

# Modern Software Development Approaches

CS-C3150, Software Engineering

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# Modern Processes

- Most “modern” software development processes are adaptations of IID
- Often called **agile software development**
- Typically shorter iterations - faster response time
- Higher degrees of automation



# Agile Development

# Agile Software Development

- The agile manifesto
- Old ideas, good marketing, new packaging
- Well-known methods
  - eXtreme Programming (XP)
  - Scrum
  - Kanban

# The Agile Manifesto

**Kent Beck et alii 2000**

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

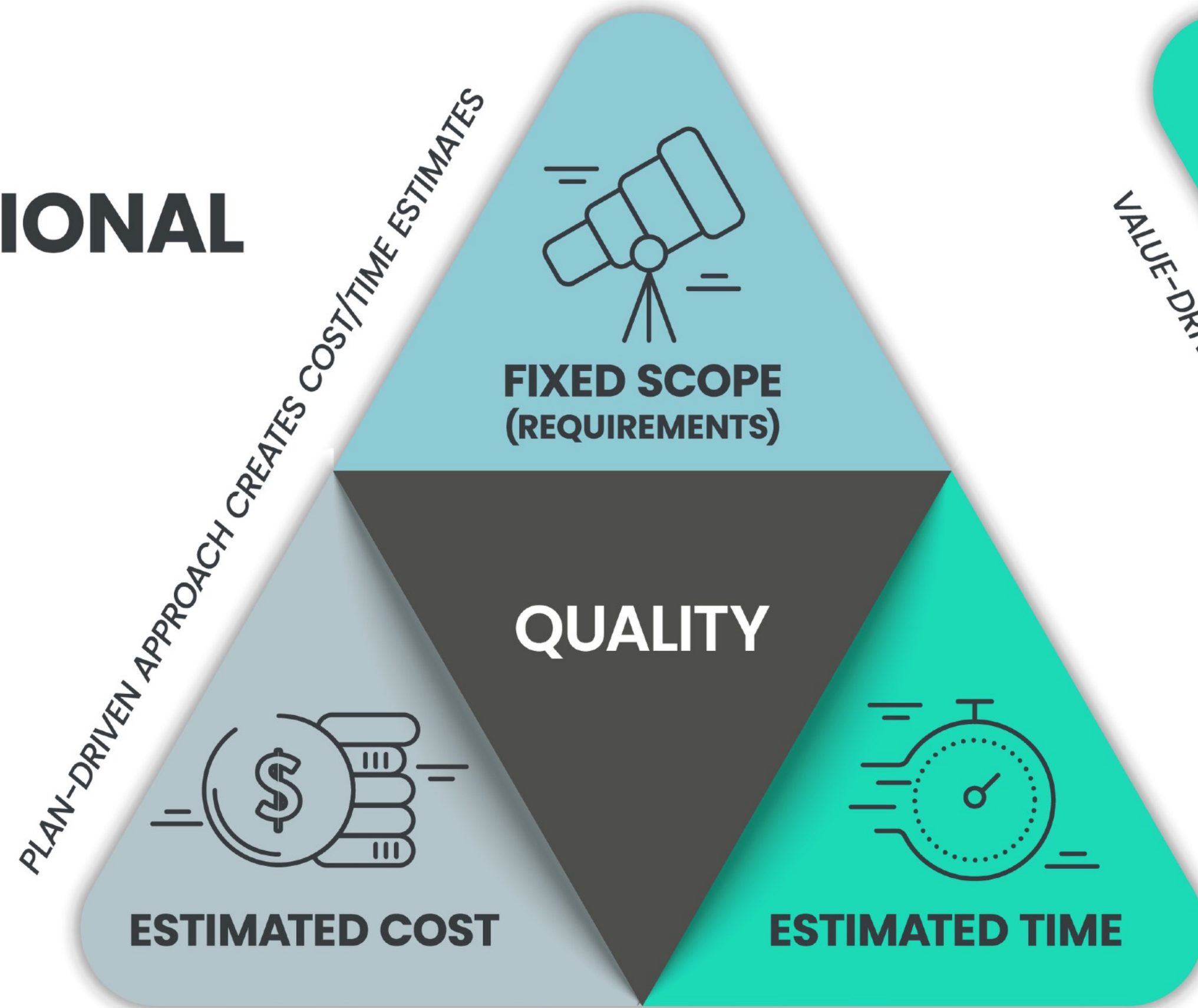
- **Individuals and interactions** over processes and tools
- **Working software** over comprehensive documentation
- **Customer collaboration** over contract negotiation
- **Responding to change** over following a plan

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

# IRON TRIANGLE

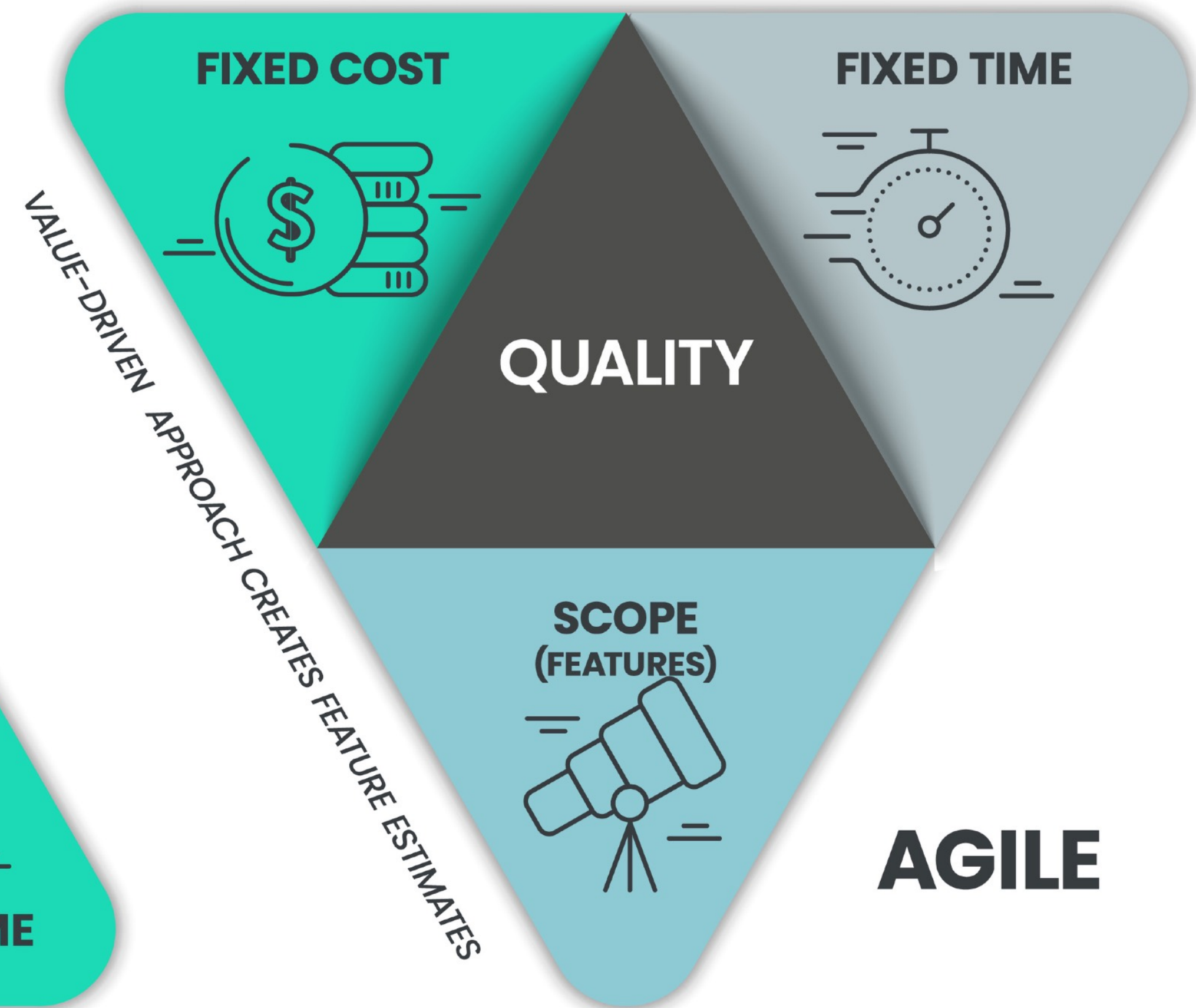
## PARADIGM SHIFT

**TRADITIONAL**



*SUBJECT TO COST, TIME AND QUALITY RISKS*

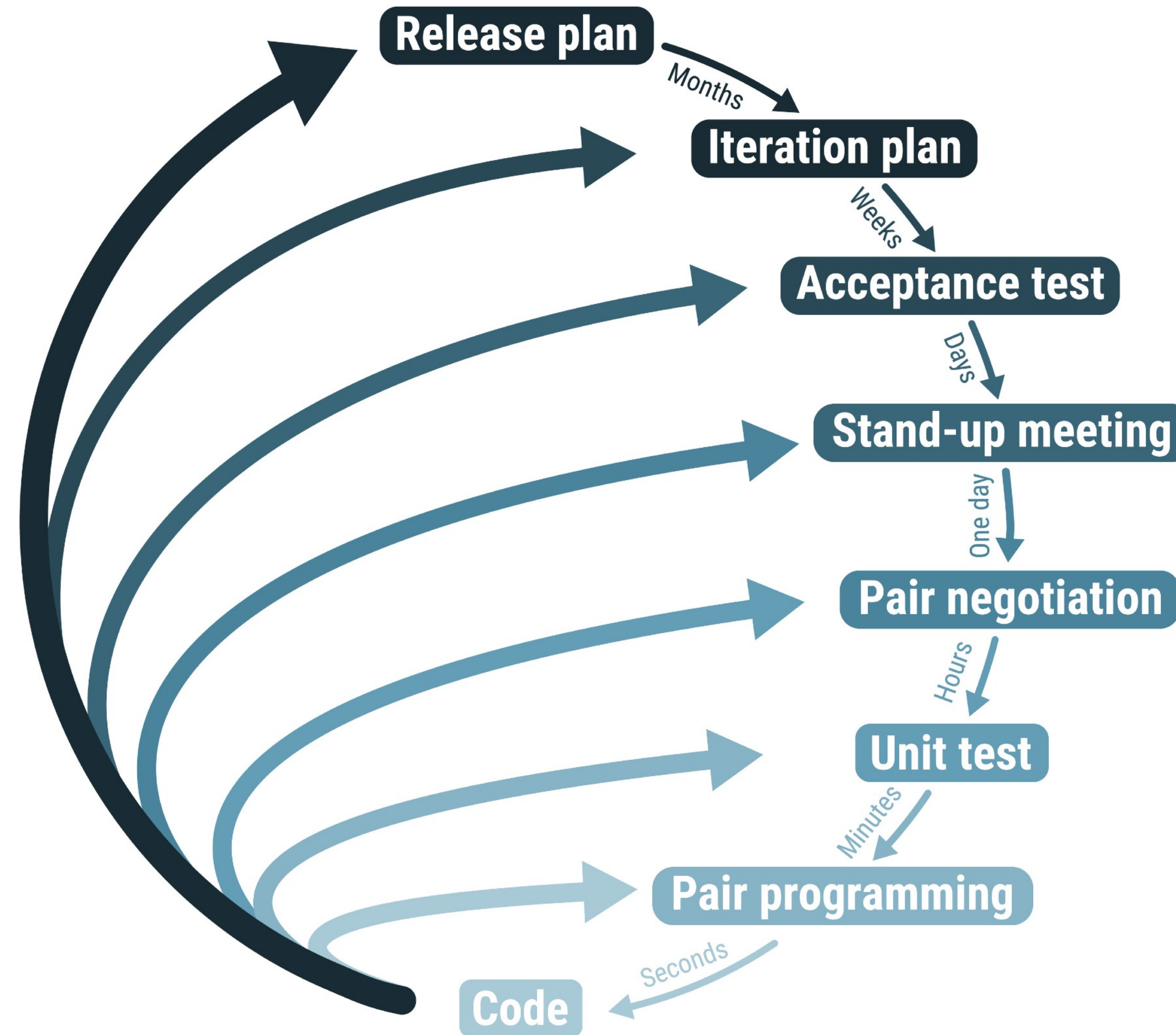
*RISK DECLINES AS PROJECT PROGRESSES*



# Time-boxing

- •Fixing the iteration end date and not allowing it to change
  - 1-6 weeks is the normal length for a time-boxed iteration
  - 3-6 months is usually too long and misses the point and value
- Shorter steps have lower complexity and risk, better feedback, and higher productivity and success rates
- The scope is reduced, rather than slip the iteration end date
- Lower priority requests back on the wish list
- Should not be used to pressure developers to work long hours to meet the deadline -> If the normal pace of work is insufficient, do less

# PLANNING/FEEDBACK LOOPS



**EXTREME PROGRAMMING (XP)**



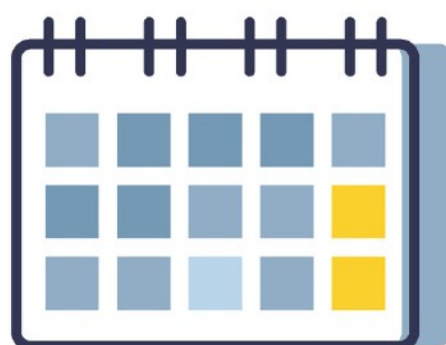
# SCRUM



**Product Owner**



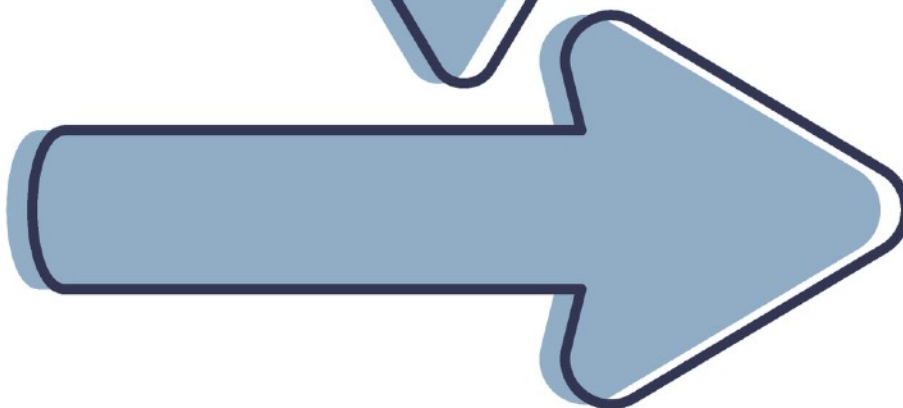
**Scrum Master**



**Sprint Planning**



**Product Backlog**



**Sprint Backlog**



**Sprint**



**Daily Scrum Meeting**



**Product Increment**

# Kanban

## To Do

Installer Update

Upgrade Production Server

Migrate Graphic Assets to Cloud

Database Query Profiling

Improve Retention

Merge New Engine Build

Promotion Discounts

Optimize Loading Time

Test New Workstations

Merge Alpha 1 and Dev Branches

Export Item Shop

Predictive Analytics

## In Progress

Add Ads to App

Server Load Balancing

Add VR Overlay

Revenue Dashboard

New Search Panel

Upgrade Automatic Build System

Detailed Server Logs

Automatic Crash Logs Upload

Dynamic Pricing

## Testing

Item Shop Optimization

New UI Icons

Switch to new Database

AI Image Recognition

Fix Automatic Build

UI Redesign

Add In App Purchases

Test New Performance Profiler

## Done

Build System Configuration

Dashboard KPI

Localize to German

AI Keyword Sorting

Create Alpha 2 Branch

AI Lead Coder Job Desc

Renew Digital Signage

# Kanban

## To Do

## In Progress 5

## Testing 5

## Done

**WIP (Work-in-Progress) Limits!**

Installer Update

Upgrade Production Server

Migrate Graphic Assets to Cloud

Database Query Profiling

Improve Retention

Merge New Engine Build

Promotion Discounts

Optimize Loading Time

Test New Workstations

Merge Alpha 1 and Dev Branches

Export Item Shop

Predictive Analytics

Add Ads to App

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Detailed Server Logs

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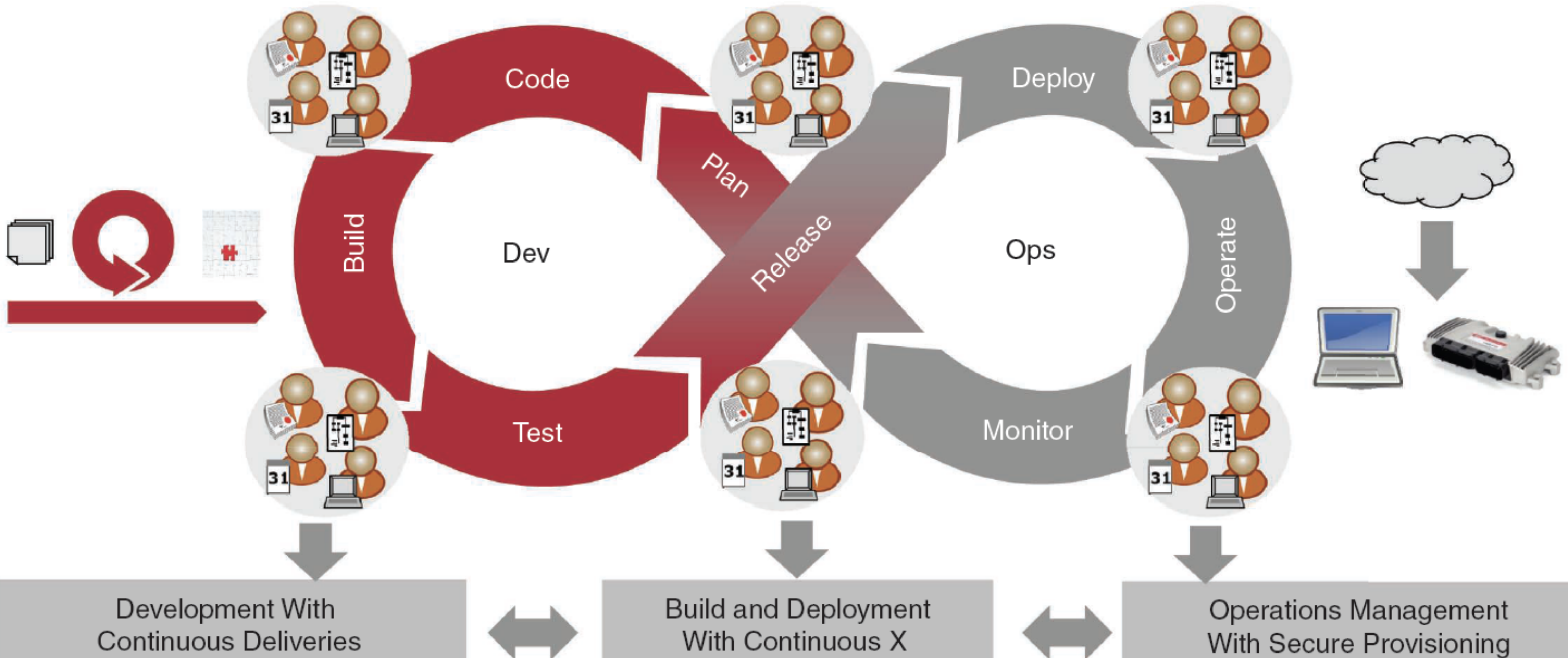
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# DevOps

Requirements Engineering With Feature Mapping and Dependency Management



**Thanks & Have Fun!**