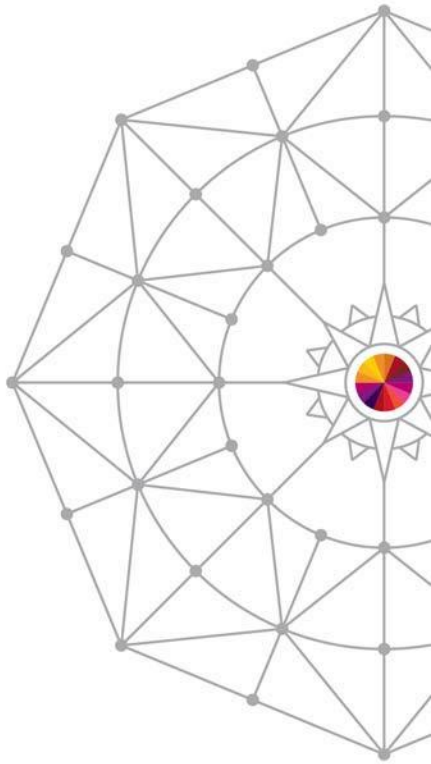
Big Data Drives Enterprise Analytics

Chris Spaight
Worldwide Market Manager
zEnterprise Analytics, IBM



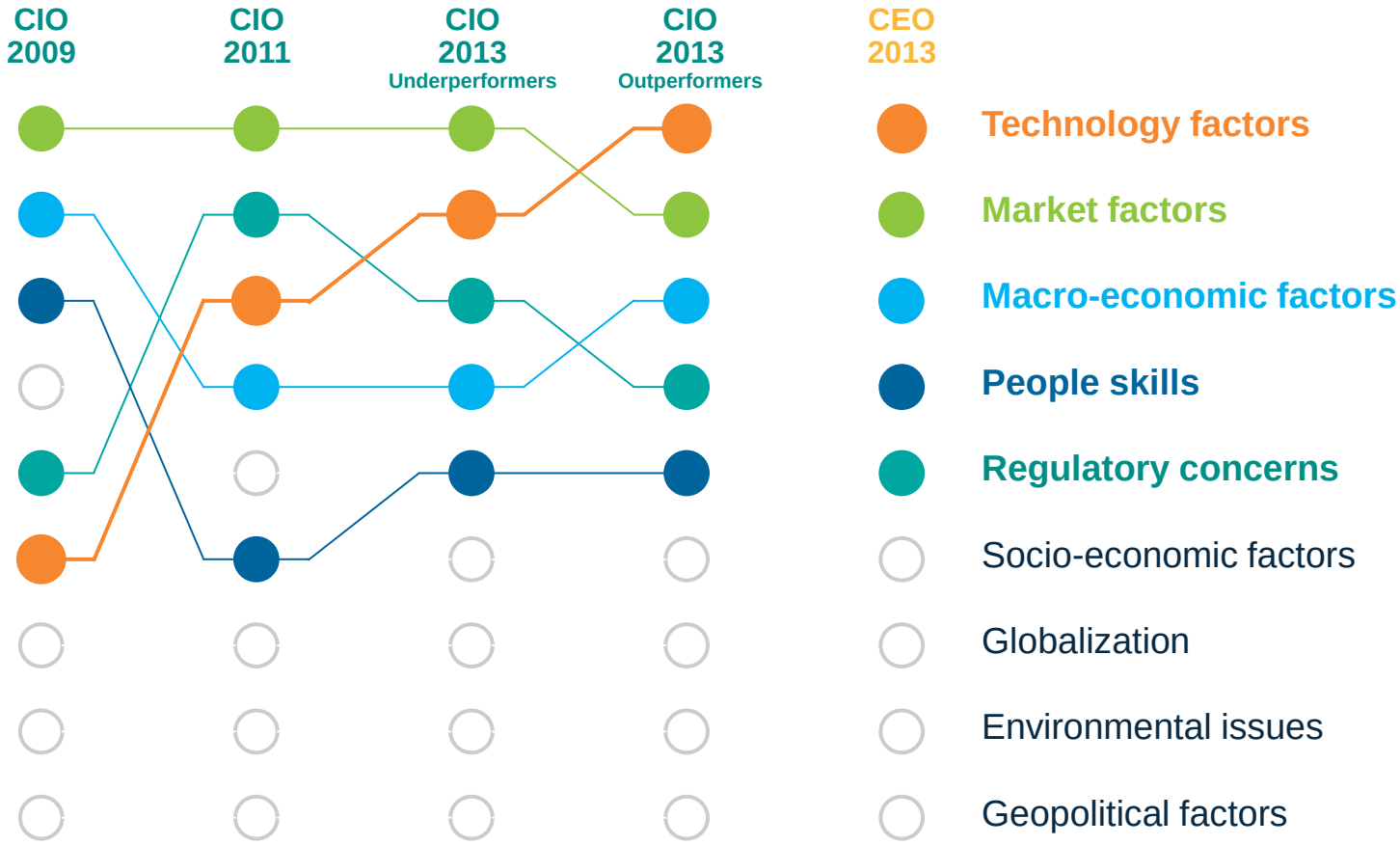
#SHAREorg

SHARE is an independent volunteer-run information technology association that provides education, professional networking and industry influence.

Today's agenda

- **Why analytics**
- What data to be analyzed
- New era of computing
- Evolution of analytics
- Why System z
- HTAP and data analytics lifecycle
- Analytics components
- Customer success stories
- Use cases
- Learn more

Today's leaders recognize the importance of technology



Source: IBM Institute for Business Value, Global C-Suite Study, 2013

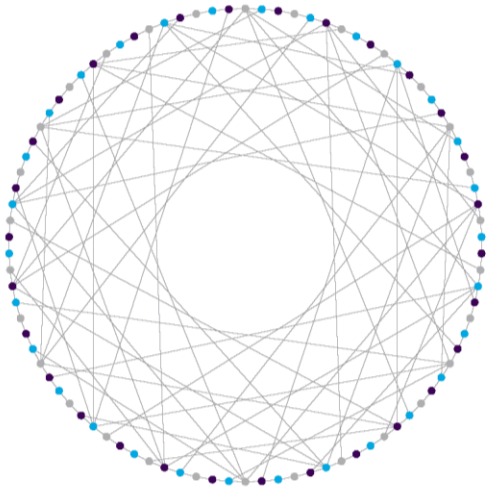
Evolving customer needs are driving new business IT models

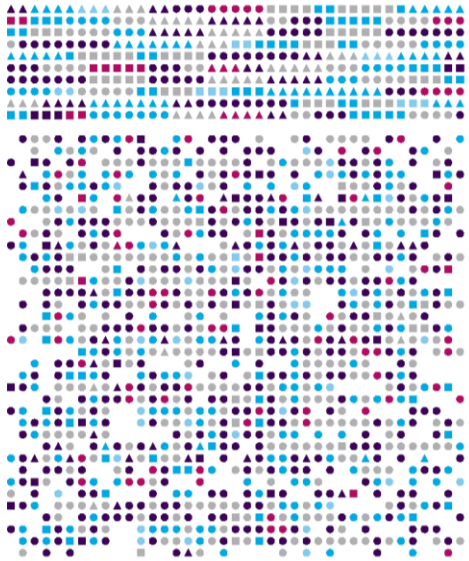
	To…
Monolithic Applications	**Composable Services**
Static Infrastructure	**Dynamic** Services, defined by Software
Programmed Systems	**Cognitive** Systems
Structured Data At Rest	Unstructured **Data in Motion**
Stable Well-Defined Workloads	Unpredictable **Workloads**
Standard Devices	A Variety of **Devices**
Proprietary Standards	**Open** Innovation
Corporate-owned IT	Infrastructure **As-a-Service**

These shifts in the industry are informing IBM's strategy

Data is becoming the world's new natural resource	Cloud is transforming IT and business processes into digital services	Social, mobile and access to data are changing the way we are understood and engaged
500 million DVDs worth of data is generated daily	**85%** of new software is being built for cloud	**80%** of individuals are willing to trade their information for a personalized offering
1 trillion connected objects and devices by 2015	**25%** of the world's applications will be available in the cloud by 2016	**84%** of millennials say social and user-generated content has an influence on what they buy
80% of the world's data is unstructured	**72%** of developers say cloud-based services or APIs are central to their app designs	**5 minutes**: response time users expect once they have contacted a company via social media

Data is becoming the new natural resource





1 trillion

connected objects and devices on the planet generating data by 2015

2.5 billion

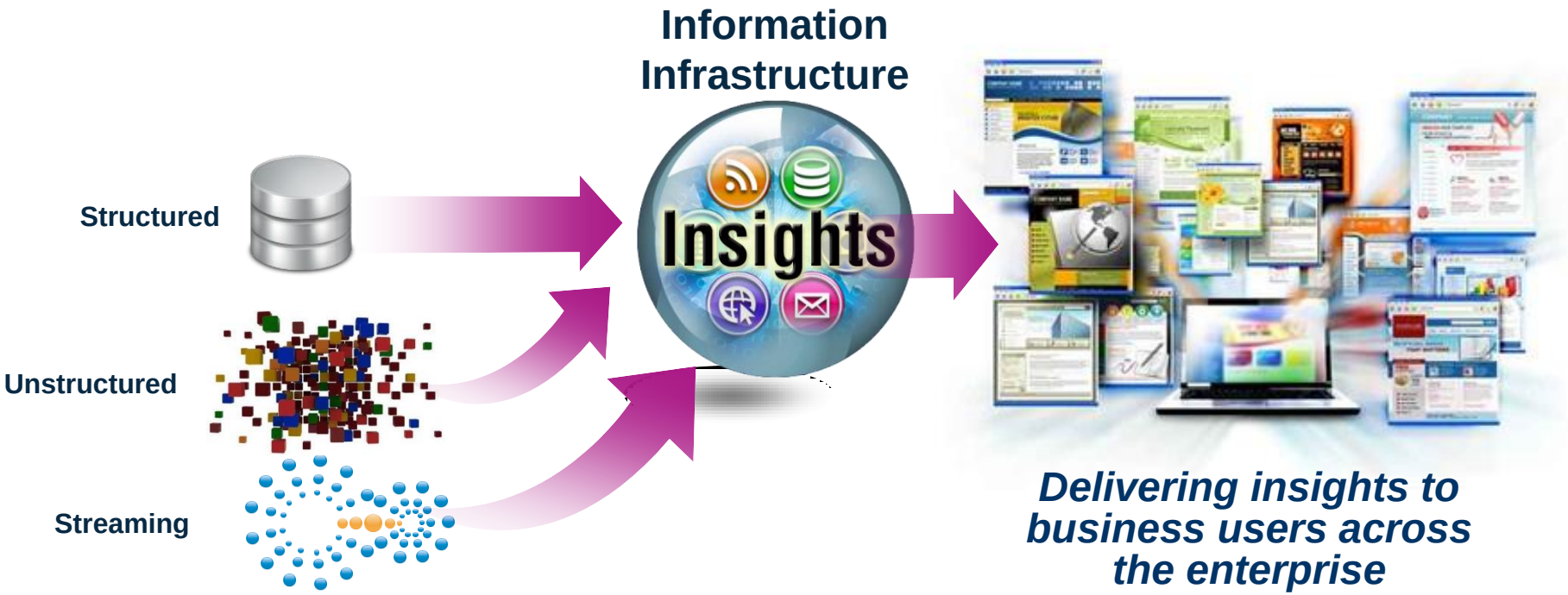
gigabytes of data generated every day

80%

of the world's data is unstructured. Audio. Video. Sensor data. Social media. All represent new areas to mine for insights.

Today, every discussion about changes in technology, business and society must begin with data. In its exponentially increasing volute, velocity and variety, data is becoming a new natural resource. It promises to be for the 21st century what steam power was for the 18th, electricity for the 19th and hydrocarbons for the 20th

Analytics has evolved from a business initiative to a business imperative

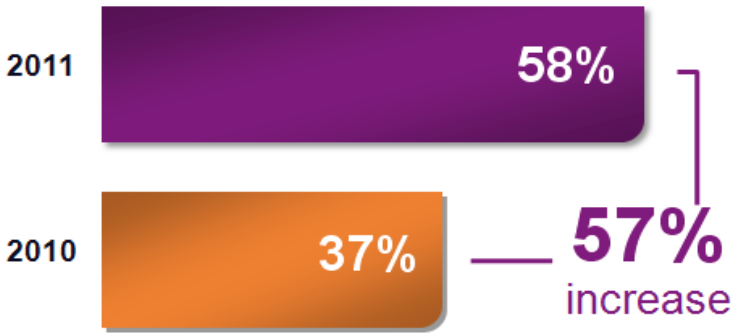


Delivering insights to business users across the enterprise

- **Data in motion:**
  - Event Stream Processing
  - Real-Time Operational Decisions
- **Data at rest:**
  - Un-modeled multi-structured data
  - Complex Analysis of structured data

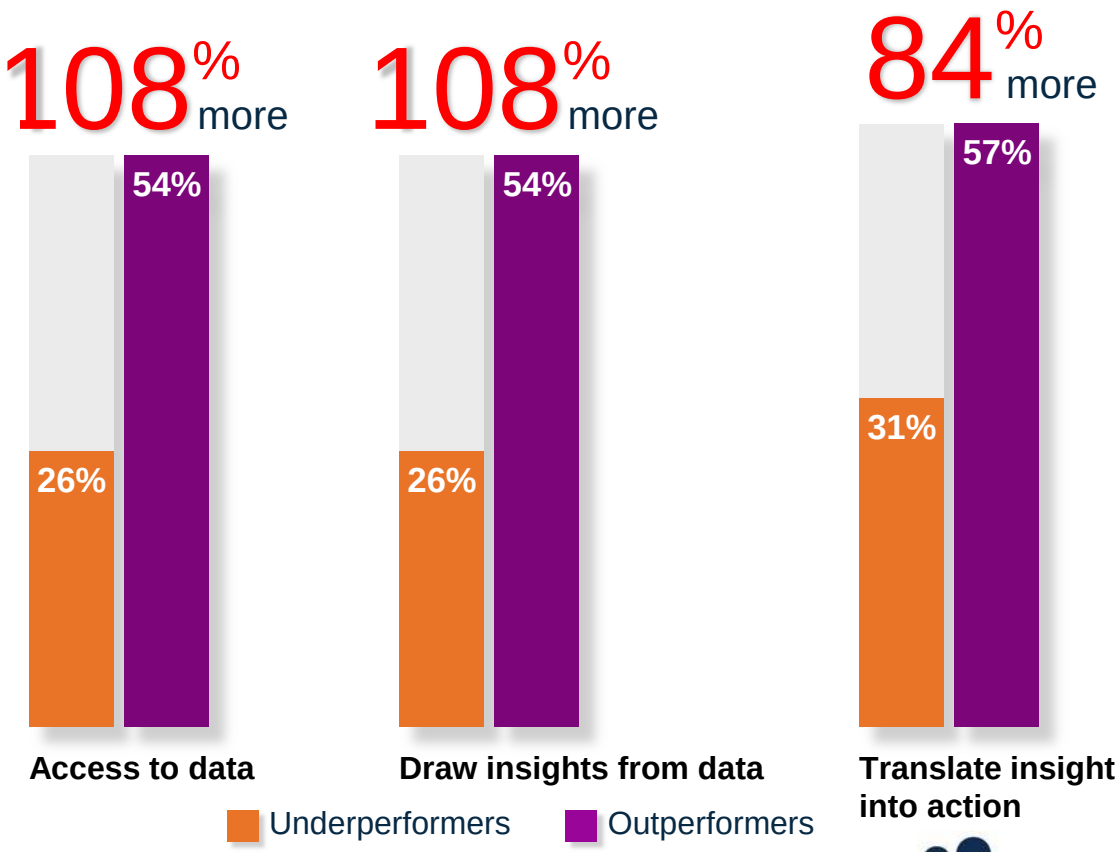
Analytics separates underperformers from outperformers

Respondents who say analytics creates a competitive advantage



Sources: IBM Institute for Business Value

Outperformers strongly differentiate their organizations in three key areas

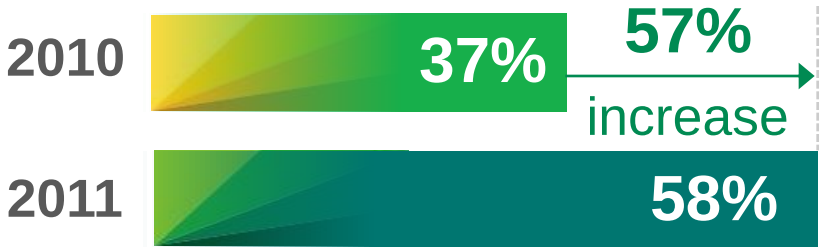


Source: 2012 IBM CEO study, "How good is your organization at driving value from data?

Analytics has evolved to a business imperative

More organization are using analytics to create a competitive advantage…

Respondents who believe analytics creates a competitive advantage



Source: The New Intelligent Enterprise, a joint *MIT Sloan Management Review* and IBM Institute of Business Value analytics research partnership. Copyright © Massachusetts Institute of Technology 2011

…and leaders are outperforming their competitors in key financial measures

1.6x Revenue growth

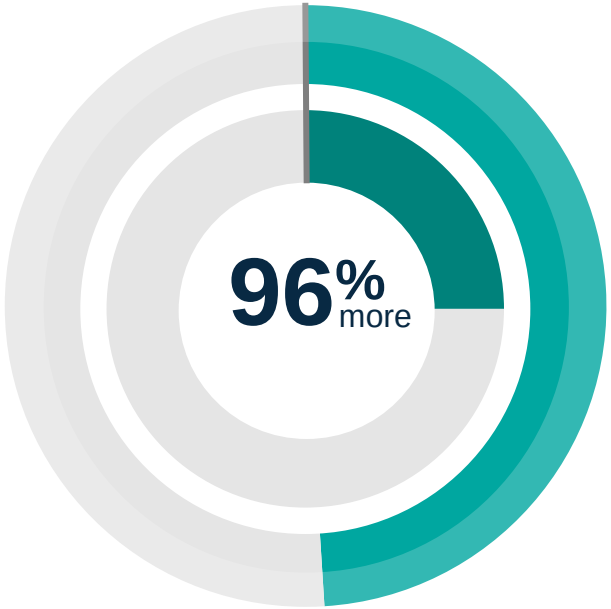
2.0x EBITDA growth

2.5x Stock price appreciation

Source: *Outperforming in a data-rich, hyper-connected world*, IBM Center for Applied Insights study conducted in cooperation with the Economist Intelligence Unit and the IBM Institute of Business Value. 2012

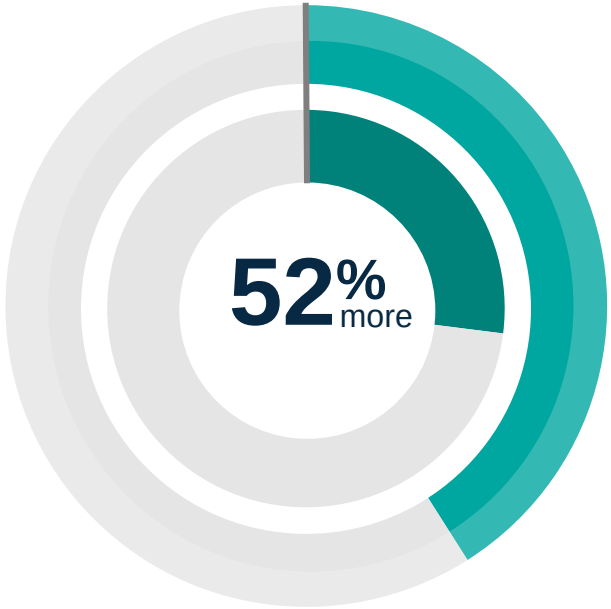
CIOs in outperforming enterprises are focusing particularly heavily on developing the resources to acquire deeper customer insights

Combining internal and external data for better insights



25% Underperformers | **49%** Outperformers

Customer analytics drive big data initiatives



27% Underperformers | **41%** Outperformers

Source: IBM Institute for Business Value, Global C-Suite Study, 2013

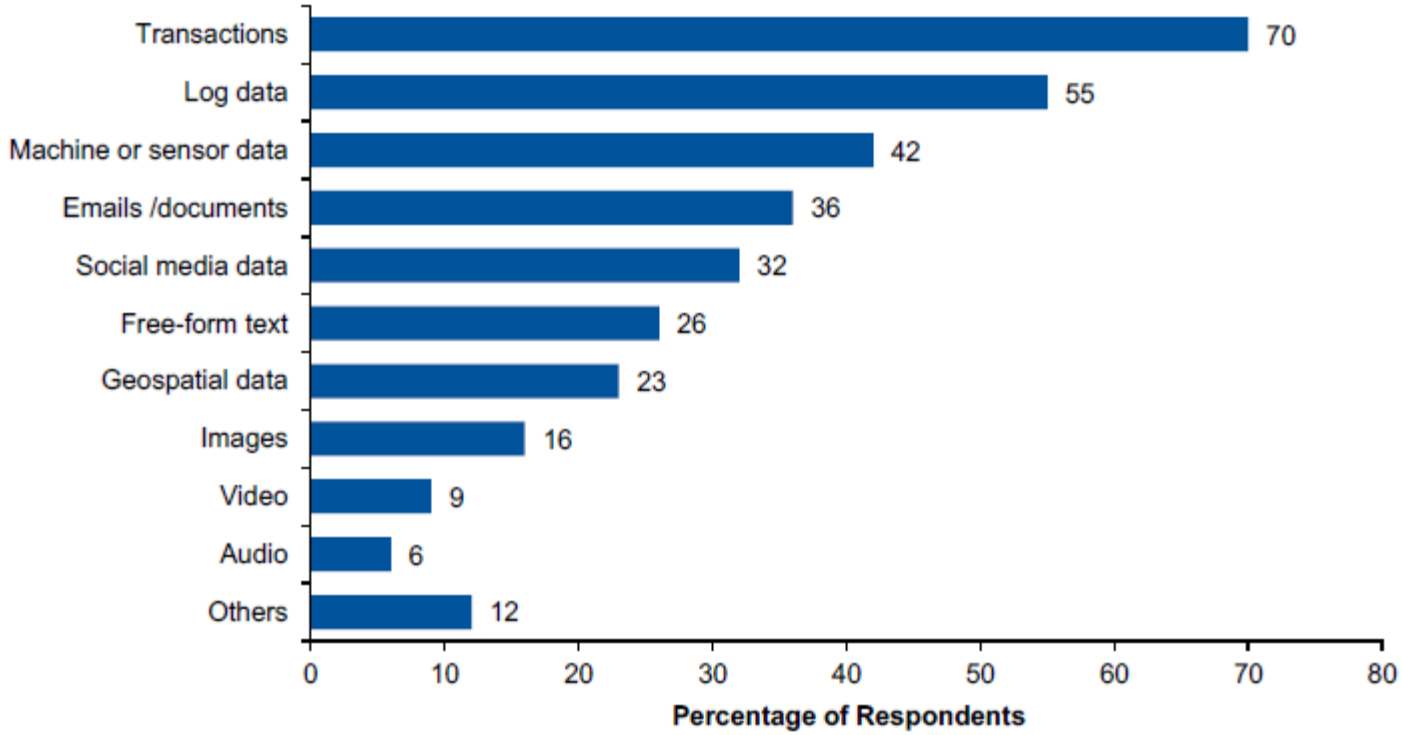
Today's agenda

- Why analytics
- **What data to be analyzed**
- New era of computing
- Evolution of analytics
- Why System z
- HTAP and data analytics lifecycle
- Analytics components
- Customer success stories
- Use cases
- Learn more

The Big Data starting point

Transactional sources are the dominant data types analyzed in big initiatives

Types of data analyzed



N =465 (multiple responses allowed)

Source: Gartner (September 2013)

Gartner research note "Survey Analysis - Big Data Adoption in 2013 Shows Substance Behind the Hype" Sept 12 2013
Analyst(s): Lisa Kart, Nick Heudecker, Frank Buytendijk

The Big Data starting point

Transactional sources are the dominant data types analyzed in big initiatives

Types of data analyzed by industry

	Manufacturing and Natural Resources	Media/ Communications	Services	Government	Education	Retail	Banking	Insurance	Healthcare	Transportation	Utilities
Transactions	73%	62%	67%	67%	54%	93%	83%	81%	75%	79%	80%
Log data	44%	57%	58%	59%	54%	40%	66%	61%	33%	71%	60%
Machine or sensor data	53%	38%	35%	33%	31%	27%	27%	48%	42%	50%	40%
Emails /documents	27%	43%	43%	41%	46%	27%	34%	39%	17%	29%	20%
Social media data	32%	52%	39%	26%	54%	73%	27%	13%	-	50%	-
Free-form text	17%	24%	28%	30%	31%	20%	34%	35%	67%	21%	40%
Geospatial data	27%	14%	19%	19%	38%	27%	27%	26%	8%	29%	40%
Images	19%	24%	17%	11%	38%	13%	5%	16%	25%	7%	-
Video	8%	29%	12%	7%	31%	13%	-	6%	8%	7%	-
Audio	10%	19%	8%	4%	8%	-	-	6%	-	-	-
Other	8%	14%	13%	15%	8%	7%	10%	16%	42%	14%	-
n =	*59*	*21**	*127*	*27**	*13**	*15**	*41*	*31*	*12**	*14**	*5**

Note: Highlighted cells indicate the top three data types by industry.
Multiple responses allowed

Source: Gartner (September 2013)

Gartner research note "Survey Analysis - Big Data Adoption in 2013 Shows Substance Behind the Hype" Sept 12 2013
Analyst(s): Lisa Kart, Nick Heudecker, Frank Buytendijk

Today's agenda

- Why analytics
- What data to be analyzed
- **New era of computing**
- Evolution of analytics
- Why System z
- HTAP and data analytics lifecycle
- Analytics components
- Customer success stories
- Use cases
- Learn more

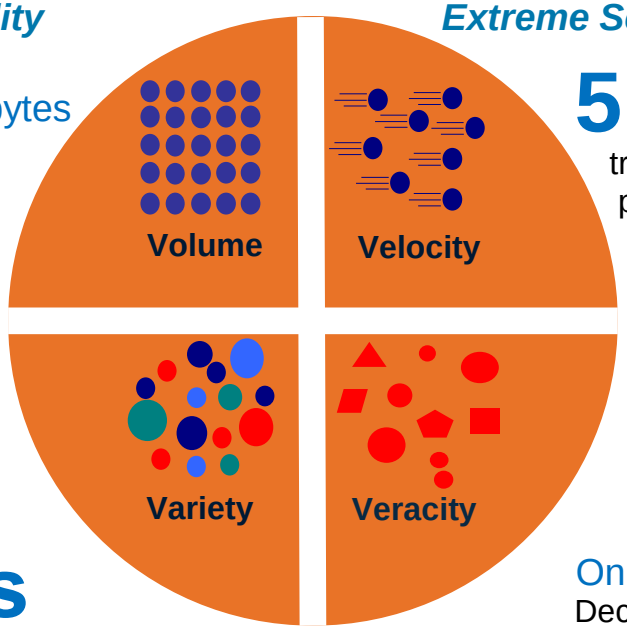
We've moved into a new era of computing - V4*

Radical Flexibility

12 terabytes
of Tweets create daily

Extreme Scalability

5 million
trade events per second



100's
Of video feeds from surveillance cameras

Information from everywhere

Only **1in3**
Decision makers trust their information

Information is not viable

Data is pouring in from every conceivable direction:

- Operational & transactional
- Machine to Machine – Metering, scanning/RFID/ facilities management
- Inbound/outbound customer contact points
- Mobile media and the web

"Running out of data is not a problem, *but drowning in it is*."

– John Naisbitt

* *4 Vs = Volume, Velocity, Variety, Veracity*

Becoming information-driven

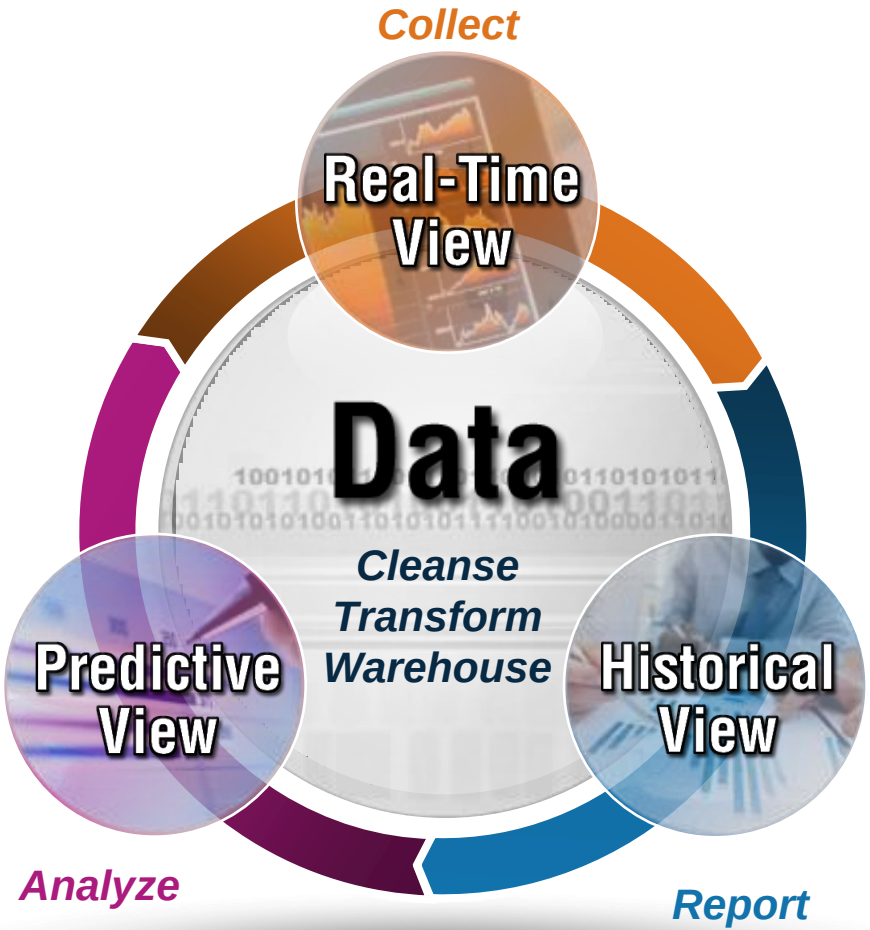
Examples

1	Customers		▪ Advanced client segmentation ▪ Leveraging customer sentiment analysis ▪ Reducing customer churn
2	Finance		▪ Enabling continuous planning and forecasting ▪ Automating financial and management reporting ▪ Improving visibility, insight and control
3	Risk		▪ Making risk-aware decisions ▪ Managing financial and operational risks ▪ Reducing the cost of compliance
4	Operations		▪ Optimizing the supply chain ▪ Deploying predictive maintenance capabilities ▪ Transform threat & fraud identification processes

Today's agenda

- Why analytics
- What data to be analyzed
- New era of computing
- **Evolution of analytics**
- Why System z
- HTAP and data analytics lifecycle
- Analytics components
- Customer success stories
- Use cases
- Learn more

Historic approach towards business analytics



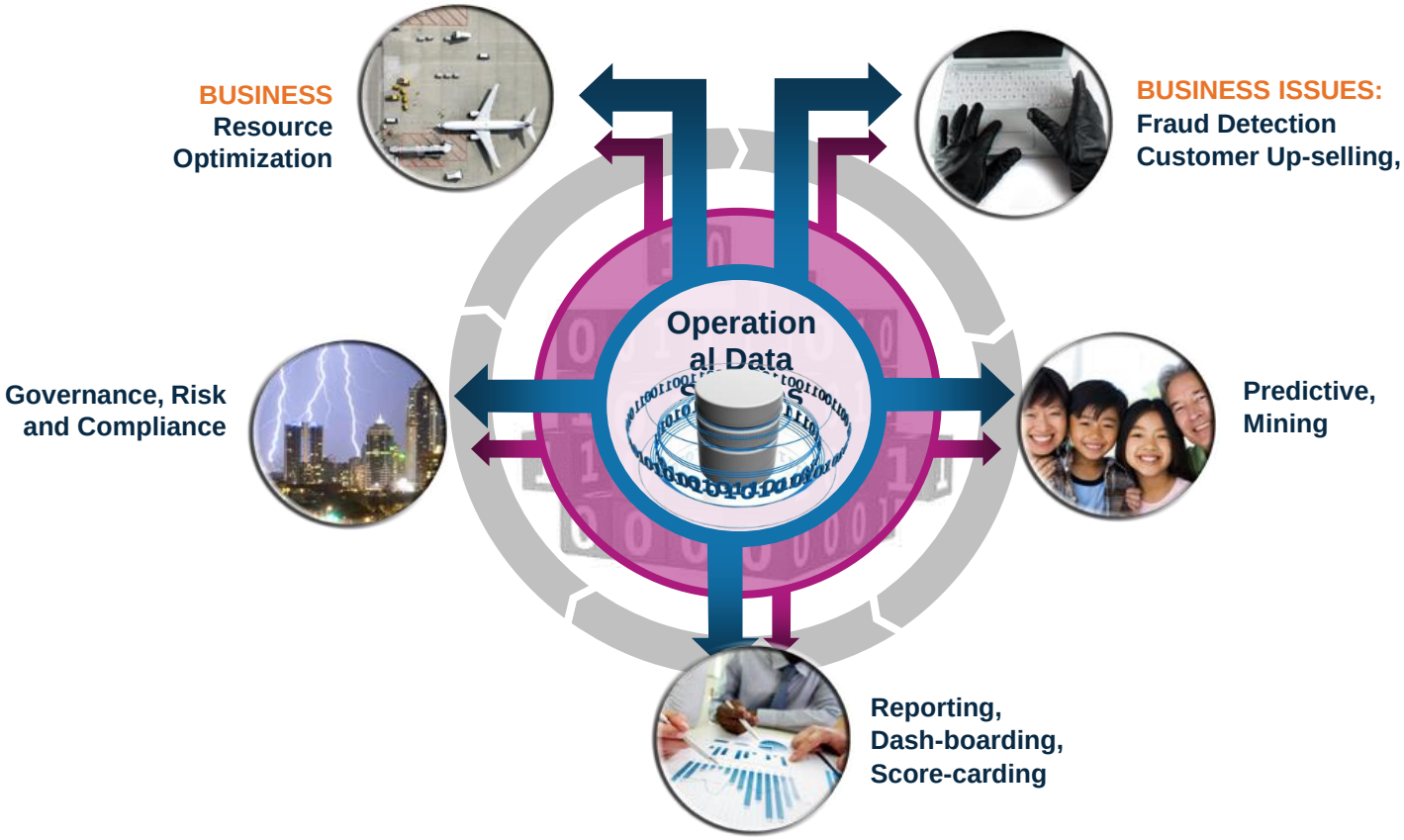
The organization's focus is on optimizing the *IT outcomes* of each *individual silo*

Problems:

- Significant effort spent copying and moving data – resulting in veracity/security issues
- Business does not have access to the most current view
- Complicated infrastructure requiring multiple skill types
- No single point of management
- Business continuity concerns

A “smarter” approach to decision management

focuses on the most important data, and works outward from there



Centralized control of decision information

Fast, consistent, easily managed information

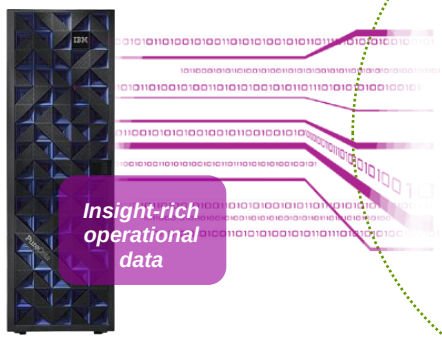
- Centrally managed
- Consistent information
- Easy to access
- Easy to update
- Fast business recovery
- Simplified administration
- Maximize business value from resources

Leverage the right technology for a 360 degree view of your business

Insight-rich

DB2 Analytics Accelerator

Secured data for real-time analysis



DB2 Analytics Accelerator

Integrated

zEnterprise

Insights

Analytic Applications/Tools

Centrally deploy analytic tools for easy management

BigInsights

BigInsights

For external data insights

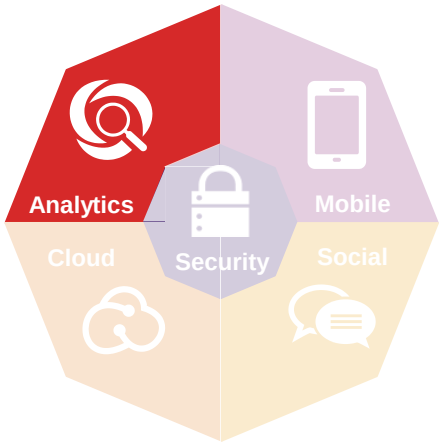
InfoStreams monitors data streams, extracting valuable information

Today's agenda

- Why analytics
- What data to be analyzed
- New era of computing
- Evolution of analytics
- **Why System z**
- HTAP and data analytics lifecycle
- Analytics components
- Customer success stories
- Use cases
- Learn more

System z is uniquely positioned

zBC12



zEC12

Creating personalized client experiences

Speeding delivery of new products and services

Integrates business operations within a single system

A robust infrastructure

Analytics is a game changer in the digital world

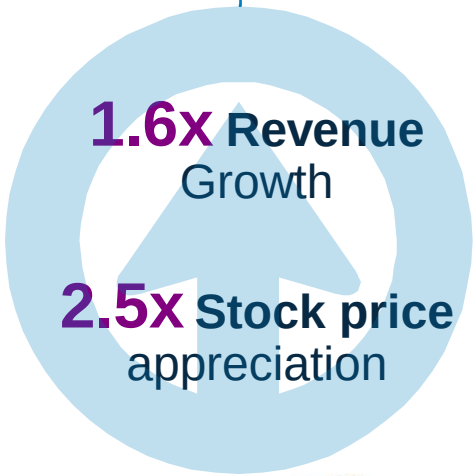
Businesses across all industries are exploiting analytics in new ways:

How do I **target and retain** my best customers? → Work from a current, **single view of the client**

How do I **reduce fraud**? → **Drive insights** in to payment systems

How do I **focus resources** for maximum effectiveness? → **Know right now** where everyone and everything is

Leaders in analytics are **outperforming their competitors** in key financial measures[1]



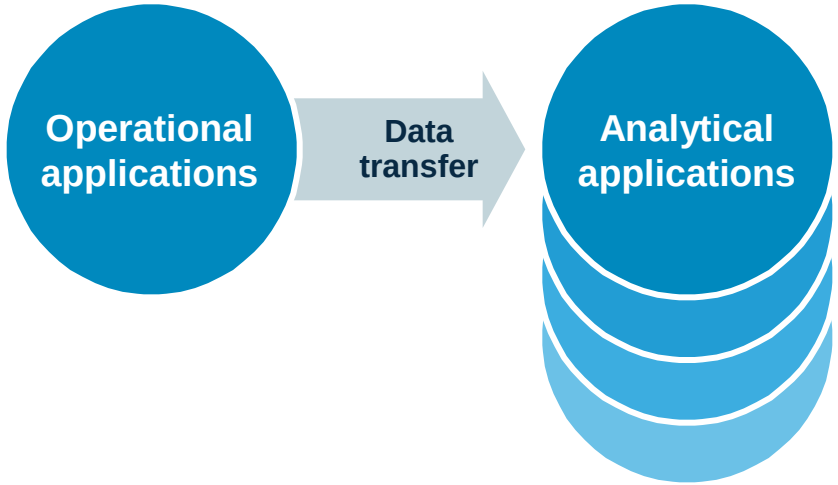
Traditional approach to analytic systems has significant limitations

Extract, Transform and Load (ETL)

- **Multiple copies of data**
  Redundancy, inconsistency, complexity and cost
- **Significant compute power**
  increases cost
- **Transaction and analytics isolation**
  Increases time to insight

1TB ETL per day, Initial copy plus three derivatives costs

***>$8Million** over 4 years*



Source: CPO internal study. Assume dist. send and load is same cost as receive and load.. Also, assume 2 switches and 2 T3 WAN connections.

The most valuable insights occur when the analysis executes where the data originates

Operational and analytics applications reside with the data in a single system

zEnterprise *– a single solution to:*

- Provide a single source of data for multiple analytics applications
- Access, Combine & Manage a relevant mix of information
- Deliver timely and secure access for more accurate answers

72%

of responders plan to analyze transactional data from enterprise applications using Big Data technologies

80%

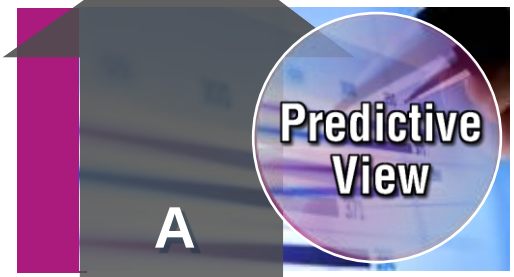
of world's corporate data resides or originates on mainframes

Data is our clients' most important resource. The more effectively and efficiently they use that data, the greater their competitive advantage

Analytics models and software. These are the tools that deliver actionable insights from data.

Predictive View

… what happens if trends continue?
… what happens if <fill in the blank>?
… what is likely to happen next?
… how to achieve the best outcome?



ADVANTAGE

Data warehouses, marts, etc. These data sources support reporting and predictive model creation.

Historical View

… what happened?
… how many, how often, where?
… what the problem is, exactly?
… what actions are needed?

The operational systems that house the book of record. These data sources are critical to day-to-day business processes.

Real-Time View

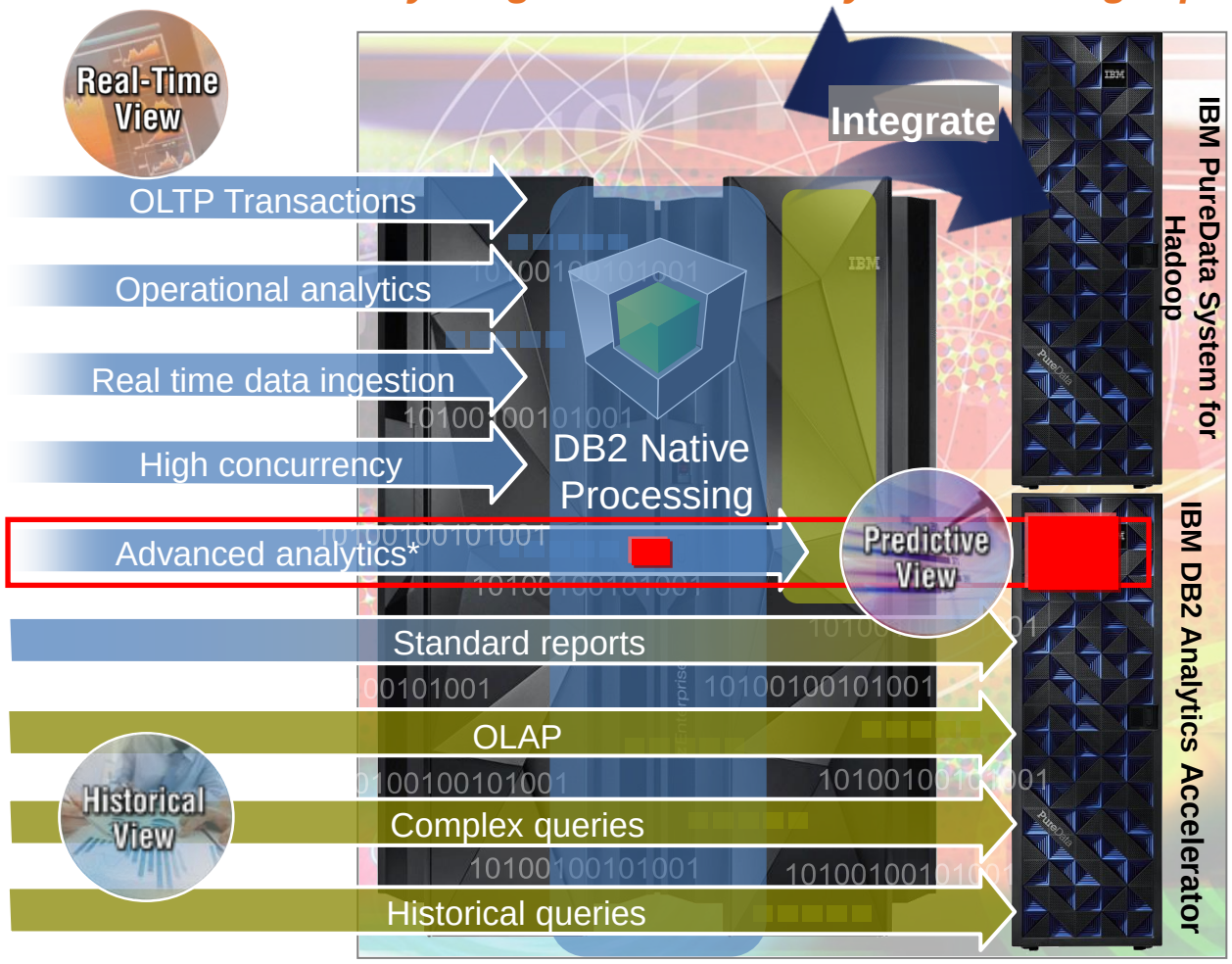
Mission-critical business analytics solutions depend on where the source data resides

Today's agenda

- Why analytics
- What data to be analyzed
- New era of computing
- Evolution of analytics
- Why System z
- **HTAP and data analytics lifecycle**
- Analytics components
- Customer success stories
- Use cases
- Learn more

HTAP: Hybrid Transaction Analytic Processing
Single Workload-Optimized System for OLTP, DW, Historical Data

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

* *Not formally planned or announced yet. Possible functions.*

The System z strategy integrates transactional and analytics processing hardware and software into one end-to-end data lifecycle

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

The System z strategy integrates transactional and analytics processing into one streamlined, end-to-end data lifecycle

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

- Operational Decision Management
  - Next generation of business rules technology
  - Improves policy change management and automate decision making.
- WebSphere/CICS/IMS
  - Engine" that powers transactional environments.
  - Combination of integration and middleware software for sophisticated, integrated, highly available, secure, and reliable business applications.

Rules

ODM

CICS/IMS
WebSphere
SAP
…

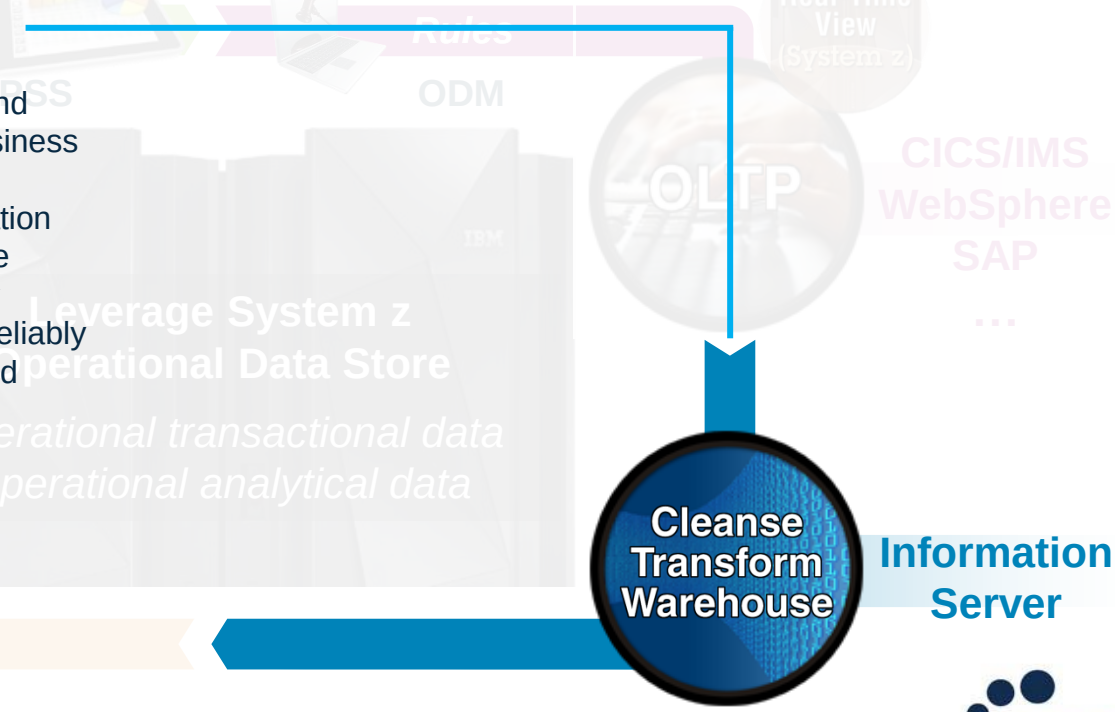
Leverage System z
Operational Data Store
Operational transactional data
Operational analytical data

Cognos
Report
Historical View (System z)
Cleanse
Transform
Warehouse
Information Server

The System z strategy integrates transactional and analytics processing into one streamlined, end-to-end data lifecycle

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

- IBM InfoSphere Information Server
  - Data integration platform
  - Understand, cleanse, transform and deliver trusted information for business analytics, data warehousing
  - Integrates heterogeneous information from across entire IT infrastructure
  - Insures information is consistently defined, accurately represented, reliably transformed, and regularly updated



The System z strategy integrates transactional and analytics processing into one streamlined, end-to-end data lifecycle

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

Cognos

- Translate data from various corporate systems into:
  - Deliver information where, when and how it is needed
  - Self-service reporting and analysis, detailed filtering
  - Gauges, maps, charts, and other graphical elements
  - Data exploration - drill down, up and thru
  - Integrated results from multiple sources, combined in a more meaningful way
  - While delivering integrated offerings designed to optimize performance

The System z strategy integrates transactional and analytics processing into one streamlined, end-to-end data lifecycle

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

- High-performance data mining and text analytics workbench
  - Set of mining algorithms that provide insight and prediction
  - Identify patterns and trends in data that can be used to optimize business decisions
  - Create Practical Solutions Faster
- ILOG
- Business problems –
  - Modeled “into” an abstract mathematical model, that is resolved by a solving engine
  - Mathematical programming solving engine (CPLEX) for linear and quadratic programs
  - Handle problems with millions of constraints or variables

Today's agenda

- Why analytics
- What data to be analyzed
- New era of computing
- Evolution of analytics
- Why System z
- HTAP and data analytics lifecycle
- **Analytics components**
- Customer success stories
- Use cases
- Learn more

Accelerate data warehousing on System z

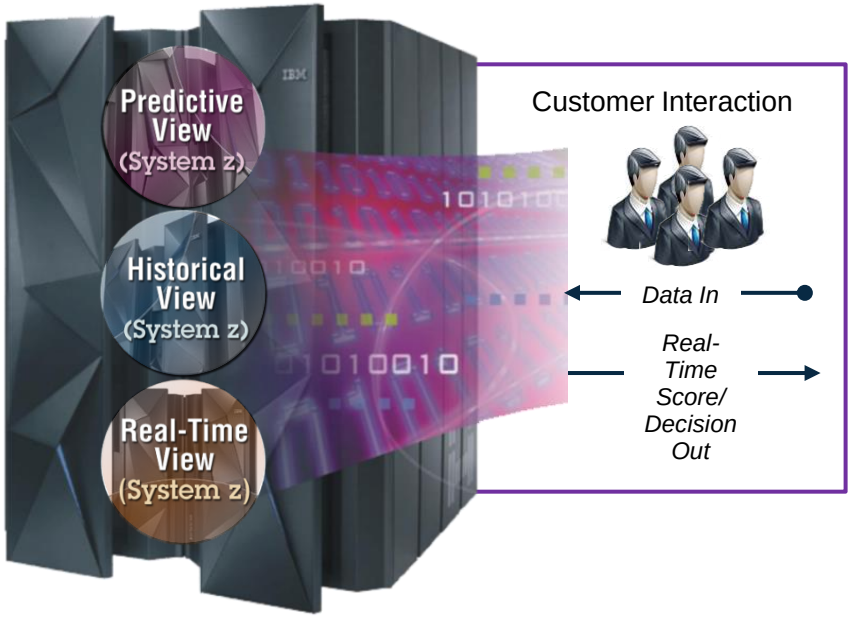
DB2 Analytics Accelerator improves the speed of business decisions

Blending System z and Netezza technologies to deliver unparalleled, mixed workload performance for complex analytic business needs.

- Enables integration of analytic workloads and transaction processing on zEnterprise
- Ensures cost-effective, timely, accurate and secure insight in near real-time
- Benefit from the proven System z qualities of service Accelerates complex queries, up to 2000x faster
- Improves access to historical data and lowers the cost of storing, managing and processing historical data
- Minimizes latency
- Reduces zEnterprise capacity requirements
- Improves security and reduces risk
- Complements existing investments

A key enabler for predictive analytics: Real-time scoring with DB2 for z/OS and SPSS

- Delivers better, more profitable decisions, at the point of customer impact
  - Enables more informed customer interaction
  - Improves fraud identification and prevention
- With improved accuracy, speed and performance while reducing cost and complexity
  - Improves accuracy by scoring directly within the OLTP application against the latest committed data
  - Delivers the performance needed to meet SLAs of OLTP applications
  - Single infrastructure for reduced complexity and redundancy of HW, SW and administration resources
  - Avoid data governance and security issues, save network bandwidth, data copying latency, disk storage
  - Receives the same high qualities of service as OLTP/business systems
  - Easier to incorporate scoring into applications



IBM SPSS Modeler with Scoring Adapter for zEnterprise™ V15.0

zEnterprise Analytics System 9700 and 9710

A cost-competitive, integrated combination of hardware, software and services to deliver business reporting and business critical analytics

A flexible zEnterprise deployment model

- **Solution Priced** - for deployment as an additional logical partition (LPAR) on an existing system or as a new system
- **Preselected** – to deliver a comprehensive, yet flexible end-to-end solution
- **Pretested** – to meet business reporting and critical analytic demands

zEnterprise Analytics System 9700

zEnterprise EC12

zEnterprise Analytics System 9710

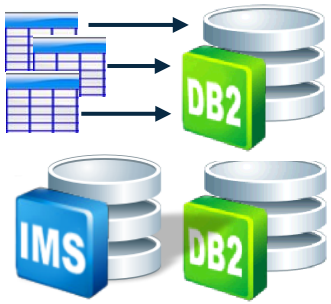
zEnterprise BC12

Enhancing Big Data analytics with IMS and DB2 for z/OS v11

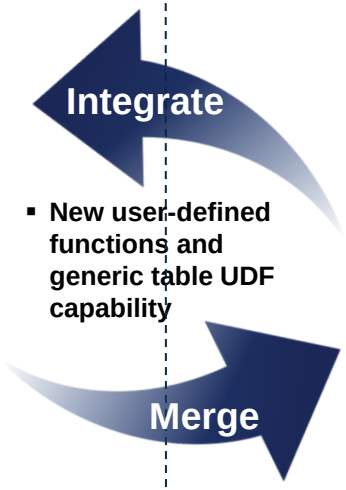
Unstructured data sources are growing fast

Much of the world's operational data resides on z/OS

- Two significant needs:
  - Merge new data with trusted OLTP data from zEnterprise data sources
  - Integrate this data so that insights from Big Data sources can drive business actions
- IMS & DB2 - connectors allow BigInsights to easily/efficiently access data
- **DB2 connectors** to allow DB2 apps to easily and efficiently access Hadoop data sources

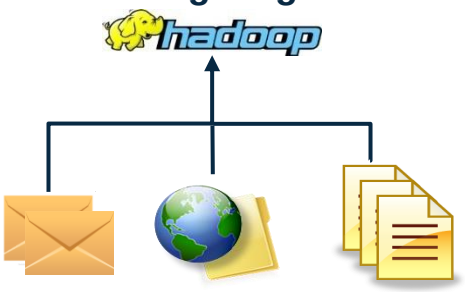


- **Relational projection of IMS model**



- **New user-defined functions and generic table UDF capability**

IBM BigInsights



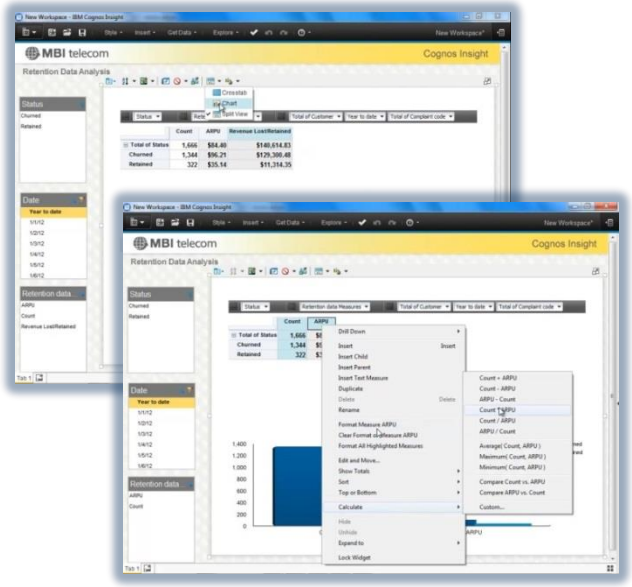
Cognos and QMF

Making diverse business information…understandable

- Translate data from various corporate systems into:
  - Deliver information where, when and how it is needed
    - Self-service reporting and analysis, detailed filtering
    - Organized and customizable Navigation
    - Advanced Visualizations
    - Gauges, maps, charts, and other graphical elements
    - Data exploration - drill down, up and thru
    - Integrated results from multiple sources, combined in a more meaningful way

Big Insights for Linux on System z

- Makes it simpler to use Hadoop to get value out of big data and build big data applications
- Enhances open source technology to withstand the demands of your enterprise
- Enterprise-ready Apache Hadoop–based platform for data processing, warehousing and analytics
- Advanced analytics for structured, semi-structured and unstructured data
- Professional-grade visualization, development and administration tooling to boost productivity
- Application accelerators that help speed implementation and accelerate time-to-value. Integration with popular IBM offerings as well as third-party solutions



Today's agenda

- Why analytics
- What data to be analyzed
- New era of computing
- Evolution of analytics
- Why System z
- HTAP and data analytics lifecycle
- Analytics components
- **Customer success stories**
- Use cases
- Learn more

Swiss Mobiliar
Insurance & Pensions

accelerates 50 percent of queries by a factor of 100

Business Challenge:
How to maximize profitability as its business grows

Technical Challenge:
Running its growing transaction processing and analytics workloads side by side without increasing compute requirements

Solution:
Deploy IBM DB2 Analytics Accelerator for z/OS bringing together transactional processing and analytics workloads in a cost-effective solution

achieved its objective of **providing access to the most timely, accurate data** to improve customer satisfaction

"Queries that used to take five hours to complete are now processed in just 20 seconds in the optimized mainframe environment—and we can run them any time, day or night, with no interruption to our production systems on the mainframe."
Thomas Baumann, IT Performance Architect at Swiss Mobiliar

dramatically decreases analytics query times

Business Challenge:
How to improve customer service and satisfaction in order to drive greater revenue

Technical Challenge:
Existing analytic processes were unable to manage the analysis of historic and transaction data from Petrol's retail stores, service stations and home oil/gas businesses

Solution:
Implemented IBM DB2 Analytics Accelerator to support high performance queries and IBM SPSS to make real time, point of sale product recommendations

Increased retail sales revenue
through point-of-sale improvement, suggest-sell insight

IBM provides us with tools that align with smarter commerce, enabling us to deliver the right message to the right person at the right time, to understand product affinities and intelligently drive the sale all in a customer centric way"

BANCA CARIGE
Cassa di Risparmio di Genova e Imperia

leverages new approach to real-time analytics to boost productivity by 400%.

Business Challenge:
How to maximize value from big data in order to improve product development and customer relationships

Technical Challenge:
Unable to quickly extract actionable insights from big data and identify market opportunities in order to adapt or expand its offering to meet customer demand

Solution:
Created a secure analytics platform, to extract true business value from their big data for better business decisions about everything from product development to special offers to promotions

1000+ users
simultaneously get high-speed analytics on
real-time data

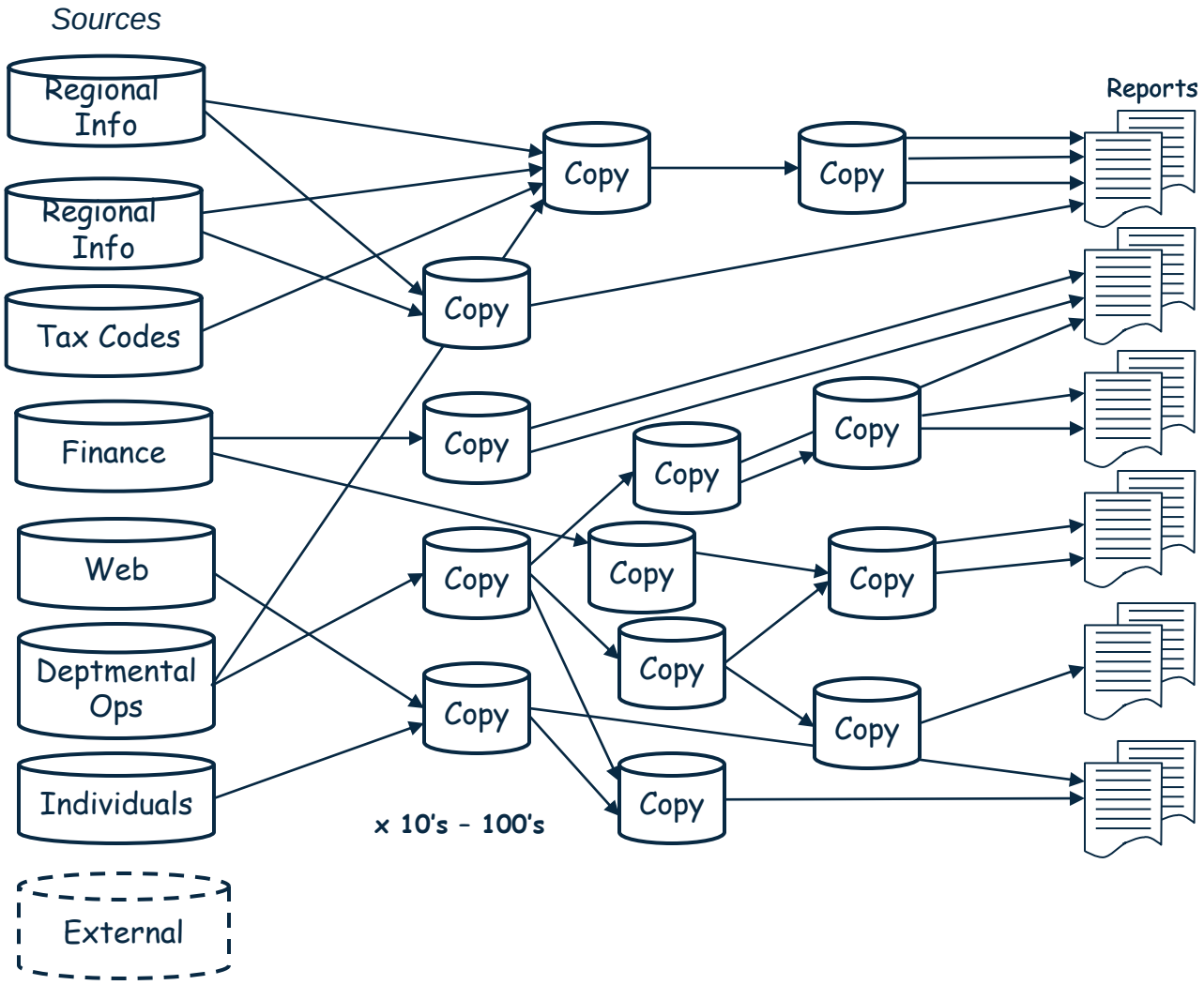
Time cut from months to weeks
to deliver the insight needed to develop and release new marketing campaigns

"IBM DB2 Analytics Accelerator enables us to support the additional workloads that come with business growth without activating more cores on the mainframe."

Today's agenda

- Why analytics
- What data to be analyzed
- New era of computing
- Evolution of analytics
- Why System z
- HTAP and data analytics lifecycle
- Analytics components
- Customer success stories
- **Use cases**
- Learn more

Fraud Detection Migrates from this…



Goals

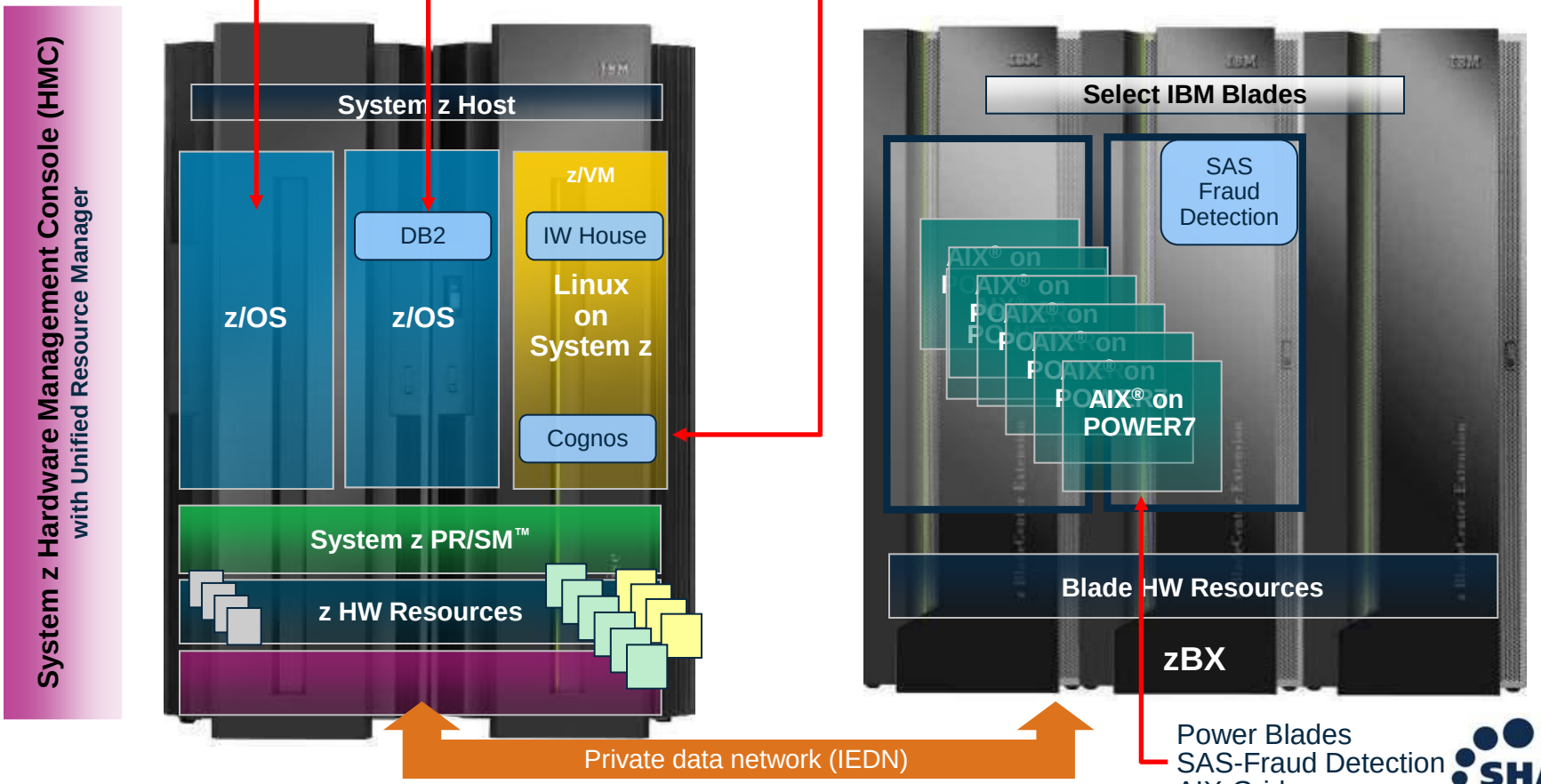
- **Business Processes**
- **Business Benefits**
- **Person Insight**
- **Individual info**
- **Regional trends**
- **Revenue Assurance**
- **Focused analysis**
- **Trends**
- **Fraud Detection**
- **Immediate notification**

End-to-end business analytics - Fraud Detection

Operational database
DB2 for z/OS

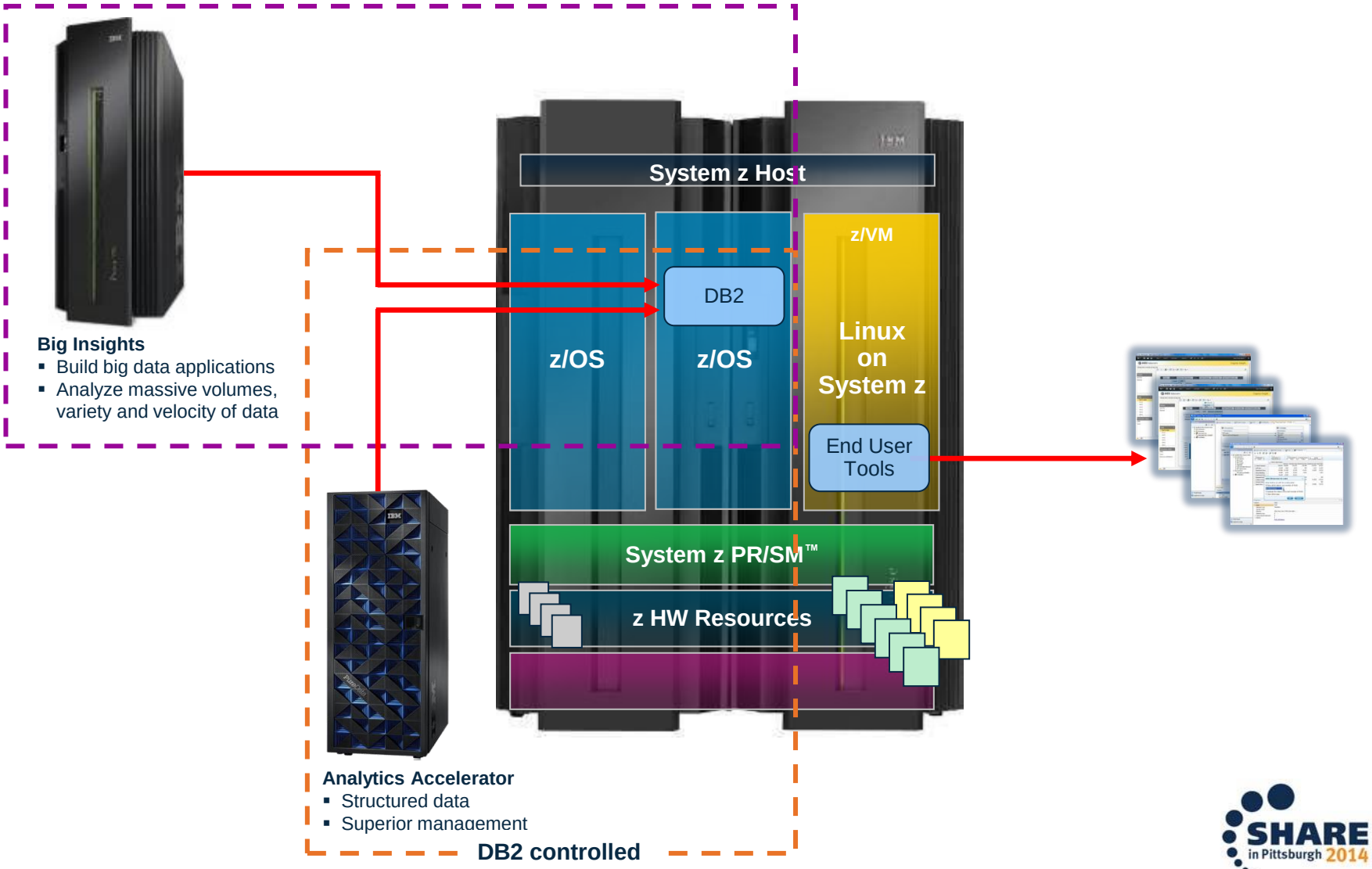
Data Warehouse
DB2 for z/OS
DB2 Utilities

Linux on Z
Cognos
Reporting

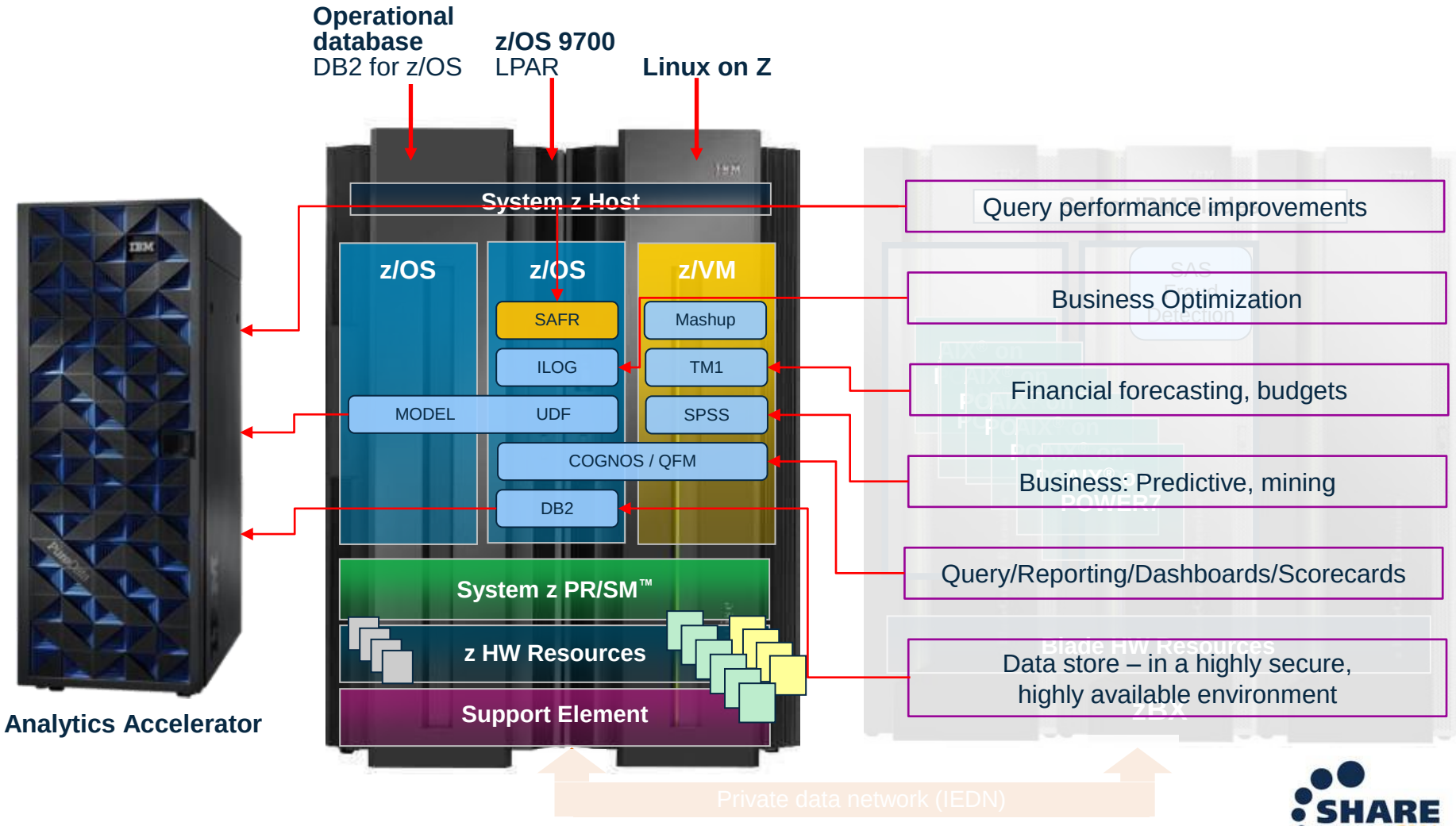


Power Blades
SAS-Fraud Detection
AIX-Grid

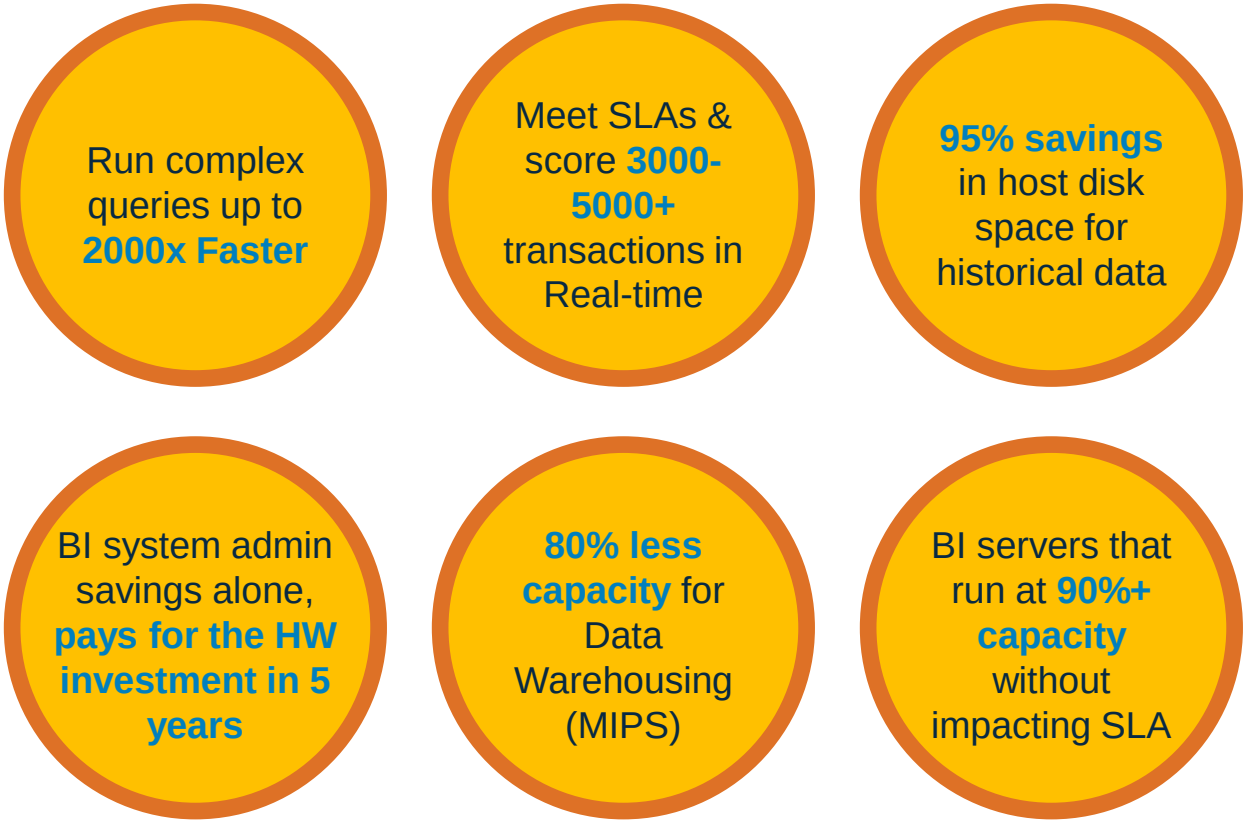
End-to-end business analytics – Big Insights



End-to-end business analytics - functions



zEnterprise Analytics Solutions Deliver…



Today's agenda

- Why analytics
- What data to be analyzed
- New era of computing
- Evolution of analytics
- Why System z
- HTAP and data analytics lifecycle
- Analytics components
- Customer success stories
- Use cases
- **Learn more**

Growing your IBM skills – a new model for training

Meet the authorized IBM Global Training Providers in the Edge Solution Showcase

- Access to training in more cities local to you, where and when you need it, and in the format you want
  - Use IBM Training Search to locate training classes near to you
- Demanding a high standard of quality / see the paths to success
  - Learn about the New IBM Training Model and see how IBM is driving quality
  - Check Training Paths and Certifications to find the course that is right for you
- Academic Initiative works with colleges and universities to introduce real-world technology into the classroom, giving students the hands-on experience valued by employers in today's marketplace
- www.ibm.com/training

Arrow

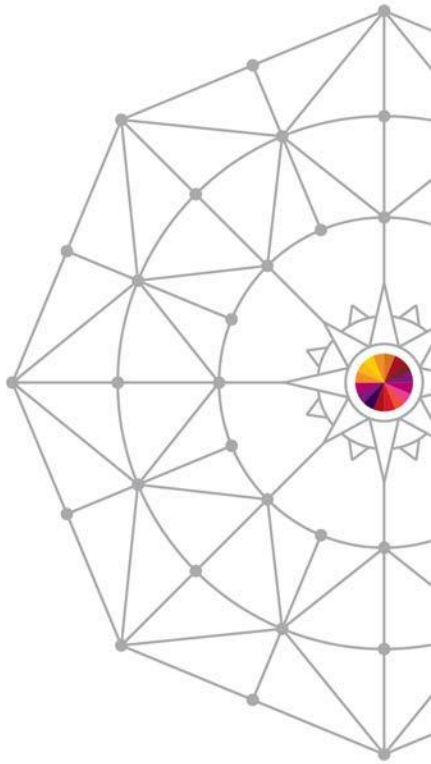
Avnet Academy
Global Training Provider
AVNET

Global Knowledge

INGRAM MICRO

LearnQuest

Thank You



#SHAREorg

SHARE is an independent volunteer-run information technology association that provides education, professional networking and industry influence.

Trademarks

The following are trademarks of the International Business Machines Corporation in the United States and/or other countries.

* Registered trademarks of IBM Corporation

The following are trademarks or registered trademarks of other companies.

Adobe, the Adobe logo, PostScript, and the PostScript logo are either registered trademarks or trademarks of Adobe Systems Incorporated in the United States, and/or other countries.
IT Infrastructure Library is a registered trademark of the Central Computer and Telecommunications Agency which is now part of the Office of Government Commerce.
Intel, Intel logo, Intel Inside, Intel Inside logo, Intel Centrino, Intel Centrino logo, Celeron, Intel Xeon, Intel SpeedStep, Itanium, and Pentium are trademarks or registered trademarks of Intel Corporation or its subsidiaries in the United States and other countries.
Linux is a registered trademark of Linus Torvalds in the United States, other countries, or both.
Microsoft, Windows, Windows NT, and the Windows logo are trademarks of Microsoft Corporation in the United States, other countries, or both.
Windows Server and the Windows logo are trademarks of the Microsoft group of countries.
ITIL is a registered trademark, and a registered community trademark of the Office of Government Commerce, and is registered in the U.S. Patent and Trademark Office.
UNIX is a registered trademark of The Open Group in the United States and other countries.
Java and all Java based trademarks and logos are trademarks or registered trademarks of Oracle and/or its affiliates.
Cell Broadband Engine is a trademark of Sony Computer Entertainment, Inc. in the United States, other countries, or both and is used under license therefrom.
Linear Tape-Open, LTO, the LTO Logo, Ultrium, and the Ultrium logo are trademarks of HP, IBM Corp. and Quantum in the U.S. and other countries.

* Other product and service names might be trademarks of IBM or other companies.

Notes:

Performance is in Internal Throughput Rate (ITR) ratio based on measurements and projections using standard IBM benchmarks in a controlled environment. The actual throughput that any user will experience will vary depending upon considerations such as the amount of multiprogramming in the user's job stream, the I/O configuration, the storage configuration, and the workload processed. Therefore, no assurance can be given that an individual user will achieve throughput improvements equivalent to the performance ratios stated here.

IBM hardware products are manufactured from new parts, or new and serviceable used parts. Regardless, our warranty terms apply.

All customer examples cited or described in this presentation are presented as illustrations of the manner in which some customers have used IBM products and the results they may have achieved. Actual environmental costs and performance characteristics will vary depending on individual customer configurations and conditions.

This publication was produced in the United States. IBM may not offer the products, services or features discussed in this document in other countries, and the information may be subject to change without notice. Consult your local IBM business contact for information on the product or services available in your area.

All statements regarding IBM's future direction and intent are subject to change or withdrawal without notice, and represent goals and objectives only.

Information about non-IBM products is obtained from the manufacturers of those products or their published announcements. IBM has not tested those products and cannot confirm the performance, compatibility, or any other claims related to non-IBM products. Questions on the capabilities of non-IBM products should be addressed to the suppliers of those products.

Prices subject to change without notice. Contact your IBM representative or Business Partner for the most current pricing in your geography.

This information provides only general descriptions of the types and portions of workloads that are eligible for execution on Specialty Engines (e.g, zIIPs, zAAPs, and IFLs) ("SEs"). IBM authorizes customers to use IBM SE only to execute the processing of Eligible Workloads of specific Programs expressly authorized by IBM as specified in the “Authorized Use Table for IBM Machines” provided at www.ibm.com/systems/support/machine_warranties/machine_code/aut.html (“AUT”). No other workload processing is authorized for execution on an SE. IBM offers SE at a lower price than General Processors/Central Processors because customers are authorized to use SEs only to process certain types and/or amounts of workloads as specified by IBM in the AUT.