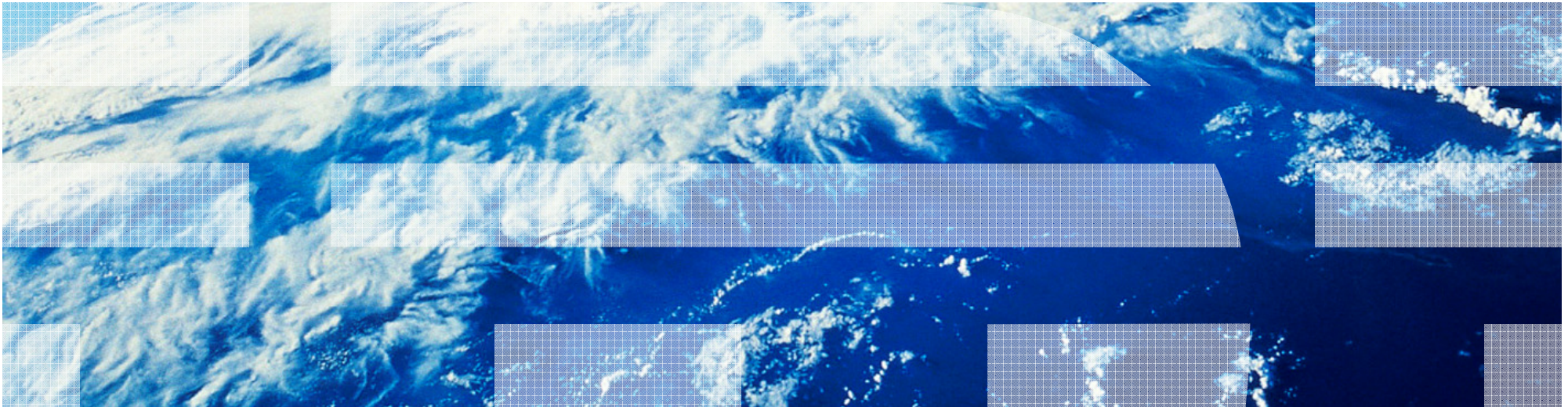


***Maximize the Value of your data
with Business Intelligence on
System z***

A New Era in Reliable Information



Yet businesses still struggle

Lack of Insight

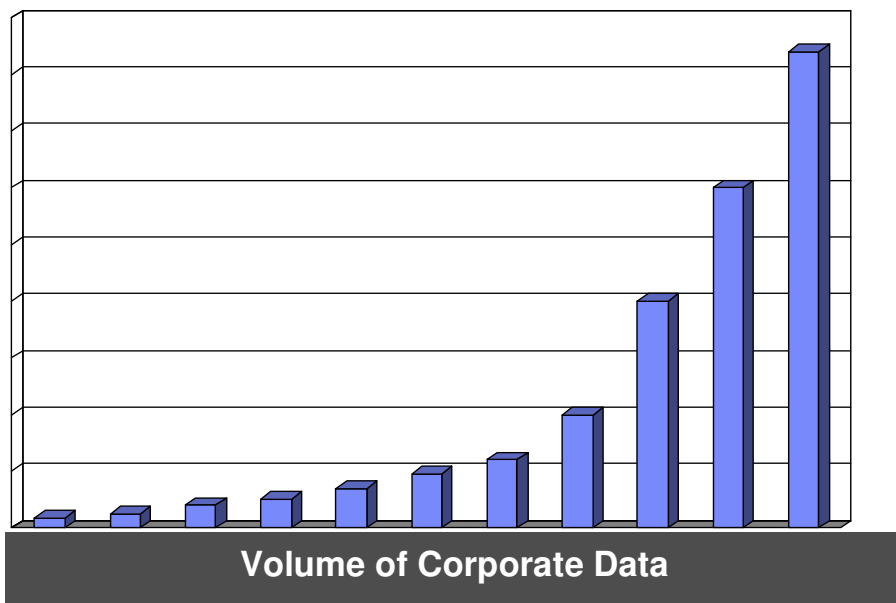
1 in 3 managers frequently make critical decisions without the information they need

Inefficient Access

1 in 2 don't have access to the information across their organization needed to do their jobs

Inability to Predict

3 in 4 business leaders say more predictive information would drive better decisions



*The average US fortune 500 company contained about 2003 - 86 terabytes of electronic data:
in 2008 – 490 TBytes.
By 2013 - Will reach 4.2 petabytes*



Variety of Information

*By 2013, annual global IP traffic will reach **two-thirds of a zettabyte or 667 exabytes.***

Source: IBM Institute for Business Value

Source: Wikipedia 3/2010

Data Warehousing on System z



- *A large portion of today's operational data resides on the mainframe*
 - DB2 zOS, *The world's largest known TP database*
 - IMS - *A transactional workhorse for very large workloads.*
 - VSAM -*Data behind some of the largest banking applications in the world!*
- *BI is moving to the strengths of the z platform*
 - Secure, scalable, highly reliable (99.999 available)*
 - Operations become dependent on the data warehouse*
- *Powerful and Mature Workload Management for mixed workloads*
 - Demands drive the need for high speed and low latency, blurring the lines between DW and OLTP database characteristics*

z/OS

availability

integrity

scalability

“The mixed workload performance will become the single most important performance issue in data warehousing “

*Source:
Gartner Data Warehouse magic
Quadrant, December 2008*

– *The **transactional DBMSs** have an edge that challenges the data warehousing DBMSs*

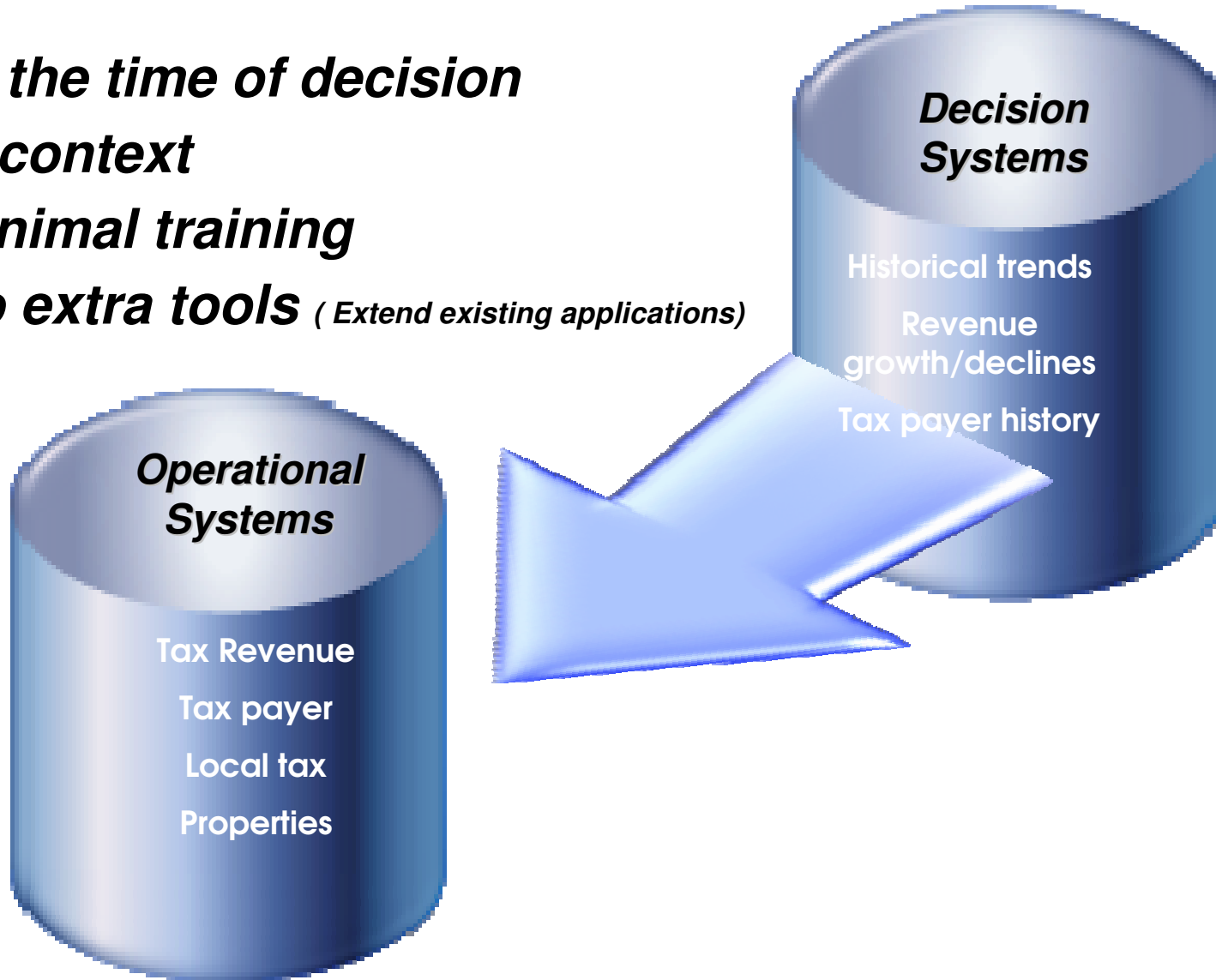
– *Source: Garner Data Warehouse magic Quadrant, 2006*

Coupling Operational with the Decision System

Using Dynamic Warehousing to Change the Playing Field

Leveraging the data warehouse to make right time decisions

- ***At the time of decision***
- ***In context***
- ***Minimal training***
- ***No extra tools*** (*Extend existing applications*)



System z – Scalable and secure data serving



- **Centralized data serving for the enterprise**
- **A common view of data updated in real time**
- **The Scalability and flexibility to be responsive**
- **Underpinned by availability and security**
- **Enablement of zIIP specialty engine helps reduce cost**
- **DB2 for z/OS over 100 enhancements in V8 / V9 /V10**

SMART IS: Data on a grand Scale



IBM – The 50TB Study:

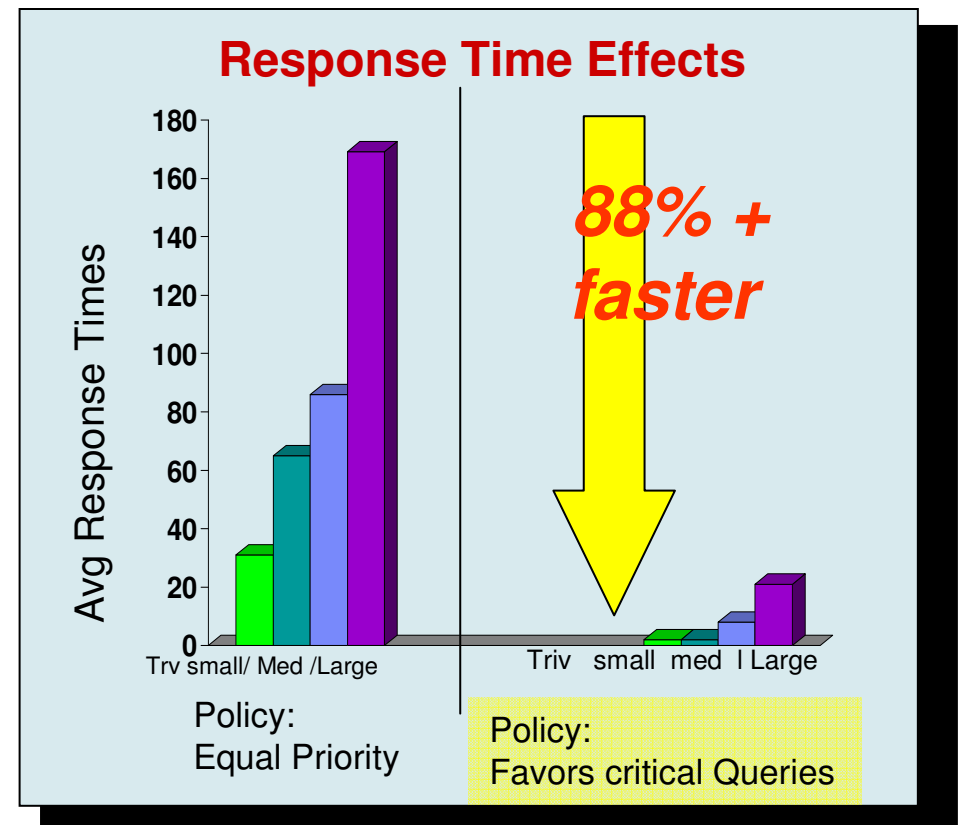
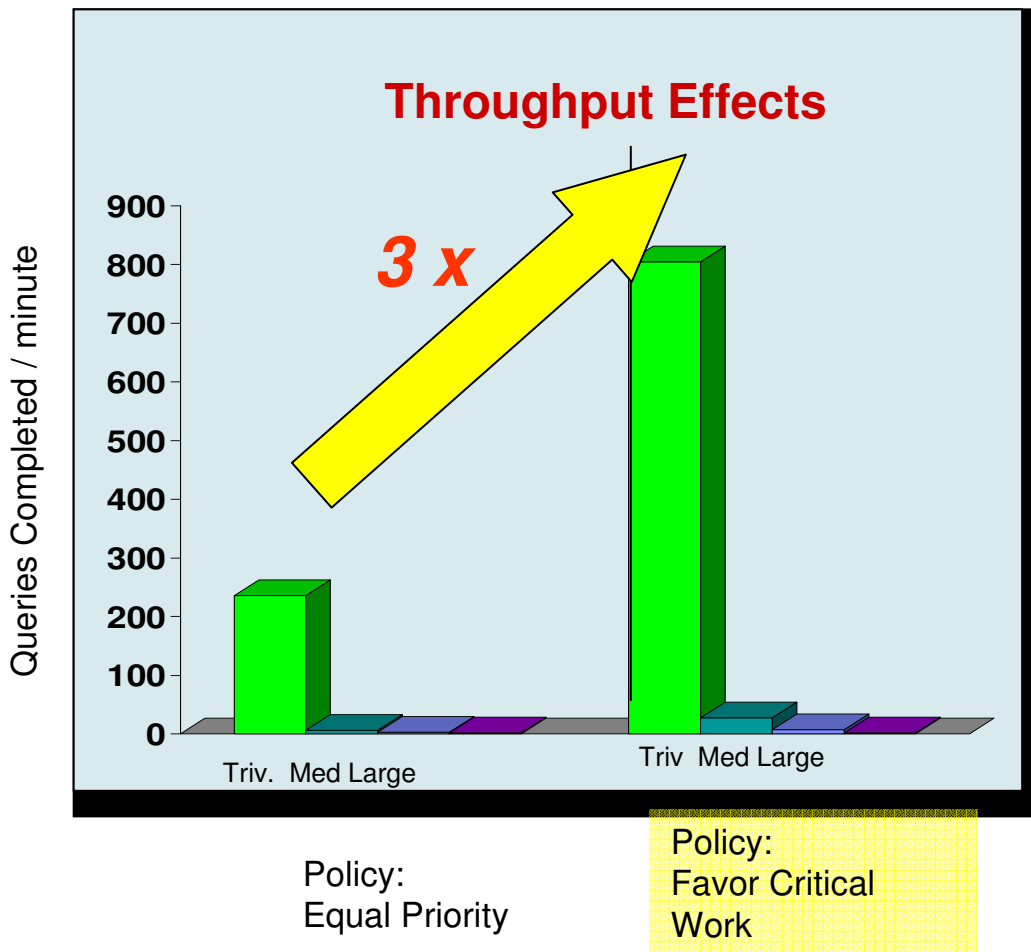
- Load and compress four million rows per second
- Scan up to 300 billion rows in an hour
- Prioritize critical queries above longer queries in workload
- Compress data and indexes by up to 60%-

Workload Manager:

Monopolization of Processing Resources

Prevent large queries from monopolizing a system

Number of critical queries that completed: tripled,
Response times for critical work improved 88% and more.



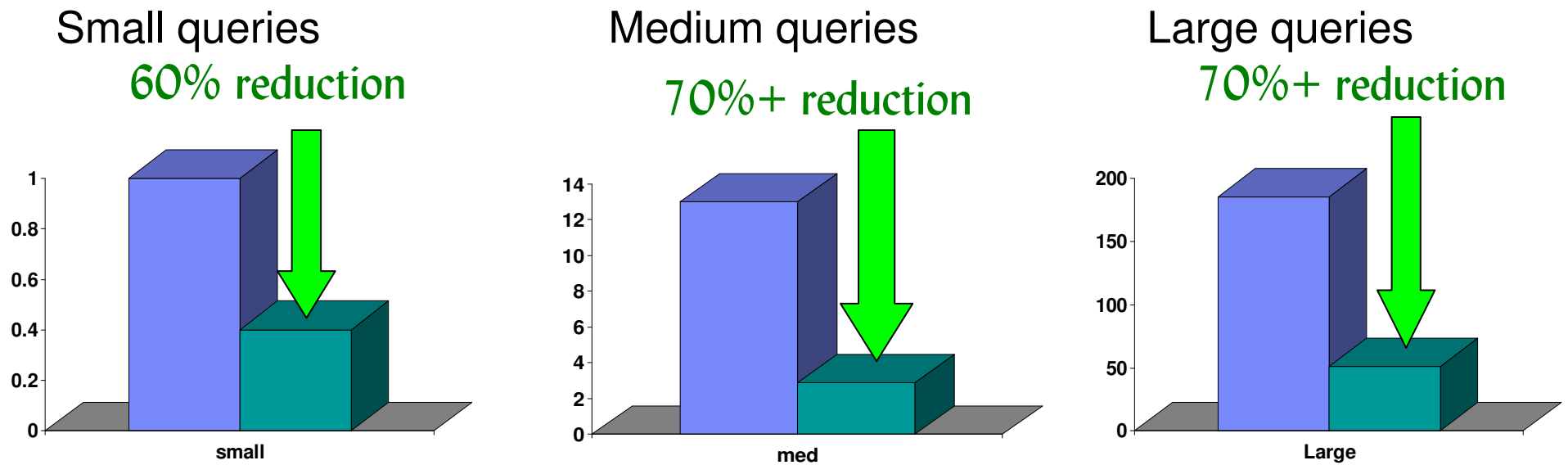
WLM: prioritizing critical work



real customer experience

identifying and executing critical queries in a diverse workload

Real-world query workloads, execute a large number of different queries at the same time. Identifying and prioritizing critical queries within a large pool of queries, based on source or user, is critical when managing workloads.



Light blue – average query response time w/o WLM policy to Identify critical queries in workload
Med Blue – average query response time with WLM controls in place

Conclusion:

In each case, the important query workload saw significant reductions in response times.

Workload Management:

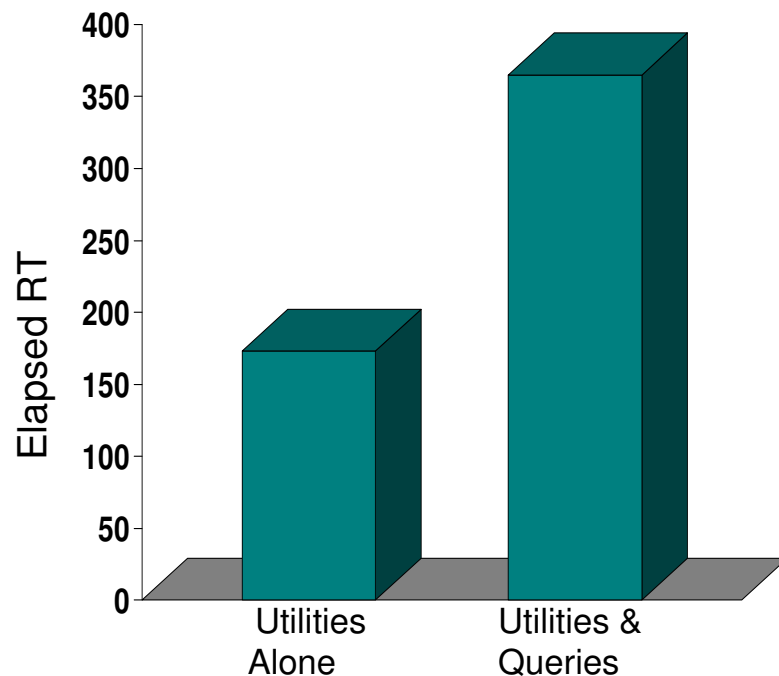
do not impact query workloads, ensuring timely execution

Minimal Impact from data loads, reorgs, and other maintenance tasks

WLM - Favor Queries

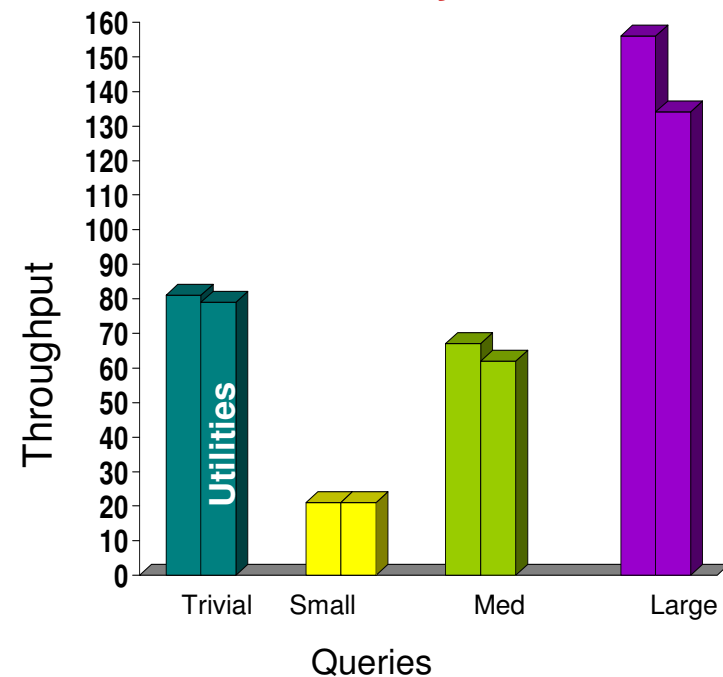
-DYNAMICALLY change policies

Data Utility Work






**Elapsed time of Utilities
- does take longer**

General Query Workloads



**Query throughput slows, but continue as
select ETL processes continue**

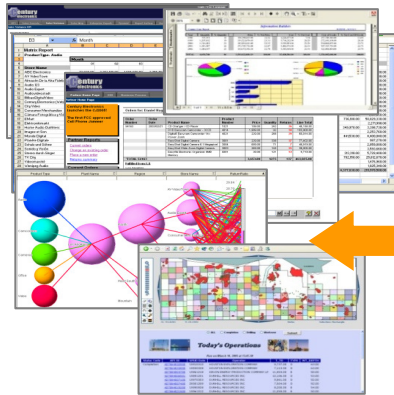
IBM Smart Analytics System 9600	IBM Smart Analytics Optimizer
 <p data-bbox="138 675 336 703">GA June 2010</p>	 <p data-bbox="1115 675 1281 703">GA 4Q 2010</p>
	
<p data-bbox="157 756 991 829">Complete, end-to-end environment for BI workload Processes ALL queries submitted by end-users</p> <p data-bbox="157 850 317 878">Software:</p> <p data-bbox="222 902 951 976">Includes z/OS, DB2 for z/OS, Linux, InfoSphere Warehouse, Cognos, DB2 Connect</p> <p data-bbox="157 995 323 1023">Supports:</p> <p data-bbox="222 1047 898 1154">Data movement / ETL End user tools (Cognos) / BI queries/reports Data Storage (Data warehouse)</p> <p data-bbox="157 1174 380 1201">Environment:</p> <p data-bbox="157 1226 991 1382">Runs in z/OS-DB2 LPAR, Linux for System z LPAR for Tooling Is an all purpose environment to deploy any BI workload</p>	<p data-bbox="1119 740 1902 813">Workload optimized, appliance-like, add-on to a Data Warehouse on System z</p> <p data-bbox="1119 833 1953 906"><i>MUST connect TO a DB2 for z/OS environment that is running a BI workload</i></p> <p data-bbox="1119 919 1806 946">Will enhance a Smart Analytics System 9600</p> <p data-bbox="1119 966 1276 993">Software:</p> <p data-bbox="1171 1018 1953 1157">Includes IBM Smart Analytics Optimizer software running on blades and connects to DB2 for z/OS to enable query routing to the IBM Smart Analytics Optimizer</p> <p data-bbox="1119 1177 1285 1205">Supports:</p> <p data-bbox="1171 1229 1938 1414">(Subset of) complex and long-running BI queries with access to data in a star or snowflake schema Order of magnitude acceleration of a SUBSET of queries that are selected/routed to the accelerator by DB2 for z/OS</p>
<p data-bbox="134 1433 1963 1461">For acceleration of multidimensional star schema queries, use IBM Smart Analytics Optimizer as add on option</p>	

IBM Centralized BI Environment –



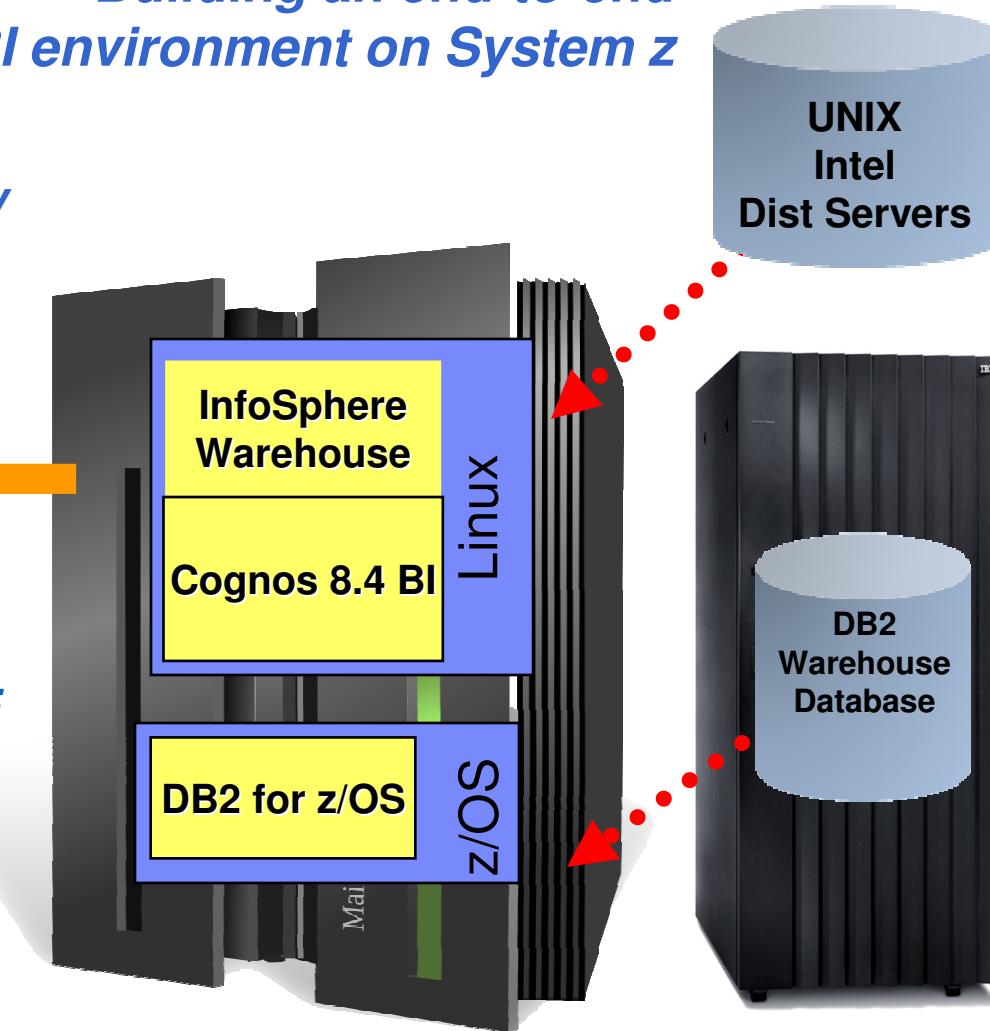
Building an end-to-end BI environment on System z

End-user functionality



BI tooling in z-Linux LPAR:

- InfoSphere Warehouse
- Cognos



Optional software:

- Federated Server**
 - Sybase, Oracle
- Classic Federation**
 - IMS, VSAM,

8700 Storage: Smart Control Unit

- Simplified Management

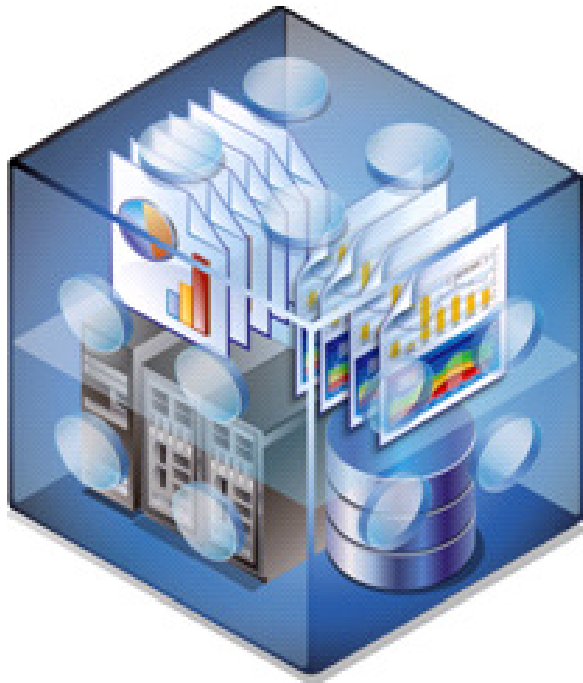
z/OS foundation LPAR for enterprise BI:

- **DB2 for z/OS** – highly available, secure, query prioritization, concurrent utilities/queries
 - **z/OS**: Highly secure, Efficient, Trusted, Responsive

IBM Smart Analytics System 9600

Overcoming the obstacles to business transformation

- ✓ **An integrated, high-performance analytics solution for accelerating delivery of insights for faster, smarter action**
- ✓ **Able to adjust and grow based on your company's ever changing business needs**



- broad analytic capabilities*
- powerful warehouse capabilities*
- scalable and fully-integrated IBM hardware*
- set-up services and single point of premium support*

- ✓ **Delivering results in days instead of months**

Server Options:

Dedicated – LPAR Options:

- Dedicate z10 server or bolt-on LPARs to existing server
 - Includes general processor, zIIP and IFL engines to meet capacity requirements
 - Supporting memory, channels, OSA card
 - Fixed configurations from 4, 12, 25, 50 TBytes / concurrent Cognos Users: 25, 50, 100
- Lab Services will define TWO LPARs
 - **z/OS LPAR** - for DB2 for z/OS database delivering highly available, secure environment
 - **z/VM LPAR** – multiple Linux Virtual images – InfoSphere Warehouse, Cognos

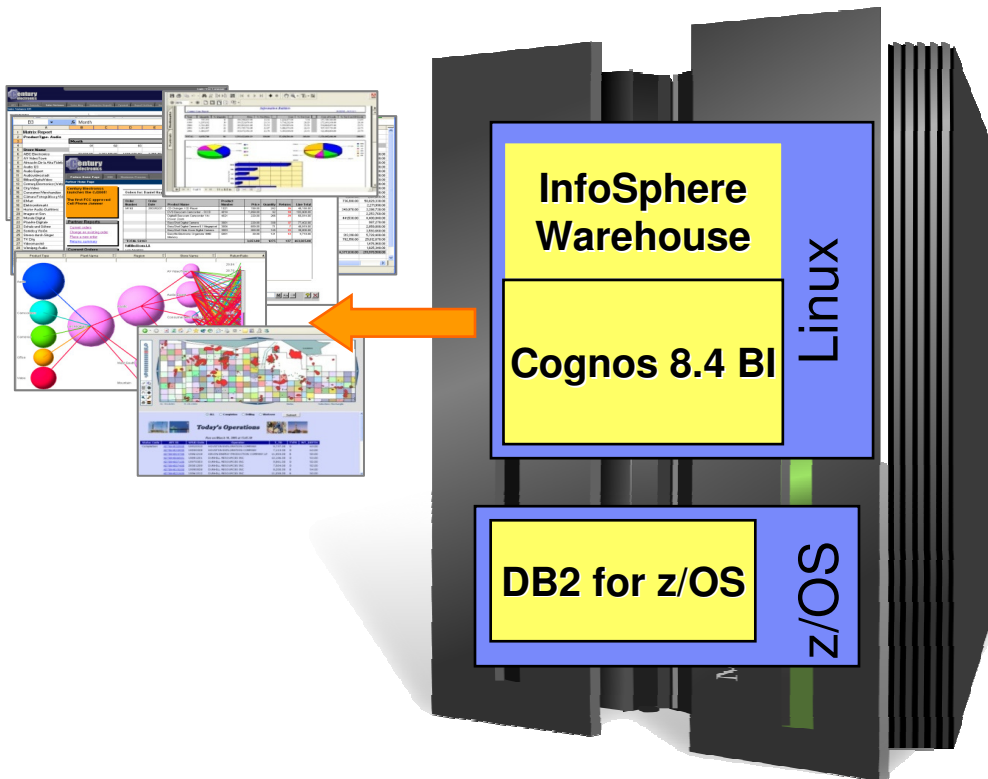
BI tooling in z-Linux LPAR:

•InfoSphere Warehouse:

- Cubing Services –
 - In memory cubes
 - OLAP type processing
- Design Studio –
 - simplifies database definition
 - GUI frontend for table/index structure
- ELT –
 - in database transformation of data

• Cognos:

- Query and Reporting
- Go!Mobile – access to information
 - Delivered to handheld devices
- Go!Search –
 - Easy reuse of created assets



Cognos 8 BI – the flagship BA product



- **Enterprise Reporting**

- Supports multiple report types: Production, Managed, Ad-hoc, Financial, etc
- Is adaptable to any data source
- Operates from a single metadata layer
- Can be personalized and targeted
- Can be distributed via email, portal, MS-Office, search application and mobile device

- **Analysis**

- Enables the guided exploration of information that pertains to all dimensions of your business
- Performs complex analysis and scenario modeling easily and quickly
- Gets to the “why” behind an event or action to improve business performance.
- Moves from summary level to detail levels of information effortlessly

- **Dashboards**

- Translate complex information into high-impact presentations
- Allow you to spot changes
- Are highly intuitive
- Align decision makers

DS8700 Storage Subsystem



Included in the 9600 configuration:

Default - Installs with fiber channel drives

Upgradeable with 3 disk options –

Default with 9600, fiber channel disks

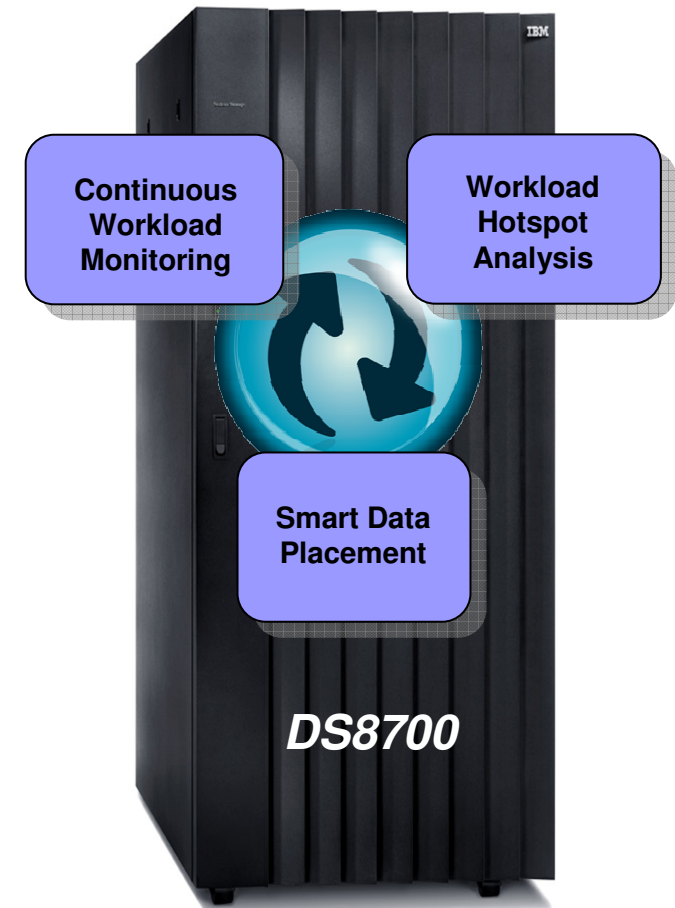
Optional: SSD and slower cheaper SATA drives
- mix and match for workload

8700 microcode tools: Storage Easy Tier –

- Two data relocation functions that enable smart data placement and optimize SSD deployments
 - Dynamic ability to migrate sub-volume placement of data
 - Dynamic ability to migrate full volumes
- New Storage Tier Advisor tool provides guidance for existing client workloads

DB2 Utilities can take advantage of installed SSD:

- DB2 Online Reorg- can identify and automatically move DB2 data to SSD volumes to improve response times



Client challenges with SSD

Inefficient use of a very expensive asset is difficult to justify

- SSDs are considerably more expensive than traditional disks
- Without optimization tools, clients have been over-provisioning them



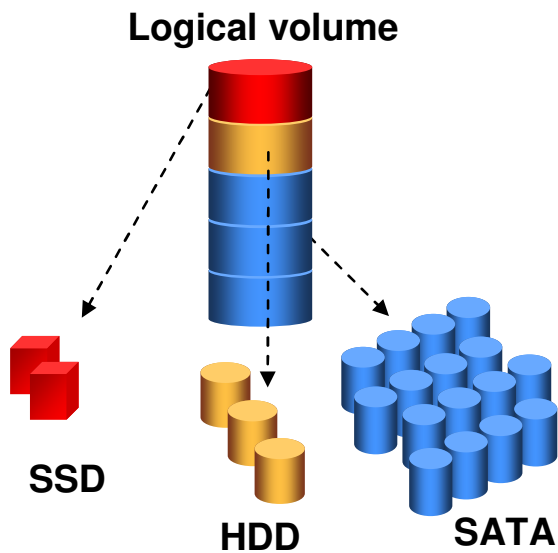
Result: Many clients feel they can't afford solid-state storage yet

Smart data placement with 8700 feature - Easy Tier

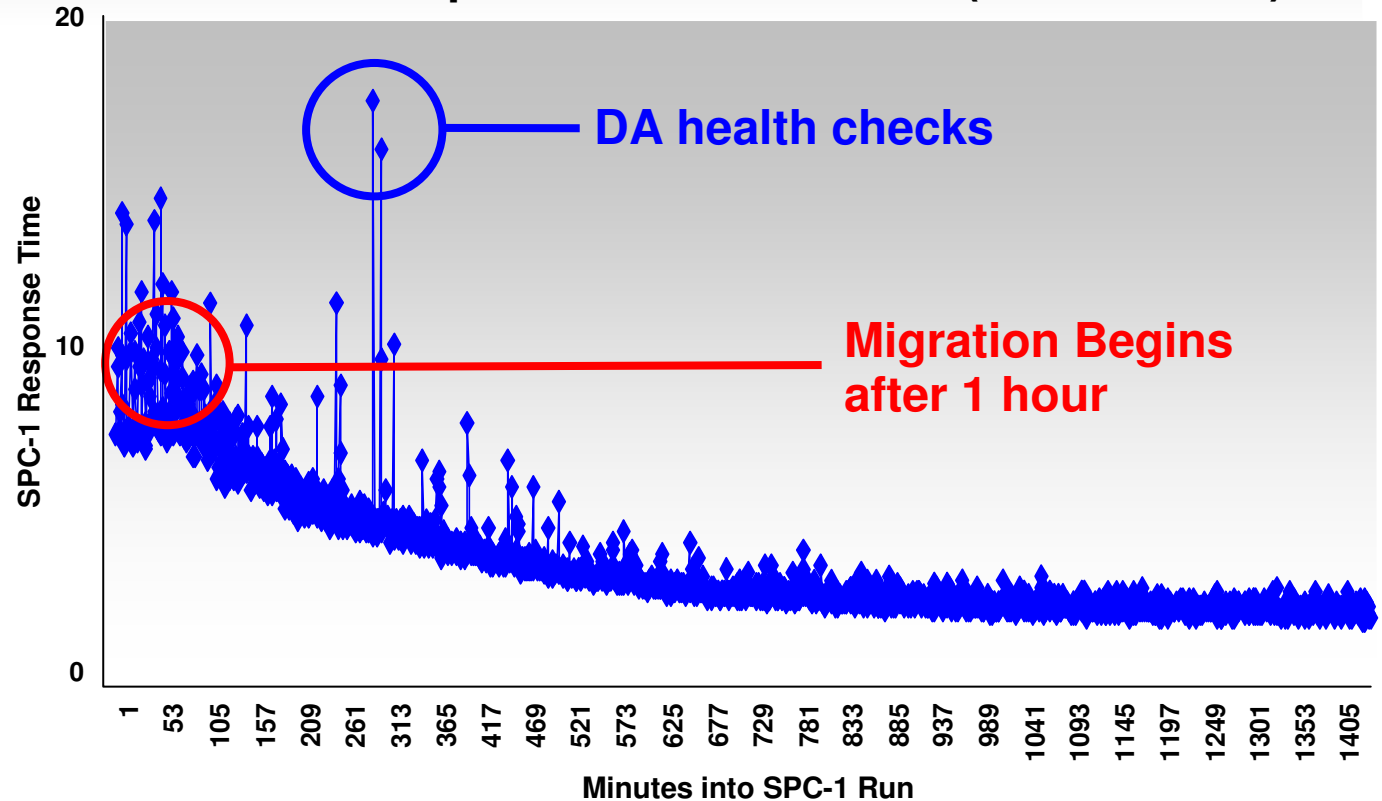
- Relocating just 5% of the data from HDDs to SSDs, reduced response time from 9ms to 2ms!

**Reduction of
78%!**

Easy Tier



SPC-1 Response Time - Full Run (milliseconds)



Florida County Success Story –



using Cognos 8 BI for Linux on System z, and here's why:

Requirements:

- Demand for BI has really taken off
- New Federal reporting requirements
- Every new system, every new solution, every new application is having a business intelligence component
- Multiple Cognos 8 BI deployments - 6+
- Wanted an enterprise BI standardized solution, but
- Needed higher capacity – grow from approx 400 to 1000 users
- Do more with less - less researchers, less software, less hardware, same staff
- Had available IFL's on System z

Results:

- 11 days to move from distributed to System z deployment model for Cognos 8 BI
- Quickly and easily meet new requirements
- Consolidate multiple BI deployments on to a single platform
- Single point for BI administration
- Consolidate multiple disparate data sources
- Ensure 99.999% availability
- Offer a complete disaster recovery plan
- Additional green savings

Using System z to standardize on a single BI solution

Smart Analytics in action at IBM

The Smart Analytics Cloud enables IBM to deliver business intelligence with greater efficiency across the enterprise.

- Establishes a corporate strategy for service delivery of BI.
- Reduces the time and cost to deliver BI to new divisions and departments.
- Maintains current departmental business processes, corporate security and compliance.
- Maximizes departmental budgets by subscribing to standard services.
- Private cloud solution implementation offers economies of scale and flexibility.

Compelling results:

- Consolidating >20 multi-product, departmental BI deployments to Cognos 8 BI on System z.
- Deploying a private cloud to support >200,000 named users across our global workforce.
- Realizing value from >60 data sources across IBM.
- 1 petabyte of data

SMART IS: Delivering Business Intelligence with greater efficiency across the corporation



Customer Quote: CIO OFFICE:

“Our commitment to informed decision making led us to consider private cloud delivery of Cognos via System z, which is the enabling foundation that makes possible >\$20M savings over 5 years.”

IBM Smart Analytics Optimizer

Capitalizing on the leading relational and columnar heritage

What is it?

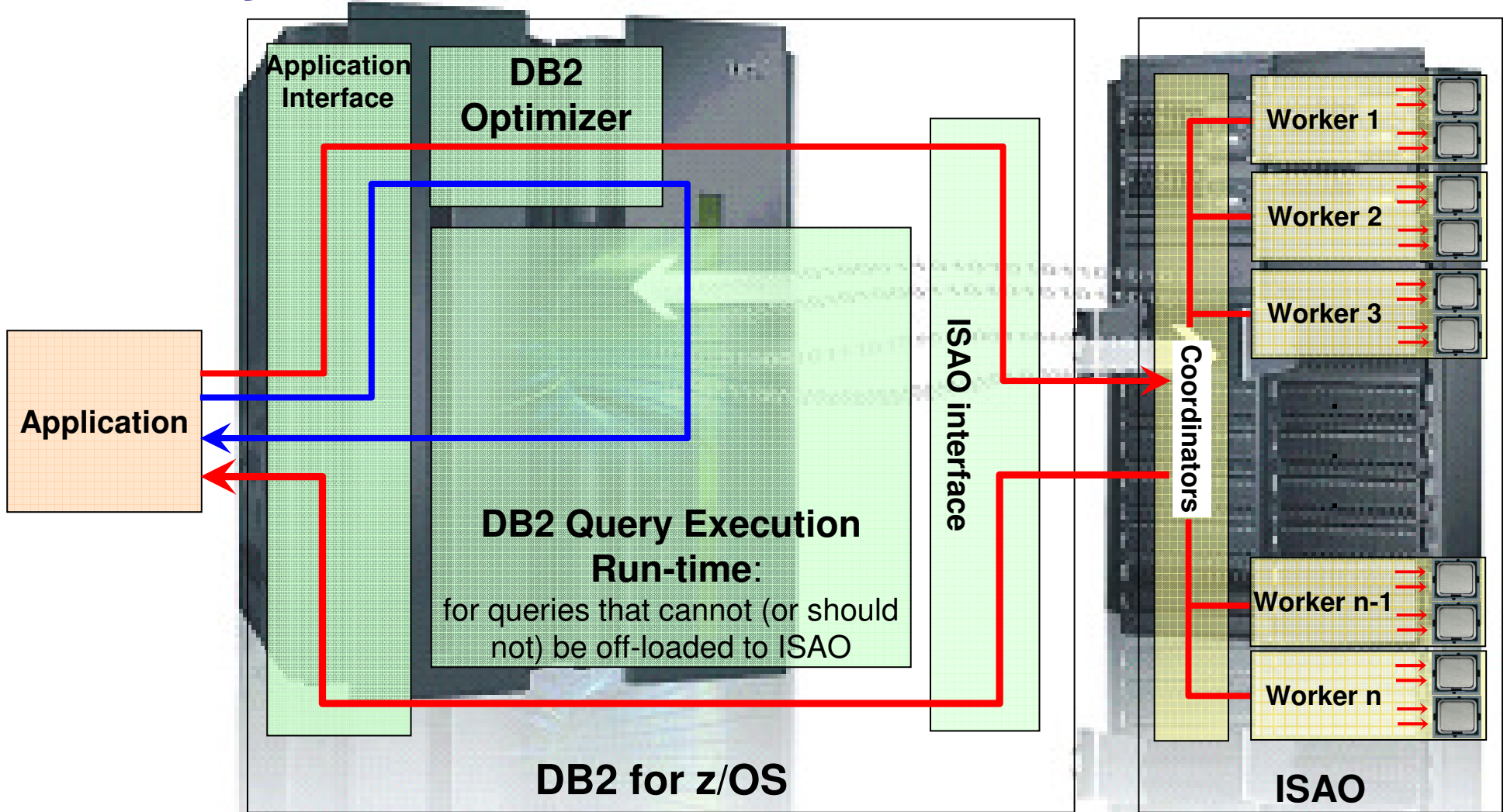
- ✓ *A high performance, appliance-like add-on rapidly delivers information to decision makers faster and transparently.*
- ✓ *Hardware: zEnterprise BladeCenter Extension, IBM DS5020 Open Storage subsystem*
- ✓ *Software: IBM Smart Analytics Optimizer 5697-AQT, IBM Smart Analytics Optimizer Studio*

How is it different

- **Performance:** Featuring breakthrough technologies that deliver an order of magnitude performance improvement
- **Integration:** data is managed and secured by the highly reliable DB2 for z/OS database platform
- **Self-managed workloads:** queries are executed in a very efficient way
- **Transparency:** applications connected to DB2, are entirely unaware of ISAO
- **Simplified administration:** workload optimized, appliance-like add-on that provides hands-free operations, eliminating many database tuning tasks



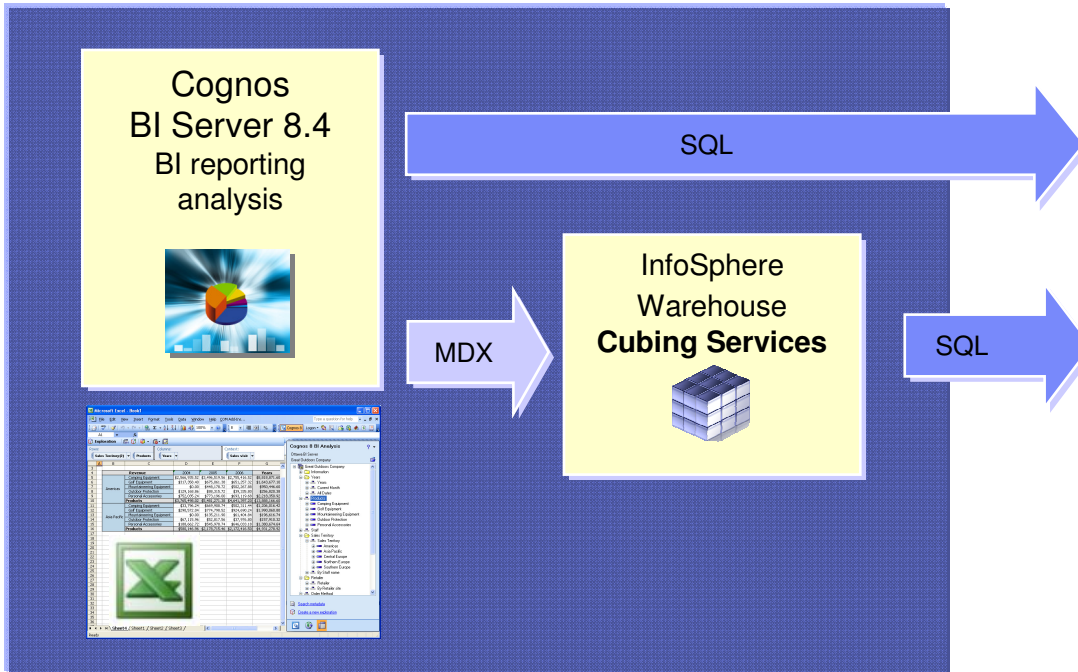
Query Execution Process Flow



- Queries executed without ISAO
- Queries executed with ISAO

ISAO Integration and “Front-Ends”

Linux LPARS



- Cognos BI reports and ad-hoc analysis result in SQL or MDX (OLAP) requests
- Excel spreadsheets for interactive, situational LOB users
- Cubing Services adds MDX (OLAP) capabilities and provides additional (limited) in-memory caching
- ISAO marts may be considered as another option to support cubes

as well as ANY tool that connects to DB2 today:

- Cognos 8.4 BI
- DataQuant (z/OS)
- IBI - WebFocus
- SAS
- Business Objects
- 2 Tier implementations:
 - Brio
 - Microstrategy

Tightly integrated management -



IBM Smart Analytics Optimizer
Management made easy

*Management and access is through established
System z and DB2 for z/OS interfaces*



zEnterprise –

Unified Resource Manager

- Define and control zEnterprise BladeCenter Extension
- Manage hardware configuration - firmware, Blades,
- HMC -single consolidated view of resources, system activity
- Cross platform hardware problem detection, reporting and call home for zBX
- Same maintenance process as System z server

DB2 Integration –

DB2-SMP/E –

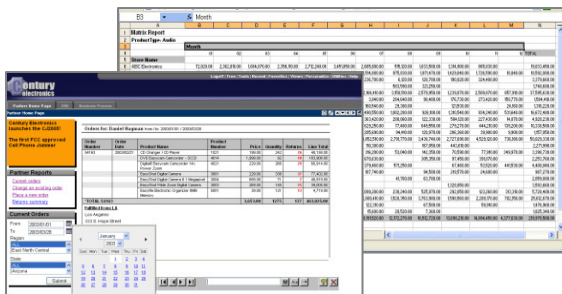
- PTFs for v9, integrated into v10
- Future Optimizer code updates: via PTFs - 5697-AQT

DB2 stored procedures

- define and control IBM Smart Analytics Optimizer
- manage mart definitions

IBM Smart Analytics Optimizer Studio -

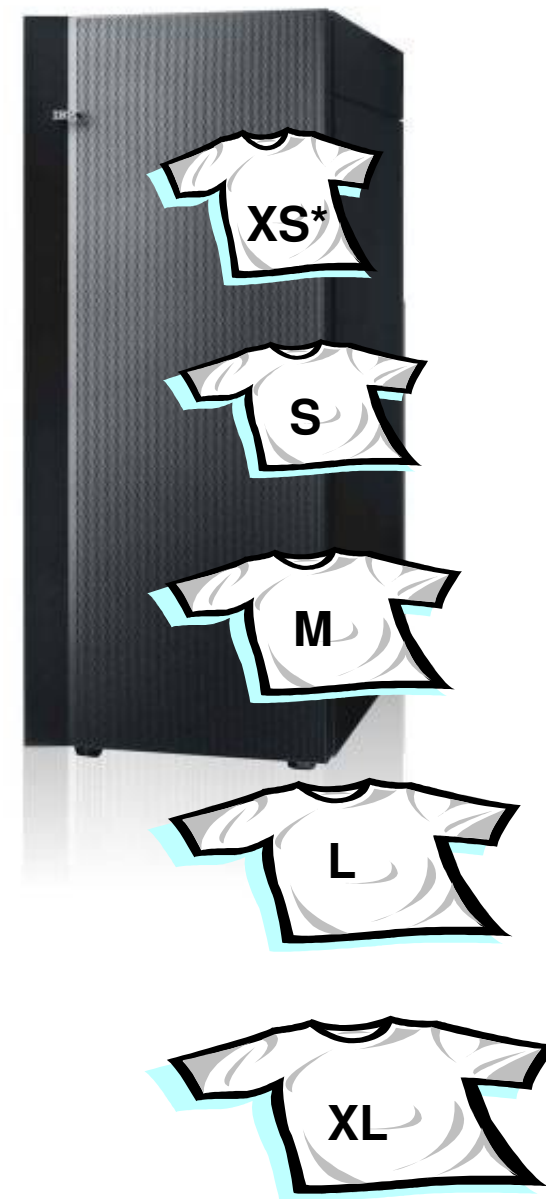
- an Eclipse-based graphical user interface on client PC
- Data Studio plug-in for GUI day-to-day management
- Data Mart LifeCycle Mgmt - Defines and model marts, deploy mart , update mart, delete mart
- Loads IBM Smart Analytics Optimizer data
- Optimizer: start, stop, trace, software update



Data Studio- Plug in

Machine Type: 2458

- Supported on new generation
 - System z Server, and z10
- Hardware Integration
 - Consists of -
 - Blades in a Blade Center chassis
 - Each BladeCenter can have up to 14 blades.
 - Maximum of 4 BladeCenters
- **RIGHT sized for your environment**
- **5 Pre-determined configurations**
 - Range from 0.5- 4 TBs of DB2, in-memory data
- **Simplified installation processes**
 - IBM z-CE installs the BladeCenter
 - Connects to Z
 - BladeCenter managed by Z/IBM Smart Analytics Optimize software
- **Easy MES Upgrade to any larger models:**
 - Upgrade from any zBX to a larger configuration
 - Delta hardware ships for zCE installation at account



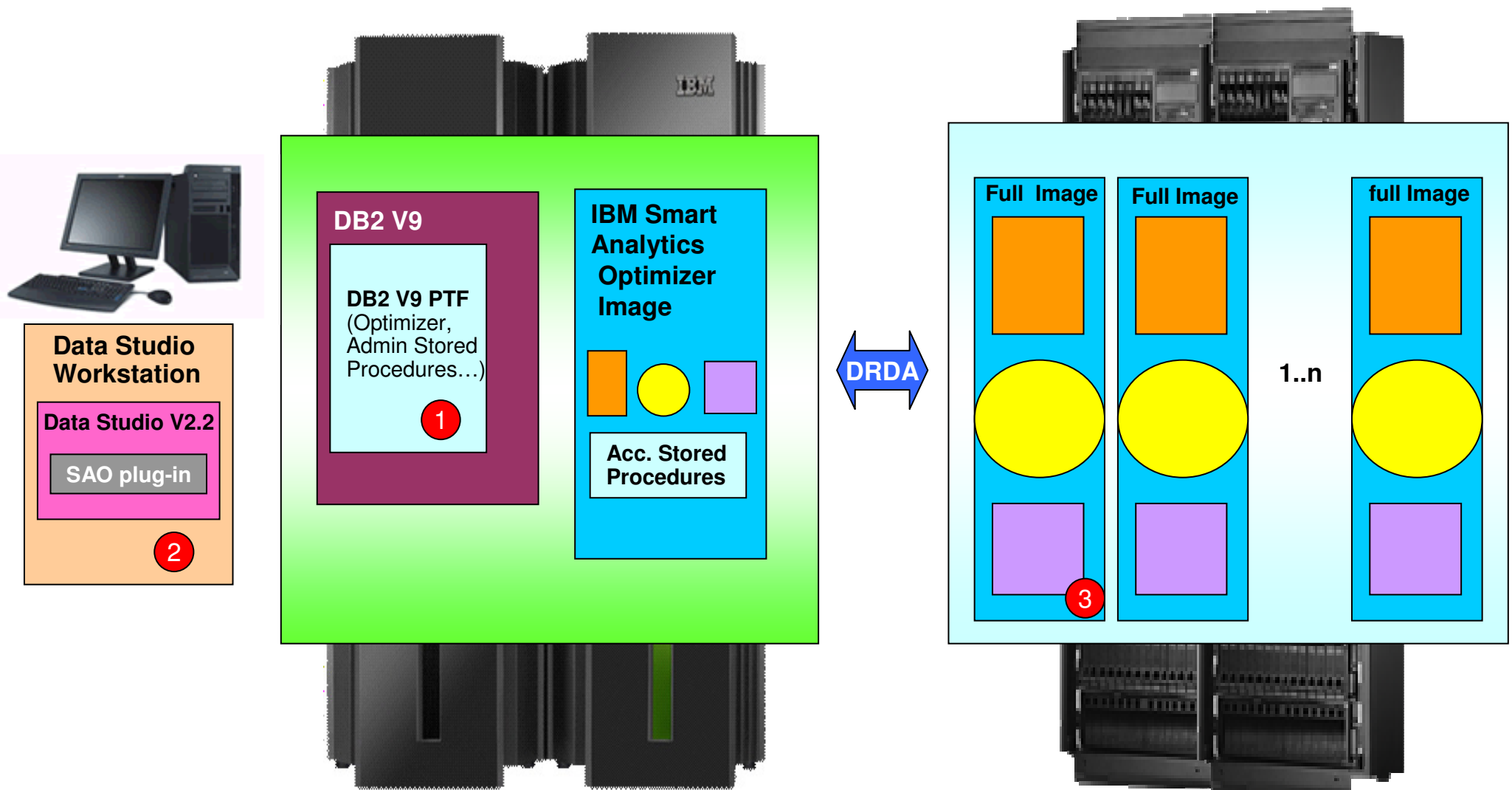
IBM Smart Analytics Optimizer - Software

2 *DBA Tool*

1 *DB2 V9 PTF enhancements*

IBM Smart Analytics Optimizer Image –

3 *OTC installed via SMP/E*



Orders of Magnitude Faster for Queries

Beta Customer Results

For customers who have struggled with gaining the required performance out their complex queries of full table scans, multiple compares, and complex logic – *the results are astounding!*



... and its acceleration factor ::

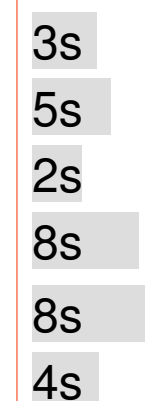
Runtime of queries w/o ISAO



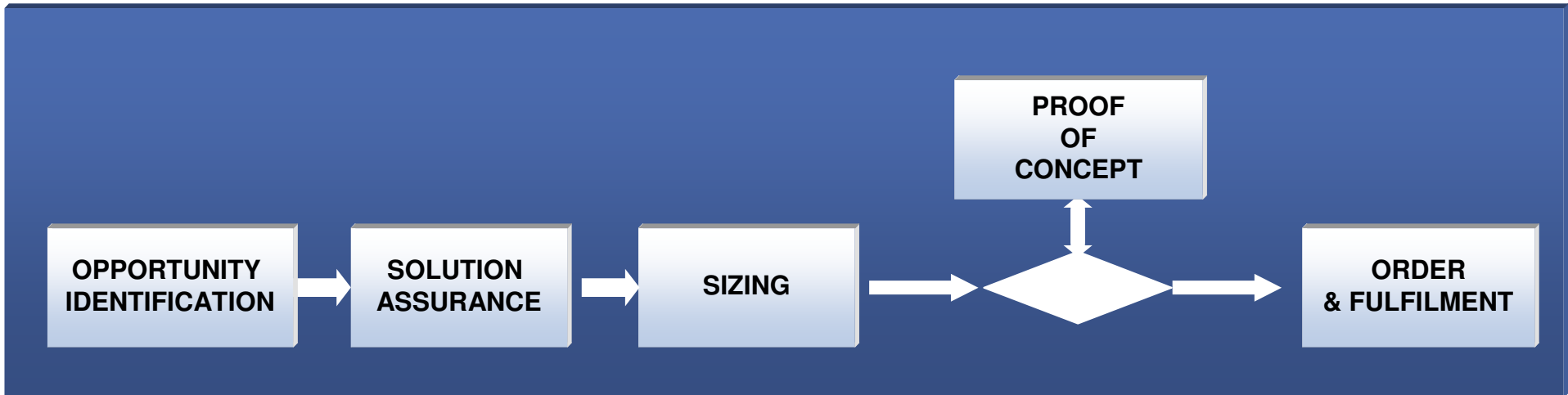
Factor



with ISAO



The IBM Smart Analytics Optimizer Sales Process specifics: Solution Assurance



SOLUTION ASSURANCE

QUESTIONNAIRE

- Initial assessment based on size, query response time, update characteristics and customer pain points

Quick Workload Test

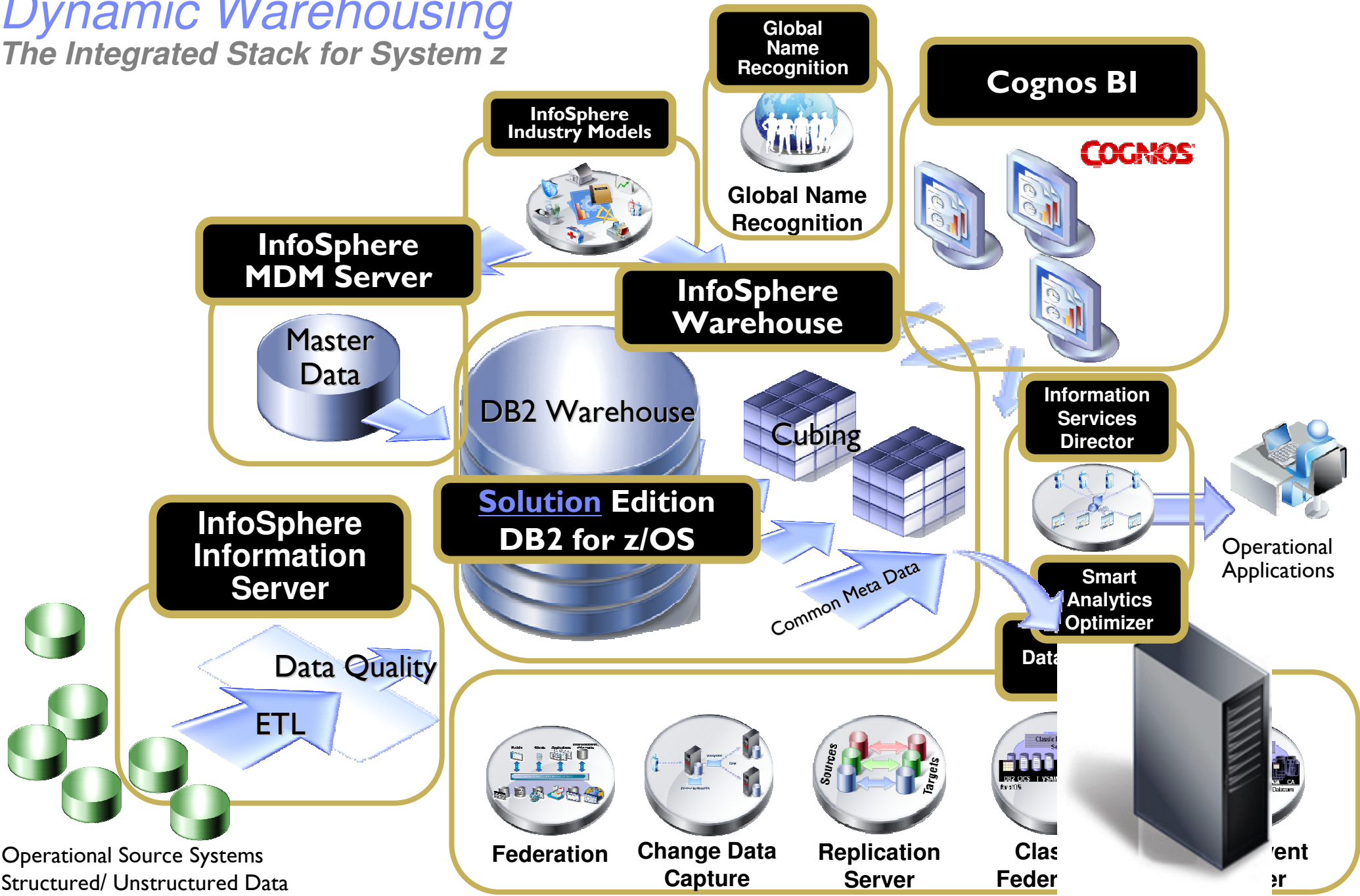
- Assessment based on dynamic customer workload, runtime statistics, table sizes and SQL.

Detailed Online Workload Analysis

- Assessment based on data mart definition for customer data model and offload capabilities in a real IBM Smart Analytics Optimizer environment. Addresses all inhibitors for offload and data mart definition questions.

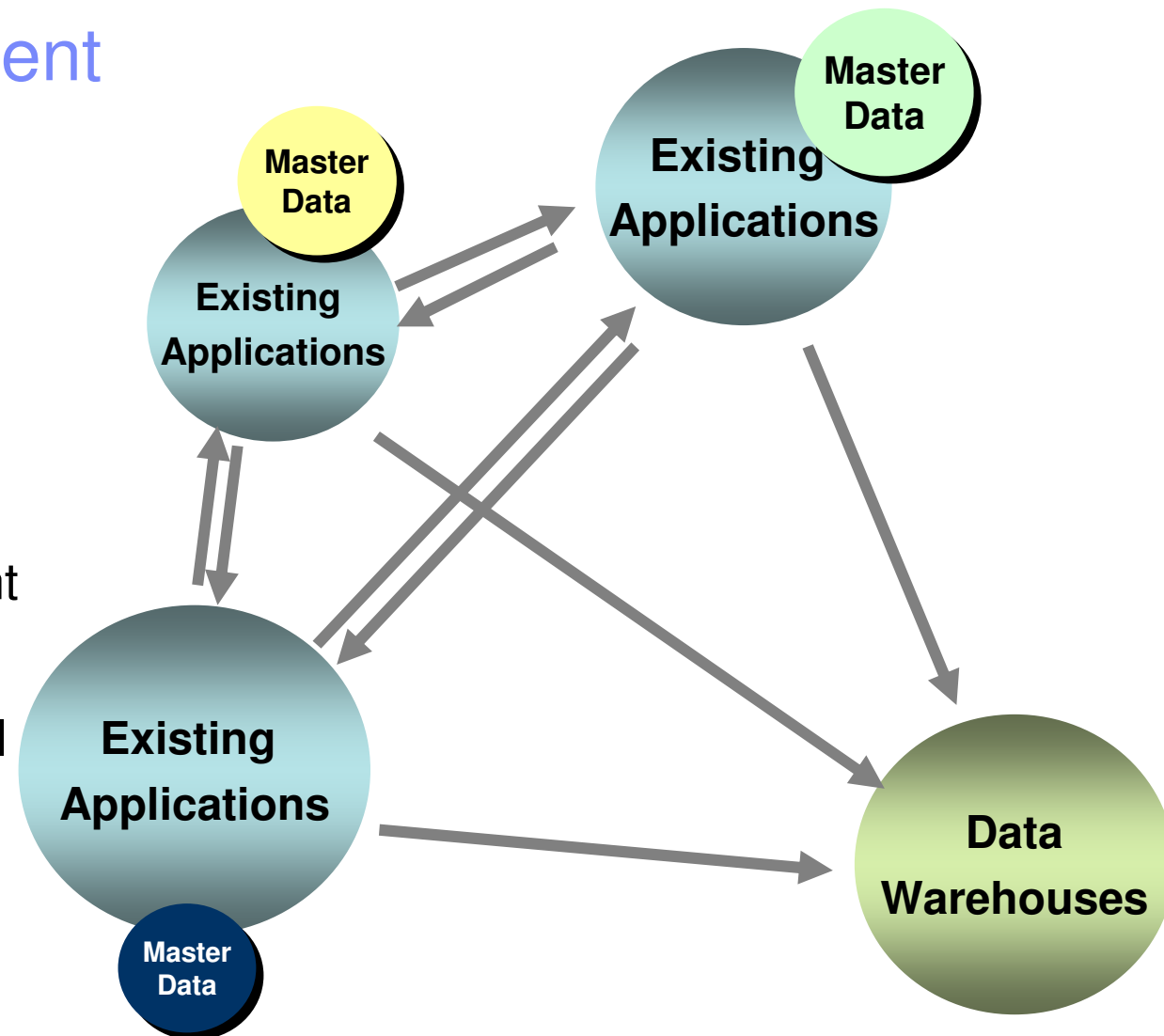
Dynamic Warehousing

The Integrated Stack for System z



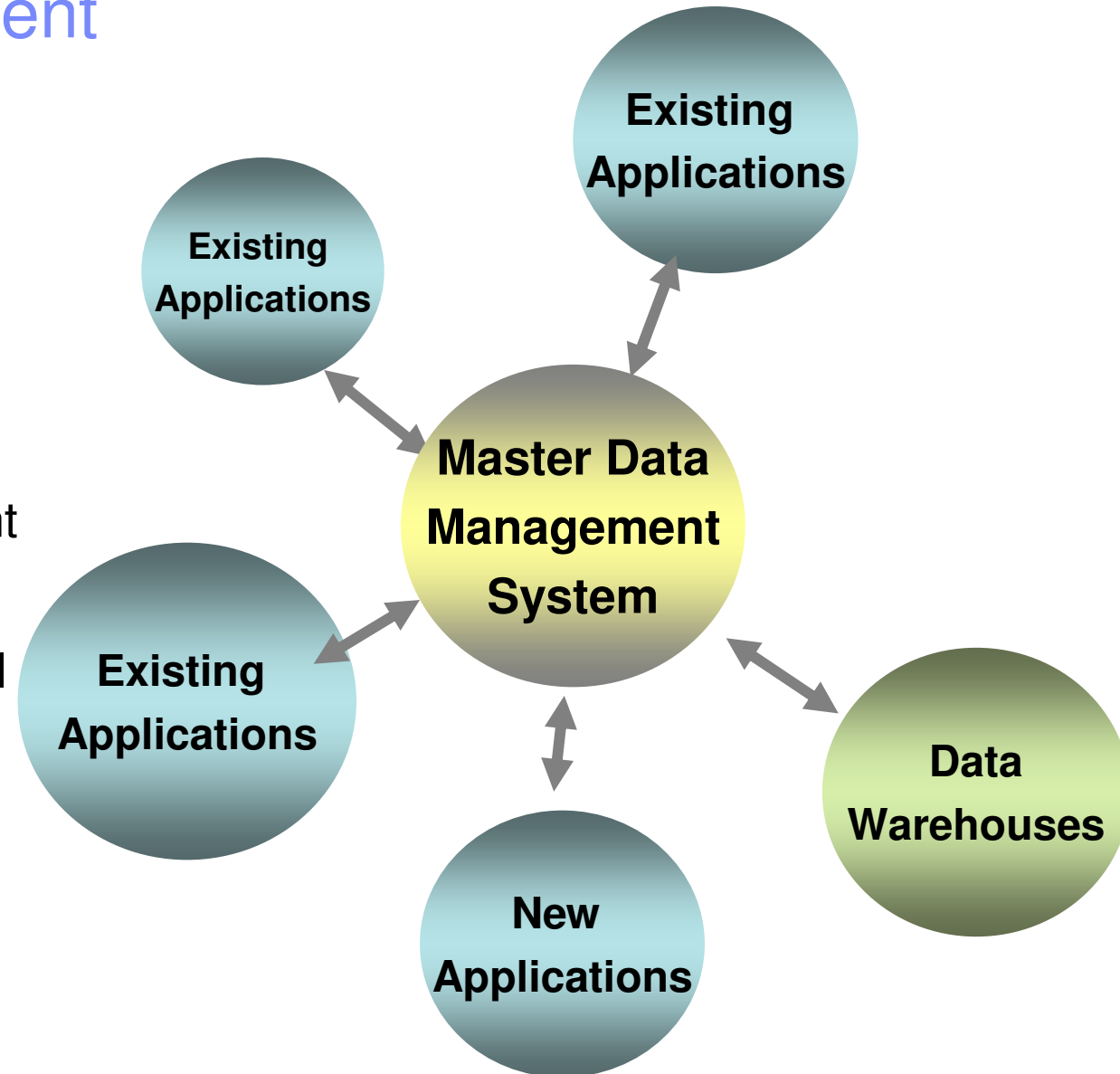
Benefits of Master Data Management

- Decouples master information from individual applications
- Becomes a central, application independent resource
- Simplifies ongoing integration tasks and new app development
- Ensure consistent master information across transactional and analytical systems



Benefits of Master Data Management

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SPSS Predictive Analytics Software

Key Categories

➔ **Data Collection**

Delivers accurate view of customer attitudes & opinions

➔ **Statistics**

Drives confidence in your results & decisions

- **IBM SPSS Statistics**

➔ **Modeling**

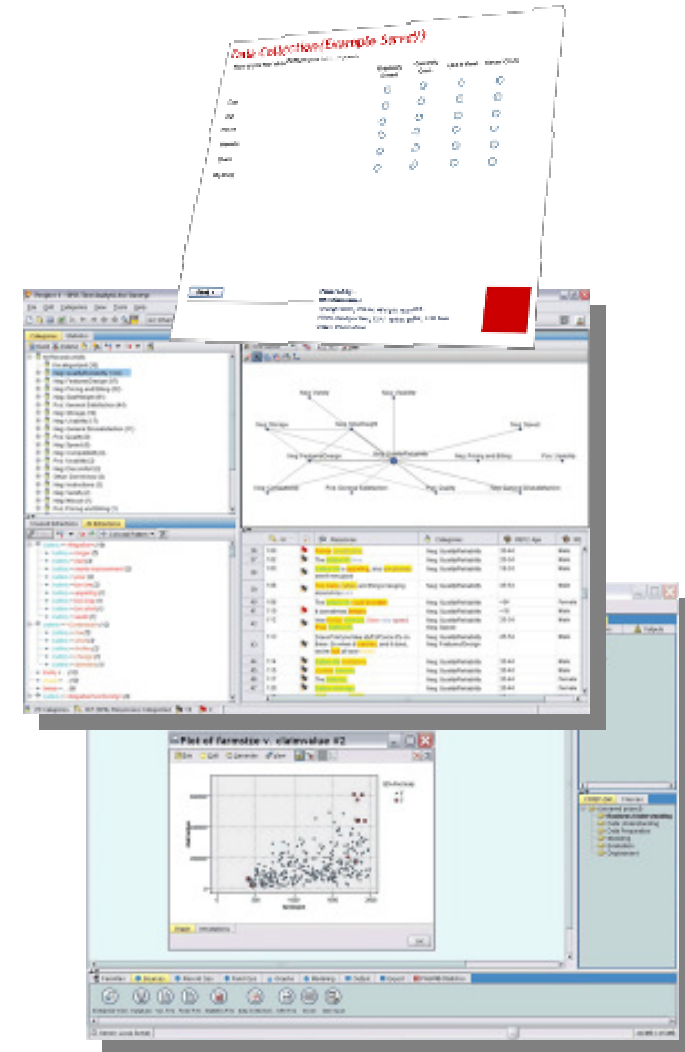
Brings repeatability to ongoing decision making

- **IBM SPSS Modeler**
- **IBM SPSS Text Analytics**

➔ **Deployment**

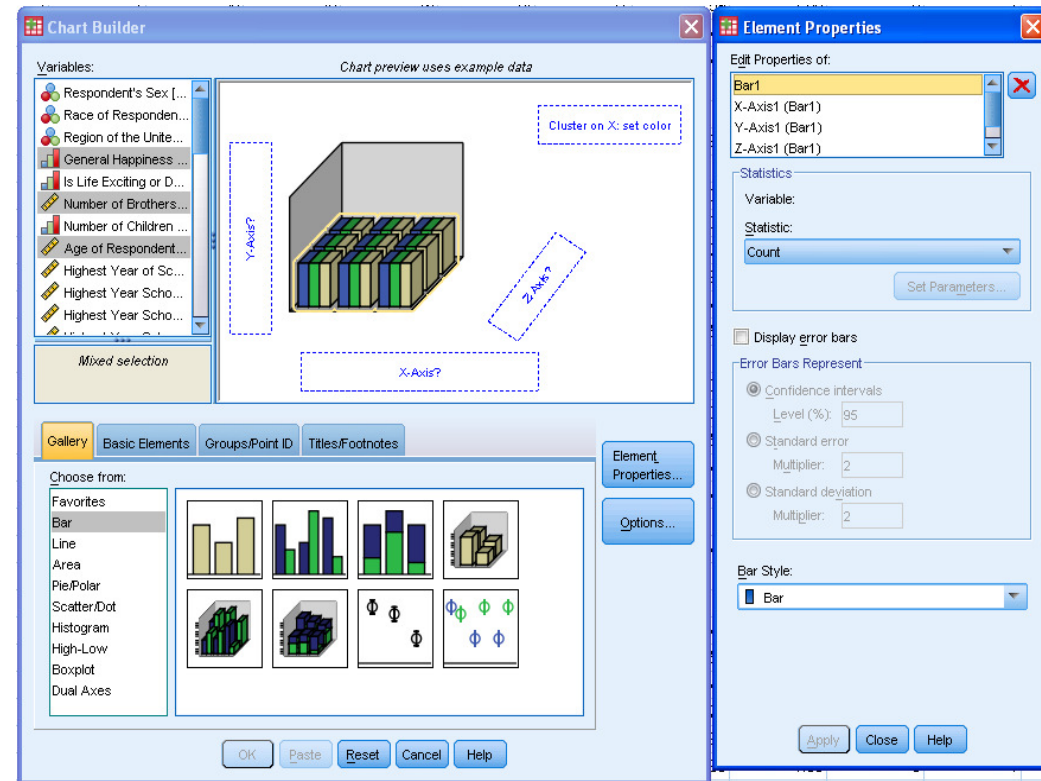
Maximizes the impact of analytics in your operation

- **IBM SPSS Collaboration & Deployment Services**



Predict: SPSS Statistics – range of packages

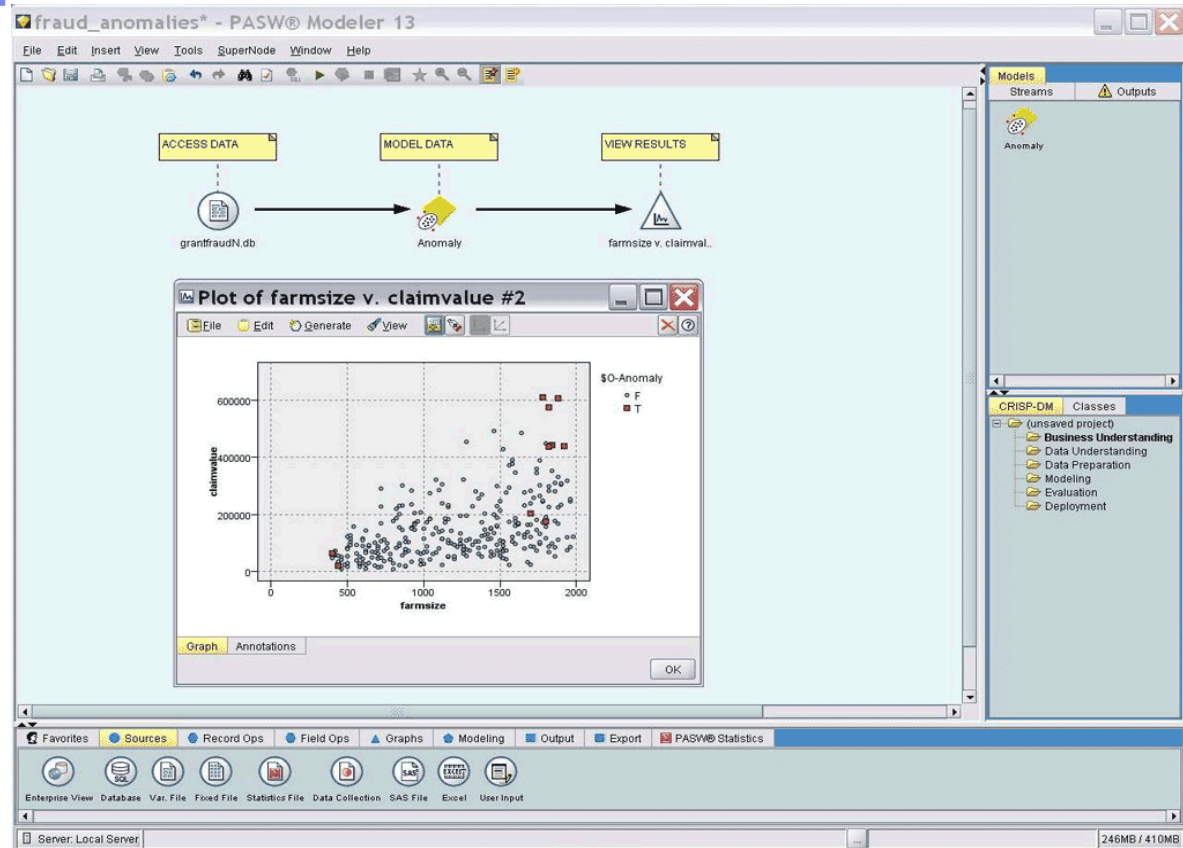
- **Advanced statistics and data management for analysts researching business problems**
- **Collection, preparation, analysis, interpretation, explanation and presentation of data**
- **Provides insight into a sample of data and tools for prediction and forecasting based on the data**



Drives confidence in your results and decisions

Predict: SPSS Modeler

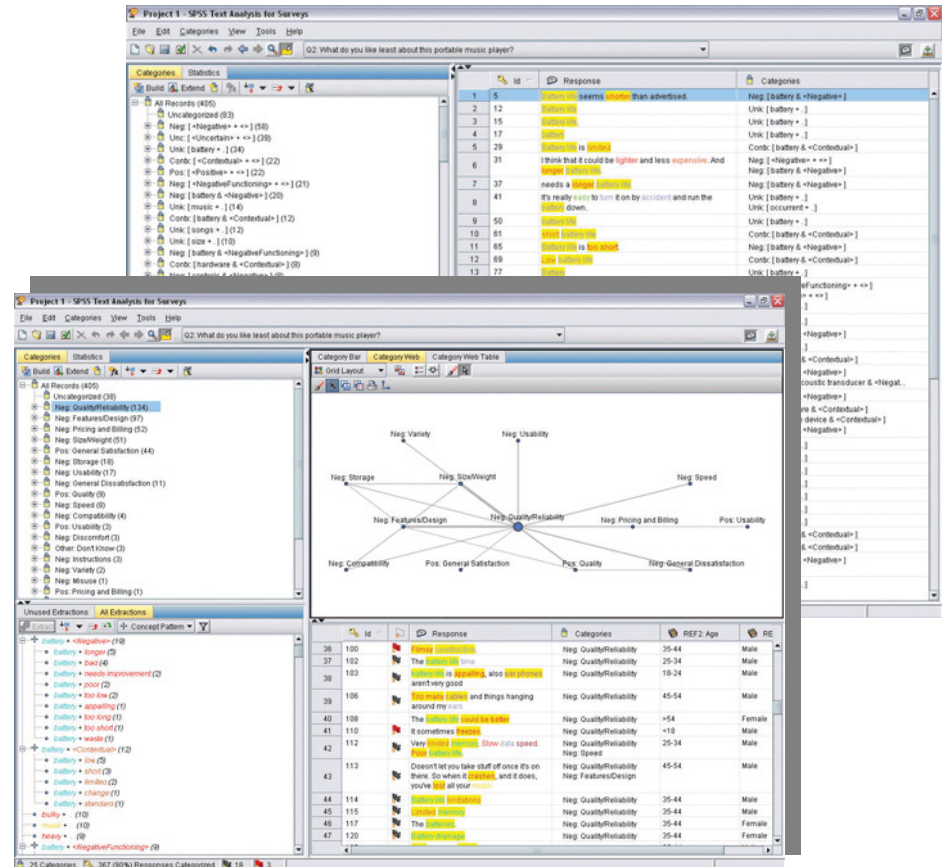
- Workbench with data preparation functions to build analytic streams or jobs and a run time environment for job execution
- Use a variety of pre-built algorithms to create models easily and intuitively.
- View models interactively and apply a variety of analysis and visualization techniques that help you understand and communicate the results of your analysis efforts.
- Collaboration capabilities boost user productivity, and server-based options dramatically increase scalability and performance.



Brings repeatability to ongoing decision making

Predict: SPSS Text Analytics

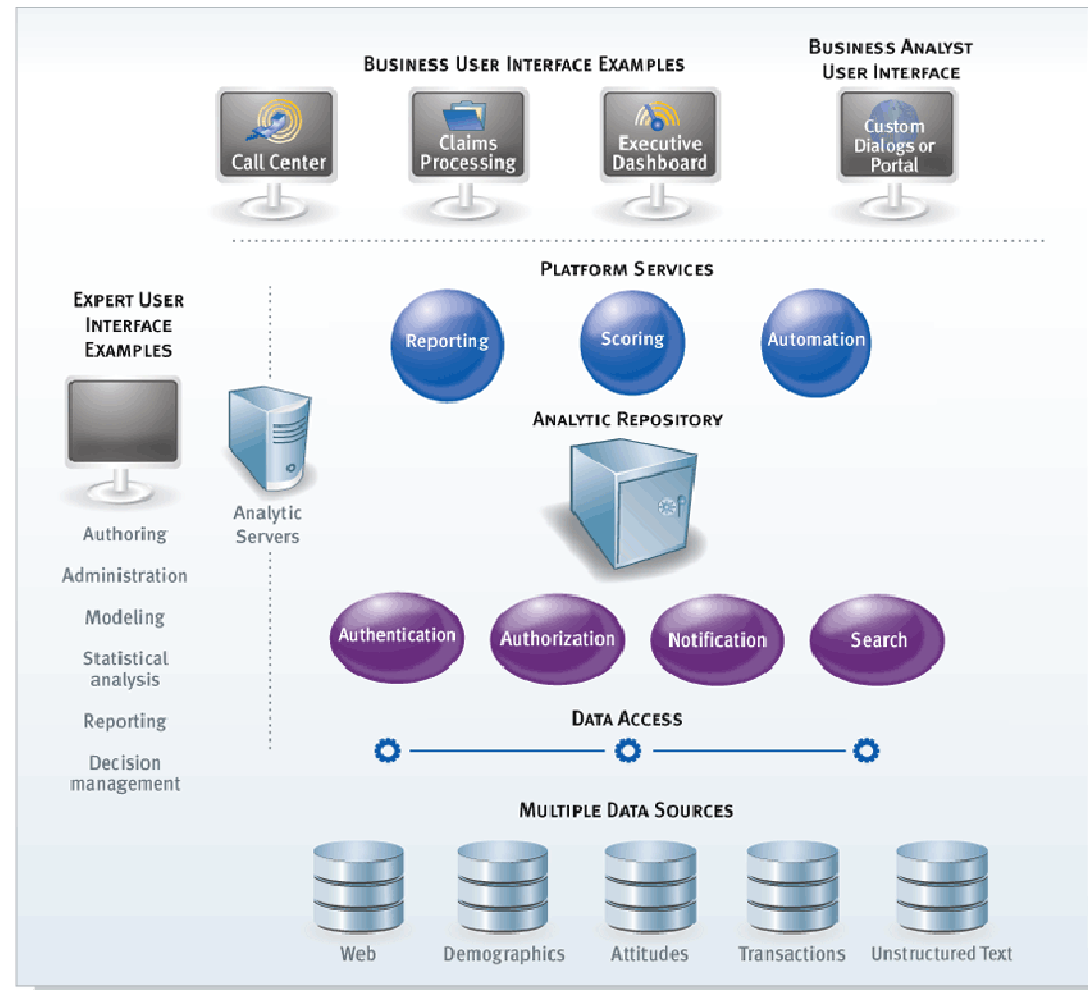
- uses natural language processing, heuristic rules and statistical techniques to reveal conceptual meaning in text
- Extracts concepts from text and categorizes them
- Makes unstructured qualitative data more quantifiable, enabling the discovery of key insights from sources such as survey responses, documents, emails, call center notes, web pages, blogs, forums and more



Brings repeatability to ongoing decision making

Act: SPSS Collaboration & Deployment Services

- Flexible enterprise foundation for managing and deploying analytics throughout the organization
- Automates analytical processes
- Enables collaboration by securely sharing and reusing analytic assets
- Streamlines deployment of analytical information on a scheduled or real-time basis



Maximizes the impact of analytics in your operation

Summary:

- Complete portfolio of software for Business Intelligence Applications
 - End User Tools:
 - SPSS – modeler, statistics, text analytics
 - Cognos, QMF, DataQuant – reporting and operational BI analytics
 - ISV Tools: IBI-WebFocus, SAS 9 BI, Fraud Management
 - ETL:
 - Information Server
 - Federated Server, Federated Classic
 - Data management:
 - DB2 v10 for z/OS
 - DB2 utilities
 - Master Data Management (for z/OS)
 - Foundation Offerings:
 - IBM Smart Analytics System – 9600 (z10)
 - IBM Smart Analytics Optimizer
 - System z Benefits:
 - Advanced Query prioritization
 - Continuous Availability
 - Government certified security
 - High energy savings
 - Virtualization technology to avoid bottlenecks
 - Dynamic upgrades

Thank You