Modernizing the Enterprise for an Agile World: Trends and Challenges

IBM®

Driving Trends

Market Insights

Bola Rotibi, Research Director

Creative Intellect Consulting Ltd

CIC
CREATIVE INTELLECT CONSULTING LTD.

Modernizing the Enterprise

Dana Boudreau

Program Director - Rational

Driving Trends
November 7th, 2012

Market Insights

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CIC
CREATIVE INTELLECT CONSULTING LTD.

CIC: Who are we?

- Analyst research, advisory and consulting firm

- Focus on Software development, delivery and lifecycle management

- Combined 90 years IT industry and analyst experience

- Authored many reports and thought leading research

The changing world order

Finding balance is crucial

Greater Opportunities
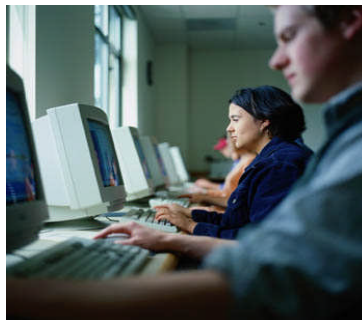
for how we work, live and play:

Cloud computing

Mobile

Social media

Smart devices

Entertainment

Broader scope, connectivity, engagement and reach

Greater productivity

The consumerization impact

Increasing threat landscape

- Internal

- End point devices & smart devices (e.g. Smart metering devices)

- Cyber crime - McAfee report "Night Garden" highlights web server vulnerabilities

- Application code vulnerabilities:

More resources looking for application and system vulnerabilities

IBM X-Force study exposes the diverse risks from security vulnerabilities

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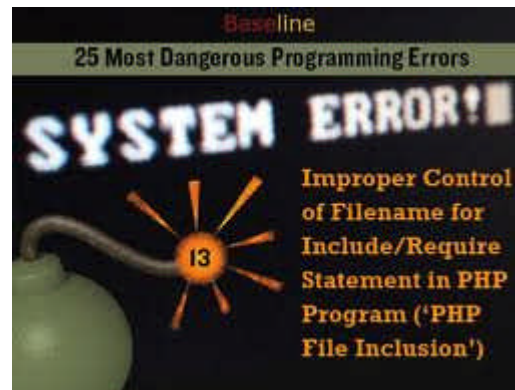
Understanding the value of social reach

Applications & Networks

Communication Connectivity

Reach & Influence

A diverse remit for Engagement, Influence and Insight

The social challenge: a big data story?

Winners and losers dictated by those who can leverage the data diversity and volume to drive insight and opportunity and respond quickly to impacts

A shift in focus and potential

User Power & Control

Choice

Influence

Self determination & service

Expectations

Involvement

Shifting liability & risk

Making User Experience & Engagement Matter

Market Insights

Real world feedback

CIC IT Decision Maker Study 2011/2012

- Three industry sectors
  - Financial
  - Retail & manufacturing
  - Communications

- Two interviews per organization
  - Business
  - Technology

- Role level
  - Senior business management and technical leads

Resulting drivers raising the bar

| Driving business growth & competitiveness | Raising the operational bar | Market reach & engagement |

Actionable Insight
Business, Operations, Customer, Supplier – Big data correlations and support

An expanded conversation

"How can I scale without scaling costs"

"Help me reduce costs"

"Help me be more efficient"

Business Efficiency & Productivity

"Help me grow the business"

"Help me innovate"

"How can I leverage..."

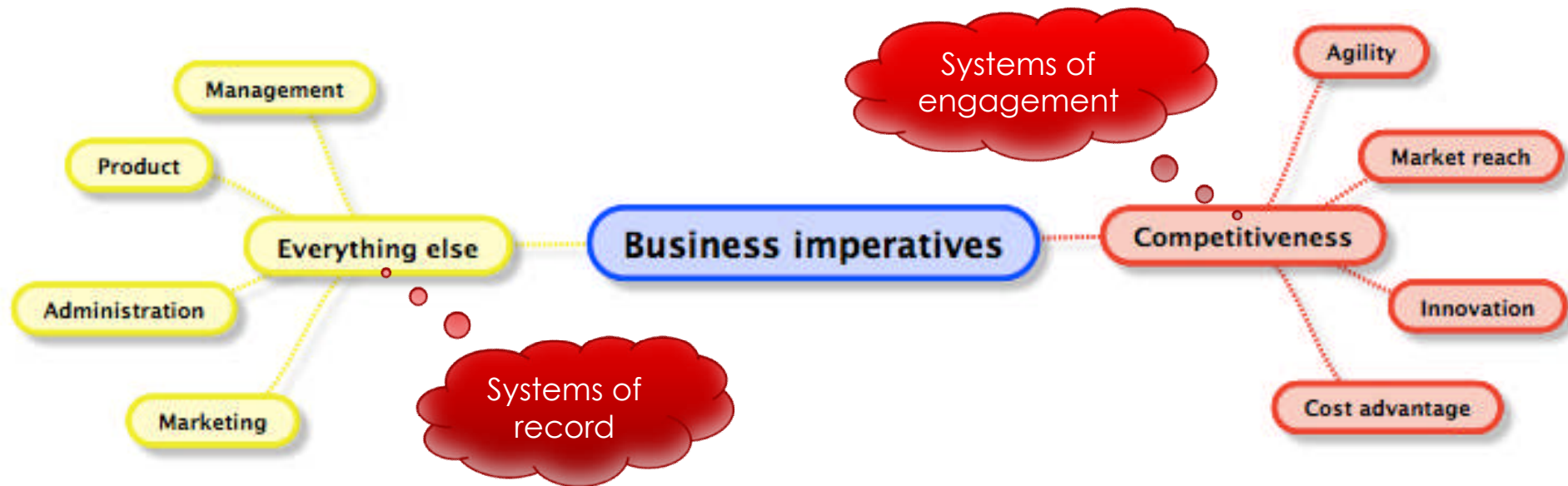"Help me adapt and deliver quickly"

"Help me improve the quality"

Business Agility & Expansion

Today's IT context

Business imperatives → Technology opportunities → Challenges → Solutions
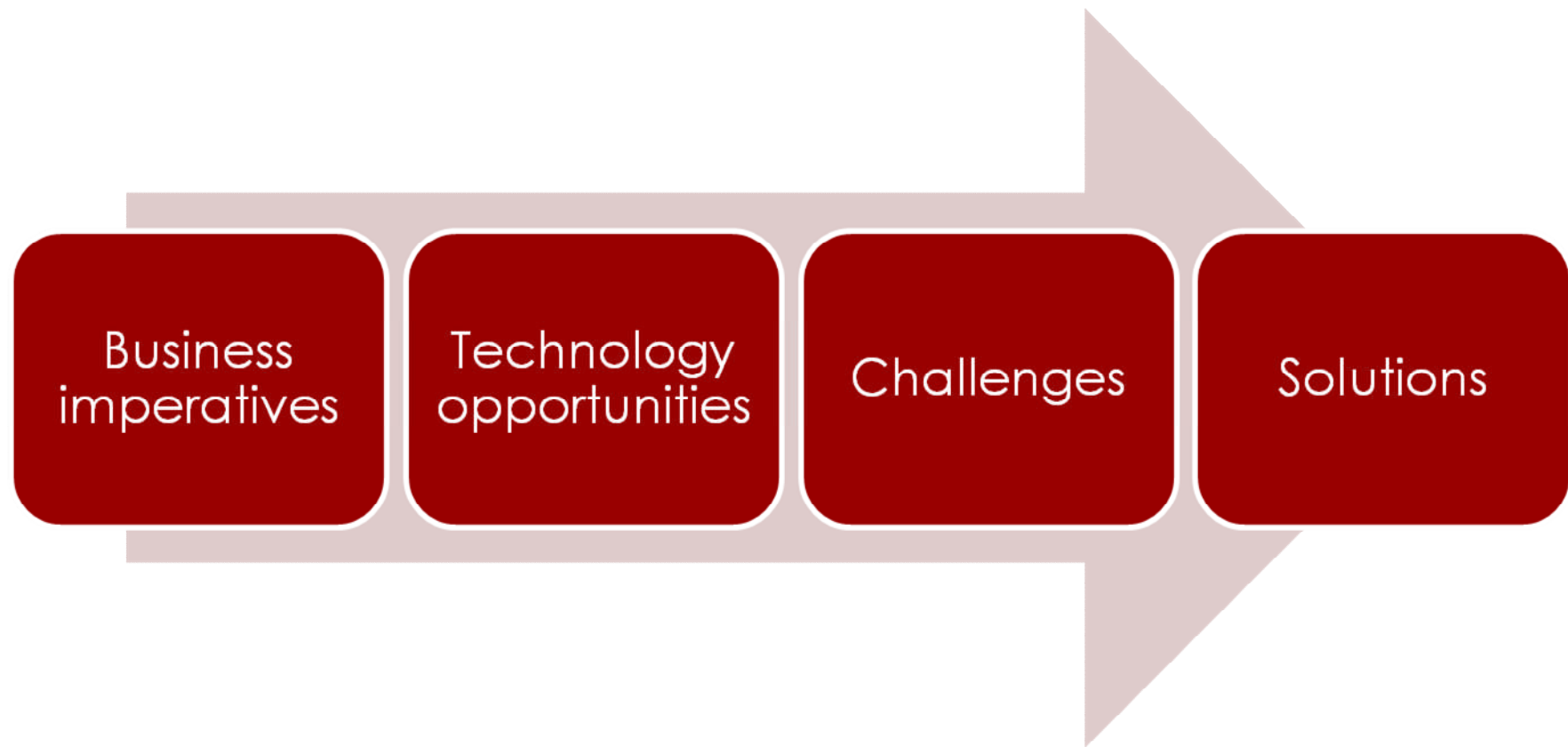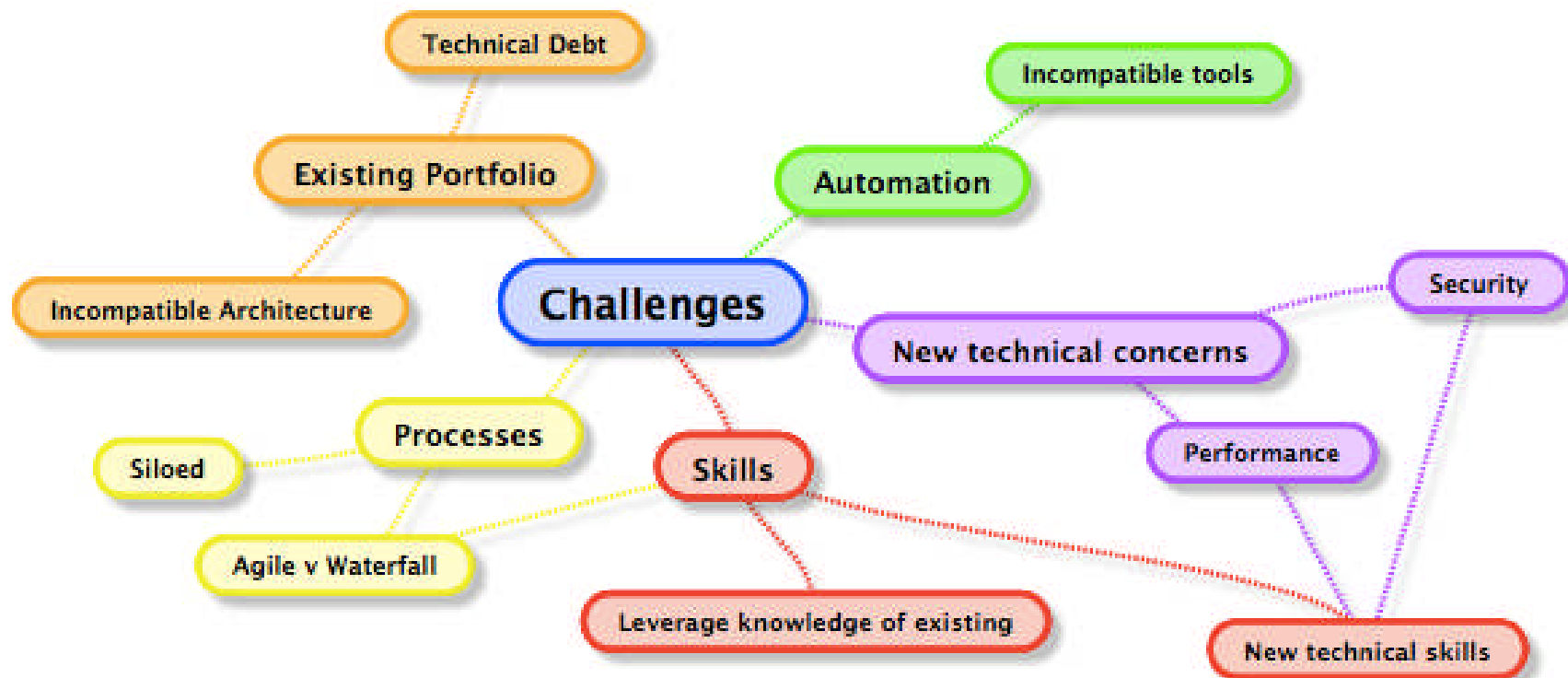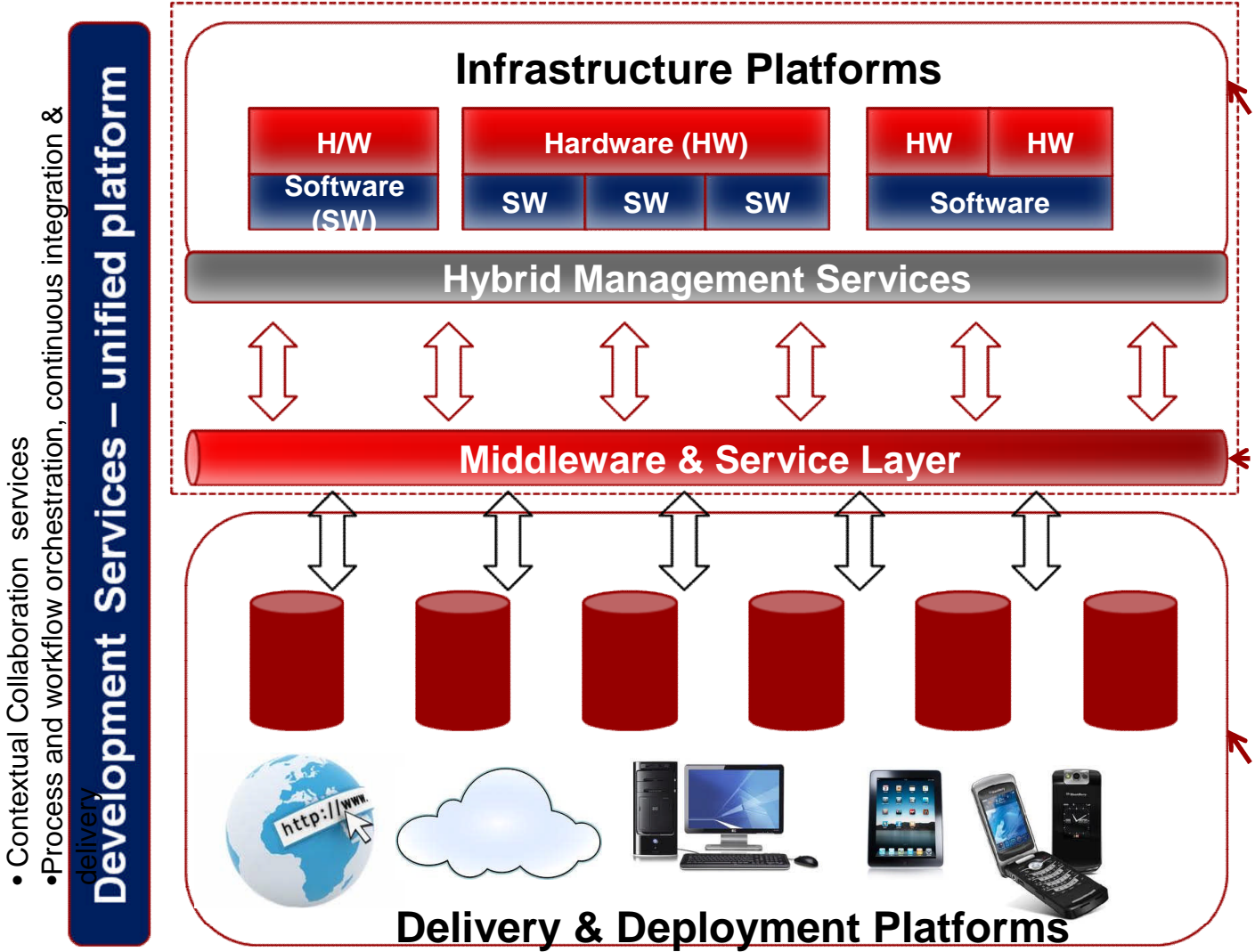
Business imperatives

Technology opportunities

- For systems of record *and* engagement

- Clients *and* employees

Challenges

Managing mixed workloads and hybrid platforms

Development Services – unified platform
- Contextual Collaboration services
- Process and workflow orchestration, continuous integration & delivery

Infrastructure Platforms

H/W	Hardware (HW)	HW	HW
Software (SW)	SW	SW	SW	Software

Hybrid Management Services

Middleware & Service Layer

Delivery & Deployment Platforms

Balancing competing concerns & pressures

Transparency Visibility, Insight

Multiple Sourcing

Flexibility of choice & Managed governance

Skill utilization & transfer

Globalization & Distributed teams and systems

Interoperability

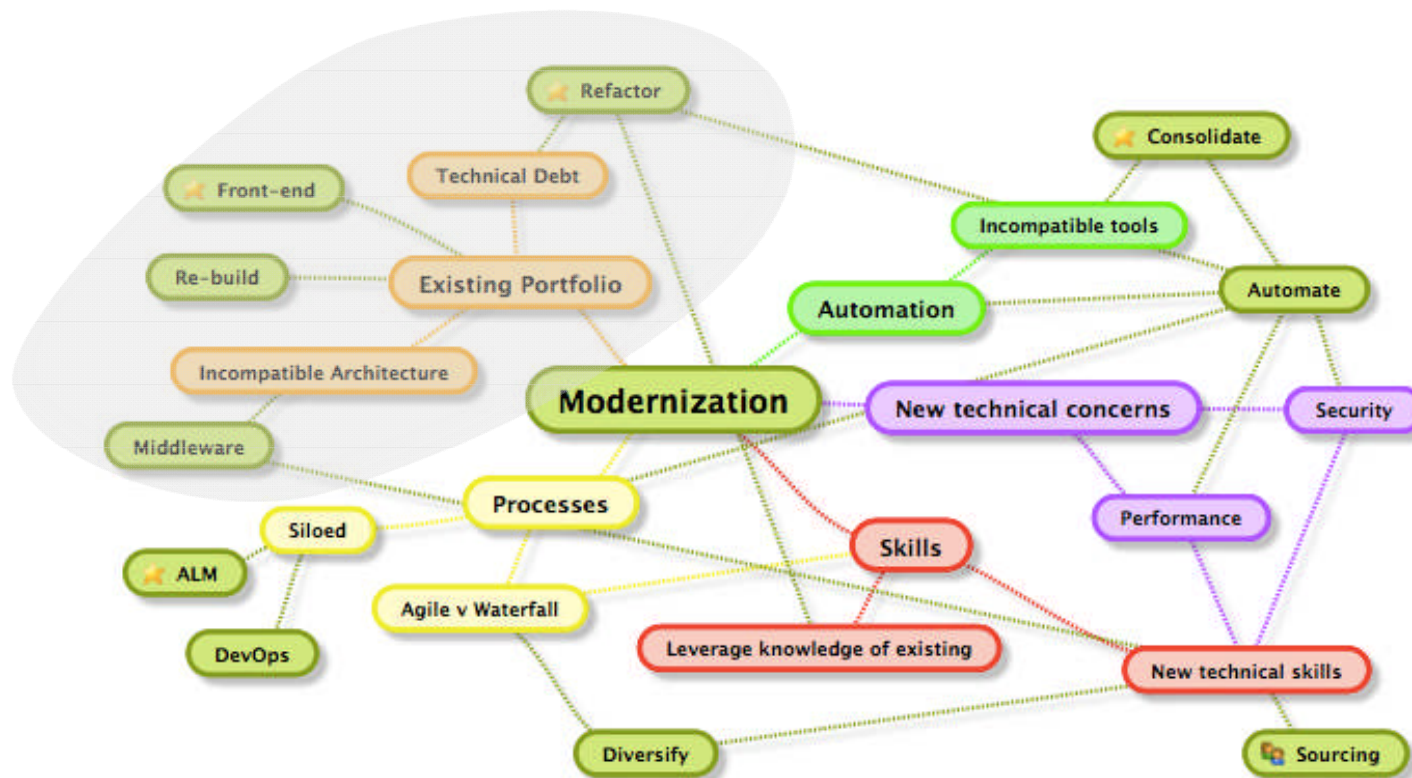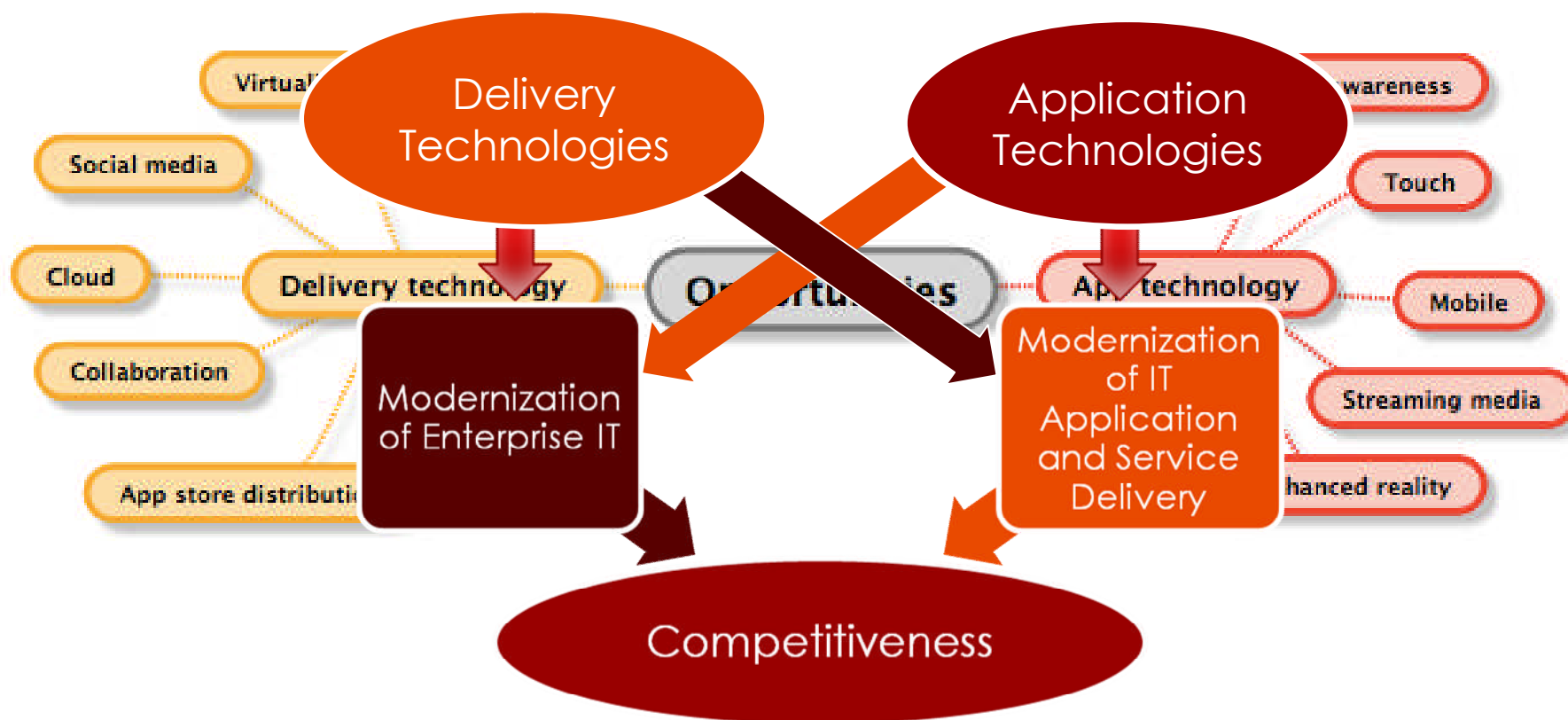End-to-end velocity with disparate workflows & team dynamics

Automation

Addressing the challenges

Enterprise IT modernization
and modernizing of IT

20

Modernizations

Applying technologies for modernization

Real World Insights

Driving business growth & competitiveness

- **Short** term growth agility (e.g. Light weight IT support to quickly address market opportunities)
- **Sustainable** long term growth (the challenge of and need for a more strategic architectural planning approach)
- **Ability** for controlled and incremental innovation

- Global Pharmaceutical IT Architect Group:

- Agility, growth and innovation through collaborating with external systems, services & partners
  - Focused away from building large scale global architectural systems and delivering short lived (e.g. 3 months) systems for difficult complex problems
  - Connected with established external data sources services and real world evidence to :
    - identify new drug combinations and new formulations for existing products and compounds
    - Apply analytics and search facilities across publically available scientific document databases to identify important influencers to test new hypotheses

Raising the operational bar

- **Optimized** operations and network infrastructure - Cost reduction and new ways to deliver and operate at lower costs and more efficiently
- **Effective** and efficient lifecycle, management and administrative control
- **Environmentally** and socially responsible focus on system resources (power consumption etc.)
- **Internet** interactions and connections
- **Improved** productivity through self service and client control
- **Global** support and interaction
- Interoperability and accessibility to all business systems and data
- **Stabilising** and maximising skill resources (technical and business)
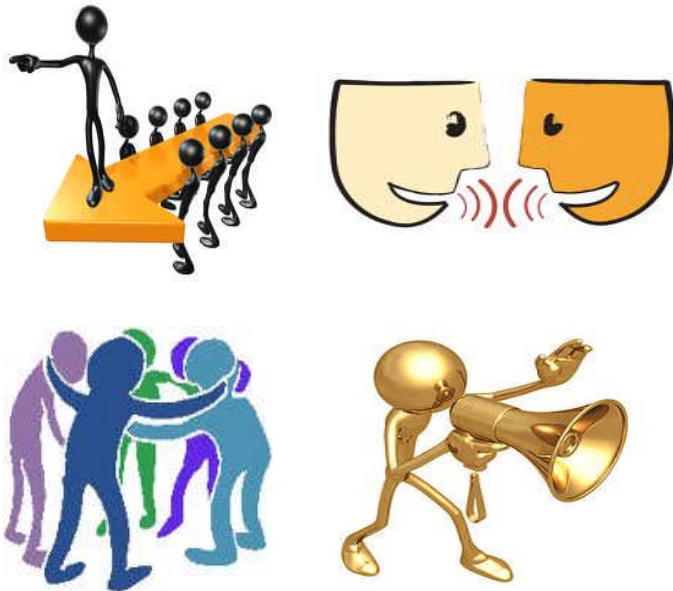
People

Process

Technology

Tools

People strategies

Addressing culture and mindset challenges

- US Healthcare group:
  - Strong CTO support – maps out core areas with plan for bridging gaps
  - Adoption awareness team to drive knowledge of tools and processes

- European Tax & Revenue office:
  - Focus on the right people to interact – Architects, Development and Service Managers with Business roles
  - Employ lifecycle collaborative practices & tooling support – ALM, Agile processes
 - Guidelines for app deployment and boundaries for operation

Process strategies

- European Tax & Revenue office:
  - Employed Agile Practices – promote better awareness of stakeholders & workflows
  - Strengthened handover Policies – Ops team write out guidelines for acceptance and deployment configuration
  - Clear distinction between Dev & Ops dynamics and goal drivers – guidelines for process, application and technology
  - Application and workload monitoring to identify performance criteria for application design

- US Healthcare group:
  - Prioritized on the main fail points at the interface
  - Identified use cases and enterprise process flow
  - Aligned common process links for Dev and Ops

Technology & Tool strategies
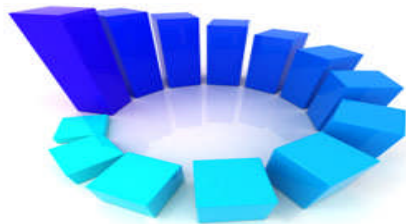
- European Tax & Revenue Office:
  - Centralized group captures and manages the guideline standards for Dev & Ops tools and processes
  - Standardized ALM and ITSM tooling platform support
  - Integration strategy for configuration, change and problem management
  - Looking to implement Asset Management tool

- US Healthcare group:
  - Out of the box integration between Incident & Problem Management tool and Production Defect tool
  - Piloted provisioning support for non production environment to improve environment provisioning and flexibility

Operational Improvements & Asset Expansion

- **European health insurance provider:**
  - Underlying hardware a hybrid of mainframe and BladeCenter centralized the resource management facilities
  - Enabled more effective and efficient balancing of resources to meet critical application demand.

- **North American bank:**
  - Modernized its middleware and tooling to expose mainframe data assets to the diverse range of devices and online applications used by customers

- **Global specialist in mobile broadband**
  - Delivering their configuration management services through a dedicated managed service provider enabling better monitoring and profiling of usage – leading to cost savings

Market reach & engagement

- **Flexible** means of engagement – multi-channel accessibility and delivery
- **Interoperability** support
- **Cost choice** – flexible pricing and access framework support
- **Mobile** (multi-device), Internet, Self Service
- **Contextual** interaction and social collaboration
- **Digital media** (video, HTML5 etc.) and content support and promotion

- Global Computer Aided Engineering Modelling & Design Provider:

- Cloud delivery service
  - Opening up costly but valuable simulation services to a wider market audience and helping to improving the quality of products.
  - Providing wider access to powerful simulation scenarios whilst freeing up in house resources
  - Improving the skills and people training
  - Delivering more intensive processing power
  - Enabling greater collaboration amongst client base and with the provider

Cloud opportunities

- European Games Publisher: rethink and improve business and work processes

- Hybrid Cloud Services for internal and external game testing and development
  - Improved security – supported sign code and tracking of downloads
  - Allowed new considerations for code management
  - Developer supported deployment e.g. Direct deployment for online games

Technology support helping to deliver key aspirations

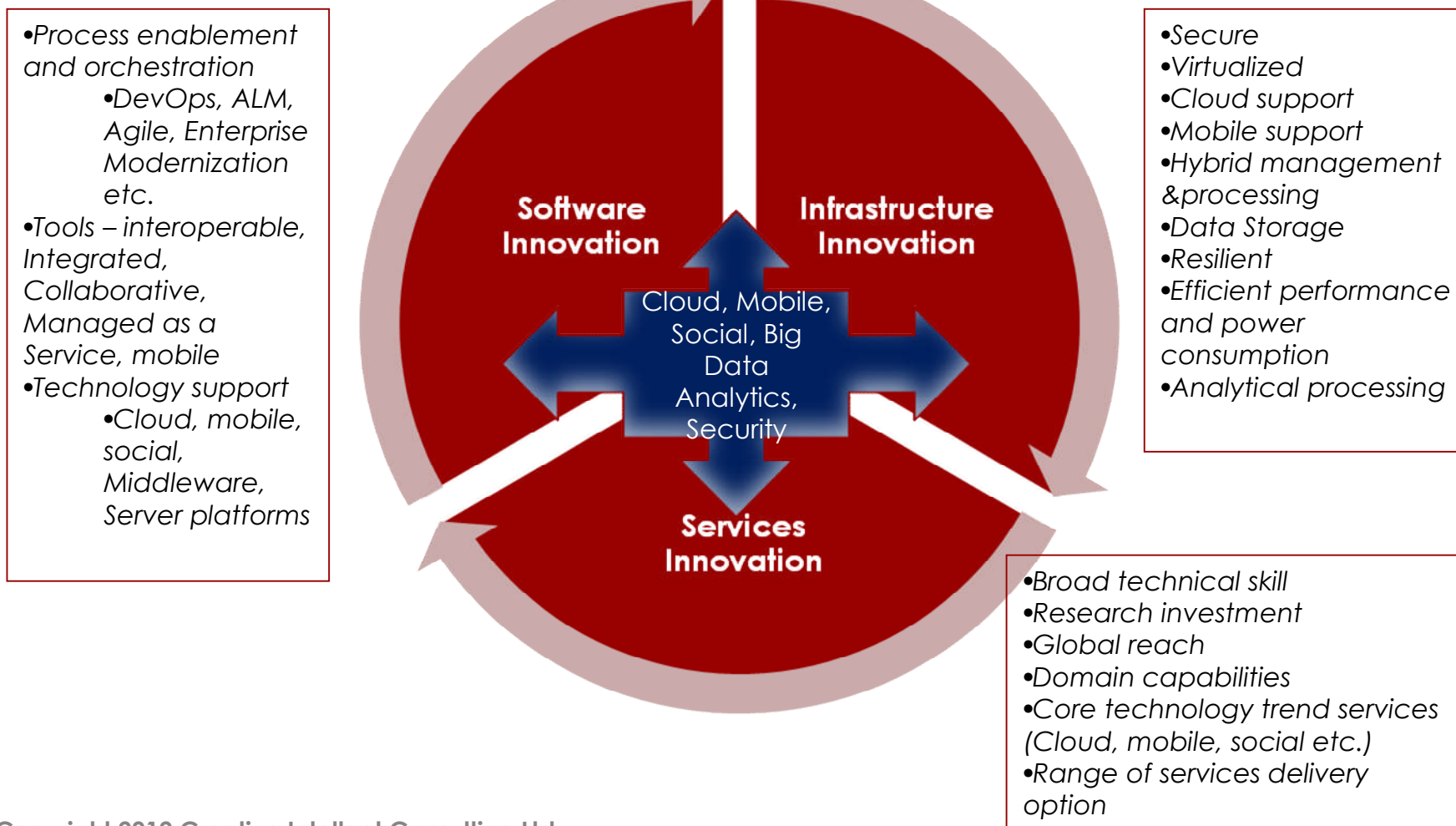| Aspiration	Realization	Infrastructure/ Technology	Challenges & Concerns
Cost efficiency	**Shift** of CAPEX to OPEX **Greater** utilization of assets **Lower** hidden costs such as energy **(TCO)** Total Cost of ownership reduction **Enable** growth and improve Time to Market	Virtualization. Cloud computing (public/private/hybrid) (BYOD) Bring Your Own Device	Control and ownership Ensuring corporate governance Match internal SLA with cloud SLA
Improved software security	**Automated** & embedded security controls **Adherence** to known security profiles **Compliance** with corporate governance and legislation	Two factor authentication. Federated security. Encryption. Software testing tools. Penetration testing tools. Server appliances.	Multi-layered attacks. Integration of multiple platforms. Secure code processes. Risk of BYOD and data security.
Improve Market reach and audience share	**Competitive** advantage through applications	Social and digital media Mobile platform and application	Software quality Software testing Speed of development

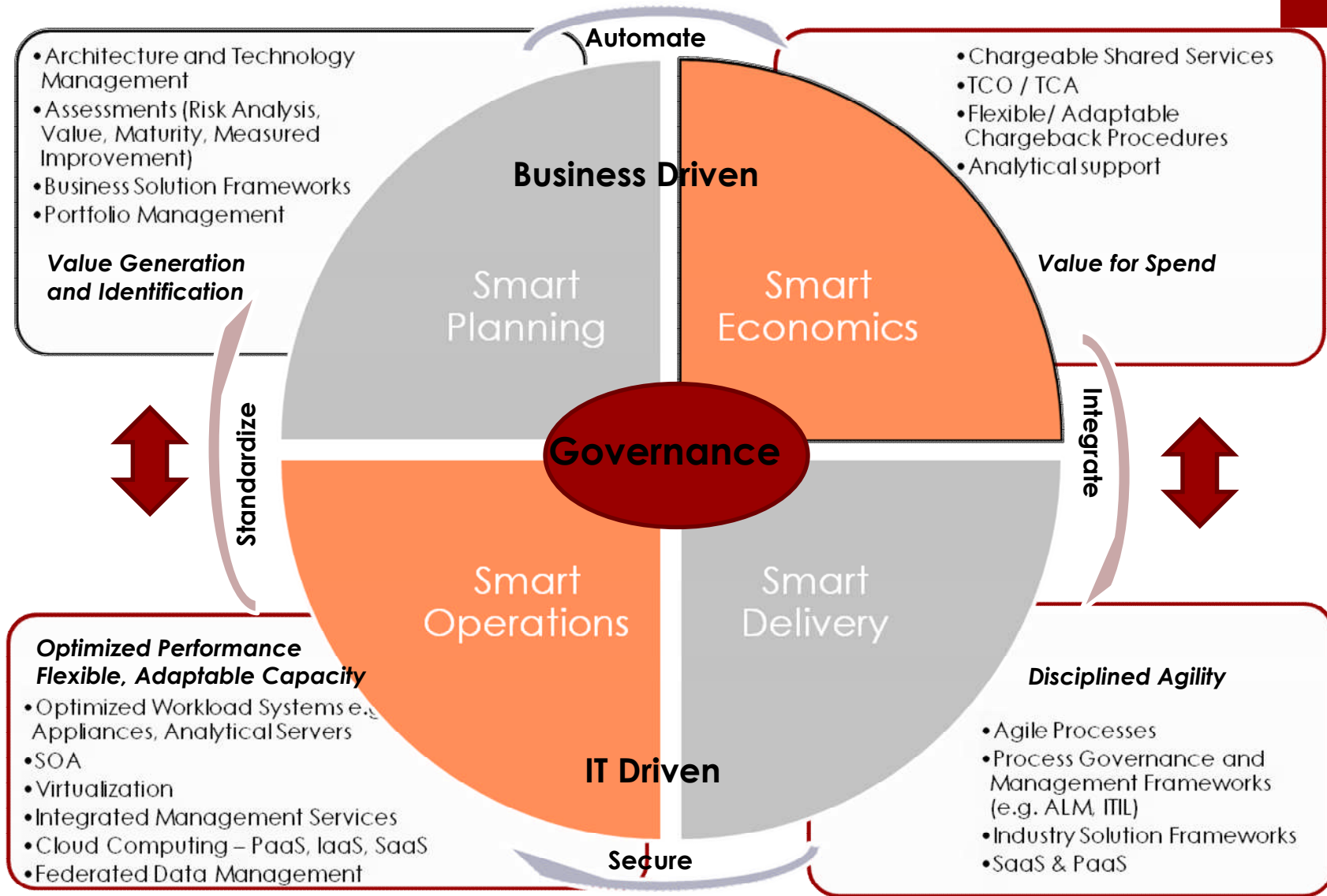# Technology support helping to deliver key aspirations - continued

Aspiration	Realization	Infrastructure/ Technology	Challenges & Concerns
Insight through data analytics	**Generating** revenue from existing data **Creation** of new markets and services based on data relationships	Cloud Social analytic and Data analysis tools Federated data sources Faster storage networks Business Intelligence Big Data (Hadoop)	Data security Data ownership with federated data Explosion in data storage Data transformation and format Data quantity
Improve customer experience	**P**ersonalized applications for users **M**obile applications **S**ocial media **E**asy development of front-end applications.	Rich Internet Applications (RIA) HTML5 Native App Development tools (e.g.Worklight)	Developer training User experience design Interaction design

Technology support helping to deliver key aspirations - continued

Aspiration	Realization	Infrastructure/ Technology	Challenges & Concerns
Operational efficiency	**R**educe cost of management. **E**nforce governance principles **I**mproved quality **F**aster delivery	DevOps - ITIL/ITSM Application Lifecycle Management Agile methodologies and lifecycle management Middleware services (messaging & transaction processing) Expert Integrated Systems	Removing silo mentality Speeding up deployment Change of development practices
Back office efficiency	**B**etter access to core business systems.	Middleware services CRM/ERP SOA Enterprise Systems	Secure end-to-end applications Getting past silo mentality Securing core systems while making it easy for application developers to write to

A charter for modernization & evolution

• *Process enablement and orchestration*
    • *DevOps, ALM, Agile, Enterprise Modernization etc.*
• *Tools – interoperable, Integrated, Collaborative, Managed as a Service, mobile*
• *Technology support*
    • *Cloud, mobile, social, Middleware, Server platforms*

Software Innovation

Infrastructure Innovation

Cloud, Mobile, Social, Big Data Analytics, Security

Services Innovation

• *Secure*
• *Virtualized*
• *Cloud support*
• *Mobile support*
• *Hybrid management &processing*
• *Data Storage*
• *Resilient*
• *Efficient performance and power consumption*
• *Analytical processing*

• *Broad technical skill*
• *Research investment*
• *Global reach*
• *Domain capabilities*
• *Core technology trend services (Cloud, mobile, social etc.)*
• *Range of services delivery option*

Automate

- Architecture and Technology Management
- Assessments (Risk Analysis, Value, Maturity, Measured Improvement)
- Business Solution Frameworks
- Portfolio Management

Value Generation and Identification

- Chargeable Shared Services
- TCO / TCA
- Flexible/ Adaptable Chargeback Procedures
- Analytical support

Value for Spend

Business Driven

Smart Planning

Smart Economics

Governance

Standardize

Integrate

Smart Operations

Smart Delivery

IT Driven

Optimized Performance Flexible, Adaptable Capacity

- Optimized Workload Systems e.g. Appliances, Analytical Servers
- SOA
- Virtualization
- Integrated Management Services
- Cloud Computing – PaaS, IaaS, SaaS
- Federated Data Management

Disciplined Agility

- Agile Processes
- Process Governance and Management Frameworks (e.g. ALM, ITIL)
- Industry Solution Frameworks
- SaaS & PaaS

Secure

Continuous Improvement through Audit & Validation

Modernizing the Enterprise for an Agile World: Trends and Challenges

Dana Boudreau

Program Director - Rational

Today's IT context

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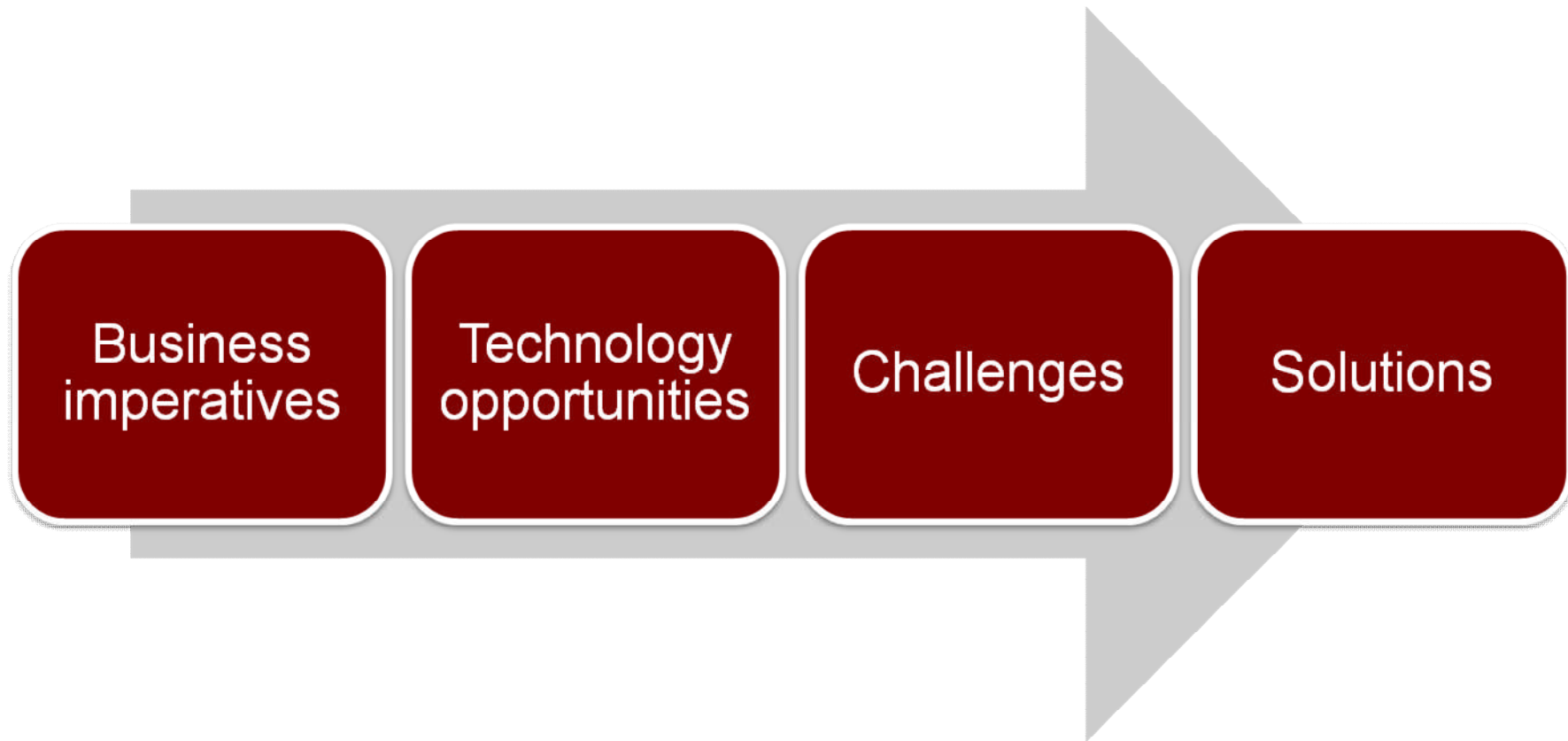
Trends in enterprise application management & development

Portfolio Strategy and Management

- "Average amount spent on **ongoing operations and maintenance exceeds 65%** of the IT budget, but many firms report much higher percentages" [1]
- Understanding the application portfolio results in development spend where it can have **the most value**. [2]

Continuous Integration [2]

- Early and frequent builds and testing provides immediate feedback to developers, resulting in bugs being found earlier when **less costly to fix**.
- This has **rarely been done** in mainframe development where the time to deploy and test changes is measured in weeks not hours, and cost for test automation can be prohibitive.

Mobile Development [3]

- **75% respondents** currently working in mobile computing, **growing to 85%** within the next two years
- **31% are focused** on extending existing core applications with mobile capabilities

Cloud Computing [3]

- **75% believe** that over the next two years their organizations will begin to build cloud infrastructure
- **25% of the respondents** indicated that they plan to develop new applications for the cloud
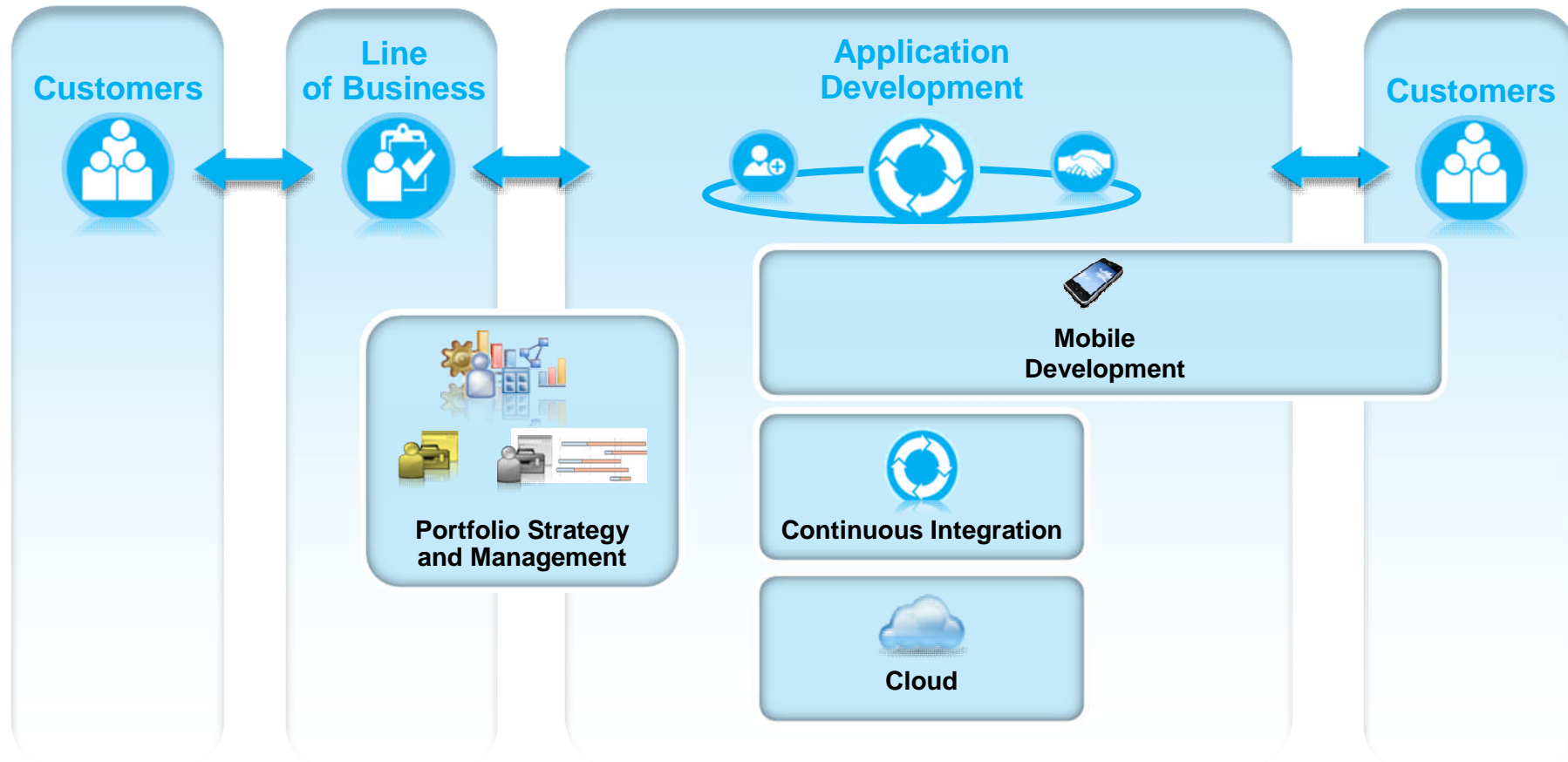
[1] The Application Portfolio Management Landscape —Combine Process And Tools To Tame The Beast, Forrester, Phil Murphy , 2nd May 2011
[2] Statement from IBM, May 2012
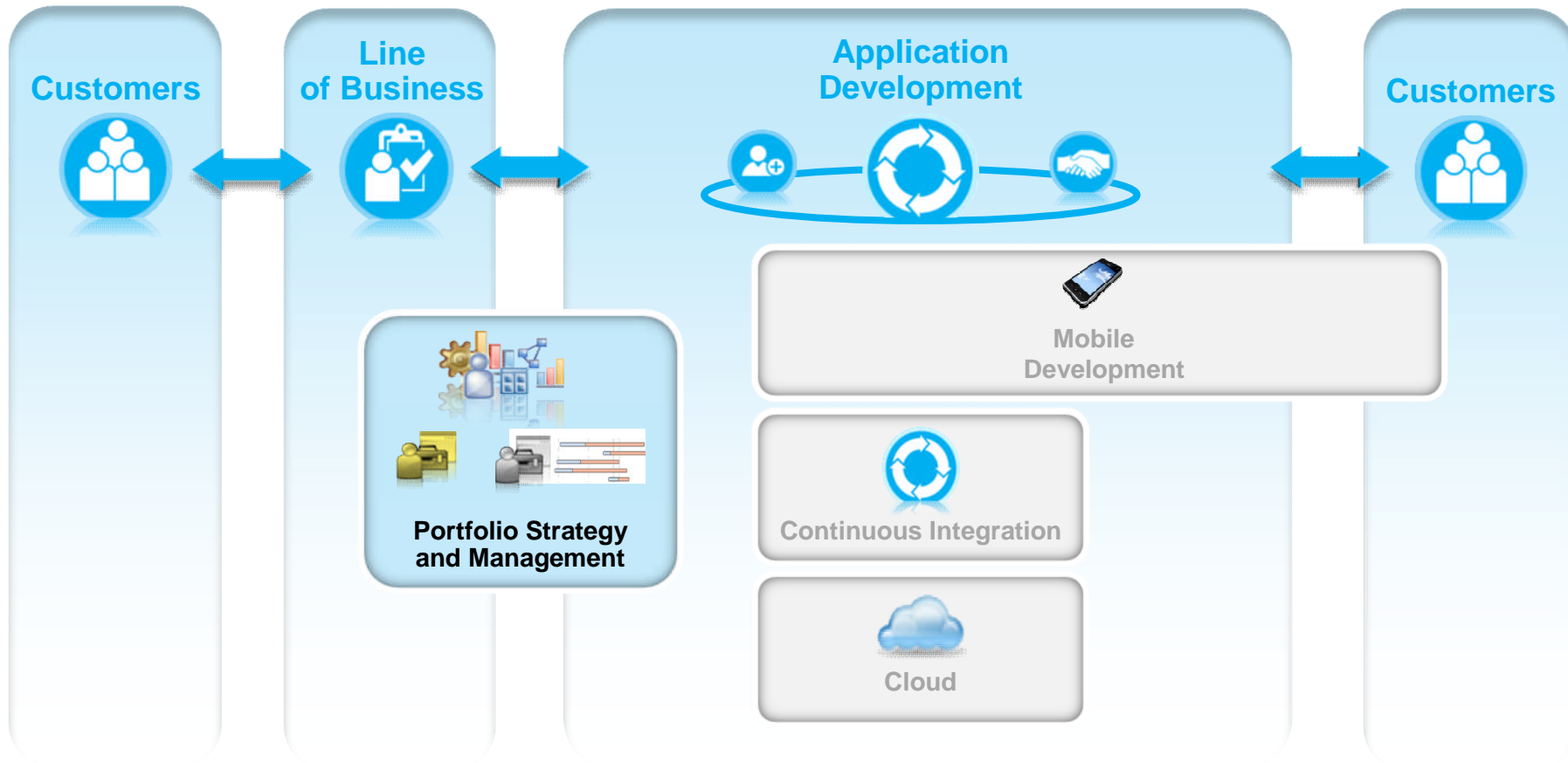[3] The 2011 IBM Tech Trends Report: Tech Trends of today. Skills for tomorrow

Positioning of these trends within application management and development
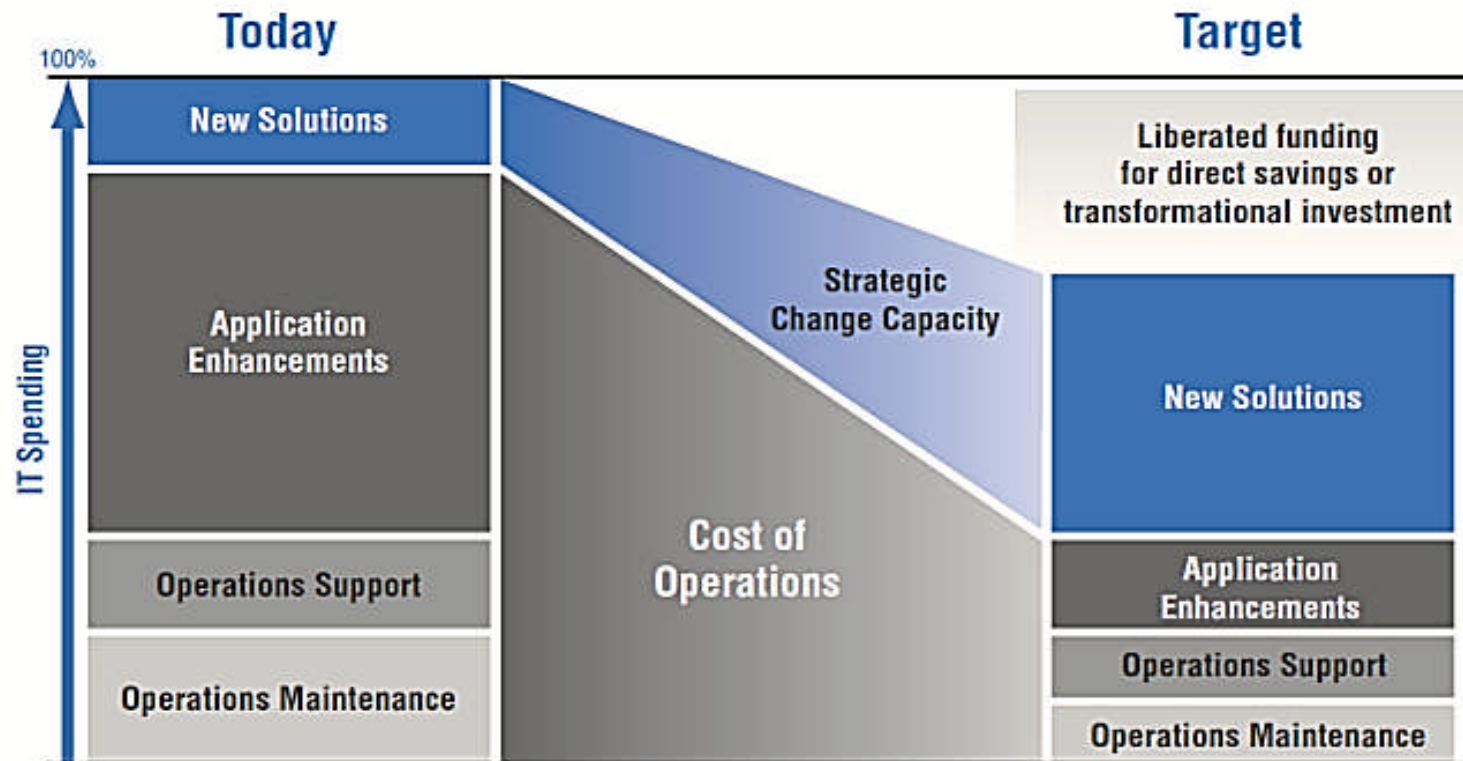
Customers	Line of Business	Application Development	Customers

Portfolio Strategy and Management

Mobile Development

Continuous Integration

Cloud

Positioning of these trends within application management and development

Customers ↔ **Line of Business** ↔ **Application Development** ↔ Customers

Portfolio Strategy and Management

Mobile Development

Continuous Integration

Cloud

Enterprises want to… *drive business innovation through software*

But…

- *70% of IT budget locked into maintenance and operations rather than enabling innovation*
- *Business and IT not aligned on how to prioritize work to maximize business value*
- *More than 75% of projects miss their target delivery dates*

Solution: Portfolio Strategy and Management

Increase business value with better LOB and IT alignment, proactive portfolio evolution and delivery governance

Mobile Compliance Consolidation

Application Portfolio Management

Delivery Management

Demand Management

GOVERNANCE

Cloud Outsourcing Modernization
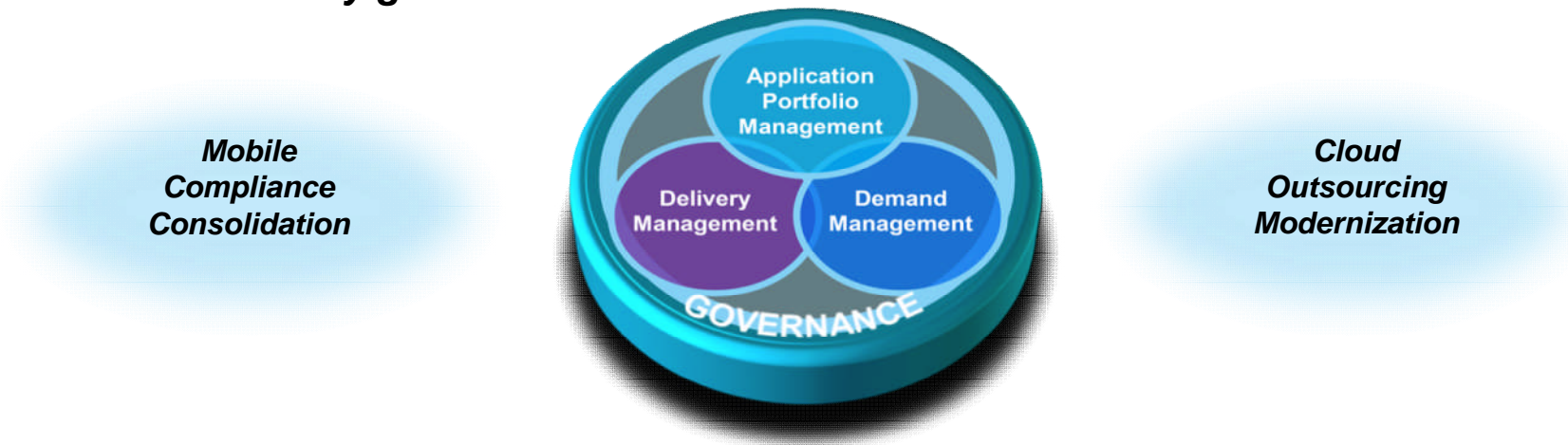
- Application Portfolio Management: Continuous assessment to improve agility and identify savings that can be targeted towards innovation

- Demand Management: Prioritize business needs and proposals, determine sourcing choice, and align with strategy to maximize value

- Delivery Management: Govern project delivery involving the business, development and operations, track status and manage change

"Making IT resource consumption transparent and understandable to business leaders enables healthy business discussions around how to shift resources to where they will do the most good for the whole business."

– Define "Application" Based On Your Content To Avoid False Starts In Your Rationalization Efforts,
Forrester Research, Inc., January 26, 2011

Solution: Portfolio Strategy and Management

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Mobile Compliance Consolidation

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GOVERNANCE

Cloud Outsourcing Modernization
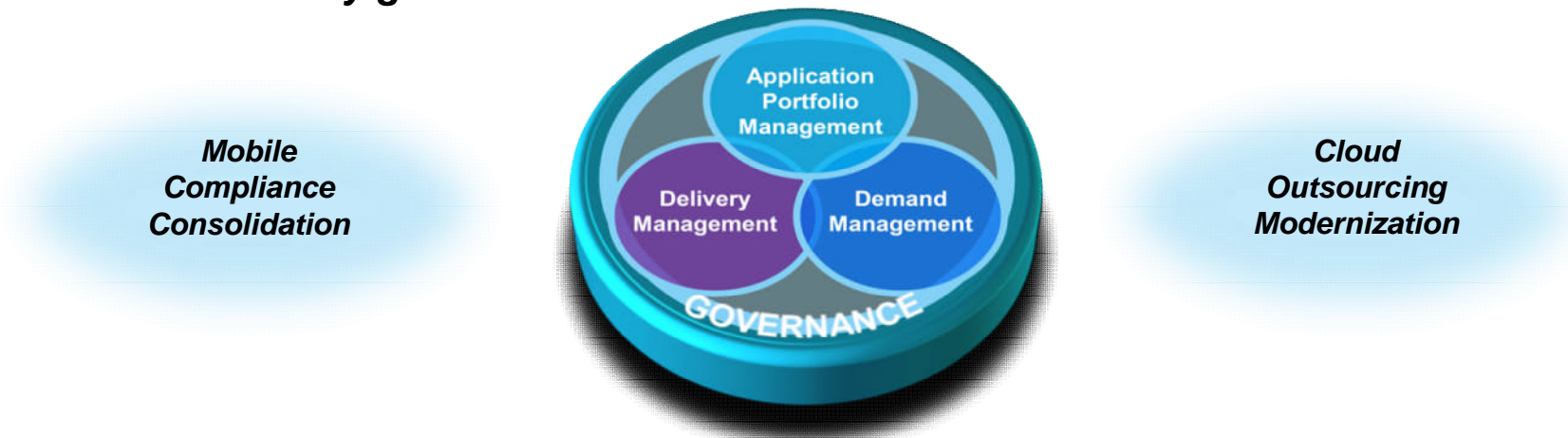
- Rational Focal Point 6.5.1
- Rational System Architect 11.4.1
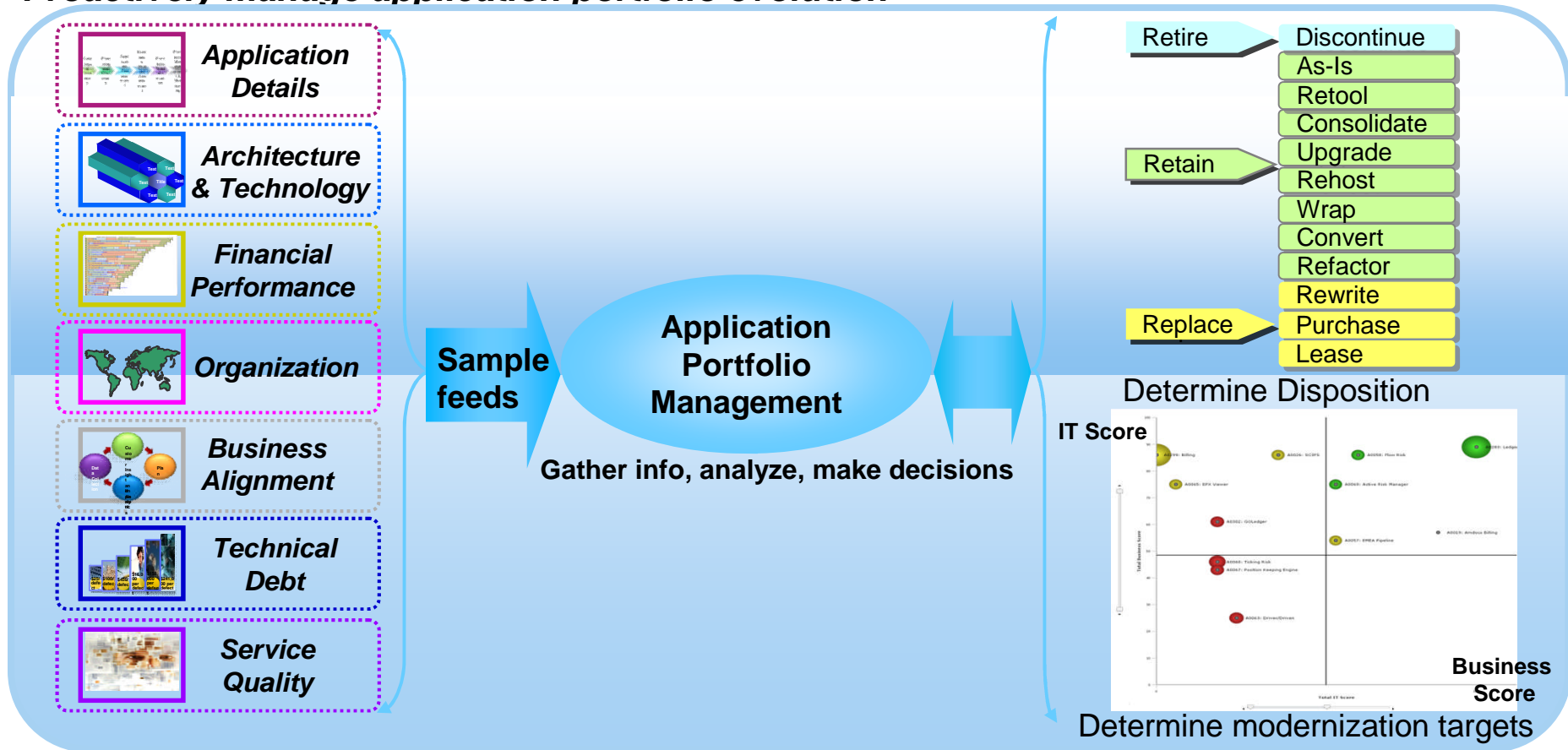- Rational Requirements Composer 4.0
- Rational Team Concert 4.0

"IBM raises the level of management information and control within our organization, and this has already made a significant contribution to the successful management of our core banking replacement program."

– Jan Kühnel, CIO, Bank DnB NORD

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Application Portfolio Management
Proactively manage application portfolio evolution

Application Details

Architecture & Technology

Financial Performance

Organization

Business Alignment

Technical Debt

Service Quality

Sample feeds → **Application Portfolio Management**

Gather info, analyze, make decisions

Retire → Discontinue

As-Is
Retool
Consolidate

Retain → Upgrade
Rehost
Wrap
Convert
Refactor
Rewrite

Replace → Purchase
Lease

Determine Disposition

IT Score

Business Score

Determine modernization targets

"APM and associated application revitalization has enabled IBM's IT to cut maintenance costs by 20% and defects by 58%."

— IBM Corporation

Demand Management
Evaluate and prioritize business needs and projects

Have business drivers determine priorities

Assess value and uncertainty

Collaborate to choose between competing projects
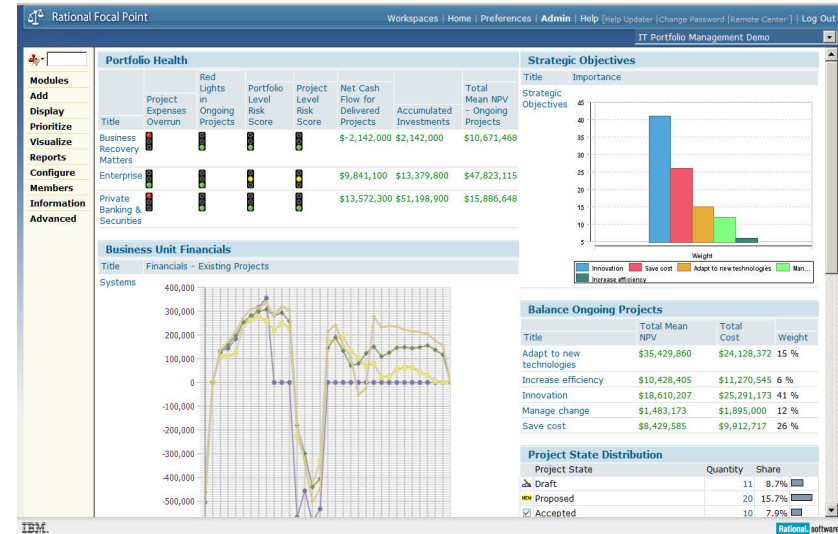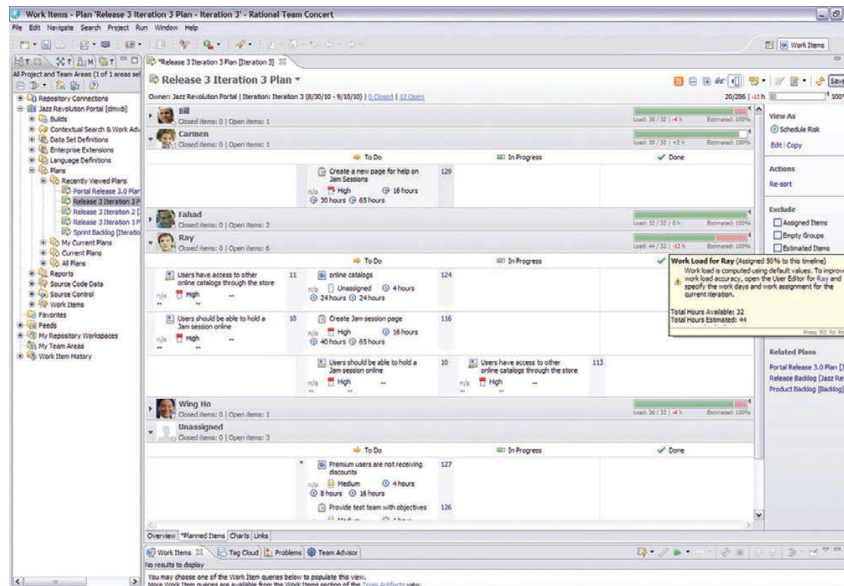
Delivery Management

Govern project execution and make course corrections

- Define and approve business commitments, and link to RTC to enable execution and tracking

- Improve project success rates through milestone reviews with stakeholders from the business, IT and operations

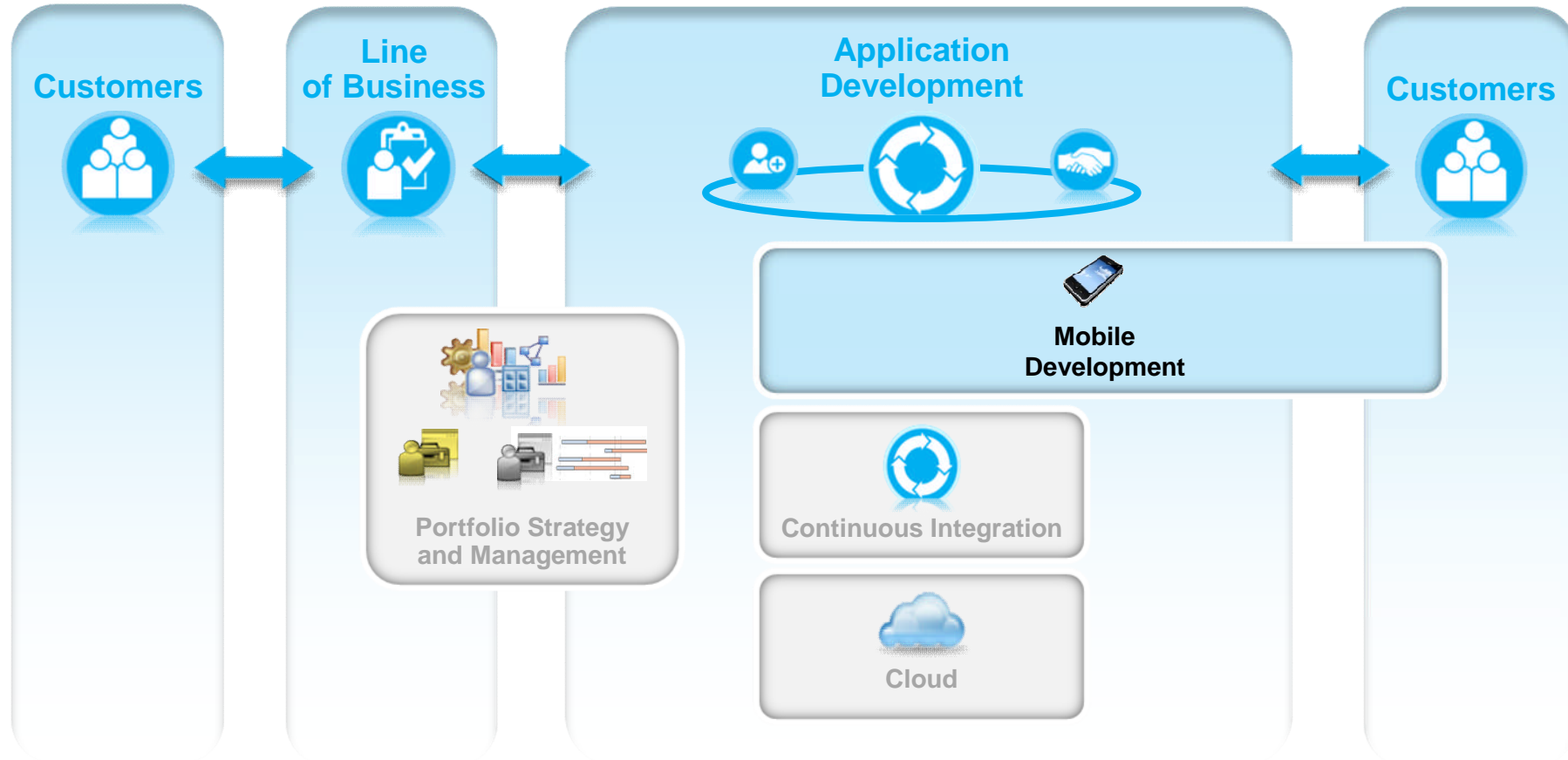- Manage project change and monitor value delivered

Track project status, and drill down into development artifacts as needed

**Drive day-to-day development.
Identify and escalate delivery issues**

Positioning of these trends within application management and development

Customers

Line of Business

Application Development

Customers

Mobile Development

Portfolio Strategy and Management

Continuous Integration

Cloud

Enterprises want to… *extend existing services and information to customers and employees on their smart phones and tablets*


But…
They lack the skills and time to re-write their existing applications, and they cannot afford to develop natively for multiple mobile platforms and devices

Solution: End to end mobile development

Design, code, build, test, and deploy mobile apps that run on a wide variety of mobile platforms; Quickly refactor and extend existing back-end services and data to new mobile UIs
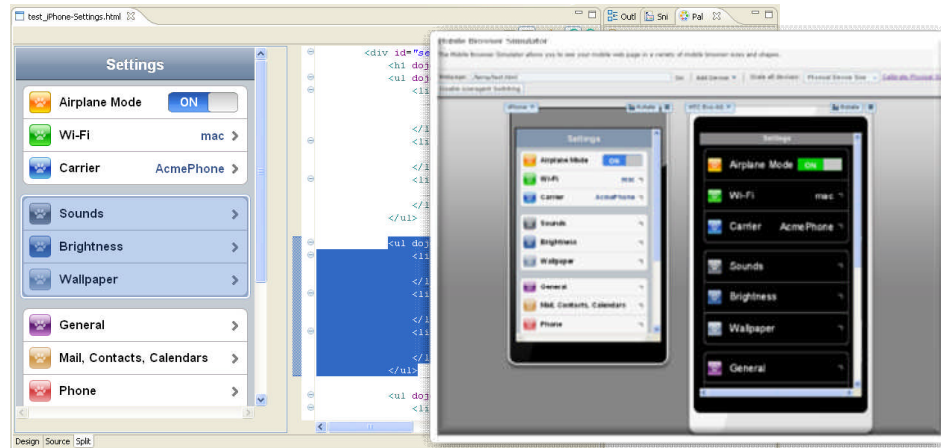
Construct, debug, and test mobile UIs

Refactor and extend existing logic as mobile-consumable services

- Quickly deliver to the most popular mobile platforms (iOS, Android, Windows Phone, Blackberry) by
  - leveraging portable standards like HTML5 & JavaScript
  - supporting native functions like camera and GPS from a single code base with hybrid approaches
- Refactor and extend existing back-end services to provide an optimal mobile experience

Over 60% of respondents indicate mobility spend in the range of 10–40% of total IT spend and nearly 80% of organizations plan to spend the same or more on mobility in the next 12–18 months
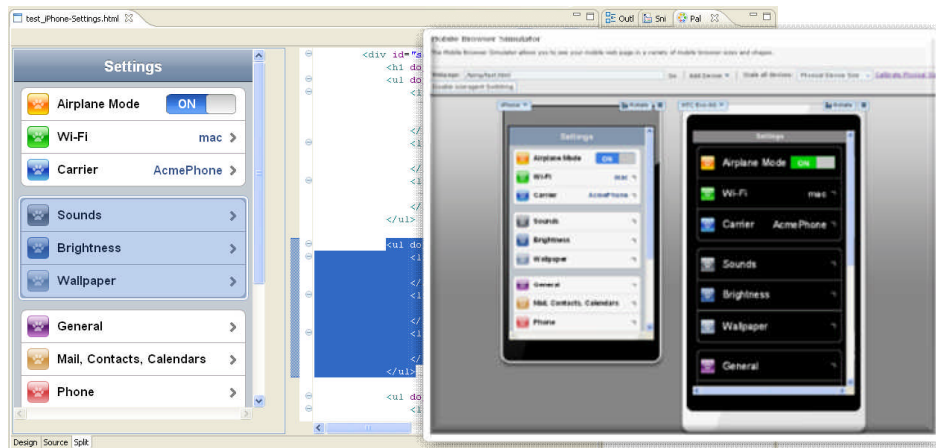— The State of Mobile Enterprise Software in 2011:
An IDC Survey of Applications, Platforms, Decisions, and Deployments

Solution: Rational IDEs including IBM Worklight

Design, code, build, test, and deploy mobile apps that run on a wide variety of mobile platforms; Quickly refactor and extend existing back-end services and data to new mobile UIs

Construct, debug, and test mobile UIs

Refactor and extend existing logic as mobile-consumable services

- Rational Developer for zEnterprise v8.5*
- Rational Developer for Power Systems v8.5*
- Rational Application Developer v8.5*
- Rational Business Developer v8.5

* Includes IBM Worklight

"We chose IBM Worklight because it was the best technology for Lotte to consolidate application development, enhancement and maintenance, while ensuring cost savings and timely delivery to our customers."
— Kang, Chang Nam, IT Planning Director, Lotte Credit Card
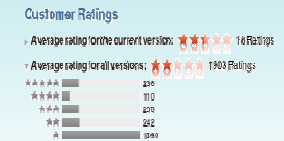
Key mobile development and delivery challenges

Delivering for multiple platforms

- Highly fragmented set of…
  - Platforms and devices
  - Languages, APIs, and tools
- Native programming models not portable across platforms

Consumerization of IT and need to deliver high quality apps

- High quality user experience is a requirement
- Quality influenced as much by design as it is by function

Customer Ratings
Average rating for the current version: 18 Ratings
Average rating for all versions: 1303 Ratings

Accelerated time to market requirements

- Higher frequency of releases and updates
- Added pressure on teams to deliver on time and with quality
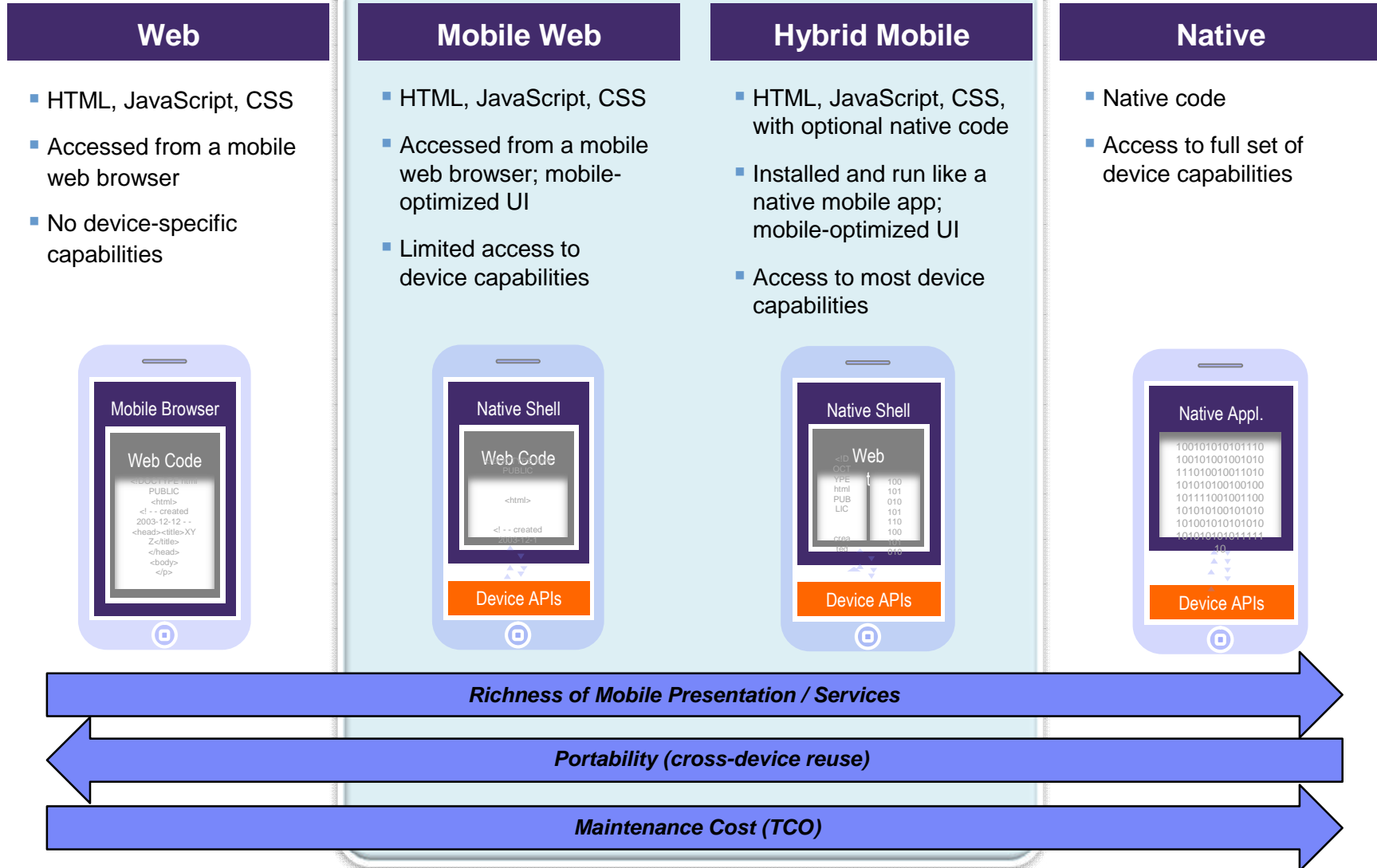
Mobile Lifecycle

Connecting apps and mobile users with existing enterprise systems

- Existing services typically need to be adapted and extended for mobile
- Enterprise wireless networks are running out of bandwidth to accommodate employee devices
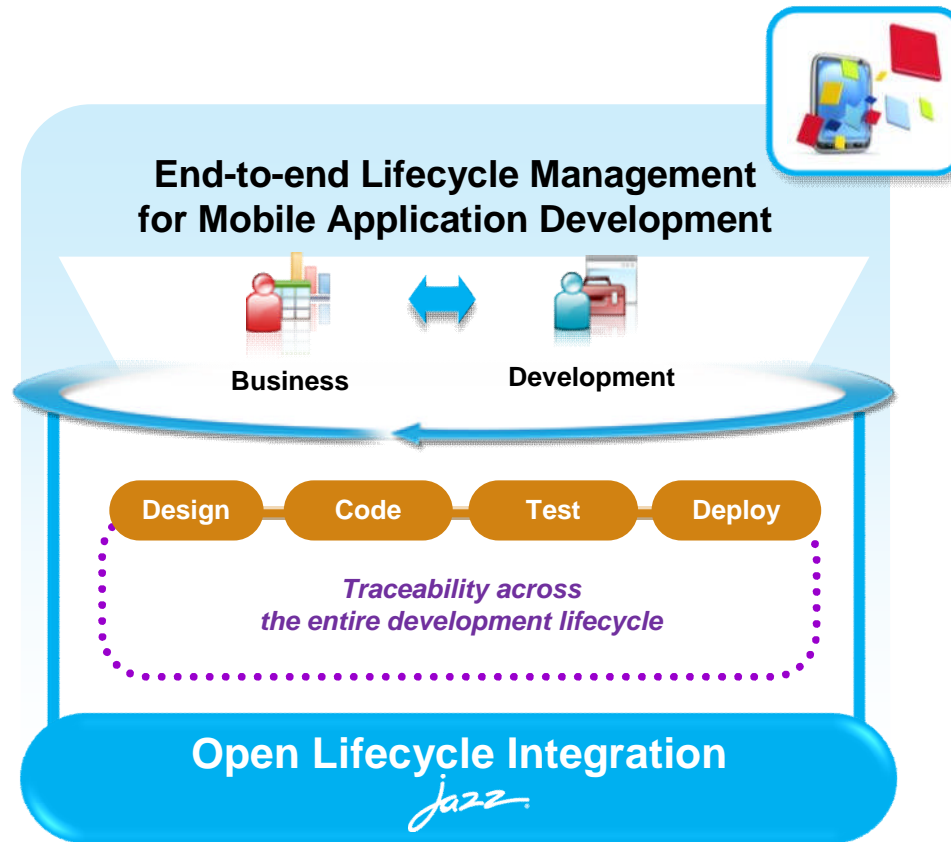
Mobile application styles

Web	Mobile Web	Hybrid Mobile	Native
▪ HTML, JavaScript, CSS	▪ HTML, JavaScript, CSS	▪ HTML, JavaScript, CSS, with optional native code	▪ Native code
▪ Accessed from a mobile web browser	▪ Accessed from a mobile web browser; mobile-optimized UI	▪ Installed and run like a native mobile app; mobile-optimized UI	▪ Access to full set of device capabilities
▪ No device-specific capabilities	▪ Limited access to device capabilities	▪ Access to most device capabilities	

Mobile Browser
Web Code
<!DOCTYPE html
PUBLIC
<! - - created
2003-12-12 - -
<head><title>XY
Z</title>
</head>
<body>
</p>

Native Shell
Web Code
PUBLIC
<html>
<! - - created
2003-12-1

Device APIs

Native Shell
Web
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OCT
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PUB
LIC
crea
ted

100
101
010
101
110
100

Device APIs

Native Appl.
100101010101110
100101001001010
111010010011010
101010100100100
101111001001100
101010100101010
101000101010010
101010101011111
10

Device APIs

Richness of Mobile Presentation / Services →

← **Portability (cross-device reuse)**

Maintenance Cost (TCO) →

Aligning teams across the application development lifecycle
IBM Rational Collaborative Lifecycle Management

**End-to-end Lifecycle Management
for Mobile Application Development**

Business   Development

| Design | Code | Test | Deploy |

*Traceability across
the entire development lifecycle*

Open Lifecycle Integration
jazz.

Client Challenge

Delivering cross-platform mobile applications that align with business goals and are perceived as high quality, both from a user experience and functional point of view.

Mobile-relevant Capabilities

- UI sketching and storyboarding with lightweight requirements management
- Test execution management and optimization
- Continuous native mobile app builds

New for Mobile

- RTC Eclipse Client and Build System Toolkit support for Mac OS
  - Extends Worklight Studio with RTC tools for developers on Mac
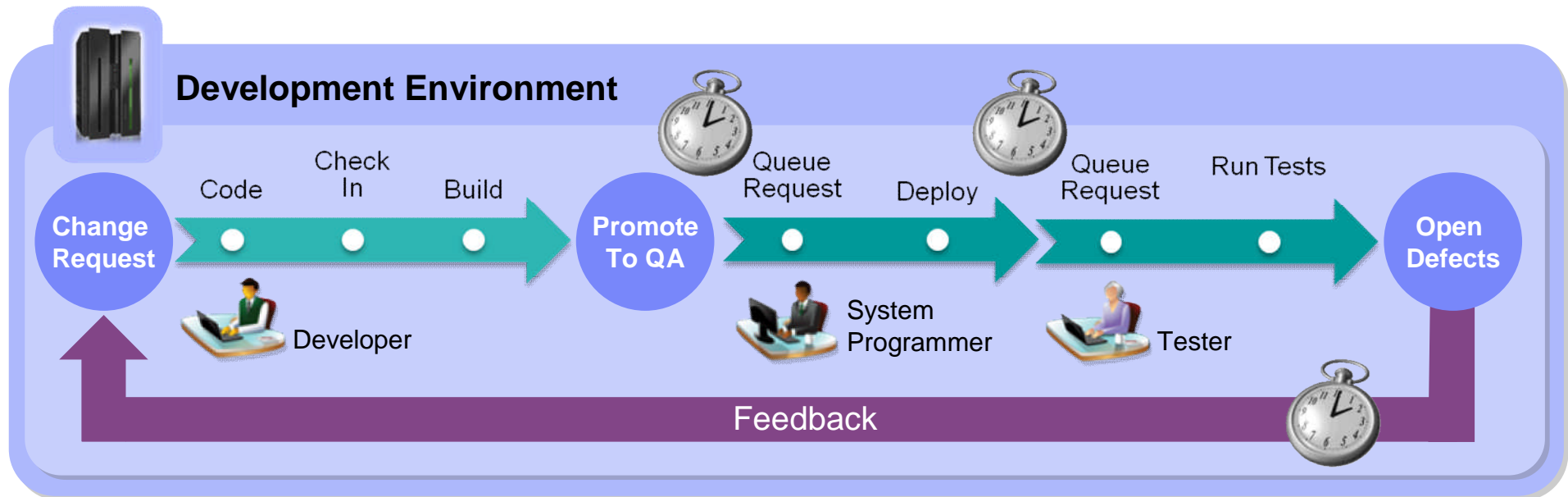 - Enables Jazz builds to execute on Mac

Positioning of these trends within application management and development

Customers → Line of Business → Application Development → Customers

Portfolio Strategy and Management

Mobile Development

Continuous Integration

Cloud
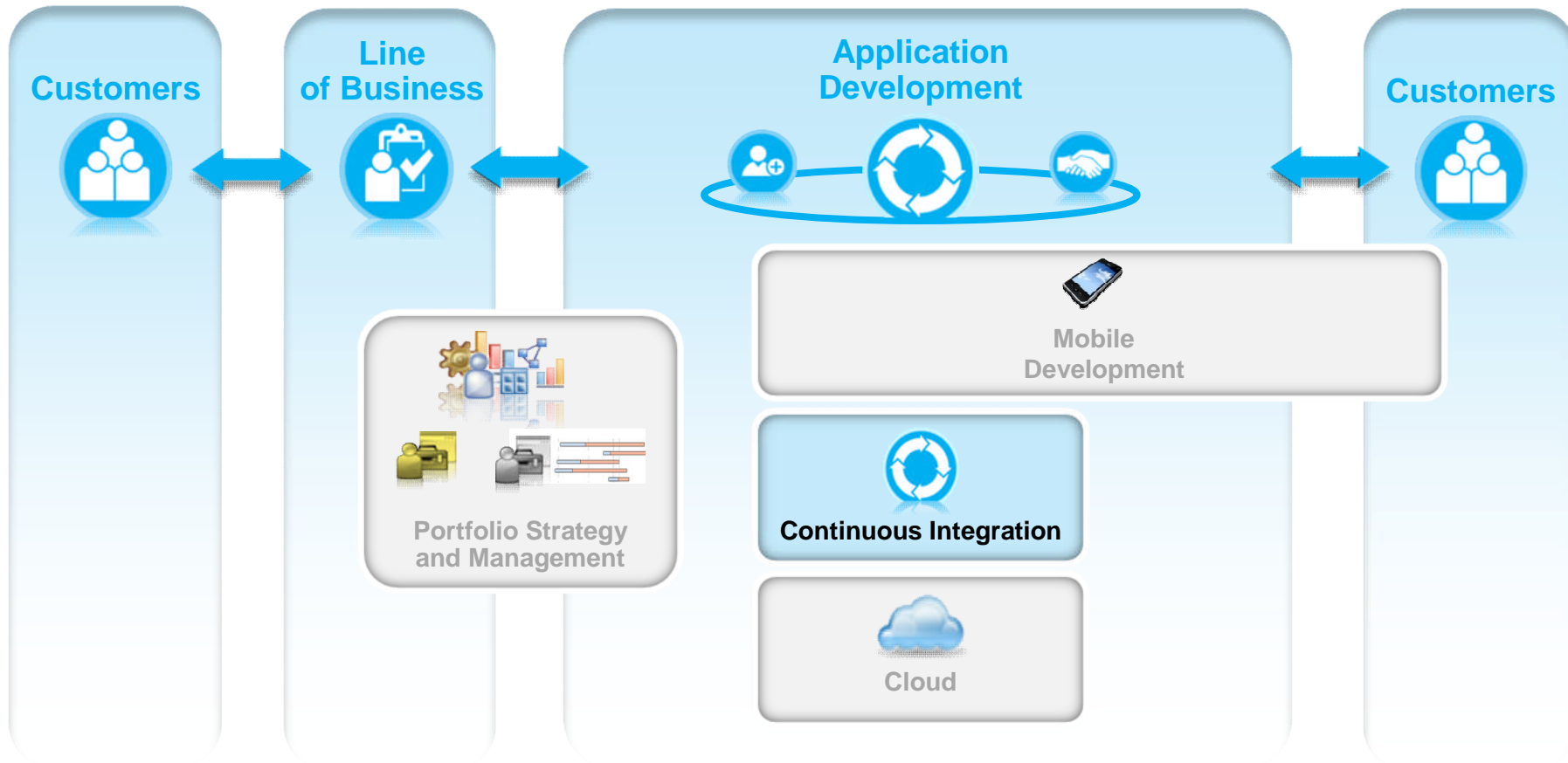
Enterprises want to… *deliver end-to-end application enhancements quickly to stay competitive, trust that complex enterprise systems can be broadly integrated, and bolster confidence in application quality*
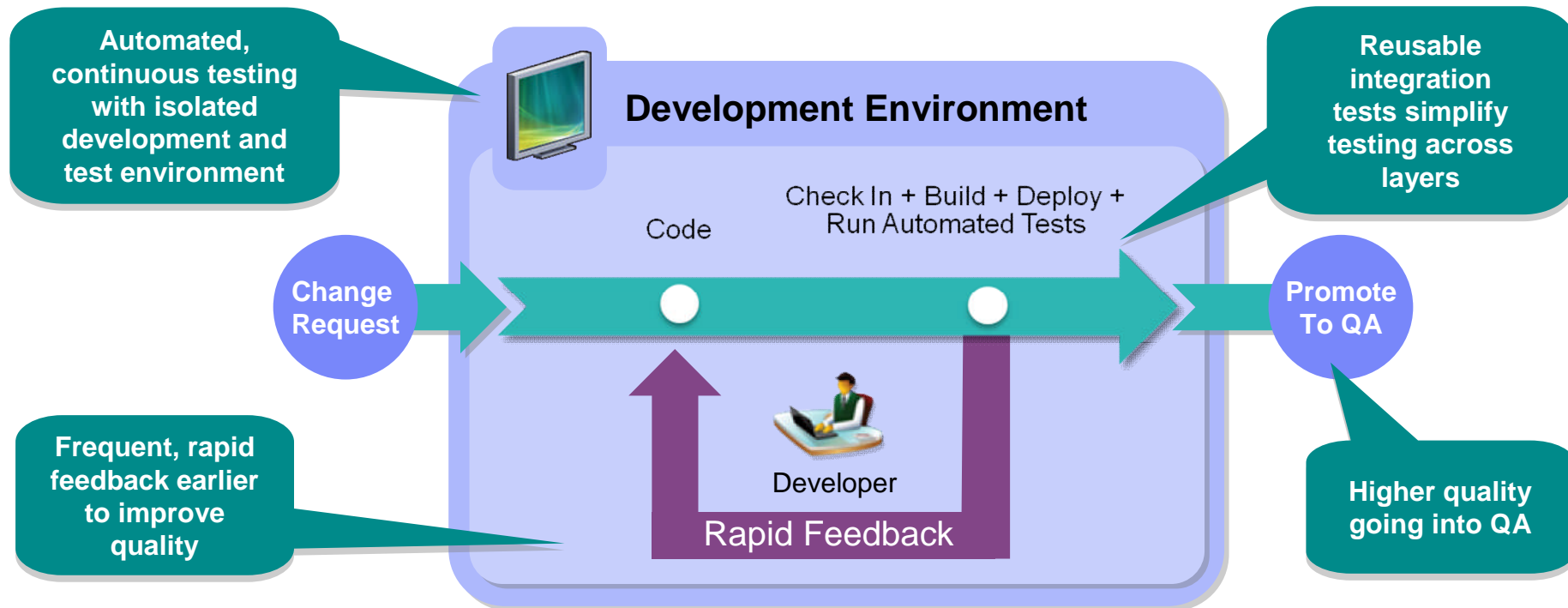
Development Environment

Change Request

Code — Check In — Build

Developer

Promote To QA

Queue Request — Deploy

System Programmer

Queue Request — Run Tests

Tester

Open Defects

Feedback

But…
It takes days or even weeks to test and fix changes due to reliance on manual processes and limited access to test resources, and running builds and automated tests frequently can be too costly

Solution: Continuous Integration

Reduced delivery time, end-to-end visibility of test activities, safer and faster V2V migrations
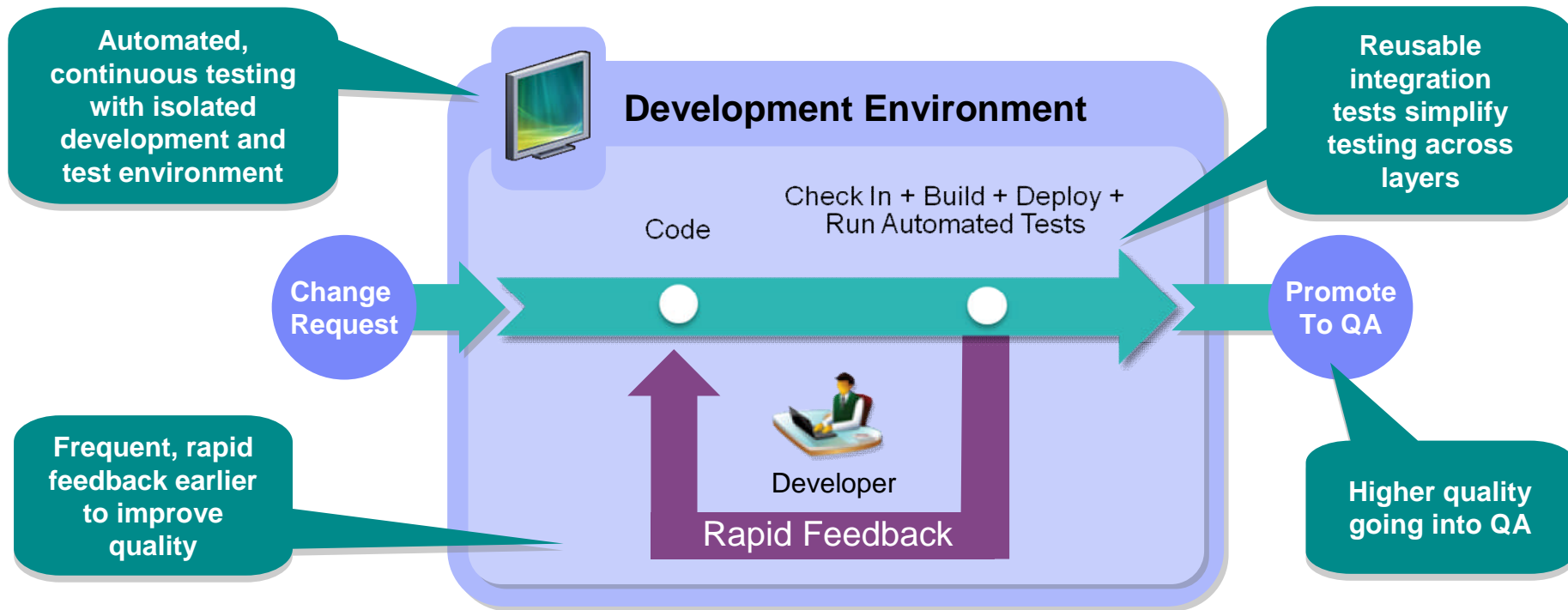
Automated, continuous testing with isolated development and test environment

Development Environment

Code

Check In + Build + Deploy + Run Automated Tests

Reusable integration tests simplify testing across layers

Change Request

Promote To QA

Developer

Rapid Feedback

Frequent, rapid feedback earlier to improve quality

Higher quality going into QA

- Fast, dependable, automatic feedback speeds time to market
- Lower cost of application testing using off-mainframe z/OS test environment
- Enables confidence by automatically tracking and promoting code health

57

Solution: Continuous Integration

Reduced delivery time, end-to-end visibility of test activities, safer and faster V2V migrations

Automated, continuous testing with isolated development and test environment

Development Environment

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Reusable integration tests simplify testing across layers

Change Request

Promote To QA

Frequent, rapid feedback earlier to improve quality

Developer

Rapid Feedback

Higher quality going into QA

- Rational Developer for System z 8.5
- Rational Team Concert 4.0
- Rational Quality Manager 4.0
- Rational Development and Test Environment for System z 8.5 **NEW!**
- Rational Test Workbench powered by Green Hat Technology

Positioning of these trends within application management and development

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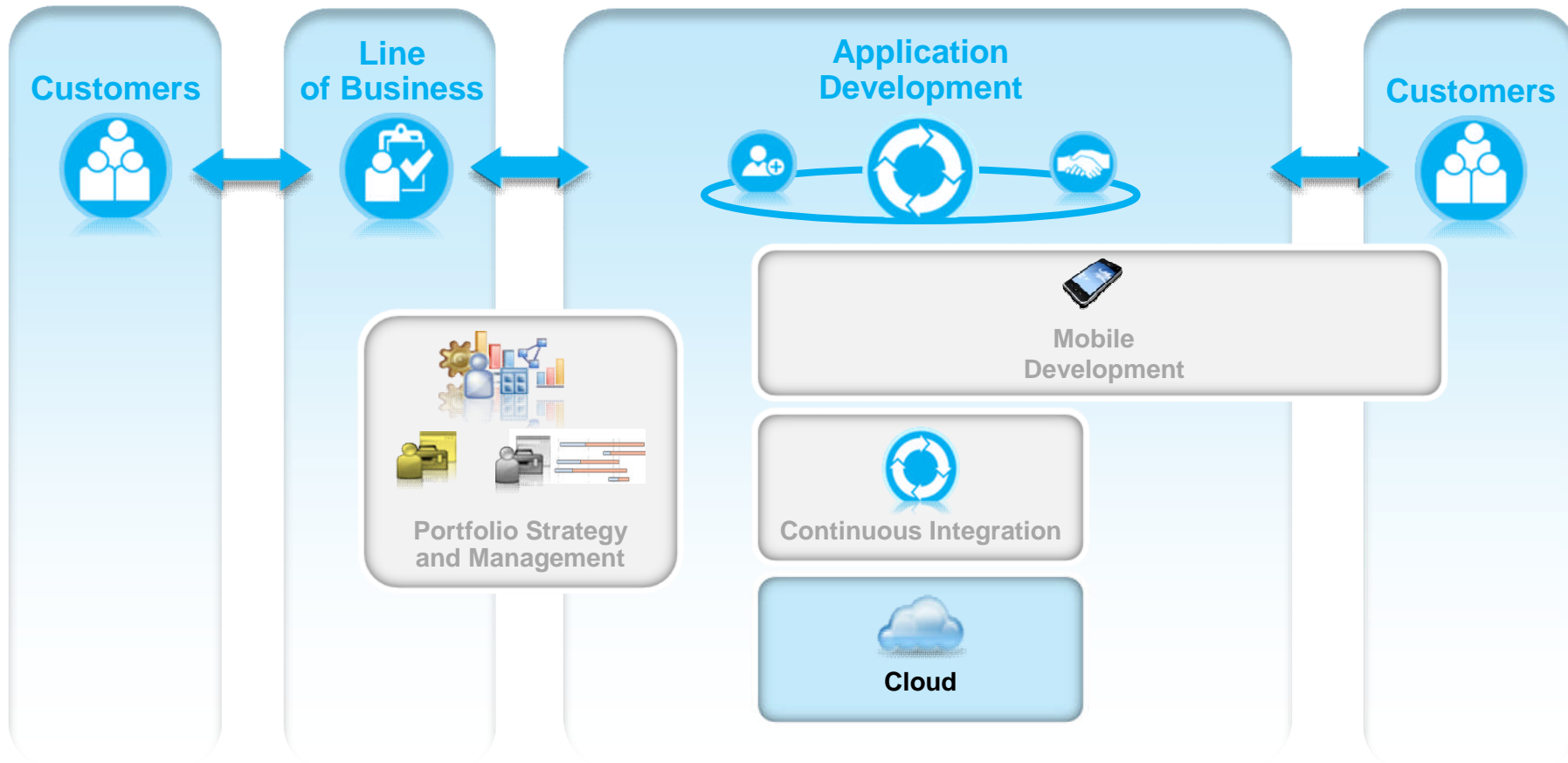
Enterprises want to… *quickly, consistently and affordably equip practitioners with development tooling for entire teams and easily maintain the environment*
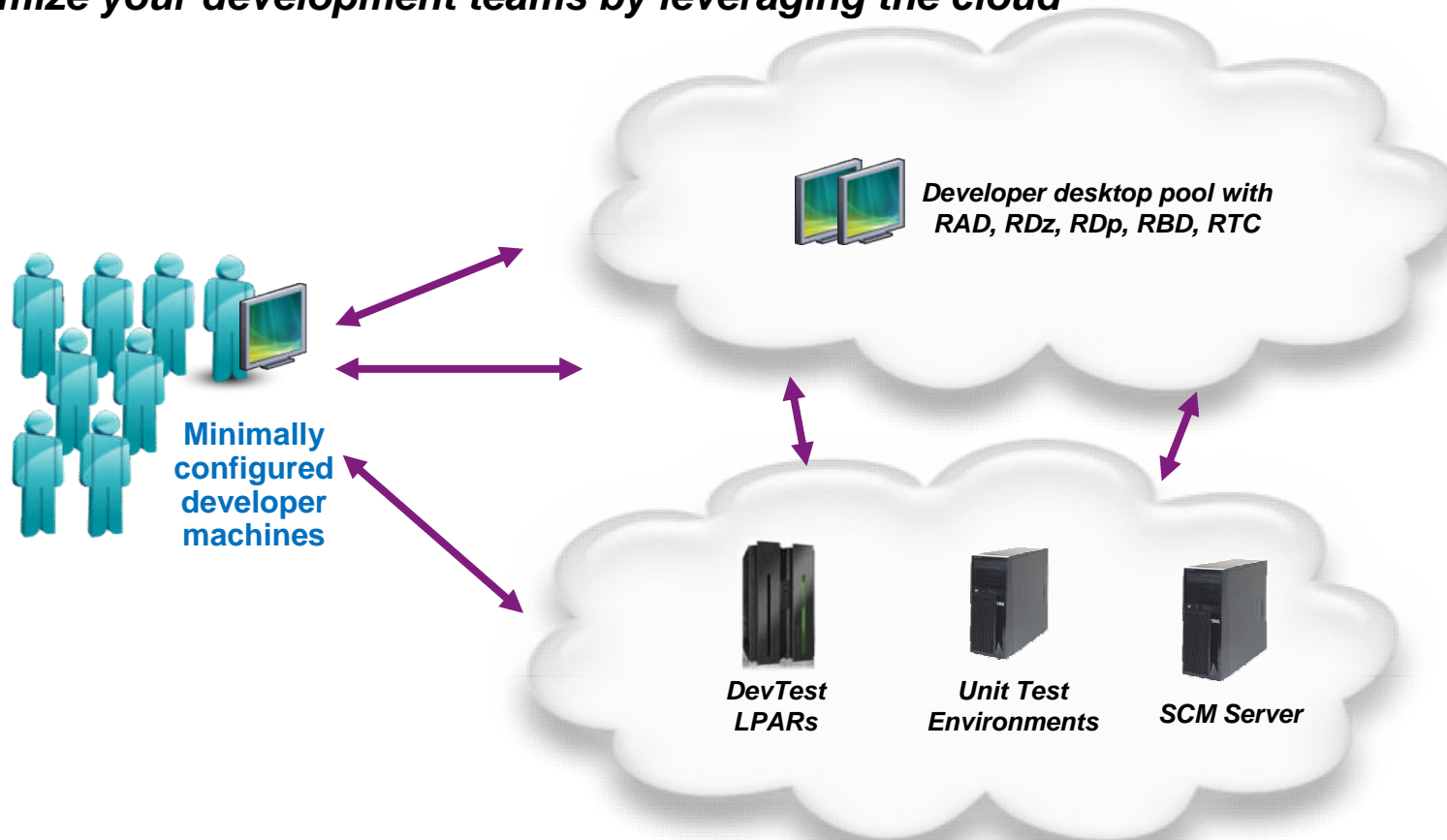
Developer Desktops with IDE v7.5 + Rational Team Concert

Developer Desktops with IDE v8.5 + Rational Team Concert

Rational Team Concert Server

Developer Desktops with IDE v8.0 + Rational Team Concert
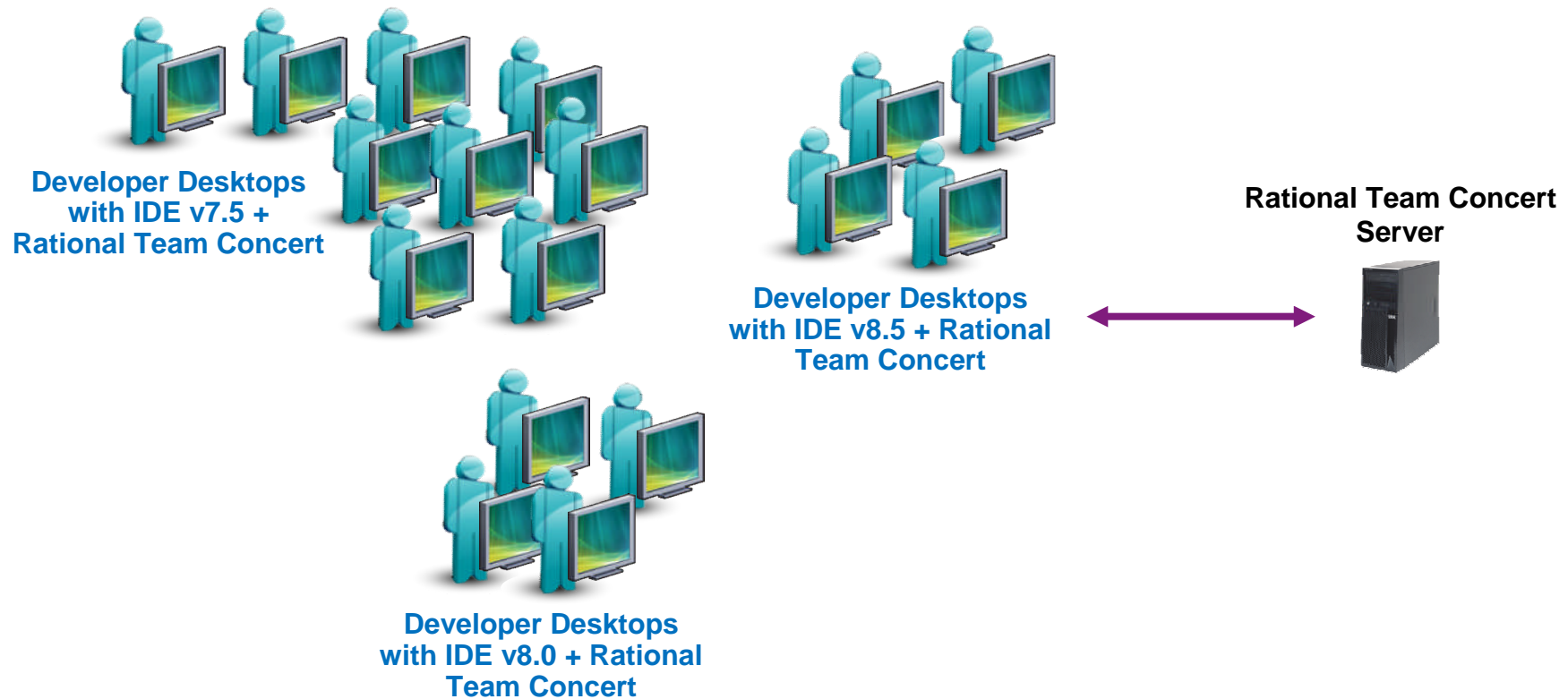
But…

Managing individual desktops is time consuming, costly, and error prone

Solution: Development on the cloud

Optimize your development teams by leveraging the cloud

Developer desktop pool with RAD, RDz, RDp, RBD, RTC

Minimally configured developer machines

DevTest LPARs

Unit Test Environments

SCM Server

- Save capital expenses by providing your developers with powerful IDEs without high-end machines
- Quickly provision the right tools, in the right configurations for new projects
- Ensure consistent and accurate installs and updates via centralized management

Solution: Development on the cloud
Optimize your development team by leveraging the IBM Smart Cloud

IBM Smart Business Desktop Cloud

Developer desktop pool with RAD, RDz, RDp, RBD, RTC*

Minimally configured developer machines

System z   **WAS**   **RTC Server**

DevTest LPARs   *Unit Test Environments*   *SCM Server*

IBM Smart Cloud Enterprise
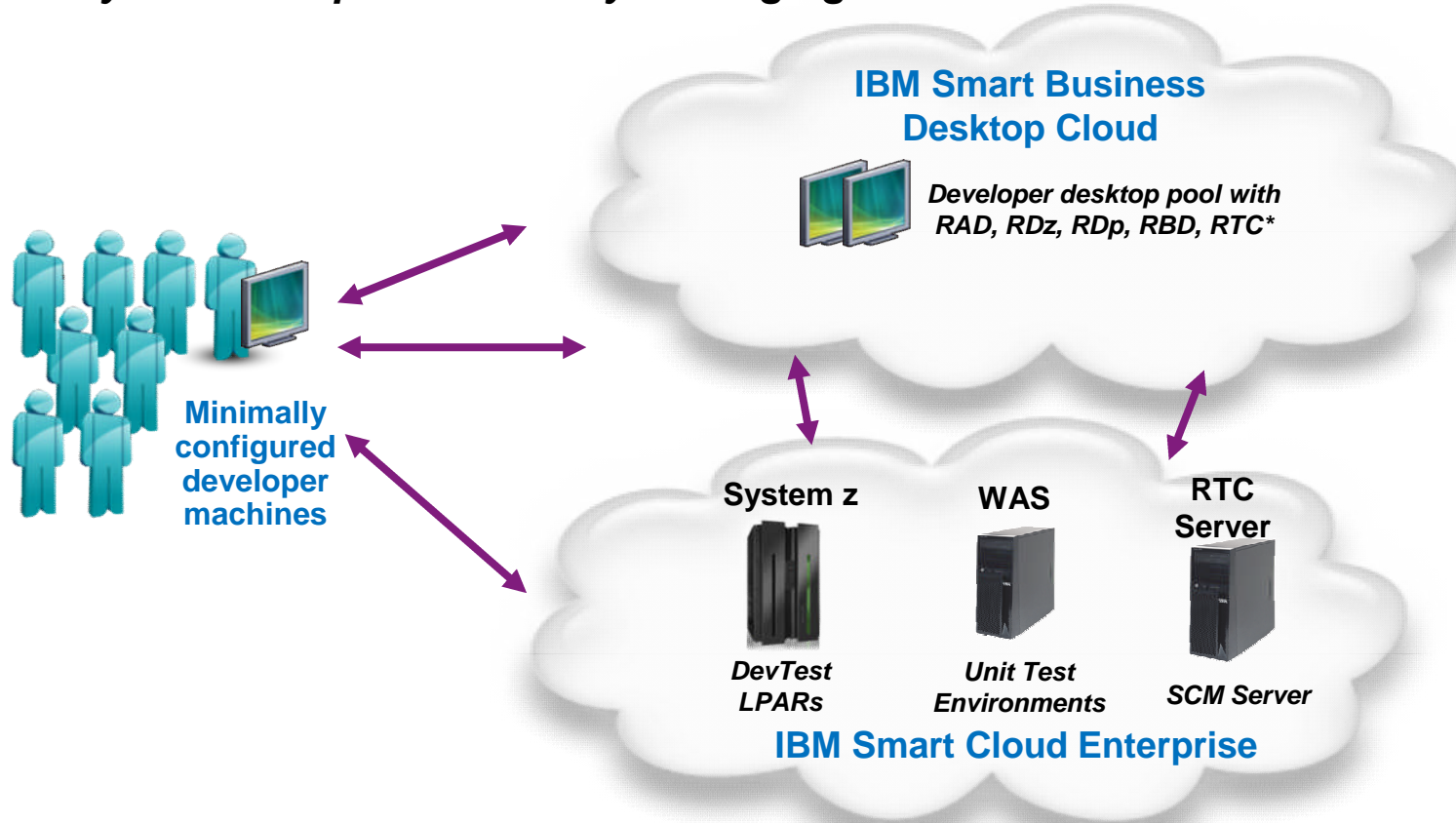
- IBM Smart Business Desktop Cloud – private cloud offering providing custom desktop cloud implementations
- IBM Smart Cloud Enterprise – public cloud offering providing pay per usage infrastructure

*Requirements for virtualization platform varies by product

Positioning of these trends within application management and development

Customers ← → **Line of Business** ← → **Application Development** ← → **Customers**

Mobile Development

Portfolio Strategy and Management

Continuous Integration

Cloud
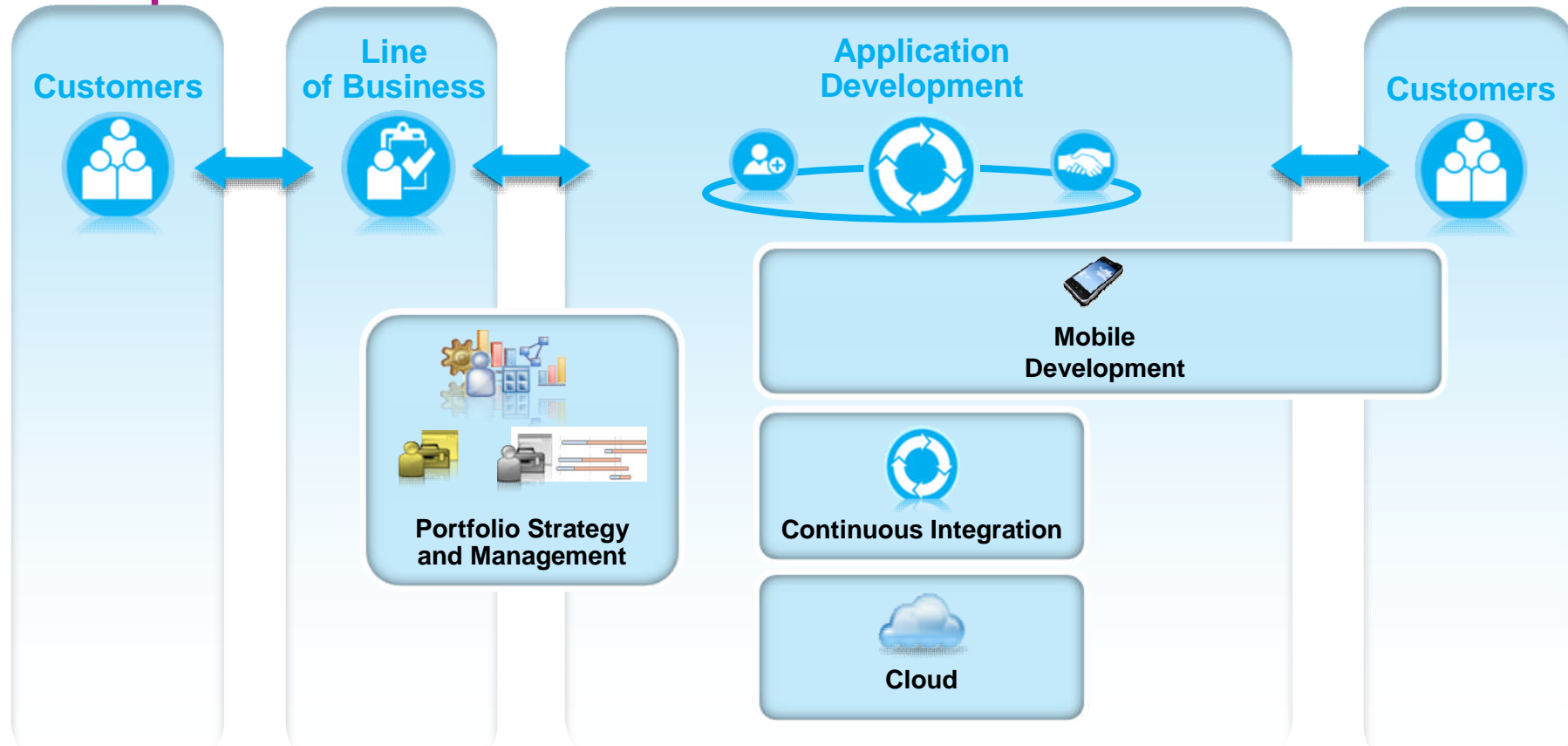
- **Portfolio strategy and management** for application portfolio, demand and delivery management
- **End-to-end mobile development** to quickly extend existing services and information to mobile devices
- **Continuous integration** to accelerate development and improve visibility into test activities
- **Cloud-based development environment** to reduce cost and speed delivery

Summary

Portfolio Strategy and Management

- "Average amount spent on **ongoing operations and maintenance exceeds 65%** of the IT budget, but many firms report much higher percentages" [1]
- Understanding the application portfolio results in development spend where it can have **the most value**. [2]

Continuous Integration [2]

- Early and frequent builds and testing provides immediate feedback to developers resulting in bugs being found earlier when **less costly to fix**.
- This has **rarely been done** in mainframe development where the time to deploy and test changes is measured in weeks not hours, and cost for test automation can be prohibitive.

Mobile Development [3]

- **75% respondents** currently working in mobile computing, **growing to 85%** within the next two years.
- **31% are focused** on extending existing core applications with mobile capabilities

Cloud Computing [3]

- **75% believe** that over the next two years their organizations will begin to build cloud infrastructure
- **25% of the respondents** indicated that they plan to develop new applications for the cloud

[1]The Application Portfolio Management Landscape —Combine Process And Tools To Tame The Beast, Forrester, Phil Murphy , 2nd May 2011
[2] Statement from IBM, May 2012
[3] The 2011 IBM Tech Trends Report: Tech Trends of today. Skills for tomorrow

All of this is relevant to z!

Getting started
Next steps to modernize your enterprise applications

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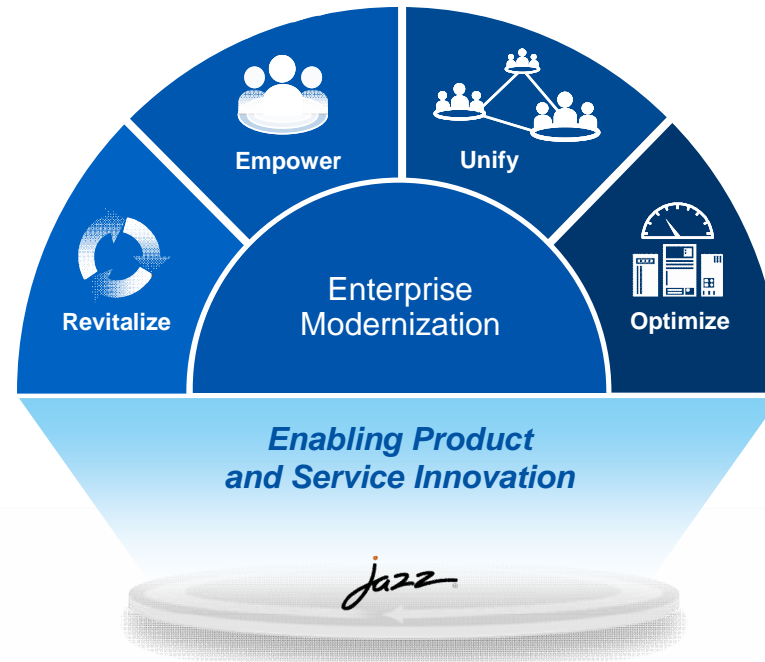
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