DevOps:
A Cornerstone of an Integrated Supply Chain

Peter Eeles
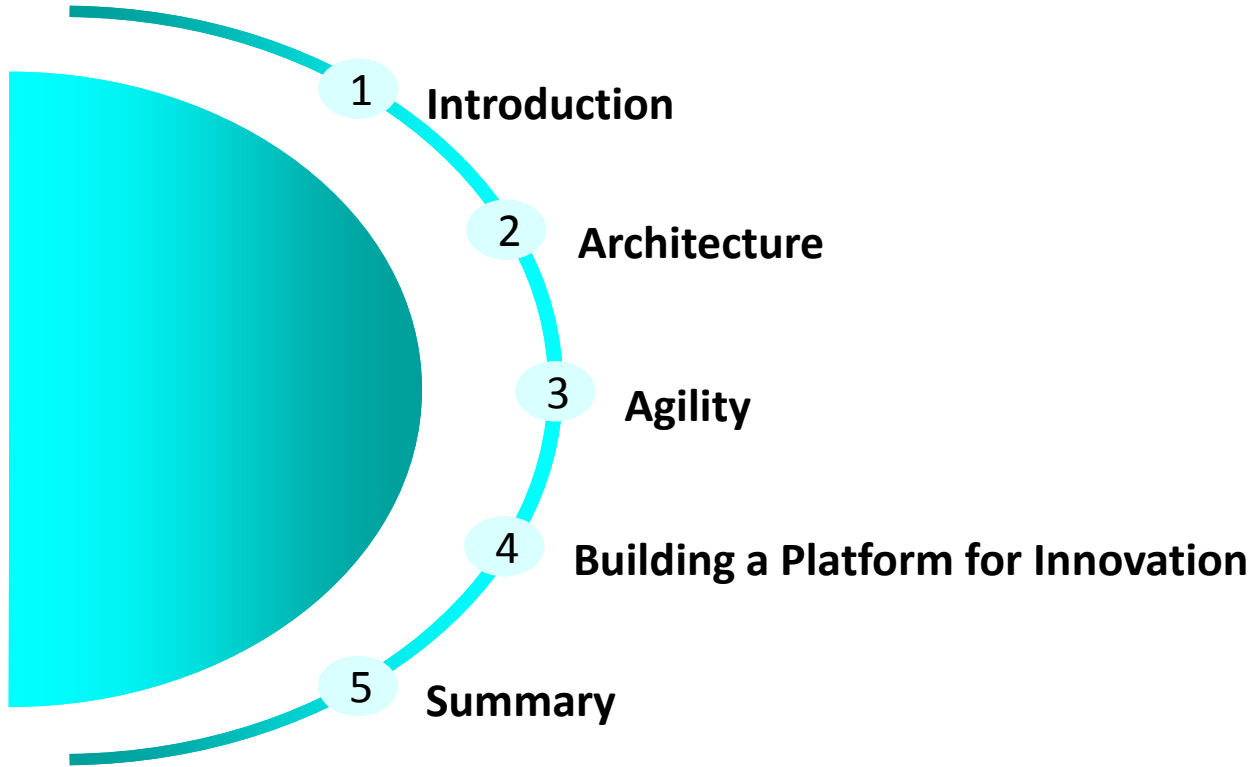FSS Industry Lead, IBM Rational Worldwide Tiger Team
peter.eeles@uk.ibm.com

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The IBM Technical Summit

Agenda

1 **Introduction**

2 **Architecture**

3 **Agility**

4 **Building a Platform for Innovation**

5 **Summary**

A lack of continuous delivery impacts the entire business

CHALLENGES

Costly, error prone manual processes and efforts to deliver software across an enterprise

Slow deployment to development and test environments leave teams **waiting and unproductive**

Upgrade risk due to managing multiple application configurations and versions across servers

Customers

Business Owners

Development/ Test

Operations/ Production

41%
Experience development delays

34%
Experience deployment delays

45%
Experience production delays

4-6 weeks
To deliver code changes

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Capitalizing on technology trends

Collaboration
Connect individuals, inside and outside the organization, to share insights, assets and improve quality

Big data
New applications provide insights by interpreting massive quantities of data

Cloud
Software can be developed and hosted in a more flexible, accessible, lower-cost manner

Mobile "apps"
Modern workforce expects constantly updated software to connect to enterprise systems

Intelligent/connected system
The software component in smart products and devices enables value creation through connectivity and insight

Software innovation

Customers

Line of business

Software development

Development > Testing > Deployment

Source: IBM Institute for Business Value.

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The "Business-IT" and "IT-IT" gaps

MIND THE GAP

IT

Business   →Gap←   Development   →Gap←   Operations

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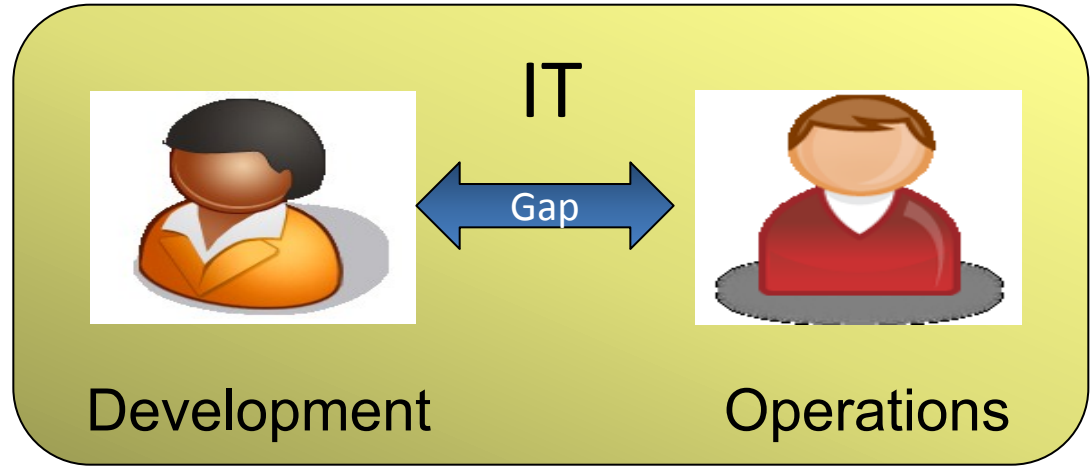
Viewing the landscape as a supply chain

MIND THE GAP

Business — Gap — **IT** — Development — Gap — Operations
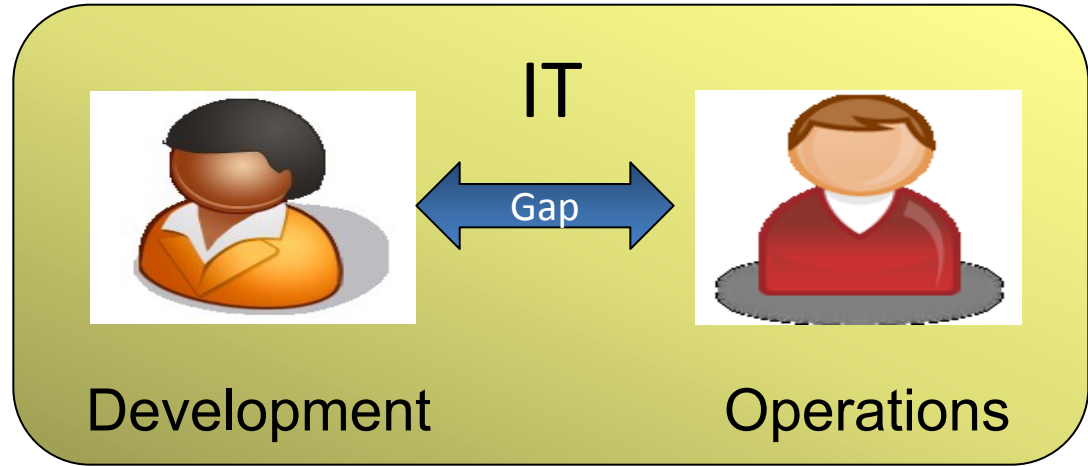
| Enterprise Architecture | Portfolio Management | Requirements | Design | Development | Test | Release | Monitoring |

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Innovation enablers

The "What"

The "How"

| Architecture | enables → | Agility |

enables ↓   Innovation   ↓ enables

Change

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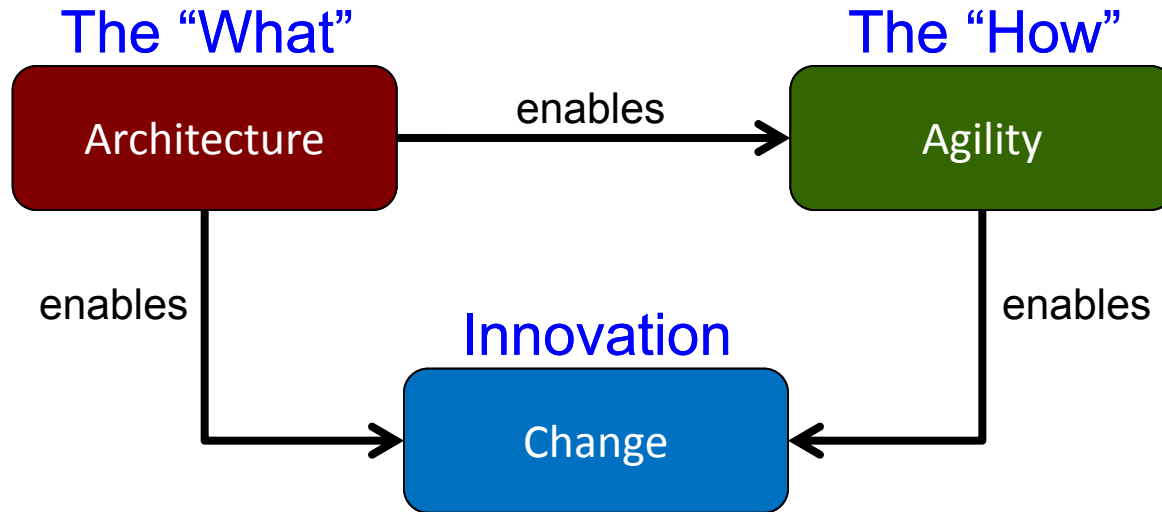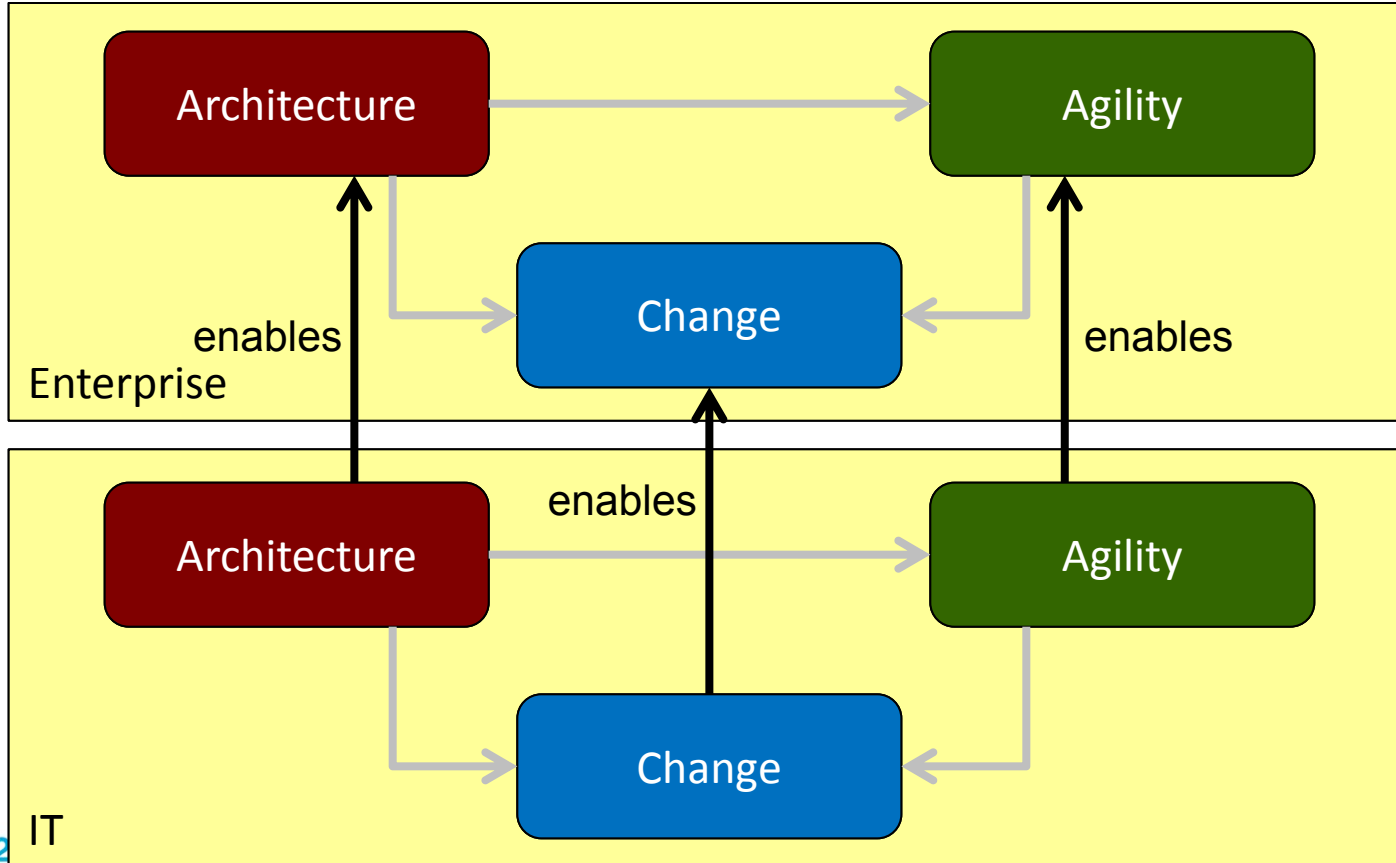
The enterprise informs IT …
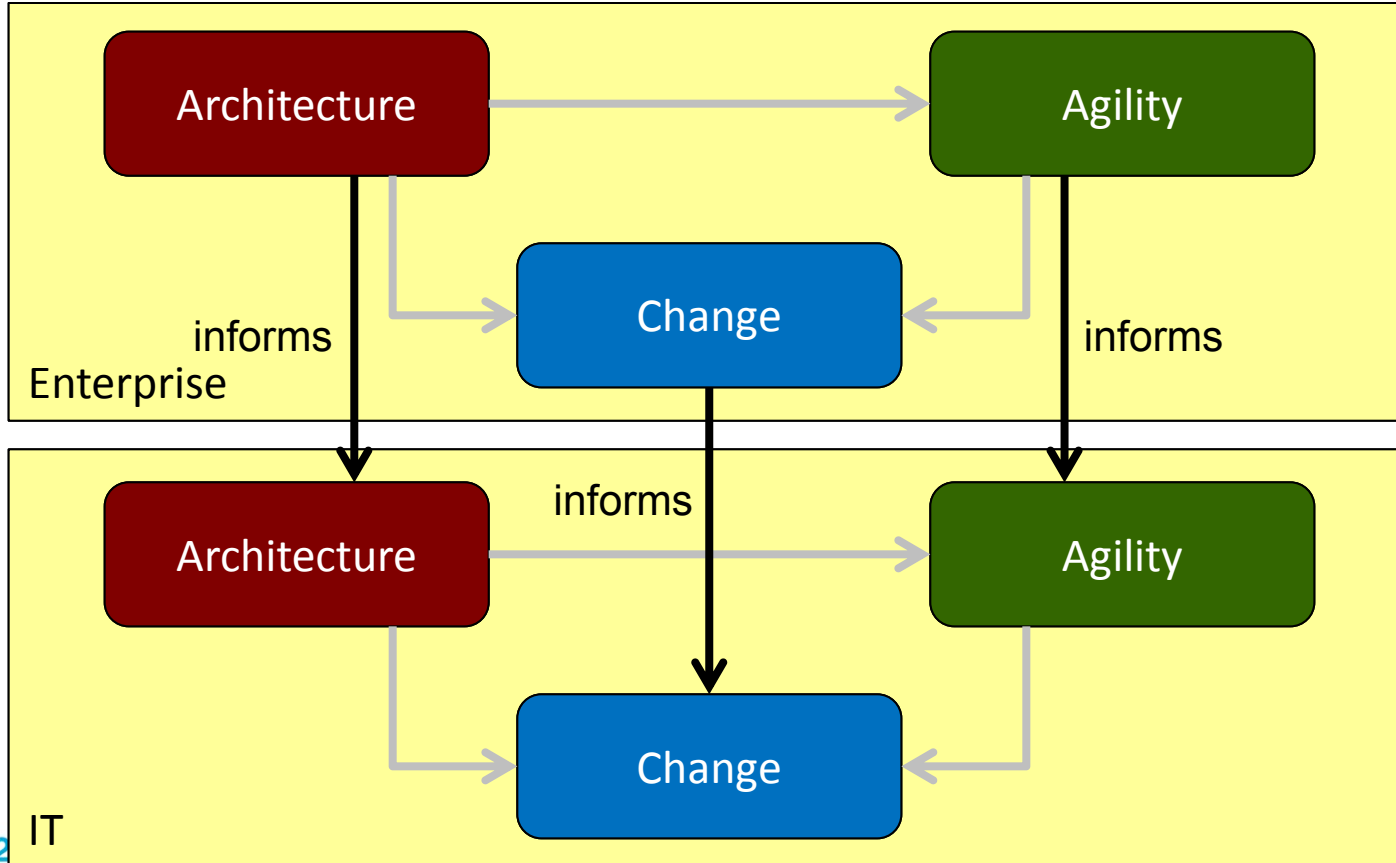
… and IT enables the enterprise

Similar concepts, differing scope

Architecture	Business Systems Applicati
Agility	Business Transitio Portfolio Strategy Continuo
Change	Waves o

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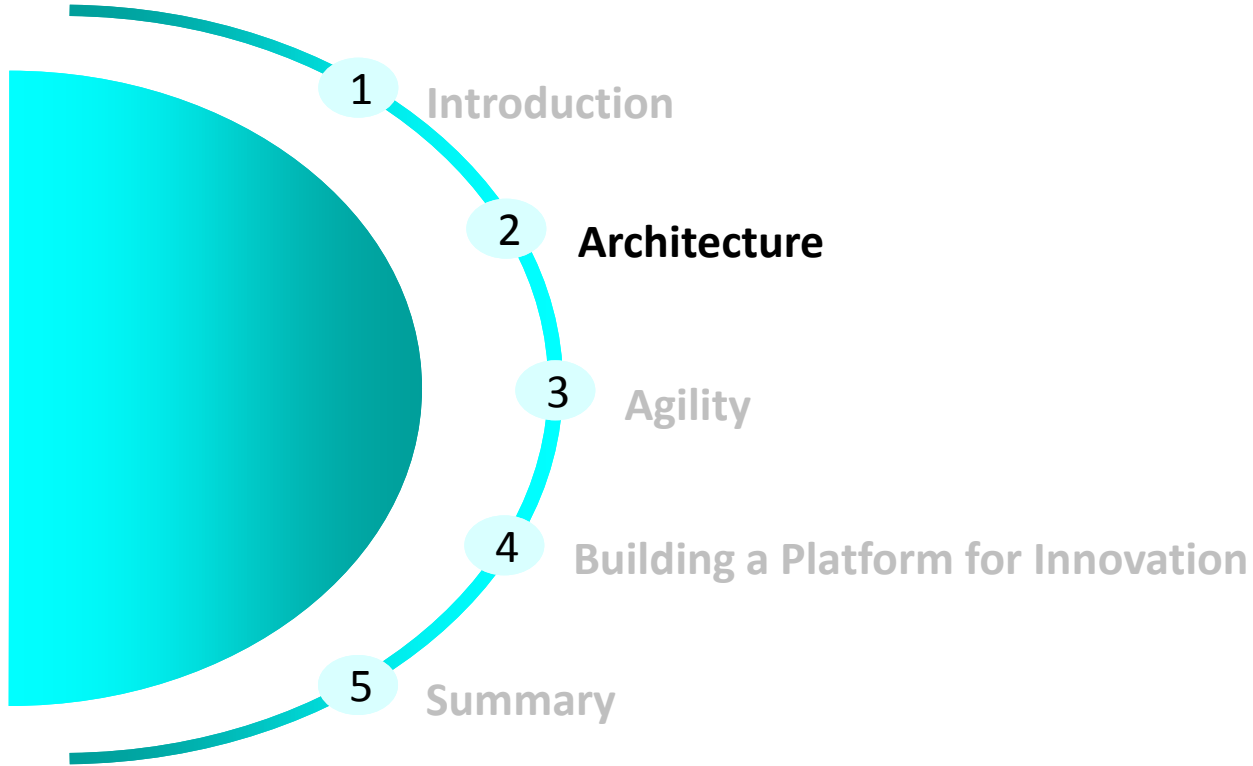
Can you spot the innovation enablers?
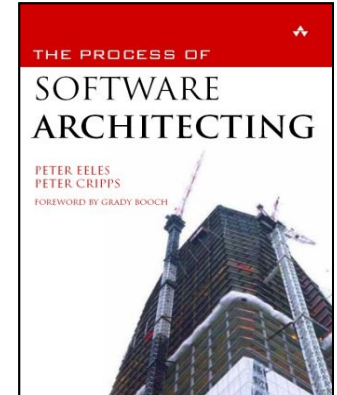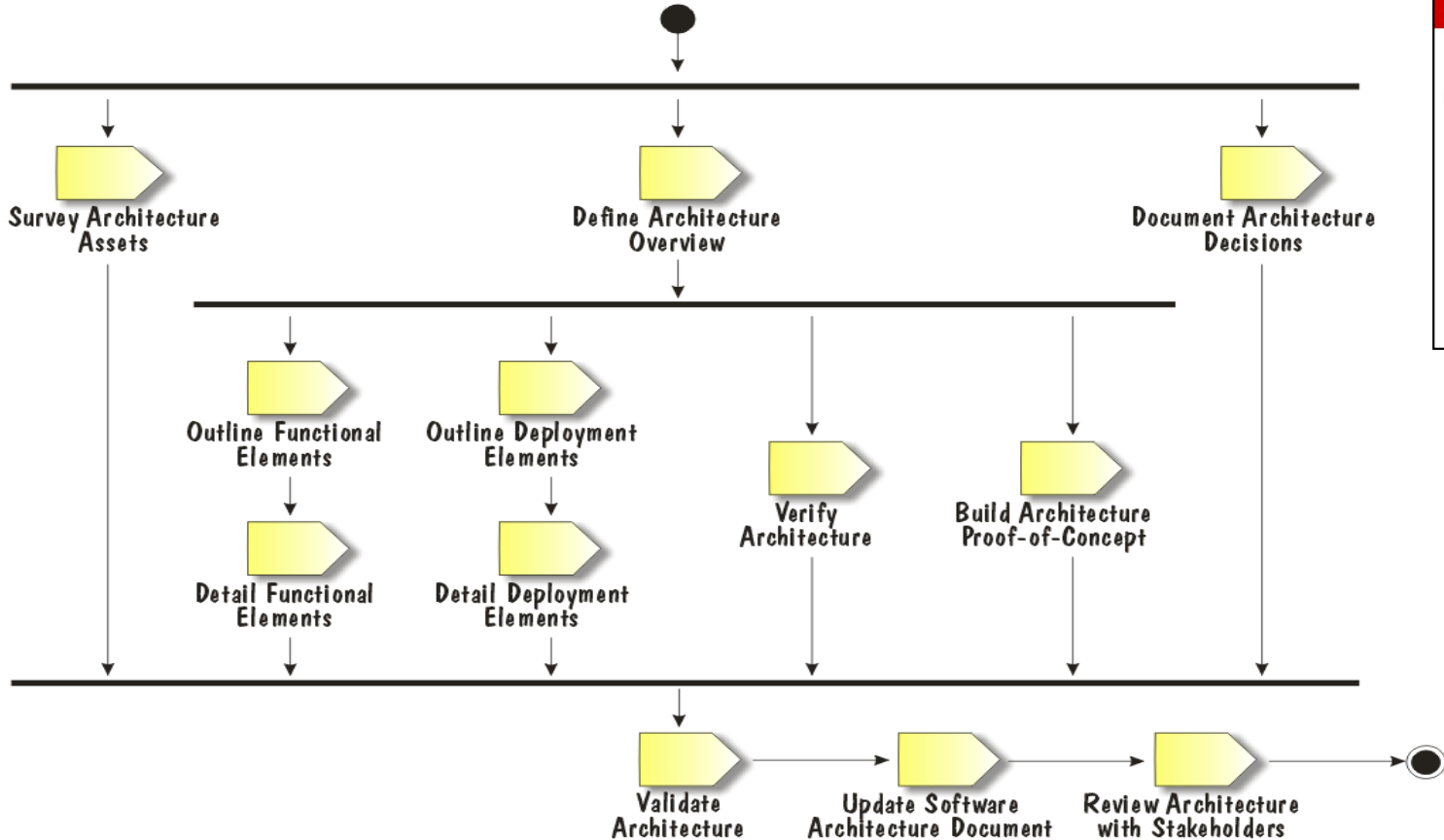
Proven architecture practices

Asset reuse

Define Architecture Overview

Decision capture

Component-based development

Architecture proving

Quality attribute-driven development

Multiple views

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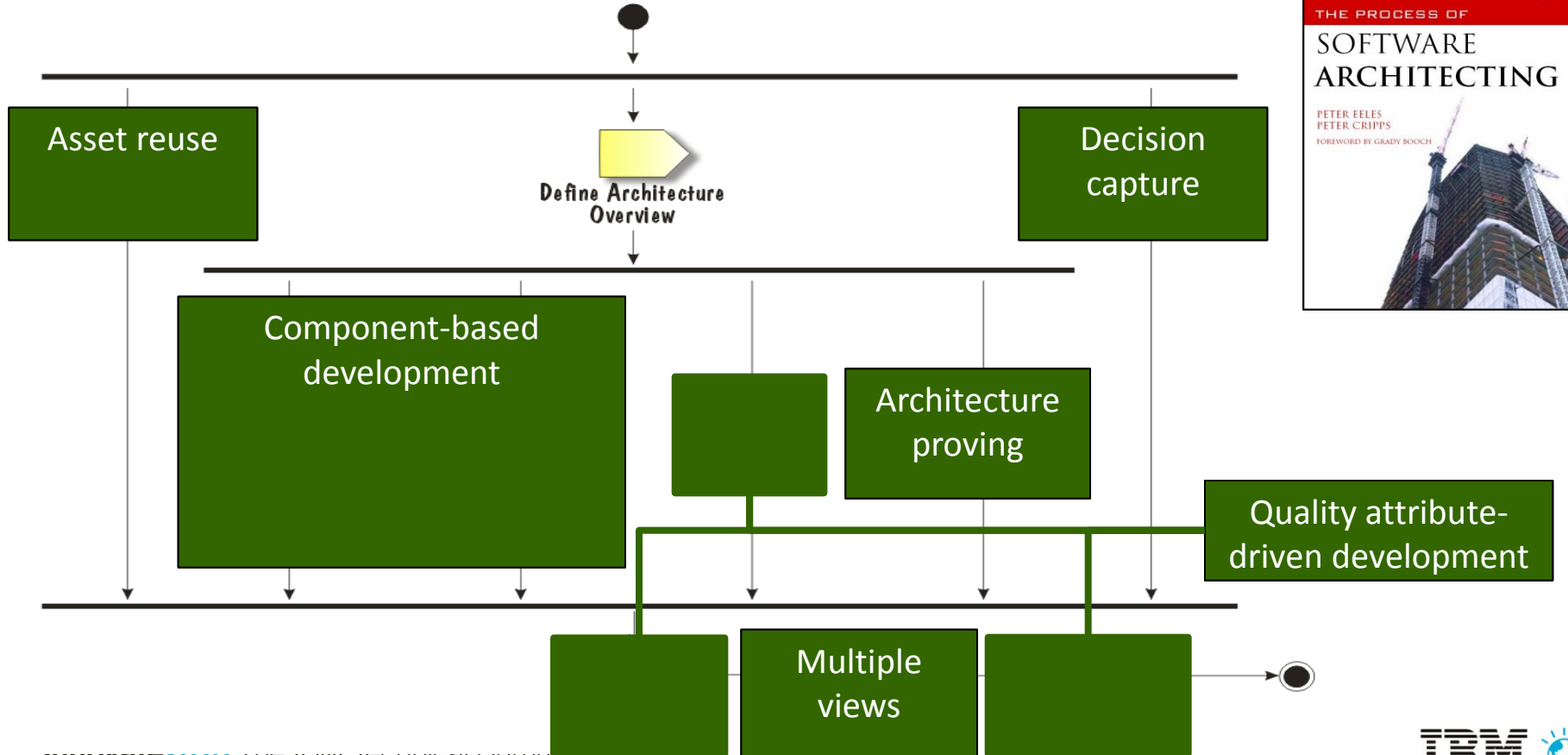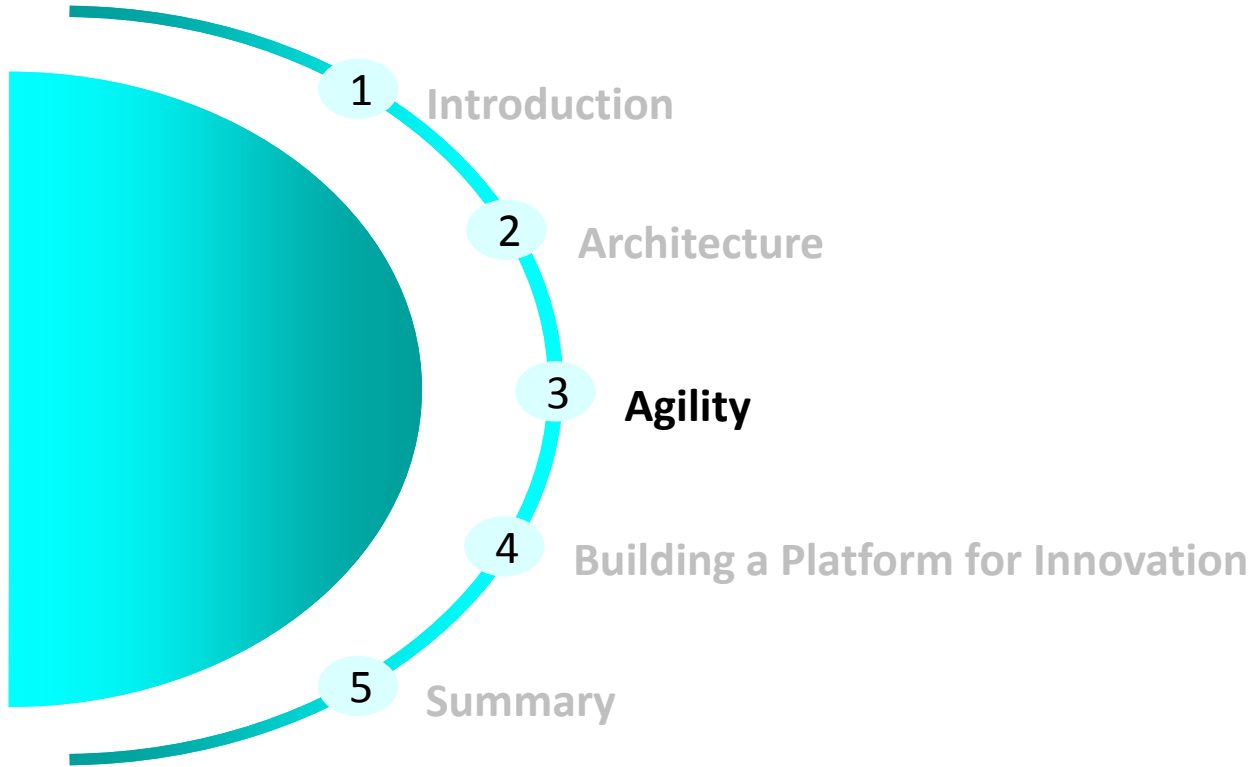
Iterative development practices
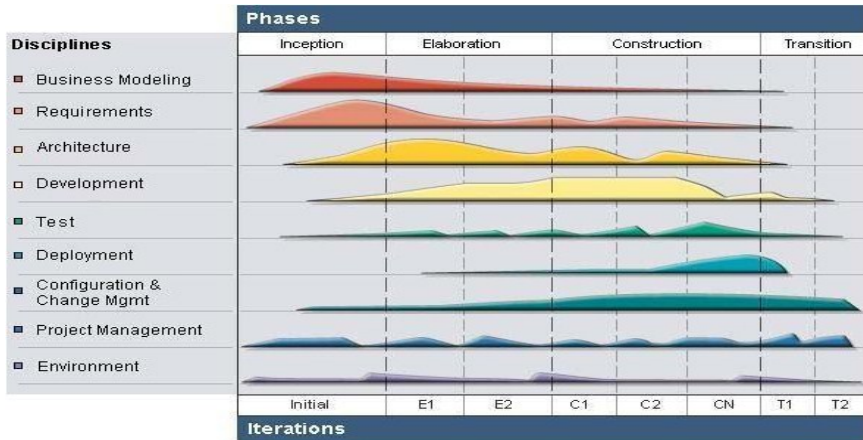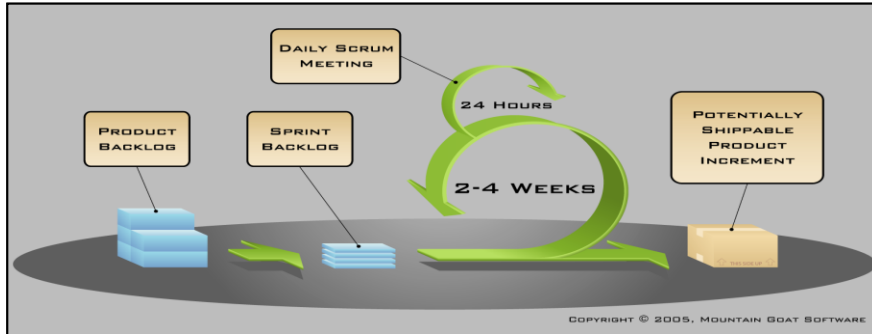
- Iterative development
  - Incremental releases provide improvements in capability until the final system is complete

- Risk-value lifecycle
  - Phases represents the strategic plan for the project and drives the goals and objectives of each iteration

- Shared Vision
  - Ensures that all stakeholders share a common view of the problems being solved

- Use Case-Driven Development
  - Use cases make natural units of implementation in an iterative development approach

- Release Planning
  - Focused on the just-in-time project planning needed to scope the release of executable software within an iteration

Phases			
Disciplines	Inception	Elaboration	Construction	Transition
Business Modeling				
Requirements				
Architecture				
Development				
Test				
Deployment				
Configuration & Change Mgmt				
Project Management				
Environment				
	Initial	E1	E2	C1	C2	CN	T1	T2
Iterations				

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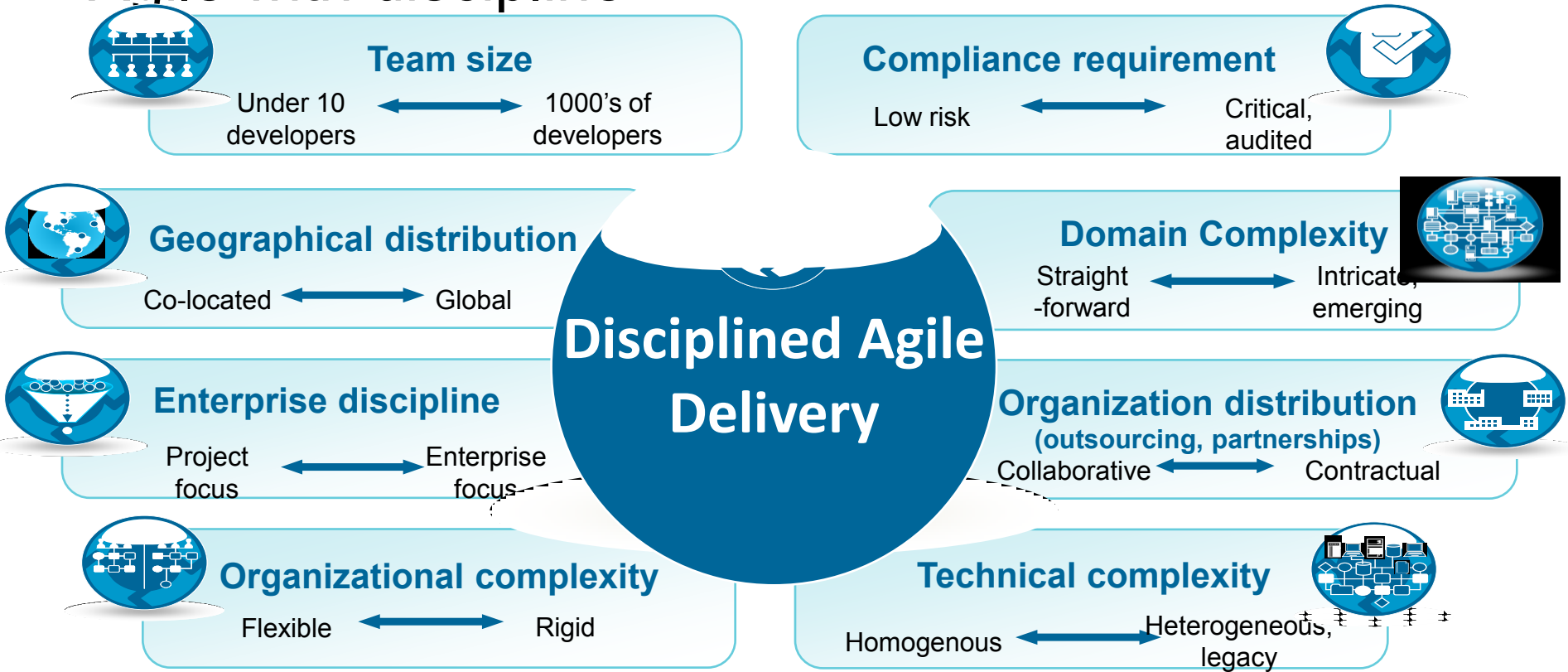
Agile practices

- Test-Driven Development (TDD)
  - Creating tests that are a specification of what the code should do first
- Continuous Integration
  - Encourages frequent the integration and testing of programming changes
- Refactoring
  - Changing an existing body of code in order to improve its internal structure

- Whole Team
  - A focus on the value of highly-collaborative teams as exemplified by Scrum's daily standup meeting. Instills of sense of collective ownership and responsibility
- User Story-Driven Development
  - Capture requirements in a lightweight manner. Encourages collaboration with the relevant stakeholders throughout a project
- Team Change Management
  - Supports the logging of defects or new requirements, by any member of the team, that are within the scope of the current iteration

DAILY SCRUM MEETING

24 HOURS

2-4 WEEKS

PRODUCT BACKLOG

SPRINT BACKLOG

POTENTIALLY SHIPPABLE PRODUCT INCREMENT

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Agile with discipline

Team size

Under 10 developers ←→ 1000's of developers

Compliance requirement

Low risk ←→ Critical, audited

Geographical distribution

Co-located ←→ Global

Domain Complexity

Straight-forward ←→ Intricate, emerging

Enterprise discipline

Project focus ←→ Enterprise focus

Organization distribution (outsourcing, partnerships)

Collaborative ←→ Contractual

Organizational complexity

Flexible ←→ Rigid

Technical complexity

Homogenous ←→ Heterogeneous, legacy

Disciplined Agile Delivery

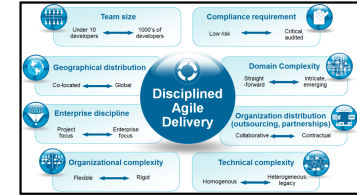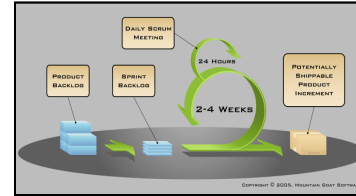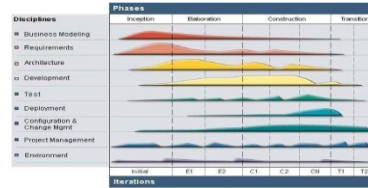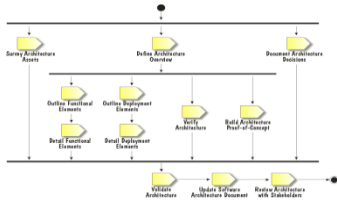# "Disciplined Agile Delivery" practices (examples)

- Measured Performance
  - This practice allows project and portfolio-level measurements to inform key business decisions

- Formal Change Management
  - Applied when change approval is required from stakeholders outside of the project team, or when a deliverable has been baselined as part of a contract and the deliverable needs to be modified

- Concurrent Testing
  - Often an independent test team is present (especially in larger organizations) that typically provide a level of user acceptance testing before the solution is put into production

Team size: Under 10 developers ↔ 1000's of developers

Compliance requirement: Low risk ↔ Critical, audited

Geographical distribution: Co-located ↔ Global

Domain Complexity: Straight-forward ↔ Intricate, emerging

Disciplined Agile Delivery

Enterprise discipline: Project focus ↔ Enterprise focus

Organization distribution (outsourcing, partnerships): Collaborative ↔ Contractual

Organizational complexity: Flexible ↔ Rigid

Technical complexity: Homogenous ↔ Heterogeneous, legacy

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Practice summary

Traditional	Iterative	Agile	Disciplined Agile
• Multiple Views	• Iterative Development	• Test-Driven Development	• Measured Performance
• Quality Attribute-Driven Development	• Risk-Value Lifecycle	• Continuous Integration	• Formal Change Management
• Component-Based Development	• Shared Vision	• Refactoring	• Concurrent Testing
• Asset Reuse	• Use Case-Driven Development	• Whole Team	
• Decision Capture	• Release Planning	• User Story-Driven Development	
• Architecture Proving		• Team Change Management	

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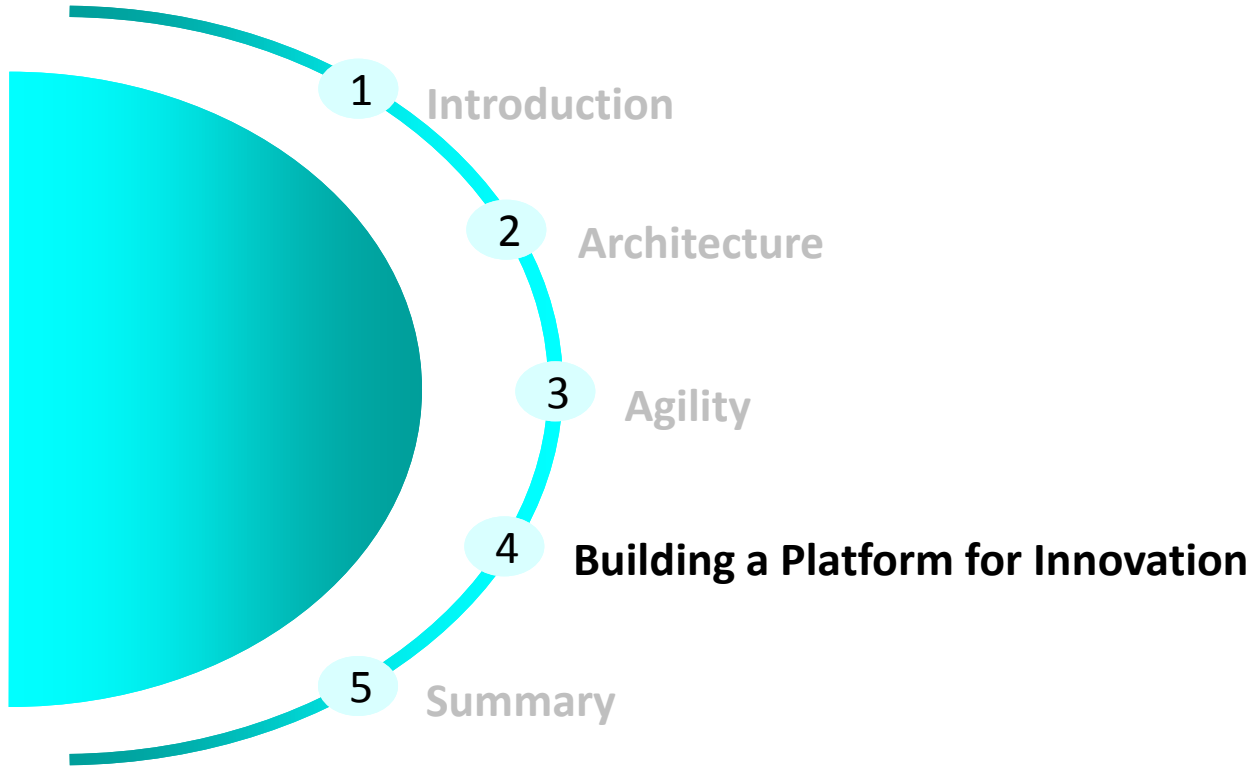
Technology imperatives

MIND THE GAP

Collaborative Development
Change management
Software configuration management
Continuous integration

Continuous Testing
Quality management
Test automation
Service virtualization

IT

Continuous Release and Deployment
Release management
Environment provisioning
Deployment automation

Continuous Monitoring and Optimization
Application performance monitoring

Gap

Business

Development

Enterprise Architecture

Portfolio Management

Requirements

Design

Development

Test

Release

Monitoring

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DevOps practices

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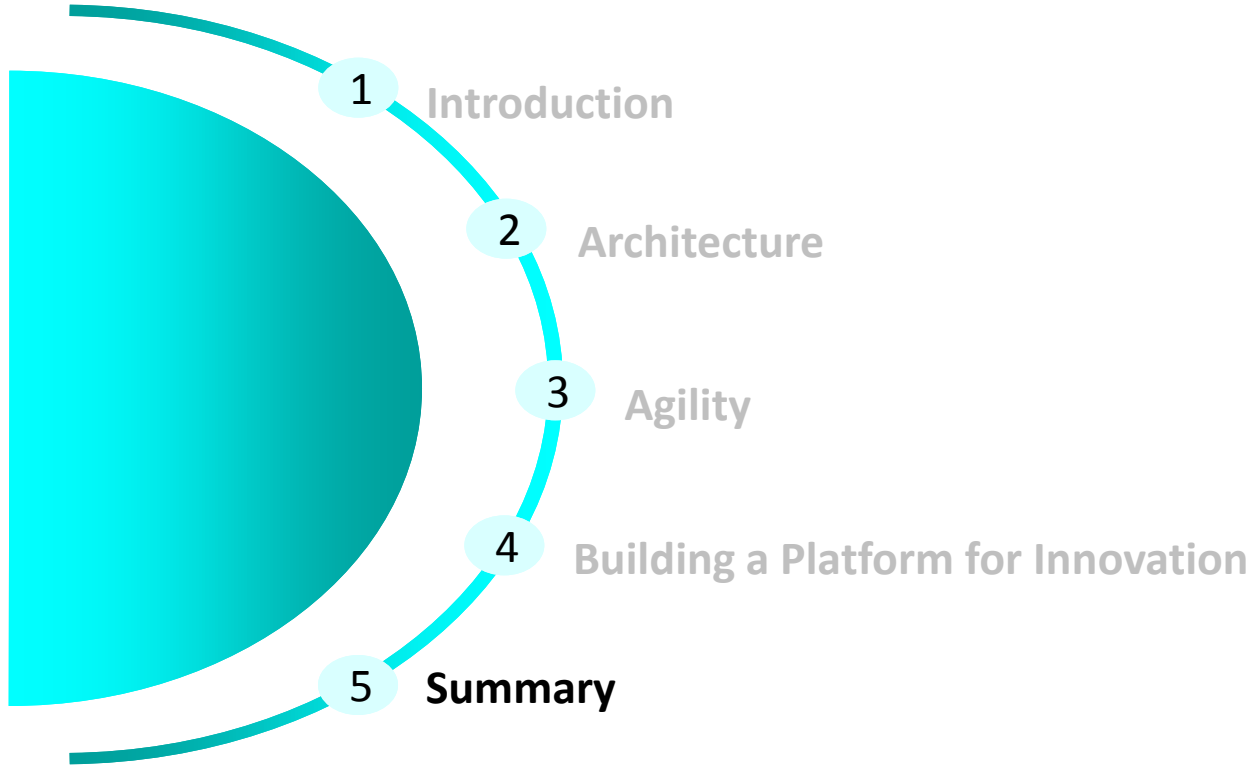
Summary

- A poor foundation can stifle innovation

- Architecture and agility are complementary innovation enablers

- With the right foundation, IT enables the enterprise

- The "next big thing" after agile is … DevOps!

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