IBM

5th European GSE/IBM TU for z/VSE, z/VM and Linux on System z

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Smarter Computing

Overview

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GSE
GUIDE SHARE EUROPE
Deutsche Region

Agenda

- Why Smarter Computing?

- What is Smarter Computing?
  - Big Data – designed for data
  - Optimized Systems – tuned to the task
  - Cloud – managed in the Cloud

- What is the value of Smarter Computing

- How can you proceed to realize Smarter Computing?

Why Smarter Computing?

Three years ago we started describing the Smarter Planet we saw emerging, **fueling innovation across industries.**

Neonatal Care

Telecom

Resource Management

Manufacturing

Law Enforcement

Fraud Prevention

Traffic Control

Trading

Nothing is changing more than IT …

The way it's accessed	The way it's applied	The way it's architected

ubiquitously	for insight	Integrated and optimized

IT organizations need to respond to dramatic increases in workload while meeting demands for new services and improved service quality.

32.6 million servers worldwide
- **85% idle** computer capacity
- **15%** of servers run 24/7 without being actively used on a daily basis

1.2 Zettabytes (1.2 trillion gigabytes) exist in the "digital universe"
- **50%** YTY growth
- **25%** of data is unique; **75%** is a copy

Between 2000 and 2010
- servers grew **6x** ('00-'10)
- storage grew **69x** ('00-'10)
- virtual machines grew **51% CAGR** ('04-'10)

Data centers have **doubled** their energy use in the past five years
- **18%** increase in data center energy costs projected

Internet connected devices **growing 42% per year**

Since 2000 security vulnerabilities grew **eightfold**

…while IT budgets are growing less than 1% per year.

IT leaders must address the vicious cycle of sprawling IT, inflexible IT and incomplete data to overcome the IT conundrum

Sprawling IT:
Every IT investment leads to more sprawl which drives up infrastructure and management costs.

Inflexible IT:
Inflexibility of infrastructure limits integration across silos and responsiveness to customer demands.

Incomplete Data:
Decisions are made on incomplete data,
big ideas are seen as risky, and small decisions are not optimized.

Vicious Cycle

Any enterprise can reverse the cycle by *designing*, *tuning*, and *managing* their IT infrastructure in this new era we call Smarter Computing.

Designed for data: Big Data
Remove barriers to harnessing all available information and unlock insights to make informed choices.

Tuned to the task: Optimized Systems
Remove financial barriers by driving greater performance and efficiency for each workload.

Managed in the cloud: Cloud
Remove barriers to rapid delivery of new services and reinvent business processes to drive innovation.

Smarter Computing

Virtuous
Cycle

Smarter Computing is realized through an IT infrastructure that is designed for data, tuned to the task, and managed in the cloud

Smarter Computing
The IT Infrastructure that Enables a Smarter Planet

Designed for data
Harness all available information - **89% of CEOs** want better insight via business intelligence and analytics

Managed in the Cloud
Reinvent IT - **60% of CIOs plan to use cloud technologies** and **55% of business executives** believe cloud enables business transformation

Tuned to the task
Drive greater performance and improve IT economics - **total cost per workload can be reduce up to 55%** with optimized systems

Designed for Data
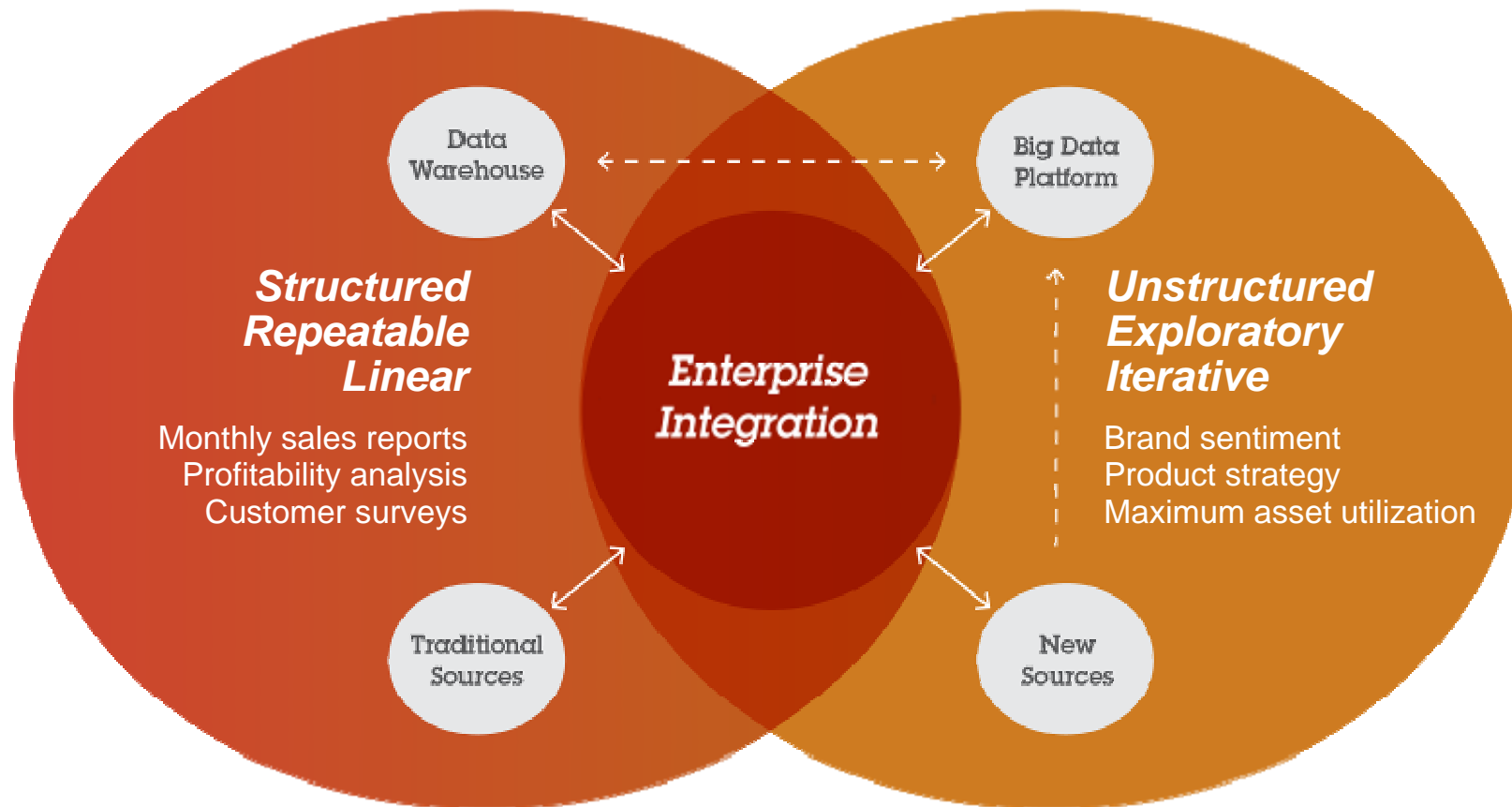Big Data and Integration for better decision making

Designed for Data means:
Extending beyond traditional sources of data to generate insight by leveraging new forms of information

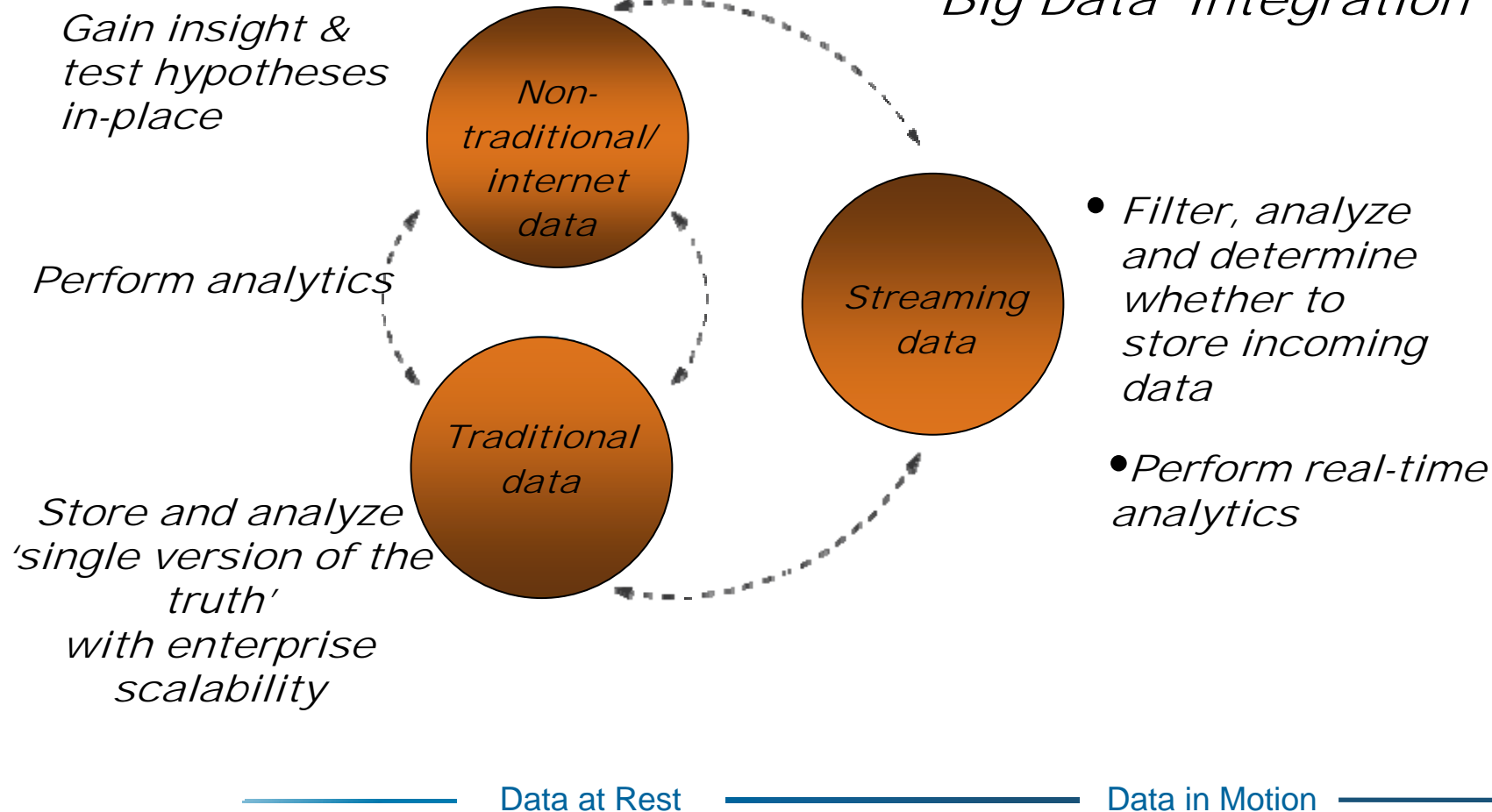**Traditional Approach**
Structured, analytical, logical

New Approach
Creative, holistic thought, intuition

Data Warehouse

Big Data Platform

Structured Repeatable Linear

Enterprise Integration

Unstructured Exploratory Iterative

Monthly sales reports
Profitability analysis
Customer surveys

Brand sentiment
Product strategy
Maximum asset utilization

Traditional Sources

New Sources

Integrating Big Data will unlock new insights to understand customer behavior and needs, optimize decisions in real-time and foster collaborative decision making

Gain insight & test hypotheses in-place

Non-traditional/ internet data

'Big Data' Integration

Perform analytics

Streaming data

• **Filter, analyze and determine whether to store incoming data**

Traditional data

•**Perform real-time analytics**

Store and analyze 'single version of the truth' with enterprise scalability

Data at Rest ——————— Data in Motion ——————→

Key capabilities need to be addressed to integrate Big Data into an enterprise's information supply chain

Manage

- Reduce database & storage costs
- Scale database with business needs
- Enhance performance & availability to meet SLA's
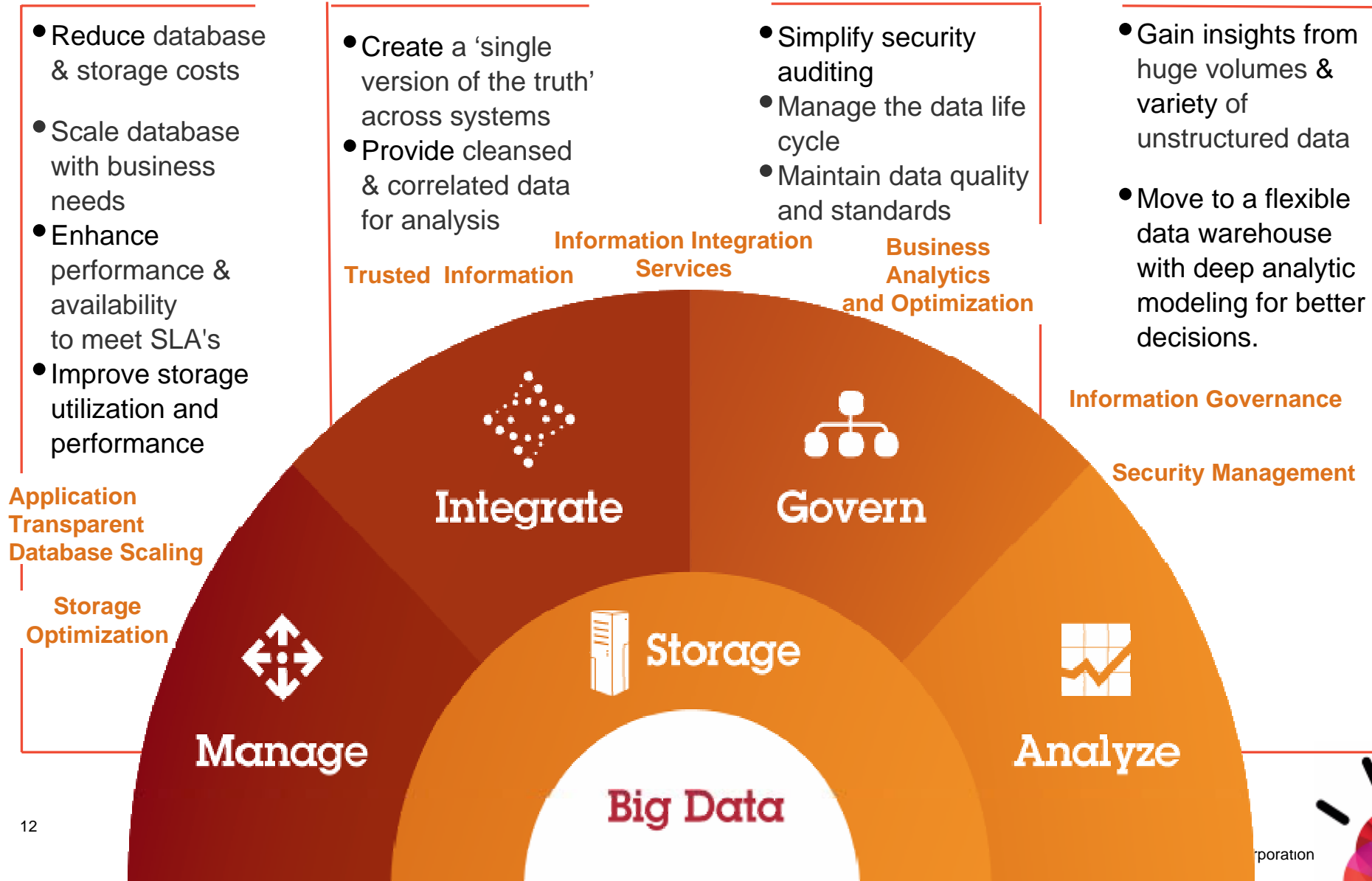- Improve storage utilization and performance

Application Transparent Database Scaling

Storage Optimization

Integrate

- Create a 'single version of the truth' across systems
- Provide cleansed & correlated data for analysis

Trusted Information

Information Integration Services

Govern

- Simplify security auditing
- Manage the data life cycle
- Maintain data quality and standards

Business Analytics and Optimization

Analyze

- Gain insights from huge volumes & variety of unstructured data
- Move to a flexible data warehouse with deep analytic modeling for better decisions.

Information Governance

Security Management

Integrate

Govern

Storage

Manage

Analyze

Big Data

rporation

Clients are deploying projects to leverage Big Data capabilities

Manage

Consolidate databases using DB2 on POWER7 or System z and IBM IT Transformation Strategy & Design services

Borçelik cut software licensing and maintenance costs by 25% by moving their SAP applications to IBM DB2 and Power Systems.

Integrate

Master a single version of the truth using InfoSphere MDM on POWER7 and eX5 to reduce the cost of data integration projects up to 90%

Suncorp Metway leveraged IBM Initiate Master Data Service to integrate data from 23 sources into a single master data hub, saving $10 million per year in storage.

Govern

Manage data lifecycle to cut storage costs up to 80% using IBM InfoSphere and IBM Information Protection Services.


BlueCross BlueShield of North Carolina used IBM Optim Data Growth Solution Software to reduce storage costs 40% to 50%, saving $2 million annually.

Analyze

Replace existing data warehouses with data ready systems and high-performance appliances using IBM Smart Analytics System and IBM Netezza
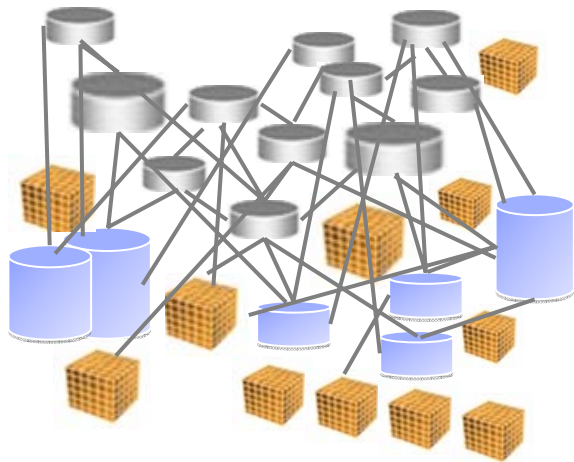

Catalina Marketing used predictive analytics on IBM Netezza, providing a retailer with a 30% increase in coupon redemption rates.
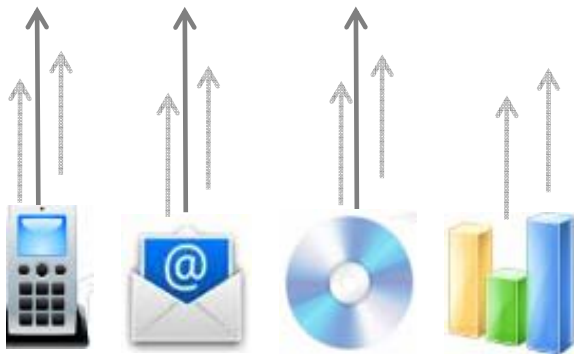

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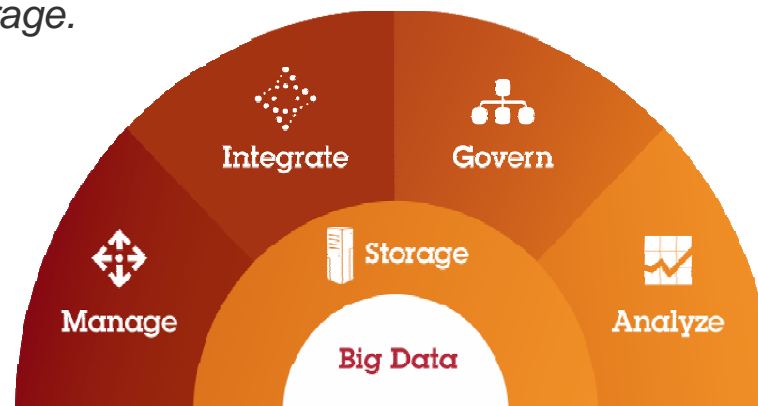
Tuned to the Task
Optimized Systems for superior economics

Workload optimized systems are designed to meet the needs of specific workloads and improve outcomes
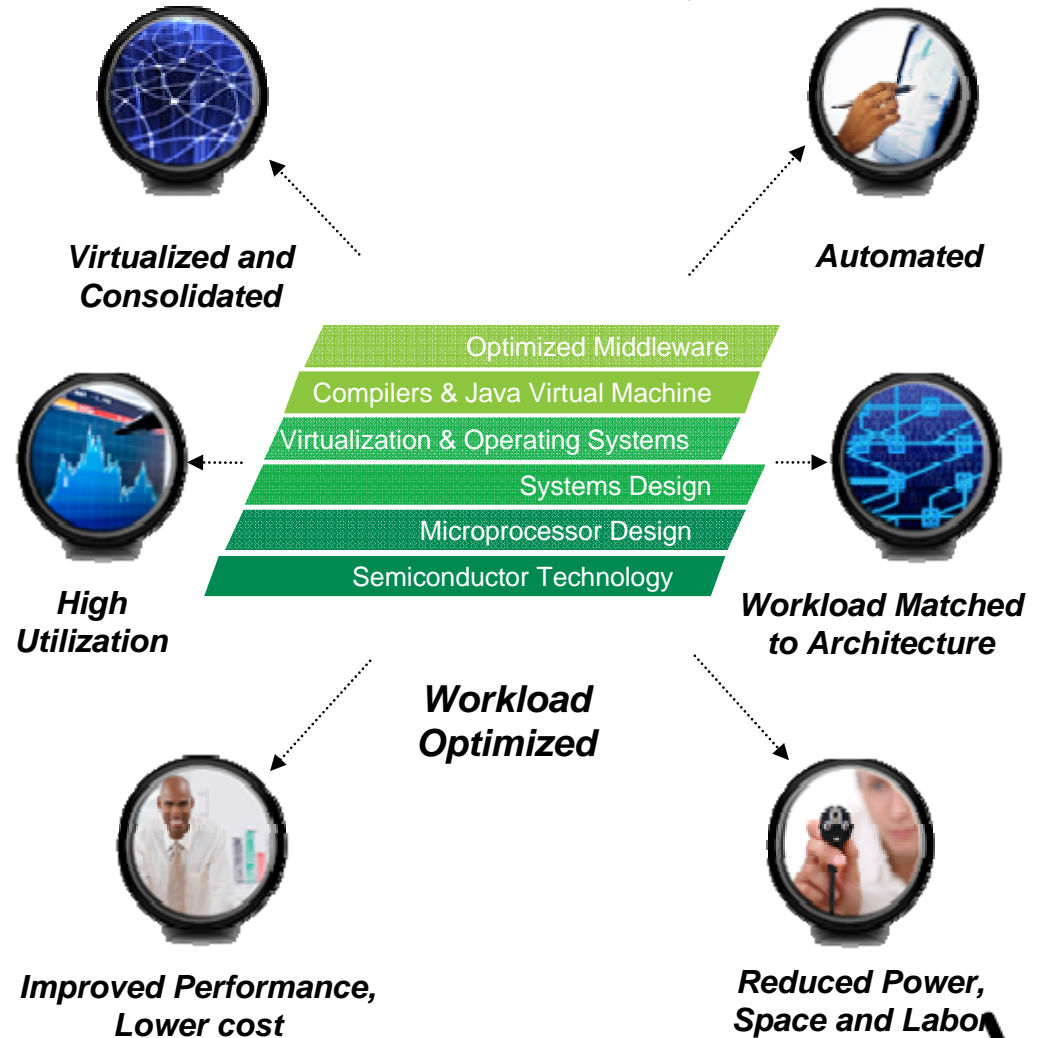
Yesterday:
Cluttered and Complex

Today & Tomorrow:
Simplified, Shared, Dynamic

Server Sprawl creating management nightmare

Improved IT Economics

Virtualized and Consolidated

Automated

Optimized Middleware
Compilers & Java Virtual Machine
Virtualization & Operating Systems
Systems Design
Microprocessor Design
Semiconductor Technology

High Utilization

Workload Matched to Architecture

Workload Optimized

Improved Performance, Lower cost

Reduced Power, Space and Labor

New workloads creating more demands

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Clients require a range of workload optimized systems

Client-built with optimized components

Integrated, Optimized Systems

Appliances

Need flexibility to deploy multiple workloads of different types—e.g., data management, messaging, web facing etc.

Requires moderate flexibility to tune small number of workloads—e.g., information management and analytics

Flexibility not required—need high performance at low cost for a specific workload

Important considerations in deploying Optimized Systems can be categorized into 3 areas

Architecture
Create a strong architectural foundation to address Business needs

- Selection of operating system, server and storage platform
- Middleware exploiting the hardware architecture
- Security, Reliability, Availability and scalability characteristics
- New workloads eg. analytics leveraging Big Data
- Consolidation and virtualization leading to private clouds

Economics
Optimize Total Cost of Ownership

- IT administration labor costs
- Hardware, Software licensing cost
- Networking costs
- Facility and Energy costs

Performance
Align performance Requirements with business needs

- Policy based resource allocation
- Single pane of glass management of the entire infrastructure

Key capabilities need to be addressed to improve the Total Cost of Ownership (TCO) of the IT systems infrastructure

Re-deploy Existing Workloads

- Maximize performance for existing workloads
- Meet or exceed service levels
- Improve visibility & management of IT resources

Consolidate Workloads

- Reduce the total cost of ownership for the IT infrastructure
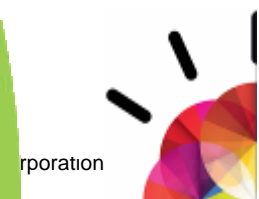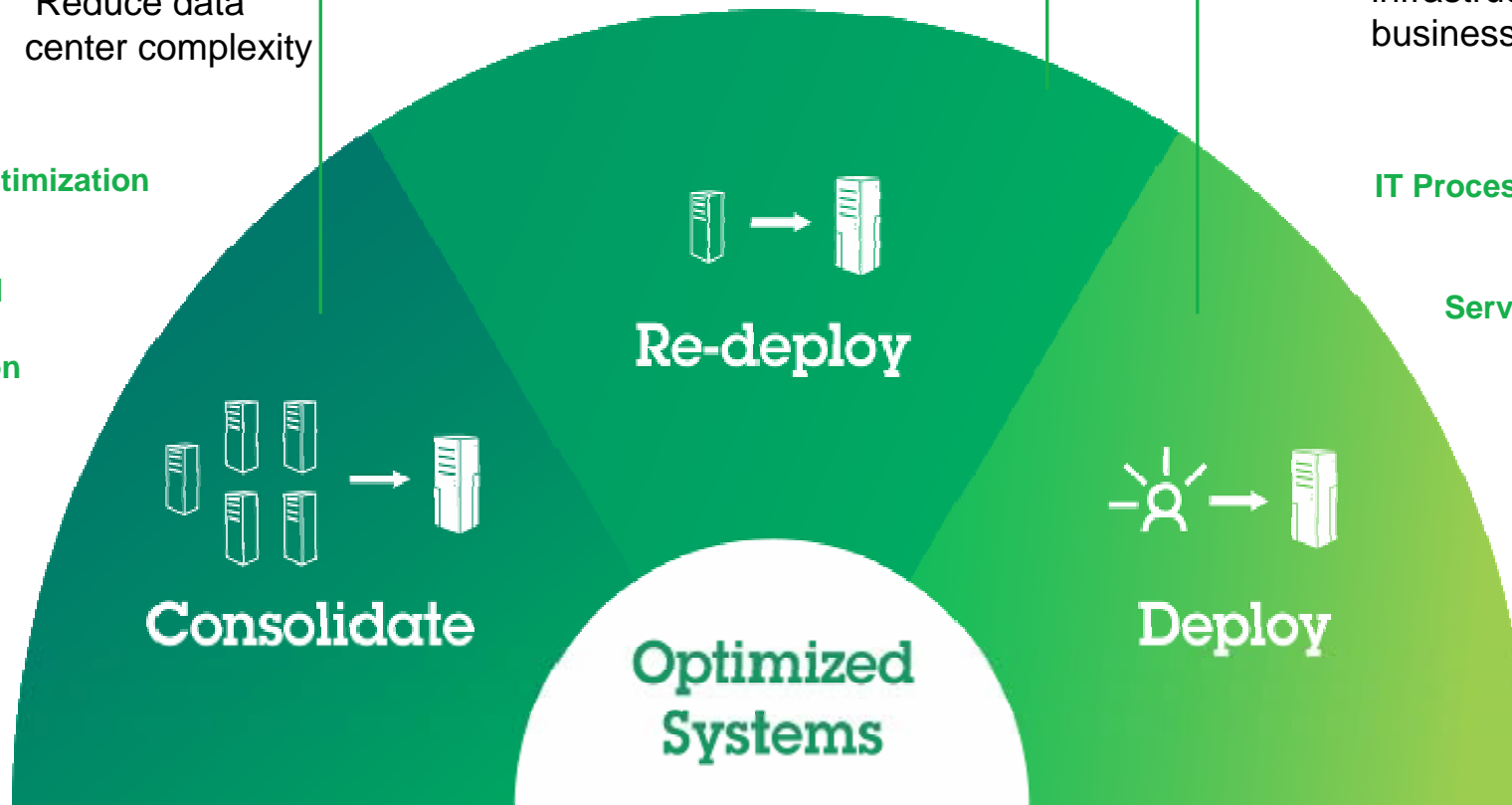- Reduce data center complexity

Deploy New Workloads

- Rapid deployment
- Ease of use
- Scale the IT infrastructure as business grows

Enhanced Monitoring & Event Management

Workload Optimization

Server and Storage Virtualization

IT Process Management

Service Automation

Re-deploy

Consolidate

Deploy

Optimized Systems

rporation

Clients are leveraging Optimized Systems based on specific needs

Consolidate Workloads

Large scale server consolidation on Linux using zEnterprise, zLinux, IBM Server Optimization and Integration Services

Bank of Russia deployed IBM System z to consolidate from 200 distributed servers to 4 mainframes, reducing technical staff workload by 85%

Re-deploy Existing Workloads

Storage Upgrade / Optimization using StorwizeV7000, SVC, EasyTier, IBM Implementation Services for Disk Systems, IBM Information Lifecycle Management Services—intelligent storage services catalog

Sprint deployed IBM SAN Volume Controller with XIV, realizing 60% reduction in storage maintenance costs, doubling storage utilization and reduction in both space and power requirements

Deploy New Workloads

Deploy new data warehousing/ analytics workloads on IBM Netezza appliances

Deployed new workloads on POWER7 and re-deployed existing Cognos workloads from x86 to z196 for scaling

Re-deploy

Consolidate

Deploy
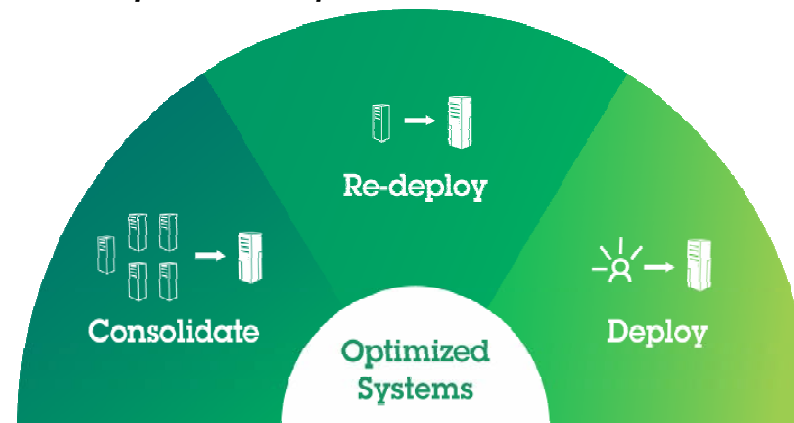
Optimized Systems

Optimized Systems provide the ideal *infrastructure foundation* for Big Data and Cloud

Optimized Systems for Big Data

- Workload Optimization for Business Analytics, Data Warehouse, Predictive/ Prescriptive analytics

- Storage optimization leveraging capabilities such as compression, de-duplication, encryption and archival

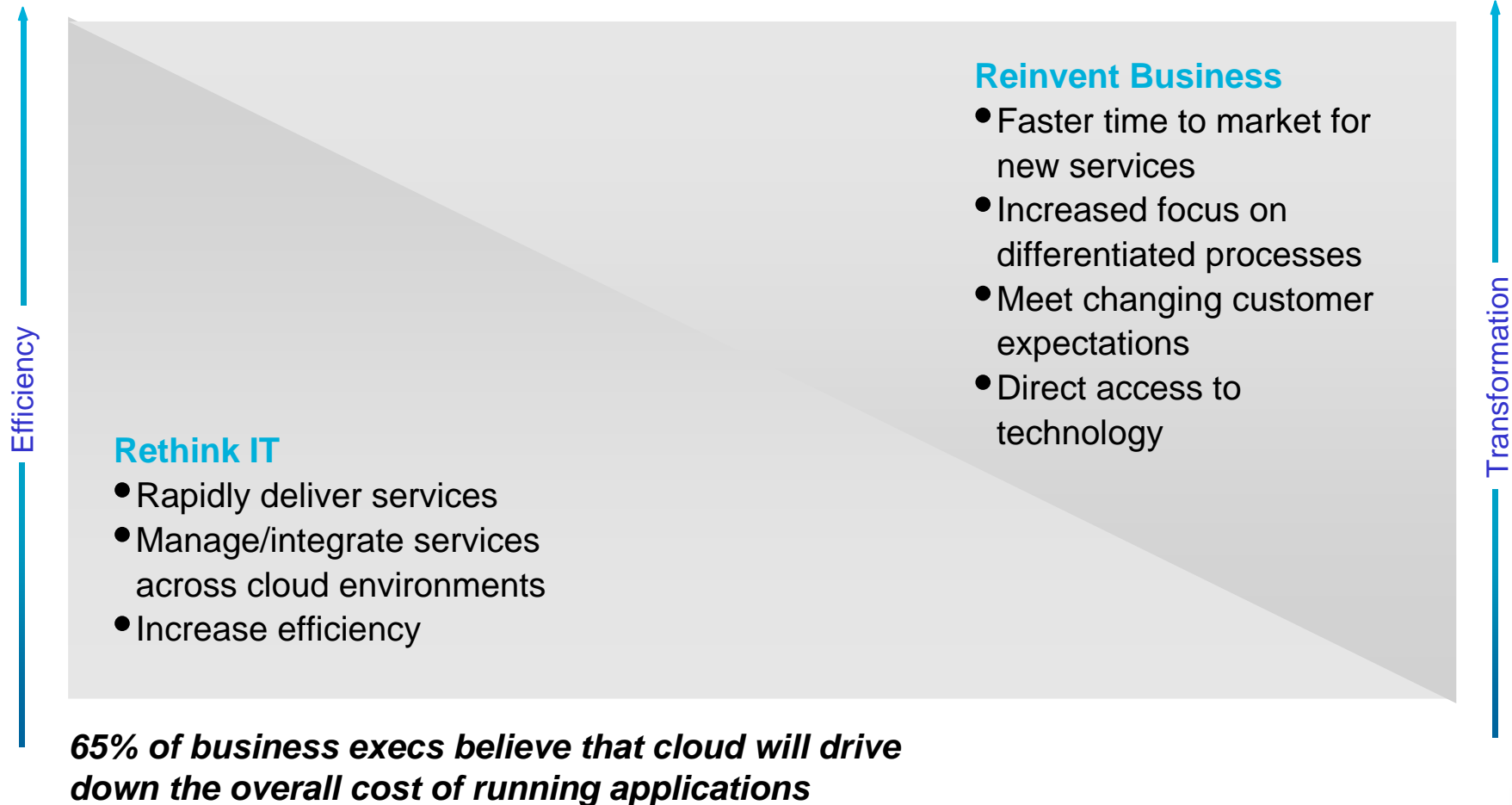**Optimized Systems** for Cloud

- Secure foundation for virtualizing servers, storage and networks

- Automated resource management, provisioning and charge back aligning IT assets with business priorities

Big Data

Cloud

Optimized Systems
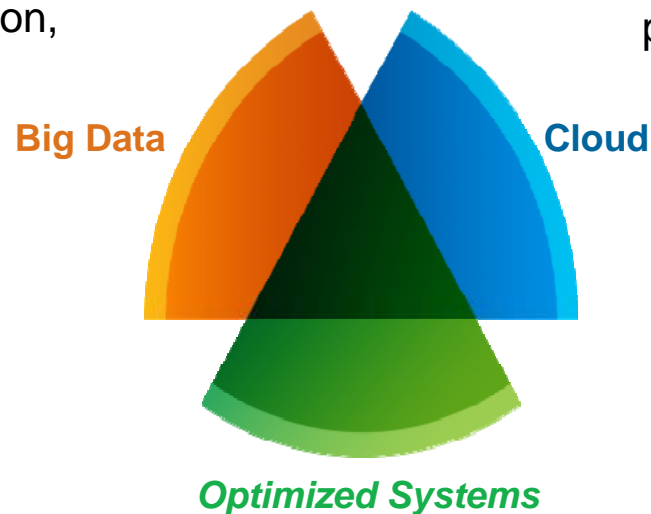
Managed in the Cloud
Cloud to reinvent IT
and drive innovation

The market forces leading to Smarter Computing are driving the proliferation of Cloud computing.

98% of IT execs believe that cloud delivers greater agility and flexibility in their IT environments

Efficiency

Transformation

Reinvent Business
- Faster time to market for new services
- Increased focus on differentiated processes
- Meet changing customer expectations
- Direct access to technology

Rethink IT
- Rapidly deliver services
- Manage/integrate services across cloud environments
- Increase efficiency

65% of business execs believe that cloud will drive down the overall cost of running applications

Both business and IT are unified in their view of cloud's overall value.

Cloud Computing

IT without Boundaries
New IT and business processes that break down traditional silos and simplify access to information

Create new business value
Empower internal and external communities to define and create new offerings and services.

Improve speed and dexterity
Speed the delivery of new offerings and services by creating new models of self-service and deployment.

→ **Economic and Business Value**

Transformation to cloud begins with 3 key steps: virtualize, automate and optimize.

Virtualized Infrastructure

Virtualization management

Systems management

Physical hardware

- Consolidate and virtualize across Servers, Storage and Networks
- Monitor the virtualized environment

Standardization and Automation

Automated Provisioning

Integrated Service Management

- Provisioning / de-provisioning
- Pool standardized virtualized building blocks
- Capture and catalog virtual images
- Monitor and Manage Instances

Cloud Management Stack

Self Service Automation

Metering and Charging

Policy based provisioning

- Shared resources
- Integrated virtualization management with IT service delivery processes
- Simplified deployment with virtual appliances

Every stage of cloud adoption requires service management to realize the full benefits of cloud strategy and to optimize return on investment.

Cloud Management Stack

Self Service Automation

Metering and Charging

Policy based provisioning

Standardization and Automation

Automated Provisioning

Integrated Service Management

Virtualized Infrastructure

Virtualization management

Systems management

Physical hardware

← Service Management →
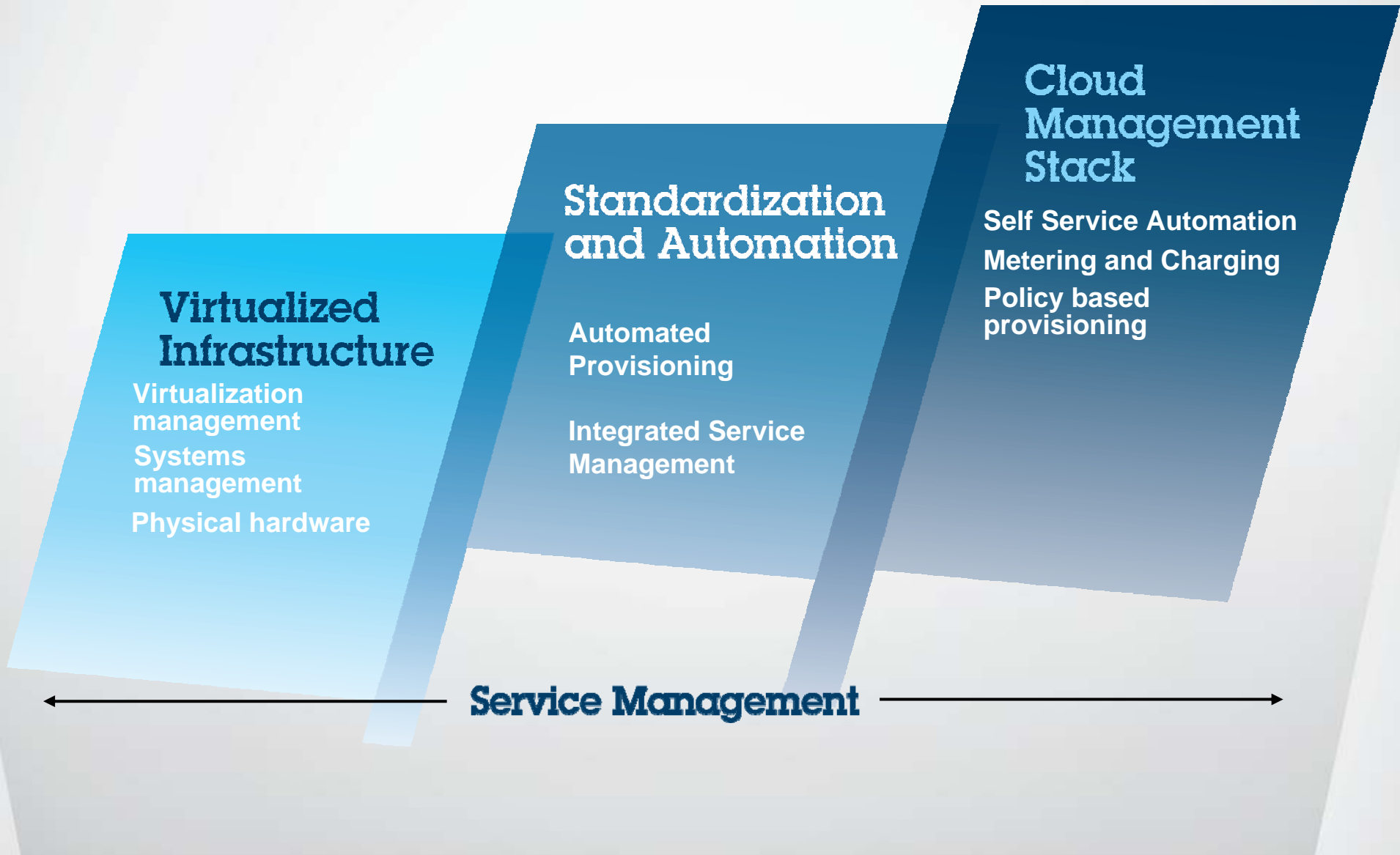
Integrated Service Management provides the *Visibility, Control, & Automation* needed to unlock the value of Cloud delivery models…

On average, 81%* of Cloud payback is driven by labor savings enabled by service management

- **Simplify user interaction with IT**
  - User friendly <u>self-service interface</u> accelerates time to value
  - <u>Service catalog</u> enables standards which drive consistent service delivery

- **Enable policies to lower cost**
  - <u>Automated provisioning</u> and de-provisioning speeds service delivery
  - Provisioning <u>policies</u> allow release and reuse of assets

- **Increase productivity**
  - Move from management silos to a <u>service management system</u> to enhance service delivery

VISIBILITY

See your business services

CONTROL

Manage your service policies

AUTOMATION

Optimize your service delivery processes

*Average of the three studies based on IBM Research study 2009
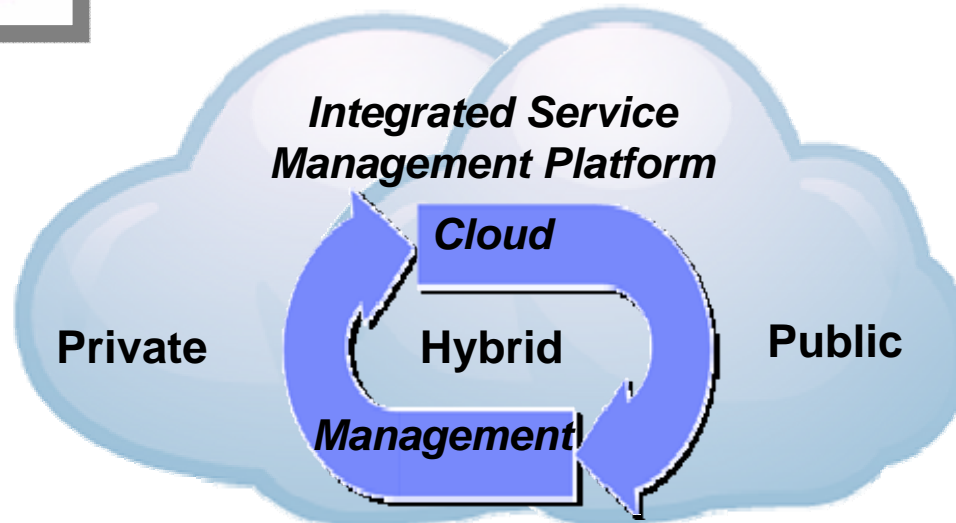
Integrated Service Management enables operations & infrastructure to provide a closed-loop system for automated self-service

Design
- Workload optimized systems
- Pre-integrated cloud & managed services

Integrated Service Management Platform

Cloud

Private — Hybrid — Public

Management

Manage
- Access, identity and threat protection
- Real-time monitoring for heterogeneous virtual environments
- High availability services
- Metering and billing
- Adherence to SLAs for service delivery

Deliver
- Integrated design & delivery
  - Integrated architecture, development & testing platform
  - Automated composite image capture, library & provisioning
  - Self-service catalog

Cloud Computing capabilities enable improved service delivery

Cloud Enabled Data Center

- Reduce operational and infrastructure costs
- Simplify management and increase visibility and control of virtualized environments
- Elasticity to deploy applications and improve efficiency of service delivery

Monitoring & Event Management

Server and Storage Virtualization

Workload Optimization

Cloud Platform Services

- Define standardized workloads that can leverage fit-for-purpose systems
- Accelerate time to market for new services

IT Process Management

Cloud Service Provider

- Create the most advanced, reliable, highly secure and scalable infrastructure for creating and managing cloud services quickly and cost effectively
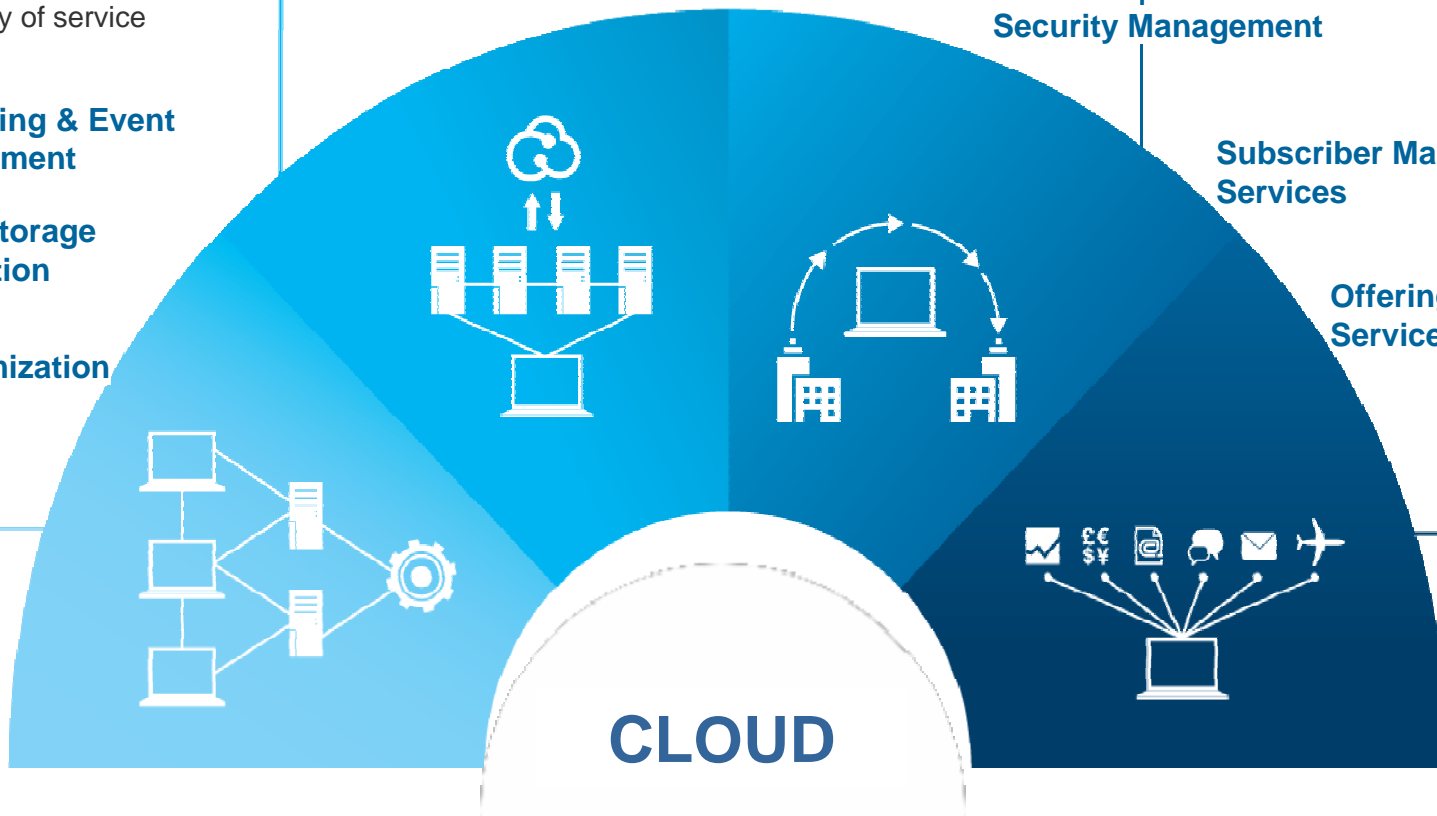
Service Automation

Business and IT as a Service

- Gain immediate access to enterprise class solutions without capital expense

Security Management

Subscriber Management Services

Offering Support Services

CLOUD

IBM delivers prescriptive, repeatable cloud solutions for our clients' most pressing priorities

Cloud Enabled Data Center

Optimize and manage virtualized infrastructure for up 45% increase in system administration productivity and up to 90% reduction in software costs

China Telecom implements Power Systems for improved utilization and hardware cost reduction of over 50%. They slashed time to market for new applications from 3-4 months to 2-3 days.

Cloud Platform Services

Automate infrastructure management to save up to 50% on costs and gain faster time to market

By using IBM Cloudburst Technology, Citi reduced provisioning times from 45 days to 20 minutes and increased systems admin support from 50 physical servers to 600 servers in the cloud.

Cloud Service Provider

Implement individual customer environments in weeks rather than months and grow customer base without needing increased floor space

Acxiom deployed dedicated cloud environments for clients by leveraging the eX5 platform to deliver 5 times the performance of the previous dedicated servers at 15 times less cost, while reducing power requirements by more than a megawatt.

Business and IT as a Service

Consume services through IBM Smart Cloud Services to reduce costs up to 50% and a return on investment in months

United States Golf Association uses IBM Smart Cloud to economically and securely protects 590GB of mission critical data daily and ensures availability of core business functions.

Cloud
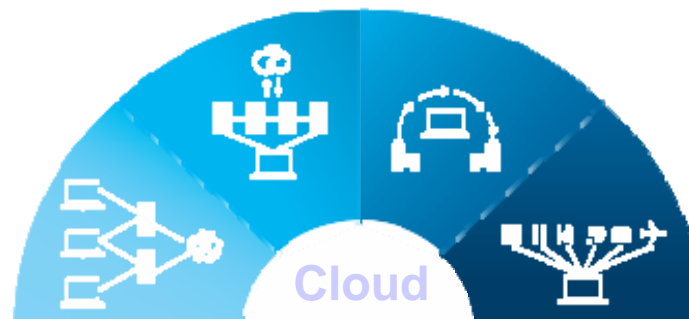
What is the value of Smarter Computing?

Through Smarter Computing, an enterprise can dramatically increase their capacity for IT service on a flat budget

Reduce cost to improve IT economics

- Server acquisition cost by up to 56%
- Database costs by 68%
- Floor space by up to 90%
- Power consumption by 80%

Reinvest in innovation

- Deliver new services more quickly
- Identify new trends more quickly
- Create new markets
- Utilize IT resources more effectively

Smarter Computing
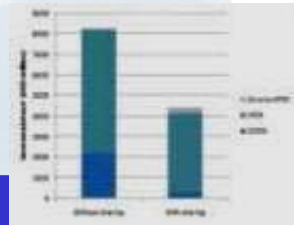Efficient and Innovative IT for Improved Economics

Designed for data

Managed in the Cloud

Tuned to the task
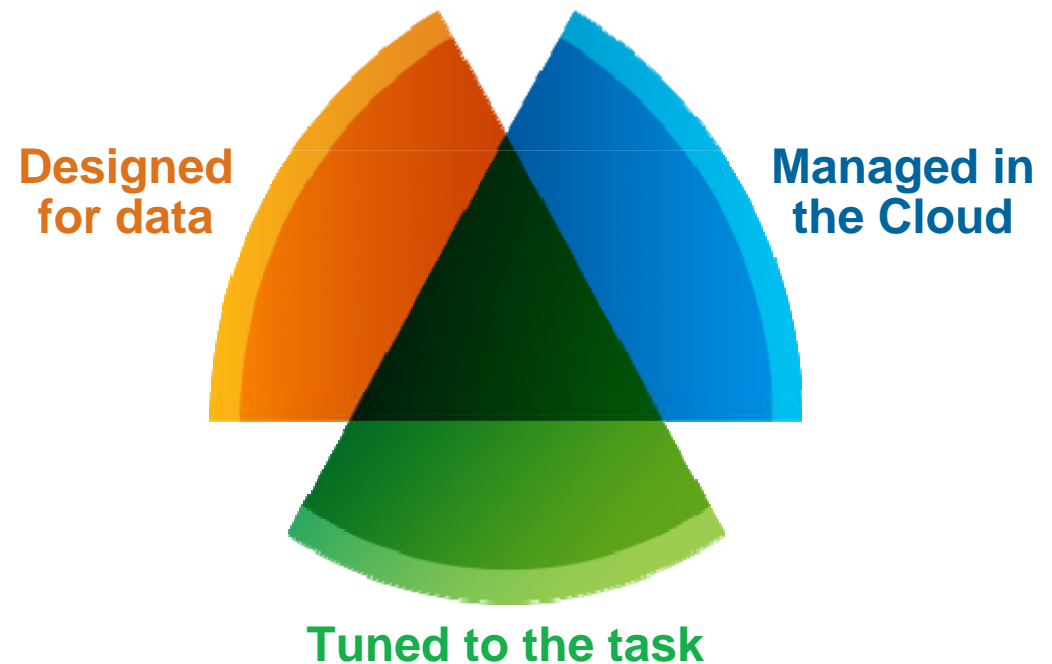
What our clients are telling us:
Cost Savings + Innovation = Value Creation

Lower IT Operating and Capital Costs

Fixed Cost to Variable Cost

Standardization enabled by integrated service management

Remove IT complexity from end users

Fast access to data analysis and powerful computing

Rapidly provisioned IT Services

University of Pittsburgh Medical Center achieved value from Smarter Computing.

$8 billion global healthcare enterprise with more than 50,000 employees challenged to lower cost of IT infrastructure to enable investment in next-generation clinical systems

Transformed to deliver:
- Doubled IT capacity and held costs flat
- Eliminated need for $80 million data center
- Enabled investment in next-generation clinical technology—"smart" hospital room and paperless hospital

UPMC
LIFECHANGINGMEDICINE

IBM can help any enterprise proceed with a strategic, staged approach to realize Smarter Computing

To create advantage by serving customers in new ways, start with **Big Data** and information integration.
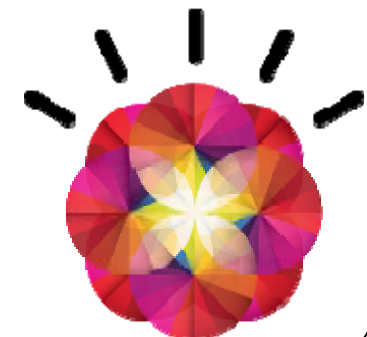
To create advantage by transforming the economics of your IT, start with workload **Optimized Systems.**

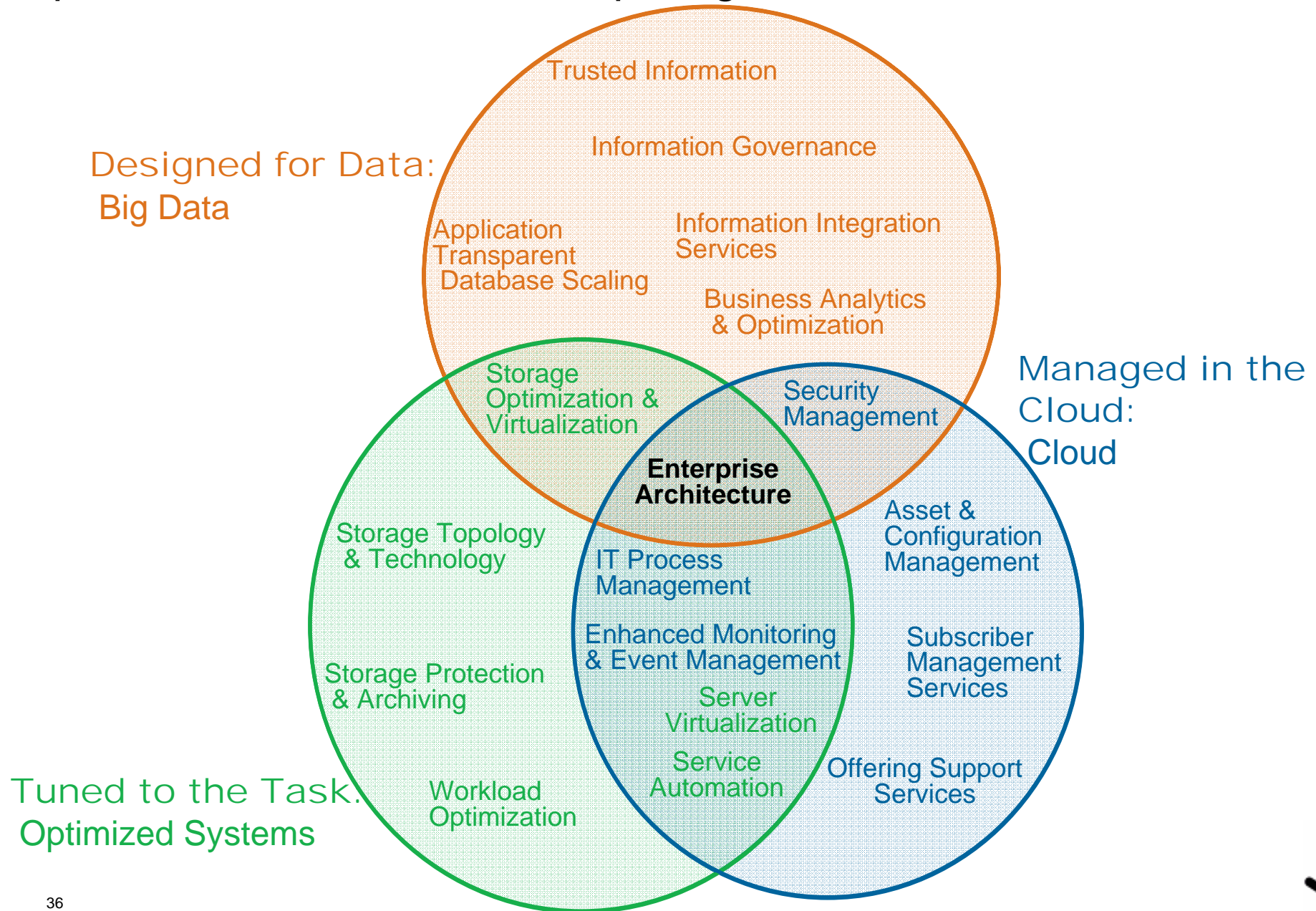To create advantage by reinventing IT and improving the speed of your service delivery, start with **Cloud.**

To maximize business advantage, do all three things together and design your IT as a **holistic system.**

How can you proceed to realize Smarter Computing?

Through our work with many clients, we have identified key capability areas that can enable an enterprise to define and prioritize their Smarter Computing initiatives.

Designed for Data:
Big Data

Trusted Information

Information Governance

Application Transparent Database Scaling

Information Integration Services

Business Analytics & Optimization

Storage Optimization & Virtualization

Security Management

Managed in the Cloud:
Cloud

Enterprise Architecture

Storage Topology & Technology

Asset & Configuration Management

IT Process Management

Storage Protection & Archiving

Enhanced Monitoring & Event Management

Subscriber Management Services

Server Virtualization

Service Automation

Offering Support Services

Tuned to the Task:
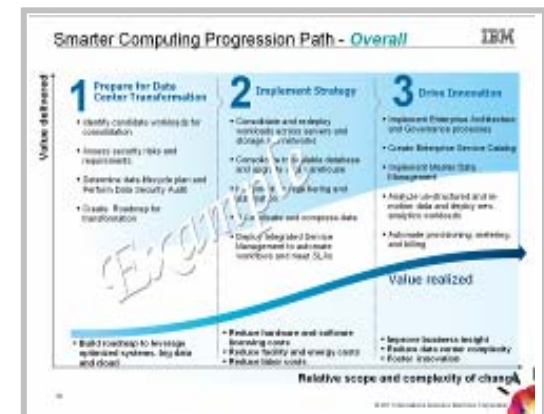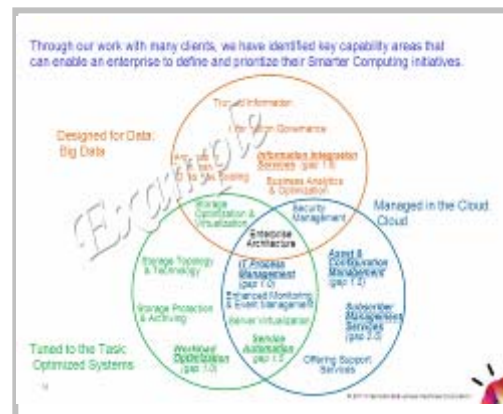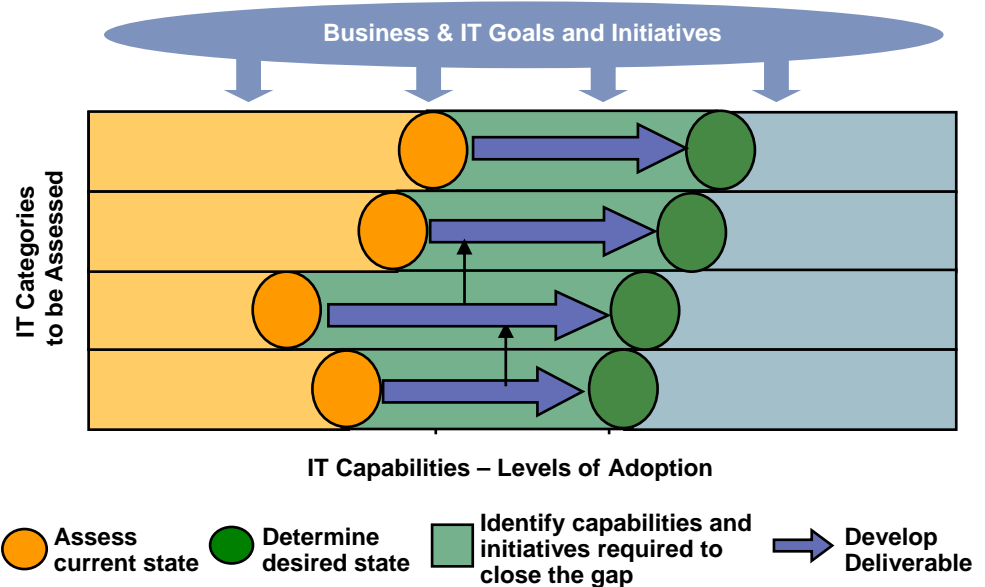Optimized Systems

Workload Optimization

The Smarter Computing assessment content areas include descriptions of these IT capabilities, which IBM considers critical for enabling an enterprise to optimize its IT investment while enhancing responsiveness to the business.

Architecture & Governance	▪ Enterprise Architecture	
Big Data Management	▪ Trusted Information ▪ Application Transparent Database Scaling	▪ Information Governance ▪ Information Integration Services ▪ Business Analytics & Optimization
IT Service Management	▪ IT Process Management ▪ Asset & Configuration Management ▪ Enhanced Monitoring & Event Management	▪ Subscriber Management Services ▪ Offering Support Services ▪ Security Management
Storage	▪ Storage Optimization & Virtualization	▪ Storage Topology & Technology ▪ Storage Protection & Archiving
Virtualization & Consolidation	▪ Workload Optimization ▪ Server Virtualization	▪ Service Automation

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The Smarter Computing Workshop identifies key IT transformation focus areas

- **Objective:**
  - To prioritize areas of improvement necessary to achieve Smarter Computing goals

- **Process:**
  - A facilitated 1/2 day group session
  - Assessment of IT's process and technology capabilities for key Smarter Computing areas
  - Collaborative prioritization of IT areas needing improvement

- **Deliverables:**
  - Assessment Summary
  - Prioritized recommendations
  - Progression paths and entry points

Business & IT Goals and Initiatives

IT Categories to be Assessed

IT Capabilities – Levels of Adoption

- Assess current state
- Determine desired state
- Identify capabilities and initiatives required to close the gap
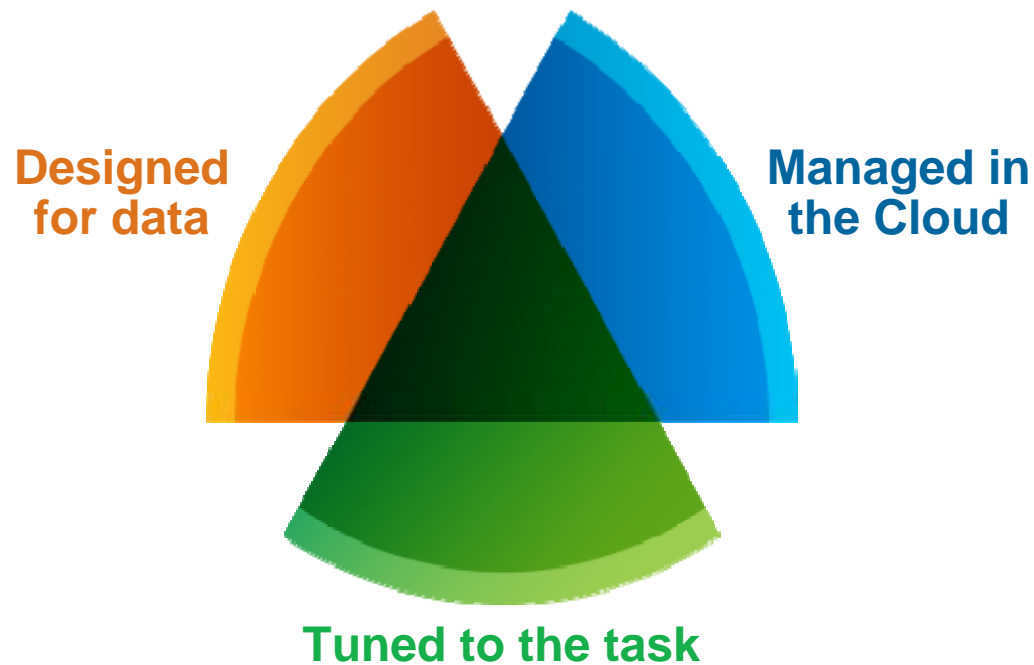- Develop Deliverable

Summary

Through Smarter Computing, an enterprise can dramatically increase their capacity for IT service on a flat budget

Smarter Computing
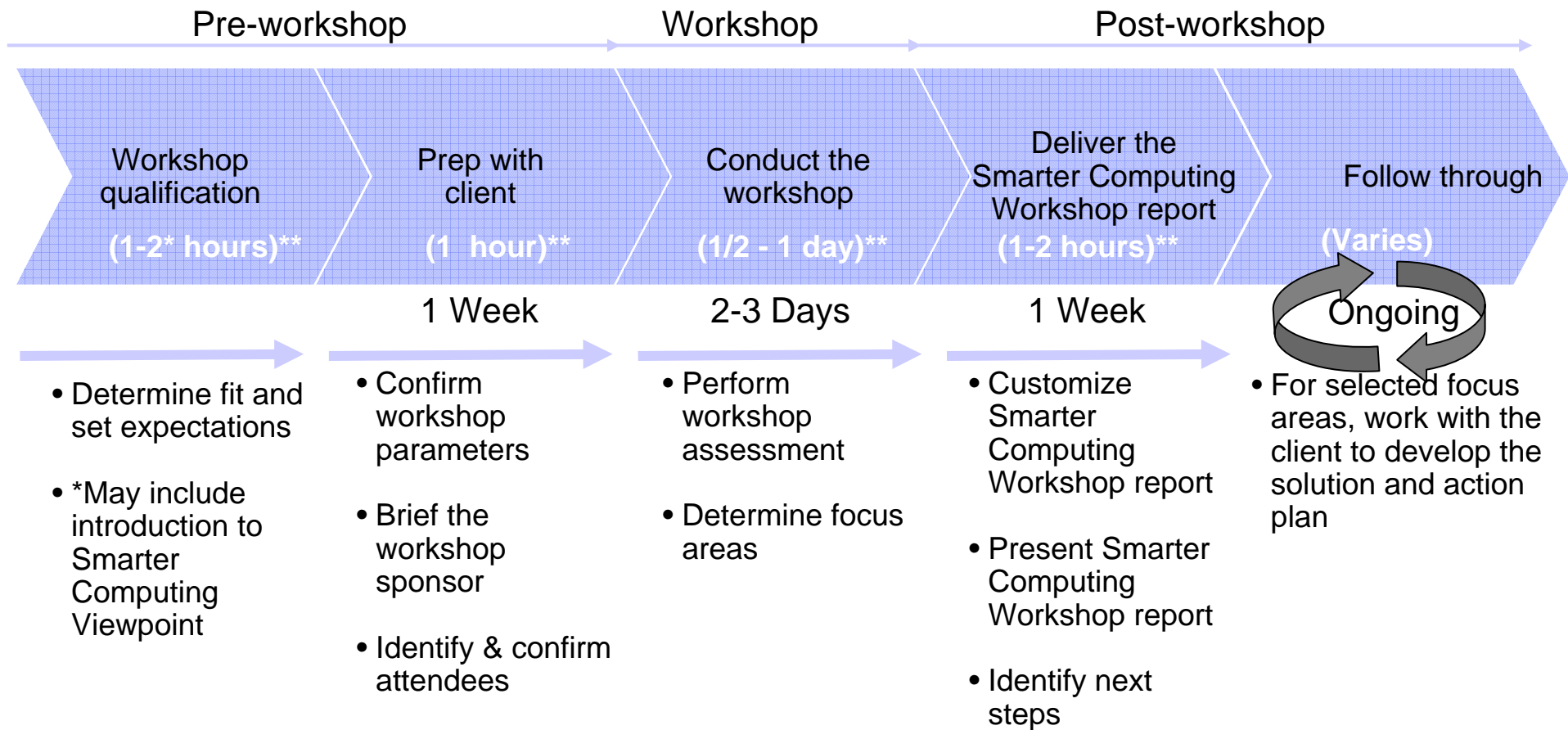Efficient and Innovative IT for
Improved Economics

Designed for data

Managed in the Cloud

Tuned to the task

ibm.com/smartercomputing

The Smarter Computing Workshop Process...

Pre-workshop → Workshop → Post-workshop

Workshop qualification	Prep with client	Conduct the workshop	Deliver the Smarter Computing Workshop report	Follow through
(1-2* hours)	**(1 hour)**	**(1/2 - 1 day)**	**(1-2 hours)**	**(Varies)**

1 Week	2-3 Days	1 Week	Ongoing

- Determine fit and set expectations
- *May include introduction to Smarter Computing Viewpoint

- Confirm workshop parameters
- Brief the workshop sponsor
- Identify & confirm attendees

- Perform workshop assessment
- Determine focus areas

- Customize Smarter Computing Workshop report
- Present Smarter Computing Workshop report
- Identify next steps

- For selected focus areas, work with the client to develop the solution and action plan

** = Estimated client time commitment