Unleashing the **Power of Business Intelligence**

FTA Technology Conference 2010
August 3, 2010

Susan Terry, Teradata
Agenda

• Business Intelligence
• Value Drivers
  > Integrated Data
  > Information Delivery
  > Performance Management
• Real-Time Analytics
  > Active Enterprise Intelligence
• Operational Impact
• Workload Management
• Business Intelligence Concepts & Trends
• Lessons Learned
Key Takeaways

• A new kind of BI: **Active Enterprise Intelligence** to drive better, faster Operational Decisions

• Active Enterprise Intelligence has high value
  > Align Strategic and Operational decisions
  > Accelerate Operational decisions

• Many leading-edge organizations and businesses are using Active Enterprise Intelligence to make a difference
  > Drive profitability, customer service, and operational excellence
  > Across all industries
  > Across multiple business functions
Teradata Executive Survey on Decisions

“...the **number** of decisions you make daily has...”

“...the **complexity** of the business decisions you are making has ...?”

“...the **amount** of data available to you is...?”

**More Decisions**
- 68% say number of daily decisions has increased over last year

**More Complexity**
- 45% say decisions are more complex

**More Data**
- 96% say data is increasing
- 52% say data is doubling or tripling every year

Business Intelligence - Defined

A Converging and Evolving Topic... ...for Purposes of Today’s Discussion:

**Business Perspective**
(Performance management / competitive differentiator)

“*The ability to analyze discrete pieces of information and use them to gain a competitive edge.*”

Gartner Group

**Technology Perspective**
(Information management & delivery)

“*A set of processes and technologies that transform raw, meaningless data into useful and actionable information.*”

Forrester Research
Tactical Challenge

“Employees spend an average of 25% of time looking for information.”

<table>
<thead>
<tr>
<th>C-level execs</th>
<th>63%</th>
<th>28%</th>
<th>18%</th>
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</thead>
<tbody>
<tr>
<td>• Unable to take the right strategic decisions</td>
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<td>• Take delayed decisions</td>
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<td></td>
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<tr>
<td>• Don’t understand their global business</td>
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<table>
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<tr>
<th>Senior managers</th>
<th>45%</th>
<th>38%</th>
<th>18%</th>
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<td>• Take the wrong business decisions</td>
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<tr>
<td>• Take late business decisions</td>
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<tr>
<td>• Don’t understand their competence area</td>
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<th>General staff</th>
<th>38%</th>
<th>30%</th>
<th>15%</th>
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<td>• Become time-inefficient employees</td>
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<tr>
<td>• Don’t perform as desired</td>
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<tr>
<td>• Don’t give the best service</td>
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Base: 40 large multinationals (multiple responses accepted)

Goal: to become information centric, not report focused.

Source: Forrester Research, 2005
Strategic Challenge

“Today’s best and brightest organizations are analyzing massive databases at lightning speed to provide greater insights into human behavior...this new breed of decision makers is calling the shots.”

Ian Ayres, Super Crunchers: Why Thinking -By- Numbers Is The New Way To Be Smart, Bantam, 2007
Tax Decisioning Landscape
*Bringing More “Science” to the “Art”*

**External Data**

- **Growing The “Gut”**
  - Augmenting w/ pertinent information

- **Providing Closed Loop Clarity**
  - Vision & insight on hunches/trends

- **Tying Cross-Functional Initiatives Together**
  - Insures synergy vs competitive goals

- **Providing Flexibility & Agility**
  - Creating an Information Infrastructure to enable quick change & adaptability
Value Drivers
3 Limited Business Value
• Each data mart can provide answers to subject-specific questions
• With each new data mart, IT repeats its development efforts
• This includes sourcing data that already exists in another environment

State Tax System
• Which taxpayers pay corporate income tax that don't pay withholding tax?
• Which businesses have registered to collect sales tax but are not remitting payment to the state?

Federal Data
• Which tax returns without withholding taxes included typically have an audit adjustment by the IRS?
• Which out of state aircraft purchases are hangared in state?

Business Value
IT Development
Integrated Data

**Differentiated Business Value**
- Combining the environments requires only incremental work for each new subject area
- Enables new cross-functional insights that can’t be achieved with separate data marts; new differentiated decisions

**Combined State Tax & Federal**
- Who filed a federal return, but did not file a state return? Vice versa?
- Which out of state businesses conduct business within the state but do not file a state return?
- Which out of state aircraft purchases are hangar-ed in state, but the owners have not paid use tax?

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**Business Value**

**IT Development**
Integrated Data

Differentiated Business Value

Combined State Tax, Federal, Other State Agency, and 3rd Party
- Who filed a federal return and is registered with the Secretary of State and has assets per a commercial data source, but did not file either an income tax and/or state sales tax return?
- Which service providers reside in a neighboring state, were issued a permit to do business, have assets per commercial data, have office locations or otherwise performed services in -state, and have filed a federal return but not a state return?

Business Value
IT Development
Integrated Data
Differentiated Business Value

- Agencies find that as their warehouses grow, they add incrementally **less data** and **less effort** to enable **new applications** and **new business value**
  > Enables more sophisticated questions
  > Lowers the IT Development line
- The value to effort ratio increases significantly
The Superior Business Value Of Centralized, **Integrated** Detail Data

**Compliance and Business Value** Compounds Exponentially
Real-Time Analytics
The Focus: Delivering Business Decisions

What are the Implementation Challenges at Each Stage?

**REPORTING**
WHAT happened?

**ANALYZING**
WHY did it happen?

**PREDICTING**
WHAT WILL happen?

**OPERATIONALIZING**
WHAT IS happening?

**ACTIVATING**
MAKE it happen!

### Business Requirement:

<table>
<thead>
<tr>
<th>Standard batch reports</th>
<th>Increased Ad-hoc analysis</th>
<th>Deep analytics used to understand cause/effect &amp; correlation</th>
<th>Timely access to data</th>
<th>Event notification services</th>
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<td>Known Questions</td>
<td>Answers to complex questions that involve cross functional queries</td>
<td>Formulation of business models based on analytics &amp; observations</td>
<td>Integration of strategic and operational business functions</td>
<td>Automation of Customized offers</td>
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<td>Limited Ad-hoc</td>
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### IT Challenges:

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Teradata Government Systems
What Is Active Enterprise Intelligence?

• **Active**
  > Better, faster decisions that drive actions
  > Responsive and agile

• **Enterprise**
  > Consistency – single view of the business
  > Scope – across appropriate business functions
  > Reach – new operational users, processes, and applications

• **Intelligence**
  > “Strategic” *Intelligence*, aligned to drive
  > “Operational” *Intelligence*
Active Enterprise Intelligence in Tax Administration

**Situation**

Multiple fraudulent refund claims are being filed by the same individual

**Problem**

Refunds are issued and redeemed prior to identifying fraud. Unable to recoup/collect.

**Solution**

Targeted, precision, dynamic downloads of refund claims that match potential fraudulent criteria for review prior issuance of refunds.

**Impact**

- Fraud is identified before refund is issued
- Increased efficiency
- No lost revenue
Real-Time Analytics

Accelerating Operational Decisions

- **Business event**
- **Data captured**
- **Intelligence delivered**
- **Action taken**

- **Value**
- **Time**

- **Data Latency**
- **Analytic Latency**
- **Decision Latency**

- **Opportunity**
- **Missed Opportunity**

- “Moment of Impact”
- Too late to take action

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Active Data Warehouse for Real-Time Analytics

Using what you already have in new ways!!

Real-Time Analytics

Enterprise Data Warehouse Historical Data Foundation

Operational Intelligence

Strategic Intelligence Foundation

Current data, Logical ODS

History, Logical marts Detail data

Using what you already have in new ways!!
Active Enterprise Intelligence

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<tr>
<th>Call Center</th>
<th>Customer Service</th>
<th>Performance Dashboard</th>
<th>Correspondence</th>
<th>Integrated Tax System Integration</th>
<th>Active Audit</th>
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### Operational Intelligence

### Strategic Intelligence

- Executive Management
- Department Management
- Outreach and Training
- Legislative

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**Active Enterprise Integration**

**Active Workload Management**

- **Active Access**
- **Active Events**
- **Active Data Loads**
- **Active Availability**

**Active Data Warehouse - Single Data Store for both Operational and Strategic Intelligence**

- Data Mining
- CAMS/Dashboard
- Ad Hoc Analysis
- Reporting
Active Intelligence Drives Business Value

Measures Key Performance Indicators

> Taxpayer Service Centers
  - Analyze call activities
  - Understand your customers

> Tax Return Processing
  - Number of tax returns filed
  - Type of returns filed
  - Large refund requests

> Collections
  - Aging of accounts
  - Analyze reasons for non-collectable accounts

> Compliance
  - Monitor productivity
  - Measure return on investment of compliance programs
  - Analyze reasons for non-compliance activity
Real-Time Enterprise Reference Architecture

**Service-Oriented Architecture**
SOA (Web Services)
- IBM WebSphere
- BEA WebLogic
- Microsoft
- Tibco BusinessWorks
- SAP NetWeaver
- Oracle

**Transactional**
- Transactional Services
  - Transactional Repositories
  - Transactional Services
  - Transactional Repositories
  - Transactional Services
  - Transactional Repositories

**Data Warehouse**
- Analytic & Decision Making Services
  - Analytic & Decision Making Repositories
  - Analytic & Decision Making Services
  - Analytic & Decision Making Repositories
  - Analytic & Decision Making Services
  - Analytic & Decision Making Repositories

**Business Process Automation**
- Business Process Automation
  - Business Process Automation
  - Business Process Automation
  - Business Process Automation

**Data Acquisition & Integration**
- Data Acquisition & Integration
  - Data Acquisition & Integration
  - Data Acquisition & Integration
  - Data Acquisition & Integration

**Legacy Environment**
- Legacy Environment
  - Legacy Environment
  - Legacy Environment
  - Legacy Environment

**Enterprise Users — (Browsers and/or Portal)**
- Enterprise Users — (Browsers and/or Portal)
  - Enterprise Users — (Browsers and/or Portal)
  - Enterprise Users — (Browsers and/or Portal)
  - Enterprise Users — (Browsers and/or Portal)

**WAN / VAN**
- WAN / VAN
  - WAN / VAN
  - WAN / VAN
  - WAN / VAN

**OLTP**
- OLTP
  - OLTP
  - OLTP
  - OLTP

**EDW**
- EDW
  - EDW
  - EDW
  - EDW

**C/S**
- C/S
  - C/S
  - C/S
  - C/S
Operational Impact
Integrating Business Intelligence into Operations

“Where” should we add analytics?

> Websites
> Operational dashboards
> Call Centers
> Portals & portlets
> Operational reports
> Customer touch points
> Kiosks & self service
> New SOA applications
> Workflows
Supporting an Operationalized Environment

**Operational Intelligence**
- Workflow & Applications
- Active Access
- Active Events

**Strategic Intelligence**
- Business Intelligence
- Tools and Applications

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**Active Enterprise Integration**
- Active Load
- Active Workload Management
- Active Availability

**Teradata Warehouse**
Active Enterprise Intelligence in Tax Compliance Administration

**Situation**
Compliance program identifies thousands of non-compliant tax returns year after year.

**Problem**
Limited resources to work the same type of leads year after year.

**Solution**
Analyze targeted criteria to determine the reasons for this specific non-compliance. Determine issues causing non-compliance (taxpayer education, change needed on return, rewrite instructions, issue flyer, is it a particular industry or geographical area?)

**Impact**
- Increased voluntary compliance
- Increased efficiency & productivity
- Increased taxpayer service
Workload Management
ADW: Mixed Workload Challenges

Ingest
Varying Priority

Streaming
695K rows/day

Batch loads
350M rows/day

Decision Support
Moderate to Low Priority

Reports
395K Queries/day

Queries

Real Time
High Priority

Web Site
300K-1M requests/day

Applications

Teradata

395K Queries/day

695K rows/day
Dynamic Workload Management

- Executive Director gets highest priority on his requests
- **Finance users get high priority between 8:00am and 10:00am and 1:00pm and 3:00 and then switch to low**
- Compliance queries that take longer than 10 minutes between 7:00am and 11:00am move to medium priority
- **User Randy gets high priority when running a compliance request**
- User Nicole gets low priority when running a compliance analysis report
- **User Darryl can run no more than 10 queries at a time between 8:00am and 6:00pm**
- Web and call center applications get high priority 24 hours a day
Workload Management

Number Of Incoming Queries

Reject Filter

Delay Throttle

Reject Throttle

Exception Reject

Outside Of SLA

Queries After Filters and Throttles

Exception Reclass
Business Intelligence Trends

- Companies are leveraging Business Intelligence (BI) solutions to gain a competitive advantage, increase revenue, and to streamline the business.

- Business users prefer to use familiar BI tools for self-service analytics but are also demanding a consistent view of data.

- Companies are seeking new ways to provide front-line workers with insight and actions to guide them with daily operational decisions.
Lessons Learned

- Drive BI implementation through **Business Process Innovation**
- Establish shared accountability between IT & Business - **Business Ownership of Data**
- Maintain ongoing **Executive Business Sponsorship** – at highest levels
- Align and integrate around a common / scalable technology architecture which supports **Business Analysis & Information Delivery** requirements
- Secure **Business Readiness** - a must and non-negotiable
- Execute in manageable phases – **Business Impact** via quick wins + long term efforts
“Perfection is not attainable, but if we chase perfection we can catch excellence.”
Thank You!
Self Service = Active Load + Web Services

Customer → “Where’s my check?” → CSR

250K queries /day

Oracle RAC → Staging Tables

Mainframe → ETL/ELT

Mini batch → WebSphereMQ

Active Data Warehouse

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