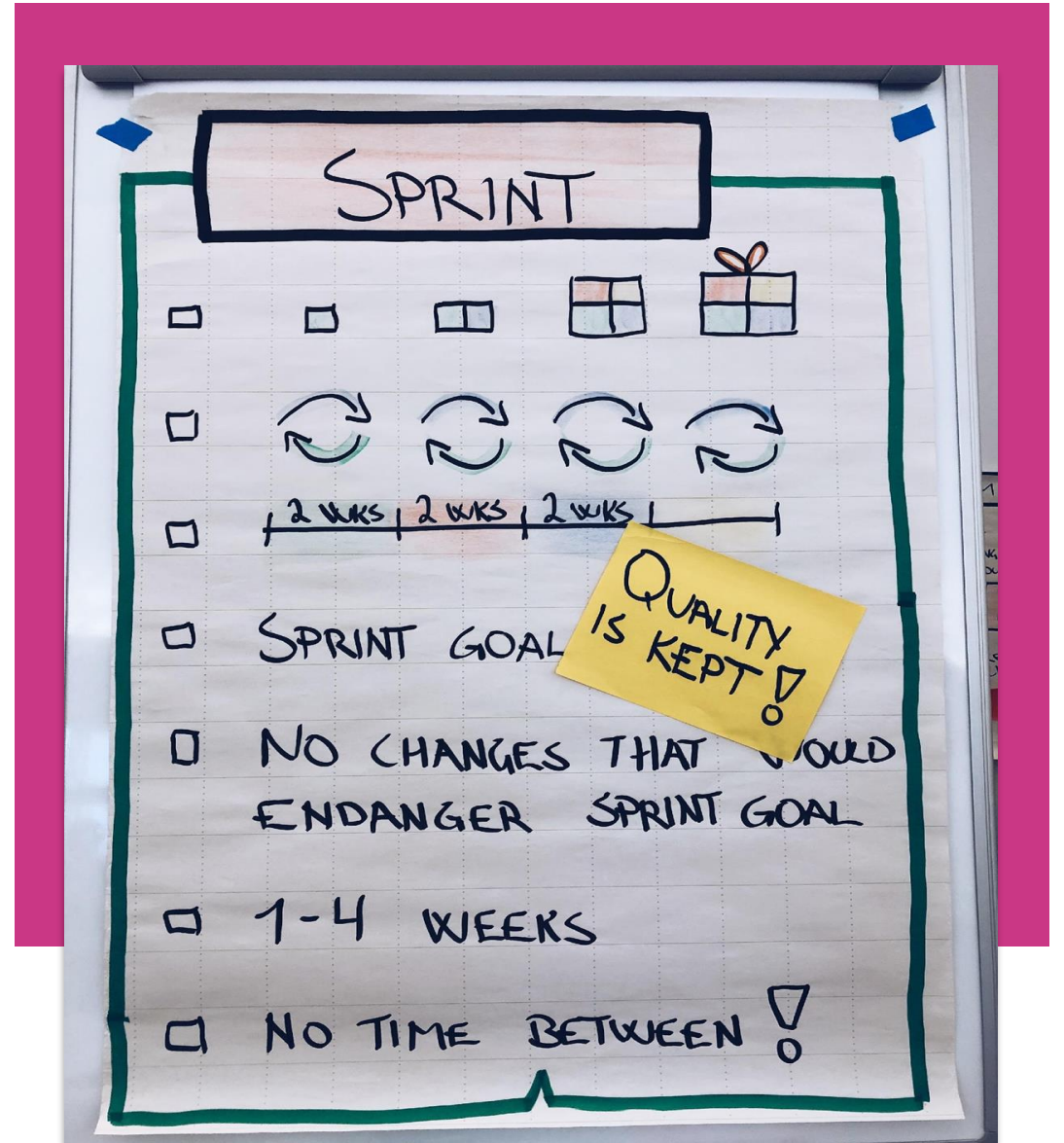




# Agile Characteristics

- + The processes of specification, design and implementation are interleaved.
- + The system is developed in series of increments.
- + Extensive tool support is used to support the development process.

# Scrum



# Scrum

- + A **scrum** (short for scrummage) is a method of restarting play in rugby football that involves players packing closely together with their heads down and attempting to gain possession of the ball.

## VIDEO PLACEHOLDER

Video team, please play the following video from 0:31-0:40 after the instructor's voice-over.

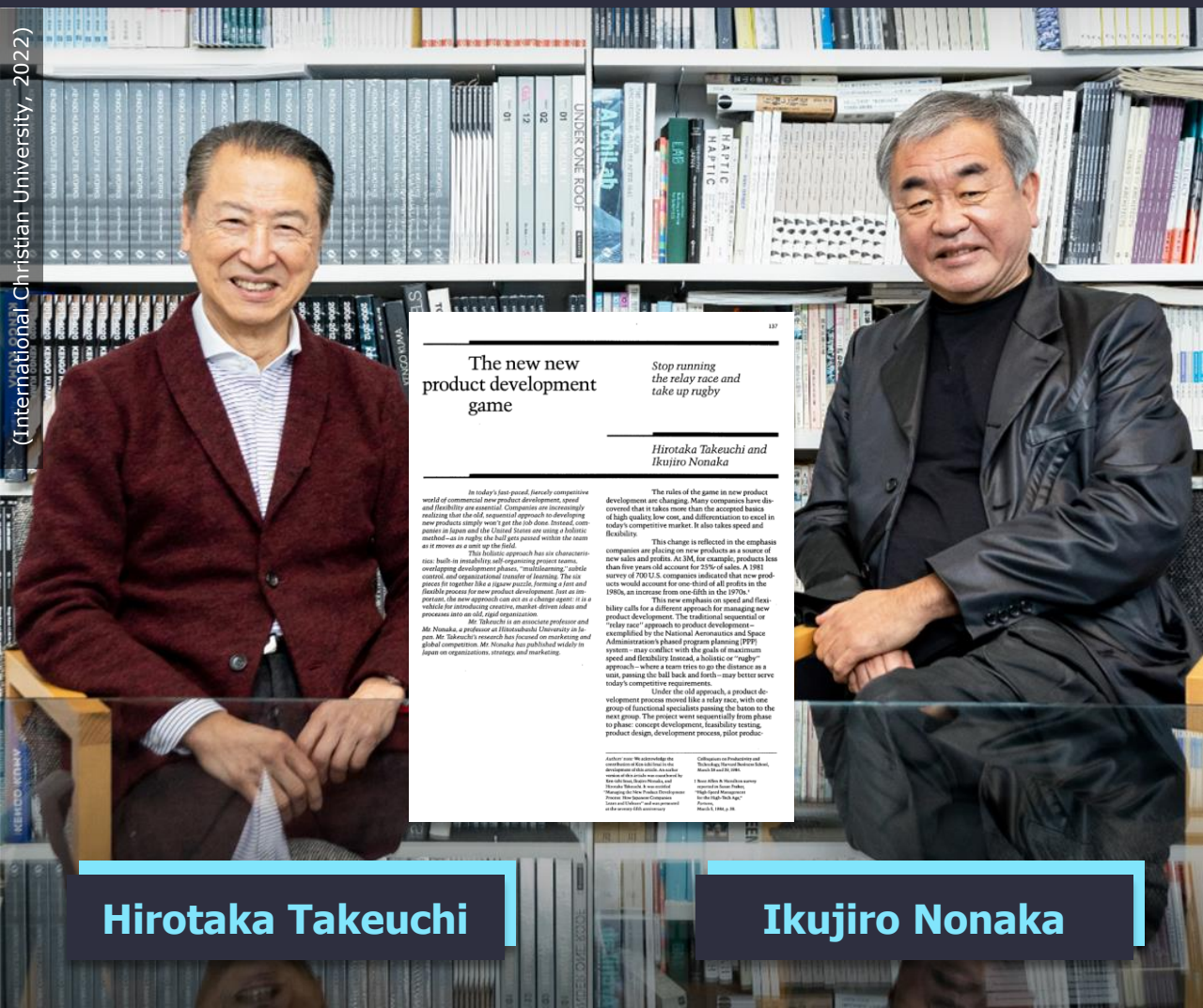
Please place the video in the slide over this shape rather than showing the video full screen.

<https://youtu.be/VIfD0nuocVo>



# Scrum

(International Christian University, 2022)



Hirotaka Takeuchi

Ikujiro Nonaka



# Scrum Team

Product owner



## Product Owner

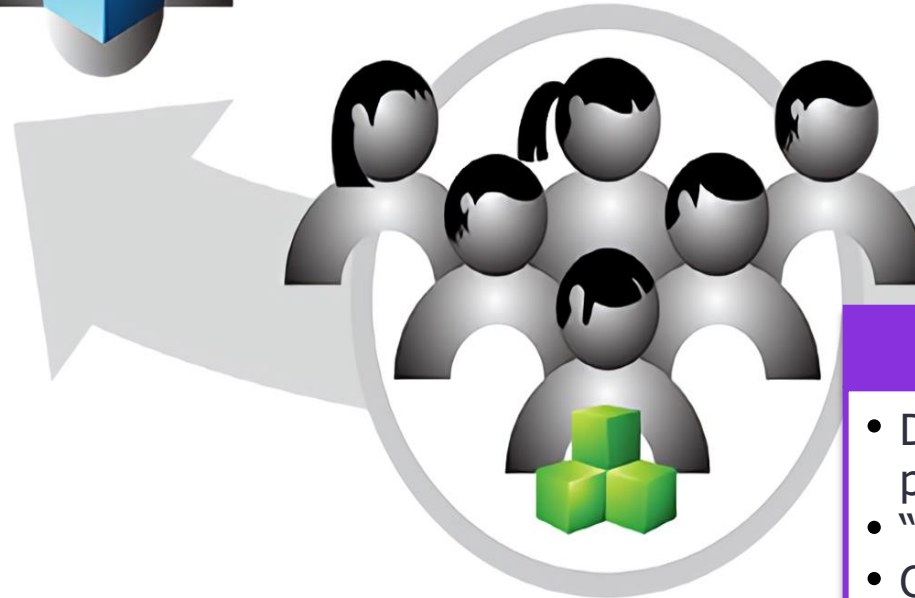
- Leader of the group
- Must understand needs
- Must maintain proper balance
- Held accountable for delivering results

ScrumMaster



## Scrum Master

- Agile coach of the team
- Observes and improves Scrum
- Manages code, resources, and pair programming



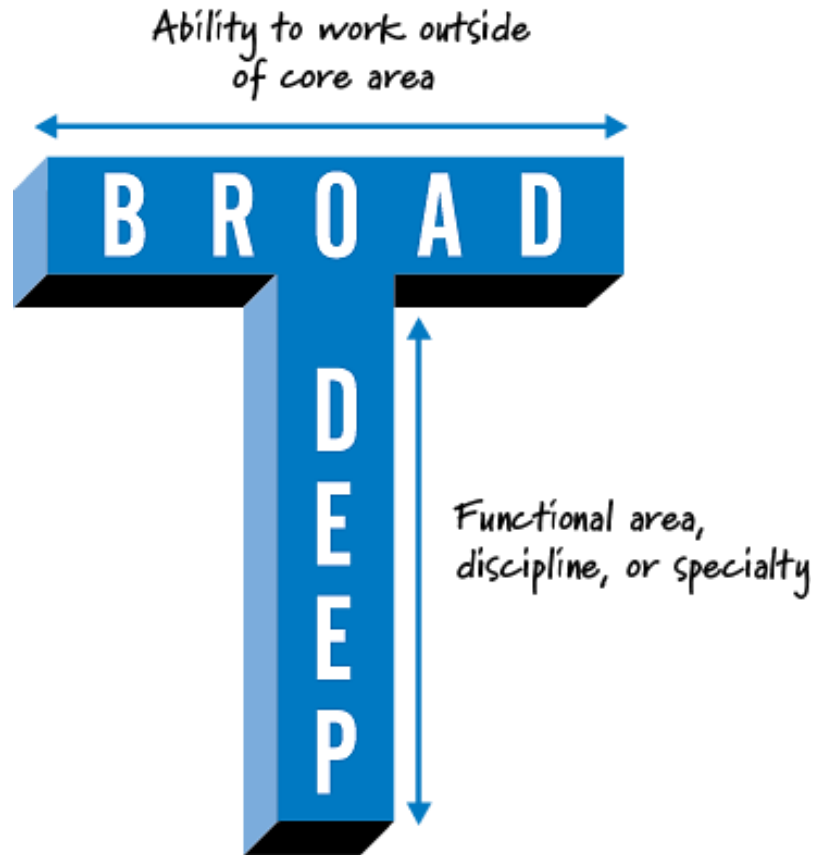
Development team

## Development Team

- Deliver the business value requested by the product owner
- "All for one and one for all."
- Collective responsibility
- A diverse, cross-functional collection of these types of people who are responsible for designing, building, and testing the desired product



# Scrum





# Scrum

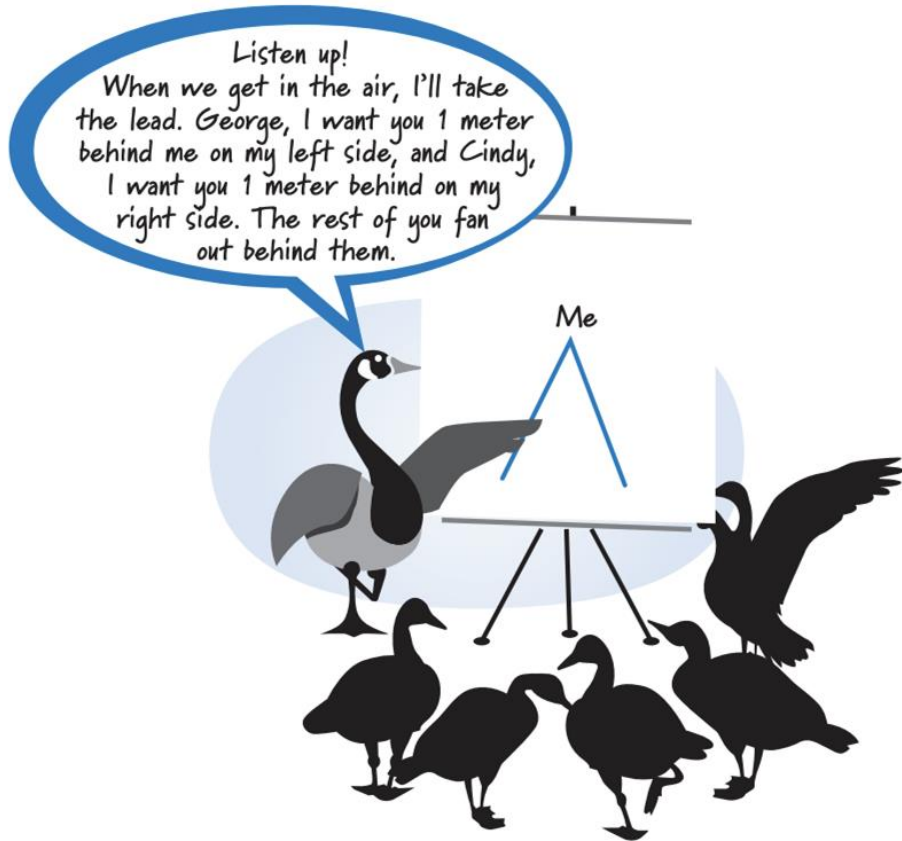


Sue

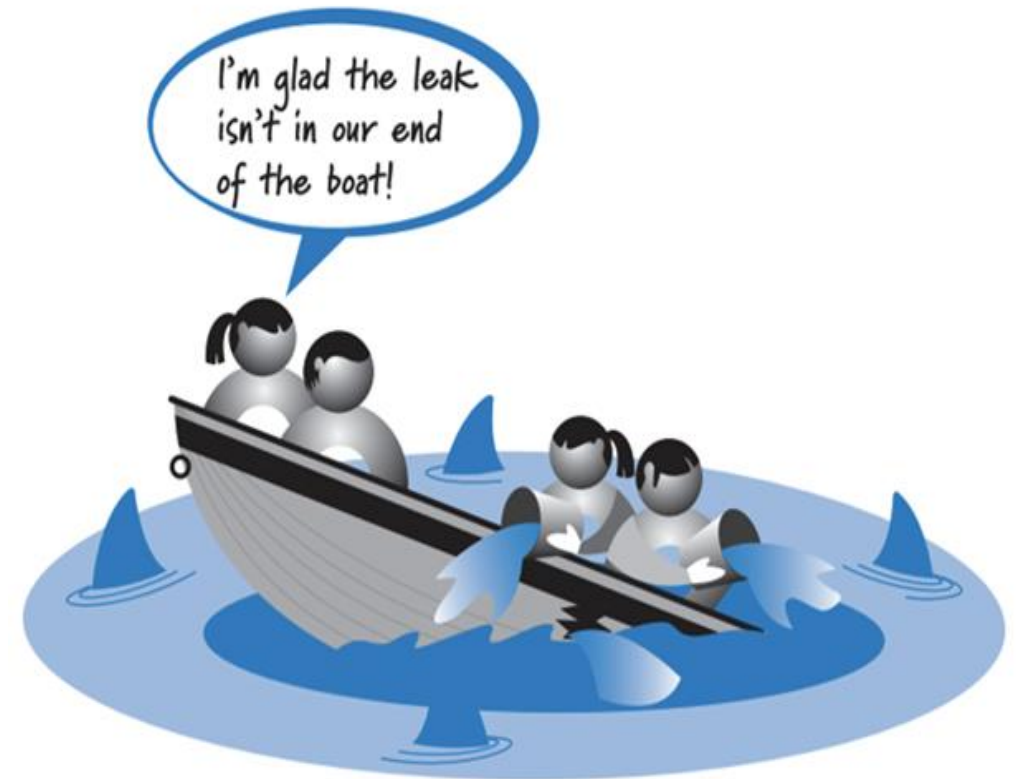


# Agile Methods

## Flocking Birds

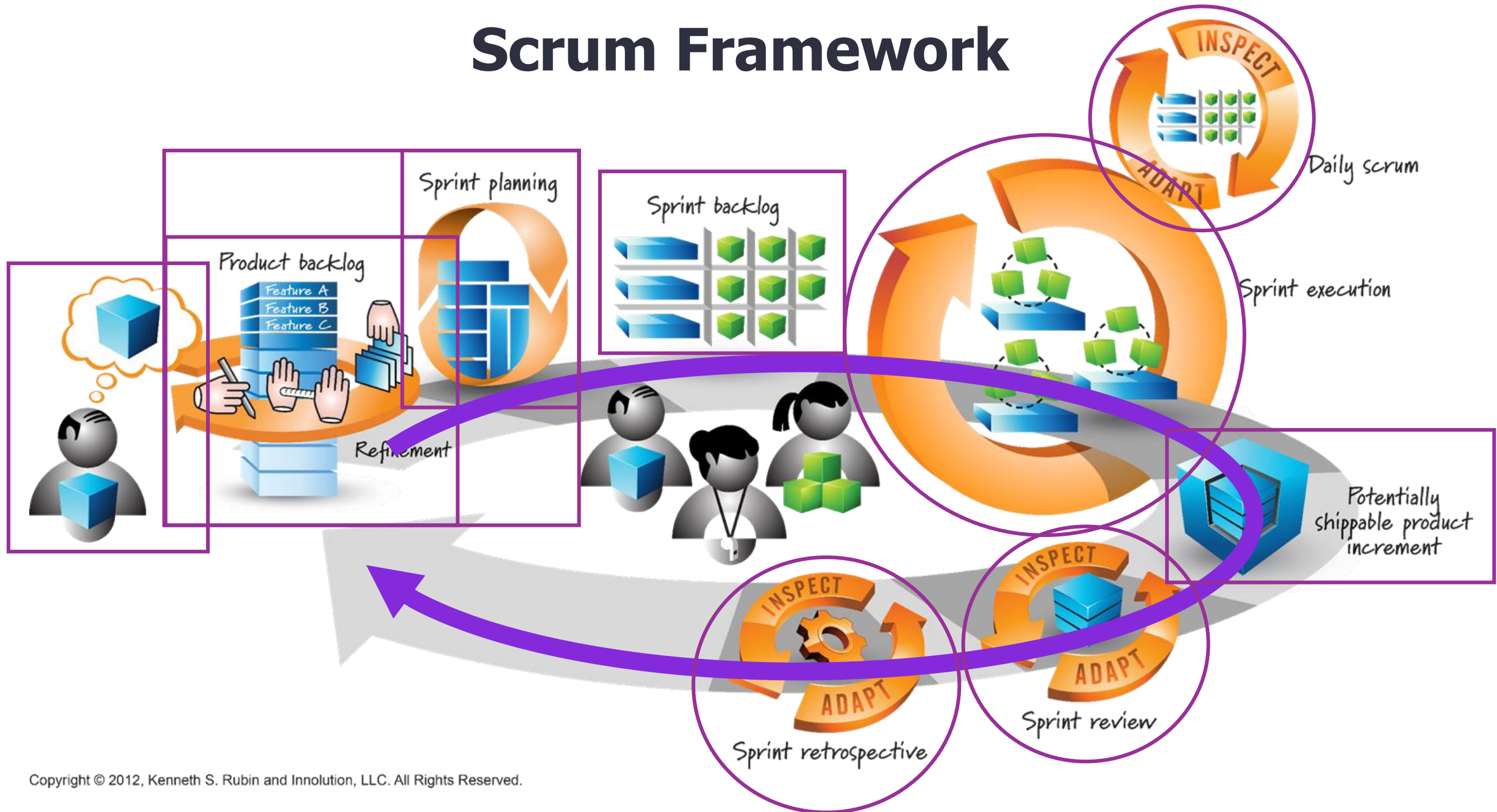


## Same Boat





# Scrum Framework



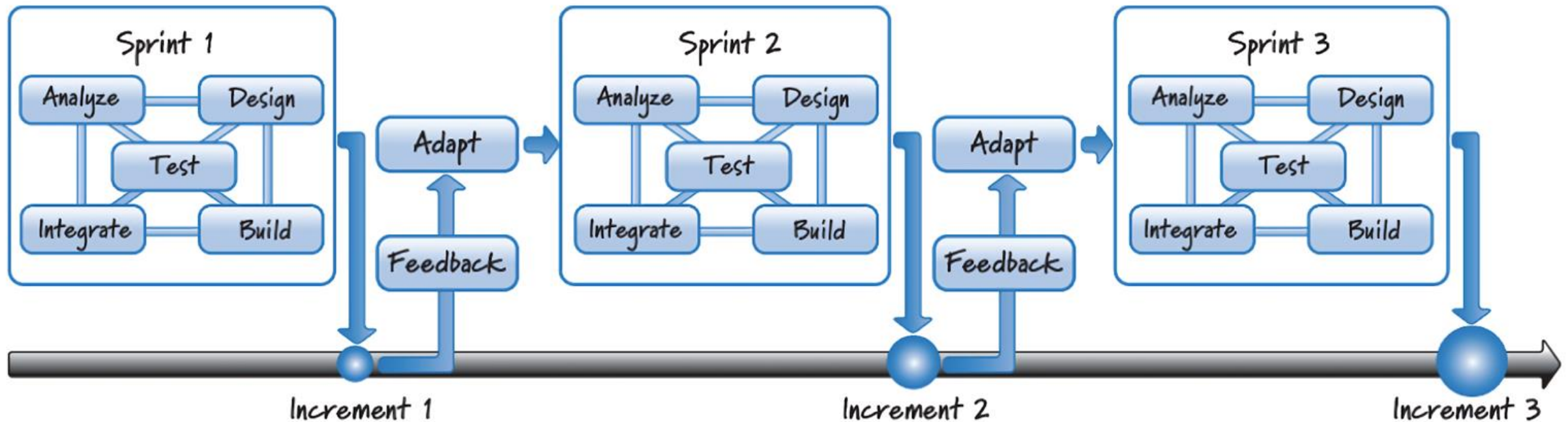


# Sprint Activities

- 1 Sprint Planning
- 2 Sprint Execution
- 3 Sprint Reviewing

# Timeboxed Sprints

- + In Scrum, work is performed in iterations or cycles called **sprints**.
- + The work completed in each sprint should create something of tangible value to the customer or user.

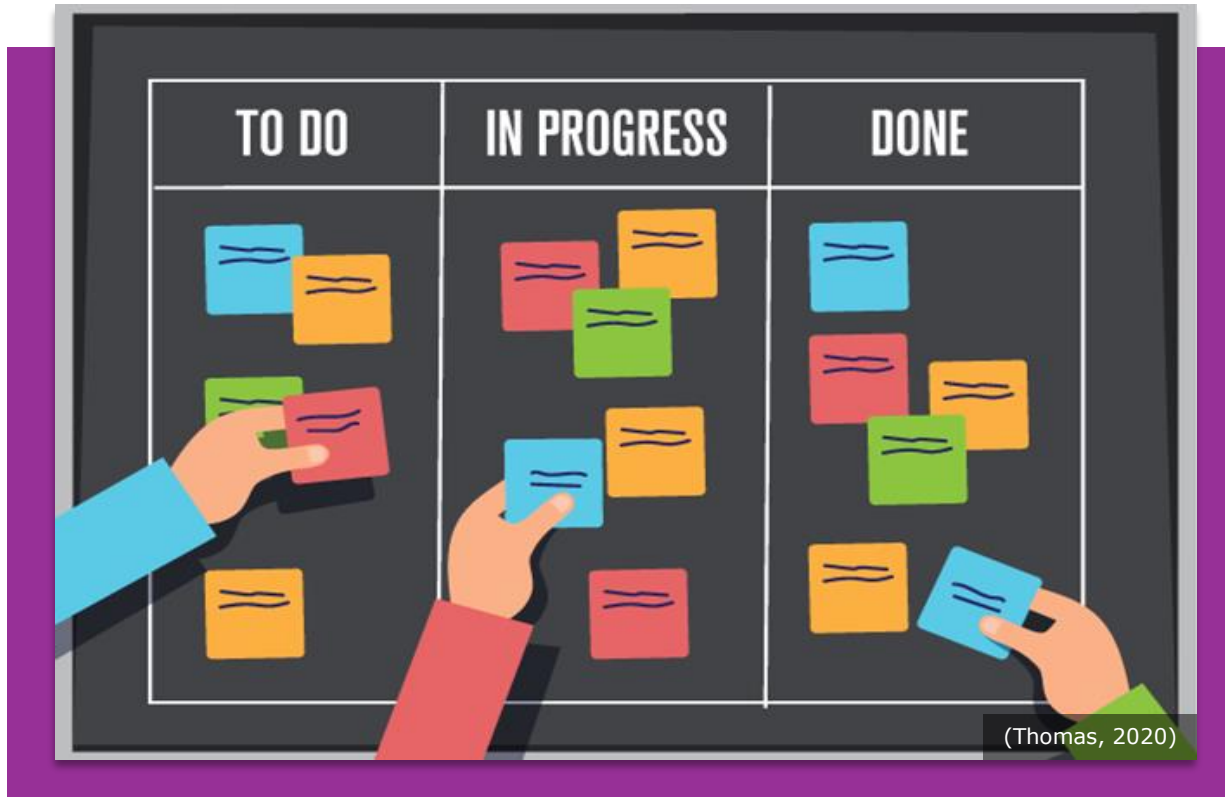


# Kanban





# Kanban



- + A popular Lean workflow management method for **defining, managing,** and **improving services** that deliver knowledge work
- + Work is represented on **Kanban boards**.
- + The Japanese word “kanban” (カンバン), meaning “visual board” or a “sign”, has been used in the sense of **a process definition** since the 1950s.
- + First developed and applied by **Toyota**
- + The capitalized term “Kanban” is known and associated with the emergence of the **“Kanban Method”** (2007).

# Kanban

- + Created as a **simple planning system**, the aim of which was to control and manage work and inventory at every stage of production optimally
- + Key players in the software industry quickly realized **the potential of Kanban**.
- + Kanban left the automotive industry's realm and was successfully **applied to other complex commercial sectors**.
- + What we now recognize as the Kanban Method emerged at the **beginning of 2007**.

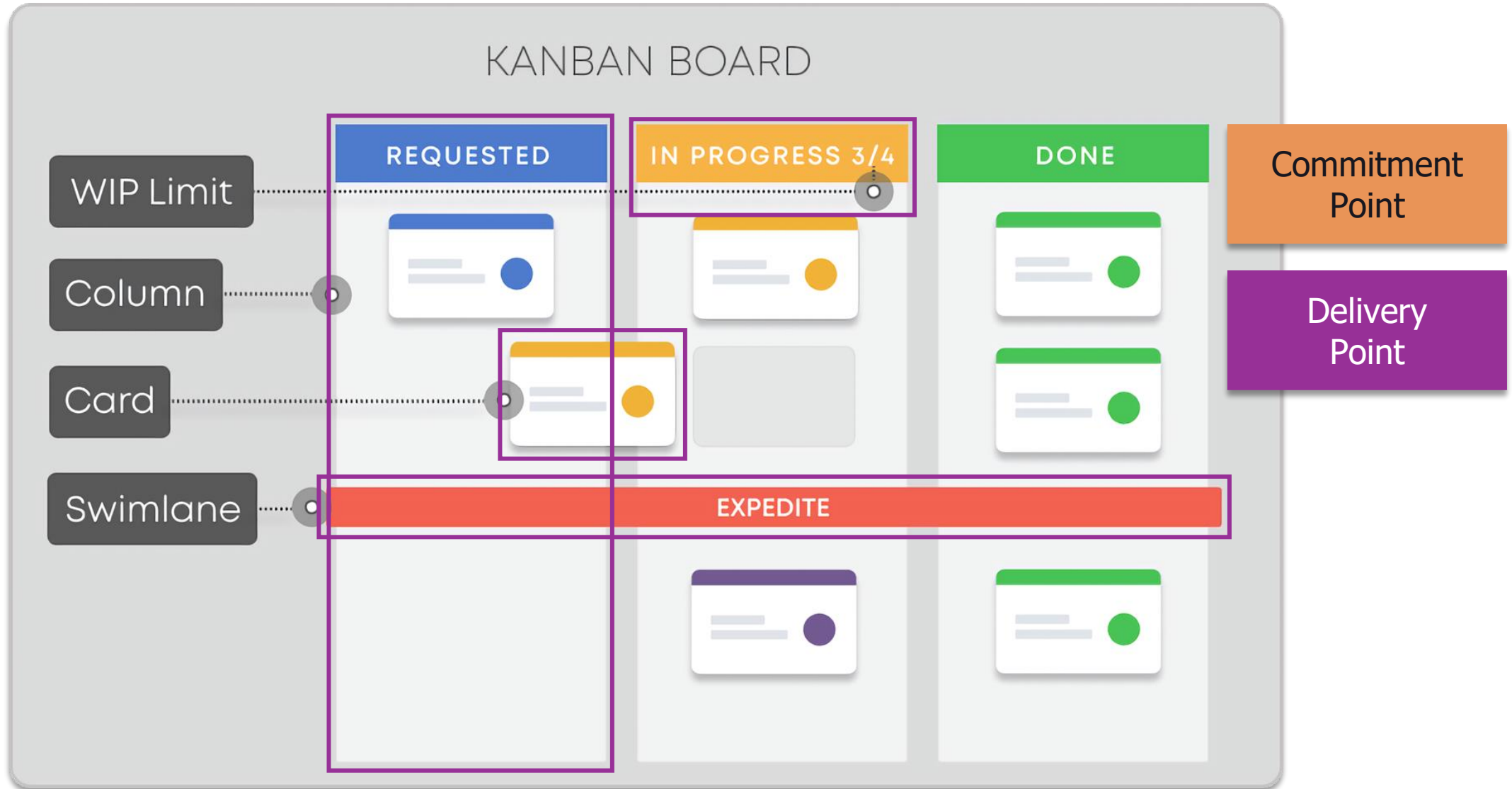




# Six Practices of Kanban

- 1 Visualize the workflow.
- 2 Limit work in progress.
- 3 Manage flow.
- 4 Make process policies explicit.
- 5 Implement feedback loops.
- 6 Improve collaboratively.

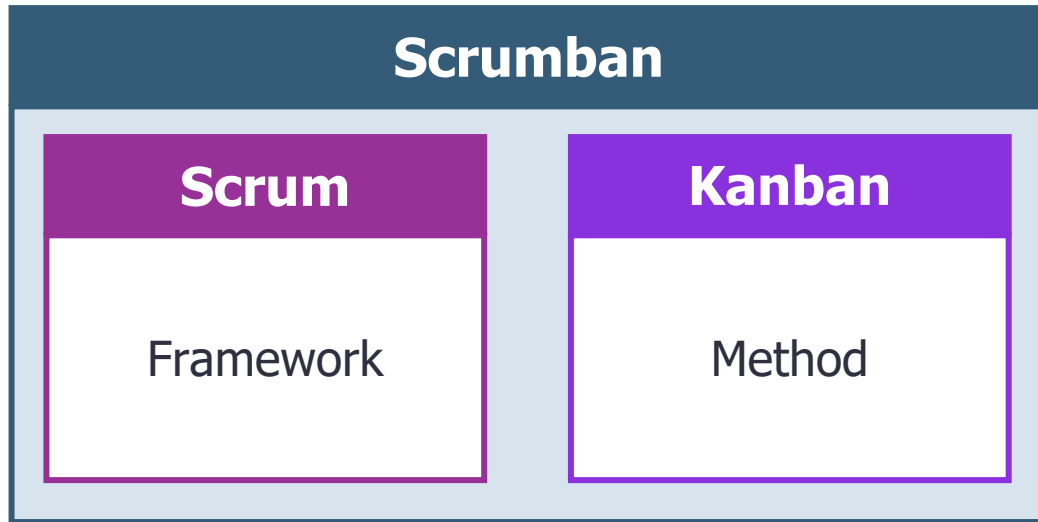
# Kanban Boards







# Scrumban



# Problems With Agile



Lack of product  
documentation



Keeping customers  
involved



Development team  
continuity



# The Product Vision

+ Simple statements that define the essence of the product to be developed

+ Answer three fundamental questions:

- 1 What is the product to be developed?
- 2 Who are the target customers and users?
- 3 Why should customers buy this product?

# Employ the Agile Scrum Method and Activities

## Product Planning and Design

- Project Proposal
- User Stories
- Product Backlog
- Software Architecture
- Sprint 0 Review
- Sprint Retrospective 1
- Peer Evaluation 1

## Project Execution Sprint 1

- Prototype development
- Software Testing
- Daily Scrums
- Sprint Review 1
- Sprint Retrospective 2
- Peer Evaluation 2

## Project Execution Sprint 2

- Static Testing
- Daily Scrum
- Project Documentation
- Prototype Submission
- Sprint Review 2
- Peer Evaluation 3



# And End With a Prototype

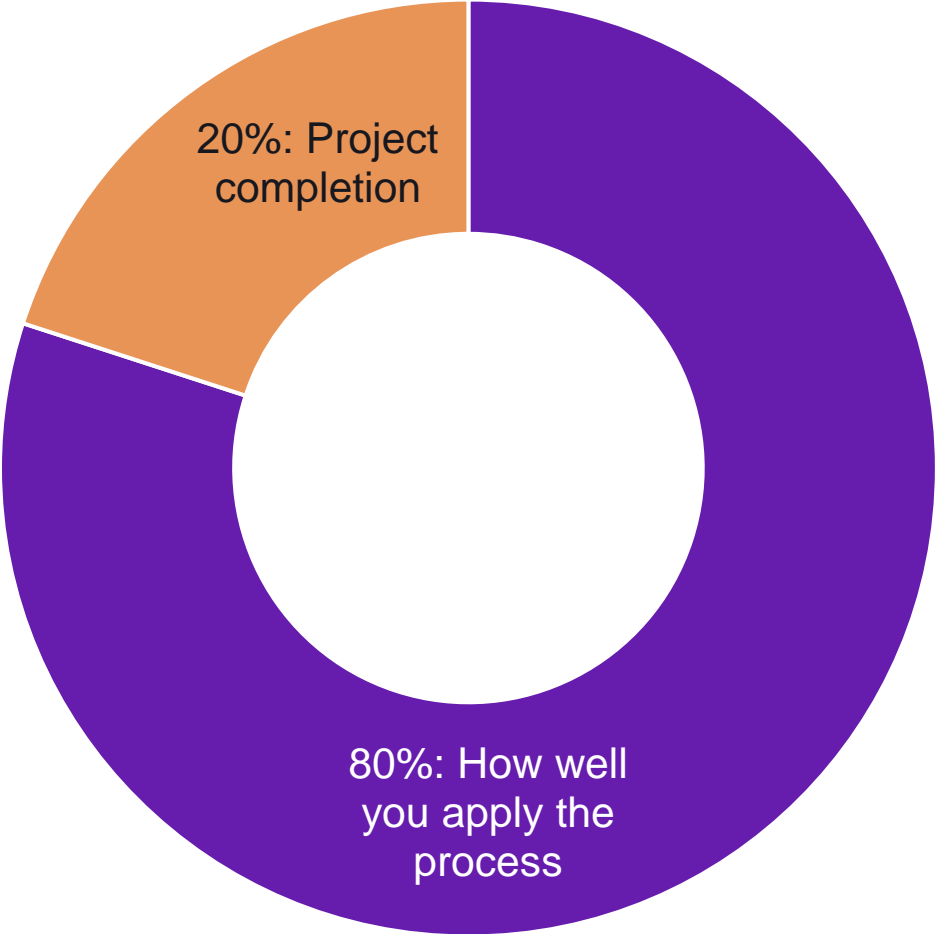


## **Project Prototyping**

Product prototyping is the process of developing an early version of a product to test your ideas and convince yourself and company funders that your product has real market potential.



# Project Grade



# Wrap Up





**Thank You  
For Watching**





# References

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