Trends and Solutions Examples in Technology for DevOps

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Innovate2012

The Premier Event for Software and Systems Innovation

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Agenda

- Delivery challenges

- DevOps principles and values

- Examples and solutions

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# The Business Promise of Tools Is Widely Anticipated
Companies acquire tools with the best of business-centric aspirations

- Higher quality

- More customer satisfaction

- Aligning business and IT

- Faster time to market

- Lower costs/higher productivity

- More predictable delivery

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Reality adds significant complexity

- Many tools from many vendors

  ▸ **Heterogeneous environments** that are flexible for partners and suppliers

- Many teams in many places

  ▸ **Distributed** development, cross site product development

  ▸ Many levels of teams
     PMO, Bus, dev teams, ops teams, etc

- Coherent process

  ▸ **Flexible** and **robust** process
     supporting Lifecycle / Agile Methods

  ▸ **Measure** and **improve** effectiveness
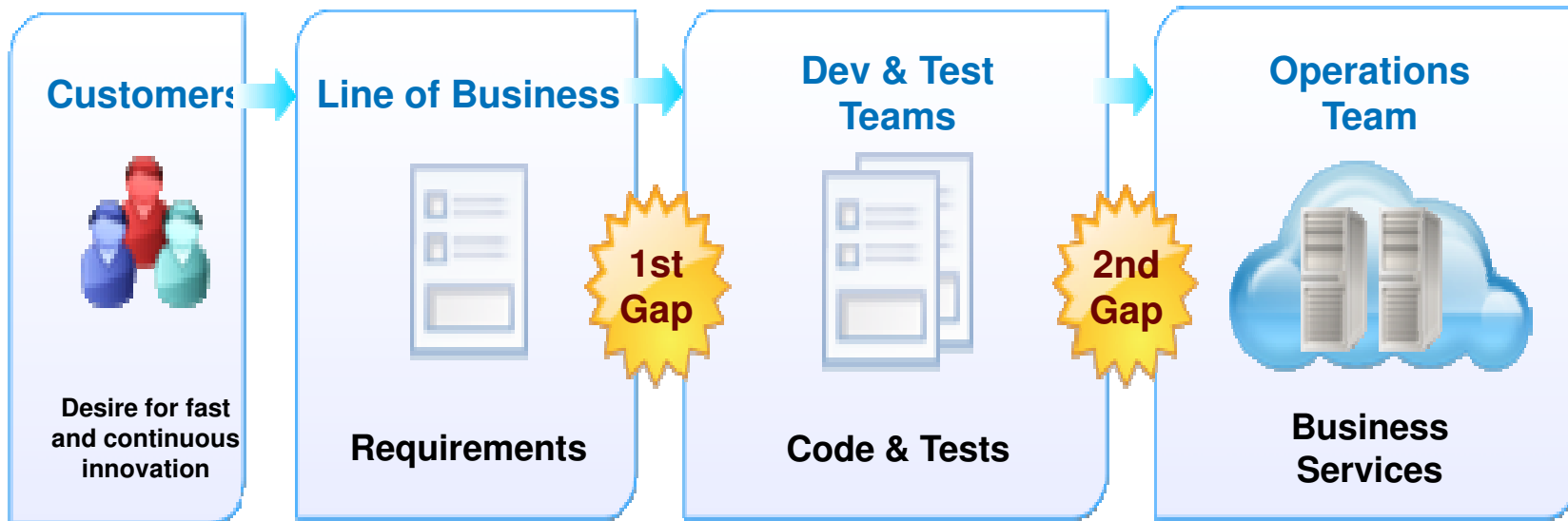
IBM
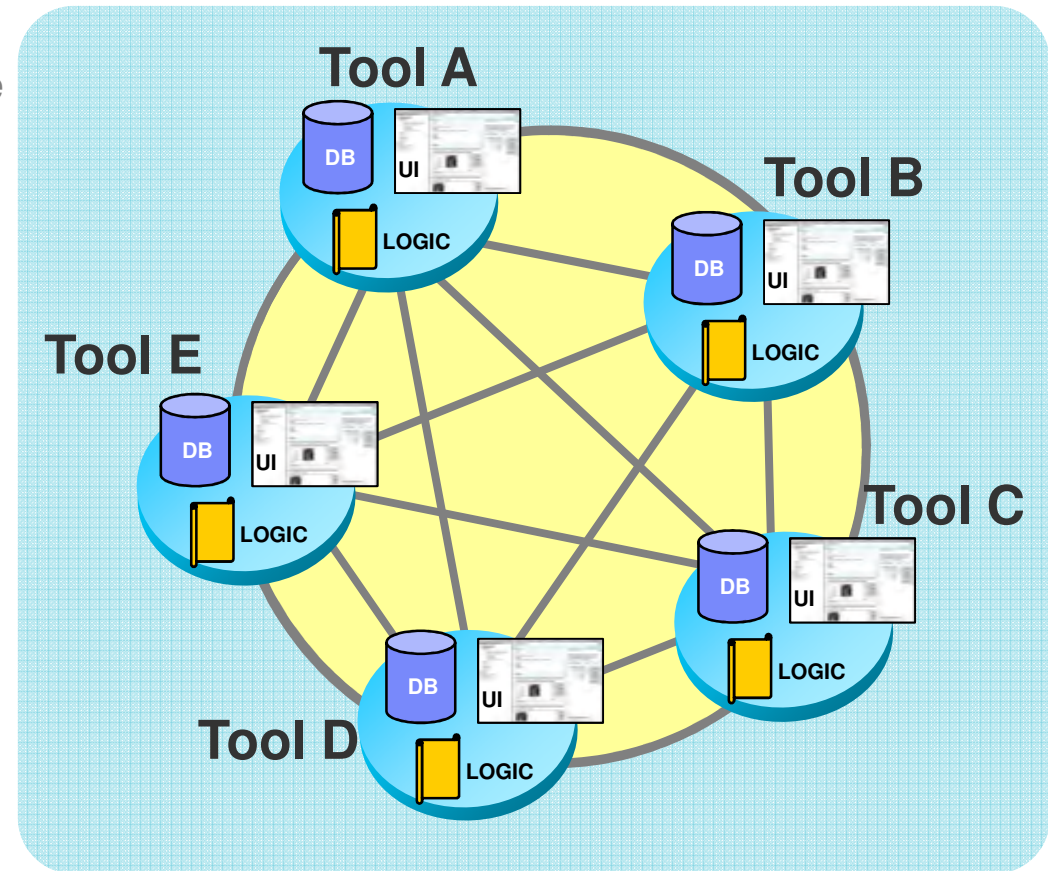
Delivery Challenges

Today's business and technical needs are pushing traditional delivery approaches to the breaking point

People

Process

Information

Customers

Desire for fast and continuous innovation

Line of Business

Requirements

1st Gap

Dev & Test Teams

Code & Tests

2nd Gap

Operations Team

Business Services

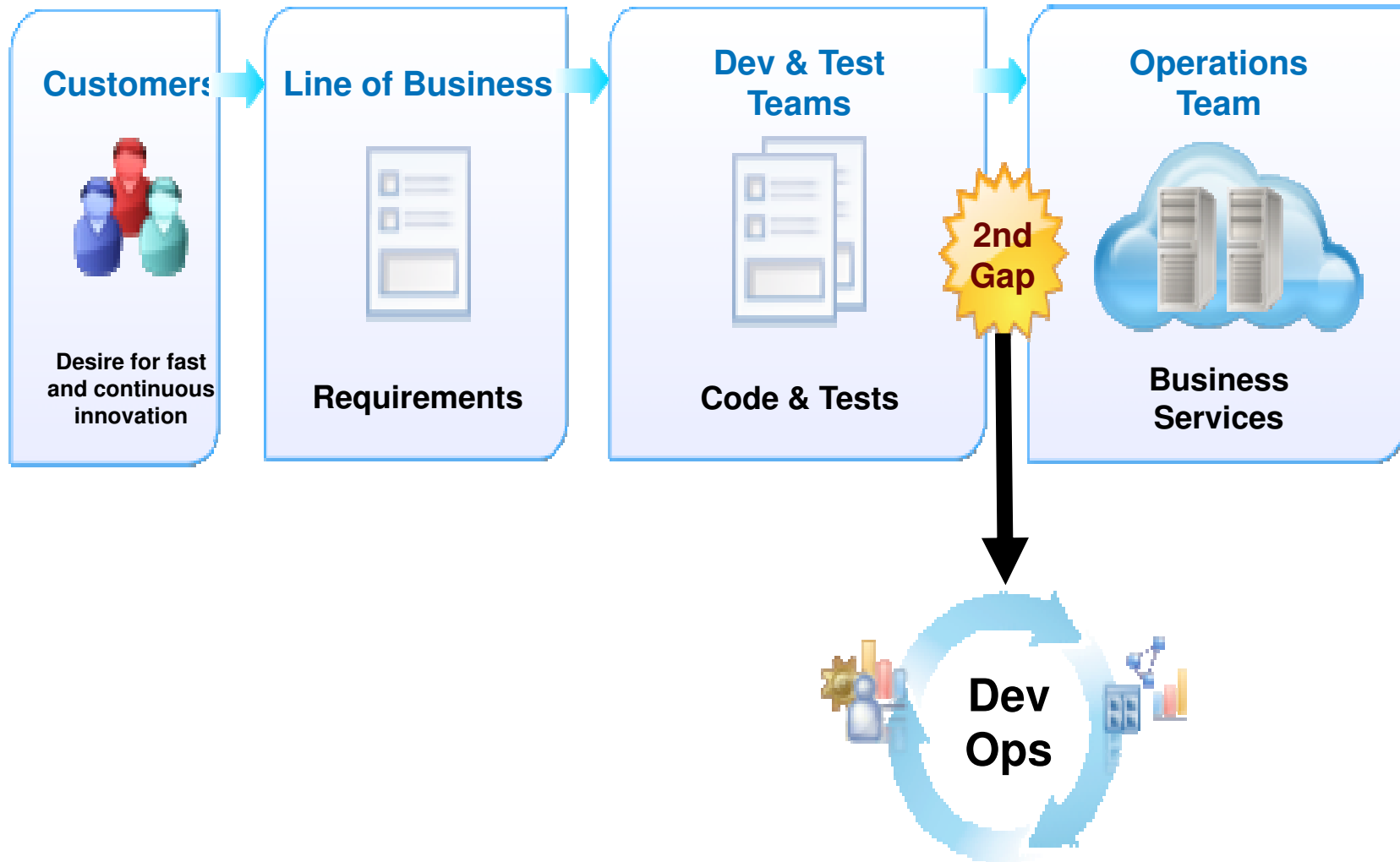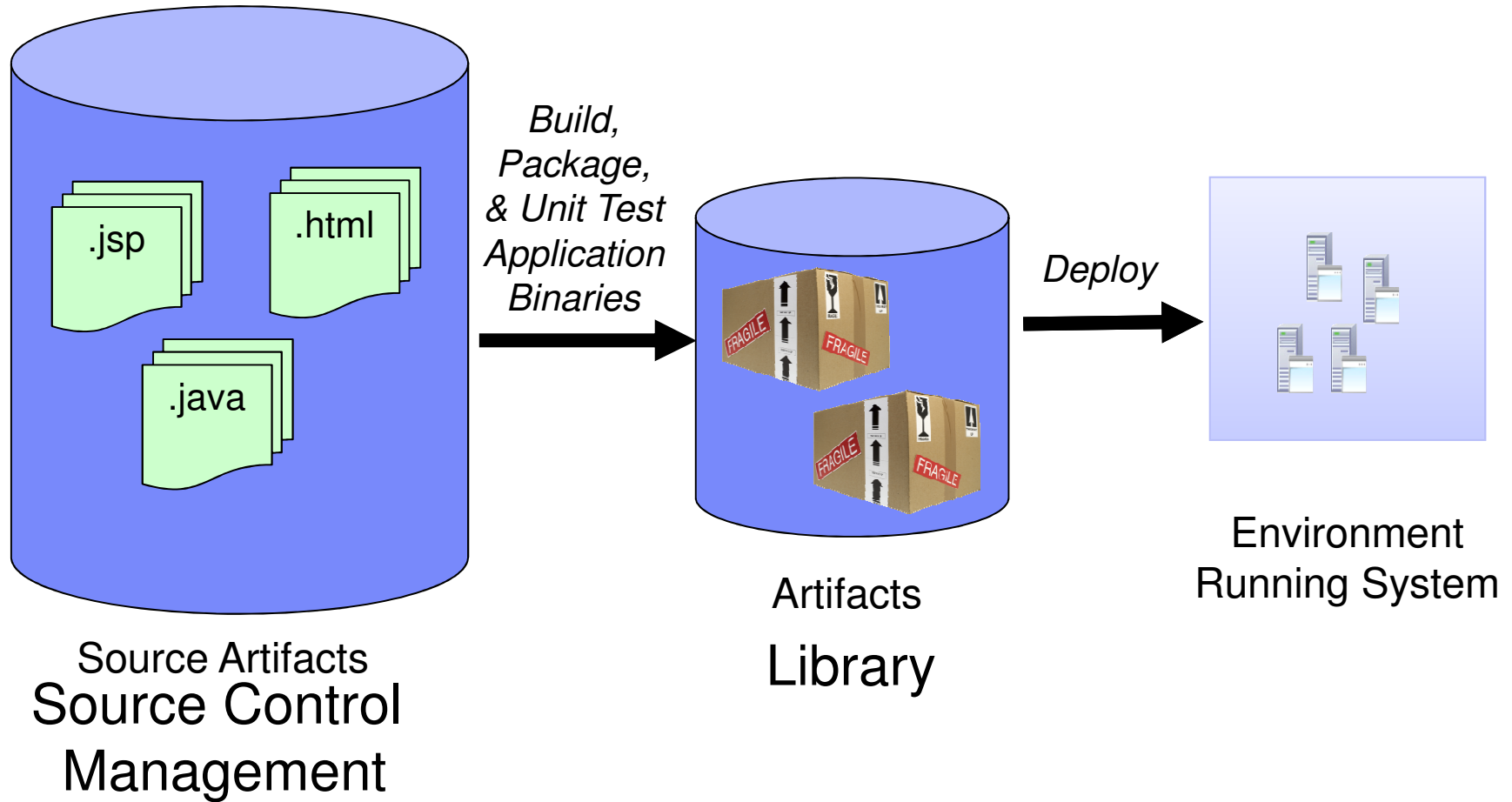"At some point, you take a step back, and you realize you have an awful lot of **siloed systems** that are **limiting transparency** across strategic projects."

- Development Director
Temenos, Inc.

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# Addressing Application Lifecycle Management gaps

Customers → **Line of Business** → **Dev & Test Teams** → **Operations Team**

Desire for fast and continuous innovation

Requirements

Code & Tests

2nd Gap

Business Services

Dev Ops

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Automating development hand off today

.jsp

.html

.java

Build,
Package,
& Unit Test
Application
Binaries

Deploy

Source Artifacts
Source Control
Management

Artifacts
Library

Environment
Running System
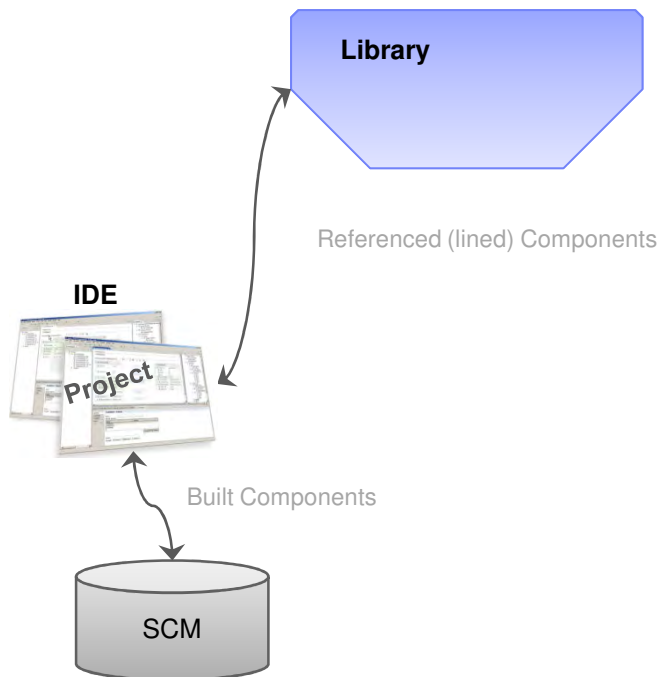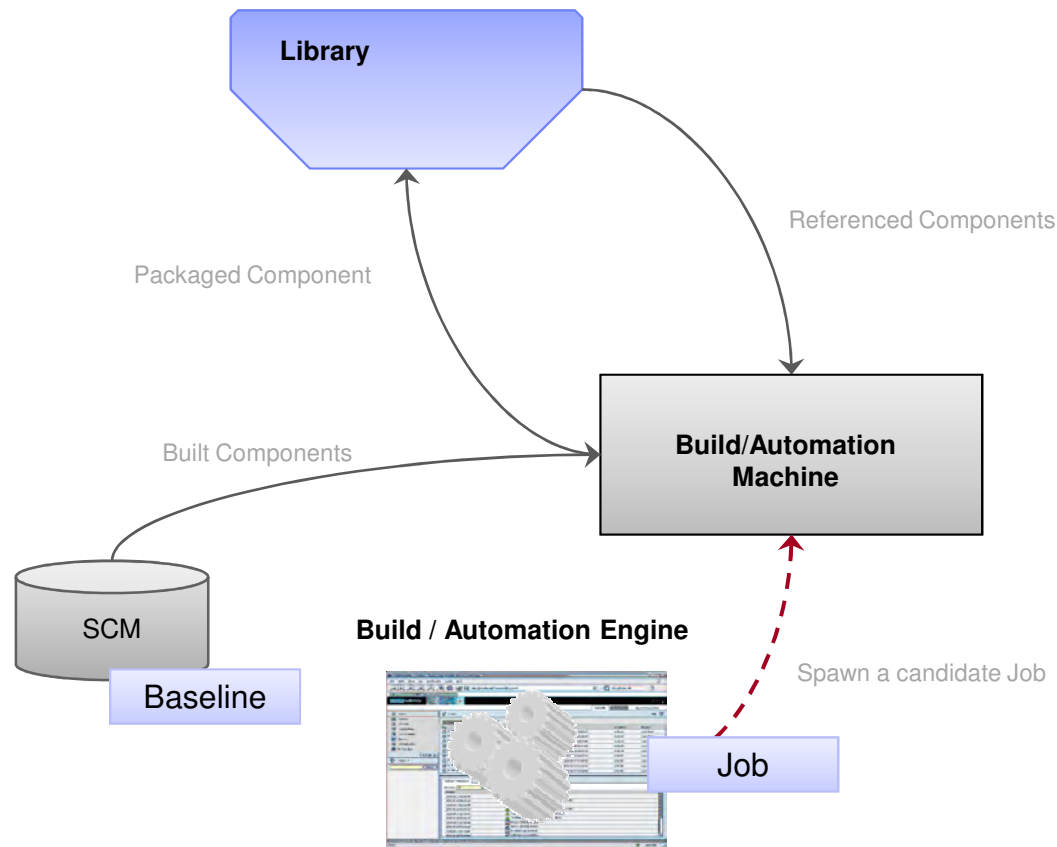
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Development phase

1. Use SCM / CM to manage the things you build.

2. Use a Library to link with the thing other have built.
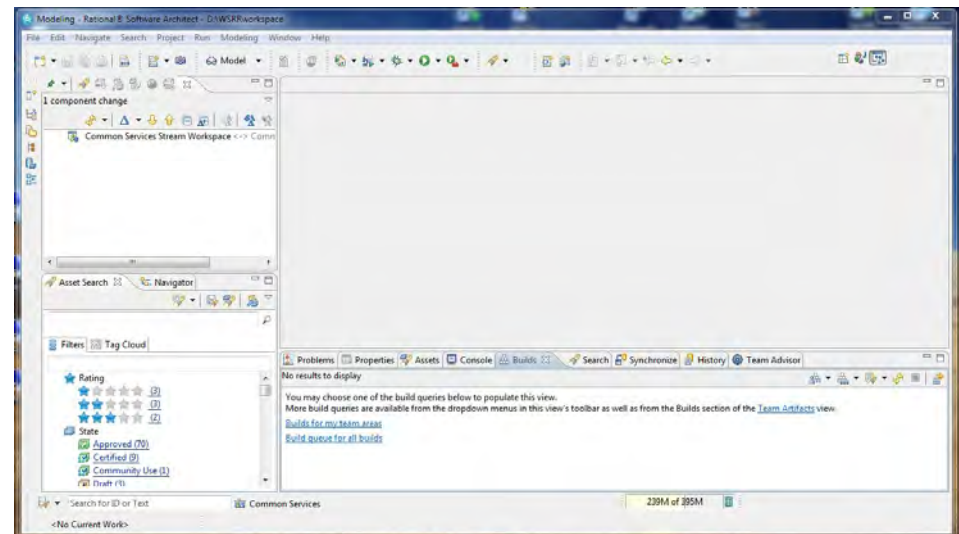
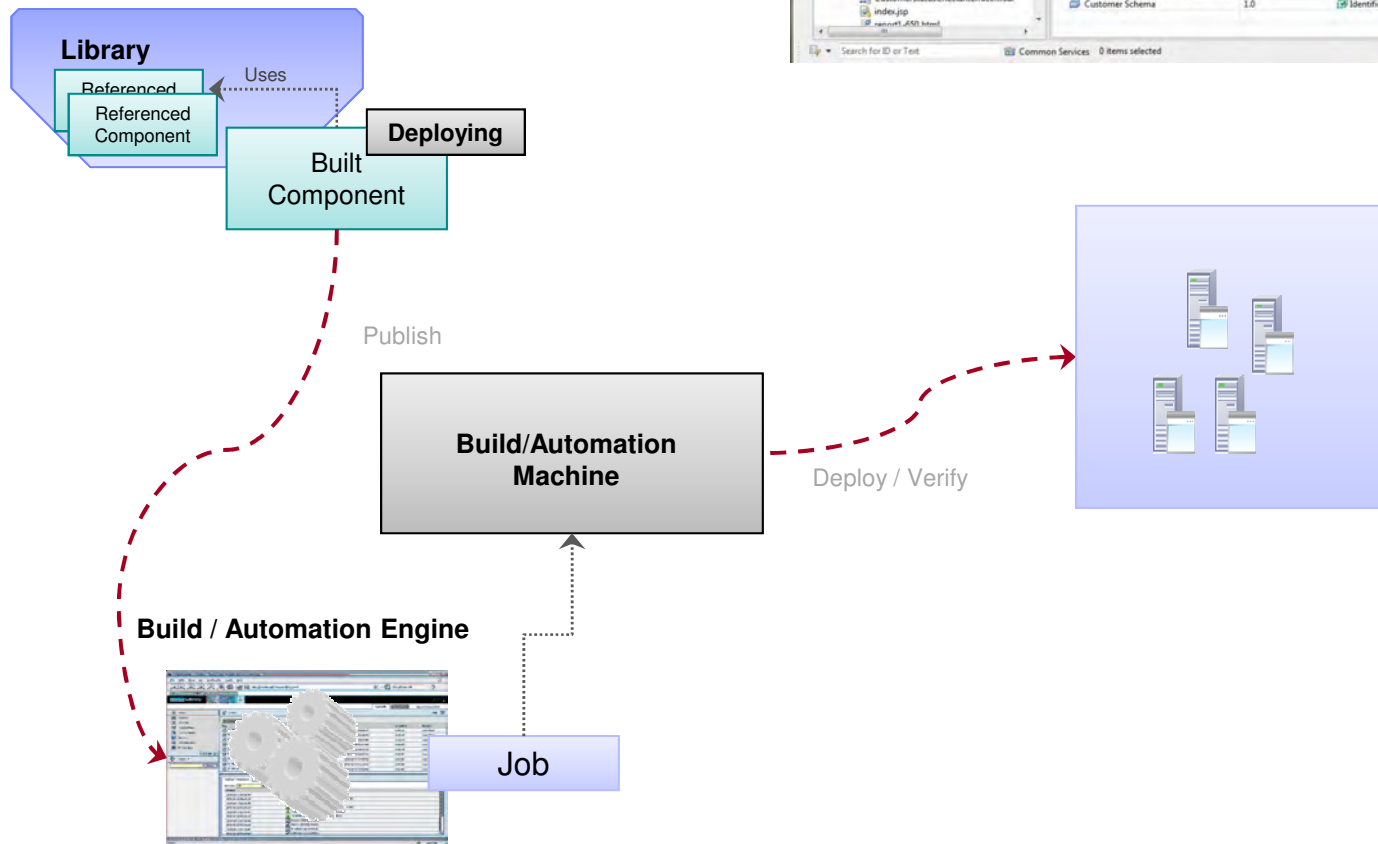# Build / Automation Phase

1. Track the Bill of Materials used in a build

2. Manage which build move onto the next stage

Library

Referenced Components

Packaged Component

Built Components

Build/Automation Machine

SCM

Build / Automation Engine

Baseline

Spawn a candidate Job

Job

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Deploy Automation Phase

1. Control what is deployed

2. Track the Bill of Materials used to deploy

Library

Referenced

Referenced
Component

Uses

Deploying

Built
Component

Publish

**Build/Automation
Machine**

Deploy / Verify

Build / Automation Engine

Job
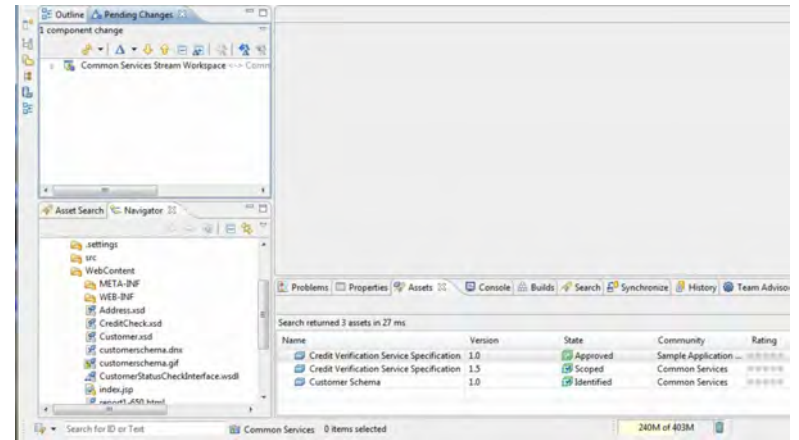
With only Agile Development improvements...

Agile Dev

Functional Testing

Acceptance Testing

Production

Operator

Setup (weeks)

Install

Test and Ops teams have increased pressures to keep up with increased loads but continue to use waterfall approaches and traditional tools.
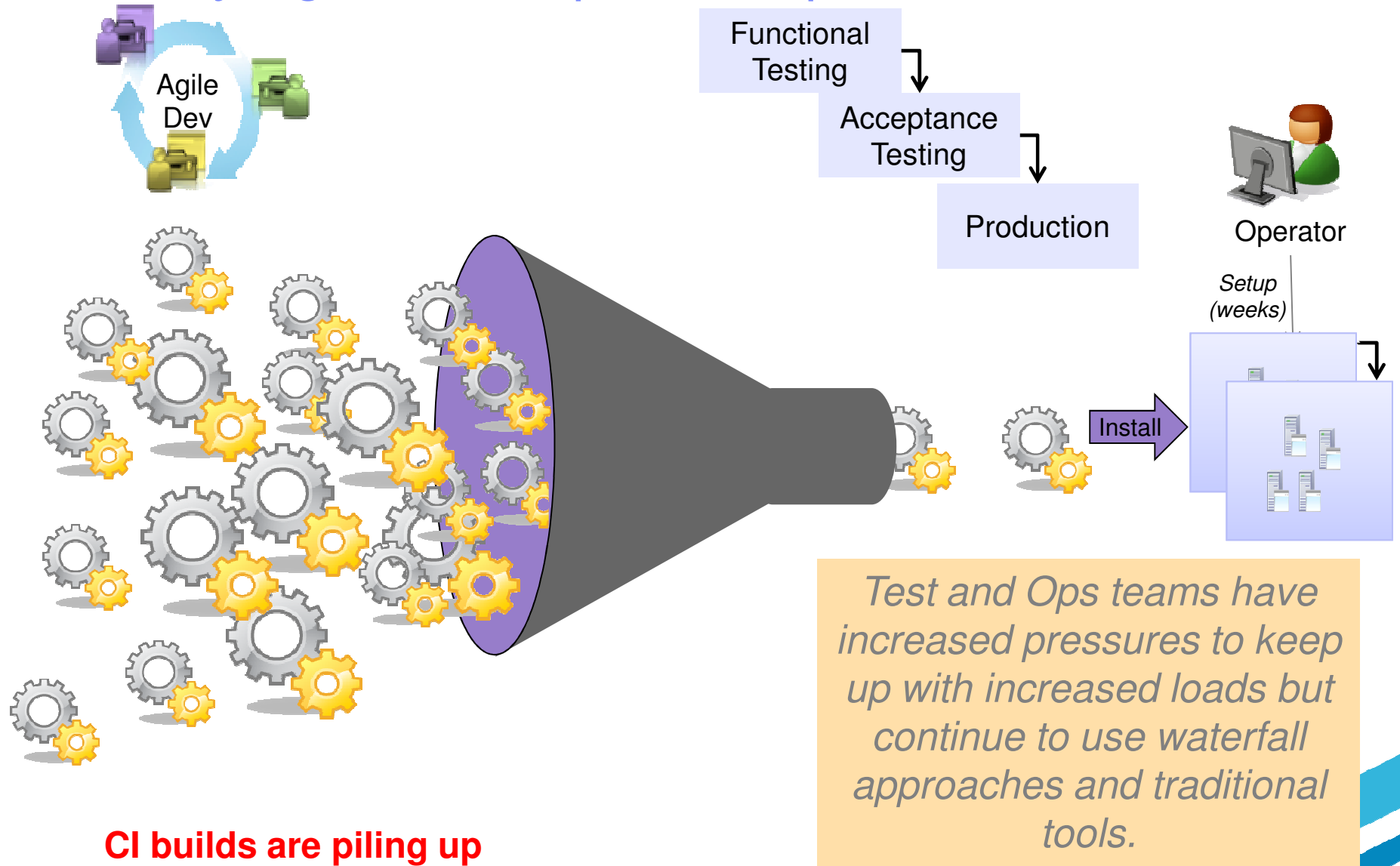
CI builds are piling up

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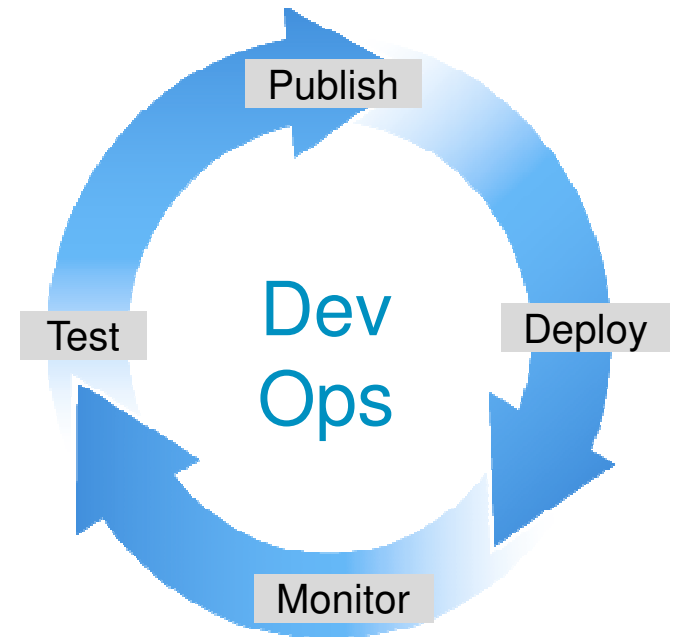# Agile Development and Delivery
Continuous Integration extends to Continuous Delivery

Agile Dev
- Build
- Test
- Prioritize
- Design

Dev Ops
- Publish
- Deploy
- Monitor
- Test
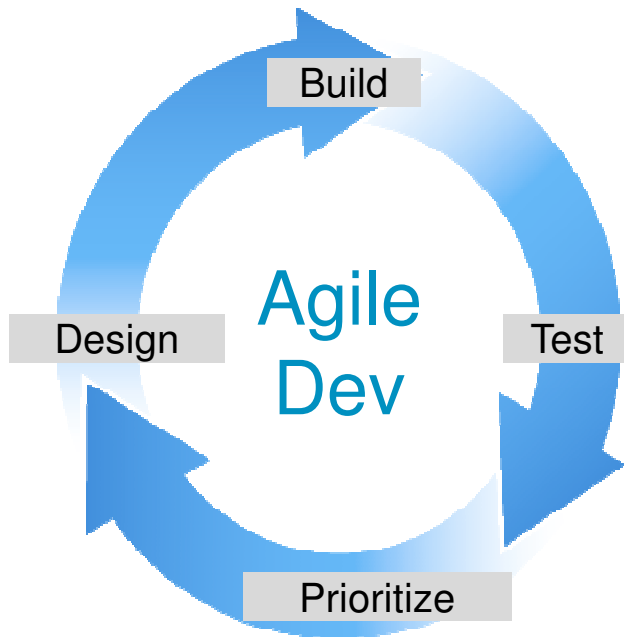
Continuous Feedback

DevOps: Tighter alignment between Development & Operations
to increase application velocity with managed risk

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DevOps Principles & Values

People

Process

Information

- Collaborate across disciplines

- Develop and test against a production-like system

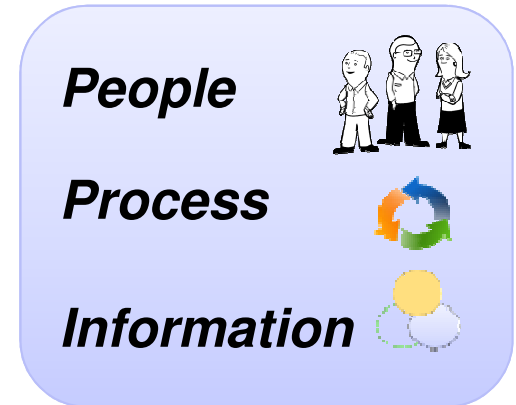- Deploy frequently

- Continuously validate operational quality characteristics

12 Principles for Better DevOps*

Collaborate

1. Do your Ops and Dev teams collaborate? Regularly?

2. Do you have agreed upon patterns for apps and platforms?

3. Do you have well defined delivery pipeline for apps and platforms?

Automate

4. Do your operation engineers understand how to developed well-structured reusable system configuration scripts?

5. Can you deploy a system in one step?

6. Do you provide Infrastructure and Platform as a Service for your development teams?

7. Can your developers launch, use, and destroy representative environments on demand without operator support?

*Based on "The Joel Test: 12 Steps to Better Code"

http://www.joelonsoftware.com/articles/fog0000000043.html

12 Principles for Better DevOps

Validate

8.Do you have automated tests to validate your application and platform function and security?

9.Do you validate platform software against expected KPIs, before deploying your application?
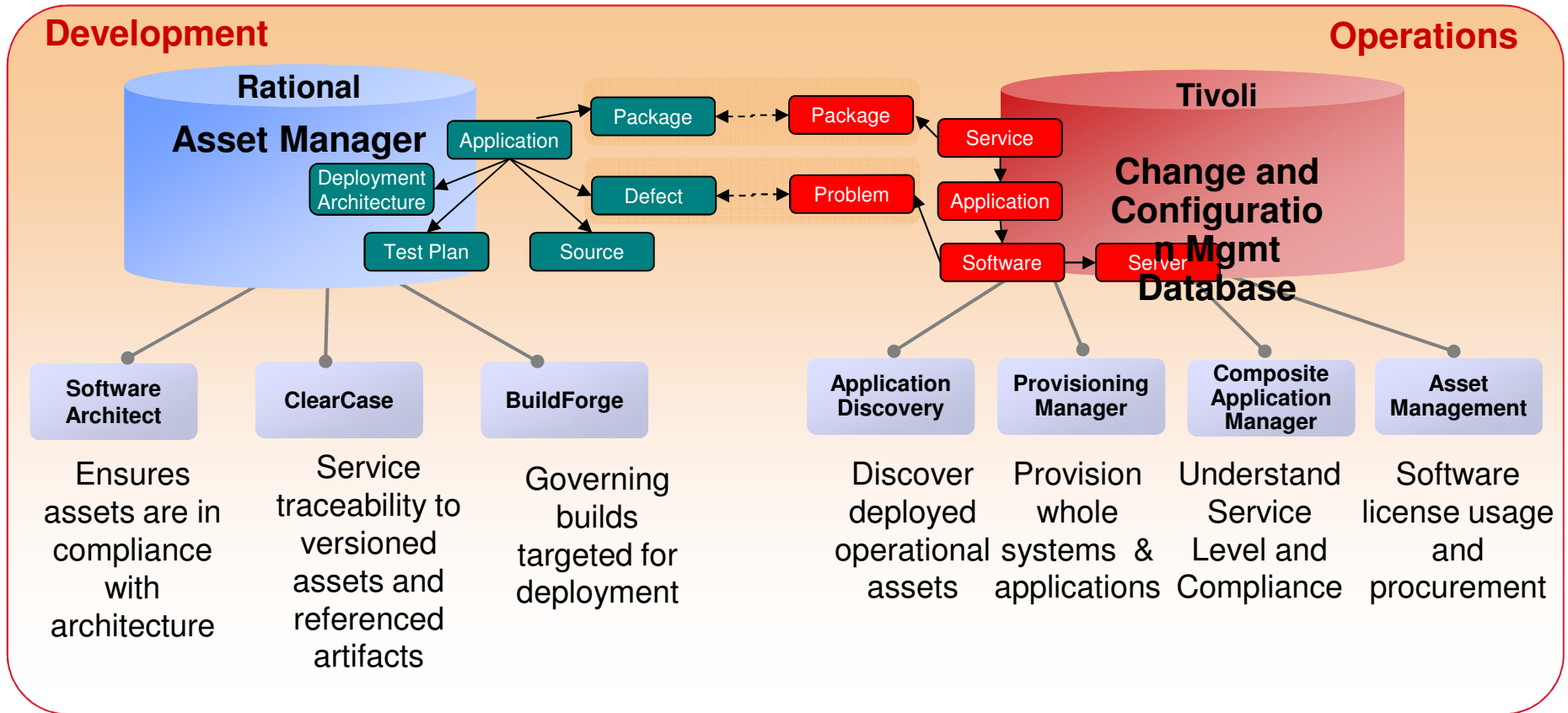
10.Do you deploy your applications daily and verify them?

Manage and Control

11.Do you use source control?

12.Do you have an issue tracking system for operations, linked to a bug database used for development?

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Examples in Devops.

Unifying Development and Operations
Federated Assets

Development

Operations

Rational

Asset Manager

Application

Package

Package

Service

Deployment Architecture

Defect

Problem

Application

Tivoli

Change and Configuration Mgmt Database

Test Plan

Source

Software

Server

Software Architect

Ensures assets are in compliance with architecture

ClearCase

Service traceability to versioned assets and referenced artifacts

BuildForge

Governing builds targeted for deployment

Application Discovery

Discover deployed operational assets

Provisioning Manager

Provision whole systems & applications

Composite Application Manager

Understand Service Level and Compliance

Asset Management

Software license usage and procurement

- Identify, trace and manage newly released assets from development to operations
  - Notify development quickly on operational problems for quick resolution
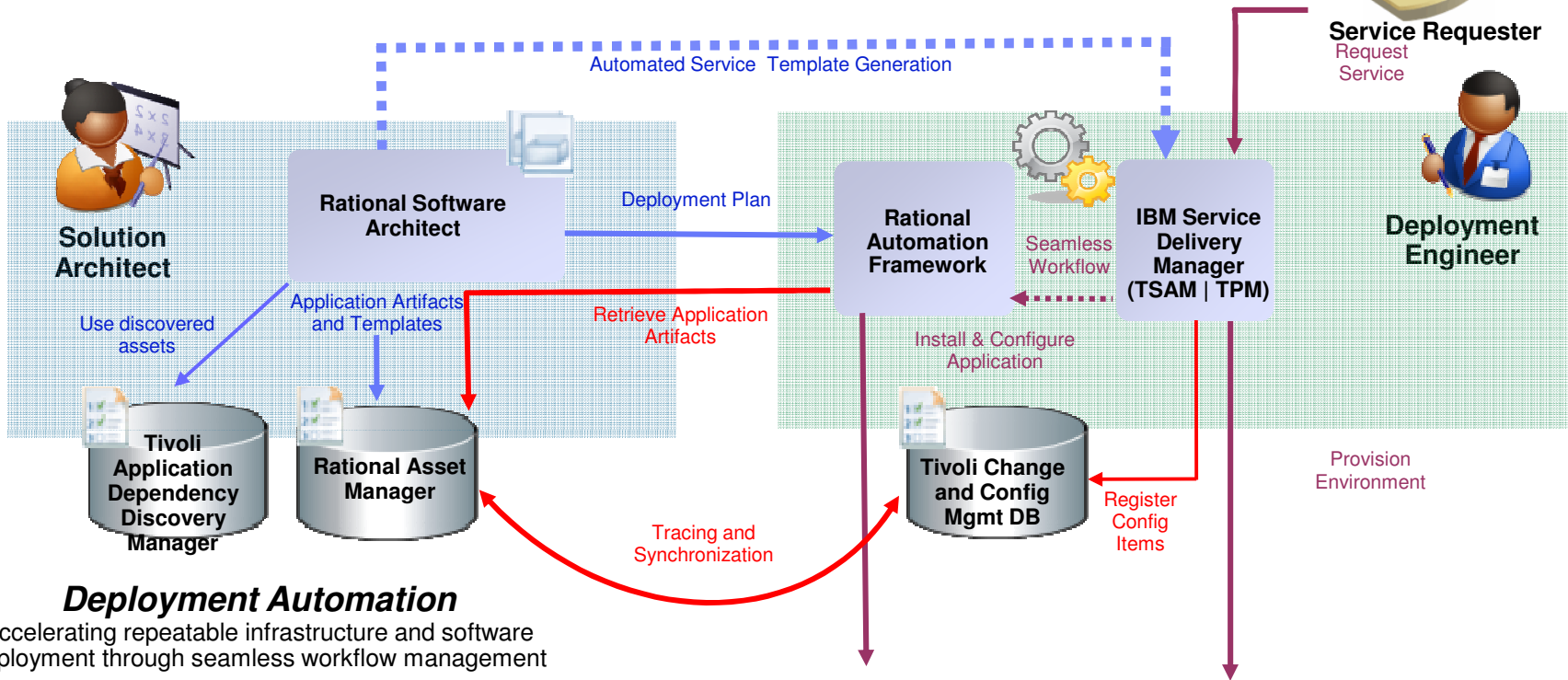- Reduce unexpected outages with complete view for operational asset impact analysis

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IBM Deployment Planning and Automation for Integrated Service Management
An Integrated Solution

- **Plan** composite application deployments using organizational standards
    - Reduce time and errors
    - Improve communication

- **Automate** infrastructure provisioning, middleware configuration, and application installation
    - Repeatedly setup standardized environments
    - Remove costly manual errors
    - Reduce provisioning times

- **Govern** and application artifacts, standards, and deployed resources
    - Adhere to organizational standards

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Deployment Planning, Automation, and Governance

Service Requester
Request Service

Automated Service Template Generation

Solution Architect

Rational Software Architect

Deployment Plan

Rational Automation Framework

Seamless Workflow

IBM Service Delivery Manager (TSAM | TPM)

Deployment Engineer

Use discovered assets

Application Artifacts and Templates

Retrieve Application Artifacts

Install & Configure Application

Tivoli Application Dependency Discovery Manager

Rational Asset Manager

Tivoli Change and Config Mgmt DB

Register Config Items

Provision Environment

Tracing and Synchronization

Physical

Virtual
Portal
RTC   WAS
DB2

Cloud

Deployment Automation
Accelerating repeatable infrastructure and software deployment through seamless workflow management

Deployment Planning
Pre-deployment validation - improving accuracy Reusing standard configurations helping avoid costly mistakes

Deployment Governance
Linking development and operation assets for improved traceability and change management
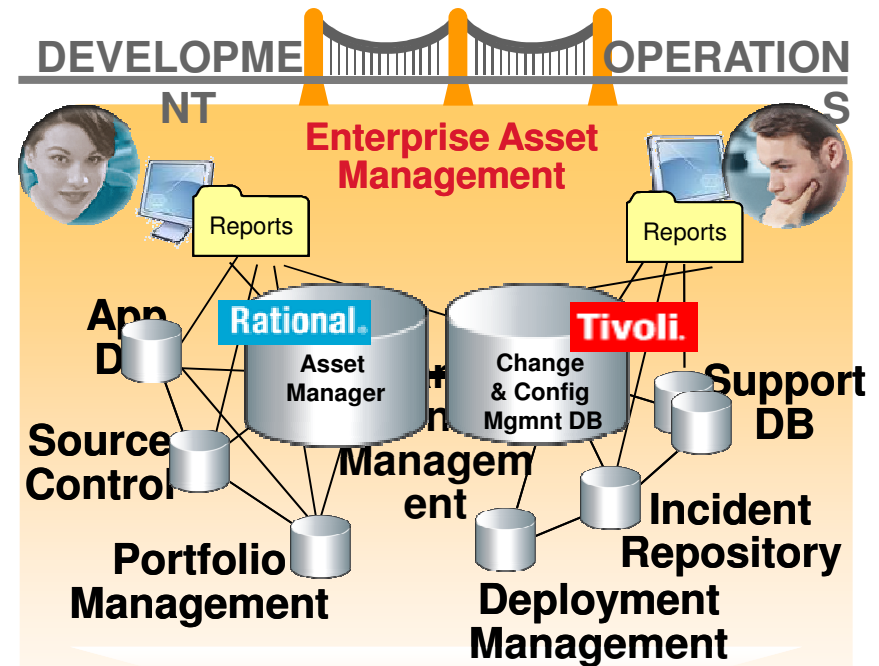
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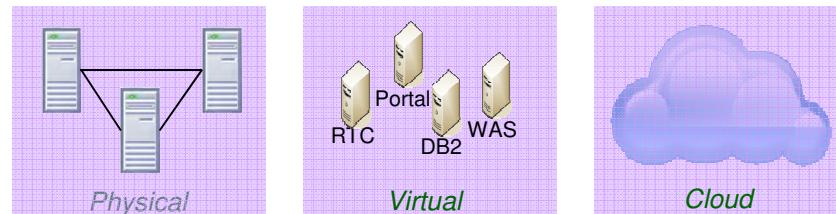
Global Petroleum Company
Delivers Enterprise Asset Governance

Situation

- Long service downtimes caused by problem diagnosis issues

- Inefficient access to resources and information impacting time to restoration

- Needed an enterprise wide view of application and service dependencies

Solution

- **One single source of truth**

  Enterprise Asset Governance

- **One common workflow**

  Solution integration with requirements, change and configuration management

DEVELOPMENT — **OPERATIONS**

Enterprise Asset Management

Reports

Reports

App D

Rational Asset Manager

Change & Config Mgmnt DB

Tivoli.

Support DB

Source Control

Management

Incident Repository

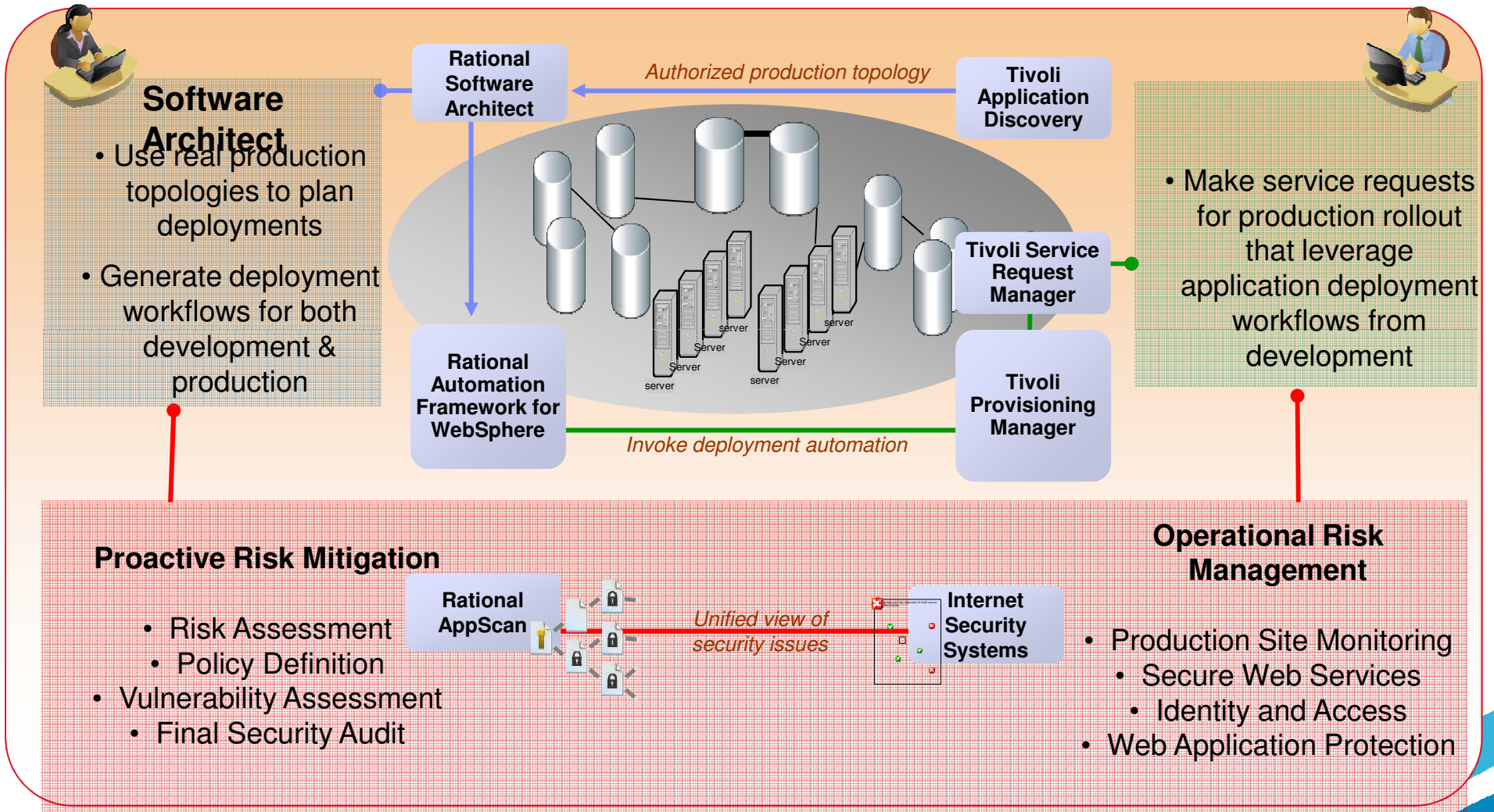**Portfolio Management**

Deployment Management

Results

✓ Significantly reduced downtime

✓ Faster root cause analysis

✓ Simplified asset synchronization and traceability between development and operations

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Unifying Development and Operations
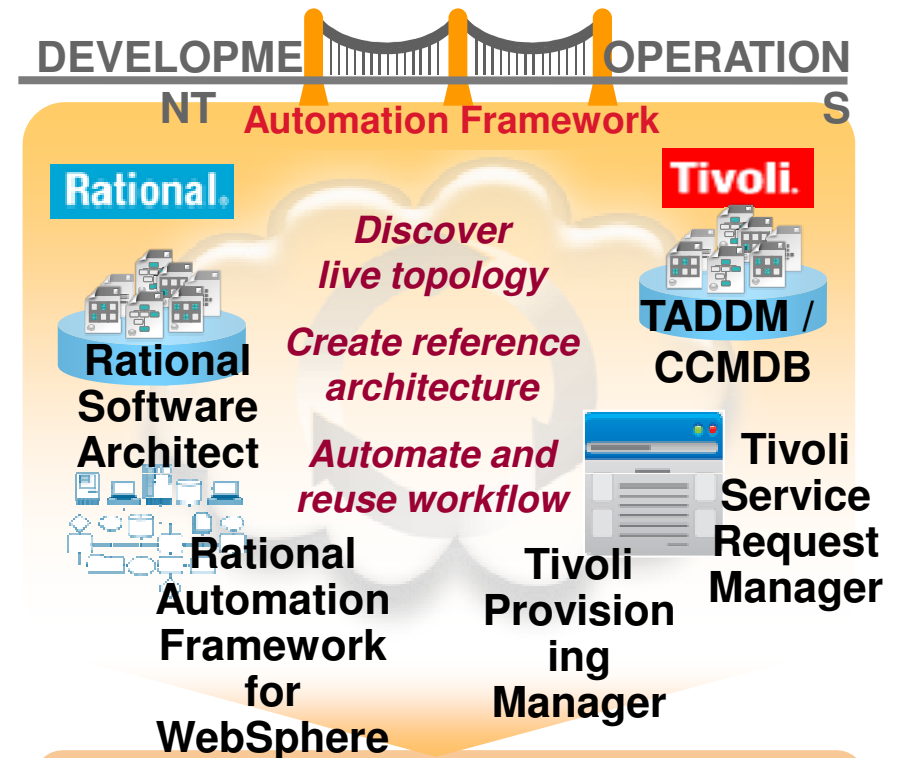## Automated Process Lifecycle

Development

Operations

Software Architect
- Use real production topologies to plan deployments
- Generate deployment workflows for both development & production

Rational Software Architect

Authorized production topology

Tivoli Application Discovery

Rational Automation Framework for WebSphere

Invoke deployment automation

Tivoli Service Request Manager

Tivoli Provisioning Manager

- Make service requests for production rollout that leverage application deployment workflows from development

Proactive Risk Mitigation

- Risk Assessment
- Policy Definition
- Vulnerability Assessment
- Final Security Audit

Rational AppScan

Unified view of security issues

Internet Security Systems

Operational Risk Management

- Production Site Monitoring
- Secure Web Services
- Identity and Access
- Web Application Protection

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Financial Services Conglomerate
Deploys Service Automation Framework

Situation

- **8K** applications including **3K** acquired
- Constant stream of change requests
- Fixed IT operations staff, frozen budget
  - Communication and accountability problems across **25 application teams**
    - Separate "layered" one-off approach to OS, data center and application deployment
- Numerous deployment errors, manual workarounds
- Backlog of **2500 priority one requests**

Solution

- **Repeatable consistent automation**
- **Deployment Reference Architecture**

DEVELOPMENT — **OPERATIONS**

Automation Framework

Rational.

Tivoli.

Discover live topology

Create reference architecture

Rational Software Architect

TADDM / CCMDB

Automate and reuse workflow

Tivoli Service Request Manager

Rational Automation Framework for WebSphere

Tivoli Provisioning Manager

Results — **104% ROI**

- ✓ Reduced backlog
- ✓ Cost savings through consistent deployment
- ✓ Compliance and traceability
- ✓ Best practices capture

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