HALKBANK

IBM

IBM Big Data & Business Analytics

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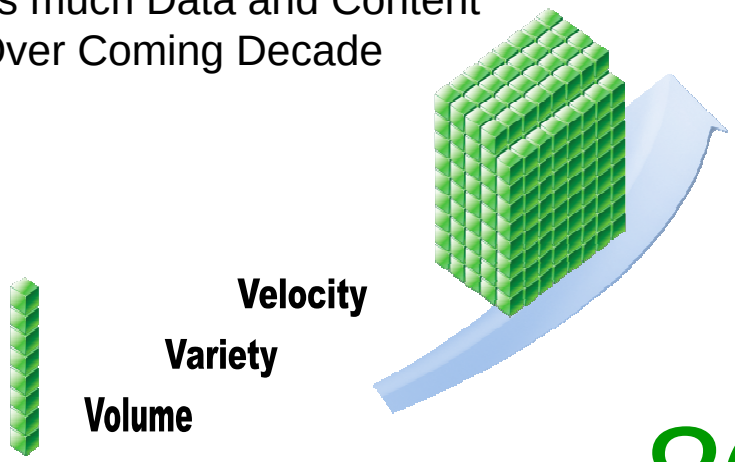
Information is at the Center of a New Wave of Opportunity…

… And Organizations Need Deeper Insights

44x

as much Data and Content Over Coming Decade

2020
35 zettabytes



2009
800,000 petabytes

80%

Of world's data is unstructured

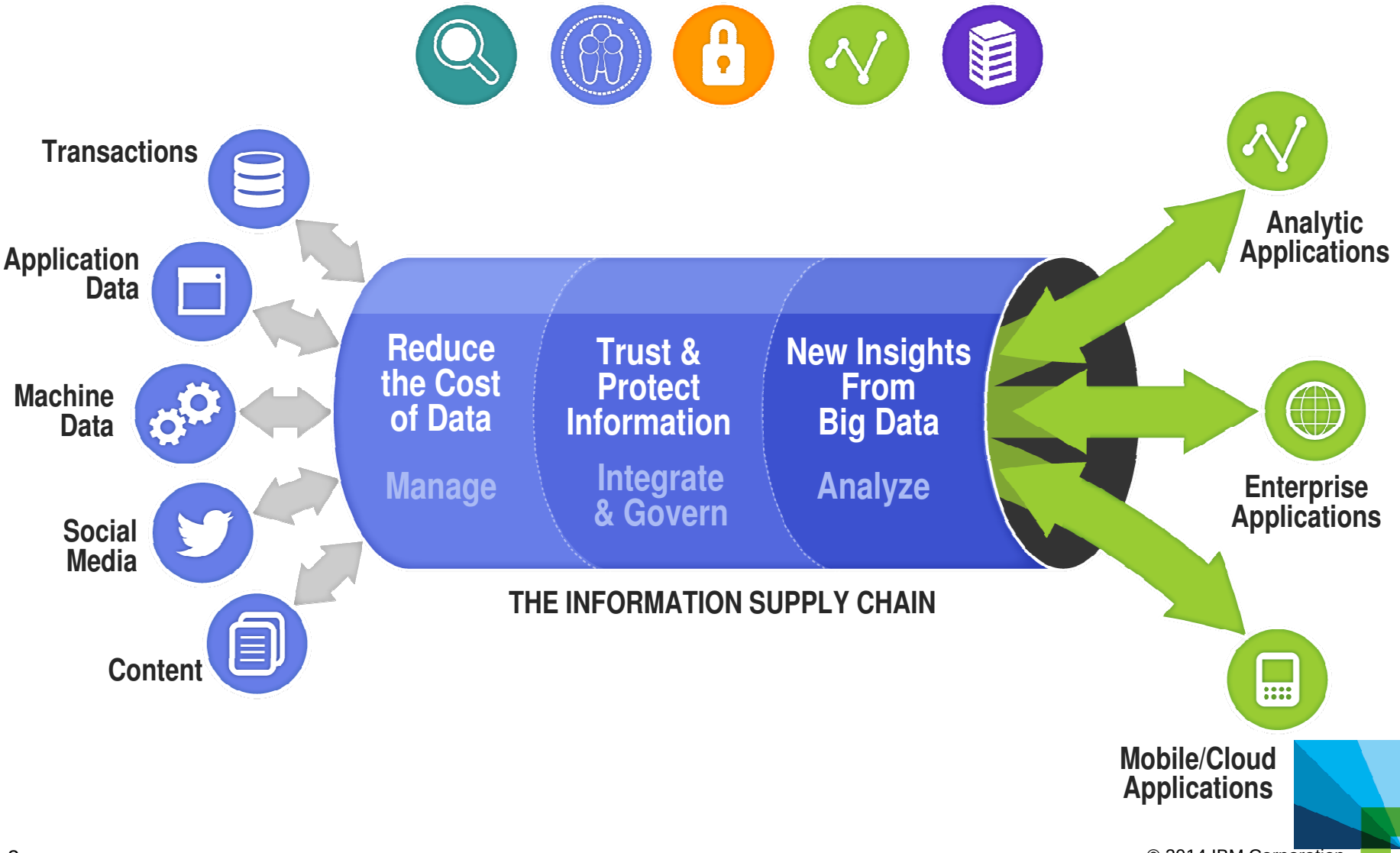
1 in 3 Business leaders frequently make decisions based on information they don't trust, or don't have

1 in 2 Business leaders say they don't have access to the information they need to do their jobs

83% of CIOs cited "Business intelligence and analytics" as part of their visionary plans to enhance competitiveness

60% of CEOs need to do a better job capturing and understanding information rapidly in order to make swift business decisions

From Natural Resources to Information Supply Chain



Meeting today's challenges means thinking differently about architecture

Reduce complexity

Each system tuned for the different needs of different analytic and transaction processing

Accelerate time to value

Data management expertise is built in each system and ready for immediate use

Improve IT economics

The entire system lifecycle is simplified from acquisition to retirement

The 5 Key Use Cases

Big Data Exploration

Find, visualize, understand all big data to improve decision making

Enhanced 360º View of the Customer

Extend existing customer views by incorporating additional internal and external information sources

Security/Intelligence Extension

Lower risk, detect fraud and monitor cyber security in real-time

Operations Analysis

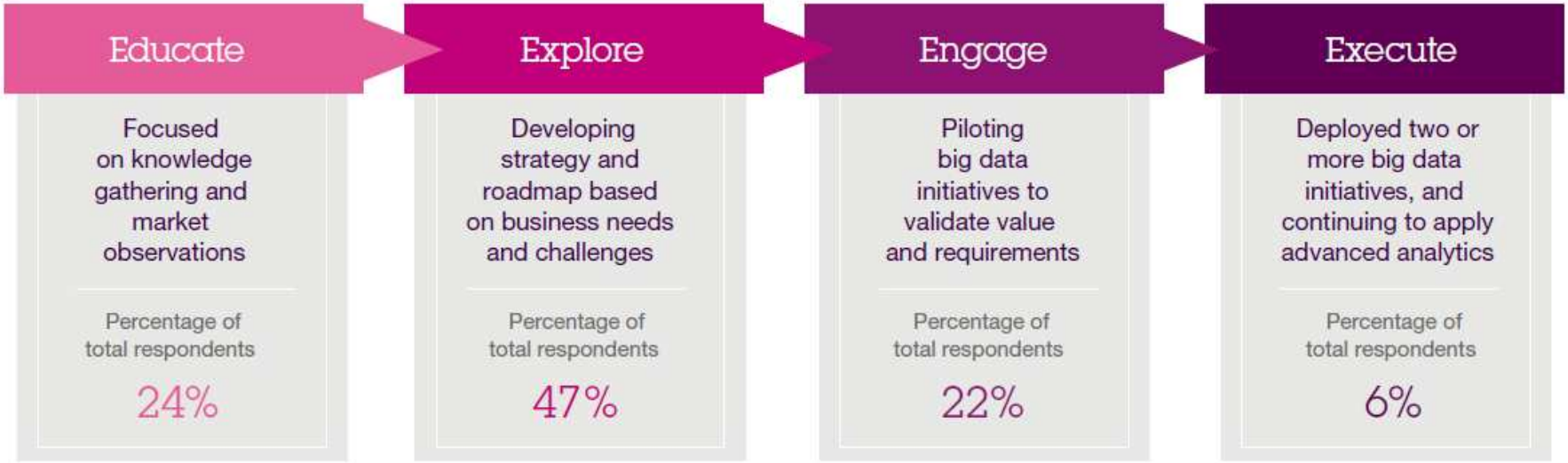
Analyze a variety of machine data for improved business results

Data Warehouse Augmentation

Integrate big data and data warehouse capabilities to increase operational efficiency

Big Data Use Study

Big data adoption stages



Respondents were asked to identify the current state of big data activities within their organizations. Percentage does not equal 100% due to rounding. Total respondents=1061

IBM

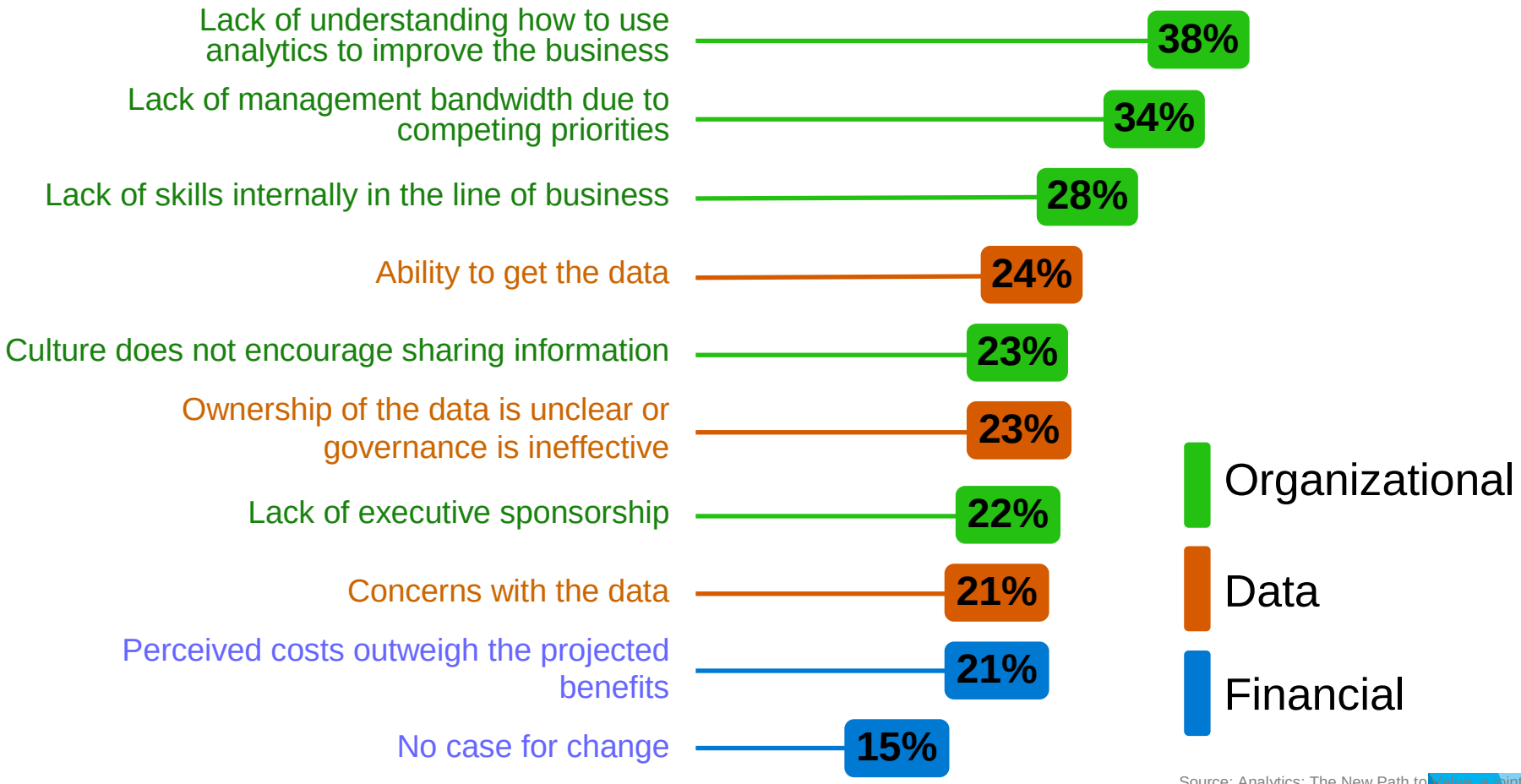
Saïd Business School
UNIVERSITY OF OXFORD

2012 Big Data @ Work Study surveying 1144 business and IT professionals in 95 countries

Why Analytics Matters

Organizational, not data or financial concerns, are holding back adoption

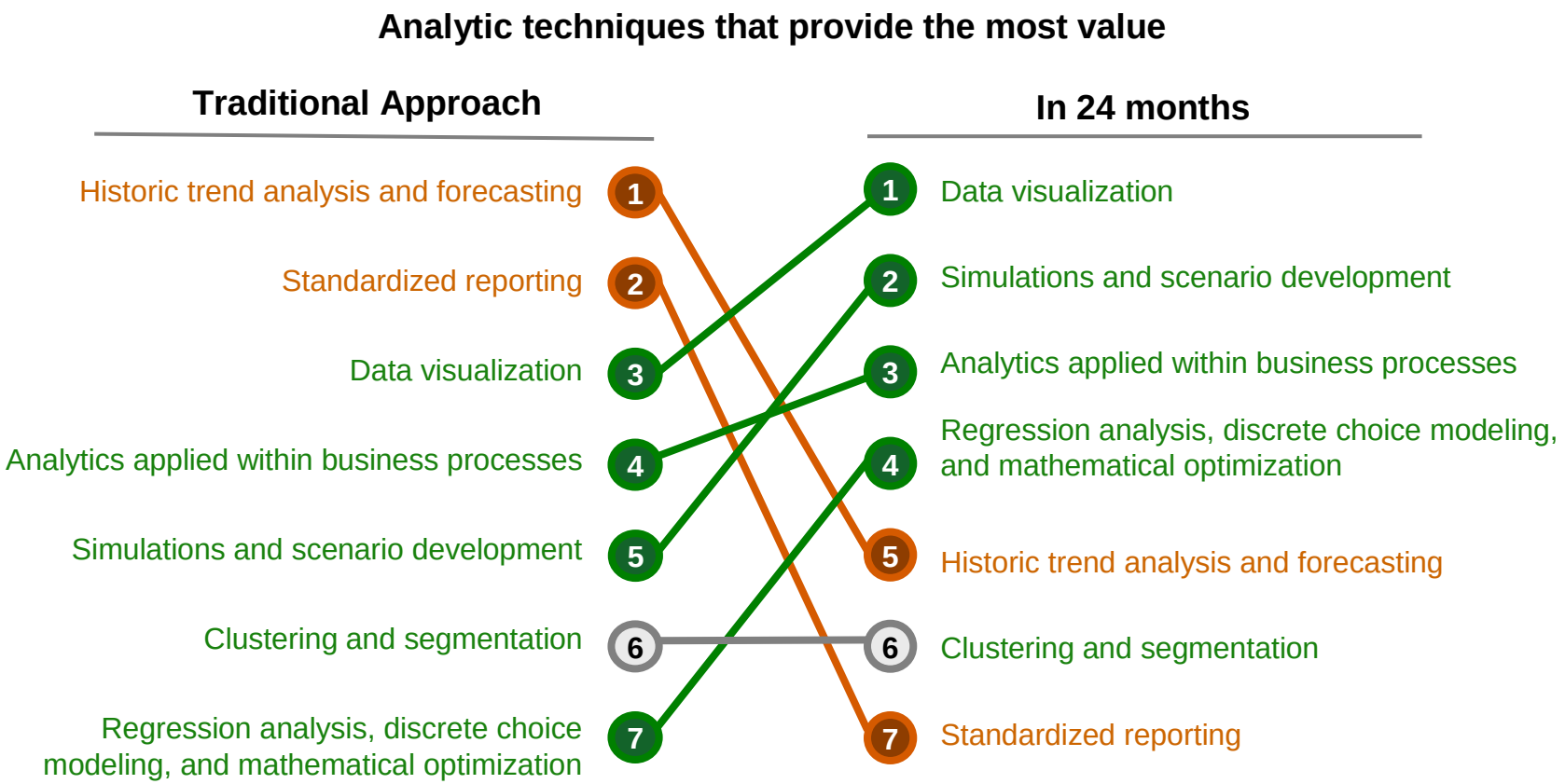
Primary obstacles to widespread analytics adoption



Source: Analytics: The New Path to Value, a joint MIT Sloan Management Review and IBM Institute of Business Value study. © 2010 Massachusetts Institute of Technology.

Why Analytics Matters

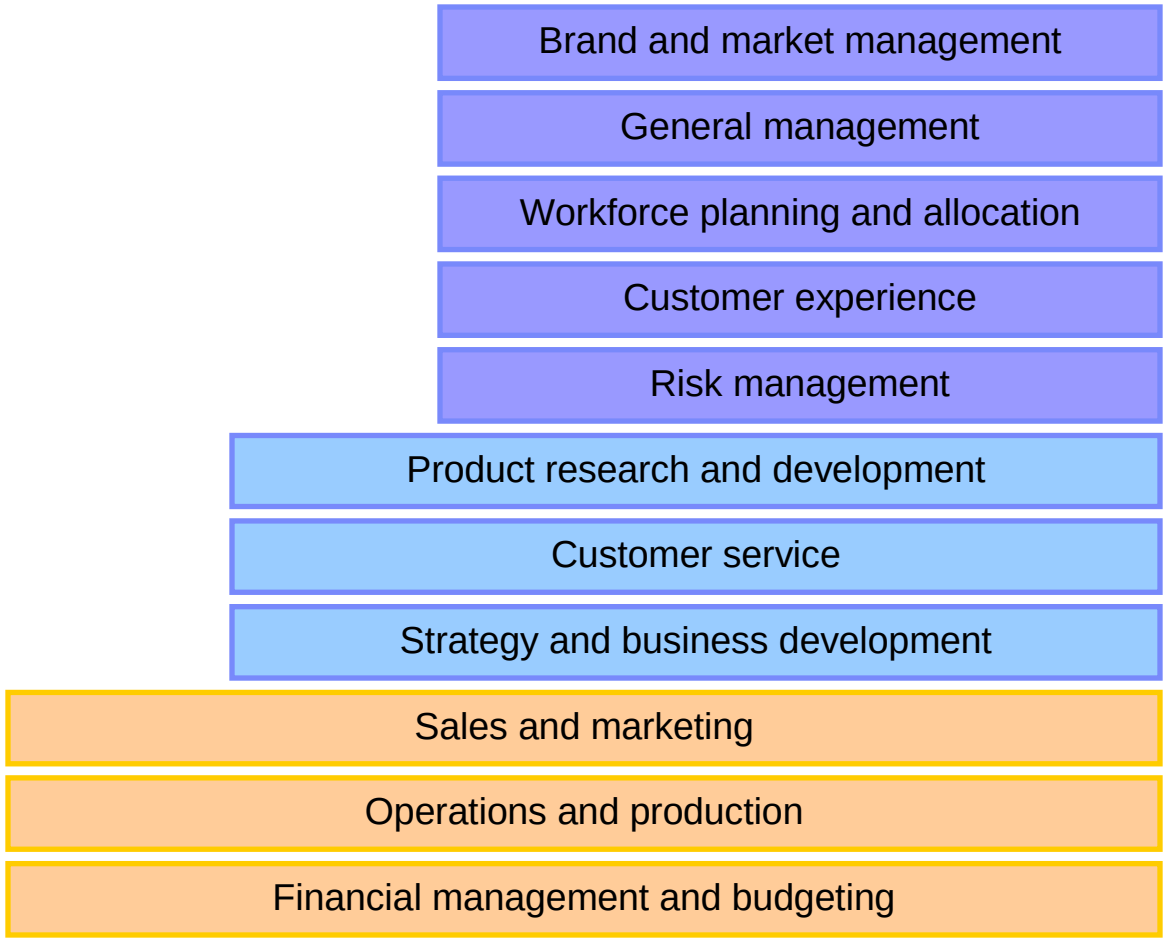
Organizations want to “see” insights more clearly – and act on them



Source: Analytics: The New Path to Value, a joint MIT Sloan Management Review and IBM Institute of Business Value study. © 2010 Massachusetts Institute of Technology.

Why Analytics Matters

Three segments emerged based on analytics capabilities with clear patterns illustrating common priorities, activities and roadblocks



Transformed (21%)

- Highest levels of analytics prowess and experience
- Seeking **targeted** revenue growth
- Feel the most pressure to do more with analytics

Experienced (46%)

- Seeking to grow revenue with focus on cost efficiencies
- Seeking to expand ability share information and insights

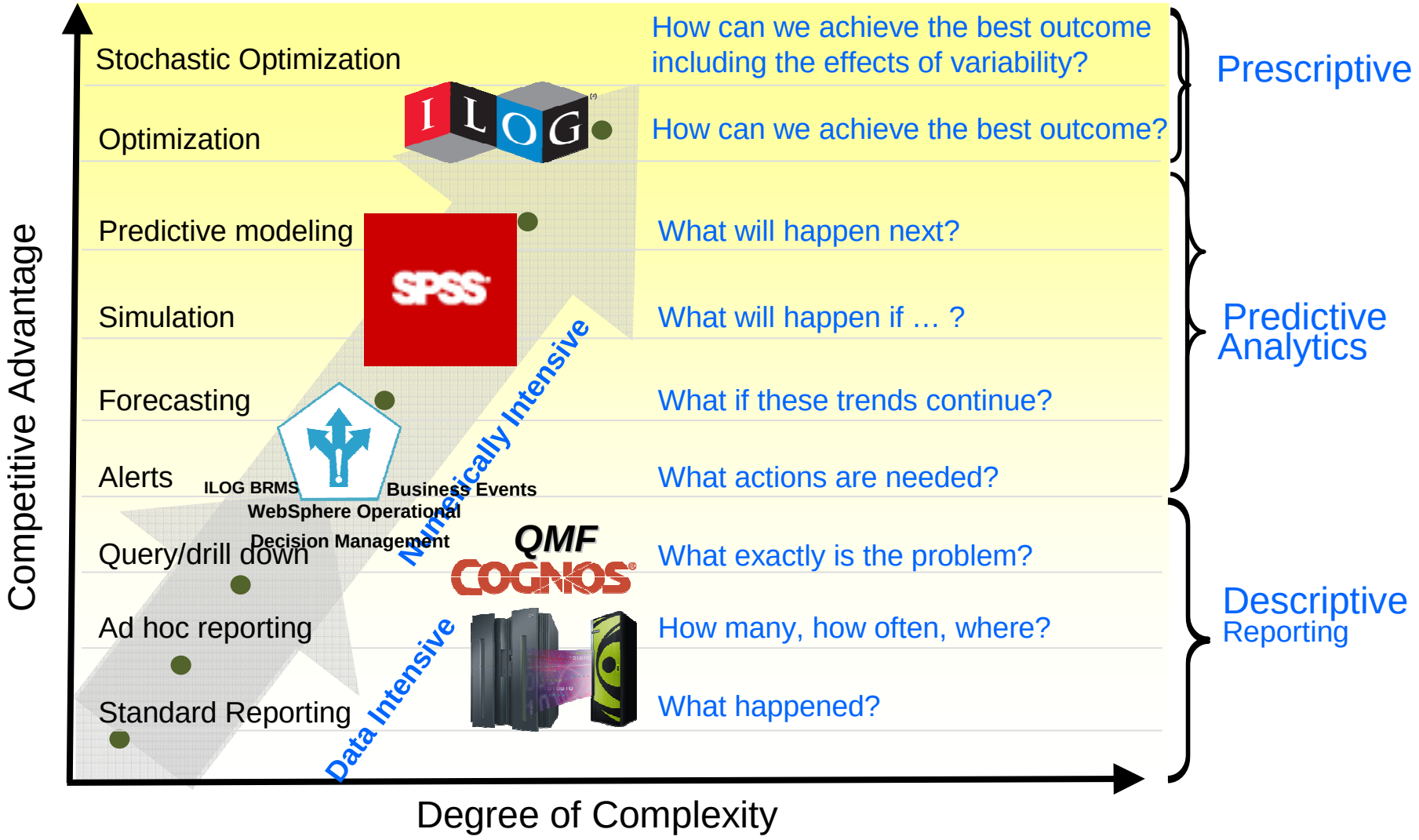
Aspirational (33%)

- Turn to analytics for ways to cut costs
- Focused on analytics at point of need

Source: Analytics: The New Path to Value, a joint MIT Sloan Management Review and IBM Institute of Business Value study. © 2010 Massachusetts Institute of Technology.

Commercial HPC > Business Analytics

Mathematical-Analytics Landscape



Increasing prevalence of compute and data intensive parallel algorithms in commercial workloads driven by real time decision making requirements and industry wide limitations to increasing thread speed

Based on: Competing on Analytics, Davenport and Harris, 2007

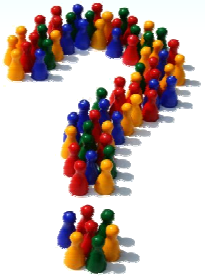
Merging the Traditional and New Data Approaches

Traditional Approach

Structured & Repeatable Analysis

Business Users

Determine what question to ask



IT

Structures the data to answer that question

- Monthly sales reports
- Profitability analysis
- Customer surveys

Big Data Approach

Iterative & Exploratory Analysis

IT

Delivers a platform to enable creative discovery

Business

Explores what questions could be asked

- Brand sentiment
- Product strategy
- Maximum asset utilization

Business Analytics Life Cycle – Async and Distributed

Scoring

Rules

Analytical Foresight

Optimized Business Processes

- Customer Support
- Sales Effectiveness
- Claims Processing
- Fraud Management
- Underwriting
- Marketing

Operational Systems

Data Mining
Segmentation
Prediction
Statistical Analysis

x/p server

Bulk

Analytics Server

x/p server

Data Mover

Staging Area

Staging Area

Transformation Server

Batch Process

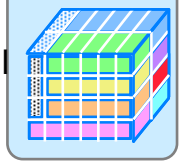
x/p server

Enterprise Data Warehouse (RDBMS)

MIS System
Budgeting
Campaign management
Financial Analysis
Selling Platforms
Customer Profit Analysis
CRM

Multi-Dimensional Analysis

x/p server



Batch Process

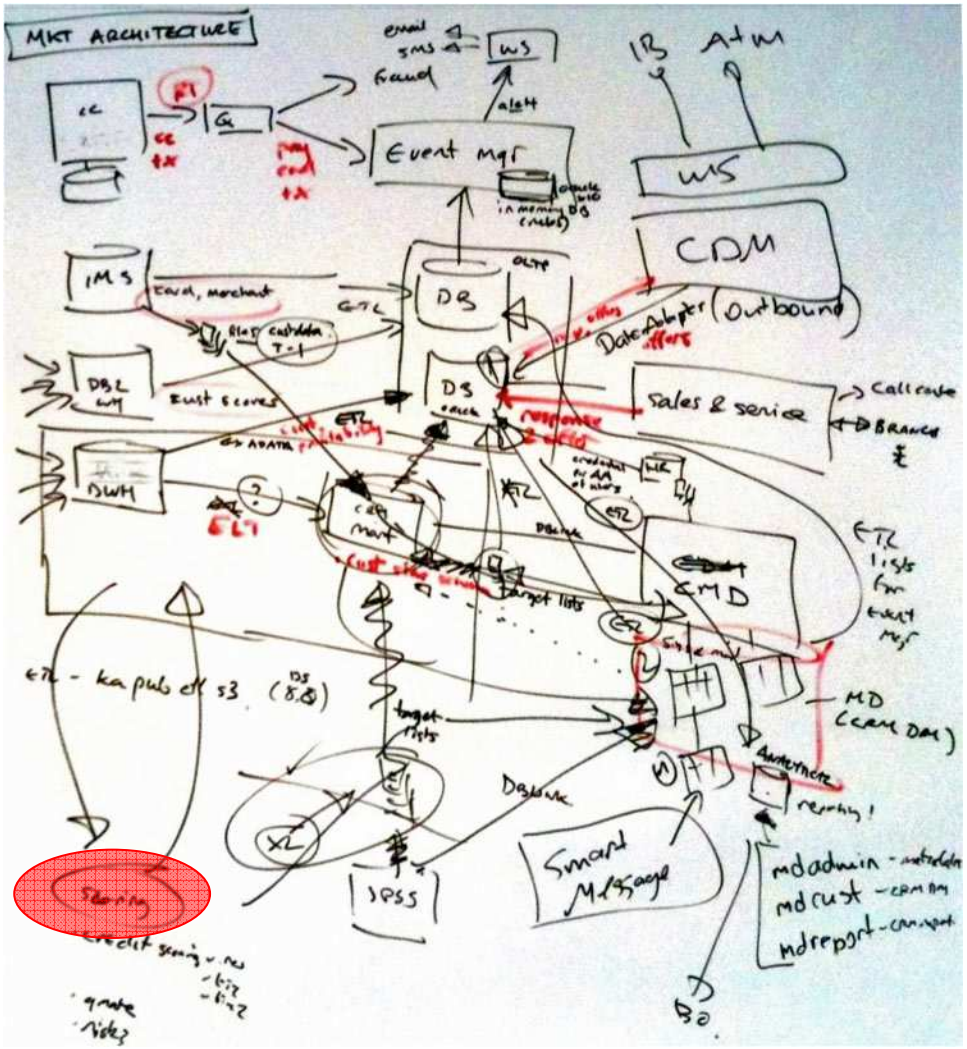
x/p server

Departmental Data Marts

Online Queries & Reporting
Business Objects & Web Intelligence

What usually happens when all views of data are **not** co-located

- **Client key concerns:**
  - Cannot deliver real-time analytics
  - Inadequate performance
  - Governance model
  - Data latency
  - Data completeness
    - Not all in one source
    - Lack access to fine-grained data
    - Lack “customer intent” e.g. cancelled transactions
- **Multi-day workshop captured the complexity of the current architecture**
- **The picture does not show all the steps before the data gets to the off-platform warehouse**

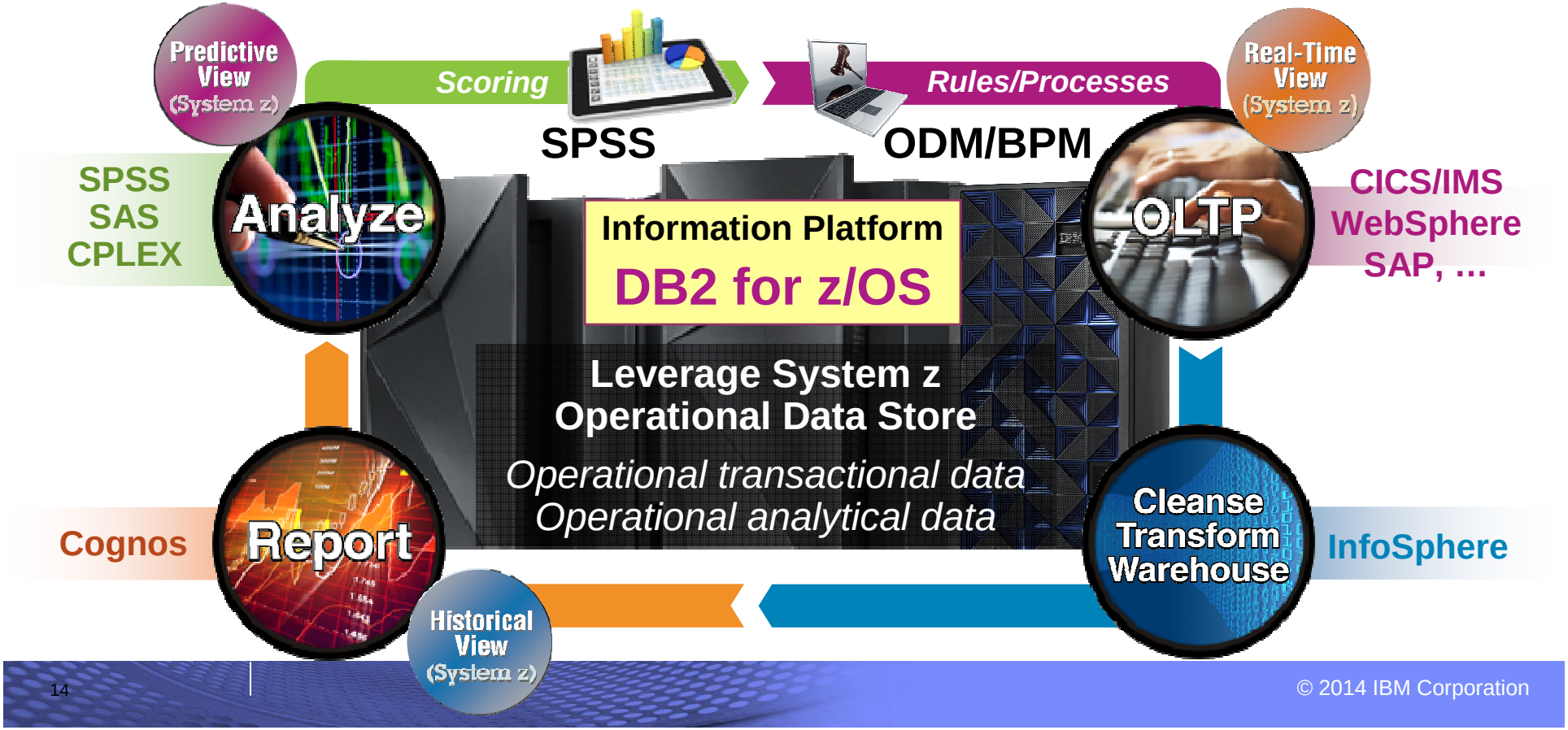


The System z strategy integrates transactions and business critical analytics into one streamlined, end-to-end data lifecycle

Differentiate DB2 for z/OS and System z to integrate analytics with real time OLTP

Superior end/end analytics lifecycle integration

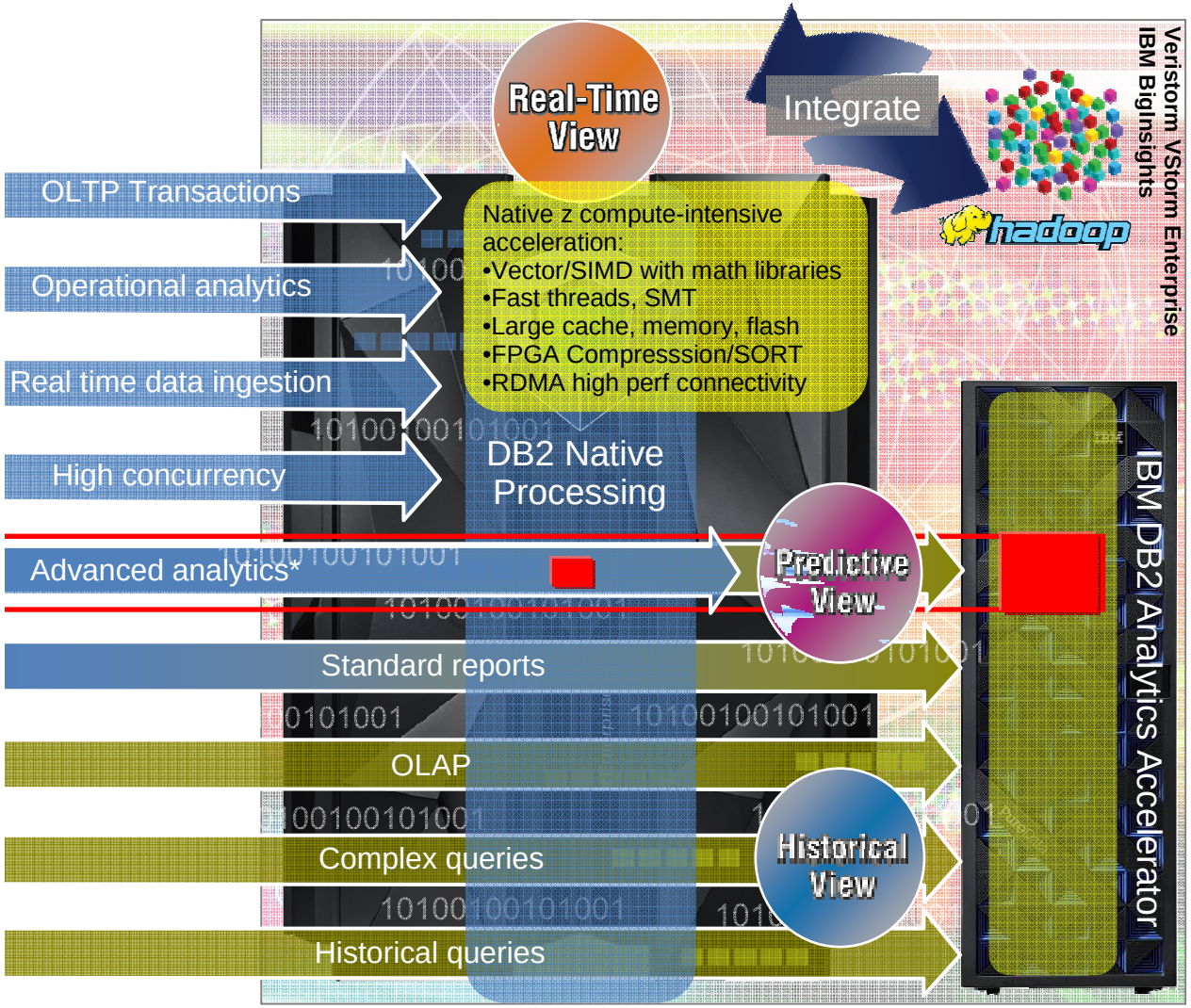
Better business response,
Reduced data movement, reduced complexity, reduced configuration resources,
More accurate, more secure, more available



System z: A Hybrid Transaction and Analytics Processing platform

A single workload-optimized system for accelerating decisions to the speed of business

Everything is online – analytics in the right place



More timely insights from data

- High-speed analytics easily integrated into operational applications
- Historical views are quickly analyzed for more train-of-thought analysis
- Decision makers can perform business analysis they never dared in the past
- Secured environment for highly sensitive data
- Speeds batch reporting cycle to meet stricter service level agreements

Operational benefits

- Configuration simplification
- Single point of entry
- Reduced data movement
- High fidelity data
- Dynamic routing for most efficient fit for purpose execution architecture
- Single environment for security, logging, back-up, and recovery
- Competitive price/performance

Real-time, data-oriented solutions transform these questions into actionable insights

How do I target and retain my best customers?
- ex.: churn management

Work from a single, current view of the customer
Next Best Action *solutions*

How do I reduce fraud?
- ex.: real-time fraud identification/prevention

Drive insights directly into payment systems
Anti-Fraud *solutions*

How do I manage risk?
- ex.: operational and financial risk visibility

Develop a real-time enterprise view of risk-related data
Governance, Risk and Compliance *solutions*

How do I focus limited resources where they will be most effective?
- ex.: supply-chain optimization

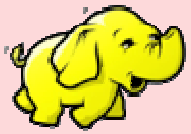
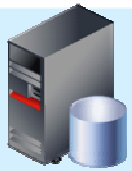
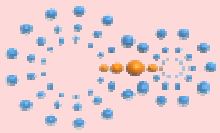
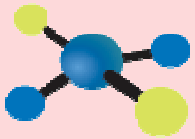
Know where everything and everyone is right now
Resource Optimization *solutions*

IBM Big Data Technology

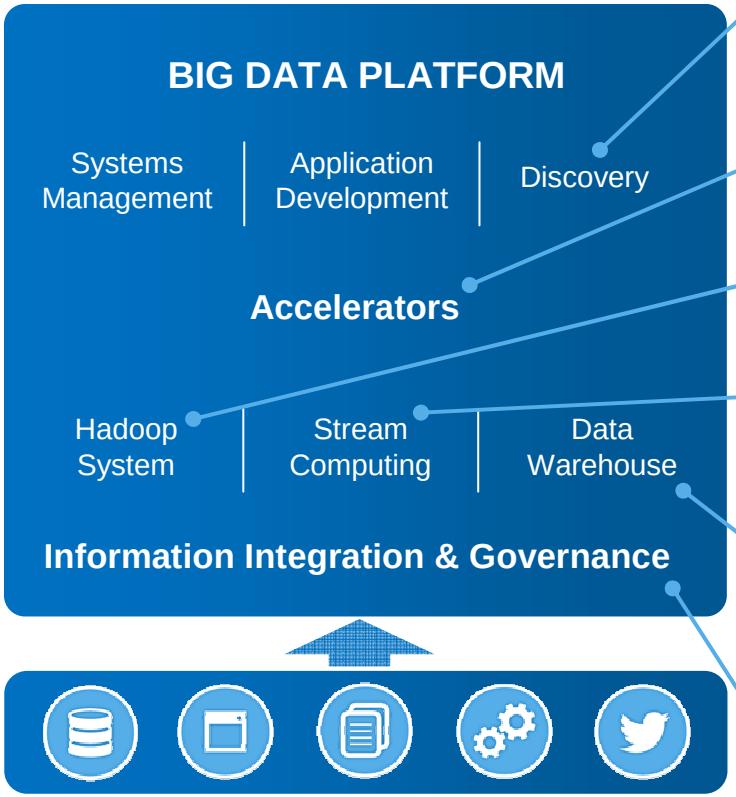
A Big Data Platform Manifesto

CONSUMABLE

"I'm a scientist that just wants to run my applications faster…"

Understand and Navigate Federated Big Data Sources		Federated Discovery and Navigation
Manage and Store Huge Volume of any Data		Hadoop File System MapReduce
Structure and Control Data		In-Memory Analytics Data Warehousing
Manage Streaming Data		Stream Computing
Analyze Unstructured Data		Text Analytics Engine
Integrate and Govern all Data Sources		Integration, Data Quality, Security, ILM, MDM

IBM's Key Platform Capabilities



Watson Explorer
Find, navigate, visualize all data

Accelerators
Speed time to value with analytic and application accelerators

InfoSphere BigInsights
Bringing Hadoop to the enterprise

InfoSphere Streams
Analytics for data in-motion exploration

PureData for Analytics & InfoSphere Warehouse
Delivers deep insight with advanced database analytics & operational analytics

Information Integration and Governance
Govern data quality and manage the information lifecycle

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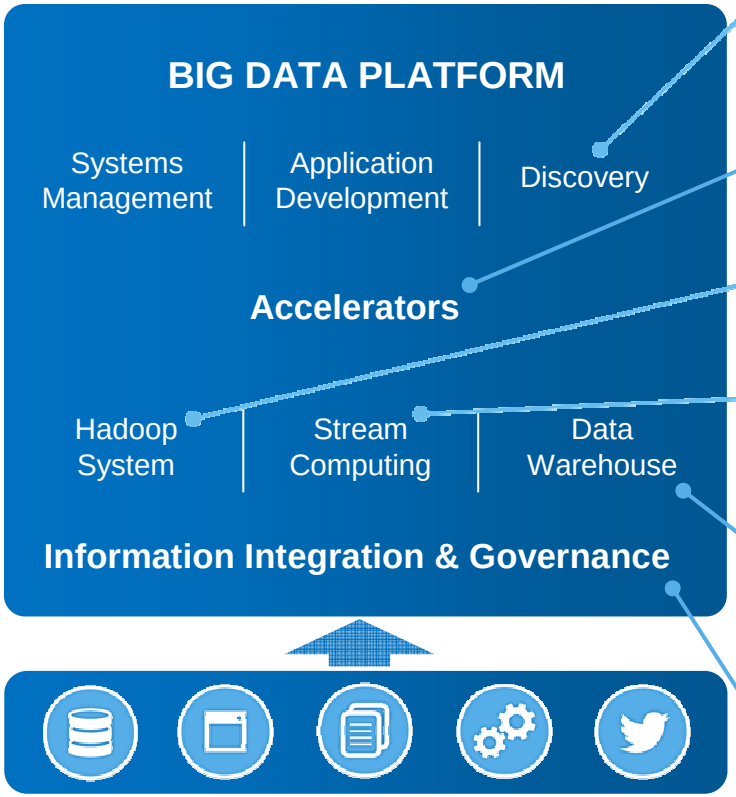

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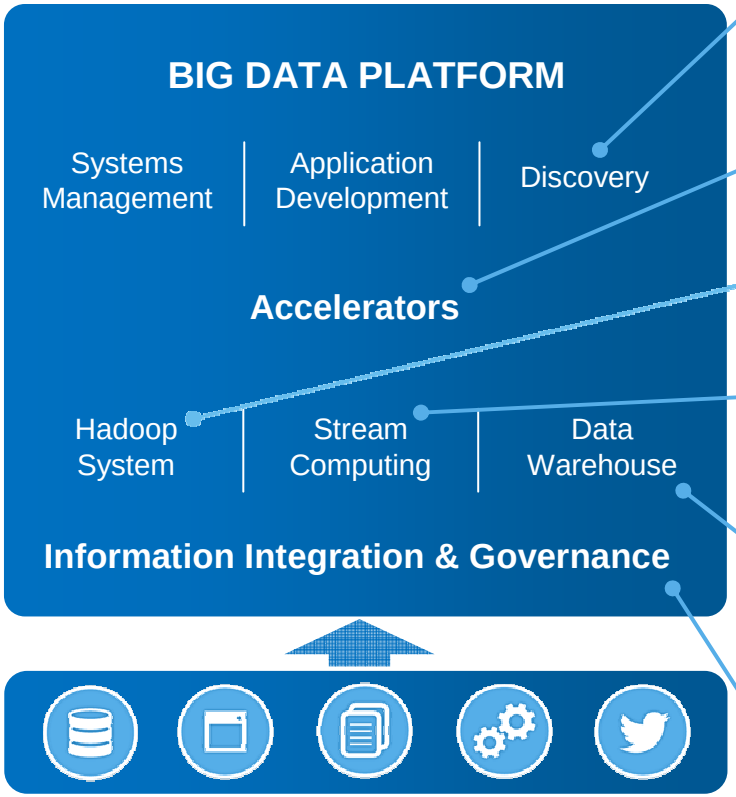

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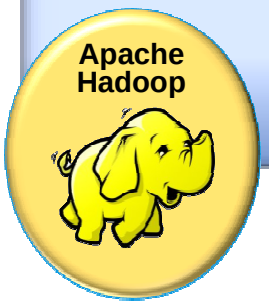
BigInsights: Value Beyond Open Source

Enterprise Capabilities

- Visualization & Exploration
- Development Tools
- Advanced Engines
- Connectors
- Workload Optimization
- Administration & Security

Open source components



IBM-certified
Apache Hadoop and related projects

Key differentiators

- Built-in text analytics
- Enterprise software integration
- SQL support
- Spreadsheet-style analysis
- Integrated installation of supported open source and other components
- Web Console for admin and application access
- Platform enrichment: additional security, performance features, GPFS (alternative file system), . . .
- World-class support
- Full open source compatibility

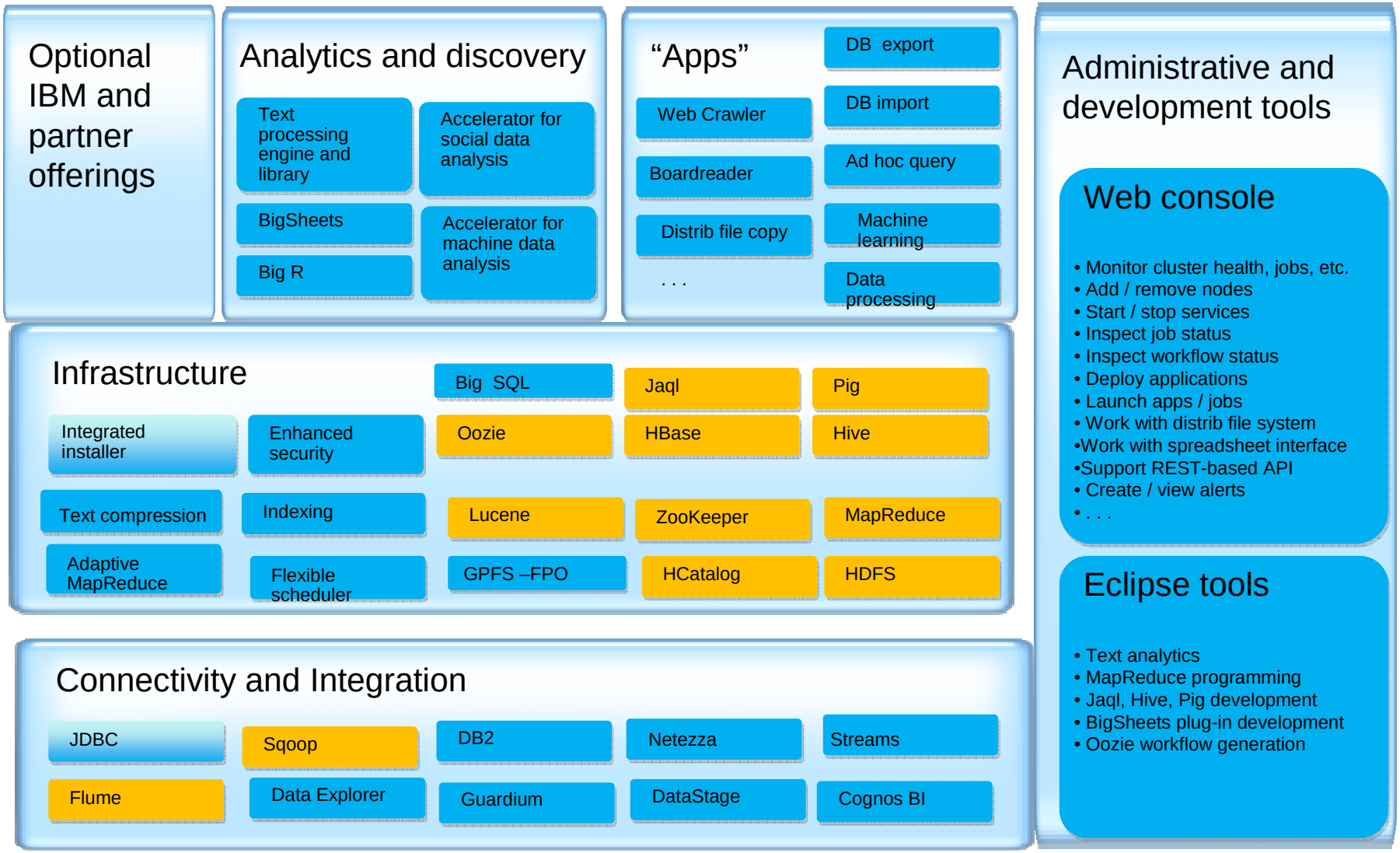
Business benefits

- Quicker time-to-value due to IBM technology and support
- Reduced operational risk
- Enhanced business knowledge with flexible analytical platform
- Leverages and complements existing software

BigInsights Enterprise Edition

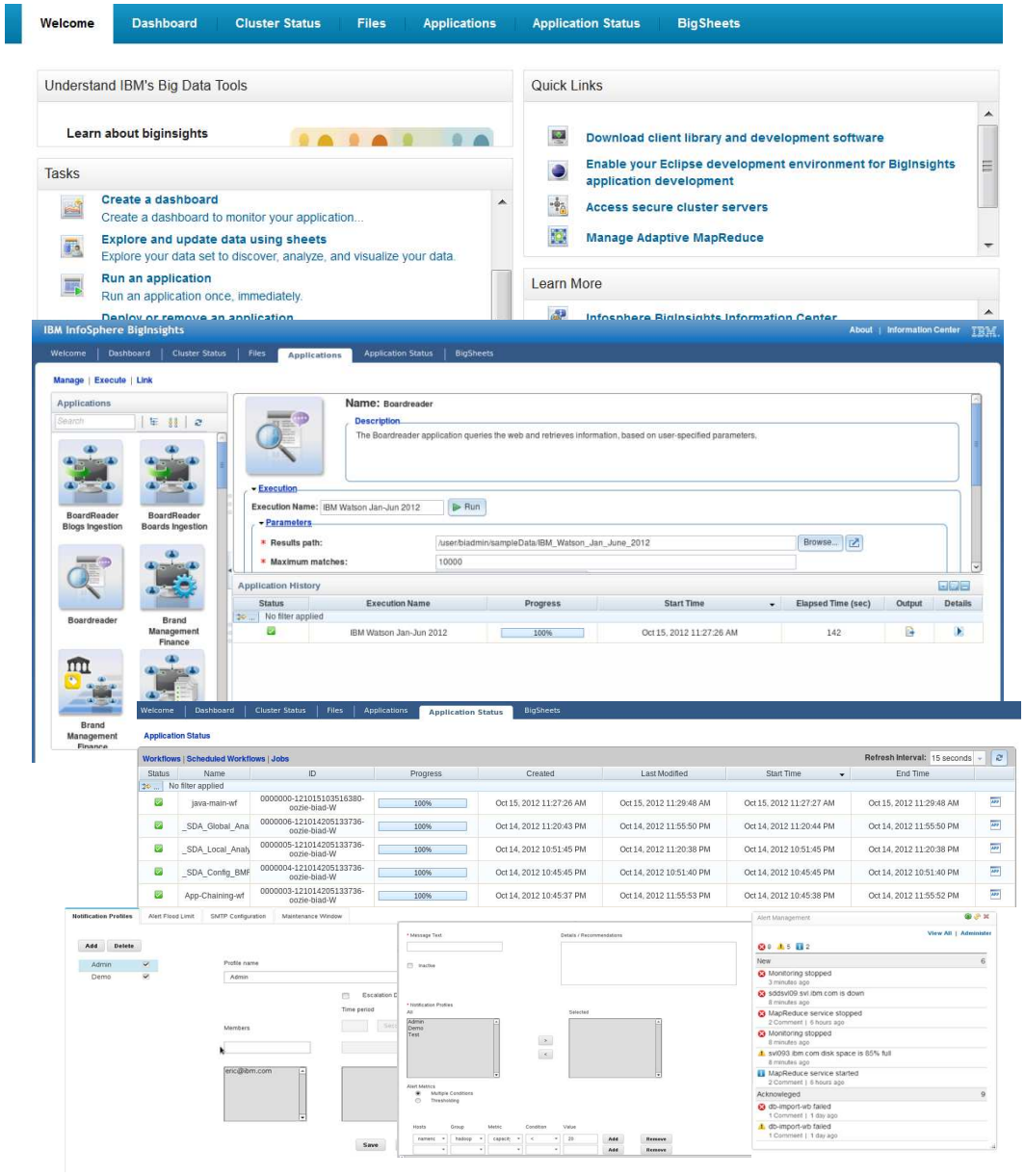
Open Source

IBM



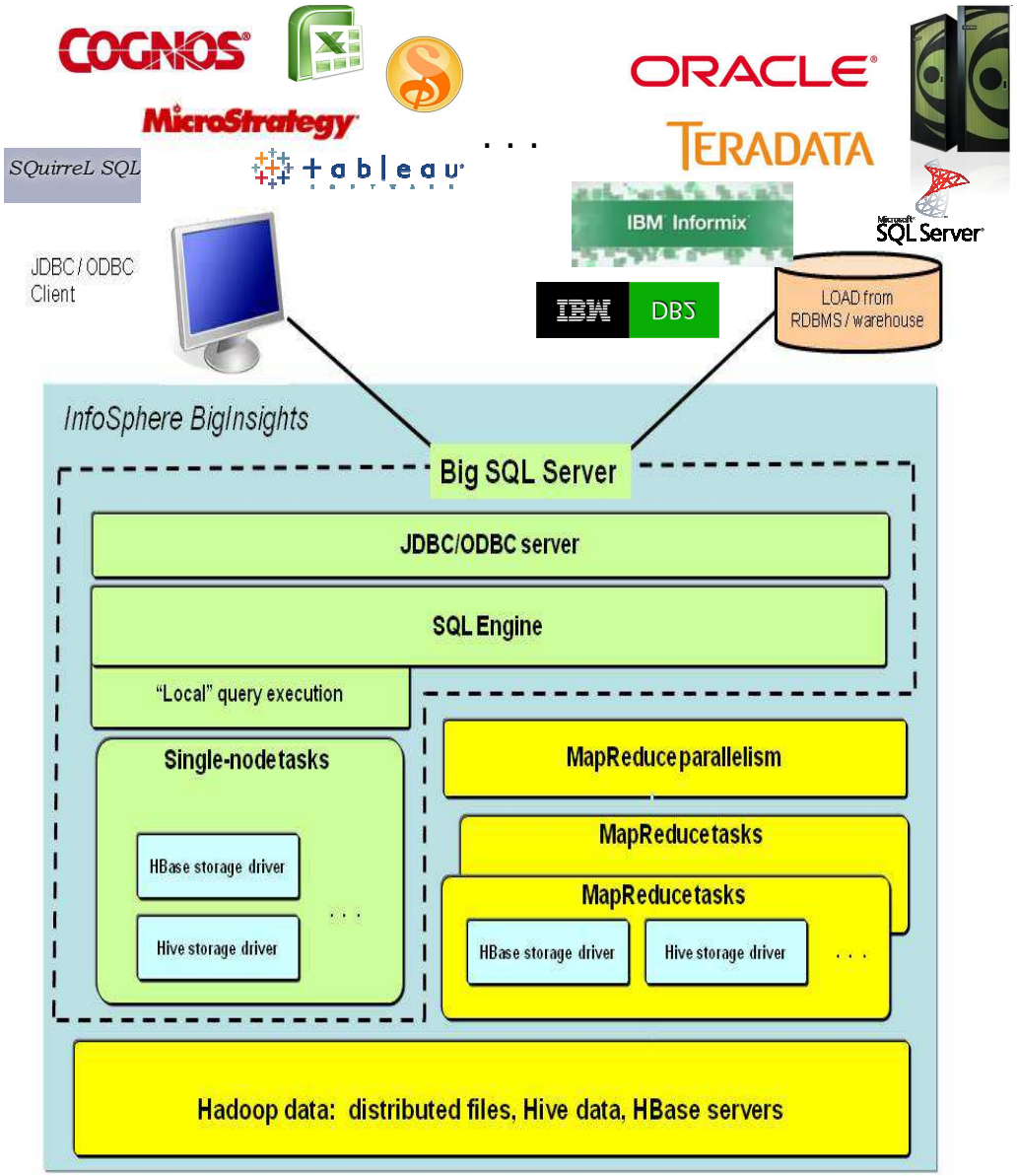
Integrated Web Console

- **Manage BigInsights**
  - Inspect /monitor system health
  - Add / drop nodes
  - Start / stop services
  - Run / monitor jobs (applications)
  - Explore / modify file system
  - Create custom dashboards
  - . . .
- **Launch applications**
  - Spreadsheet-like analysis tool
  - Pre-built applications (IBM supplied or user developed)
- **Publish applications**
- **Monitor cluster, applications, data, etc. Create / view event alerts.**



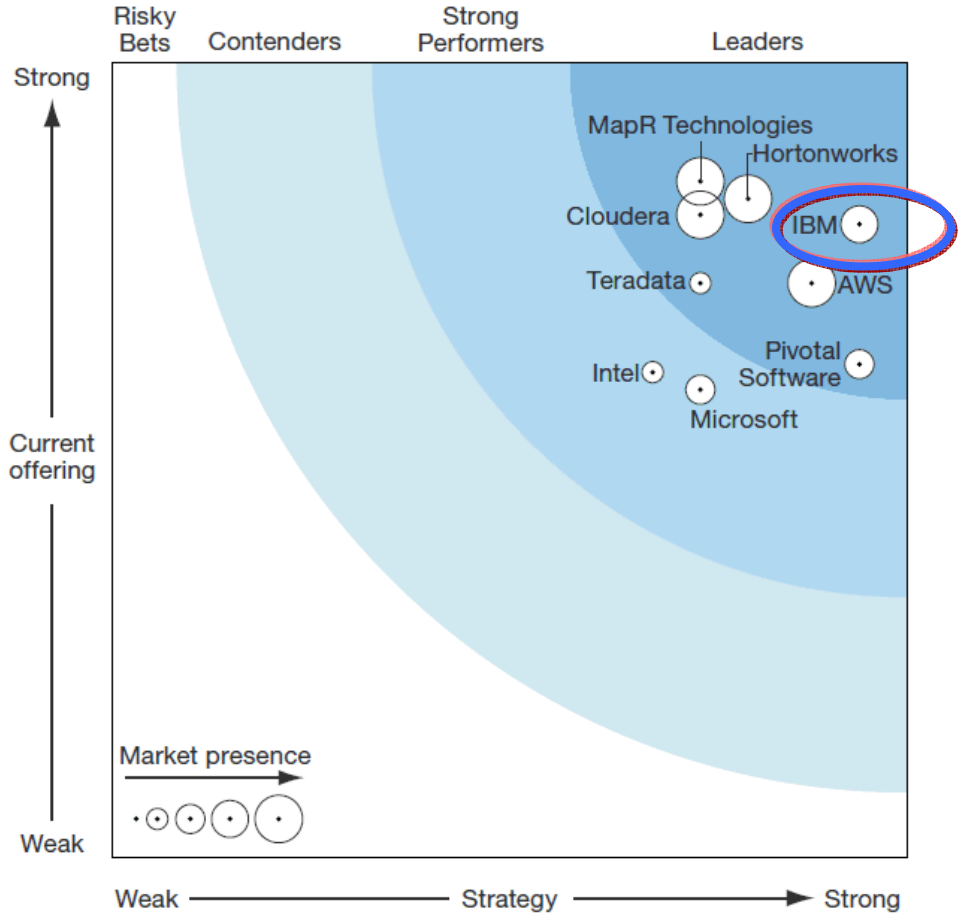
Big SQL

- **Standard SQL syntax and data types**
  - Joins, unions, aggregates . . .
  - VARCHAR, decimal, TIMESTAMP, . . .
- **JDBC/ODBC drivers**
  - Prepared statements
  - Cancel support
  - Database metadata API support
  - Secure socket connections (SSL)
- **Optimization**
  - MapReduce parallelism
    or…
  - “Local” access for low-latency queries
- **Varied storage mechanisms appropriate for Hadoop ecosystem**
- **Integration**
  - Eclipse tools
  - DB2, Netezza, Teradata, etc. (via LOAD)
  - Cognos Business Intelligence
  - , , ,



IBM is named a leader in The Forrester Wave™: Big Data Hadoop Solutions, Q1 2014

Figure 2 Forrester Wave™: Big Data Hadoop Solutions, Q1 '14



FORRESTER®

"IBM has offerings in grid computing, databases, and many other data management technologies that it can bring to a comprehensive Hadoop solution."

"IBM has advanced analytics tools, a global presence, and implementation services, so it can offer a complete big data solution that will be attractive to many customers."

"IBM has more than 100 Hadoop deployments, some of which are fairly large and run to petabytes of data."

Source: Forrester Research, Inc. The Forrester Wave is copyrighted by Forrester Research, Inc. Forrester and Forrester Wave are trademarks of Forrester Research, Inc. The Forrester Wave is a graphical representation of Forrester's call on a market and is plotted using a detailed spreadsheet with exposed scores, weightings, and comments. Forrester does not endorse any vendor, product, or service depicted in the Forrester Wave. Information is based on best available resources. Opinions reflect judgment at the time and are subject to change.

IBM InfoSphere BigInsights For Hadoop

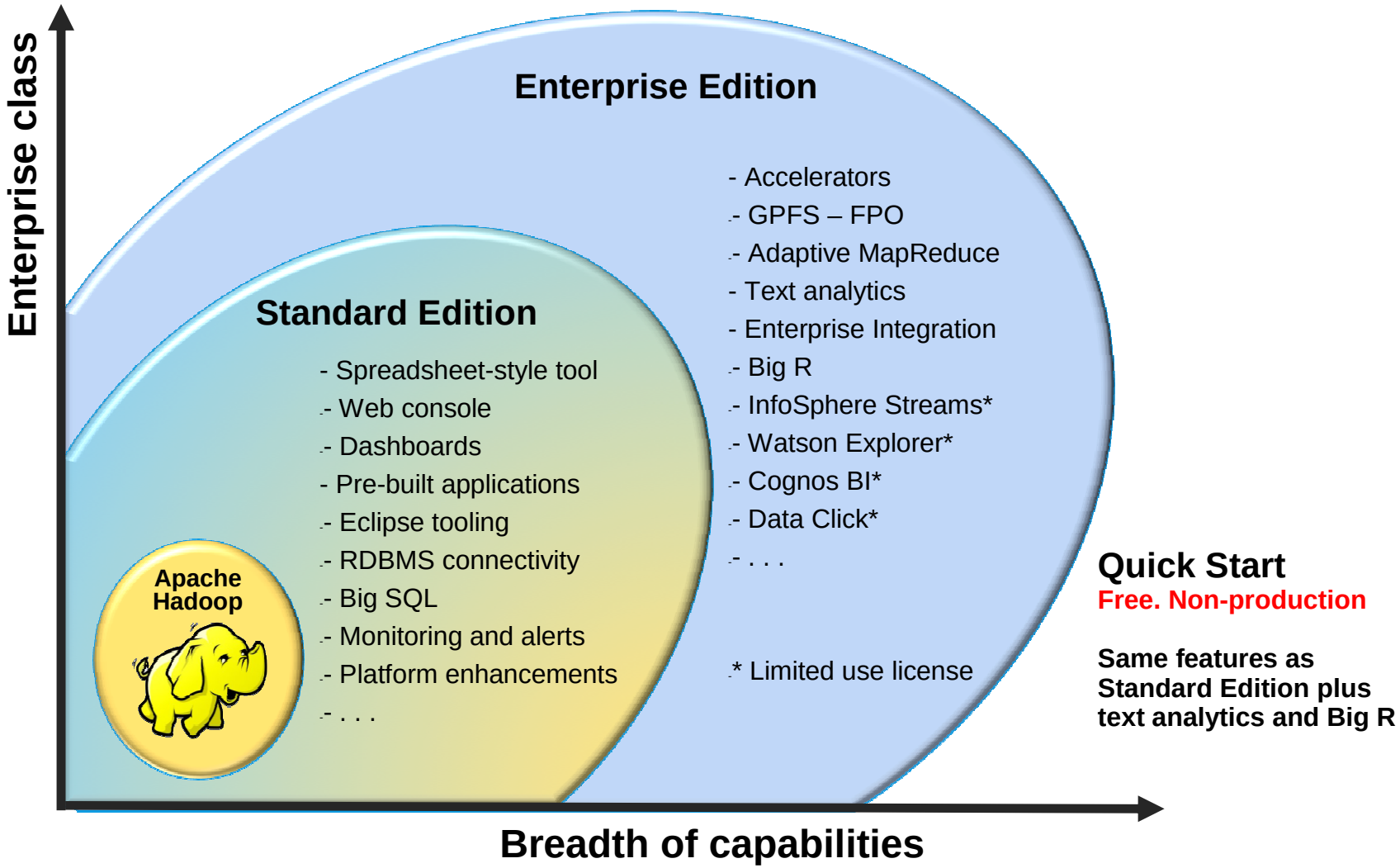
4x performance gain on average over open source Hadoop[1]

Audited STAC Report™
Securities Technology Analysis Center

1. 4x is approximate value. *See the* STAC Report™ *at* http://www.stacresearch.com/node/15370. *Testing involved the SWIM benchmark (*https://github.com/SWIMProjectUCB/SWIM*) and jobs derived from production workload traces. Testing was conducted in controlled laboratory conditions.*

From Getting Starting to Enterprise Deployment:

Different BigInsights Editions For Varying Needs



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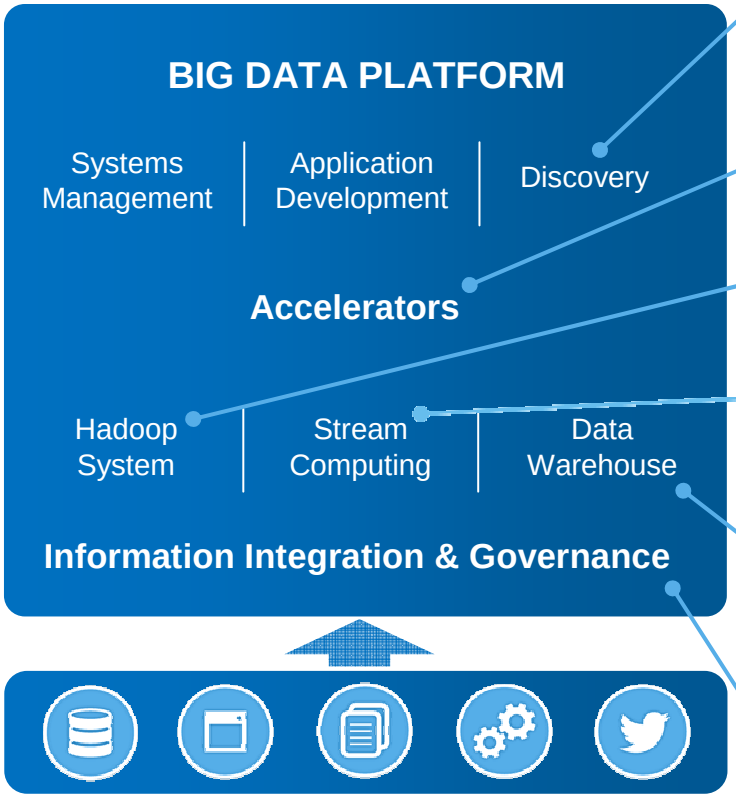

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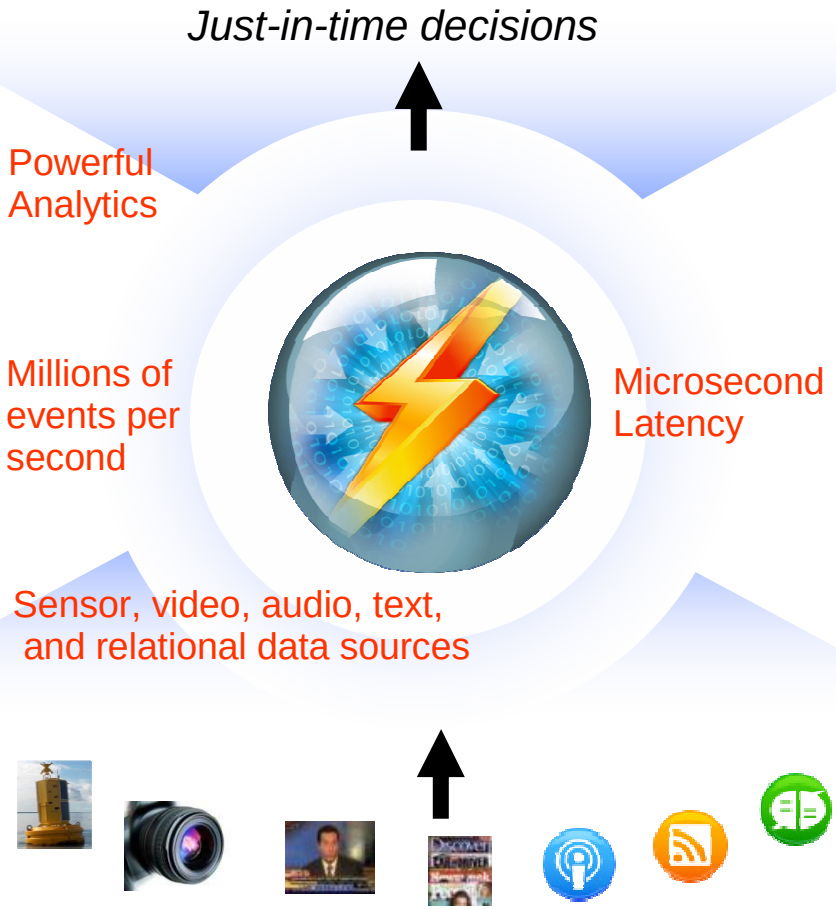
IBM InfoSphere Streams

A platform for real-time analytics on BIG data

- **Volume**
  - Terabytes per second
  - Petabytes per day
- **Variety**
  - All kinds of data
  - All kinds of analytics
- **Velocity**
  - Insights in microseconds
- **Agility**
  - Dynamically responsive
  - Rapid application development



How Streams Works

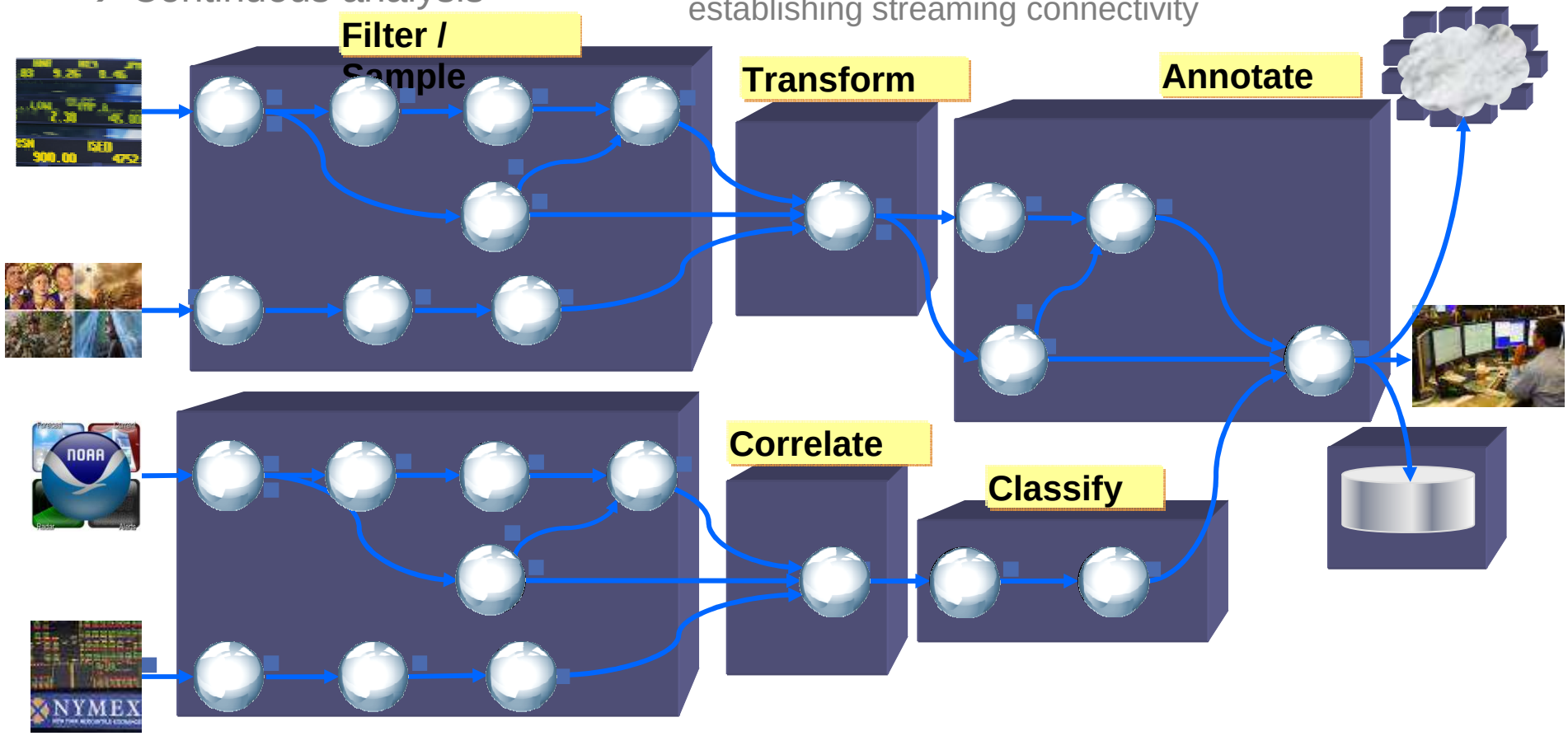
→ Continuous ingestion

→ Continuous analysis

How Streams Works

→ Continuous ingestion
→ Continuous analysis

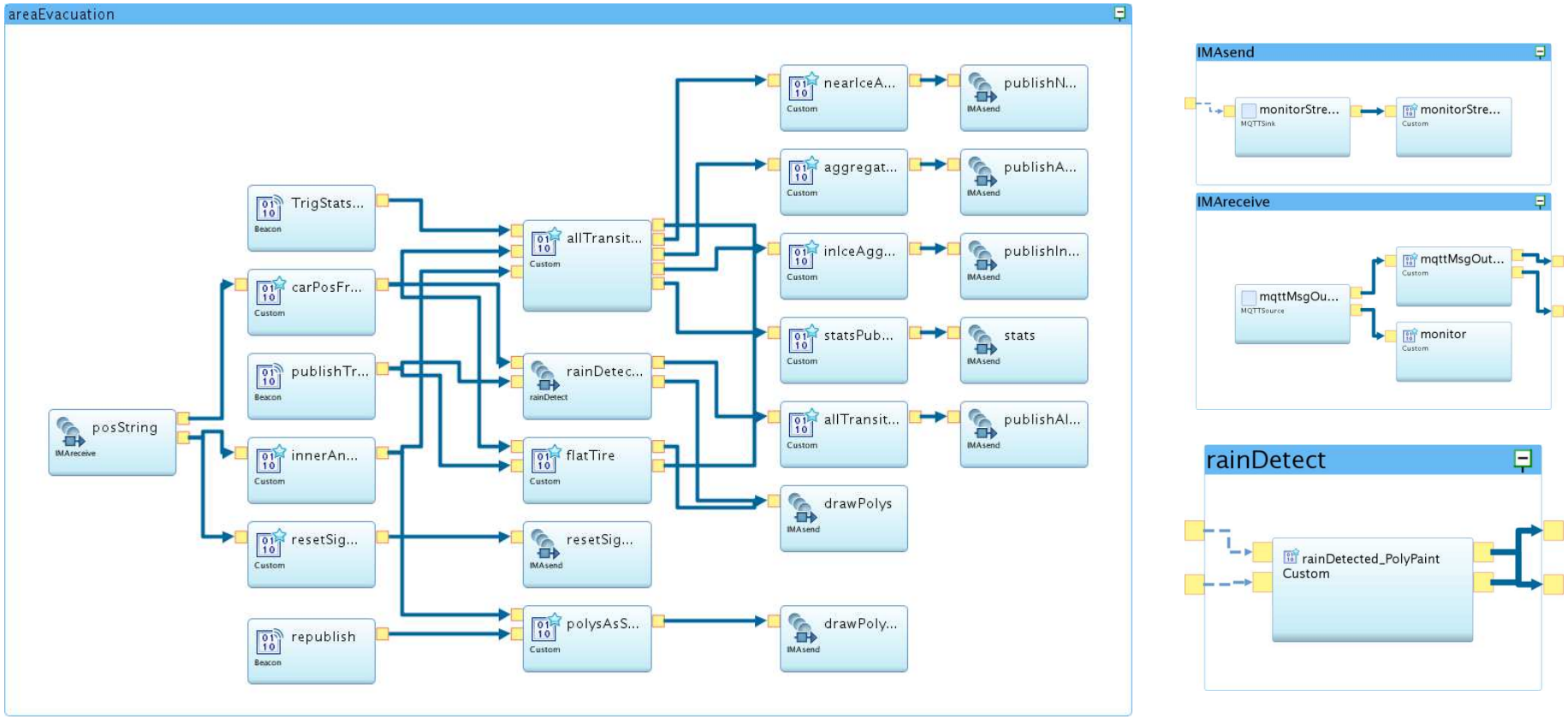
Infrastructure provides services for scheduling analytics across hardware hosts, establishing streaming connectivity



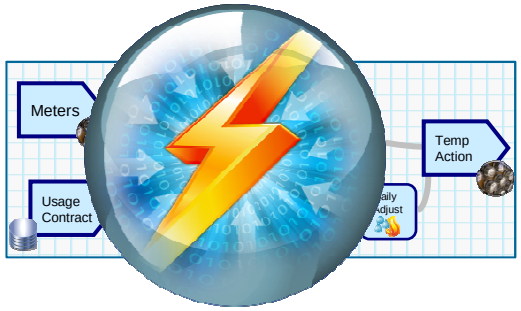
Achieve scale:
- By partitioning applications into software components
- By distributing across stream-connected hardware hosts

Where appropriate:
- Elements can be *fused* together
- for lower communication latency

Sample Application Graph

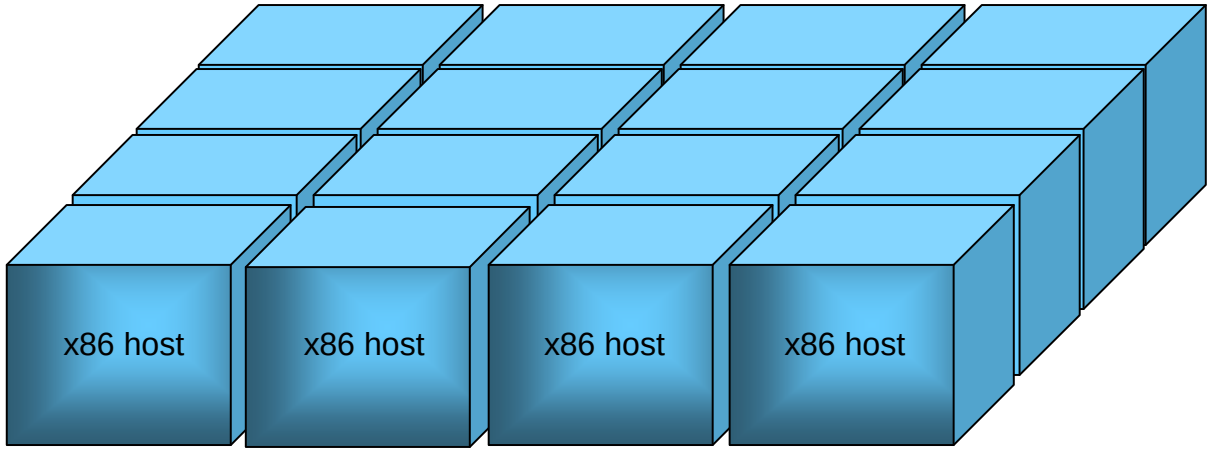


Streams Runtime Illustrated



Optimizing scheduler assigns jobs to hosts, and continually manages resource allocation

Commodity hardware – laptop, blades or high performance clusters



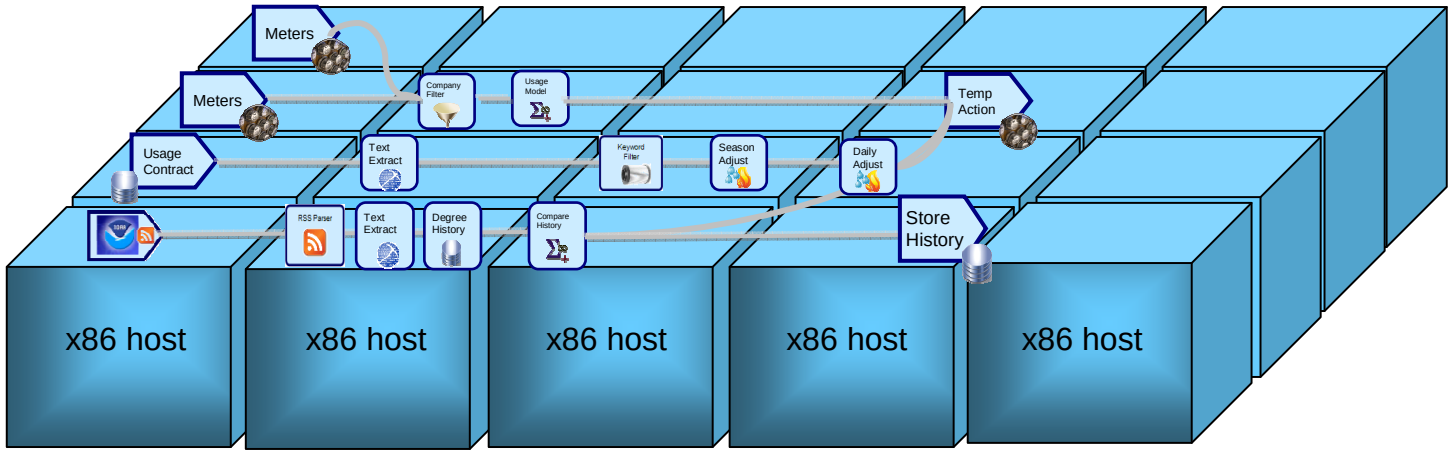
Streams Runtime Illustrated

Optimizing scheduler assigns PEs to hosts, and continually manages resource allocation

Dynamically add hosts and jobs

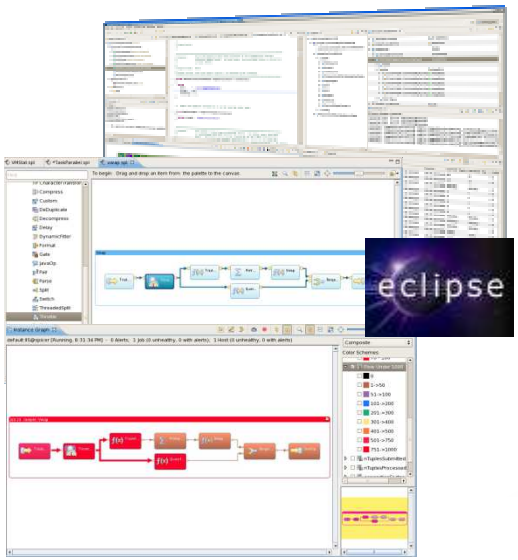
Commodity hardware – laptop, blades or high performance clusters

New jobs work with existing jobs



IBM InfoSphere Streams

Comprehensive Tooling



- Eclipse IDE, remote development
- REST API
- Web console
- Drag & Drop editor
- Instance graph
- Streams visualization
- Streams debugger

Scale-out Architecture

- Clustered runtime for near-limitless capacity
- RHEL, CentOS, SLES support
- X86 & Power multicore hardware
- InfiniBand support
- Ethernet support

Sophisticated Analytics with Toolkits & Accelerators

- Big Data, CEP, Database, Data Explorer, DataStage, Finance, Geospatial, Internet, Messaging, Mining, R, SPSS, Standard, Text & Timeseries toolkits
- Telco & Social Media accelerators

Toolkits and Accelerators to Speed Up Development

Standard Toolkit

Relational Operators

Filter	Sort
Functor	Join
Punctor	Aggregate

Adapter Operators

FileSource	UDPSource
FileSink	UDPSink
DirectoryScan	Export
TCPSource	Import
TCPSink	MetricsSink

Utility Operators

Custom	Split
Beacon	DeDuplicate
Throttle	Union
Delay	ThreadedSplit
Barrier	DynamicFilter
Pair	Gate
JavaOp	Switch
Parse	Format
Decompress	CharacterTransform

XML Operator

XMLParse

IBM Supported Toolkits

Database	DataStage
Big Data	Data Explorer
Messaging	Internet
Text Analytics	Mining
SPSS	CEP
Time Series	Geospatial
Financial	R

Open-Source Toolkits

JSON	HTTP/REST
OpenCV	Accumulo
HBase	…

Big Data Accelerators

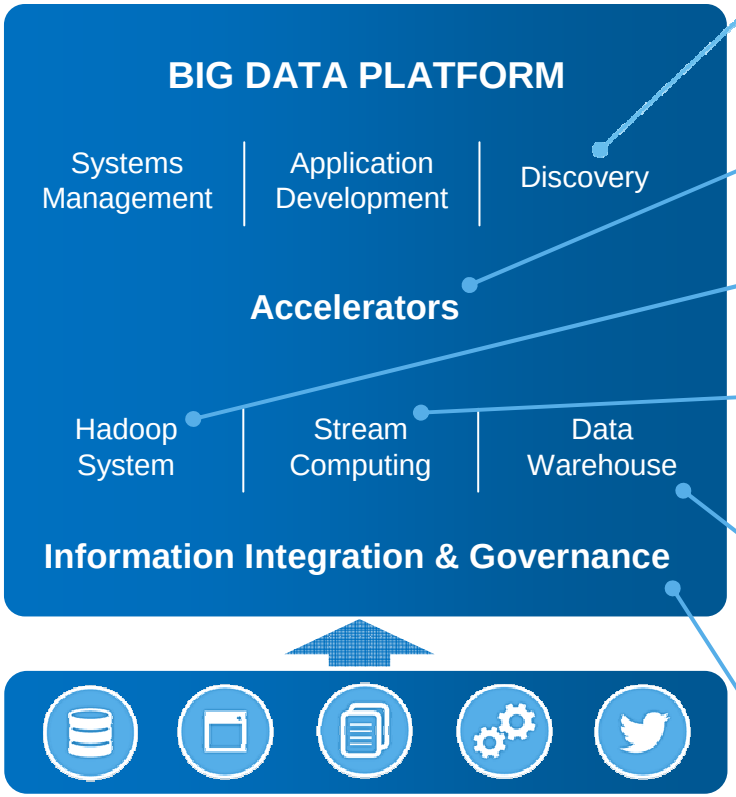
Telco Event Data Analytics

Social Data Analytics

User-Defined Toolkits

Extend the language by adding user-defined operators, types, and functions

IBM's Key Platform Capabilities



Watson Explorer
Find, navigate, visualize all data

Accelerators
Speed time to value with analytic and application accelerators

InfoSphere BigInsights
Bringing Hadoop to the enterprise

InfoSphere Streams
Analytics for data in-motion exploration

PureData for Analytics & InfoSphere Warehouse
Delivers deep insight with advanced database analytics & operational analytics

Information Integration and Governance
Govern data quality and manage the information lifecycle

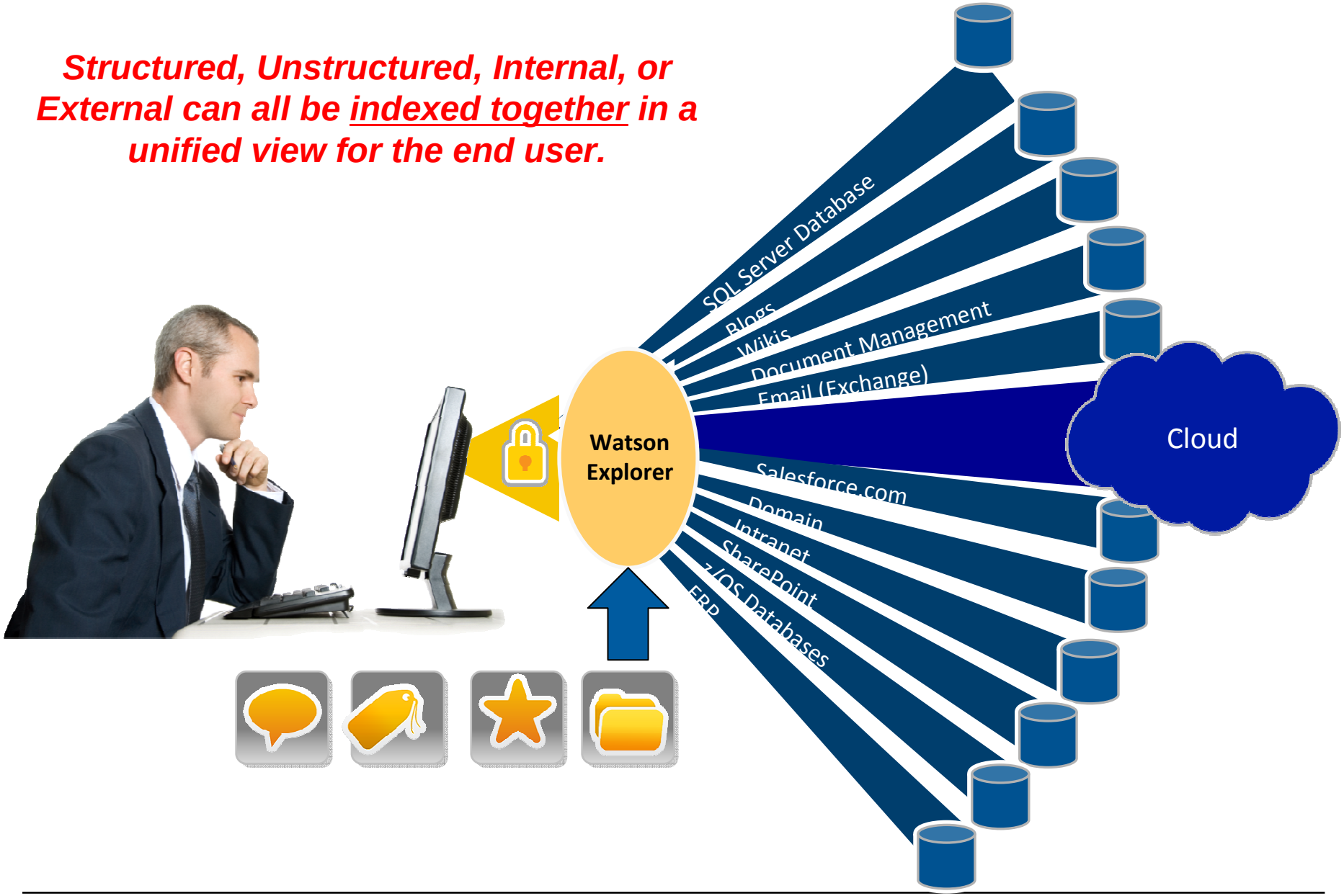
IBM Watson Explorer

Consolidates and visualizes information across enterprise applications and big data assets – helping organizations discover, analyze & integrate their data in a unified view.

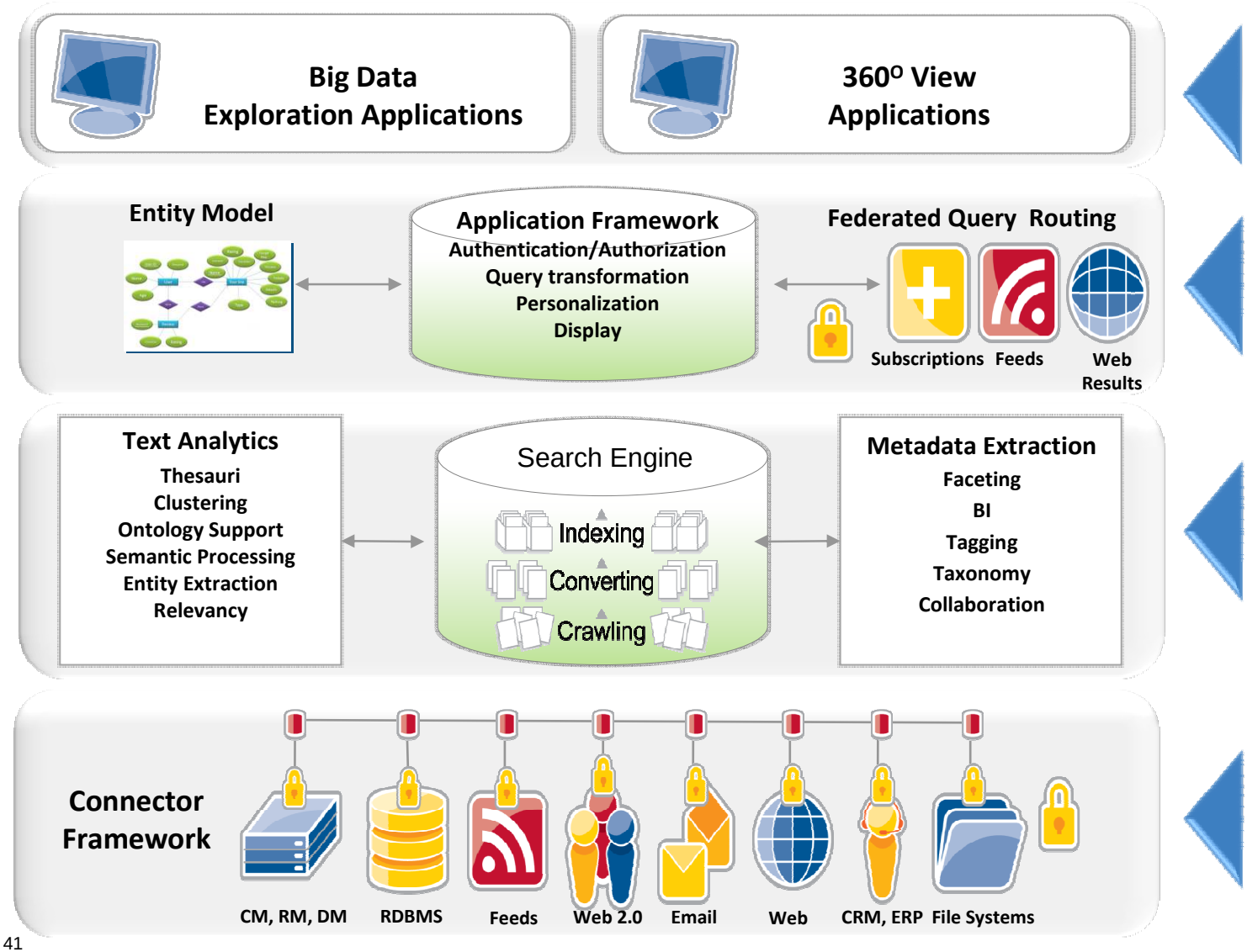
Value:

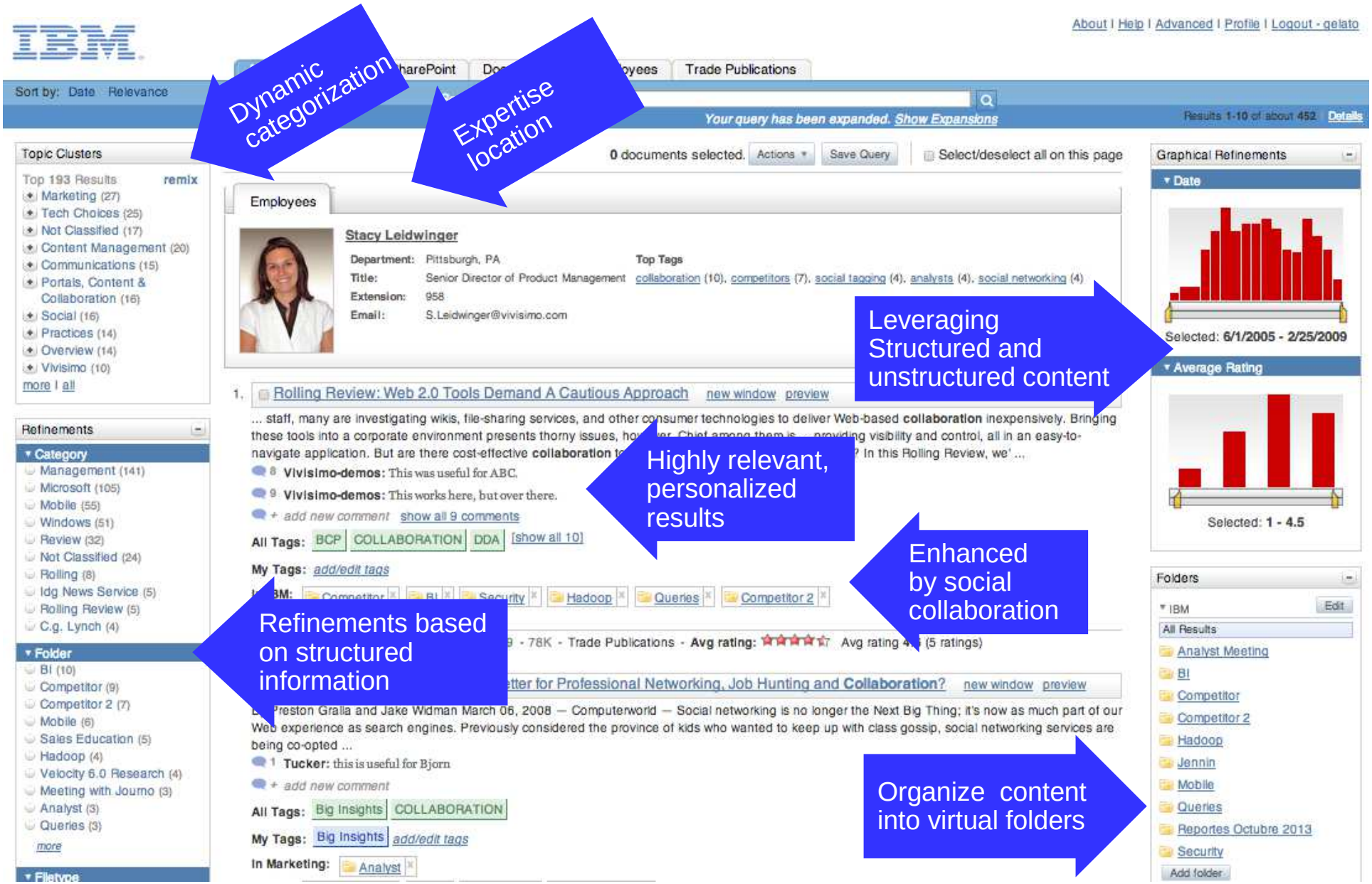
- Better visibility into available data assets
- Better use and re-use of information
- Better decision-making at all levels
- Deeper understanding of customers
- More efficient operations
- Improved compliance and risk reduction

Structured, Unstructured, Internal, or External can all be indexed together in a unified view for the end user.

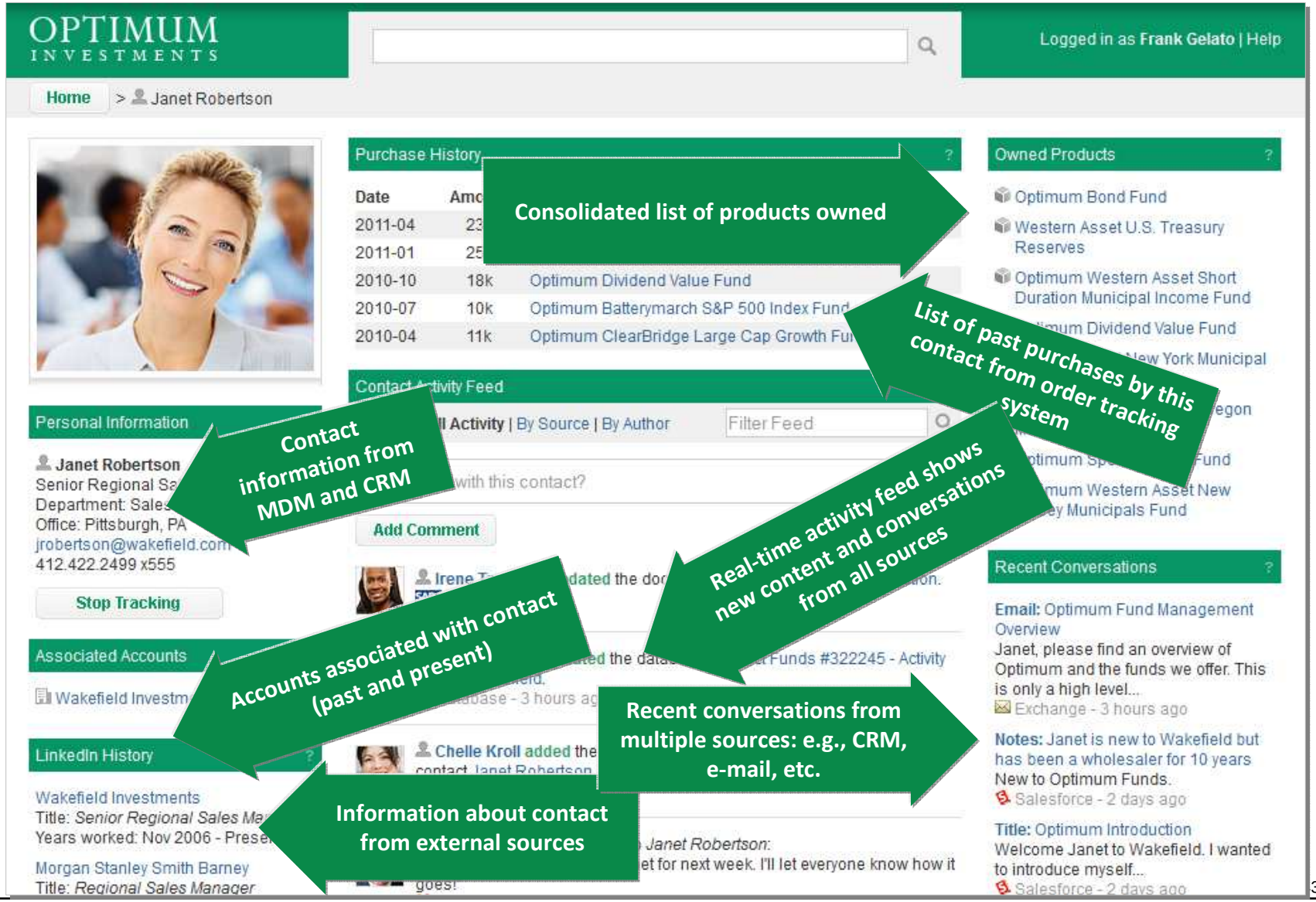


Watson Explorer application architecture




Dynamic categorization
Expertise location
About | Help | Advanced | Profile | Logout - gelato
Trade Publications
Sort by: Date Relevance
Your query has been expanded. Show Expansions
Results 1-10 of about 452 Details
Topic Clusters
Top 193 Results remix
Marketing (27)
Tech Choices (25)
Not Classified (17)
Content Management (20)
Communications (15)
Portals, Content & Collaboration (16)
Social (16)
Practices (14)
Overview (14)
Vivisimo (10)
more | all
0 documents selected. Actions Save Query Select/deselect all on this page
Employees
Stacy Leidwinger
Department: Pittsburgh, PA
Title: Senior Director of Product Management
Extension: 958
Email: S.Leidwinger@vivisimo.com
Top Tags
collaboration (10), competitors (7), social tagging (4), analysts (4), social networking (4)
Rolling Review: Web 2.0 Tools Demand A Cautious Approach new window preview
... staff, many are investigating wikis, file-sharing services, and other consumer technologies to deliver Web-based collaboration inexpensively. Bringing these tools into a corporate environment presents thorny issues, ho ... providing visibility and control, all in an easy-to-navigate application. But are there cost-effective collaboration t ... ? In this Rolling Review, we' ...
8 Vivisimo-demos: This was useful for ABC.
9 Vivisimo-demos: This works here, but over there.
+ add new comment show all 9 comments
All Tags: BCP COLLABORATION DDA [show all 10]
My Tags: add/edit tags
IBM: Competitor BI Security Hadoop Queries Competitor 2
- 78K - Trade Publications - Avg rating: Avg rating 4.5 (5 ratings)
etter for Professional Networking, Job Hunting and Collaboration? new window preview
Preston Gralla and Jake Widman March 06, 2008 — Computerworld — Social networking is no longer the Next Big Thing; it's now as much part of our Web experience as search engines. Previously considered the province of kids who wanted to keep up with class gossip, social networking services are being co-opted ...
1 Tucker: this is useful for Bjorn
+ add new comment
All Tags: Big Insights COLLABORATION
My Tags: Big Insights add/edit tags
In Marketing: Analyst
Refinements
Category
Management (141)
Microsoft (105)
Mobile (55)
Windows (51)
Review (32)
Not Classified (24)
Rolling (8)
Idg News Service (5)
Rolling Review (5)
C.g. Lynch (4)
Folder
BI (10)
Competitor (9)
Competitor 2 (7)
Mobile (6)
Sales Education (5)
Hadoop (4)
Velocity 6.0 Research (4)
Meeting with Journo (3)
Analyst (3)
Queries (3)
more
Filetype
Refinements based on structured information
Highly relevant, personalized results
Enhanced by social collaboration
Leveraging Structured and unstructured content
Graphical Refinements
Date
Selected: 6/1/2005 - 2/25/2009
Average Rating
Selected: 1 - 4.5
Folders
IBM Edit
All Results
Analyst Meeting
BI
Competitor
Competitor 2
Hadoop
Jennin
Mobile
Queries
Reportes Octubre 2013
Security
Add folder
Organize content into virtual folders

Enterprise-wide discovery enables a new category: 360 degree information application



InfoSphere BigInsights Quick Start is the newest member of the BigInsights family

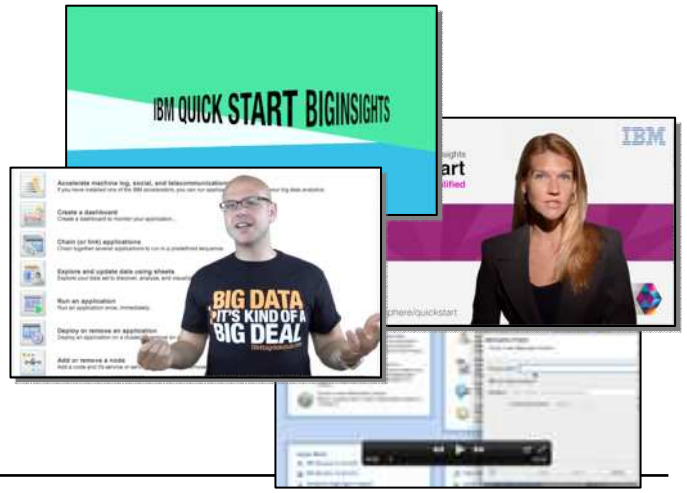
What is BigInsights Quick Start?

- No charge, downloadable edition that allows you to **experiment** with **enterprise-grade Hadoop features**
- **Simplifies** the complexity of Hadoop with easy-to-follow tutorials and videos
- No time or data limitations to allow you to experiment for a **wide range of use cases**

IBM InfoSphere BigInsights
Quick Start

Download Now! → **ibm.co\QuickStart**

Watch the videos! → **ibmurl.hursley.ibm.com/3PLJ**



IBM InfoSphere Streams Quick Start:
Real Time Analytic Processing at your Fingertips

- **What is Streams Quick Start?**
  - No charge, downloadable edition to allow you to **experiment** with **stream computing**
  - No time or data limitations for use on **your unique use cases** in non-production systems
  - **Sophisticated analytics** for streaming data - quickly ingest, analyze and correlate data
  - Comprehensive **development tools** and **scale-out architecture** to get up and running quickly, support available through forums & communities**

IBM InfoSphere Streams

Quick Start

Download Now! → Streams Quick Start

Tutorials! → Streams v3.1 Tutorials

** no formal IBM support is available

Big Data Stampede:
Leading the Charge for Big Data Success

IBM Expertise

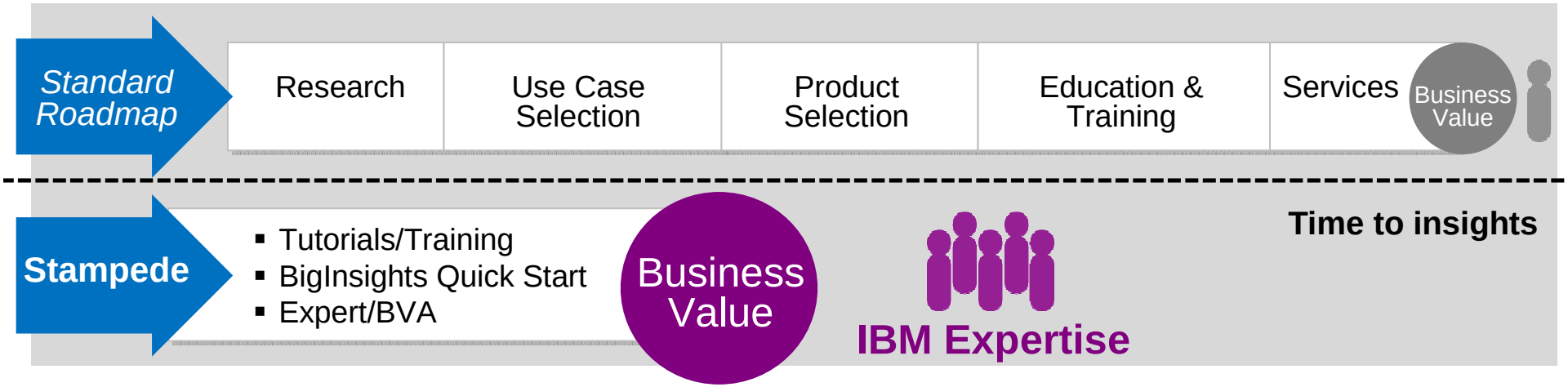
Removes the guesswork and delivers savings in time and cost

Big Data Platform

Provides the use of unmatched capabilities

Skills & Knowledge Transfer

Ensures client self sufficiency and big data capabilities



HALKBANK

Business Analytics Initiative

March 2014

HALKBANK

Business Analytics Initiative

- High Level Strategy Presentation (March)
- Identification of Initial Focus Areas
  - DWH, ETL and Reporting
  - Next Best Action
- Initial Workshop for DWH, ETL & Reporting (April)
  - As-is architecture
  - Challenges & Requirements

HALKBANK – IT CHALLENGES

- Data Latency (T-1, T-2..), Data Redundancy
- Management of two DWH overhead - Development & Maintainance
- Huge growth trend of reporting system
  - 80K, 100K, 140K query@PX13 (in last 3 months)
  - ~ 900 batches/day in total. 1-1.5TB data transfer
  - Halkbank will build Loan & Deposit DM Management System (additional load)
- DWH-PX13 resources are limited
  - New reports are on PDA
  - ~ 5000 reports, last ~2 years moved
    - %70 of cpu usage offloaded onto PDA
    - %70 İstihbarat, The rest is for BO Reports & CDC Replication
  - Application code changes required to move to PDA
- ETL process problems
  - End-to-end batch /ETL process, management & monitoring problems
  - BO, ETL, SAS, SPSS, PL1/JCL integration diffuculties
- Building test environments for BO & SPSS & improving ADLC, Security and Governance – ****Audit

HALKBANK – IT REQUIREMENTS

- Architectural Review, Evaluation of New Architecture
  - Eliminate multiple DWH Systems - Maintenance Effort
  - End to End Architecture & Flow Review
  - Reference Architecture – Best Practices
  - Optimization of Information Life Cycle Management
  - Proper Test Environment Setup
  - Addressing Governance – Security Issues
- Real Time Data Infrastructure
  - Minimize bulk data transfer
  - Accessing Real Time Data from Business, Applications & Reports
- Reporting System Enhancements
  - Business Object – BO Reporting Efforts
  - Improve Time to Market, Simplification, Access from End User
  - Building BO Report Inventory
    - Elimination of Duplicate Reports
      - Approx. 5000 active reports. (10K?) / In-house inventory system, not effective

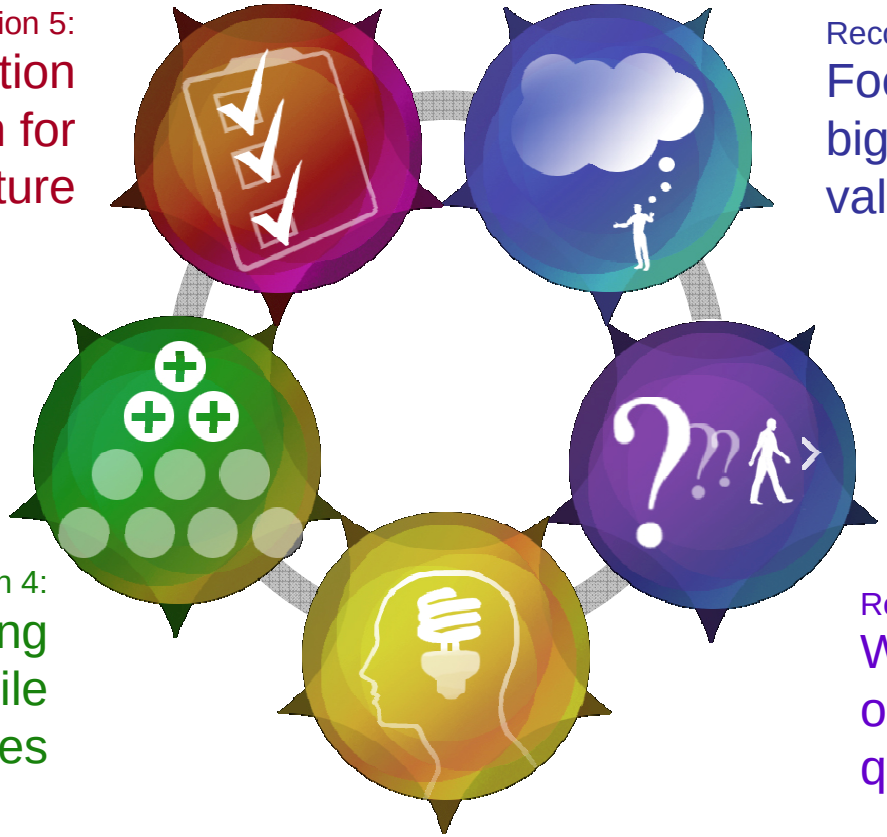
Three types of analytics programs deliver productivity or growth benefits

Areas of Benefits	Analytic Solution Domains	Benefits
Infrastructure Productivity *Take-out cost and improve efficiency*	**Information Management Foundation (IMF)**	• Eliminate multiple data silos • Enhance level of data trust and accuracy • Broaden organizational access to key data • Reduce repository footprints and data model objects • Reduce number of data integration programs and tools • Rationalize disparate reporting tools and maintenance • Reduce analysts data gathering time • Reduce cost and complexity of storing large amounts of data
Business Productivity *Improve control, bottom line and stop losses*	**Risk, Fraud and Finance (RFF)**	• Lower Finance costs as a % of revenue • Transactional activity cost reduction • Headcount reduction • Higher productivity of finance FTEs via IT enablement • Maximize ROI – tactical and strategic cash improvement opportunities • Planning and Forecasting • Risk management
	Supply Chain	• Improved demand visibility and management • Better customer channel management
Focus on growth *Intelligent profitable growth*	**Customer, Marketing and Sales (CMS)**	• Increased sales • Eliminated unproductive marketing spend • Reduced non-productive customer contacts • Increased customer lifetime value • Improved advertising reach and effectiveness • Reduced attrition
	Human Capital	• More effective deployment of headcount • Optimized sales activities • More effective service agents

What is the path to value

"New path to value" is a five-point approach to operationalizing analytics

Recommendation 5:
Use an information agenda to plan for the future



Recommendation 1:
Focus on the biggest and highest value opportunities

Recommendation 4:
Keep existing capabilities while adding new ones

Recommendation 2:
Within each opportunity, start with questions, not data

Recommendation 3:
Embed insights to drive actions and deliver value

What is the path to value

How to get started

Pick your spot

Biggest and highest value opportunity

Prove the value

Start with questions

Embed insights

Roll it out over time

Add capabilities

Information agenda

IBM can help…

Business Analytics and Optimization Jumpstart

Source: Analytics: The New Path to Value, a joint MIT Sloan Management Review and IBM Institute of Business Value study. Copyright © Massachusetts Institute of Technology 2010

IBM BAO Jumpstart Methodology

BAO Jumpstart 2.0 addresses the top obstacle to analytics adoption – lack of understanding how to use analytics to improve the business

Recommendation 1:
Focus on the biggest and highest value opportunities

Recommendation 2:
Within each opportunity, start with questions, not data

Recommendation 3:
Embed insights to drive actions and deliver value

Recommendation 4:
Keep existing capabilities while adding new ones

Recommendation 5:
Use an information agenda to plan for the future

BAO Jumpstart 2.0

Identify highest value opportunities to be addressed with analytics

Assess ability to operationalize analytics opportunities

Determine actionable next steps and the fastest path to value

Potential Follow-on Activities

- Analytics Proof-of-Value
- PM Diagnostic
- Analytics Center of Excellence
- Information Management Foundation Phase 0
- Targeted projects identified during BAO Jumpstart