IBM Business Intelligence (BI) and Analytics Update

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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

Clustering and segmentation

Historic trend analysis
And forecasting

Clustering and segmentation

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)
Best Of Breed Components
The Integrated Stack for System z

Guardium
InfoSphere MDM Server
InfoSphere Industry Models
InfoSphere Information Server
Optim
Warehouse
InfoSphere Warehouse
Master Data
Common Meta Data
Cubing
Data Quality
ETL
Operational Source Systems
Structured/ Unstructured Data

Global Name Recognition
Cognos BI
QMF
SPSS
Mashup
Information Services Director
Operational Applications

Data Synchronization
Federation
Change Data Capture
Replication Server
Classic Federation
Classic Event Publisher

Operational Source Systems
Structured/ Unstructured Data
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</th>
<th>with ISAO</th>
</tr>
</thead>
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<td>4s</td>
</tr>
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</table>
IBM Smart Analytics Optimizer Product Components

- **zEnterprise**
  - Ethernet Switch
  - OSA-Express3
  - 10 GbE
  - Private Service Network

- **zBX**
  - BladeCenter
  - Fibre Channel
  - Private Data Network

- **DS5020**
  - Disk Storage

- **CLIENT**
  - Data Studio Foundation
  - Smart Analytics Optimizer Admin Plug-in

- **IBM Smart Analytics Optimizer**
  - DS5020 Disk

- **Data Warehouse application**
  - DB2 for z/OS enabled for Smart Analytics Optimizer

- **IBM Smart Analytics Optimizer Admin Plug-in**
**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
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
The Top 10 of Cognos 10

1. **Unified workspace** with greater power, intuitive navigation and cleaner look
2. **Breadth of analytics** across historical, real-time and predictive information
3. **Collaborative BI** through built-in collaboration and social networking
4. **Easy data inclusion** by the business from one value, to entire data sets and external files
5. **Analytics on the go** for more devices and disconnected interaction
6. **Faster performance** with in-memory processing
7. **Seamless upgrade** and ease of ongoing management
8. **Trusted expertise** with built-in training videos, ‘how-to’ books and user communities
9. **Expanded deployment options** include Cloud, System z, and Power
10. **Cognos 10 Ready added value** of TM1, Planning, Analytic Applications and SPSS Modeler
Mike, Mark. The team is making pretty good progress. We’ve got CICS events showing up in Cognos Nowl 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 8 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 practices 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 8 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

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
**Initial Business case**

> $25M Savings over 5 years…

- Business case categorization
  - Infrastructure
  - Operations
  - Skill efficiency

<table>
<thead>
<tr>
<th>Z10 Infrastructure</th>
<th>Common service definition</th>
<th>Web 2.0 Boarding application</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shared peripheral infrastructure</td>
<td>Common security</td>
<td>Automated choreography &amp; administration</td>
</tr>
<tr>
<td>Shared middleware</td>
<td>Common promotion process</td>
<td>Predictive planning</td>
</tr>
<tr>
<td>Shared Cognos V8</td>
<td>Common operations process</td>
<td>Automated provisioning</td>
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</table>

- 60%
  - HW Consolidations
  - SW Costs
  - 3rd Party vendor savings

- 35%
  - Operations efficiency
  - Development efficiency
  - Improved time to value

- 5%
  - Adopter administration

* - Future focus

**VIRTUALIZATION + STANDARDIZATION + AUTOMATION**

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**Increased Flexibility**

**Reduced Cost**
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
- Open, enterprise-class BI platform
- IBM System z

IBM hardware

- 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
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