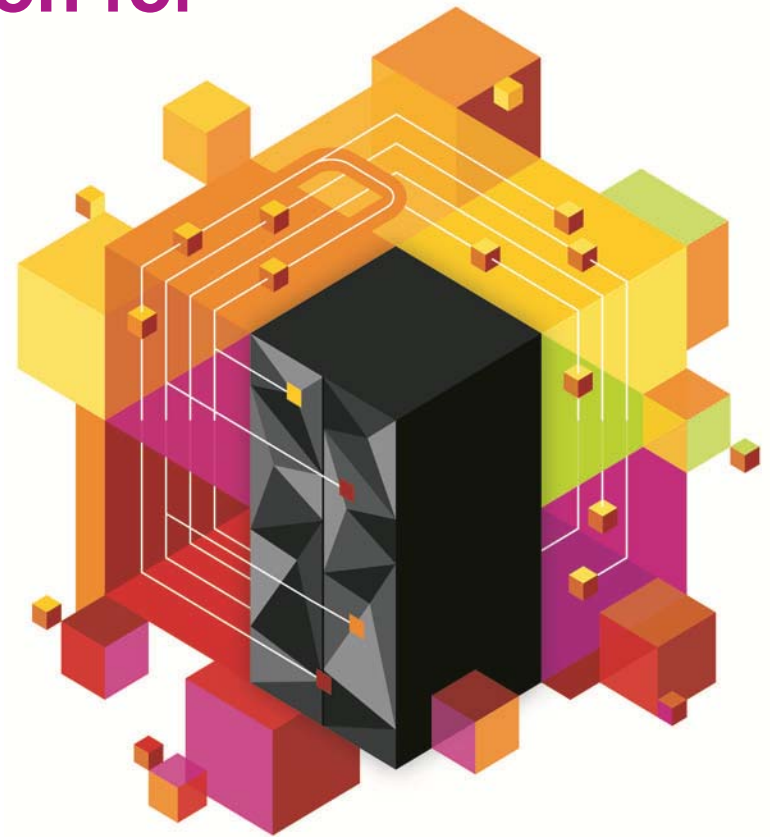# Enterprise Business Analytics

## Delivering Business Information for Optimized Performance

**Dave Jeffries**

**Director, Business Analytics on System z**

# Analytics for zEnterprise - Significant and Game Changing

Savings over 5yrs in **CPU** **87%** in **Servers** **96%**

**30 – 45% Performance Improvement** with zEC12 over z196

Meet SLAs & score **3000-5000+ transactions in Real-time**

**Run at 90%+ capacity without impacting SLA**

80% **Less Capacity needed for Data Warehousing**

BA System Admin savings alone, **pays for the investment** in 5 Yrs

**95% Savings** in host disk space for historical data
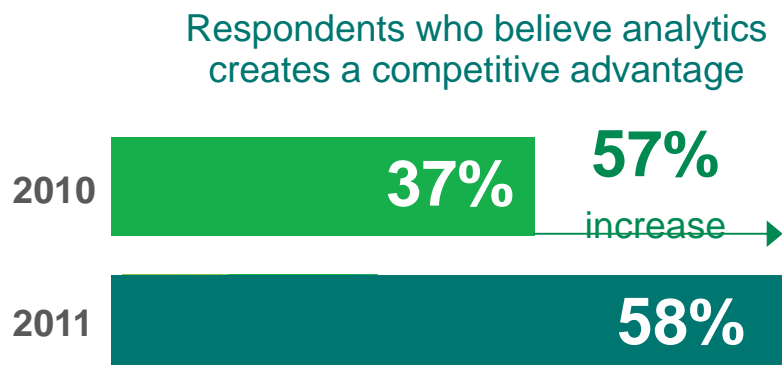
Runs complex queries up to **2000x Faster**

# Our Agenda for Understanding How..

- **The Changing Analytics Landscape**

- **New Requirements for Success**

- **Evaluate the Common Strategy for Analytics**

- **Next Generation Analytics with zEnterprise**

  - Why zEnterprise for Analytics

  - What Analytics for zEnteprise

- **What Customers are Saying**

**IBM**

# Analytics have Evolved from a Business Initiative to a Business Imperative

**More organization are using analytics to create a competitive advantage**

Respondents who believe analytics creates a competitive advantage

| | |
|---|---|
| 2010 | 37% |
| 2011 | 58% |

57% increase →

**And leaders are outperforming their competitors in key financial measures**
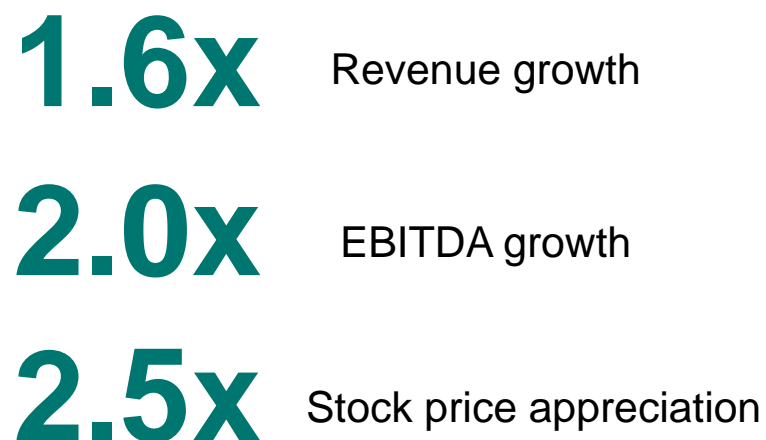
**1.6x** Revenue growth

**2.0x** EBITDA growth

**2.5x** Stock price appreciation

# …focusing on high-value initiatives in core BUSINESS AREAS

**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
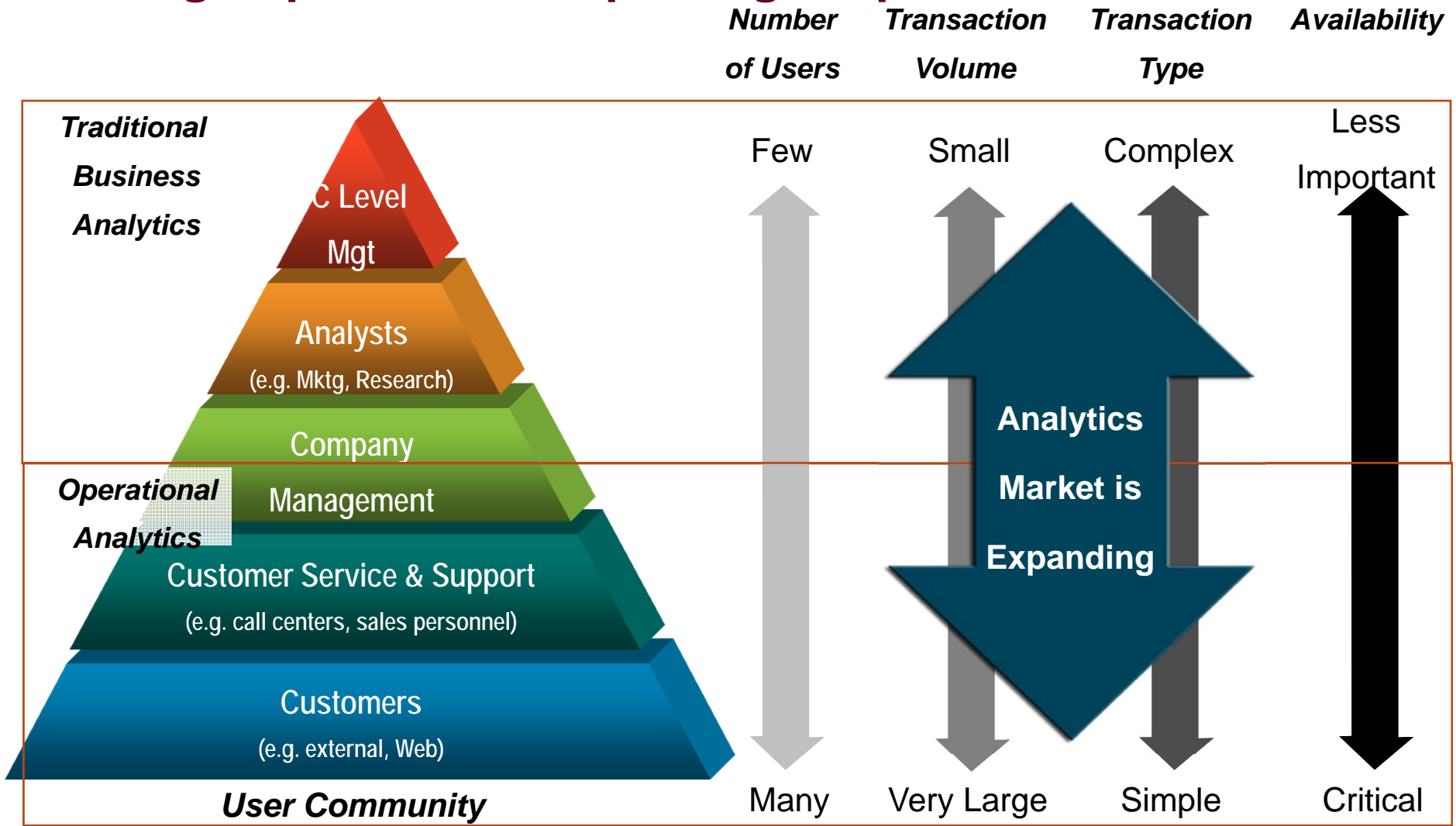- Reducing the cost of compliance

**4** Operations
- Optimizing the supply chain
- Deploying predictive maintenance capabilities
- Transform threat & fraud identification processes

# Shifting Expectations Impacting Requirements

| | Number of Users | Transaction Volume | Transaction Type | Availability |
|---|---|---|---|---|
| | Few | Small | Complex | Less Important |

**Traditional Business Analytics**

Pyramid levels (top to bottom):
- C Level Mgt
- Analysts (e.g. Mktg, Research)
- Company
- Management
- Customer Service & Support (e.g. call centers, sales personnel)
- Customers (e.g. external, Web)

**Operational Analytics**

**Analytics Market is Expanding**

*User Community*

| | Number of Users | Transaction Volume | Transaction Type | Availability |
|---|---|---|---|---|
| | Many | Very Large | Simple | Critical |

# Proven Business Value Driving Change

| | 1997 | 2012 | Adapting Infrastructure Strategy to Ensure Success |
|---|---|---|---|
| **eMail** | ▪ Telephone primary communication tool<br>▪ Outages expected<br>▪ Staff centrally located<br>▪ No governance | ▪ Mission critical<br>▪ High Volume<br>▪ Near real-time<br>▪ Corporate regulatory compliance<br>▪ Global | ▪ Archiving<br><br>▪ High Availability<br><br>▪ Reporting<br><br>▪ Mass storage |
| **Instant Messaging** | ▪ Desktop application<br>▪ No governance<br>▪ Text based | ▪ Server based<br>▪ Video sharing<br>▪ Telephony integration | ▪ Enterprise model<br><br>▪ Availability<br><br>▪ Governance<br><br>▪ Bandwidth |
| **Business Analytics & Data Warehousing** | ▪ Departmentally defined<br>▪ Ad hoc Query<br>▪ Capability based products<br>▪ Desktop application<br>▪ IT not involved | ▪ More volume, real-time<br>▪ More types of users, and mobile devices<br>▪ Corporate regulatory compliance<br>▪ Environmental concerns | ▪ Enterprise BA: Standardization / Consolidation<br>▪ Modernization<br>▪ Data Governance<br>▪ Cloud Computing<br>▪ Big Data |

# The Solution Debate: 'Freedom' vs. 'Control'



**Business Users Want**

**Ease of Use,**

**Flexibility**

**IT Wants**

**Functionality,**

**Standards**

# Need a Solution that Bridges the Gap
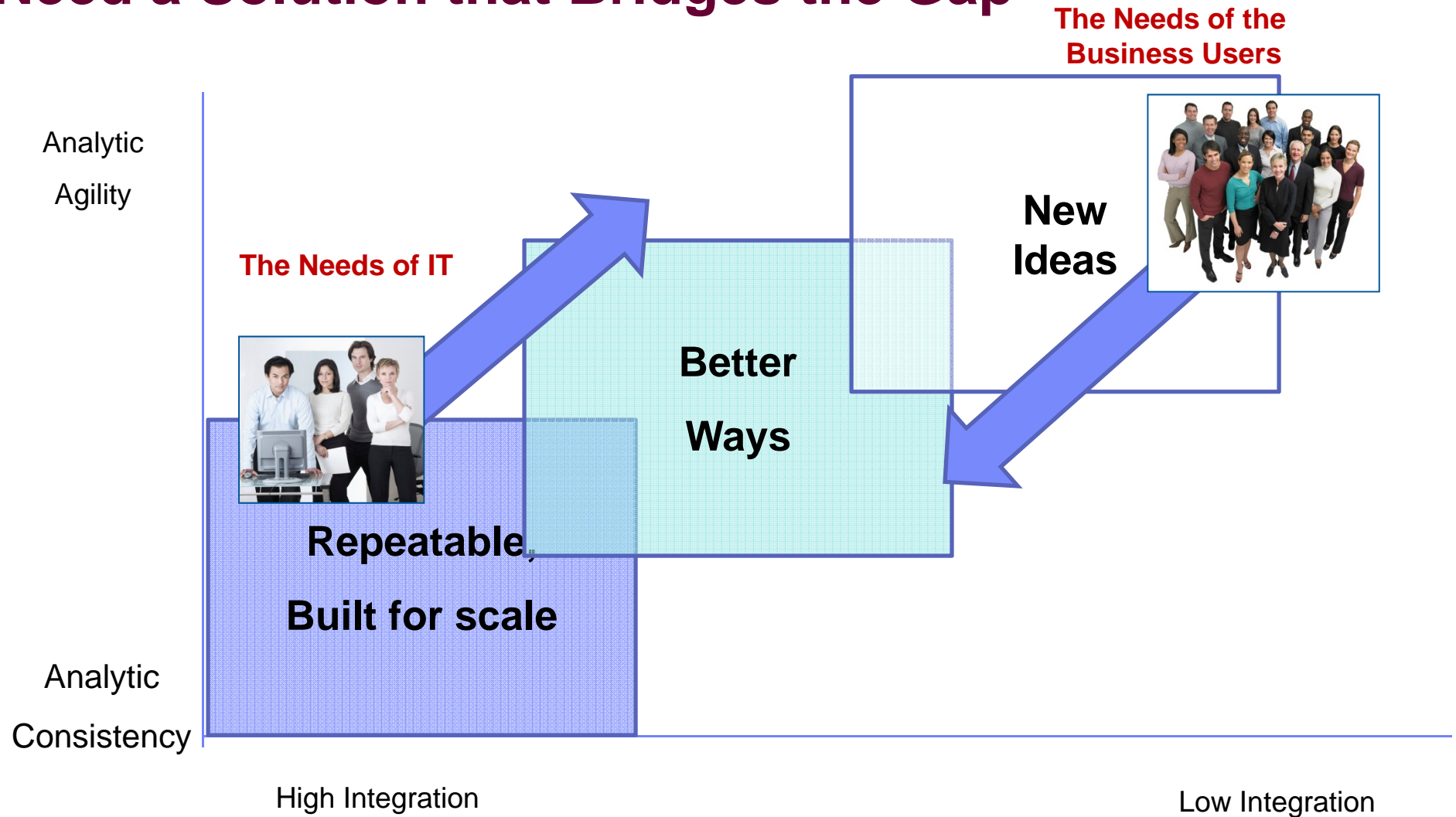
# Data must be brought back under control in order to meet their key analytics objectives

**?** *What are the 3 largest problems with your firm's BI/analytics?*

**?** *Please rate the importance of the following with regard to your informational needs*

## 57%

Our data is **scattered** in too many places (top response)

## 89%

Above all else, our data must be **secure** (tied for top response)

## 89%

When we access data it should appear as a **single source** of the truth (tied for top response)

# Solution must Address Analytics Priorities

*Select the top 3 improvements you would make to your current business intelligence and analytics strategy in order of importance. (Select up to three)*

| | | |
|---|---|---|
| Make the security of our data iron-clad to put it beyond the reach of malicious users | **SECURE** | 60% |
| Combine data in new ways to improve customer service and create new business opportunities | **ACCURATE** | 54% |
| Create immediate, normalized, and transparent views of our data | **RESPONSIVE** | 52% |
| Reduce the effort / speed our ability to comply with regulatory reporting requirements | **COMPLIANT** | 51% |
| Reduce the total cost of ownership of the environment. | **CHEAP** 28% | |

# Executives recognize that the historic multi-platform approach towards analytics is an impediment to moving forward

*Please evaluate each of the following statements with regard to your analytics platform:*

We are looking to cloud as a way to provide greater agility in meeting analytic requirements
- 24%
- 44%

Having different technical environments for transactional systems and analytic systems increases cost
- 21%
- 49%

Data sharing across platform silos makes it difficult to get an enterprise view
- 20%
- 42%

Data sharing across platform silos is excessively expensive
- 18%
- 42%

5 = Strongly Agree        4 = Agree

# The Common Approach to Analytics

**Division 'A'**

*Marketing & R&D Users*

**Division 'B'**

*Marketing & R&D Users*

**Operations**

**Sales**

**Finance**

**Executive Management**

DW & BA Administrators & Report Authors

BA Solution

Data Warehouse / Data Mart / ODS
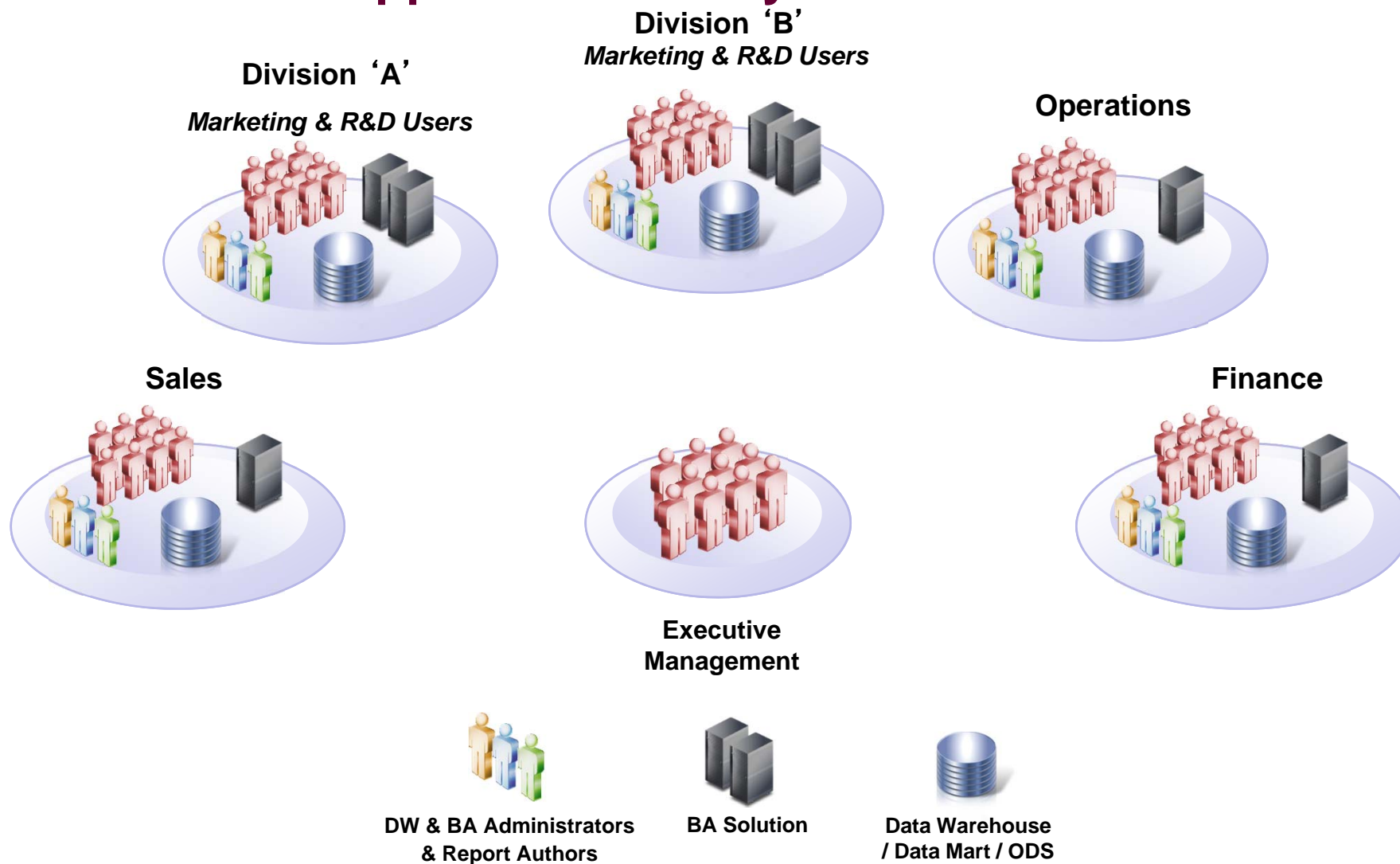
# A Look at the Core Elements for an Analytics Solution

***Customer Interaction***

**Data In**

**Transactional Data:**

- DB2 for z/OS
- IMS
- VSAM
- Non-IBM

**Data Movement & Cleansing**

**ETL:**

- Integrate, cleanse, transform, & load production data to Data Warehousing solution

**Data Warehousing**

- Data Warehouse
- Operational Data Store
- Data Mart

**Data Analysis**

**Business Analytics:**

- Business Intelligence
- Predictive Analytics

***Analytics Out***

# A Look at an Analytics Architecture across the Enterprise Today

**Operational Systems**

**Data Systems**

**Departmental Business Analytics Systems**

Continuous feed

ODS(RDBMS )

Finance

Enterprise Data Warehouse

Sales

Transactional

(DBMS, Simple Files)

*Hourly, daily, weekly, monthly, batch process*

Marketing

Data Mover

Staging Area Transformation servers

Departmental Data Marts

R&D
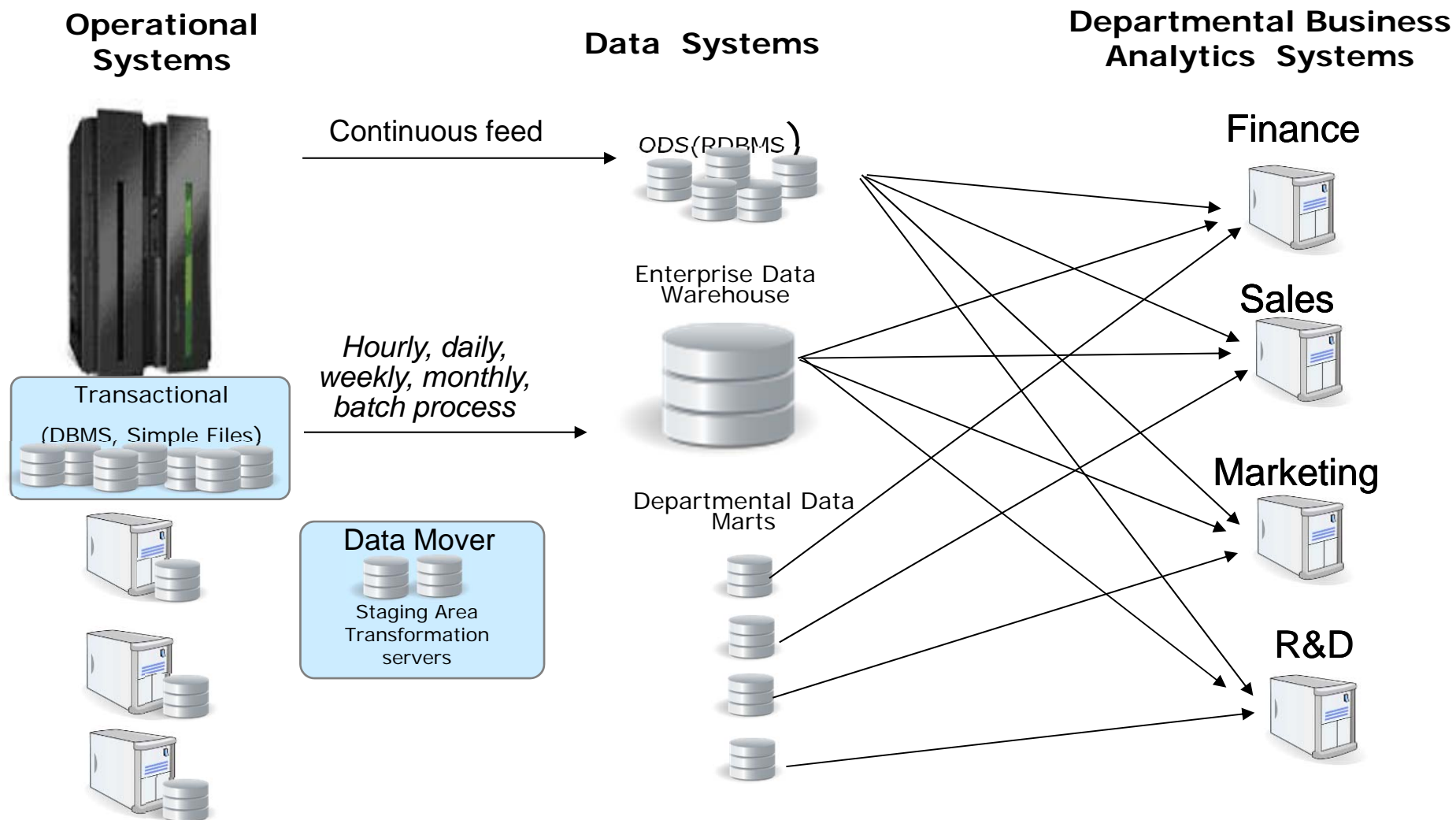
# Break that Down to the Individual Application Level



**50 Concurrent Users**

Switch

User

Cognos Gateway
Web Server

Business Data

Cognos BI Server
Active Content Manager
Cognos Dispatcher

Fail-over / Load Balancer
Cognos BI Server
Passive Content Manager
Cognos Dispatcher

Security/LDAP

Cognos Contentstore
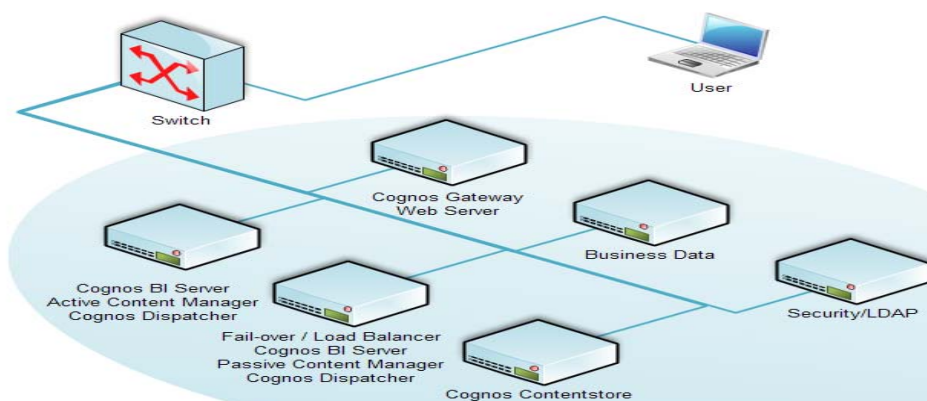
This architecture uses the loadbalancing and failover features that are built into the Cognos BI software architecture.

# Multiply that Across each Environment
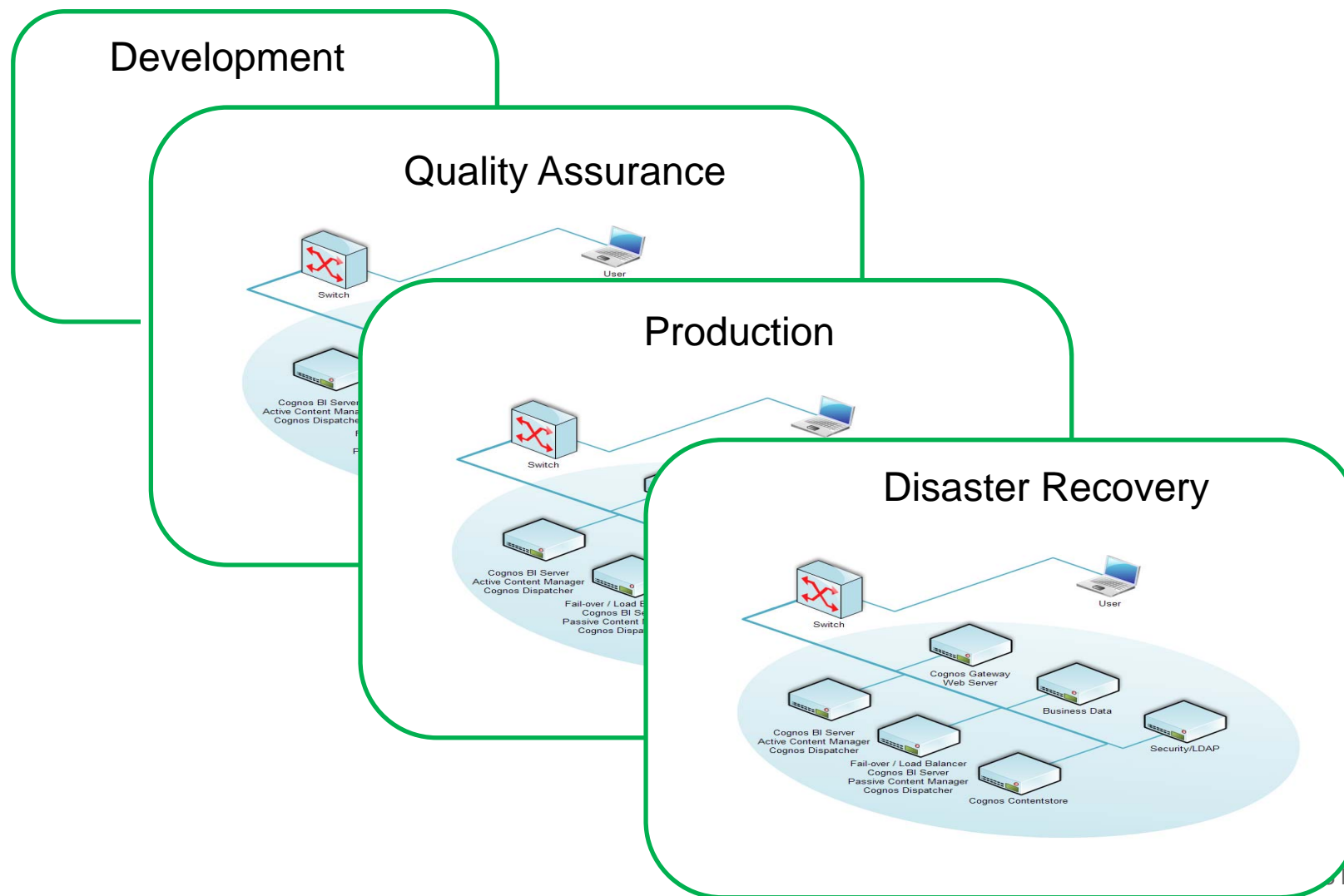
# Multiply that Across each Department

# Potential Issues Which May Limit Analytics ROI

Growth = **re-engineering**
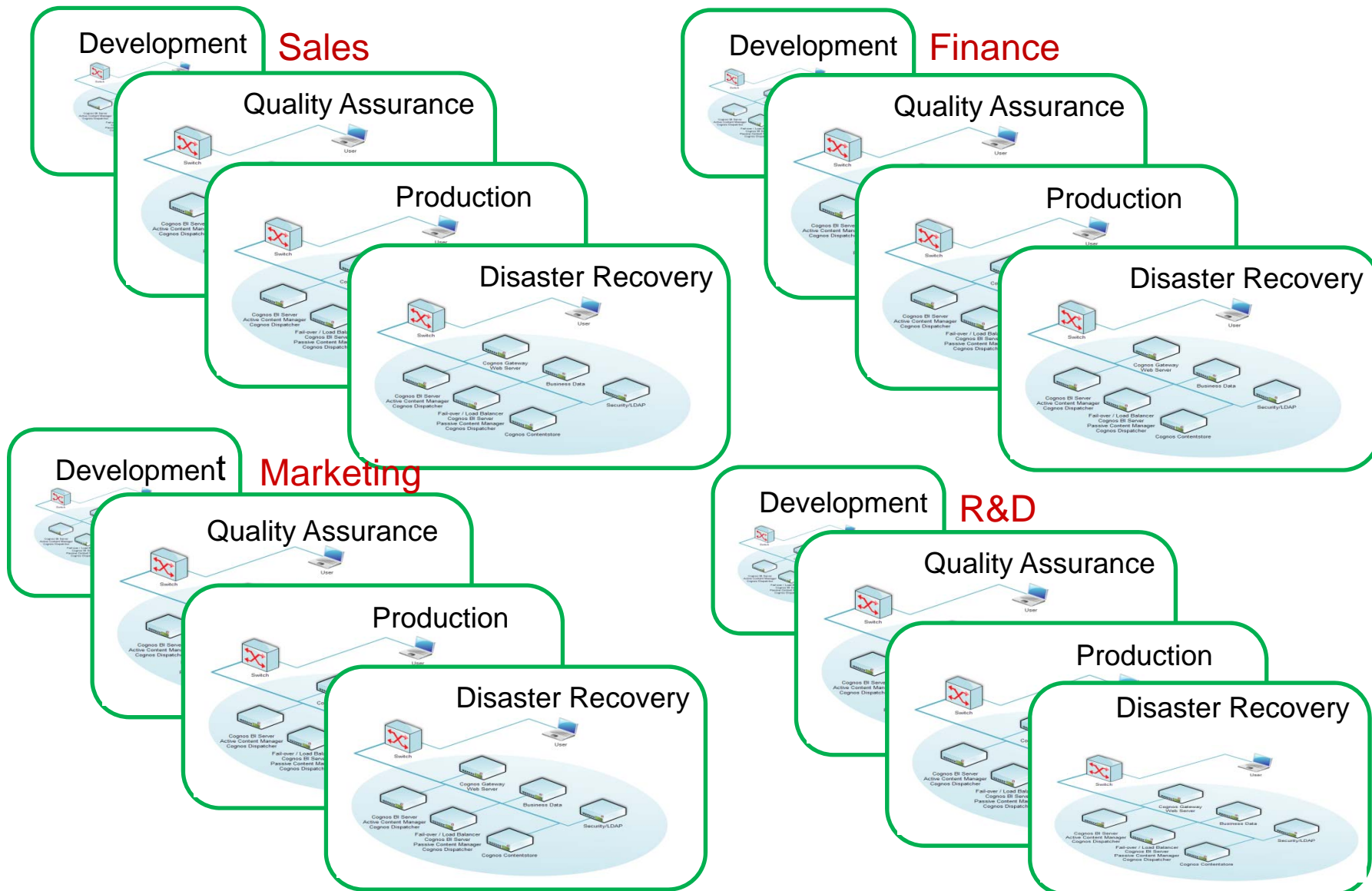
**Each depart. needs to finance & acquire** the HW, SW admin, facilities, training & support to meet demand

**Insufficient processing power** to support large or complex queries

**Duplicate environments** needed for development, test, production, high availability are multiplied over applications and lines of business

Servers are run at **sub-capacity**

Complexity of **multiple infrastructures** is impacting effectiveness of DR, admin., audit ability, compliance, etc.,

**Data transfer is limited** to off peak times

Inconsistency of **security controls** across duplicated data

**Multiple copies** of the data are being created

# IBM zEnterprise Information Hub

End-to-end, integrated foundation for modern analytics

**Bring your analytics to your data:**

- **70% of the data used for analytics originates on zEnterprise**

**Easily delivers on modern analytics requirements for:**

- **Timely, accurate and secure**

- **Superior availability, scalability and performance**

- **Rapid deployment and expansion**

- **Reduced cost and complexity**

**Evolves with your business:**

- **Start where you want and grow without re-architecting**

*Insight Out*

**Business Analytics**

- Business Intelligence

- Predictive Analytics

**Data Warehousing**

- Data Warehouses

- Operational Data Stores

- Data Marts

*Data In*

*Business System / OLTP*

# What Sets zEnterprise Apart for Analytics?

When you think mainframe, you think IBM. The company has not been shy about boosting the attributes of the System z.

www.itbusinessedge.com
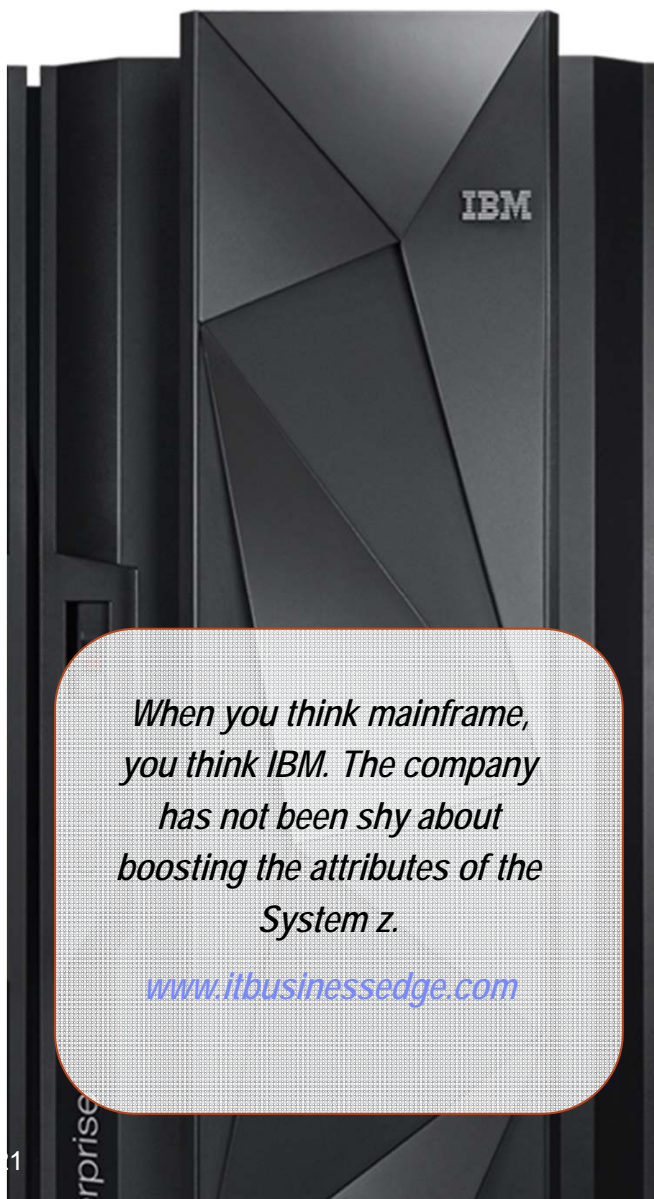
- A large % of the data that is accessed for analytics resides or originates on IBM zEnterprise

  - 2/3 of business transactions for U.S. retail banks

- 80% of world's corporate data

- Businesses that run on zEnterprise
  - 25 of the top 25 worldwide banks
  - 23 of the top 25 U.S. retailers
  - 9 of the top 10 global life/health insurance providers
  - 64% of Fortune 500
  - 45% of Fortune 1000
  - 71% of Fortune Global 500

- The System z mainframe can run over a thousand virtual Linux images on a single frame the size of a refrigerator

- 1,300+ ISVs run zEnterprise today, with more than 275 of these selling over 800 applications on Linux

- The downtime of an application running on System z equates to approximately 5 minutes per year

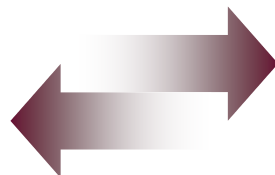# What Sets zEnterprise Apart for Analytics?

**zEnterprise: An end-to-end, integrated, rock-solid foundation for business analytics**

*Analytics Out*

**Business Analytics**

- **Business Intelligence**
- **Predictive Analytics**

**Data Warehouses, Operational Data Stores, Data Marts**
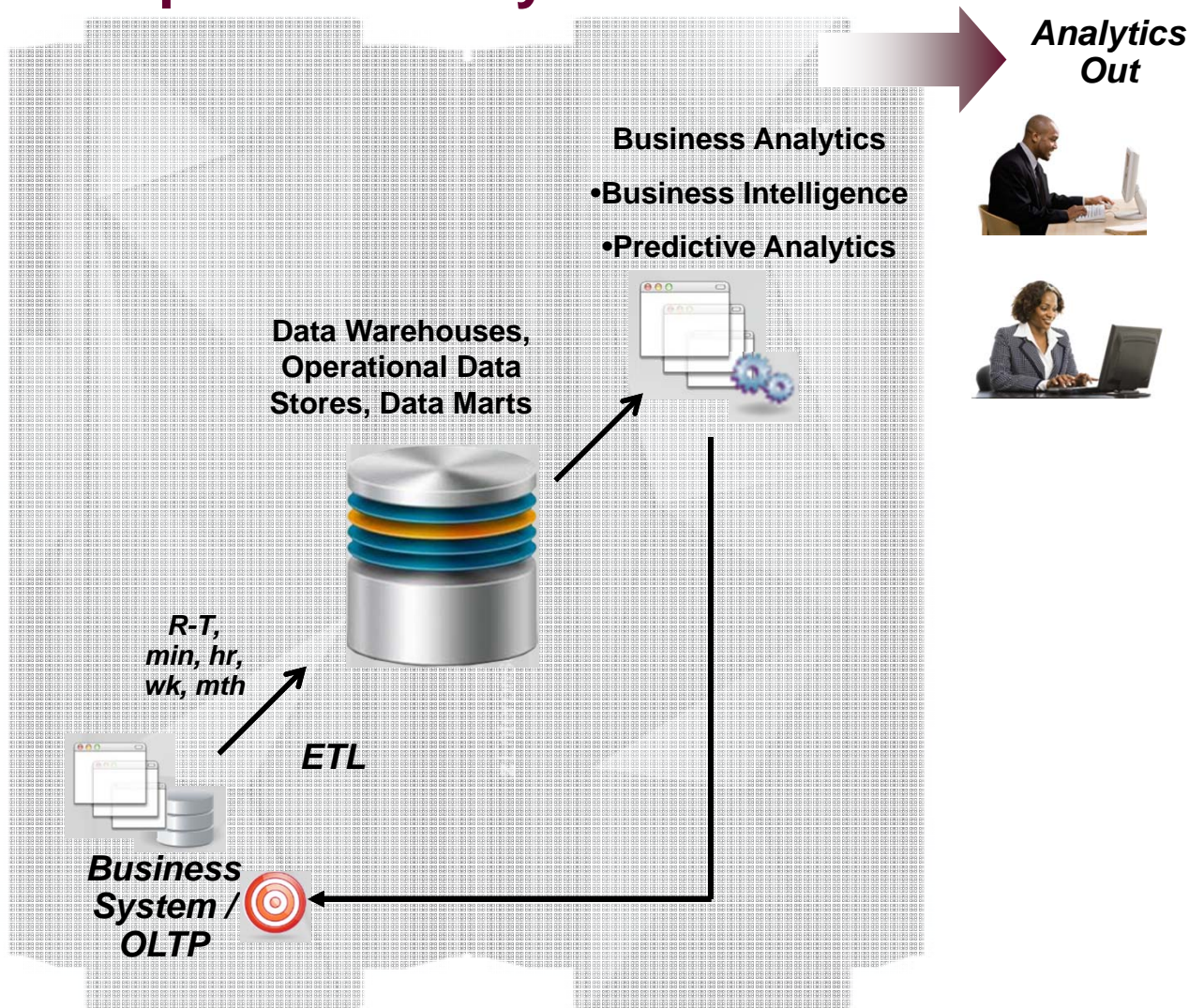
*R-T, min, hr, wk, mth*

*ETL*

*Customer Interaction*

*Data In*

**Business System / OLTP**

*Real-Time Score/ Decision Out*

# What Sets zEnterprise Apart for Analytics?

**zEnterprise: Makes the technical challenges the easy part!**

**Timely, accurate and secure information**

**Superior availability, scalability and performance**

- **Co-location** of data warehousing, business analytics, transactional data
- **Reduced data movement**
- **Lower latency** and **near real time** data
- **Rapid acceleration** of complex queries

- High **security** (EAL5+)
- High **availability** (99.999% )
- Performs at **100% capacity**
- **Prioritization** of critical queries & workloads
- Integrated **disaster recovery**

- **Processors, disk, memory added dynamically** without outage
- **Pre-install then activate** as needed
- **Flexible deployment options**

- **Centralized, scalable** infrastructure
- **Virtualization**
- Start with your **final architecture**

**Reduced costs and complexity**

**Rapid deployment and expansion**

# What Sets zEnterprise Apart for Analytics?

**zEnterprise: Start with your most critical business issue and quickly realize business value -- all with the flexibility to expand and grow without the need to re-architect**

| | | |
|---|---|---|
| Department | Application | Enterprise |
| Data Warehousing | Business Intelligence | Predictive Analytics |
| Services | Smart Analytics System 9700/9710 | Smart Analytics Cloud |

# Cognos BI v10.2 for Linux and z/OS on zEnterprise

Improved

User Experience

Enable users to focus on what's important

Improved

Performance & Scale

Meeting the demands of growing data volumes

Broad and Powerful Analytics

Ad-hoc Query

Real-Time Monitoring *

Dashboards

Reports

Collaborative BI

Unified Workspace
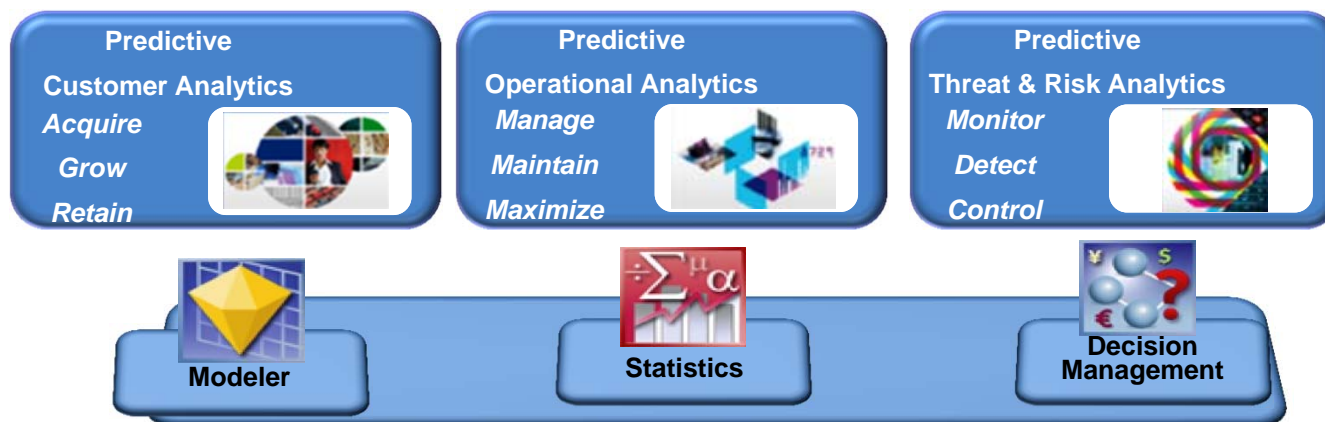
Analysis

Mobile BI *

Proven Platform
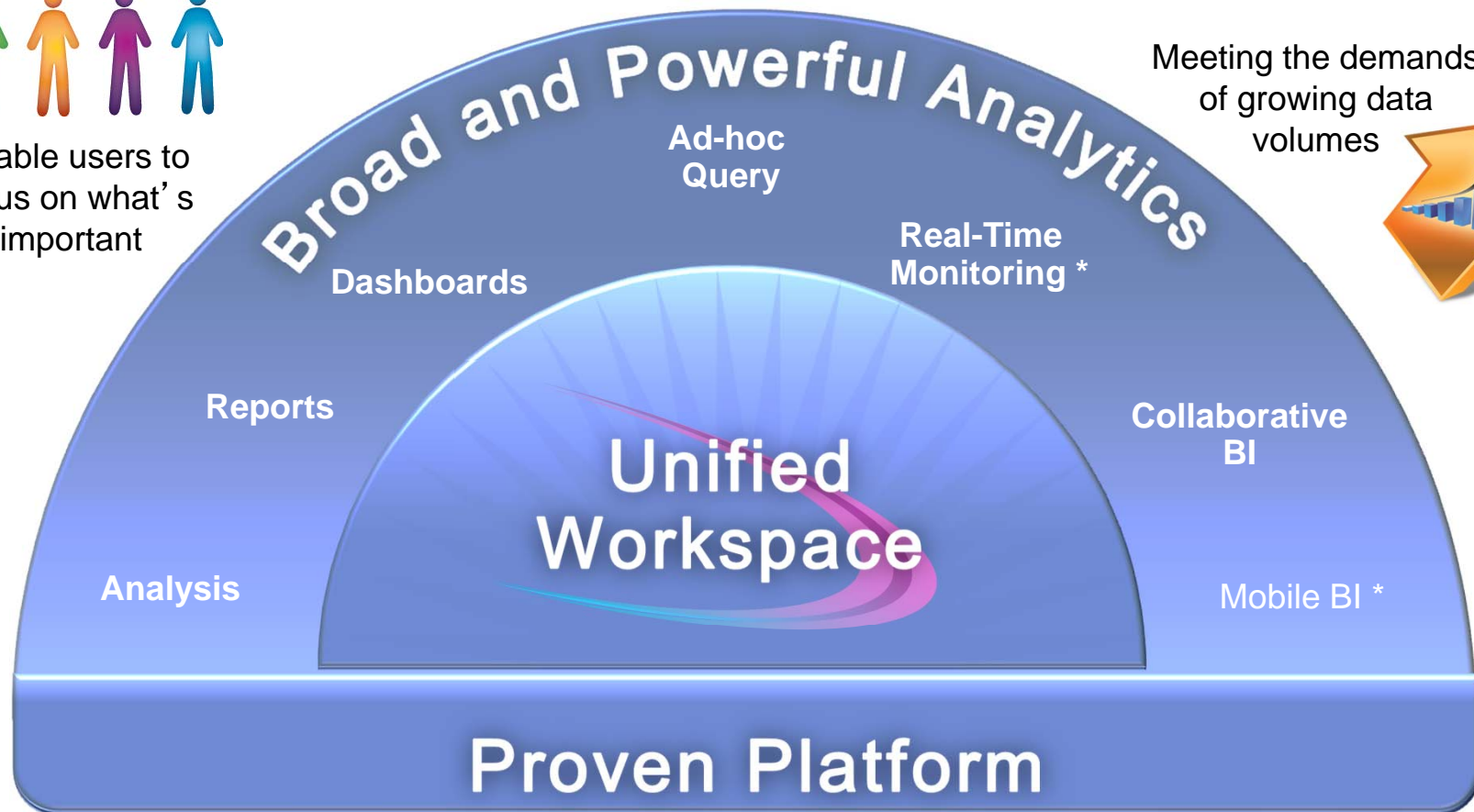
* Not supported on z/OS

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# Predictive Analytics for Linux on zEnterprise

**NEW**

| IBM SPSS Statistics for Linux on System z | IBM SPSS Modeler for Linux on System z |
|---|---|
| ▪ Apply math to decision making and research for commercial, government, and academic users | ▪ Data mining tool used for generating hypotheses and scoring<br>▪ Text analysis for unstructured data to model consumer behavior<br>▪ **In-Transaction Scoring with DB2 z/OS: Embeds the Scoring Algorithm Directly within the Transactional Application** |
| **SPSS Decision Management for Linux on System z** | **SPSS Collaboration and Deployment Services for Linux on System z** |
| ▪ Employs both predictive models and business rules to automatically generate recommended actions | ▪ Provides role-based models and security for in scoring, job scheduling, repository services, and integration |

**Predictive**

**Customer Analytics**

*Acquire*

*Grow*

*Retain*

**Predictive**

**Operational Analytics**

*Manage*

*Maintain*

*Maximize*

**Predictive**

**Threat & Risk Analytics**

*Monitor*

*Detect*

*Control*

**Modeler**

**Statistics**

**Decision Management**

**Collaboration and Deployment Services**

# Real time scoring on the zEnterprise platform…

- Helps **improve the success rate of up sell / cross sell opportunities, fraud detection customer service** by using the most current transactional data to gain a more accurate view of the "next best action" to take.

- **Increases the speed and accuracy of scoring in real time** by imbedding the scoring algorithm in DB2 and running it directly within the transactional application resulting in:

  - **Reduced costs and complexity associated with network traffic** by bringing the analytics to the data on zEnterprise

  - Ability to **meet and exceed SLAs** associated with delivery of real time analytics by offering the **same service level as the OLTP applications**
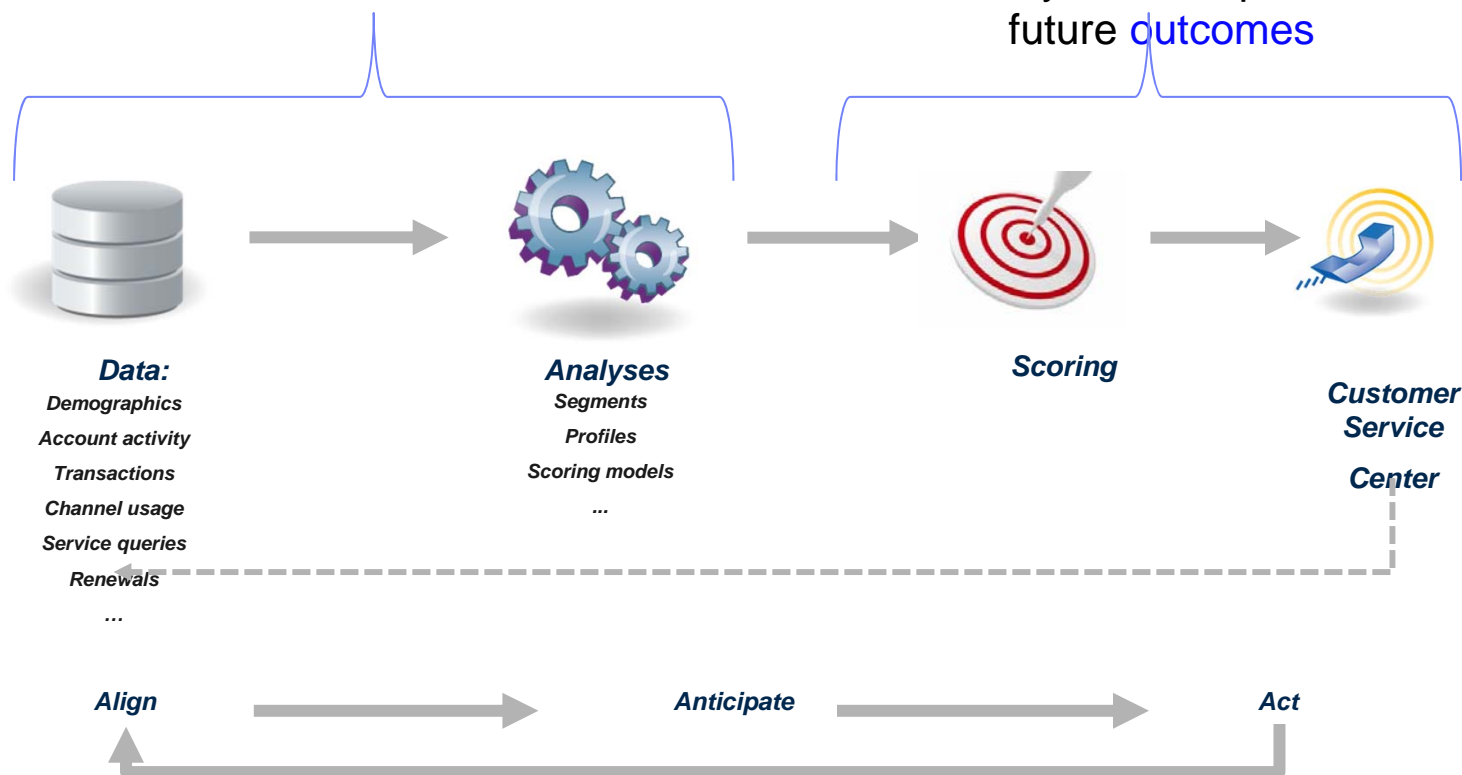
# Sample Real-time Scoring Use Cases

| By Industry | |
|---|---|
| Healthcare | Reduce fraud and waste, assist with best course of treatment |
| Banking | Monitor credit card usage in real-time to proactively detect/prevent |
| Insurance | Score claims in real-time to immediately identify fraudulent claims and identify up-sell opportunities |
| Government | Combine the details of a current crimes in progress with lessons learnt from past crimes to determine the safest course of action for the officer |
| Retail | Combine today's purchase details, with current market information and historical purchase patters to determine the best upsell opportunity when they are ready to spend money. |
| Telco | Combine todays complaint with the current account status and previous behavior to determine best upsell |

# The "how" of Predictive Scoring

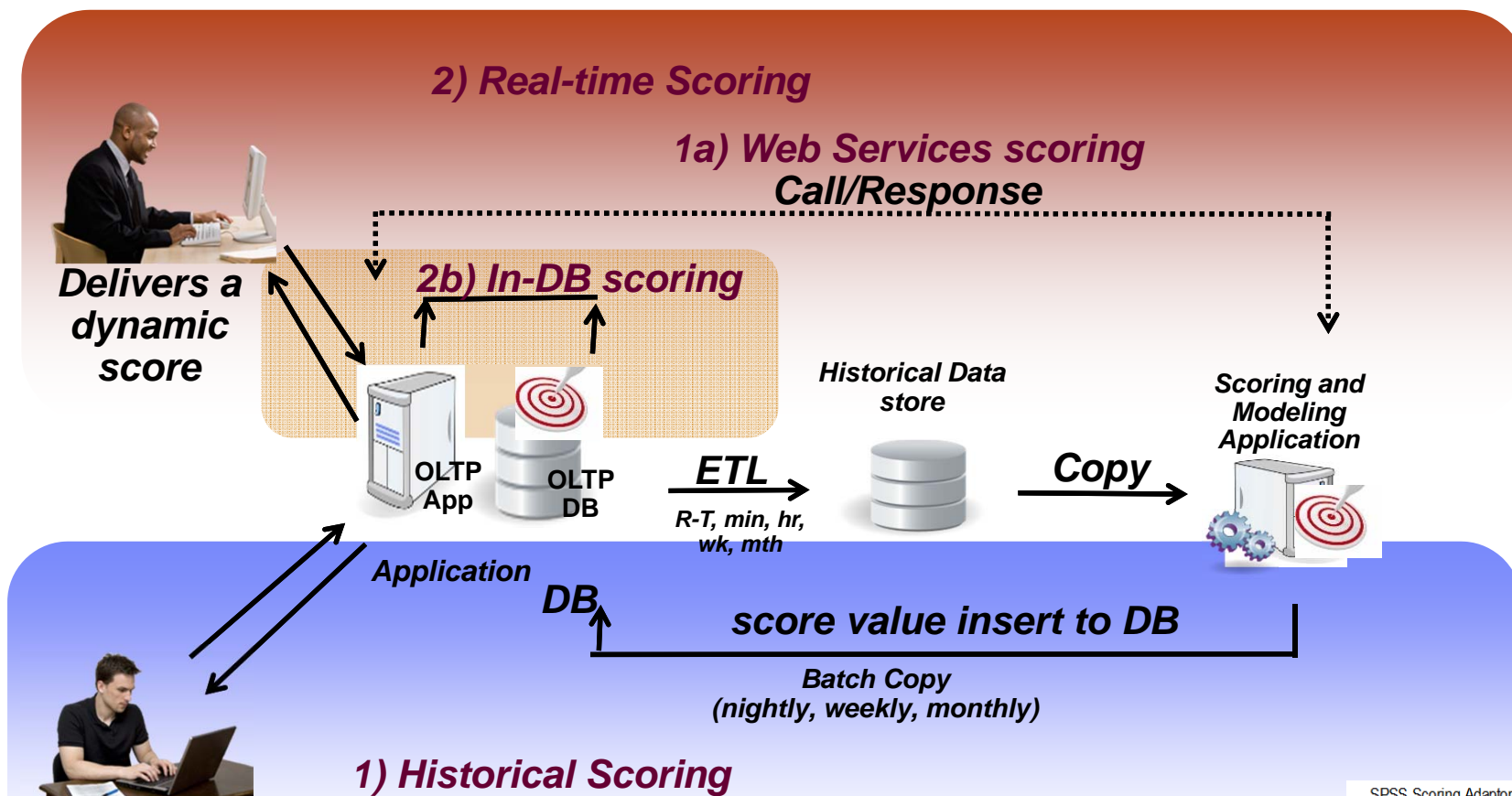Identify predictive models/patterns found in historical data

Use those predictive models with variables to score transactions & identify the best possible future outcomes

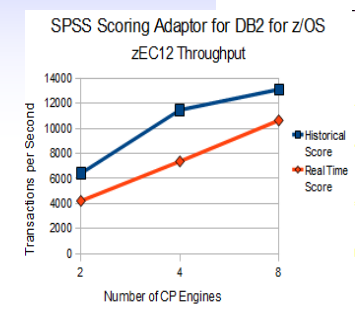**Data:**
Demographics
Account activity
Transactions
Channel usage
Service queries
Renewals
...

**Analyses**
Segments
Profiles
Scoring models
...

**Scoring**

**Customer Service Center**

**Align** → **Anticipate** → **Act**

# Scoring Options with an OLTP Application

**2) Real-time Scoring**

**1a) Web Services scoring**
**Call/Response**

**Delivers a dynamic score**

**2b) In-DB scoring**

OLTP App

OLTP DB

**Historical Data store**

**ETL**
R-T, min, hr, wk, mth

**Copy**

**Scoring and Modeling Application**

Application DB

**score value insert to DB**

**Batch Copy (nightly, weekly, monthly)**

**Delivers a static score**

**1) Historical Scoring**

✓ **Meets most demanding workload**
  ▪ 3K to 5K transactions per second requested

SPSS Scoring Adaptor for DB2 for z/OS
zEC12 Throughput

# DB2 10 for z/OS
*A highly tuned database for OLTP & Analytics*

- CPU reductions for transactions, queries, and batch

- Scales with less complexity and cost

- Improved operational efficiencies and lower administration cost

- Even better performance

➢ *64 bit Evolution Virtual Storage Relief*

➢ *Temporal Data*

➢ *Integrated XML Support*

➢ *Query Processing Enhancements*

➢ *Business Security & Compliance*

➢ *Better Productivity*

# IBM DB2 Analytics Accelerator

*Blends zEnterprise and Netezza technologies to deliver, mixed workload performance for complex analytic needs*

| Fast | Cost Saving | Appliance |
|------|-------------|-----------|
| Complex queries run up to 2000x faster while retaining single record lookup speed | Eliminate costly query tuning while offloading complex query processing | No applications to change, just plug it in, load the data, and gain the value |

## Reduces the Cost of High Speed Analytics

- Choice of historical data location – High Performance Storage Saver

- Real time analytics – Incremental Update

- Faster data refresh – Unload Lite

- New capacity – Full range of Netezza models supported

- New queries

# IBM zEnterprise Analytics System 9700/9710
## *Mixed Workloads for Next Generation Business Analytics*

The next generation of System z analytics; an integrated solution of hardware, software and services that enables customers to rapidly deploy cost effective game changing analytics across their business.

## Preselected

All the necessary components are identified and integrated into an end-to-end solution

## Pretested

Over 20 different customer typical configurations are presized and tested

## Solution Priced

Aggressively priced for a cost-effective add-on or new deployment for customers with critical data operations

# zEnterprise for Analytics Makes a Difference to our Customers



"Unlike a distributed approach to analytics, with zEnterprise we can **easily bring new projects on board and scale up to meet the needs of more users.** So the **business gets excellent performance and near-total availability**, and can regard **analytics as an always-on, real-time service.**

Larry Yarter,
Chief Architect at IBM BACC

"In just two years, Blue Insight has grown to support nearly **200,000 users** and more than **390 different projects**. Drawing information from **over 250 sources,** generating more than **30,000 reports every day**."

"So **instead of spending $250,000** for each business unit … we really deliver the analytics to that business unit at **around $13,000 annually**, and they are boarded within minutes."

James Correa, Senior Manager, IBM Business Analytics
Competency Center (BACC)



"System z provides such **huge advantages over a distributed** server landscape, you can create a new Linux system very quickly, **without worrying about whether it will affect the performance or stability** of your existing systems."

Jose Eskert, Senior System Programmer at Miami-Dade County.

# Thank You