Real-Time Analytics with IBM DB2 Analytics Accelerator and Big Data on System z

Dan Wardman

VP, Information Management Mainframe Software

IBM Software Group

PETROL

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 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

IBM

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

"DB2 Analytics Accelerator helps over 1,000 business users to get fast access to vital insights – informing the development of new products, services and strategies to grow the business."

Daniele Cericola, CIO, Banca Carige

Swiss Mobiliar
Insurance & Pensions

IBM

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

Blue Insight Project

Business Challenge:

Stay ahead of competitors through more rapid, data-driven decision-making

Technical Challenge:

Need for faster insight into growing volumes of transactional data as it was coming into the business

Solution:

Using IBM DB2 Analytics Accelerator integrated with DB2 for z/OS enables fast queries and eliminates the need to move data to marts on other platforms

400 percent speed increase in query response times to support critical analytics.

Accelerated one query process from 100 hours to just six minutes.

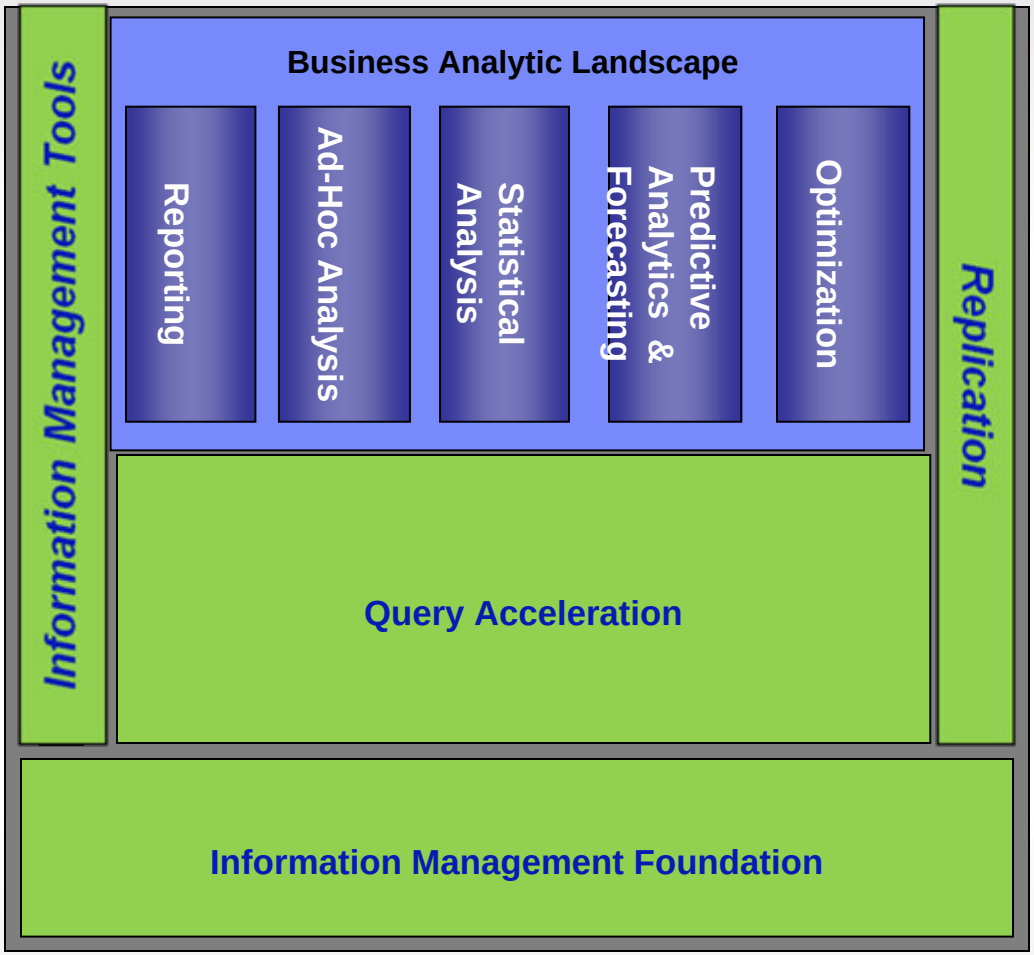
Game-changing insight is available almost in real time.

" Businesses today need to make better, faster decisions based on reality rather than on assumptions, and that means taking control of enormous volumes of data. The combination of DB2 Analytics Accelerator, Cognos BI and SPSS on the System z platform gives us that control and opens up a whole different way of doing things. "

Larry Yarter, Chief Architect, IBM Business Analytics Competency Center

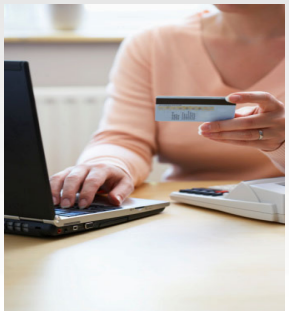
What is Analytics?

- *Analytics derive insight from data*
- *Organizations use analytics to help optimize business performance*
- *Analytics are only as good as the underlying data foundation*



What is Business Critical Analytics?

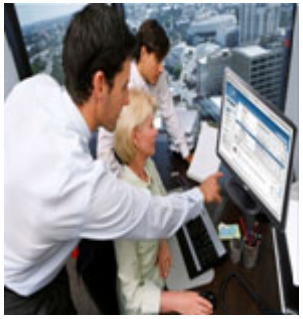
- An analytics application that is tightly integrated with z/OS transaction systems and critical to the optimal running of a business
- Make decisions and deliver business insight based on real time or near real time data
- Failure of these applications for any length of time can result in lost business
- Typically support a large concurrent user population with high volume of requests



Preventing Fraud

Reducing Customer Churn

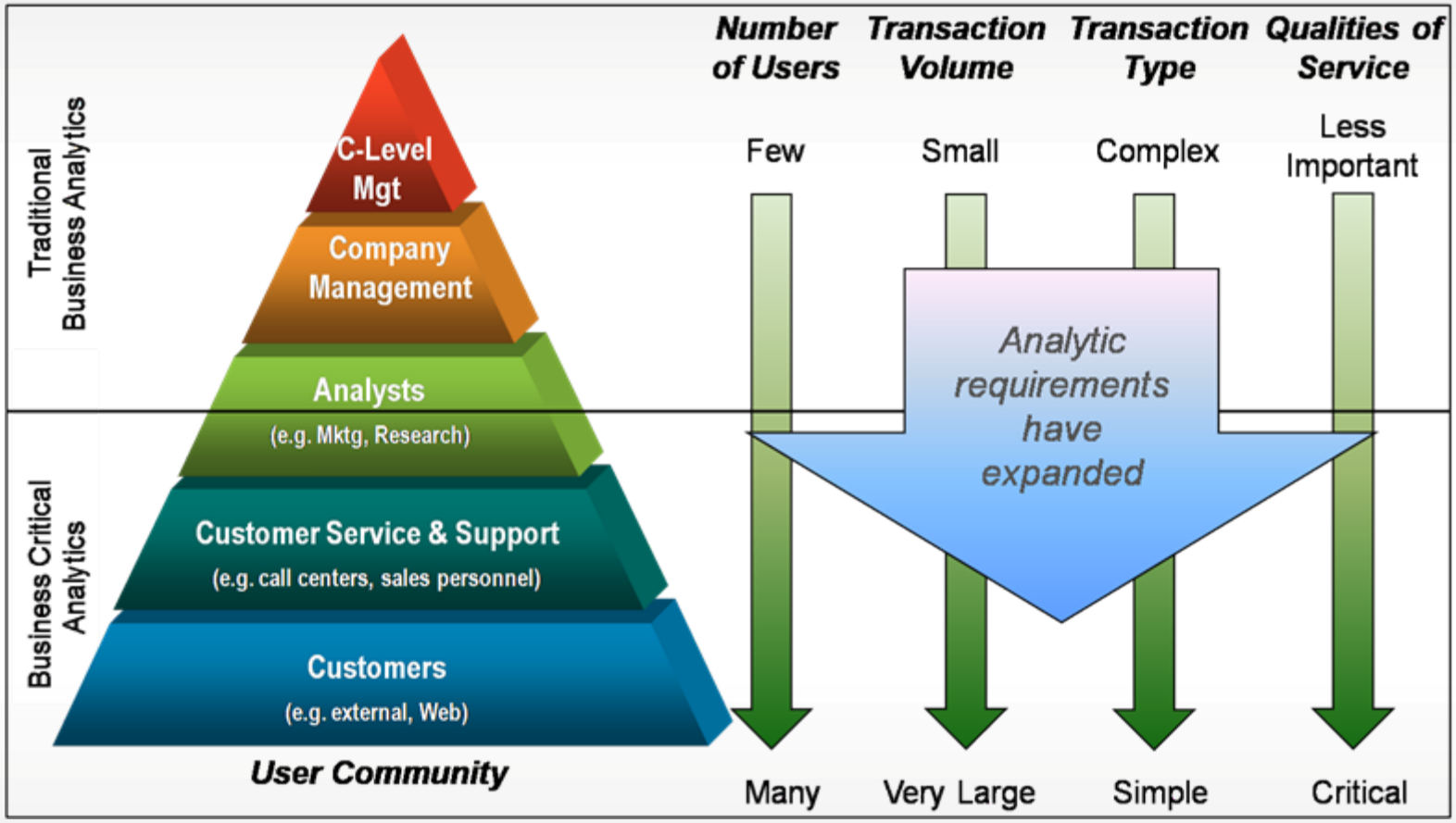
Cross-selling, up-selling customers



Realtime Operational Reporting

These applications require high degree of reliability, availability, scalability and low data latency

More users across the organization want access to business critical analytics



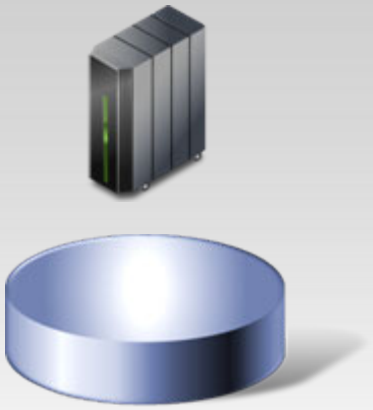
Five facts you need to know about analytics

1. Organizations are using analytics to outperform their competition
2. More users across the organization want access to business critical analytics
3. Business critical analytics demands low latency, high qualities of service and performance
4. Spreading analytic components across multiple departments can increase data latency, cost, complexity and governance risk
5. Bringing analytic components to where data originates improves data governance, while minimizing data latency, cost and complexity

Traditional Approach to Analytic Systems

Operational Applications

Transaction Processing



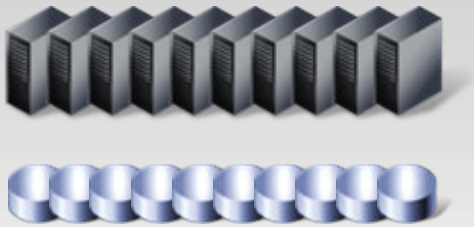
Shared Everything DB

High volume business transactions and batch processing running concurrently

Latency?
Security?
Data Governance?
Complexity?

Analytic Applications

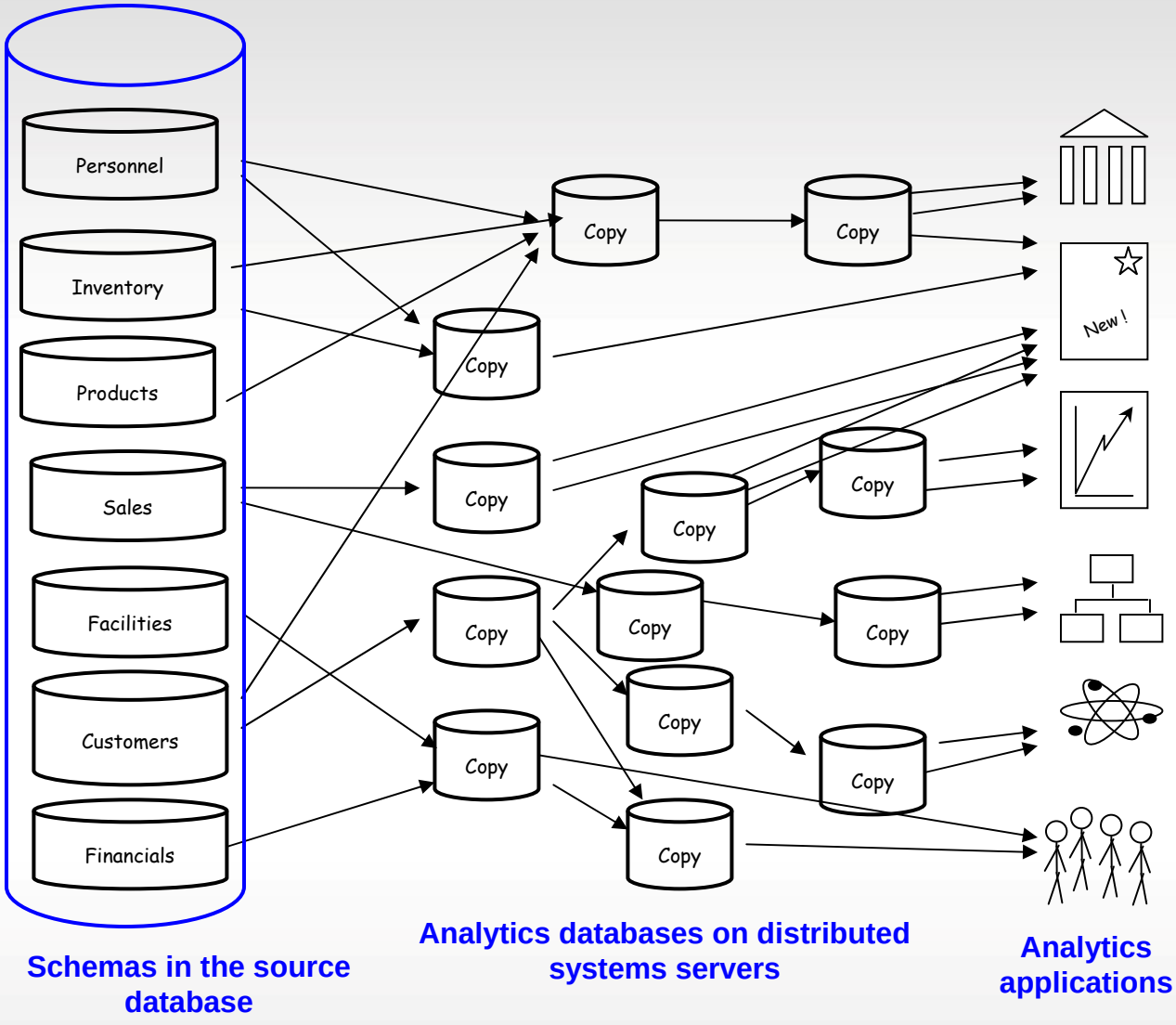
Data Store, Business Intelligence, Predictive Analytics



Shared Nothing DB

Low volume complex queries and batch reporting

typically results in . . .



Problems:

- Data latency: time between transaction and insight
- Expensive, resource-intensive data replication processes
- Greater risk of data security breaches
- Data governance issues: copies of data can become inconsistent – do users trust the data?
- Data currency challenges: copies of data can become out-of-date – users demand timely data
- Proliferation of data silos impedes integration, reduces value derived from data assets

The Hybrid Vision

Delivering business critical analytics

Combined Workloads

Transactional Processing, Traditional Analytics & Business Critical Analytics

Hybrid DB

Reduced Latency. Greater Security. Improved Data Governance. Reduced Complexity.

High volume business transactions and batch reporting running concurrently with complex queries

IBM DB2 Analytics Accelerator and IBM zEnterprise

Minimize latency. Improve performance. Drive innovation.

Bring analytics to the data
- Reduced latency
- Reduced complexity
- Reduced cost

Deliver business critical analytics
- Timely, accurate, secure data
- Availability, scalability, performance
- Rapid deployment & expansion

Evolve with the business
- Start with your top analytic requirement(s)
- Grow without changing your existing IT environment

Transactions in

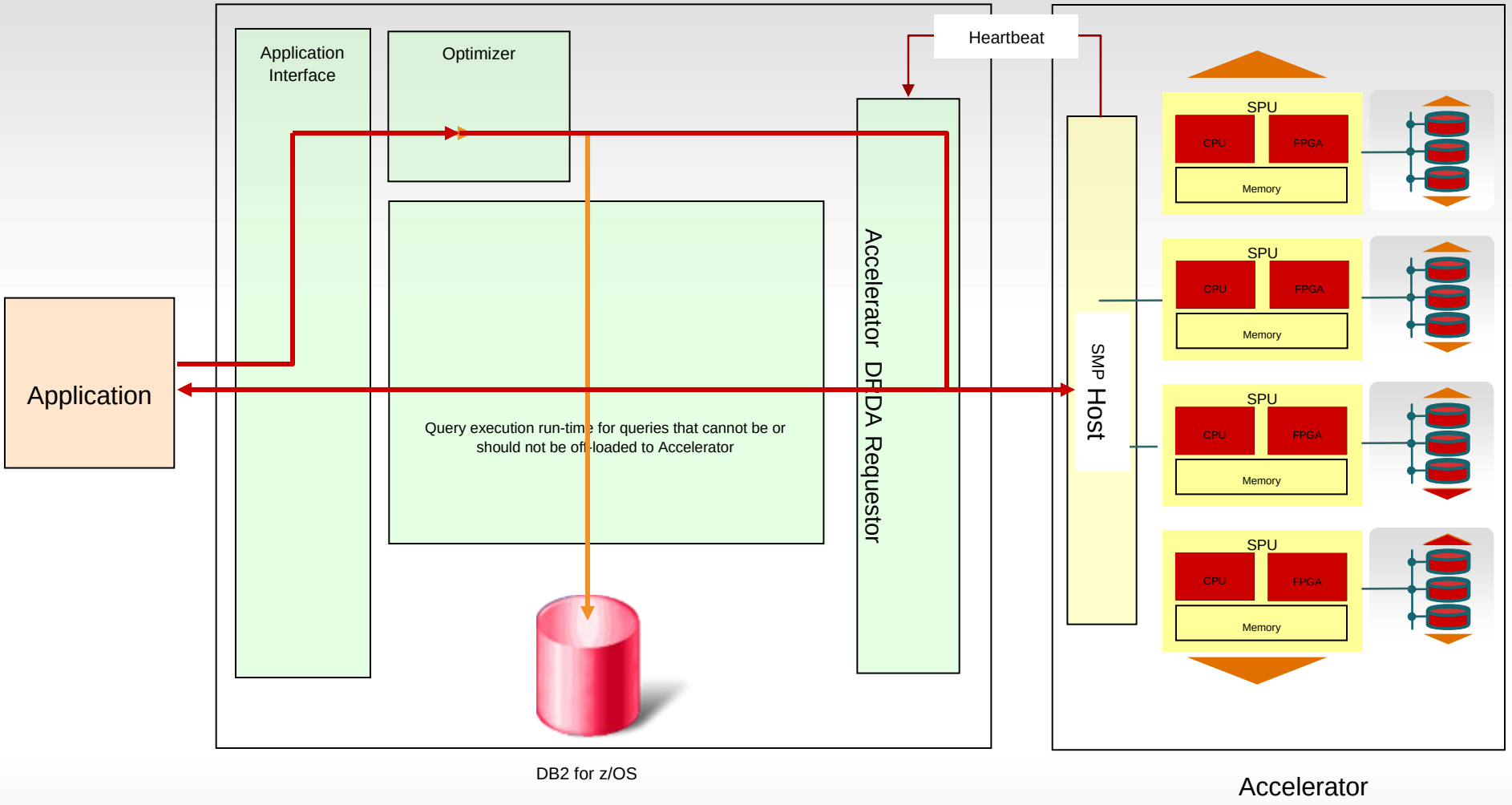
Improved business performance out

DB2 Analytics Accelerator

Do things you could never do before!

- **What is it?**
  - A high performance appliance that integrates Netezza technology with zEnterprise technology, to deliver dramatically faster business analytics
- **What does it do?**
  - Accelerates complex queries, up to 2000x faster
  - Lowers the cost of storing, managing and processing historical data
  - Minimizes latency
  - Reduces zEnterprise capacity requirements
  - Improves security and reduces risk
  - Complements existing investments

Query Execution Process Flow



Queries executed without Accelerator

Queries executed with Accelerator

Heartbeat (availability and performance indicators)

What's new in DB2 Analytics Accelerator Version 4.1

Delivering critical insight at the speed of business

Accelerate a broader spectrum of queries

-Static SQL, multi-row FETCH, and multiple encodings on the same Accelerator

Improve Enterprise Robustness & Scalability

-Enhanced workload balancing

-Improved incremental update performance

Enhance High Performance Storage Saver

-Improved ease of use through built-in restore, better access control for archived partitions and protection of moved partitions

Supports new DB2 and PureData Technology

-DB2 11

-PureData Analytics N2001 hardware

DB2 Analytics Accelerator Roadmap

- Enhancing current capabilities
- Enabling more query acceleration
- Increasing transparency
- Supporting new use cases

- Utilizing PDA technology advantages

2011

Query Accelerator

sophisticated multi-temperature data and archiving solution

ISAO V1

IDAA V2.1 (11/2011
•Netezza acceleration

2012/2013

Storage Saver

IDAA V3.1 (11/2012)
•Incremental Update
•Storage Saver

accelerating in-database transformation

2014

ELT Accelerator

IDAA V4.1 (11/2013)
•Static SQL
•Workload balance

IDAA V4.2 (xx/2014)
•ELT Accelerator
•Incremental Update Turbo
(BdB Scalability)

IDAA V5.1 (11/2014)
•ELT Accelerator
(Temp Table Support)
(DataStage Support)

2015/2016

Advanced Analytics

modeling, batch scoring, Hadoop, Streams integration

IDAA V6.1 (11/2015)
•Analytic Server
(INZA based modeling)

IDAA V4.3 (xx/2015)
•HA/DR Support
(Accel Grouping)
•Call Home

2017

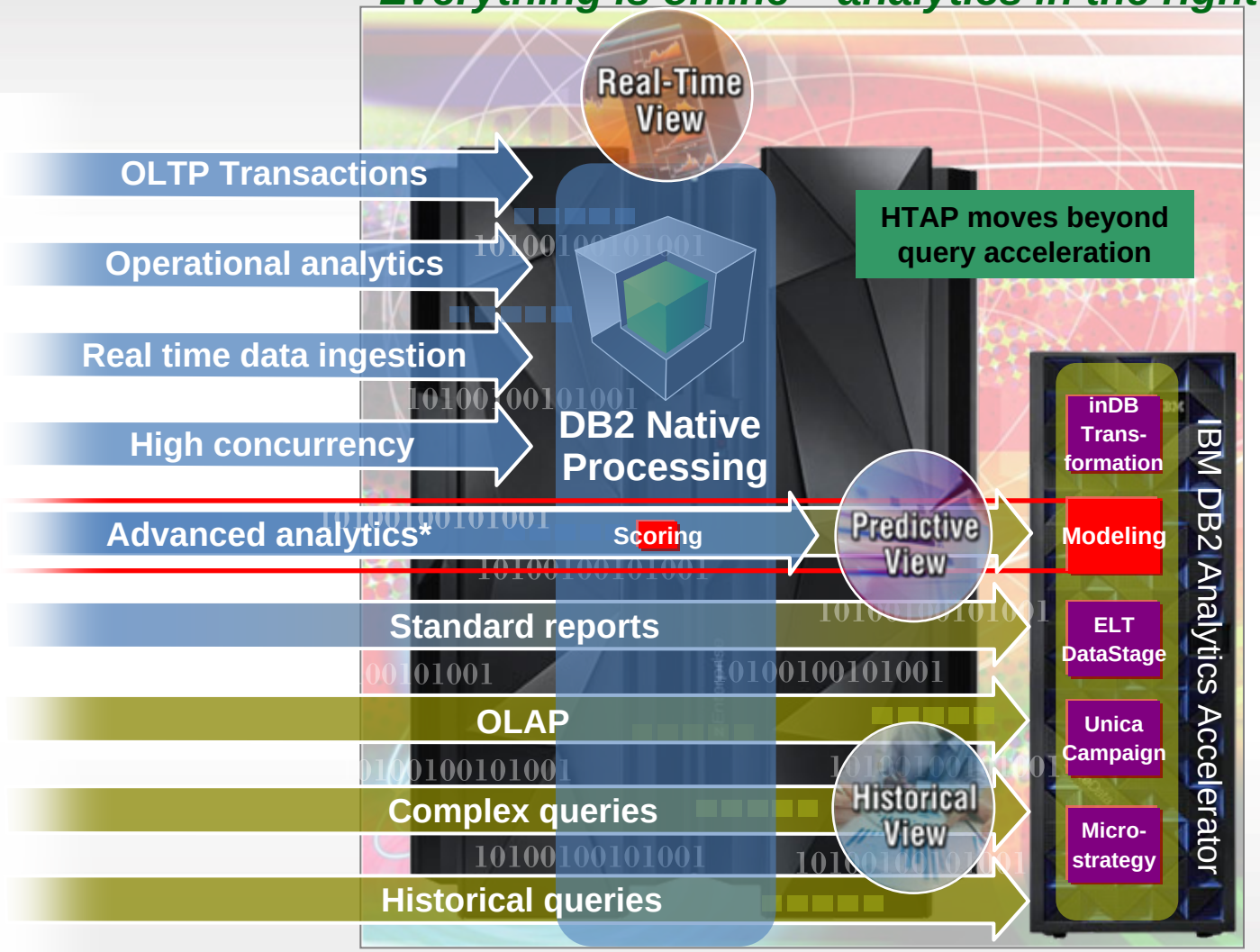
Unified Store

consolidation and unification of transactional and analytical data stores

System z: A Hybrid Transaction and Analytics Processing (HTAP) 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
- Speed operation reporting cycle to meet stricter service level agreements

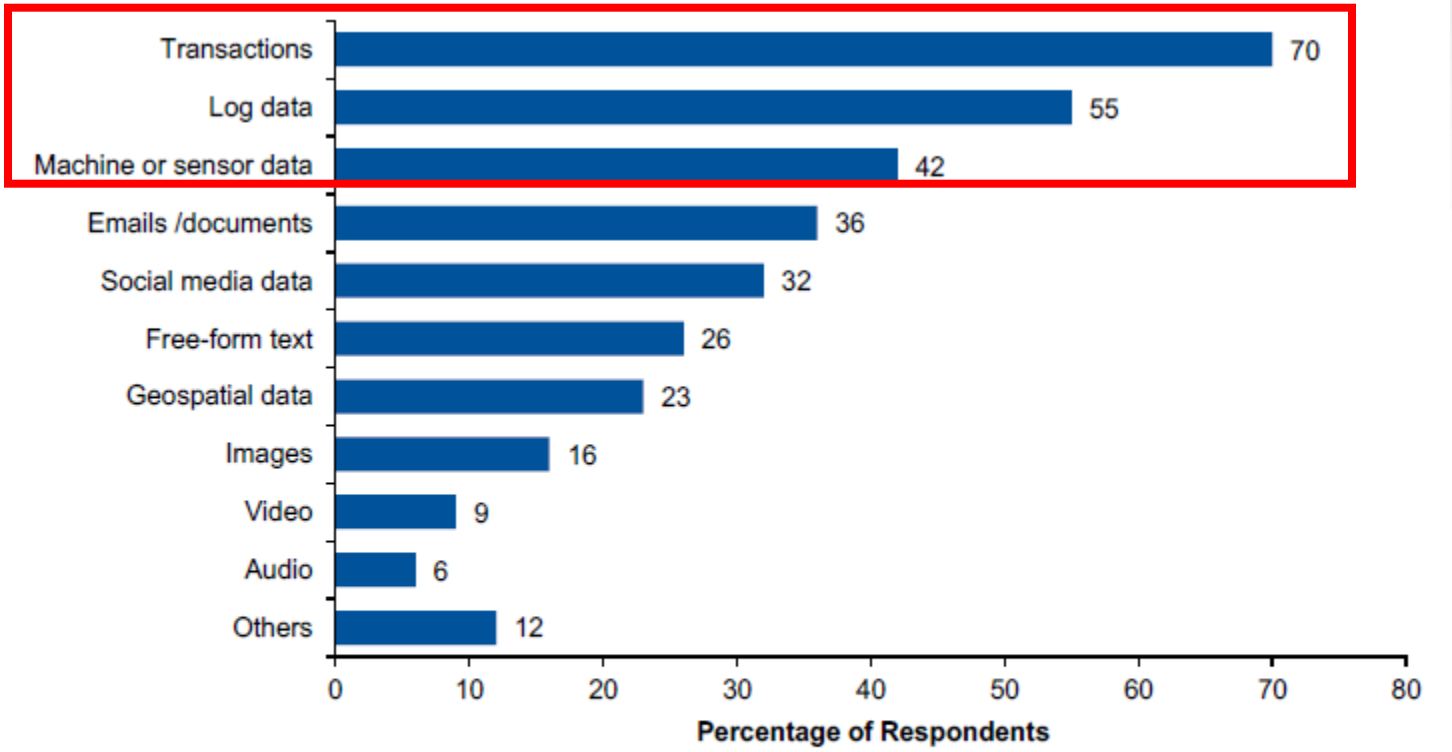
Operational benefits

- 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

The Big Data starting point (per Gartner)

Types of Data Analysed

Transactional sources are the dominant data types analyzed in big data initiatives



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

Majority of today's analytics based on relational,"structured" data

- Analytics and decision engines reside where the data warehousing and transaction data is
- "Noise" surrounds the core business data
  - Social Media, emails, docs, telemetry, voice, video, content
- What data are you prepared to TRUST?
- Where do you put your trusted Data?

"Circle of trust"

Demand for differently structured data to be seamlessly integrated, to augment analytics and decisions

- Analytics and decision engines reside where the DWH / transaction data is
- "Noise" surrounds the core business data
  - Social Media, emails, docs, telemetry, voice, video, content
- Expanding our insights – getting closer to the "truth"
  - Lower risk and cost
  - Increased profitability

"Circle of trust" widens

zEnterprise

A key data source for Big Data & Business Critical Analytics

- **Data that originates and/or resides on zEnterprise**
  - 2/3 of business transactions for U.S. retail banks
  - 80% of world's corporate data
- **Businesses that run on zEnterprise**
  - 66 of the top 66 worldwide banks
  - 24 of the top 25 U.S. retailers
  - 10 of the top 10 global life/ health insurance providers
- **The downtime of an application running on zEnterprise = apprx 5 minutes per yr**
- **1,300+ ISVs run zEnterprise today**
  - More than 275 of these selling over 800 applications on Linux

*Source IBM CEO Study 2011

Big Data & Analytics on IBM zEnterprise

Improves Experience → Increases Adoption → Drives greater insight

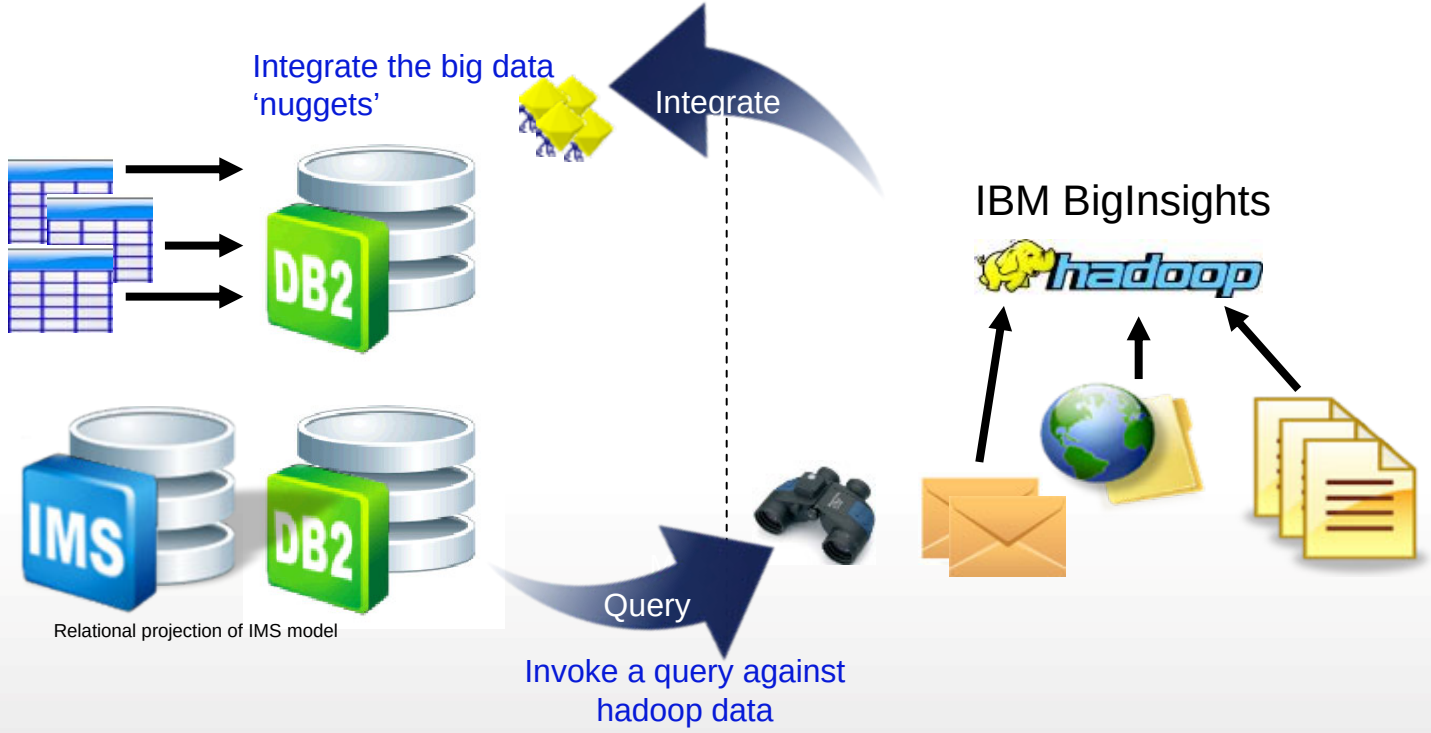
A Single Solution to:

- ACCESS, COMBINE & MANAGE a relevant mix of information
- TIMELY & SECURE ACCESS for more accurate answers

Integrate a variety of data with IMS and DB2 for z/OS

Much of the world's operational data resides on z/OS	Unstructured data sources are growing fast

- Two significant needs:
  1. Merge this data with trusted OLTP data from zEnterprise data sources
  2. Integrate this data so that insights from Big Data sources can drive business actions
- IMS & DB2 are providing the connectors & the DB capability to allow BigInsights to easily & efficiently access each data source
- DB2 is providing the connectors & the DB capability to allow DB2 apps to easily and efficiently access hadoop data sources



Variety of System z solutions for using Hadoop

Veristorm vStorm Enterprise

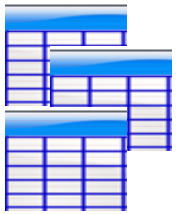
On-platform analysis of data that does not fit with relational tools

Safely combine z/OS and external data for analysis (e.g. improving claims response time)

Integrate

Request

IBM InfoSphere BigInsights



VSAM
QSAM
SMF, RMF
System logs
Operator logs
Application logs
etc.

vStorm Connect

zDoop

DB2 z/OS can integrate insights from big data sources to augment analysis (e.g. improve accuracy of fraud detection with “nuggets” from social media)

Enterprise insight for proven competitive advantage

Delivering real-time business critical analytics

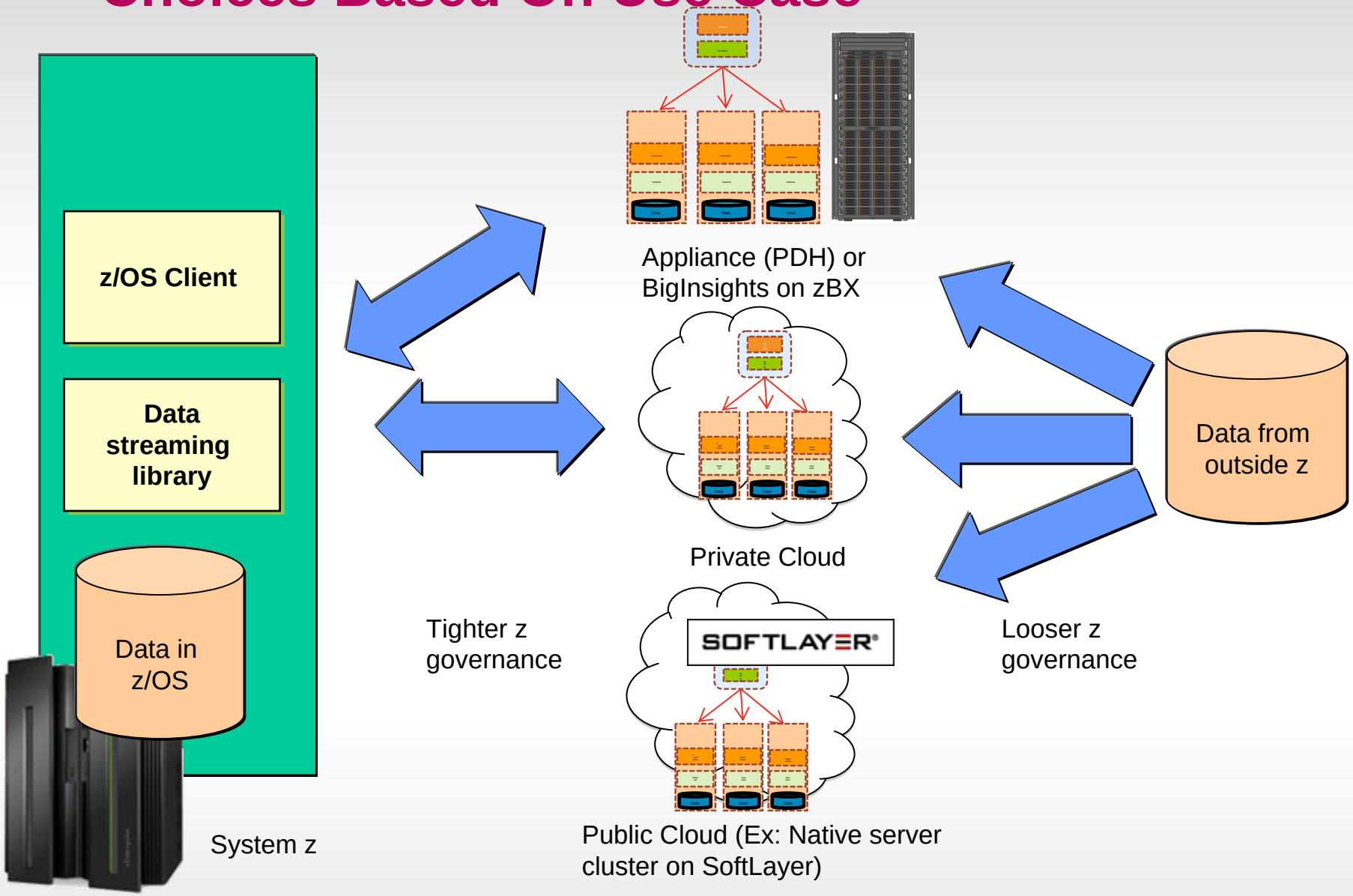
End to end IBM Big Data Analytics solution
DB2 for z/OS
DB2 Analytics Accelerator
Cognos Business Intelligence & TM1
SPSS Modeler
SPSS Statistics
SPSS Analytical Decision Management
zEnterprise Analytics System 9700 / 9710

Supports Big Data Requirements for
Volume, Velocity, Varity and Veracity

Delivers real time business critical analytics
Timely, accurate, secure enterprise insight
High Availability, scalability, performance
Rapid deployment & expansion

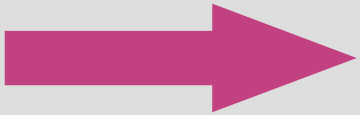
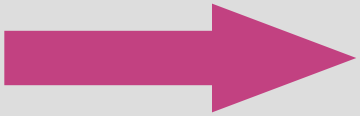
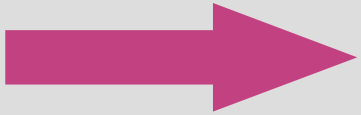
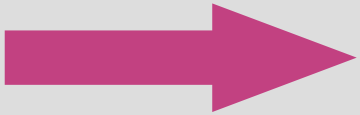
Evolves with the business
Start where you want
Grow without re-architecting

Choices Based On Use Case



Transaction to Business Action - Single zPlatform

Delivering vital business insight better, faster and cost effectively

OLTP and analytics on the same platform		**Reduce complexity and data latency, improve security and data governance, make near real-time business decisions**
Industry leading qualities of service and security		**Confidently deliver business critical analytics**
Leverage existing zEnterprise infrastructure, processes and people		**Reduce total cost of ownership**
Price competitive, easy deployment		**Deliver value quickly and cost effectively**

Learn More

- zEnterprise Big Data & Analytics Webpage

Thank You