



WHERE TEAMS ARE **R-HEROES**

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Software Development in IBM



IBM Rational Software Development Conference 2008

WHERE TEAMS ARE **R-HEROES**

A Global Team of IBM Software Developers

Pittsburg
Poughkeepsie
Somers
Yorktown Heights
Hopewell Junction

Southbury
New York City
Princeton
Hawthorne
Endicott

Andover
Bedford, MA
Bedford, NH
Essex Junction, VT
Lexington
Westborough
Westford
Cambridge

Edinburgh
London / Staines
Milton Keynes
Hursley
Warwick
York

US	16,100
Canada	3,400
Latin America	260
EMEA	4,820
AP	8,420
Total	33,000

Canada
Toronto, Ottawa
Montreal, Victoria

Cork
Dublin
Galway

Stockholm

Delft

Moscow

Krakow
Warsaw

Paris
Pornichet

Zurich

Boeblingen

China
Beijing
Shanghai

Yamato

Beaverton
Kirkland
Seattle
Foster City
San Francisco
SVL/San Jose
Almaden
Agoura Hills
Irving
El Segundo
Costa Mesa
Las Vegas

El Salto, MX

Rochester, MN
Boulder
Denver
Lenexa, KA
Tucson
Phoenix
Austin
Dallas

Fairfax
Raleigh
Charlotte
Lexington, KY
Atlanta
Boca Raton
Tampa

Rome

Cairo

India
Bangalore
Pune
Hyderabad
Gurgaon

Taiwan

Malaysia

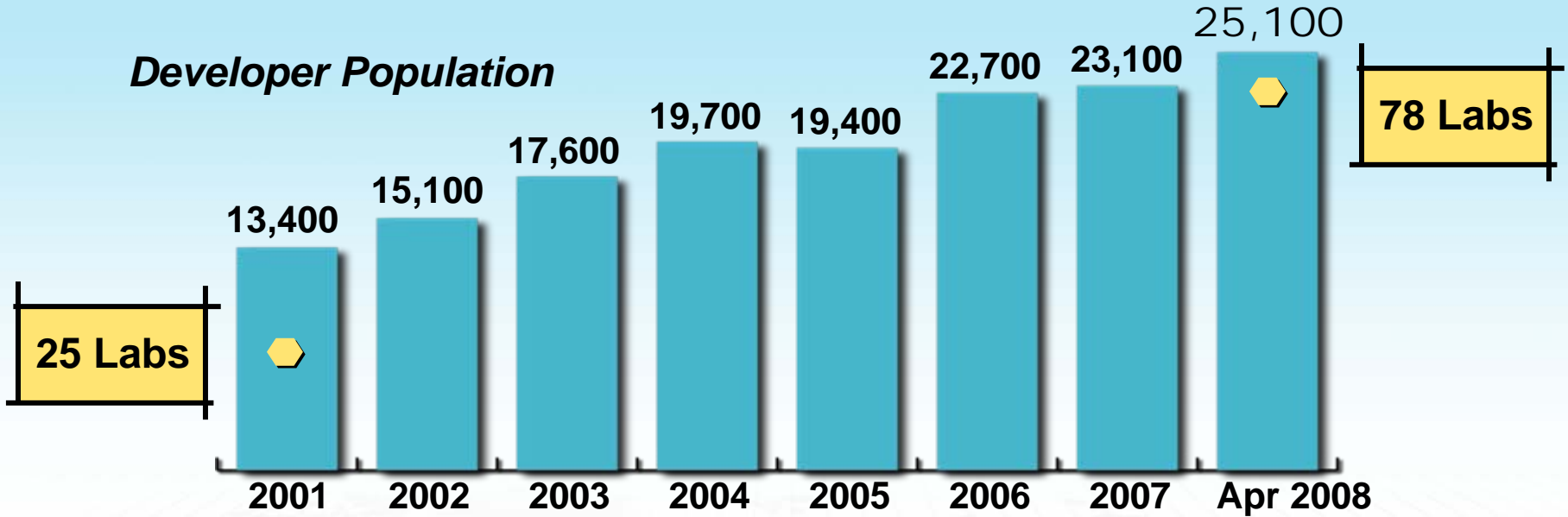
Sao Paulo

Gold Coast
Sydney
Canberra

Perth



IBM Software Group Developer Community Growth



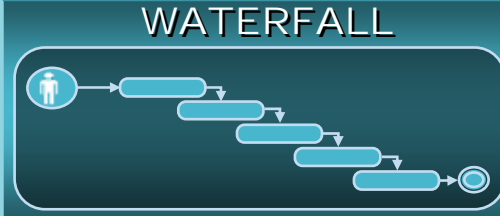
- 7,527 developers from 54 acquisitions since 2001
- 4,200 developers through organic growth
- Acquired and retained 40 Lab locations world-wide since 2001



IBM Software Development Transformation

1980's

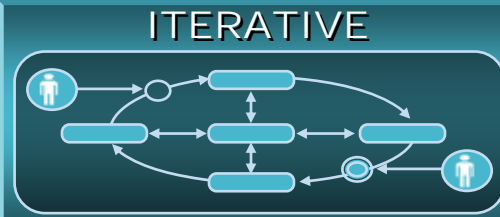
- Waterfall development
 - Rigid, late feedback, slow reaction to market changes



Rigid

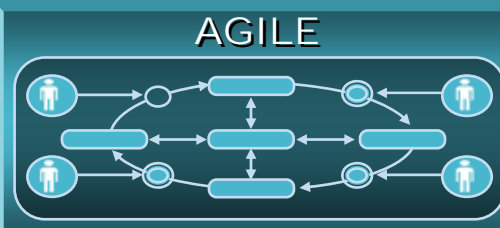
1990's

- Iterative development
 - Customized RUP, community source and component reuse, emphasis on consumability



Present

- Agile / Lean development
 - Global reach, SOA, agile practices, outside-in development, tools and not rules



Continuous Learning and Adaptive Planning



Development Governance Principles

Lightweight
central
mechanisms

Tools,
not
Rules

Support
for
Communities

Centralized
development
services



Diversity and Complexity Requires Teams to be More Effective and Adaptive

Organizational Drivers

Team Size

Geographical Distribution

Organizational Distribution

Entrenched process, people, policy

Agility at Scale
"Incremental to deal with uncertainty"
"Process to deal with complexity"

- Mature projects
- 50+ 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 & handoffs

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

Technical and Regulatory Drivers

Compliance
Governance
Application complexity



Development Transformation - Driving Change

Outside-in Design

Agile Development

Componentization
and
Reuse

Communities
and
Community Source



Outside-In Development

Outside-in development is about focusing on the business stakeholders who are affected by your software, and about applying that focus to the entire software cycle

The Four "Must Do's"

1. Focus on the stakeholders
2. Develop business scenarios
3. Use iterations
4. Remember that both iterations and final product need to be consumable by the target stakeholders and users



Agile Software Engineering

- Iterative, typically time-boxed as short iterations
- About frequent, even constant, validation with stakeholders
- Highly focused on mitigating risks
- Adaptive; comfortable with change & reprioritization
- Communication intensive (e.g., daily Scrums)
- Aimed at making incremental progress; working software is the measure
- Disciplined, scalable, and workable across sites



A good agile project will build something that meets customers needs but may be different from original plans



Components for Product Integration and Simplification

Reusable, Flexible Components

- Identified convention/standard
- Packaged function
- Flexible construction
- Best practices
- Developer ecosystem
- Community source

Standards

- Product consistency
- Product interaction in solutions
- Ease of use
- Agile product construction
- Simplified code base
- Less redundancy

Integrated, Consistent Products

What integration problem are we trying to solve?

What components do we need?

What conventions exist or do we need to develop?

What conventions are supported or implied?

When/where do we drive these into products?

Do we have components that fit or are we creating some? (through re-factoring)



Component Reuse in IBM

WebSphere
Application Server
**technology has been
reused and/or bundled
with 126 other product
offerings**

DB2
**technology has been
reused and/or bundled
with 175 other product
offerings**

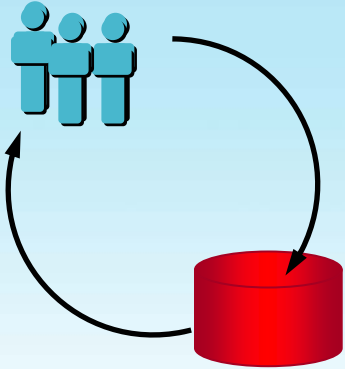
WebSphere Portal
**technology has been
reused and/or bundled
with 15 other product
offerings**

Informix IDS
**technology has been
reused and/or bundled
with 39 other product
offerings**

Cloudscape
**technology has been
reused and/or bundled
with 253+ other product
offerings**



Community Source in IBM Facilitates Reuse



Key Features:

- Access Control
- Product builds, fixes and test drivers
- Discussion Forums
- Reference information
- Defect Reporting
- Feature Requests
- Code Storage and Version Control
- Project Management

1,208 active projects and 26,149 registered users

Benefits

- **Reuse over reinvention**
- **Improving information flow**
- **Leveraging broader IBM**
- **Improving quality through peer reviews and user feedback**
- **Deliver more function on shorter schedule**
- **Most valuable assets get the most attention**
- **Facilitate development**



Business & Software Development Process

IPD – Integrated Product Development process

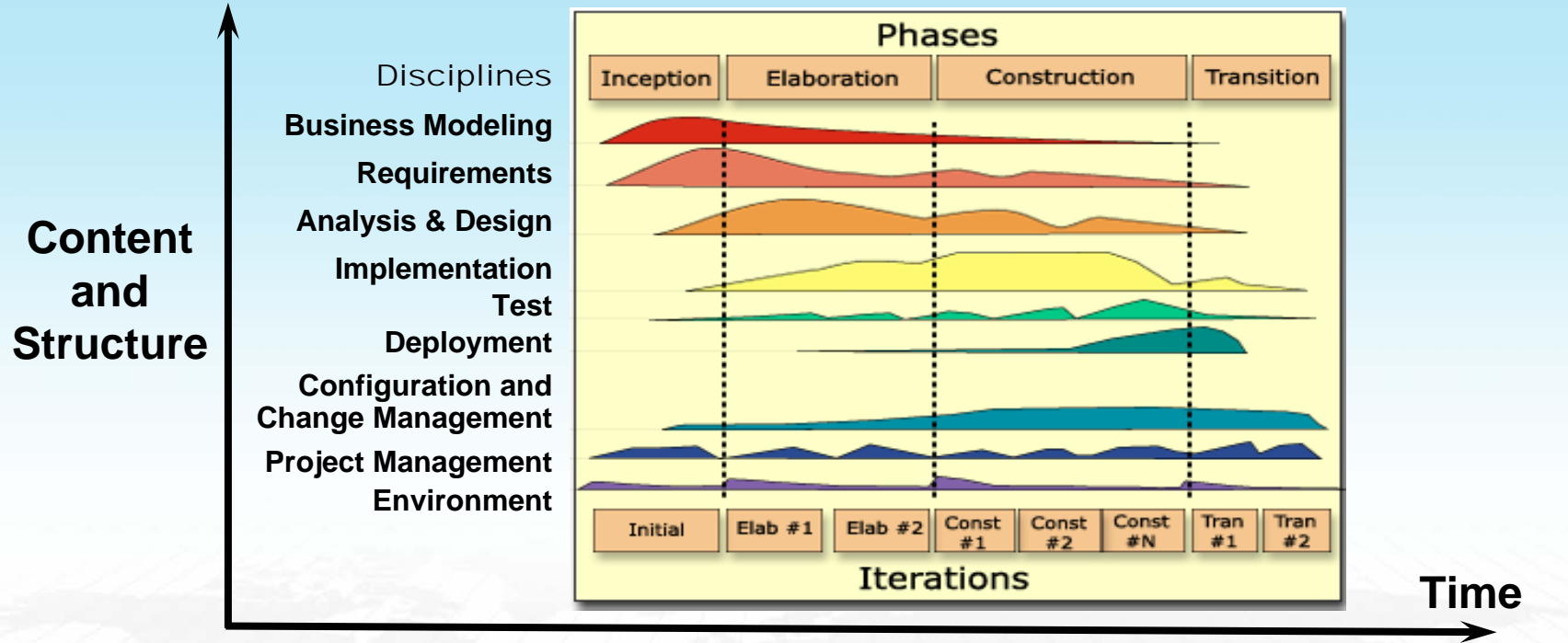
- **Structured, end-to-end process for managing business investment decisions and development efforts**
- **Methodology for defining, developing, qualifying, delivering, and supporting offerings**
- **Business life-cycle model for any type of offering**

IRUP – IBM (Internal) Rational Unified Process

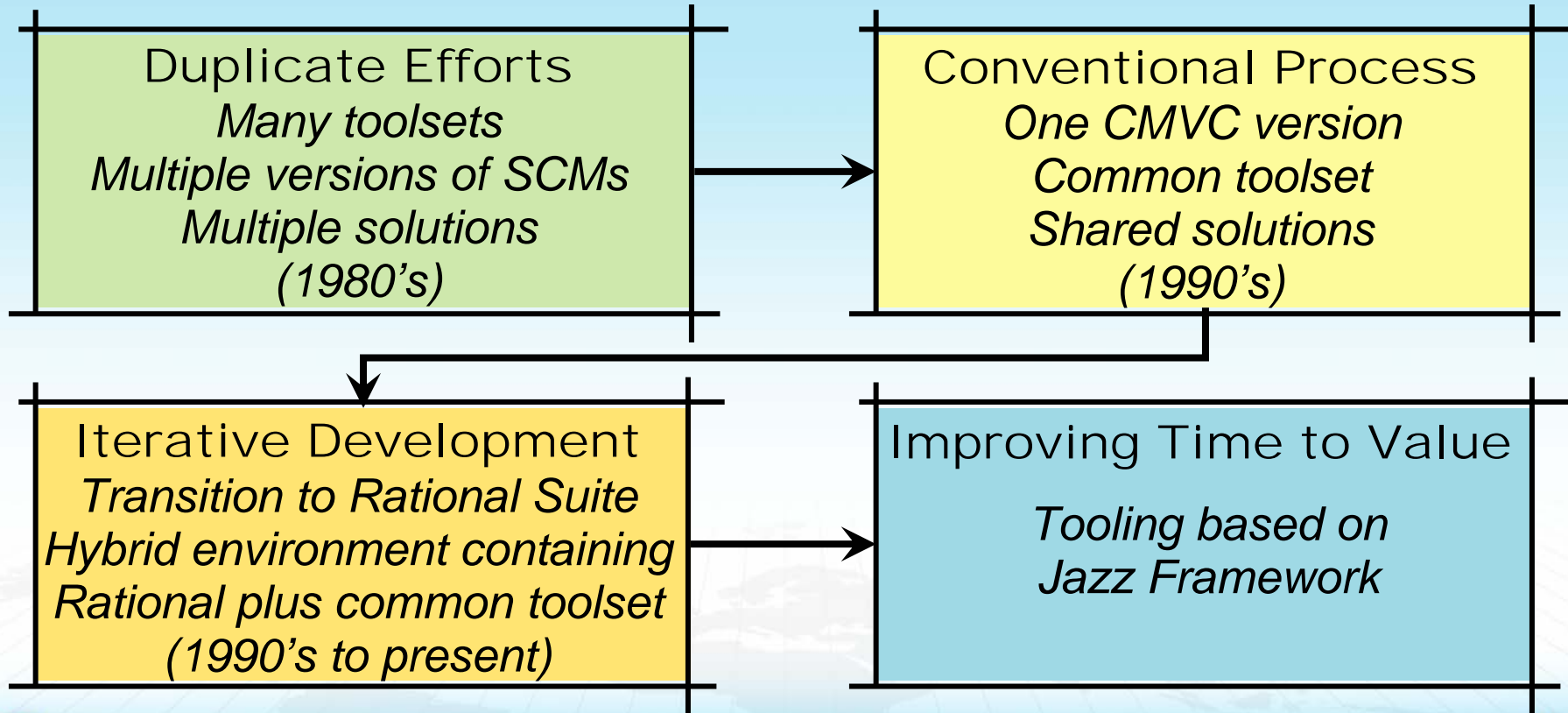
- **Customization of the Rational Unified Process to address the specific needs of IBM internal software development**
- **Underlying set of philosophies and practices for successful software development**
- **Software development life-cycle model for the development of software**



IBM Using Rational Unified Process = IRUP



IBM Development Tool Evolution



Internal Adoption of Rational Solution

- Rational products deployed to the *“Right Team”* at the *“Right Time”*
- **Top adoption enablers**
 - Executive and technical commitment
 - Dedicated deployment engineers for Team Products (CC, CQ)
 - Support for internal IBM for ALL Rational tools
 - Rational Knowledge Sharing Center Web Site
 - Education – online training, forums
 - Best practices
 - Downloads
 - Beta support



Rational Software Development Team

Using Rational Tools for Rational Development

- Rational Unified Process
- Rational Asset Manager
- Rational ClearCase
- Rational ClearQuest
- Rational Team Concert
- Rational RequisitePro

600
users

- Rational Software Architect
- Rational Build Forge
- Rational Manual Tester
- Rational Functional Tester
- Rational Performance Tester

Used by
60+ Rational
development
efforts



DB2 V9 Development

Challenge

- **Deliver high quality product, on schedule, leveraging collaborative development effort of**

1,000 developers,
spanning 12 labs,
in 8 countries

Solution

- **Rational ClearCase for configuration management**
- **Rational ClearQuest for change management**

deployed worldwide as a standardized platform for cross-site development

on schedule
highest quality



IBM Tivoli Rome Lab Increases Productivity

Challenge

- Increase productivity of development and testing teams
- Improve quality of products

Solution

- Rational Unified Process
- Rational Software Architect
- Rational Functional Tester
- Rational Method Composer

Benefit

- 30% increase in developer productivity
- Requirements and design defects cut in half
- Test productivity increased by 20%, while test coverage increased by 30%
- 20% of all functional testing automated

Overall, 200% ROI on first product release using Rational Tools



WebSphere Application Server Development

900+ Developers

- China
- Canada
- Germany
- India
- Israel
- Japan
- UK
- USA

WebSphere



4.1M+ New LOC

- 325 separate build images
- 900+ builds per week
- 200 automated build tests
- 50,000 Java cert tests
- 35,000 function tests
- 1,100+ customer scenarios

Using the Right Tools

- *Rational Unified Process* for “use cases” best practices
- Build tools, using *Rational Build Forge*
- *Rational Application Developer* for code modeling and development tools
- Automated GUI testing with *Rational Functional Tester*
- Stress testing with *Rational Performance Tester*



Tivoli Storage Manager Testing

Challenge

- **Development cycle of 12 months for major release and quarterly for maintenance put significant strain on test team**
- **Needed to automate test process to reduce cycle time and human error**

Solution

- **Rational Functional Tester for automating test bucket**

quickly assess and baseline overall quality for new product builds and maintenance releases

**reduced
test effort by 90%
from 5 days → 3 hrs**



Tivoli



Best Practices for Distributed Development Success

Sound
Development
Governance
Principles

+

Enable for
Success

+

Execute
Agile / Lean
for Productivity

=

Guiding
Principles for
Software
Development

- Lightweight central governance mechanisms
- Development Steering Committee
- Architectural Board
- Culture of sharing and reuse
- Developer Web site
- Centralized development services

- Tools, not Rules
- Community source
- Shared asset repository
- Best practices
- Common components
- Clearing House for dependency management

- Discipline, adaptive development approaches
- Continuous stakeholder feedback to understand changing needs
- Time-boxed iterations
- Eliminate waste, increase visibility

- Architecture Blueprint
- Outside-in Development
- Agile / Lean approaches
- Modeling and Componentization
- Fostering Communities and sharing Best Practices





IBM®

RU READY TO SAVE THE DAY



IBM Rational Software
Development Conference
2008

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