IBM Business Intelligence (BI) and Analytics Update

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**Warning!** This presentation contains adult content and may not be suitable for some members of the viewing audience. Viewer discretion is advised!
By 2013, 33% of business intelligence functionality will be consumed via handheld devices.

By 2013, 15% of BI deployments will combine BI, collaboration and social software into decision-making environments.


• By 2014, externalizing BI will increasingly become an expected aspect of most companies’ relationships with customers and partners.

• Externally focused BI programs will frequently go beyond information dissemination by facilitating a collaborative decision-making process that breaks through the firewall to involve stakeholders from organizations in a broad ecosystem.

Source: Gartner, Prepare for Customer-Facing Business Intelligence, Kurt Schlegel, October 2010

By 2012, BI Platform capabilities will be embedded as a service within 75% of new business applications

By 2012, emerging technologies will significantly drive adoption of BI to 50% of business users (e.g. interactive visualization, in-memory analytics, search, SaaS and SOA)

Source: Gartner BI Summit 2008, 4/2008
What Matters ... is changing
New Intelligence Enterprise Survey of 3,000 executives

Historic trend analysis
And forecasting

Standardized
reporting

Data
visualization

Analytics applied within
Business processes

Simulations and
Scenario development

Regression analysis,
Discrete choice modeling and
Mathematical optimization

Clustered and
Segmentation

Regression analysis,
Discrete choice modeling and
Mathematical optimization

Standardized
reporting

Respondents were asked to identify the top three analytic techniques creating value for the organization and predict which three would be creating the most value in 24 months.

Source: MIT Sloan Management Review, 10 Data Points: Information and Analytics at Work, N Kruschwitz and R Shockley, Fall 2010
Market pressures have provided a wake up call

- **Business Intelligence and Business Analytics**
  - Data Warehouse solutions
  - Cognos 10 for Linux on System z
  - QMF 10 Enterprise Edition for DB2 z/OS
  - SPSS for Linux on System z
  - DB2 10 – temporal data and more
  - IBM Smart Analytics Optimizer
  - IBM Smart Analytics Cloud (a result of IBM’s Blue Insight Project)
DB2 V10 for z/OS  What’s exciting?

Efficiency
- CPU reduced: transactions & queries
- *Ten to twenty times more concurrent users*

Resiliency
- More online schema changes
- Concurrency for catalog & utilities
- Improved security controls and audit

Applications
- Versioned data or *temporal queries*
- pureXML and SQL enhancements

→ Productivity improved for DBAs, application programmers, & systems – ability to *‘leap’ from V8 → V10*
IBM Smart Analytics Optimizer
Technology Preview for System z

What is it?

✓ A high performance extension that is integrated with IBM DB2 for z/OS delivering predictable, order-of-magnitude faster, analytic query response times, while lowering

How is it different

✓ Deep integration with IBM data management systems
✓ High performance query software, based on advanced data in-memory technologies
✓ Leveraging existing data system investment and values without any changes to applications
✓ For System z, extends gold-standard manageability, security, and availability to high-performance analytic applications
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:

<table>
<thead>
<tr>
<th>Runtime of queries w/o ISAO</th>
<th>Factor with ISAO</th>
</tr>
</thead>
<tbody>
<tr>
<td>163 s</td>
<td>48</td>
</tr>
<tr>
<td>2311 s</td>
<td>511</td>
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<td>35 s</td>
<td>8</td>
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<tr>
<td>5435 s</td>
<td>1424</td>
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</tbody>
</table>
IBM Smart Analytics Optimizer Product Components

- HMC
- Ethemet Switch
- OSA-Express3 10 GbE
- Private Service Network
- Private Data Network
- Data Warehouse application DB2 for z/OS enabled for Smart Analytics Optimizer
- IBM Smart Analytics Optimizer
- DS5020 Disk
- BladeCenter
- Fibre Channel
- Disk Storage

Data Studio Foundation
Smart Analytics Optimizer Admin Plug-in

CLIENT

IBM Smart Analytics Optimizer
Preview of Smart Analytics Optimizer V2
Capitalizing on the best of both worlds – System z and Netezza

What is it?
The IBM Smart Analytics Optimizer is a workload optimized, appliance add-on, that enables the integration of business insights into operational processes to drive winning strategies. It accelerates select queries, with unprecedented response times.

How is it different

- **Performance:** Unprecedented response times to enable 'train of thought' analyses frequently blocked by poor query performance.
- **Integration:** Connects to DB2 through deep integration providing transparency to all applications.
- **Self-managed workloads:** queries are executed in the most efficient way
- **Transparency:** applications connected to DB2 are entirely unaware of the Optimizer
- **Simplified administration:** appliance hands-free operations, eliminating many database tuning tasks

Breakthrough Technology Enabling New Opportunities
Extending Smart Analytics Optimizer with Netezza technology

- **Still is a Smart Analytics Optimizer**-

- **Uses Netezza technology to perform high speed query**

- **Like Version 1:**
  
  - Access to data in terms of authorization and privileges (security aspects) is controlled by DB2 and z/OS (Security Server).
  
  - Uses DB2 for z/OS for updates, logging, fast single record look-ups
  
  - DB2 for z/OS does backup and recovery and
  
  - DB2 for z/OS remains the system of record
  
  - There is no external communication to the Smart Analytics Optimizer beyond DB2 for z/OS
Key Enhancements in V2 Release

- Extending acceleration to significantly larger number of queries
- Expanded size of the data to be accelerated
- Improved concurrent query execution
- Incremental update by partition
- DB2 9 and DB2 10 for z/OS support
- Supported only connected to z196/ and zEnterprise forward
**InfoSphere Warehouse on System z**

Delivers Data Warehouse Suite on System z -

- **Advanced physical database modeling and design** – Design Studio
- **In-database data movement and manipulation capabilities of** SQL Warehouse Tool (SQW)
- **Optimize multidimensional reporting and analysis of data with Cubing Services**
10 Cognos

Intelligence Unleashed
Measure and Monitor to See “How” You’re Doing

Dashboards

- Provide at-a-glance, high impact views of complex information
- Help quick focus on issues that need attention and action
- Combine information across disparate sources
- Benefit from range of highly visual personalized, managed, or self-assembled dashboards
- Gain personalized views of operations with continuous monitoring

Real-time Monitor Business Operations

- Continuously monitor and alert when exceptions occur to take immediate action
- Detect events, anomalies and trends in data streams flowing through transactional and messaging systems
- Aggregate data streams across multiple transactional systems and data sources
- Enable self-service with user-defined dashboards, operational KPIs, and alerts
- Address full operational decision cycle from detection to action
Understand the “Why” Behind Business Performance

**Reporting**
- Address full breadth of report needs (personalized, transactional, management, statutory, production…)
- Deliver consistent information across all types of output
- Personalize and target to each department/individual without having to re-author
- Re-use queries, analyses, express author reports in business and collaborate on design with IT
- Easy access to data lineage, definitions of terms, and annotations

**Ad-hoc Query**
- Intuitive, self-service reporting
- Access to all data; drag and drop query creation
- Easy sorting and filtering
- Corporate templates for consistency
- Share ad-hoc or promote for professional distribution
Dig Deeper - Investigate Possible Better Outcomes

Analysis

• Compare and contrast to reveal symptoms and causes behind trends
• Gain same analysis experience on Web or in Excel interfaces
• Perform personal exploration across multiple dimensions of information
• Move from summary level to detail effortlessly
Enhance decisions with Statistics and Predictors of “What Might Happen”

Predictive Analytics

- High-performance data mining and text analytics workbench
- Quickly delivers positive ROI by creating the predictive intelligence
- Set of mining algorithms that provide insight and prediction
- Enables the discovery of key insights, patterns and trends in data that can be used to optimize business decisions
- Advanced statistics and data management for analysts researching business problems
  - Analysis, interpretation, explanation and presentation of data
  - Provides insight into a sample of data and tools for prediction and forecasting based on the data
- Flexible enterprise foundation for managing and deploying analytics throughout the organization
Flexible Access Wherever and Whenever Needed

BI Anywhere

- Receive in any format (PDF, HTML, Excel, XML...)
- Deliver in any language with robust Unicode support
- Access refreshable BI content in any location that best serves the individual (Excel, PowerPoint, Word, Enterprise Search, Portal)
- Search to find instant answers, related content and to author based on search terms
- Browse BI content on mobile devices including BlackBerry, Windows Mobile and Symbian devices
- Automate personal alerts, email bursting, scheduled report production
- Mashup within applications and in processes
**Deploy and Manage your BA environment**

### Model Information Services

- Deliver information in terms business understands
- Combine data into a single view across multiple disparate sources, including OLAP and relational
- Optimize models with built-in advisor, impact analysis, and integration with 3rd party metadata
- Easily manage multi-lingual, multi-tier models with reusable objects, versioning and retargeting
- Flexibly deploy model packages to deliver relevant views securely to different communities

### Administer the Deployment

- Complete view of system activity
- Task-oriented system monitoring
- Integration with 3rd party EMS
- Proactive administration before business impact
- Comprehensive security down to data layer
- Visual upgrade with automated environment validation
Cognos working with CICS (in progress)

Re: CICS Events with Cognos Now! and Mashup Center

John Knutson to Christopher Law, Mark Heid, Mike Biere
Cc: Klaus Roden, Mukul P. Markande, Prakash Dewan, Sandeep K Tyagi

Default custom expiration date: 10/29/2011

Me too. This looks very impressive.

Mike, Mark, The team is making pretty good progress. We've got CICS events showing up in Cognos Now! views and cubes now, and hopefully next week Klaus will be able to integrate them in Mashup Center and round-trip back to CICS. I'm now pretty confident that we have a good story to tell and demo when we record the webcast next Friday.
IMS Integration with Cognos

IMS V11 Open Database:

- IMS V11 allows distributed access over TCP/IP using the IMS Universal Database Driver (JDBC)
- IMS Connect and Open Database Manager now work together as a DRDA server for IMS data
  - Shipped with IMS V11 – requires System Programmer for initial setup
Cognos BI for Linux on System z
….Performance Testing

- Customer provided the need:
  - Processes operational and financial data for 10,000 other companies and exchanges info with 250 B2B partners.
  - Faced with performance & stability issues and could not expand its BI any further.
- IBM Provided the Test Infrastructure:
  - Cognos 8 BI v3 and Websphere set-up on a zLinux and a DB2 instance on z/OS.
- Numius Provided the Expertise:
  - Ported existing application from the distributed to System z:
    - Cognos 8 BI
    - Oracle on HP-UX to DB2 on z/OS
    - MS-SQL on Wintel to DB2 on zLinux
    - MS-IIS on Wintel to WebSphere on zLinux.
- Cognos Provided the Flexibility:
  - Cognos 8 BI - open to Operating Systems and Database Systems, no redevelopment was required

The Results
Cognos 8 BI for Linux on System z
- By adhering to our best practises could support more users and deliver faster performance.
- There was no change in functionality at the Cognos 8 BI level, so no impact whatsoever for the end-user.
- Not one report timed out, not one user was rejected. Even when the system slowed down, it remained stable.
- No redesign was needed to achieve his objective of reaching out to a large community.
- **System z was 400x faster in this case!!!**

Cognos 10 is showing even greater improvements on System z – work underway
IBM Cognos BI within a z/VM environment
“Distributed” Deployment with Over-commit

- Total allocation of **real IFLs** to z/VM remains the same = 8
- Number of virtual Cognos instances similar to other platforms’ physical servers or partitions
- Individual Cognos components distributed on individual Linux “guest” servers
- Number of virtual CPs/Cognos = 11: instance increased on high CPU instances to enable use of excess capacity from low CPU instances
- Number of virtual CPs/Cognos instance should be less than or equal to number of GPs/IFLs assigned to z/VM LPAR
- Over-commit ratio (sum of virtual resource type/real resource type assigned to z/VM LPAR) varies from 1.5/1 to 20/1 or more – highly dependent upon how active the guest server is
Multiple Linux systems
– virtualization with CPU over-allocation

Avg. txn duration (lower is better)

Throughput (txn/min) (higher is better)

• With additional virtual CPU capacity available to the Report Server and HTTP Server, response times were lowered, and more transactions could be processed.
The New QMF 10 – what you need to know

Enhanced to meet the challenges of today’s Business Analytics requirements

• Business Analytics functionality added to QMF for Workstation and QMF for WebSphere
  – 150 BI and analytic functions
  – Executive dashboards & significantly enhanced visual reports
  – Enhanced metadata layer presents concise and user-friendly data structures to end users
  – New Entity Relationship Diagrams (ERDs) simplify query development
  – Introduction of data source environments allows the same QMF objects to be used across distinct user groups (such as differing regions or business areas)
  – Ability to embed QMF content into 3rd party or in-house developed BI solutions

• Key benefits:
  – Rapid development and deployment of Business Intelligence solutions, enterprise-wide
  – Lightweight installation and administration: ~80MB server-side footprint vs. >1GB for most BI platforms
  – Minimal learning curve - zero coding, drag-drop authoring model
  – New QMF content remains fully compatible with existing QMF objects
  – Embeddable BI – can be integrated into web and Java apps
  – Database-based licensing model – not user or application server-based
QMF – Business Value and Benefits

• The business value of QMF 10 for DB2 for z/OS
  – Business value is typically measured by a tool’s capability to deliver required functions in contrast with its associated cost.
    • QMF 10 provides an enterprise license model with no per-user cost.
    • *Can be deployed throughout the enterprise with no additional set charges while providing rich, powerful analytic functions with a wide variety of uses and users.*
    • *It can be embedded within an application* and can now be called from nearly any other BI tool such as Excel and more. Thus assets created in QMF 10 can be used repetitively by many.

• The benefits of QMF 10 for DB2 for z/OS
  – Business Analytics is a key area of interest to any enterprise. Query and reporting solutions now have to offer much more such as:
    – Dashboards and Key Performance Indicators (KPIs)
    – Advanced analytic functions and analysis
    – Multi-dimensional analysis
    – Operational Business Intelligence
    – Heterogeneous database access

• QMF 10 provides a more sophisticated and advanced set of analytic functions while offering advances in performance and ease of use.
The QMF/EE (Enterprise Edition) Solution Suite

• The QMF product family comprises the following components:

  • **QMF for TSO/CICS**: Supports end-users who work entirely from traditional mainframe monitors to access databases in the IBM DB2 family.

  • **QMF HPO**: ‘High Performance Option’ for QMF for TSO/CICS is a multifaceted tool that helps database administrators manage QMF objects and performance in the TSO and CICS environments.

  • **QMF for Workstation**: Replicates the key functionality of QMF for TSO/CICS on distributed platforms via a rich desktop development environment. Runs on Windows, Linux, and the Mac.

  • **QMF for WebSphere**: Provides a feature set similar to that of QMF for Workstation, using a thin-client, browser-based solution. Runs on Windows, Linux, Solaris, AIX, HP-UX, iSeries, z/Linux, and z/OS.
QMF V10 – Three forms of content

• Ad-hoc & prepared queries
• Create/edit/re-use QMF queries
• Apply groupings, aggregations and conditional formats
• One-click export to Excel, data files or DB
• One-click generation of reports from the data

• Tabular and graphical reports
• Generate QMF tabular reports or graphical visual reports
• Highly customizable page-based layouts
• Draw data from any number of data sources

• QMF Dashboards
• Customized interactive dashboard solutions
• Rapid authoring model
Take it to the Web

• Disseminate QMF-powered queries, reports and dashboards to users across the enterprise using QMF for WebSphere

  • Create, run and share queries on the Web

  • Run and share reports on the Web

  • Deploy your dashboards to business end users as stand-alone solutions or embedded within web pages and web applications

• Display as

  • Pure HTML & JavaScript*
  • Adobe Flash Player
  • PDF

* Suitable for all browsers and platforms
QMF V10 Dashboards

- Provide end users with direct access to enterprise data
- Highly customizable – perfectly meet the needs of the end users
- Ability to aggregate data concurrently drawn from heterogeneous relational and OLAP sources
- Interactive, ad-hoc visualizations and optional data write-back
- Publish via the web or workstation
QMF V10 Visual Reports

- Generates HTML or PDF graphical reports, drawing data from one or more data sources
- Support for optional cover sheets, summary pages and report annexes
- Reports generated at designated intervals and made available to end users via the workstation, web or email
- Ability to directly embed reports within portals, custom web sites or web applications
Query development facilities

- Graphical development via ‘query diagram’ designer
- Step-by-step development via ‘prompted query builder’
- SQL development via colorized editor with code assist, code completion and dynamic parameter hints
- Support for both relational queries (SQL) and OLAP queries using multi-dimensional expressions (MDX) query language
- Available in both the workstation and web-based environments
Metadata layer simplifies ad-hoc analysis

• Create custom views of tables or sets of tables

• Alter table names, column names, add calculated columns, pre-joined views etc. without altering the physical structure of the underlying databases – creates a virtual view of your databases

• End users code against the virtual tables – QMF translates their SQL to that which matches the underlying table schema

• Shields users from the underlying complexity of your table schemas. Also permits DB schema changes that do not impact reports/dashboard/queries (since metadata layer can remain unaltered)
SPSS Solutions - Modeler
Data mining uses existing data to:

- **Predict**
  - Category membership
  - Numeric Value
- **Group / Find Outliers**
  - Cluster (group) things together based on their characteristics/attributes
- **Associate**
  - Find events that occur together
- **Sequence**
  - Forecasting/ Time-dependent events
Modeler Key Features

• Ease of use
• Openness
• Productivity
• Automatic Model Selection
• Powerful Data Manipulation/Transformation Functionality
• Multiple Levels of Model Deployment
• Very Scalable*
• Leverages existing database functionality*
  • SQL Pushback
  • In-Database Mining

*Server
Customers use Modeler when they want to...

- Integrate and analyze data from a range of data sources
- Apply complex pre-/post-processing steps
- Build and evaluate predictive models
- Perform advanced “predictive” analysis for deep insight e.g. segmentations, sequence detection, anomaly detection
- Score cases in an ad hoc or straightforward batch manner
- Create predictive models and results for deployment through other products
- Enable all of the above in a way that is:
  - intuitive
  - accessible to users without “expert” credentials
  - supports the most demanding requirements of advanced users
  - minimizes time taken to deliver a best-fit solution
IBM’s Blue Insight

In the spotlight

IBM

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 **+$25M savings over 5 years.**

- IBM CIO Office

**IBM’s Pains:**

- Segmented investments in BI tooling and infrastructure
- Silo’d development, redundant and possibly competing
- Lack of tooling standardization
- Limited visibility to the total cost of business intelligence costs for the enterprise
- Organizational reluctance to a centralized service

**IBM’s Strategy:**

- Common BI “appliance like” service for delivering BI to IBM
- Common service definition and boarding process
- Business intelligence experts to assist adopters
- Start with BI, grow to:
  - Predictive Analytics
  - Data Warehouse

**IBM’s Results:**

- Consolidating 115 multi-product, departmental BI deployments to 1 Cognos 8 BI on System z
- Support for our global workforce
  - 2009 – 72K
  - 2010 – 130K
  - 2011 – 200K
- Realizing value from +60 data sources across IBM
- Projected $25M in savings
  - 60% Consolidation
  - 35% Standardization
  - 5% Automation

Learn more:  [ibm.com/software/systemz/telecon/1jun](http://ibm.com/software/systemz/telecon/1jun)
What Exactly is Blue Insight?

Transformational technology delivery matched with process and solution delivery model changes

- Common BI “appliance like” service for delivering Business Intelligence to IBM
  - Common extensible infrastructure (HW & SW)
  - Common operational support
  - Common management of Cognos 8 BI licensing and Level 3 support

- Common service definition and boarding process
  - Defined BI tooling service scope (Reports, Adhoc, cubing, pervasive, etc)
  - Defined standard security and LDAP management
  - Common operational processes

- Business intelligence experts to assist adopters
  - BICC - (Business Intelligence Center of Competence)
  - Consultants available to assist in solution definition and consumption of service

- Blue Insight is NOT an enterprise data strategy or a portal strategy
  - Assumes data consumed by reports is a trusted part of the enterprise data strategy
  - Initial scope of Blue Insight was to use the standard Cognos portal delivery
**The Smart Analytics Cloud solution offering**

Creates …

That delivers …

| Smart Analytics Cloud | A private cloud within the enterprise | A solution for delivering business intelligence to the entire organization |

The solution components …

**IBM software**

- Cognos 8 BI
  - A broad range of BI capabilities

**Open, enterprise-class BI platform**

**IBM hardware**

- IBM System z
  - Centralize, Virtualize & Simplify the BI infrastructure

**IBM Services**

- **Phase 1:** Create awareness of, a strategy for and a governance foundation for BI across the organization
- **Phase 2:** Preparation for the Smart Analytics Cloud
  - **Phase 3:** Install the base cloud, integrate into the corporate enterprise and test the cloud use cases
  - **Phase 4:** Educate the enterprise for on-going success with the Smart Analytics Cloud
IBM Big Data - the Challenge... to bring Together a Large Volume and Variety of Data to Find New Insights

- Identify criminals and threats from disparate video, audio, and data feeds
- Make risk decisions based on real-time transactional data
- Predict weather patterns to plan optimal wind turbine usage, and optimize capital expenditure on asset placement
- Detect life-threatening conditions at hospitals in time to intervene
- Multi-channel customer sentiment and experience analysis
- Make risk decisions based on real-time transactional data
- Identify criminals and threats from disparate video, audio, and data feeds
The Solution – IBM’s Big Data Platform
Bring together any data source, at any velocity, to generate insight

- Analyzing a variety of data at enormous volumes
- Insights on streaming data
- Large volume structured data analysis

IBM Big Data Platform
- Variety
- Velocity
- Volume
Announcing: InfoSphere BigInsights v 1.1

Platform for V³
- Hadoop foundation
- Large-scale indexing

Analytics for V³
- Integrated text analytics

Usability
- Development Studio
- Admin console (incl. HDFS explorer)

Enterprise Class
- Provisioning, storage, and advanced security

Integration Capabilities
- Integrated install
- Connectivity with DB2, InfoSphere Warehouse and IBM Smart Analytics System.

Deployment Sizes
- Enterprise Deployment
- Pilot
- POC
- Hadoop Up-and-running

BigInsights Enterprise Edition
- Licensed
- DB2/RDBMS and Data Warehouse Integration
- Provisioning and Advanced Security
- Job and workflow management

BigInsights Basic Edition
- Free download with Apache Hadoop
- 24 x 7 Web support
- Large Scale Indexing
- Text Analytics

Deployment Tooling
- Platform
- Enterprise Class

SHARE
Technology • Connections • Results
Summary

• IBM has heard you and responded
  • Data Warehousing
  • Cognos 10 for Linux on System z
  • QMF 10
  • IBM Smart Analytics Optimizer
  • Smart Analytics Cloud
  • SPSS

• We have invested billions in new technologies and building a new information-led infrastructure

• BI has evolved from a static, report-centric environment to a more real-time and embedded analytics model – Business Analytics

• Data Warehousing has evolved to a more global, federated, real-time environment

• We are using our own technology to change our business

• You can use it to change yours
External Websites

Business Analytics pages for Cognos and SPSS
http://www-01.ibm.com/software/analytics/?pgel=ibmhzn&cm_re=masthead__products__sw-bizanalytics

QMF 10
http://g01zcdwas002.ahe.pok.ibm.com/software/data/qmf/

IBM Smart Analytics Optimizer Webpage:

Data Warehousing and Analytics

Terabyte Club for System z BI customers