

# Driving Great Business Intelligence Through SAS and Teradata Integration: A Case Study



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Information Week 500

# Discover Financial Services

- Became independent/spun June 30, 2007. Began trading as an independent company July 2, 2007 (NYSE: DFS)
- DFS operates the Discover Card, America's cash rewards pioneer
- Discover Network with millions of merchants and cash access locations
- PULSE ATM/debit network with more than 260,000 ATMs, and serving over 4,500 financial institutions

# Discover Financial Services

- Leveraging SAS analytics throughout Risk Management, Marketing, Operations and the Network
  - Data mining (Enterprise Miner)
  - Risk modeling (Foundation tools like Base and STAT)
  - Forecasting (Forecast Server)
  - Business Intelligence (BI Server)
- Over 700 SAS/Teradata users with all levels of expertise
- Single “playground” of data for analytics

# Problem

- Adaptation - Darwin
- Vast proliferation of data files in disparate sources, with varying descriptions, definitions, accuracy and timeliness.
- No centralized repository for clean, reliable and consistent data as input to risk analytics and decisioning
- Slow time to market for analytic projects
- Non-technical analytic group (SQL)
- Objective: Improve Risk decision making
  - Timeliness
  - Accuracy
  - Quality & Consistency

# Challenges

## ■ Infrastructure

- Multiple data sources with high difficulty to access
- Model/Strategy time to market (10 to 14 weeks)
- Process inefficiency (data movement of large data sets)
- Integrating SAS and Teradata technologies

## ■ Culture

- Do everything in SAS
- Do everything in Teradata
- Non-technical analytic group
- Bridging established behaviors

# Approach:

## Phase 1 - Integrating Infrastructure

### Step 1: Consolidate and Integrate data for Risk analytics

- Systematically integrate frequently used subjects areas into the Teradata Warehouse
- Eliminated the need for multiple sources
- Easy to access

### Step 2: Improve Risk analytics process

- Survey and identify most frequently used predictive variables
- Fast tracked variables into the warehouse
- Automate refresh data

### Step 3: Repeat steps 1 & 2 with other subject areas

# Approach:

## Phase 2 - Evolving Culture

### Step 1: Usability survey

- Identified current and best practices
- Identified current skill set (SAS, SQL, SAS/SQL)

### Step 2: Education

- Objective: How to better leverage SAS and Teradata technologies together
- Trained 450 of the analyst community at startup
- Mandatory training for all users – “Buddy” system

### Step 3: Repeat for new subject area users

# Current Results

- Model development time reduced
  - Model development was reduced from 14 weeks to approximately 2 weeks
  - Time to market is now gaited by audit and review requirements, not by access and processing limitations
- Accelerated analytic model runtime
  - From 175 hours to 36 minutes
- Increased analytic output by 10-fold in 2007
- Plan to double analytic output over 2008

# Future: Phase 3 – Integrated Technologies

- Leverage SAS and Teradata in-database processing
  - Transparent optimization of key SAS analytic processes within the Teradata database engine
  - In-database scoring (where it makes sense) – “right time” scoring
  - Treating SAS and Teradata as a single managed environment
  - Continue to evolve infrastructure and cultural integration
- Integrated and holistic analytics and decisioning environment
- Continue to educate analytic group on best practices
- Add more functional areas to the data warehouse
- Continue to strive for zero latency of data

# Critical Success Factors

- Executive support
- Take an evolutionary approach
- Address cultural issues
  - Highly technical analyst group
- Vendor collaboration
- Deliver results
  - Katrina analysis
  - Subprime crisis
  - Don't rely on "gut" alone

# SAS and Teradata

## *Strategic Partnership Vision and Value*

### Partnership vision

- To create breakthrough customer value
  - True scalable analytic solutions
  - Improved time to value
  - Reduced technology infrastructure costs

#### Enhanced Performance

- Reduces analytic processing from 175 hours to 36 minutes

#### Enhanced Productivity

- Opportunity to redeploy 450 SAS analysts from data prep to customer and fraud analysis

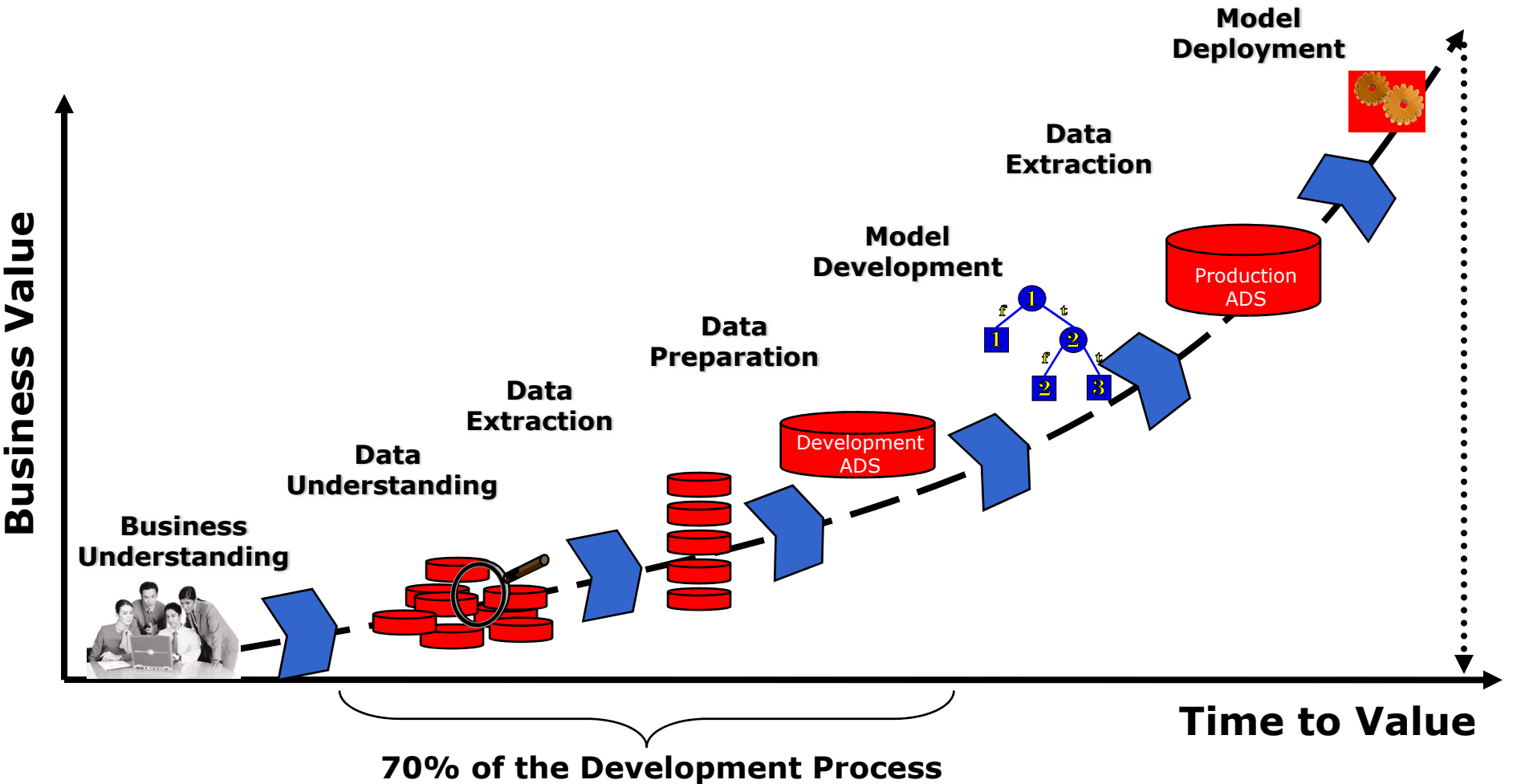
#### More Choice

- Reviewing new SAS BI opportunity with Teradata due to data integration and partnership

#### Lower TCO

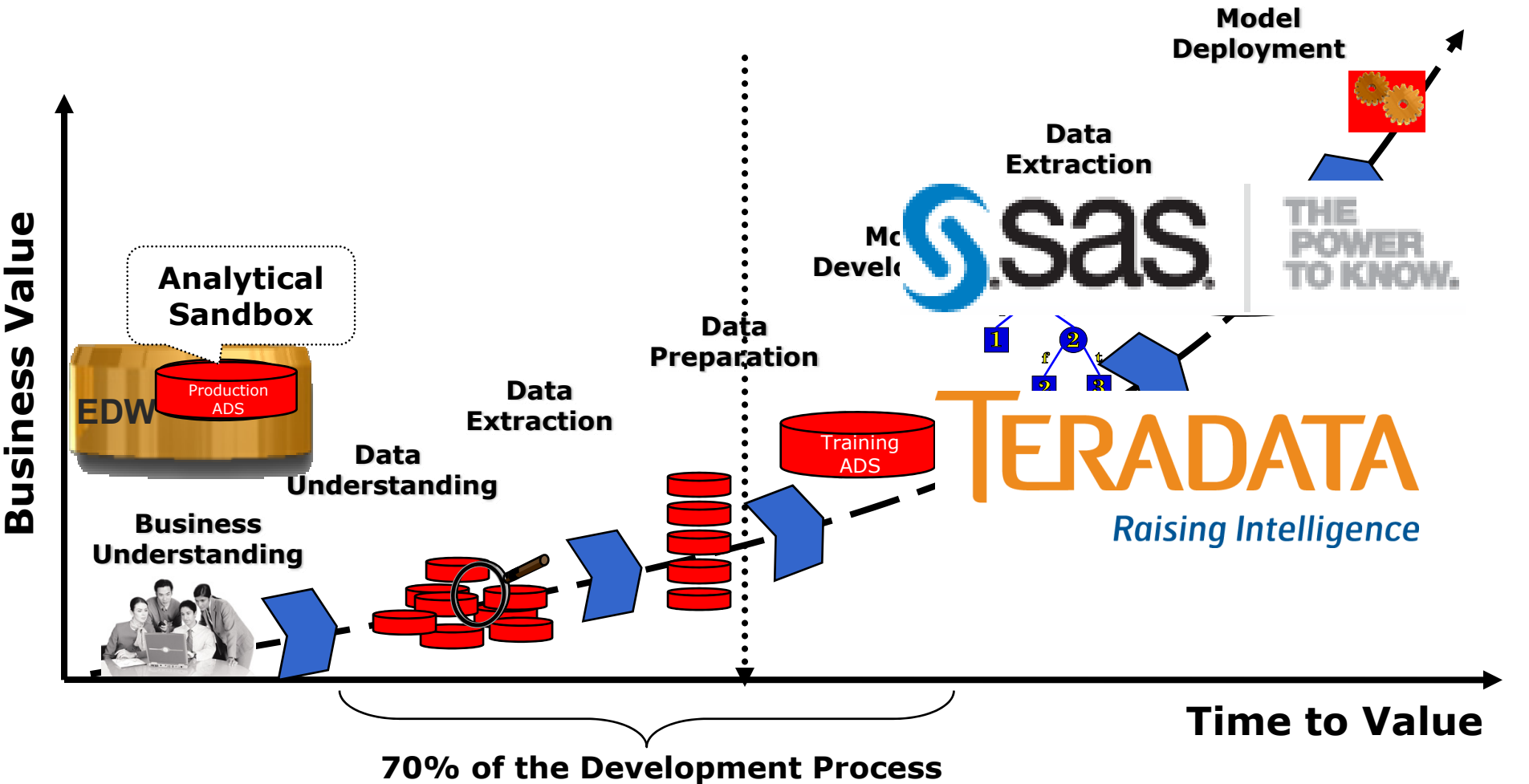
- Eliminates data redundancy and reduces IT costs by integrating SAS and Teradata

# Resource & Opportunity Costs - Analytical Process Chain



**Time to Build & Deploy Models:  
8 months**

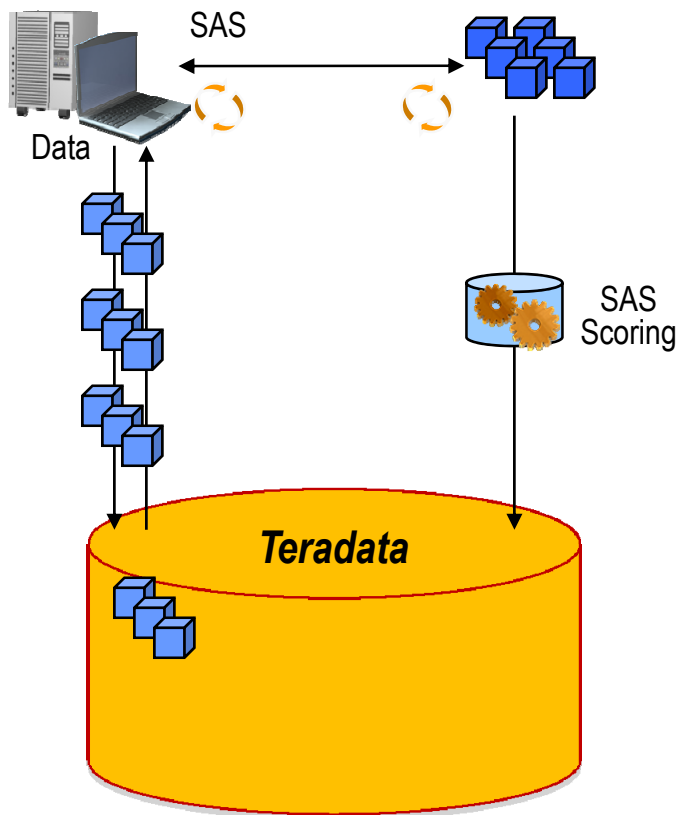
# Gain Agility, Speed and Quality - Leverage SAS and Teradata



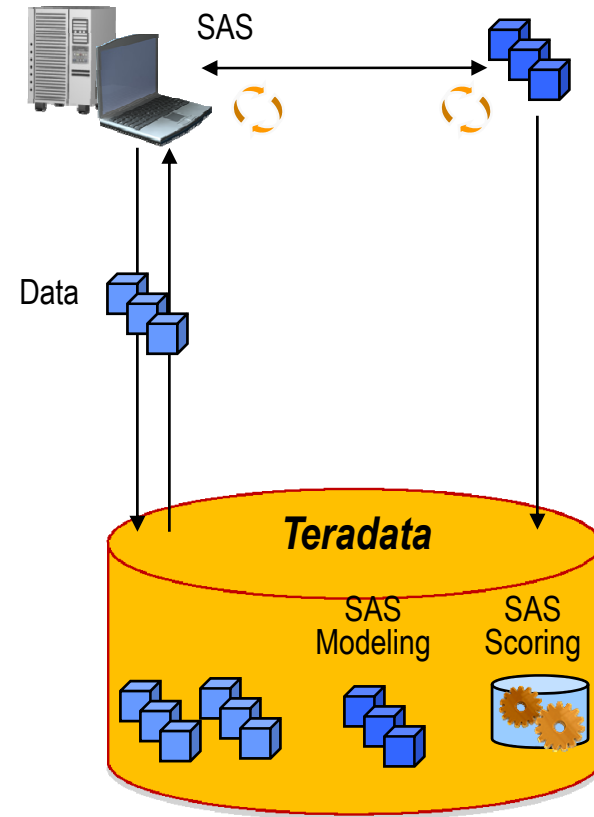
**Time to Build & Deploy Models:  
4 weeks !**

# Partnership Vision

## Conventional Processing



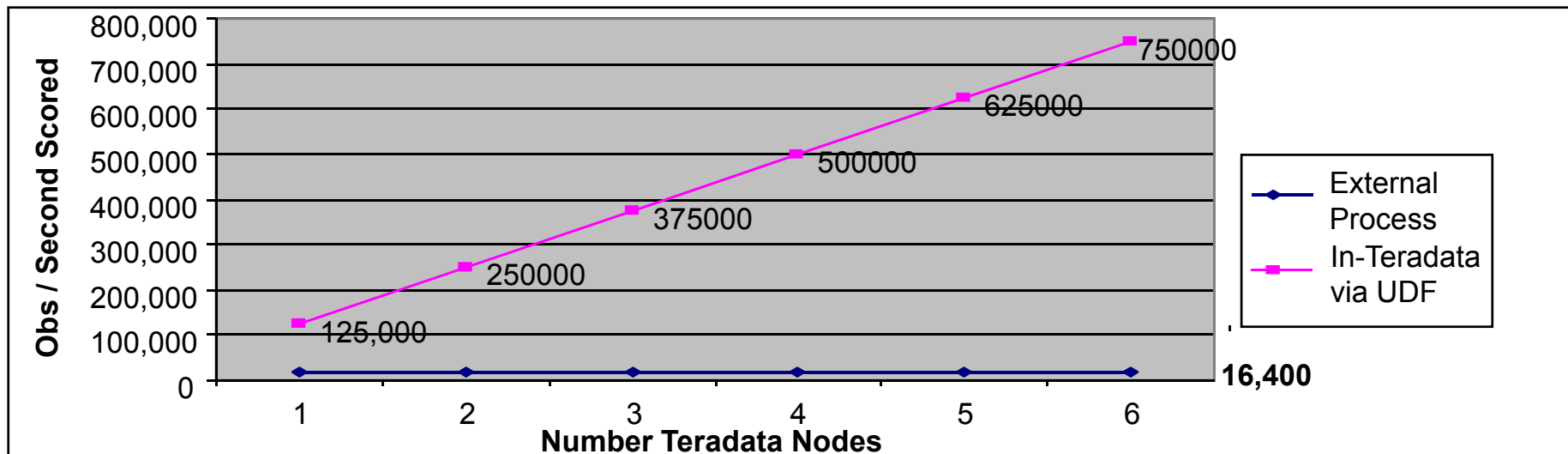
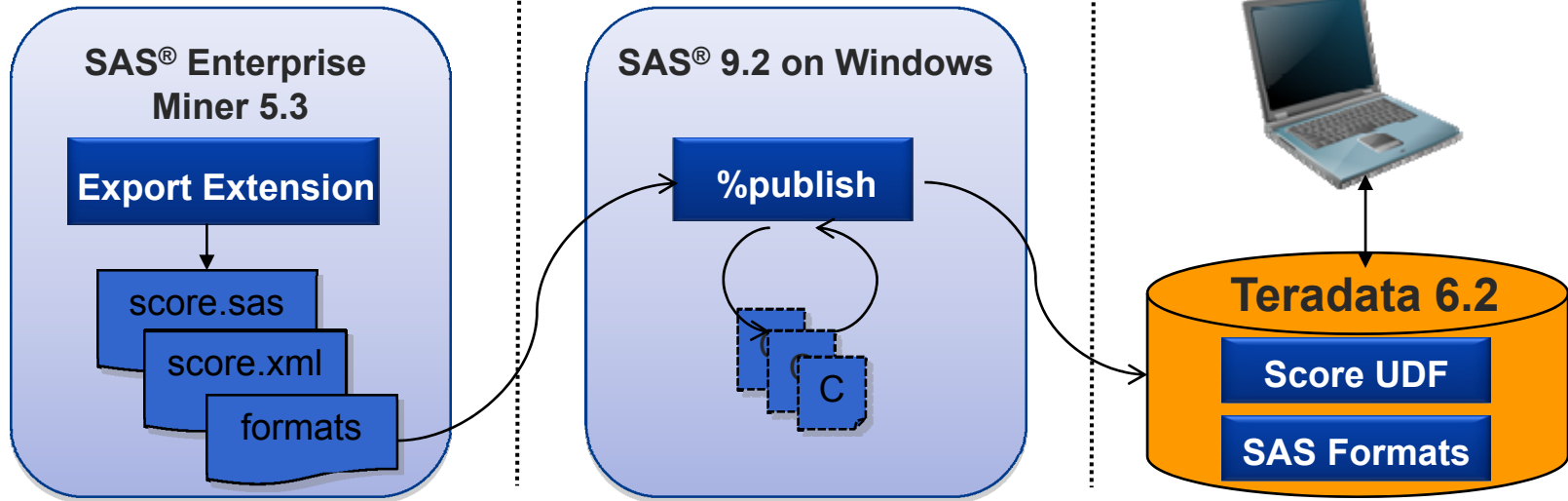
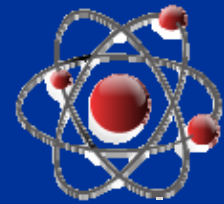
## In-Database Processing



# SAS Global Forum Announcement

- The new SAS<sup>®</sup> Scoring Accelerator for Teradata enables customers to translate scoring models created in SAS<sup>®</sup> Enterprise Miner into Teradata-specific functions to be executed directly within the Teradata environment.
- SAS' newest release of its Anti-Money Laundering solution also leverages SAS<sup>®</sup> In-Database capabilities for Teradata.

# SAS® Scoring Accelerator for Teradata



Initial Benchmark Results

# Coming Soon... Release 9.2



1. SAS Procedure running via SQL
  - Converting Proc Freq into Teradata SQL and pushed processing into Teradata
    - Before: Returned **9,000,000 rows**; Processing time: **55 seconds**
    - In-Teradata: Returned **51 rows**; Processing time: **2 seconds**
2. SAS functions (Format) as Teradata User Defined Functions (UDF)
  - Key data formatting functions pushed into Teradata via UDFs
3. SAS Stored Processes as Teradata Stored Procedures
  - SAS code callable as external stored procedures from SQL scripts
4. BI and Data Integration Suites Enhancements for database interoperability
5. Additional Solution Capability Utilizing in database processing and data

# Driving Great Business Intelligence Through SAS and Teradata Integration

Questions...

Thank you, Aldo Mancini  
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