

# IBM Rational Software Development Conference 2008

WHERE TEAMS ARE **R-HEROES**



## Scaling Agile Software Development: Strategies for Applying Agile in Complex Situations

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PPM07

# Discussion Topics

- Agile Adoption Rate
- IBM and Large-Scale Agile Adoption
- Agile@Scale
- Practices for Scaling Agile
- A systematic approach to agile adoptions
- Parting Thoughts



# Survey Results

## Agile Adoption Survey

- February 2008
- Email to DDJ mailing list
- 642 respondents

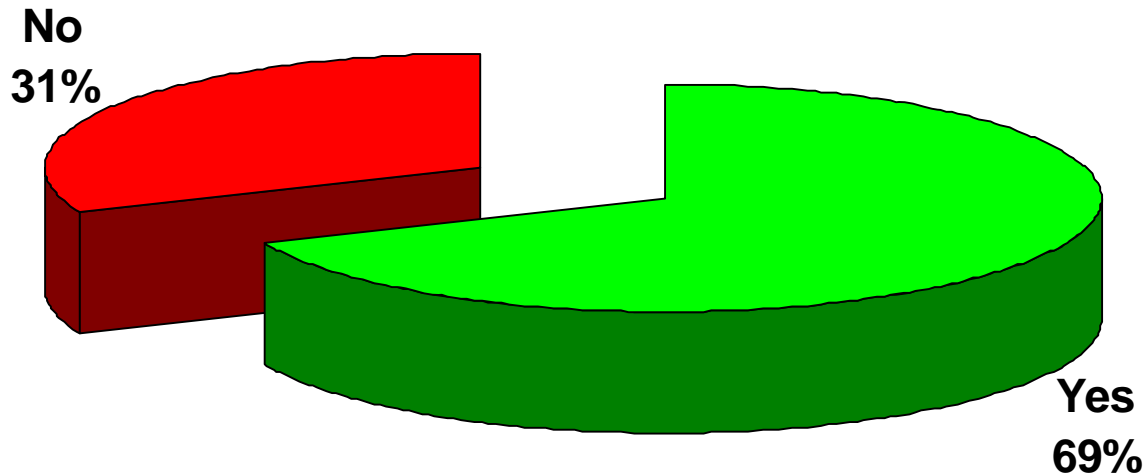
## Project Success Survey

- August 2007
- Email to DDJ mailing list
- 586 respondents

Data, summary, and slides downloadable from [www.ambysoft.com/surveys/](http://www.ambysoft.com/surveys/)



# Has Your Organization Adopted One or More Agile Techniques?



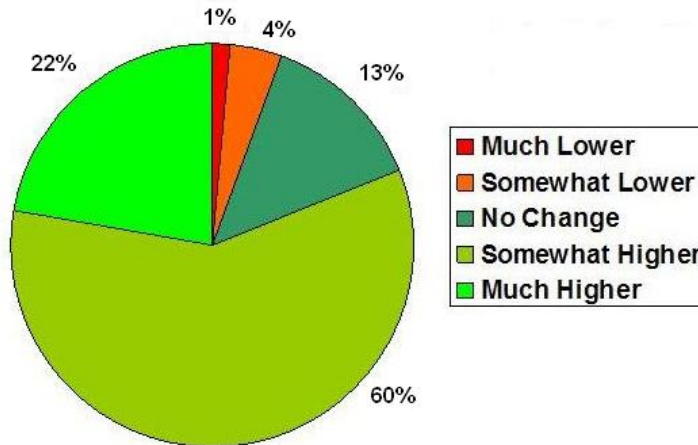
18.3% of respondents indicated they're still in the pilot stage

15% of "No" respondents hope to do Agile this year

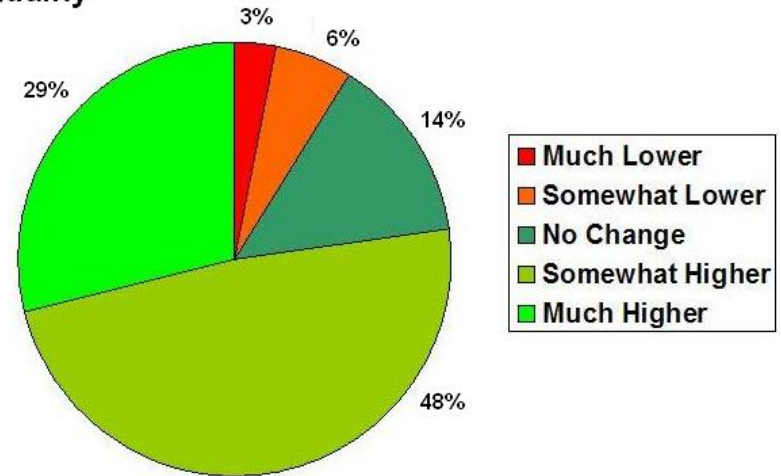
Source: Dr Dobb's 2008 Agile Adoption Survey

# Why Agile? Because it Works!

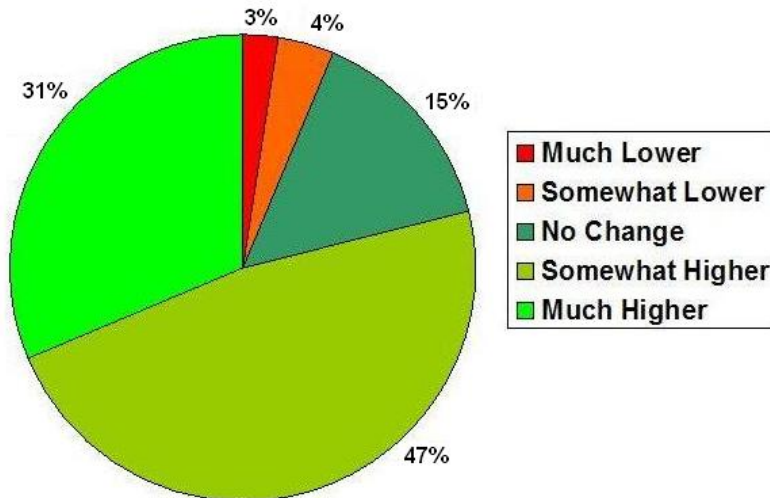
**Productivity**



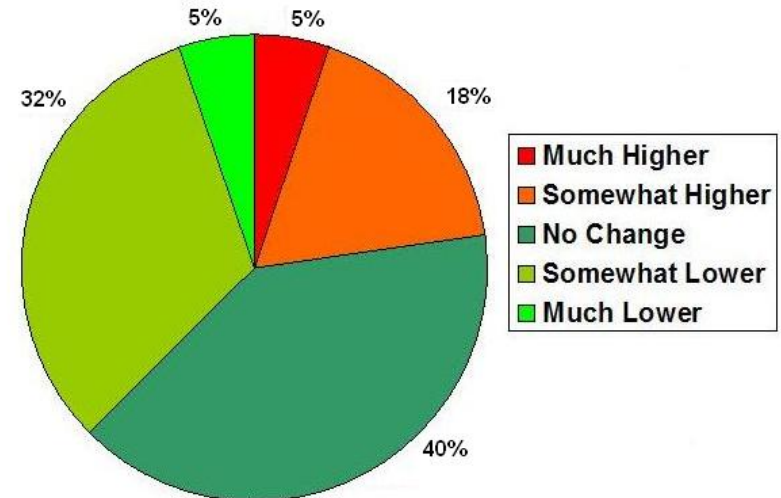
**Quality**



**Business Stakeholder Satisfaction**



**Cost of System Development**

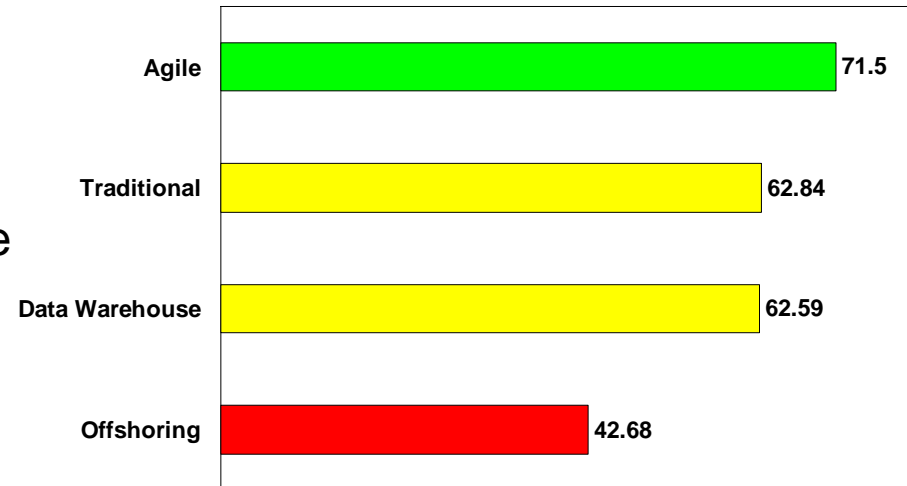


Source: Dr. Dobb's Journal 2008 Agile Adoption Survey

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## Why Agile/Lean? It's More Successful

- Quality: 87.3% believe that delivering high quality is more important than delivering on time and on budget
- Scope: 87.3% believe that meeting actual needs of stakeholders is more important than building the system to specification
- Money: 79.6% believe that providing the best ROI is more important than delivering under budget
- Staff: 75.8% believe that having a healthy workplace is more important than delivering on time and on budget
- Schedule: 61.3% believe that delivering when the system is ready to be shipped is more important than delivering on schedule

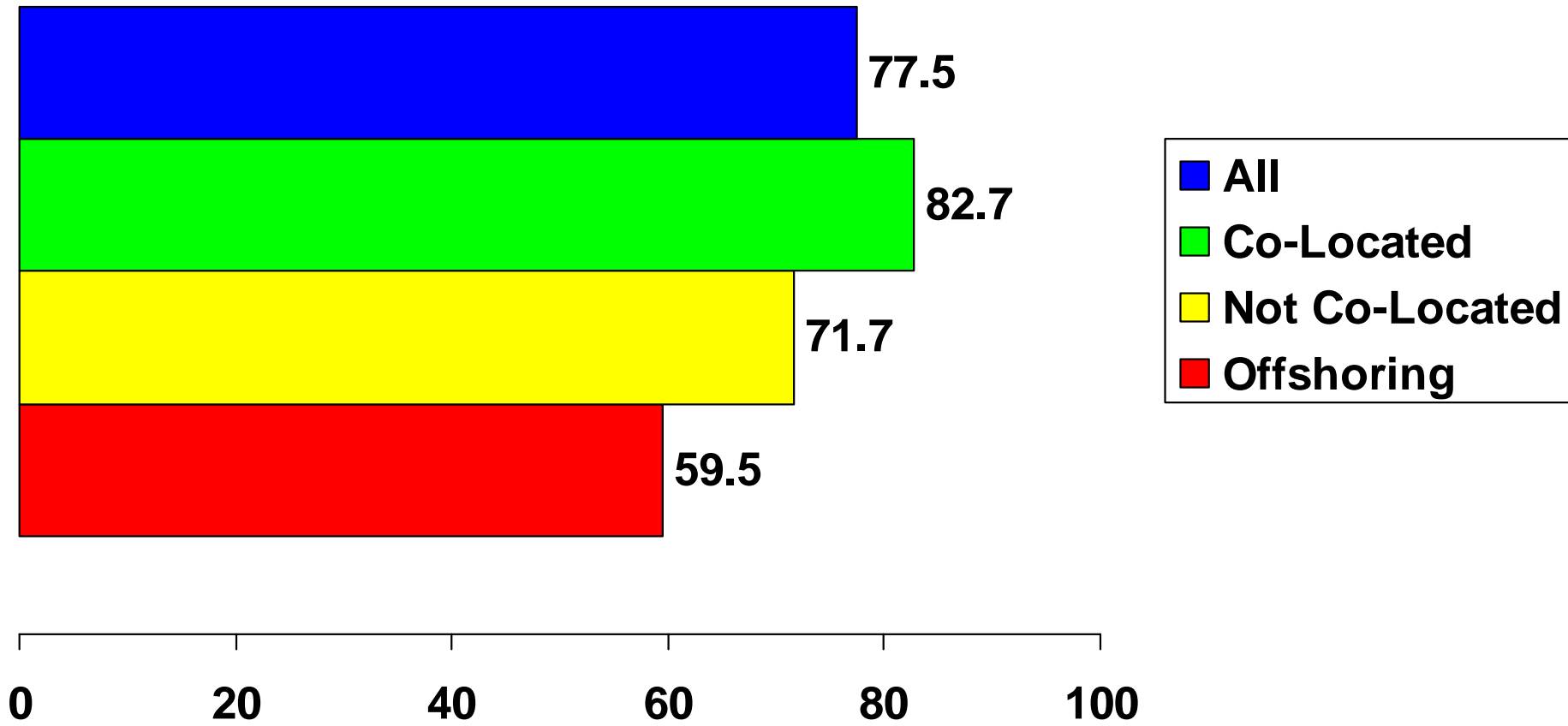


Source: Dr Dobb's 2007 Project Success Survey



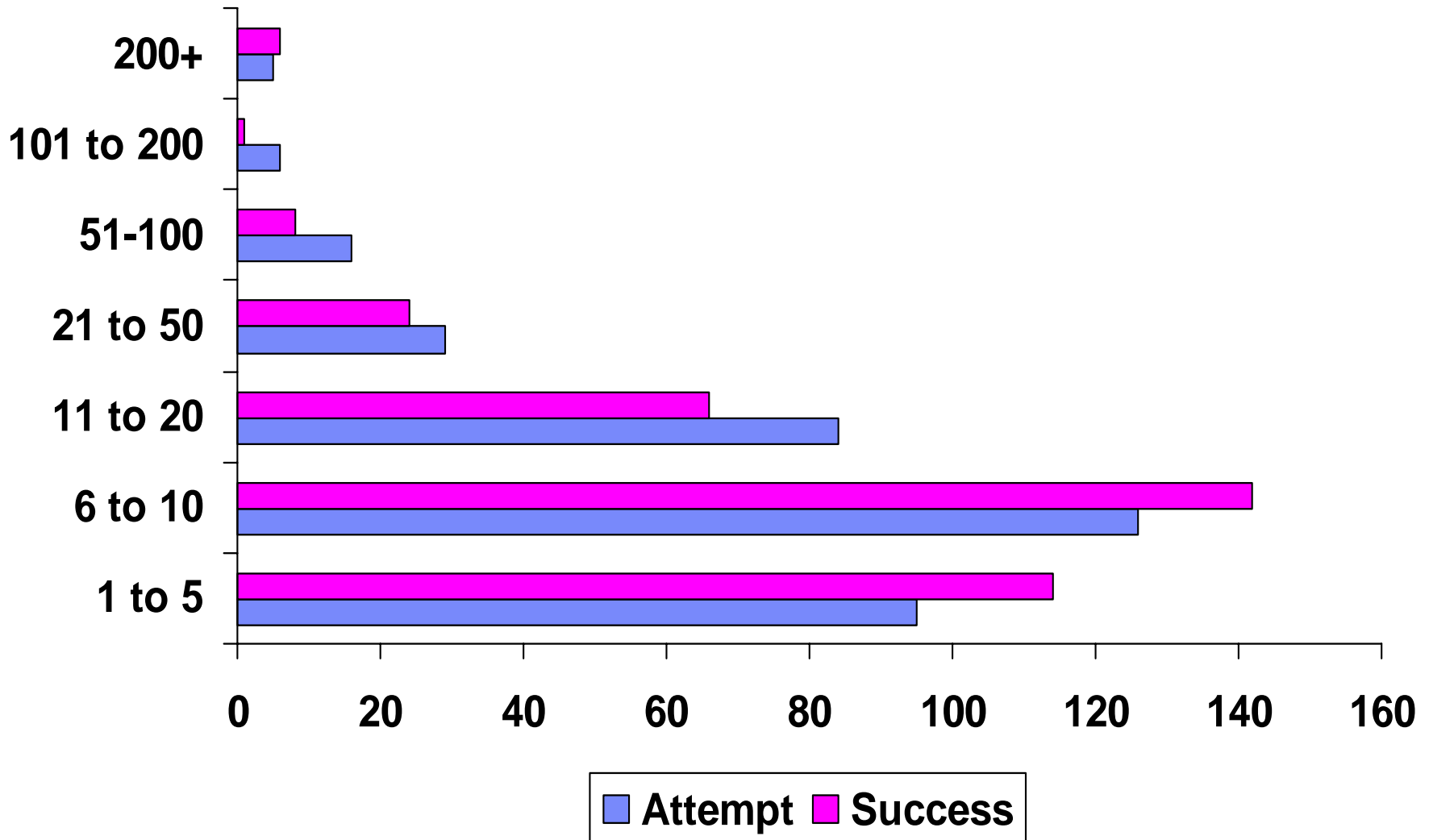
# Agile Projects Success Rates (%)

(214 co-located projects, 210 not co-located, 129 offshoring/outsourcing)



Source: Dr Dobb's 2008 Agile Adoption Survey

# Largest Team Size Attempted vs. Successful

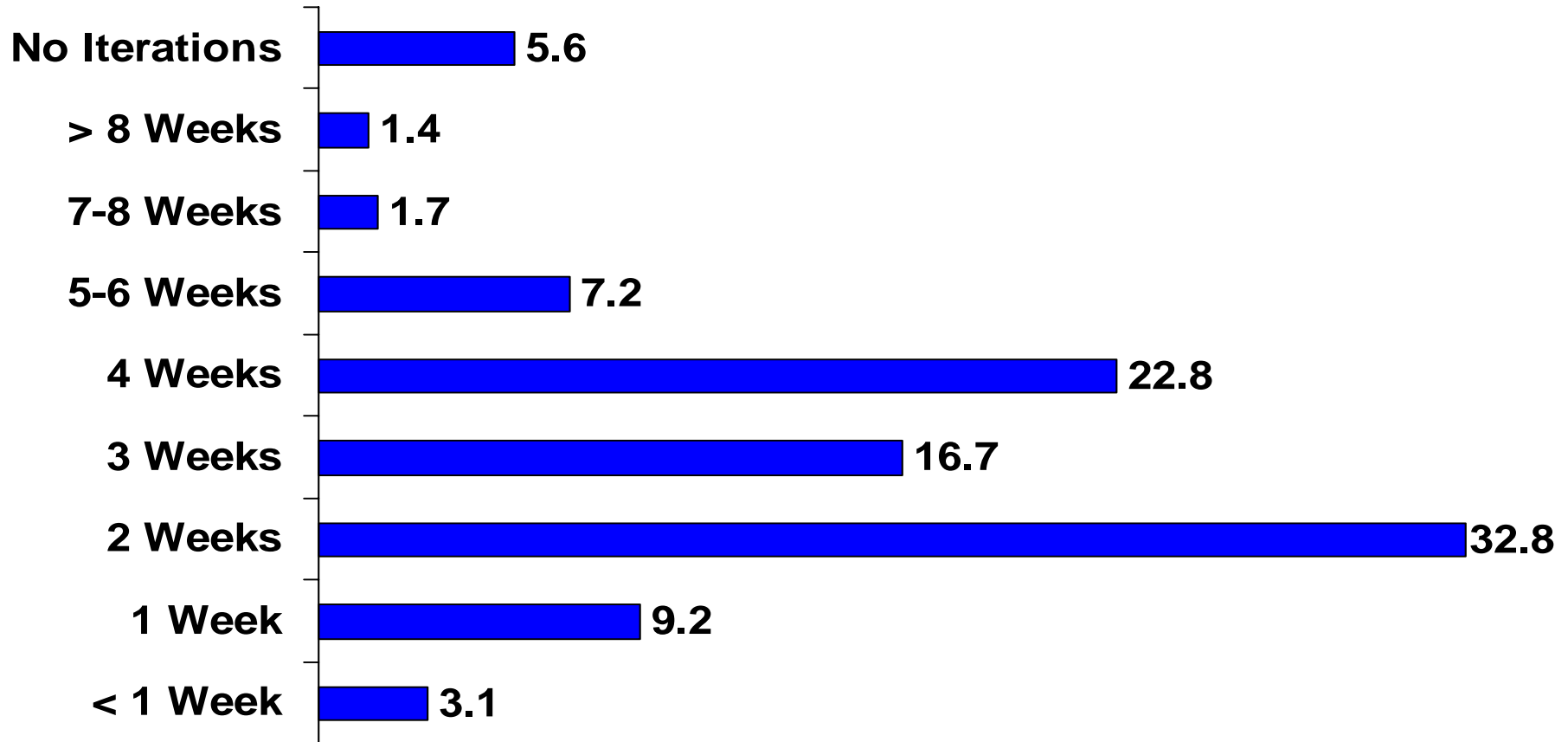


Source: Dr Dobb's 2008 Agile Adoption Survey



## Length of Iterations (% respondents)

72.7% have iterations between 2 and 4 weeks in length



Source: Dr Dobb's 2008 Agile Adoption Survey



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# IBM is Going Agile

## *One of the worlds largest agile transformations*

- **Agile key to continue “lead the pack”**
  - ▶ Tomorrow’s leaders must adopt appropriate agile techniques
- **Large scale transformation**
  - ▶ ~35,000 developers
- **Very diverse development contexts**
  - ▶ From: New products, short time-to-market, Web 2.0
  - ▶ To: Mature products, risk reduction, older technologies
- **Agility at Scale is key**
  - ▶ Team size, geographical distribution, compliance, application complexity, ...



# IBM is Going Agile

## *Sample data*

- +2,000 developers trained in last 12 months
- +100 teams using IBM Rational Team Concert
- +1,000 members of Agile@IBM community
- Yearly IBM Academy of Technology Conference on Agile Development



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# Challenges with Agile in the Mainstream

## Agile Development

*Compliance requirement*

Low risk ↔ Critical, Audited

*Enterprise discipline*

Project focus ↔ Enterprise focus

*Geographical distribution*

Co-located ↔ Global

*Entrenched process, people, and policy*

Minimal ↔ Significant

*Application complexity*

Simple, single platform ↔ Complex, multi-platform

*Organization distribution (outsourcing, partnerships)*

In-house ↔ Third party

*Team size*

Under 10 developers ↔ 100's of developers

*Degree of Governance*

Informal ↔ Formal



# Agility is Relative – It Depends on Project Dynamics

## Organizational Drivers

Team Size  
 Geographical Distribution  
 Organization Distribution  
 Entrenched process, people, policy

- Mature or existing projects
- Many developers
- Complex, multi-platform applications
- Distributed teams
- Need for scalability, reproducibility, and traceability

- Maturing projects
- Multi-platform
- Growing in complexity
- Remote or offshore work
- Greater need for coordination and handoffs

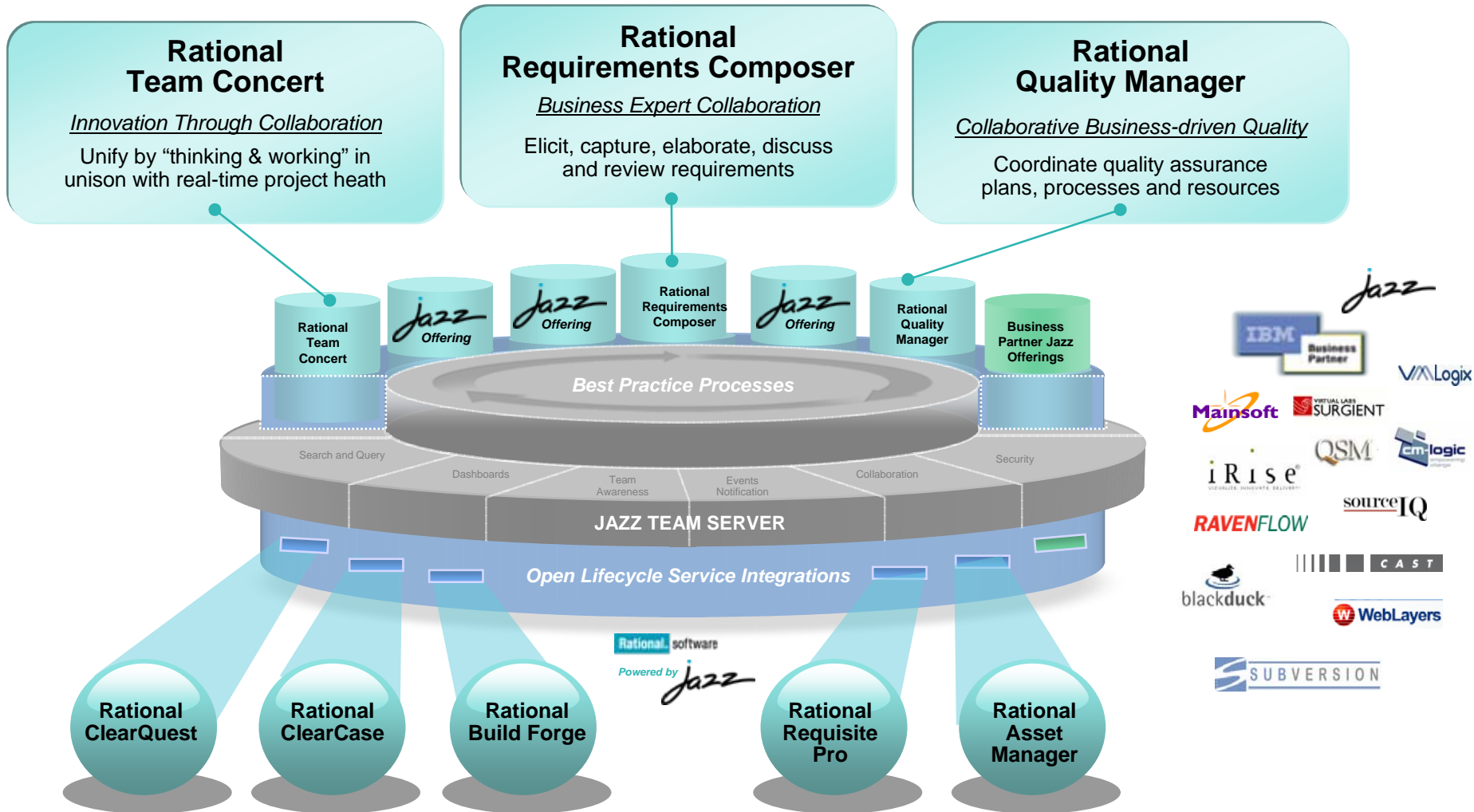
- Small team
- New projects
- Simple application
- Co-located
- Minimal need for documentation

## Technical and Regulatory Drivers

Compliance  
 Governance  
 Application complexity

# Jazz Platform

## Expanding Collaborative Application Lifecycle Management





# Solutions for Agile Teams of Every Size

Rational Team Concert (Jazz)  
 Rational AppScan  
 Rational Application Developer  
 EPF / OpenUp  
 Rational Build Forge  
 Rational ClearQuest  
 Rational PurifyPlus

Small Agile Teams  
 (under 10 developers)

- New projects
- Simple application
- Co-located
- Minimal need for documentation

Rational Team Concert (Jazz)  
 Rational AppScan  
 Rational Method Composer  
 Rational Application Developer  
 Rational ClearCase  
 Rational Build Forge  
 Rational ClearQuest  
 Rational PurifyPlus  
 Rational Performance, Functional,  
 and Manual Tester  
 RUP for Large & Distributed Projects

Mid-sized Agile Teams

- Maturing projects
- Multi-platform
- Growing in complexity
- Remote or offshore work
- Greater need for coordination and handoffs

Large Scale  
 Agile Teams

- Mature or existing projects
- Many developers
- Complex, multi-platform applications
- Distributed teams
- Need for scalability, reproducibility, and traceability

Rational Team Concert (Jazz)  
 Rational AppScan  
 Rational Application Developer  
 Rational Build Forge  
 Rational ClearCase LT  
 Rational ClearQuest  
 Rational PurifyPlus  
 Rational Performance Tester  
 RUP for Small Projects



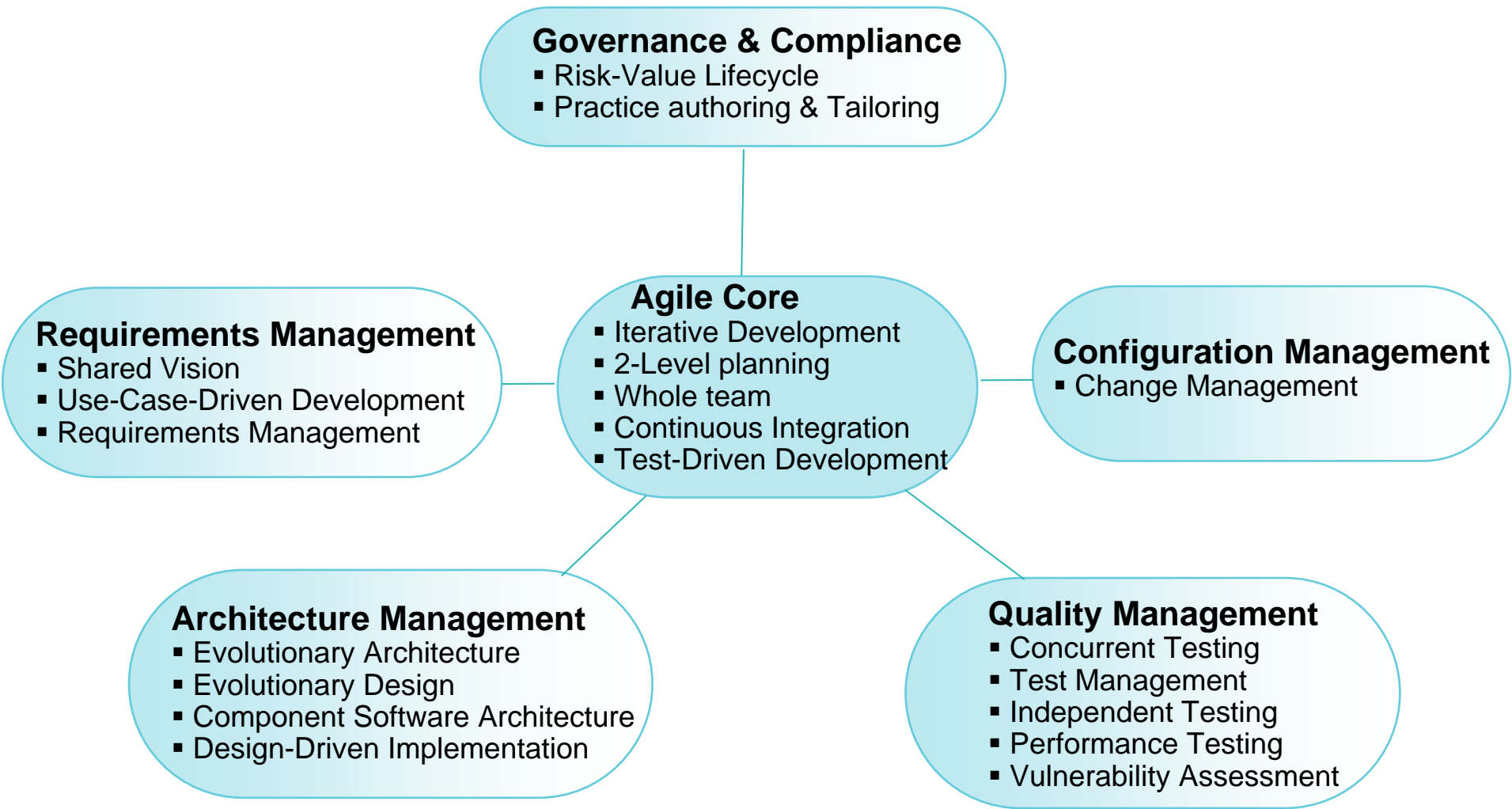
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# Planned Practices for RMC 7.5

*Start Small - Add Practices When Needed to Scale*



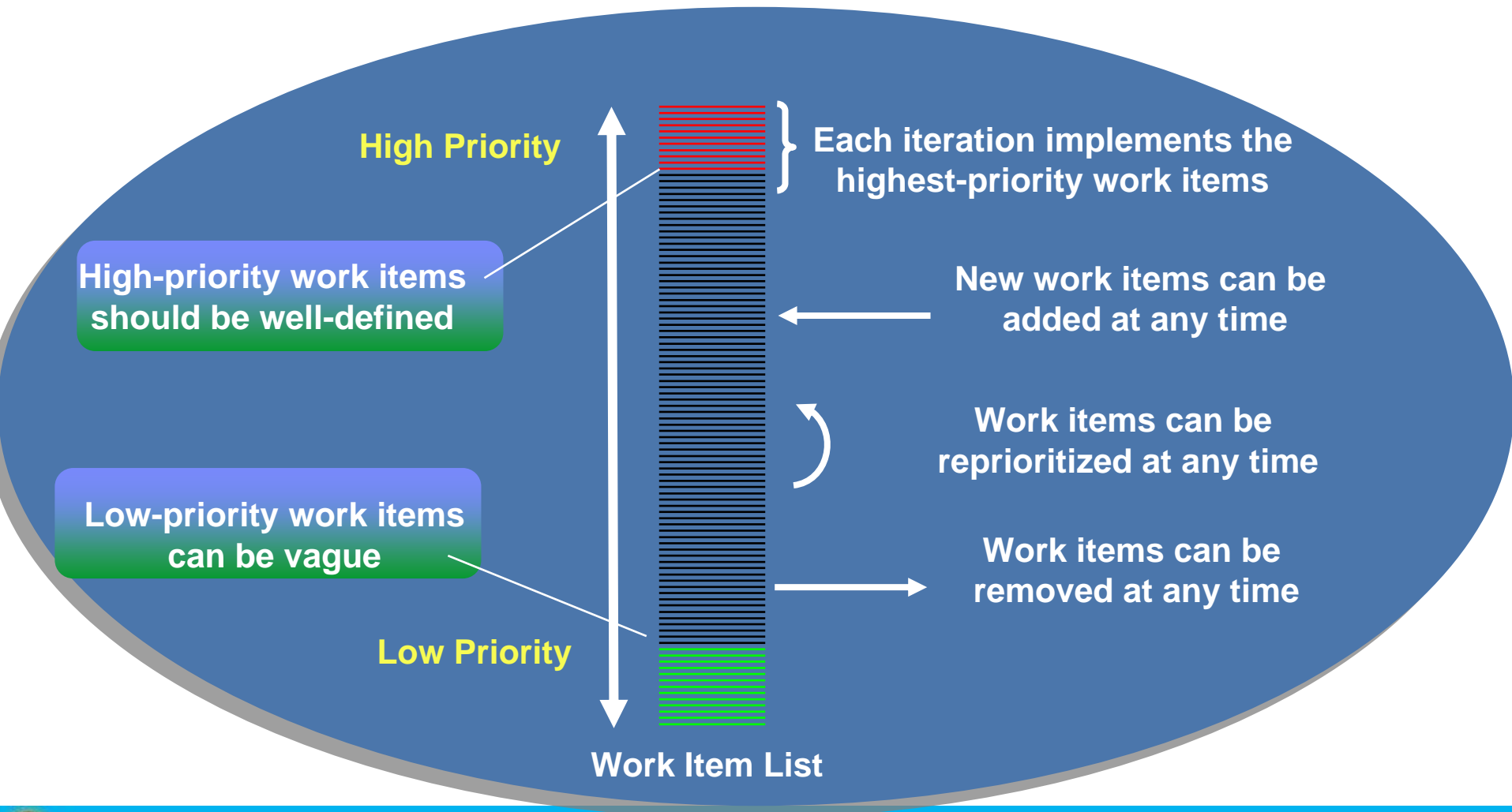
## Practice: Iterative Development



- Focuses the team
- Time-boxed
- Has a plan and assessment
- Prioritized work
- Agile estimation
- Produces a demo-able and shippable build

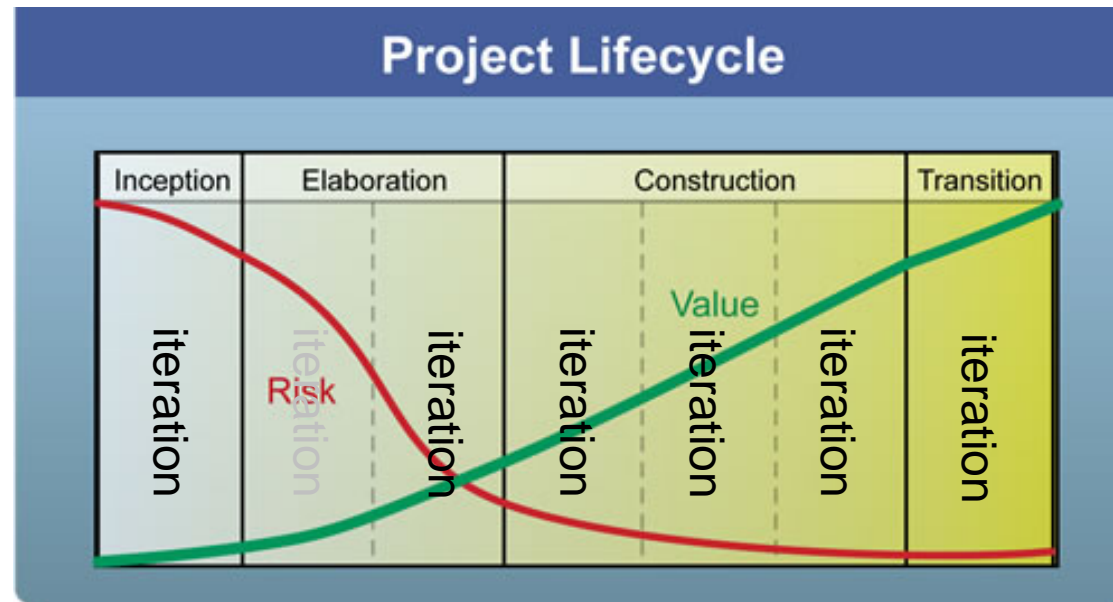
# Prioritize and Manage Work: Work Items List

Heavily influenced by Scrum/XP's Product and Iteration *Backlog*



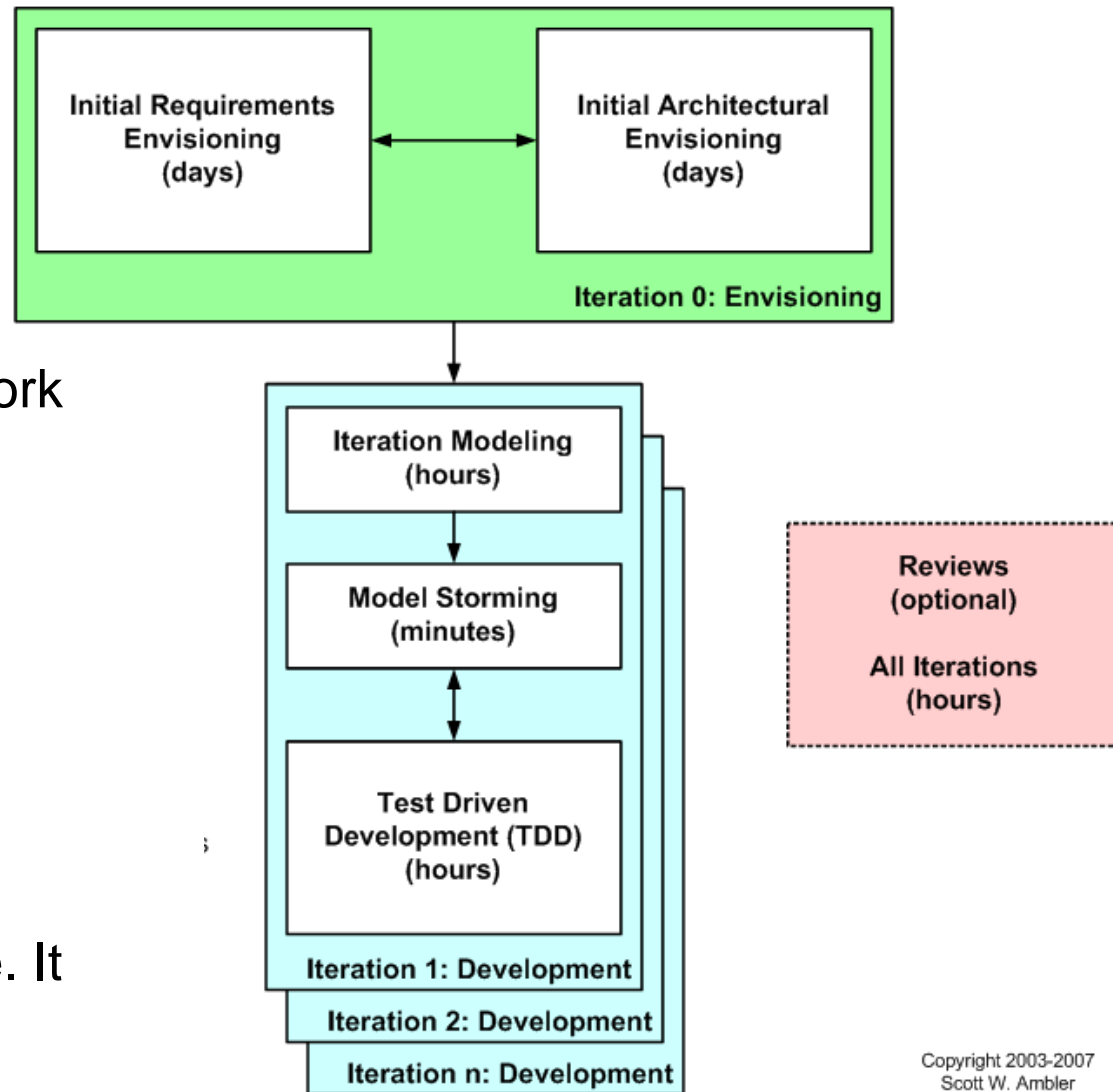
# Practice: Risk-Value Lifecycle

- Provide the extended team with explicit milestones centered on balancing risk mitigation and value creation
  - ▶ Key stakeholders frequently do not have time to carefully review and discuss the results of every iteration. Fewer key milestones are needed.
- Forces extended team to agree on:
  - ▶ Do we understand what we are building?
  - ▶ Do we understand how to build it?
  - ▶ Are we ready to release in the near future?
  - ▶ Can we release now?



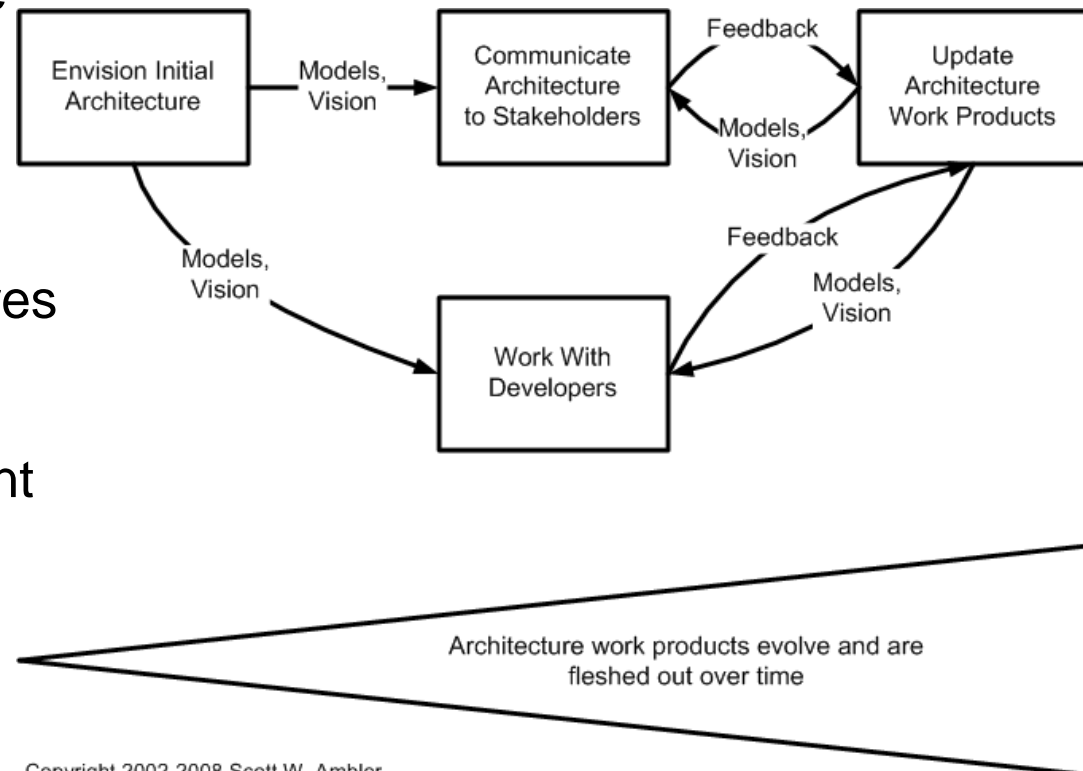
# Practice: Evolutionary Architecture

- Incrementally implement and test the architecture
  - ▶ Just-in-time' architecture work
- Identify architectural issues and prioritize with any other work
  - ▶ Prioritize based on need for technical risk mitigation versus value creation
- Document and effectively communicate key architectural decision.
  - ▶ Consider model brainstorming
- The architecture is never done. It keeps on evolving.



# Enterprise/Program Architecture

- Provide technical vision to the enterprise
- Promote reuse and common infrastructure
- Develop reference architectures
- Develop guidance
- Work closely with development teams
- [www.agiledata.org/essays/enterpriseArchitecture.html](http://www.agiledata.org/essays/enterpriseArchitecture.html)



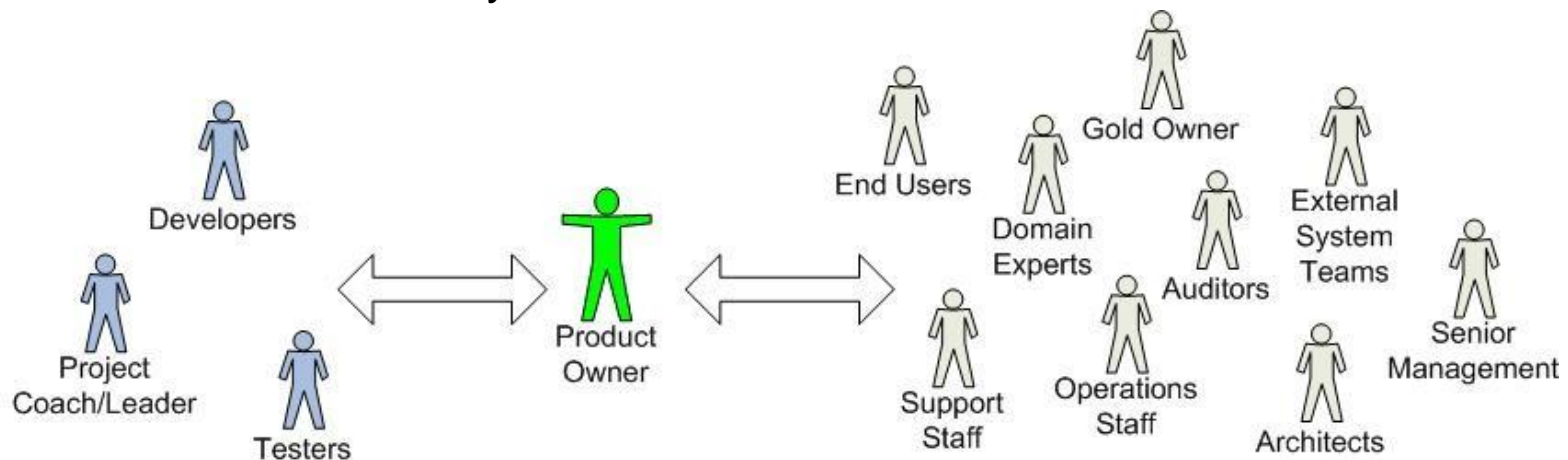
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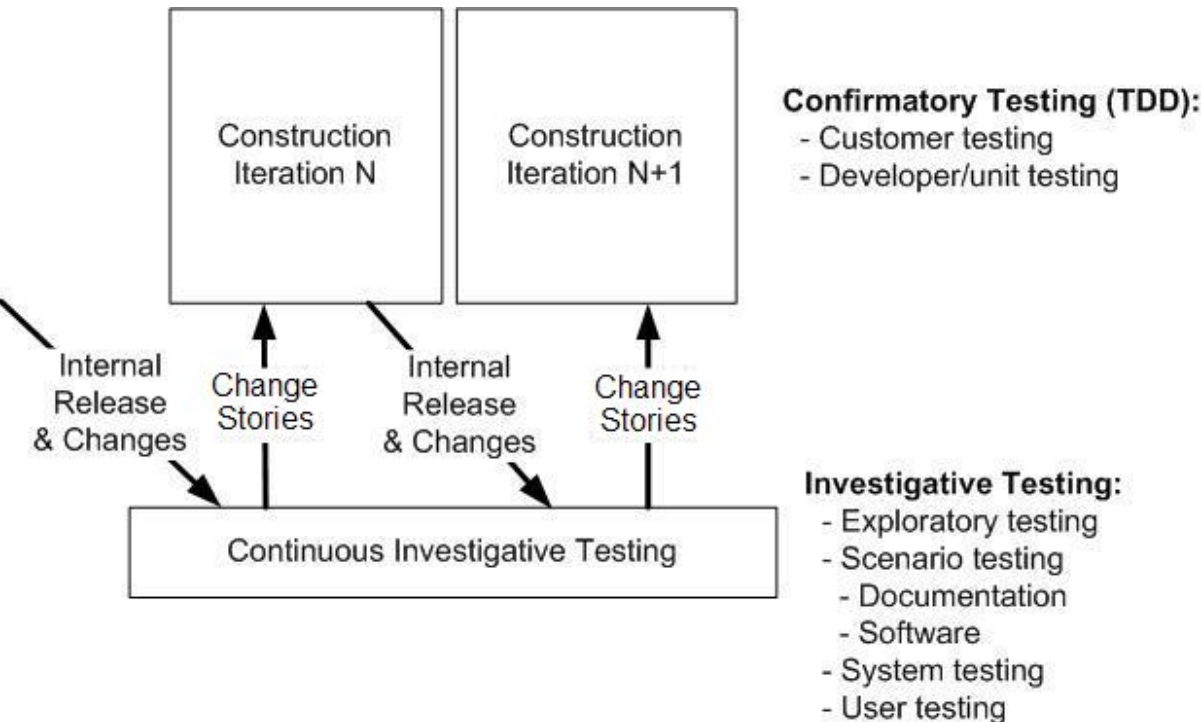
# Scaling XP's On-Site Customer and Scrum's Product Owner

- On-site customer is nice, so put them to work
  - ▶ Stakeholders can be active participants in modeling
- Product owner is really a communication conduit between the team and stakeholders
  - ▶ Must have agile business analysis skills
  - ▶ PO gets the team access to the relevant stakeholders just in time
  - ▶ Negotiate, negotiate, negotiate
- Dr. Dobb's Journal, January 2008



Practices: Whole Team, Use-Case-Driven Development

# Scaling TDD: Comprehensive Agile Testing



TDD is a form of confirmatory testing

TDD is a great start, but it's not the full testing picture

Effective agile teams push their working builds to an independent test team on a regular basis for investigative testing

Change stories must be prioritized and put back on the team's work stack

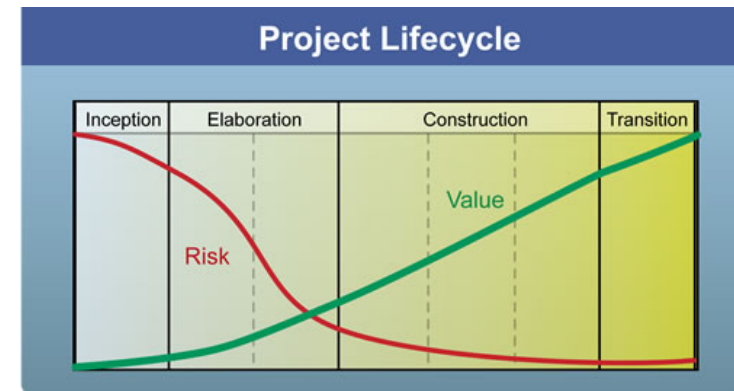
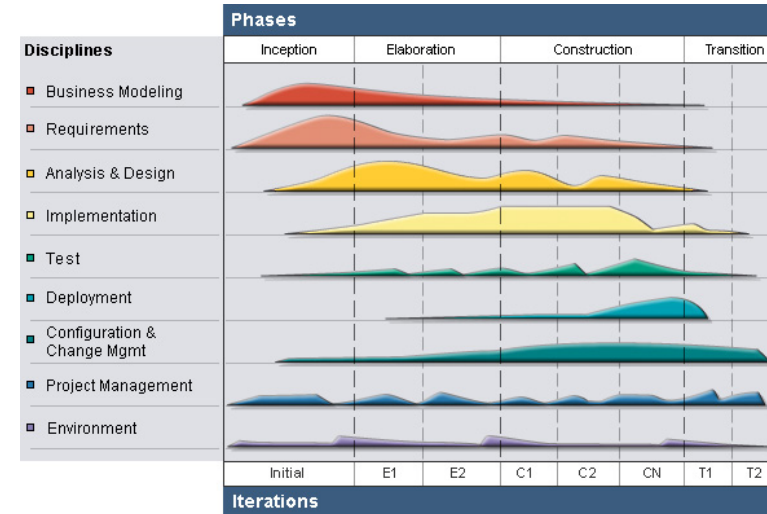
Defects == Requirements

Practices: Test-driven Development, Concurrent Testing, Test Management, Vulnerability Testing, Performance Testing

Source: January 2007 Dr. Dobb's Magazine

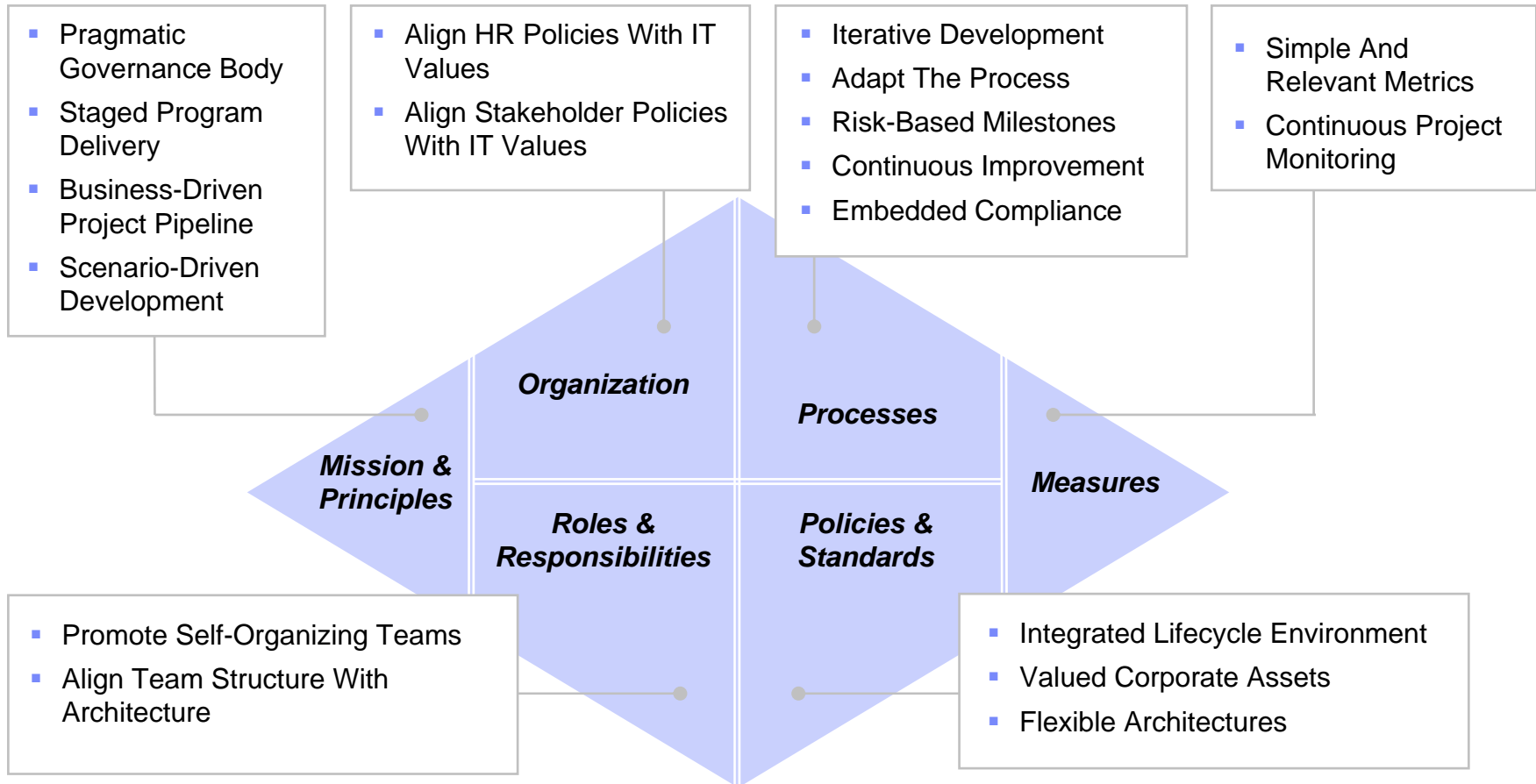
## Scale Agile via Rational Unified Process (RUP)

- Organizations have instantiated RUP to be very agile
- Scaling strengths:
  - ▶ Risk-driven milestones
  - ▶ Explicit “go/no-go” decision points
  - ▶ Stakeholder concurrence gained during Inception
  - ▶ Architecture proven via working software during Elaboration
  - ▶ Managed deployment during Transition



# Lean Development Governance

[www.ibm.com/developerworks/](http://www.ibm.com/developerworks/)



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# Measured capability improvement framework

## Map business value to software delivery best practices

- Target: Phase 1
- Already implemented
- Outside scope

Example: Financial Service Company

### Customer Business Challenges

- Create financial products more quickly
- Functionality of customer falling behind competition

### Operational Objectives

- Reduce

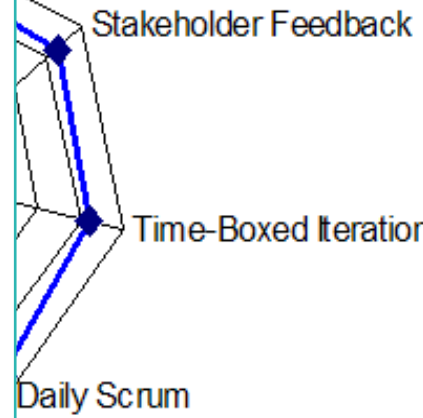
### Software Delivery Best Practices

Adopt Practice

### Ongoing Adoption Assessment

#### Operational Objectives Metrics

Project	Time to Market (M)	Quality (Defect Density)	Innovation (Cust. Sat. Survey)
A	22	2.3	7
B	14	1.4	4
C	18	1.6	6
D	9	0.3	8
E	6	0.4	10




# Service Offering: Health Assessment for Software Delivery

**Coming Soon!**



- Identify drivers for delivery improvements
- Current state: Showcase practice adoption level for target projects
- Future state: An initial roadmap outlining how you can evolve your delivery approach to address your key business drivers
- List of inhibitors that may prevent successful adoption of target practices
- Identifies potential metrics that help you track progress on the implementation of your roadmap

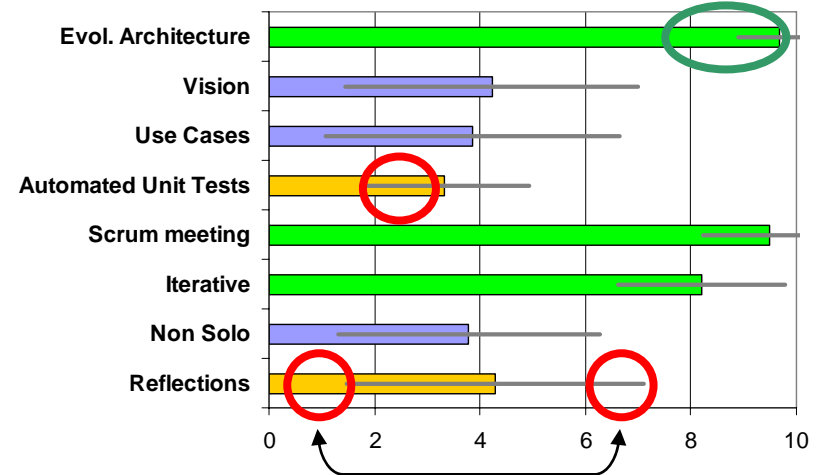


# IBM Rational Self Check for Software Teams

## The Assessment Tool

Practice	Comments	Average	Deviation
Use Cases	Use Stories instead	7.8	0.50
Unit Test	Not enough, not in build	6.8	1.89
Stakeholder Feedback	Want more	8.5	0.58
Time-Boxed Iterations	Not well specified	8.3	0.50
Daily Scrum	Not Fridays	9.3	0.50
Test Early	Not enough TDD	4.5	1.91
Reflections	Need clear actions	8.8	0.50
Static Analysis	Not automated yet.	3.3	0.96

## Big Picture of Practice Adoption



## Experience Report

### Executive Summary:

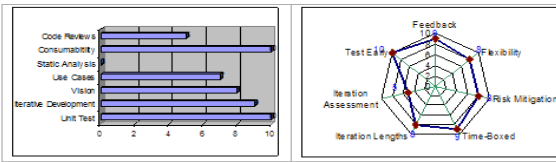
The Rational Asset Manager project proved to be an excellent example of agile and iterative practices for others to learn from including scenario-based development, automated testing, and having solid, working software at iterations end.

### Project Context:

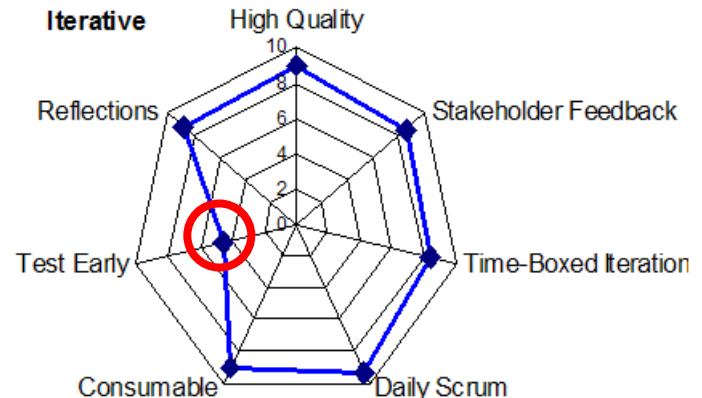
Context Factor	Value	Comments
Project Status	Just about done	Scheduled GA is June 29th
Project Length	18 months	
Team	30-35 people (20 dev) total across 4 teams	Includes developers, designers, analysts, architects, etc. Core team in Raleigh, rich client team in China (some in Austin and Chicago).
Iterations	Averaged 3 weeks each, 6 total iterations	5 iterations total (they are done)
Audit requirements	None	For example, is your product subject to CMMI level, ISO, or other standards requirements?
Programming Languages	Java, HTML, JavaScript	

Comments: Each iteration was around 60 days (they varied in length) with some being 30 days long. Iterations were predetermined, dates had to be met, meeting dates was critical, product needed to come out in Q2 of 2007.

### Use of Practices: (Scale of 0 - 10) 10 = 100% usage



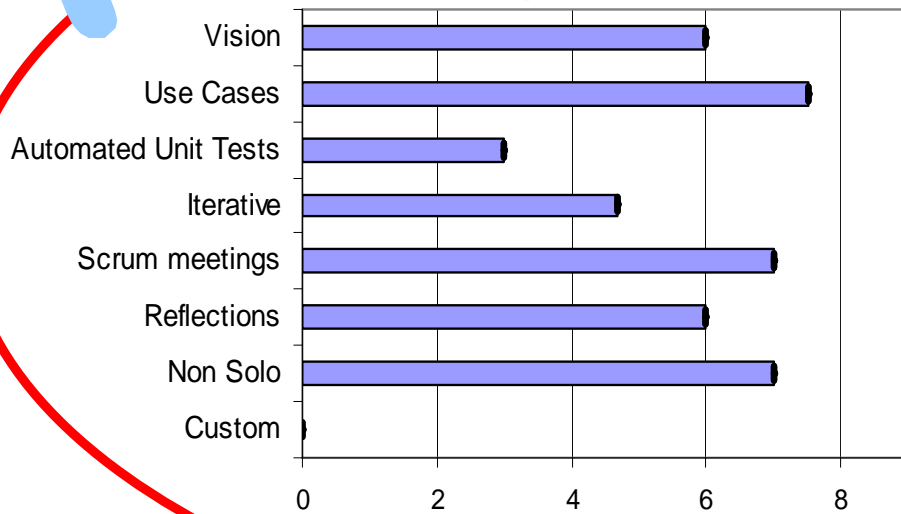
## Deep Dive on Practice



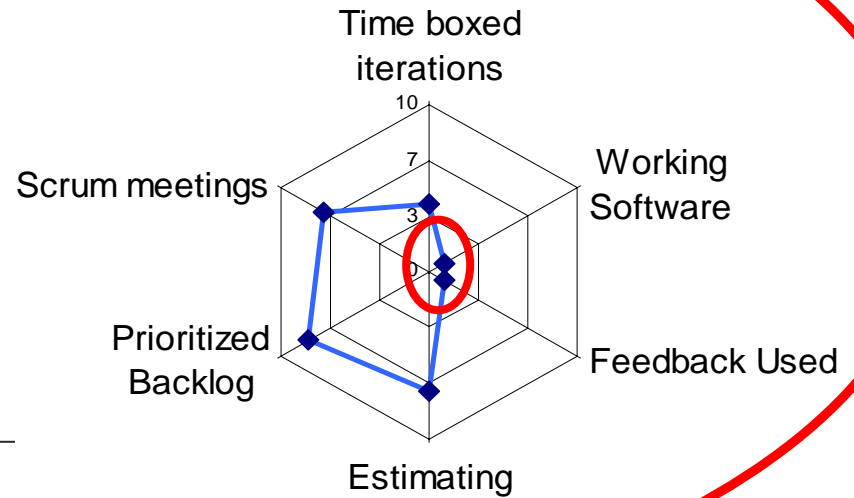


# Example: Are we iterative?

## The Big Picture



## We're iterative, right?



235 people. Multi-shore. Java

8 week "iterations". 24 Month project. New to agile.

Iterations have enabled them to realize the plan was severely overbooked and prioritization of content began early.

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## A Call To Action

- **Look beyond the Agile rhetoric**
  - ▶ Are you being helped, or being sold consultantware?
- **Agile can scale to accommodate technical and organizational complexity**
  - ▶ IBM Rational brings a wealth of knowledge to help companies succeed in complex environments
- **Get some Agile mentoring and training**
  - ▶ Project management and developer training is critical
  - ▶ Use MCIF as a systematic approach to improve
- **Adopt a scalable platform and tools that support agile development**
  - ▶ Jazz platform, IBM Rational Team Concert, BuildForge, ...
- **Adopt an Agile Form of RUP and associated practices**
  - ▶ Extend traditional agile practices with practices that scales



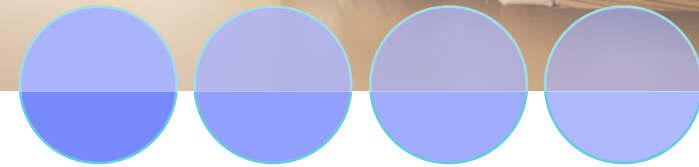
# Critical IBM Agile Resources



[www.ibm.com/rational/agile/](http://www.ibm.com/rational/agile/)

[www.ibm.com/developerworks/](http://www.ibm.com/developerworks/)

[www.ibm.com/developerworks/blogs/page/ambler](http://www.ibm.com/developerworks/blogs/page/ambler)





# QUESTIONS





# THANK YOU

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- [Change and release management](#)
- [Quality management](#)
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