

Teradata's Four-Phased Approach to Data Mart Consolidation

Quantifying the Value of Cost Savings

Data Mart Consolidation

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Executive Overview

In today's environment, it's no longer optional to have a single, enterprise-wide and integrated view of your data – it's mandatory. New regulatory requirements such as Sarbanes-Oxley, International Accounting Standards (IAS), or Anti-Money Laundering (AML) and Basel II Accords for financial institutions mandate that customer data across the enterprise be centralized, integrated, accurate, and auditable. Furthermore, increased demand for IT, in general, and data warehousing, in particular, to provide added business agility, centrality, and flexibility while at the same time significantly reducing expenditures, adds tremendous pressure to addressing data integration needs. On the one hand, IT and data warehousing groups are asked to do a lot more, and on the other, their investments are not only scrutinized, but also drastically reduced.

Data Mart Consolidation

To address the dilemma of doing more with less, a new trend has emerged around data and application consolidation. Data mart consolidation can be defined as the process of consolidating separate analytical databases and integrating not only the data they contain, but also the applications. This definition of data mart consolidation introduces the notion of a new architecture for data and applications, and eliminates the assimilation of this initiative to a simple exercise of server consolidation. Too often, data mart consolidation initiatives are pitched as a simple and shortsighted exercise of database combination. Even if server consolidation may be poised to deliver short-term cost relief, experience demonstrates that it cannot be an end in itself. First, consolidating servers and databases neither guarantees sustainability, nor allows further downstream cost reduction and business enhancement benefits. Second, for it to be financially beneficial, consolidation and integration require that an enterprise-wide, business-centric model is adopted. Too often, simply consolidating schema-based models will only yield suboptimal business benefits due to the persistence of data, process, and resource duplication.

This paper will analyze the root causes for data mart proliferation, the substantial cost structure data marts create, present a methodology for developing a data mart consolidation plan, and illustrate the potential cost savings and revenue

enhancement opportunities resulting from consolidating disparate data marts onto a single, enterprise-wide and integrated data warehouse.

Why Do Data Marts Proliferate?

There are several reasons why data marts are deployed in lieu of enterprise data warehouses. Justifications, some legitimate, others erroneous, for deploying and implementing data marts were low initial total cost of ownership, business user independence, IT-led investment choices as opposed to business-driven considerations, the belief that OLTP can be extended to decision-support, and the lack of proper data governance.

Relative System Price is Equal to Total Cost of Ownership

Many companies used to focus on a relative system price (such as hardware, software, licenses, and maintenance agreements) to make investment decisions. They typically draw a correlation between system price and total cost of ownership. From that perspective, the belief was that the implementation cost of a data mart, which varies from \$1M to several million dollars depending on the size and complexity of the data and subject area coverage, was equivalent to actual total cost of ownership (TCO). In the past few years, many companies that followed this approach came to realize

that the actual cost to support and maintain a data mart is much higher than the initial price tag. According to industry research, the average cost to support and maintain a data mart is more than \$1 million. AMR Research states, “The cost to maintain a data mart is between \$1M and \$2M. These costs include multiple Extraction, Transformation, and Loading (ETL) processes, software licenses and maintenance, storage and server hardware, and personnel. Between **35% and 70%** of these costs are **redundant** across data marts.”¹

These figures are very consistent with the experience of Teradata Corporation. There are data marts with a TCO of more than \$20M per year, while others cost only a few hundred thousand dollars per year, but on average this figure holds true. The Teradata Business Value Consulting Team has conducted more than 100 data mart consolidation assessments over the past three years across various industries, and corroborates the \$1M to \$2M figure for TCO.

The other interesting finding is that this strategy of deploying analytical databases and applications in silos can only work for a limited time. Once data marts start proliferating, the cost issue becomes uncontrollable. Prior to consolidating on Teradata solutions, some customers had allowed data mart growth to spiral out-of-control, and found themselves spending tens to hundreds of millions dollars supporting these environments.

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IT-Led Implementations and Belief of Extensibility of Online Transaction Processing to Decision Support Systems

Too often, data marts are deployed as a response to business users' demand for specific application requirements. In this approach, IT makes a technology investment based on current technology requirements, and implements online transaction processing (OLTP), application-centric data marts.

Major problems start arising when changes to the initial implementation occur. In this approach, technical criteria are driving the implementation, not end-user requirements. Every time a change is required, one of two things will typically happen. Either a new data mart will have to be created to accommodate the unexpected change, or business users will get frustrated due to the length of time required to implement the proposed change. In both cases, time, cost, and complexity will be inhibitors.

Since the vast majority of data marts are application-specific, they lack the required flexibility for expansion. Also, the belief that OLTP can easily be expanded to DSS is as technologically challenged as it is prohibitively expensive.

Several attempts to consolidate separate analytical databases onto a centralized OLTP data warehouse have failed due to a combination of the following:

- > Inability of the data warehouse to load without shutting down or experiencing serious performance problems.
- > Impossibility to handle increased and complex workloads comprising tactical and strategic queries without dramatic performance degradation.
- > Inability to handle the data mart users without hampering service level agreements.

When one or more of these requirements is violated, companies will typically start recreating data marts or adding intermediary layers. A customer for whom Teradata recently performed a data mart consolidation assessment had been provided a bandage solution consisting of creating an intermediary structure called 'Super Mart.' Adding such a layer did not address the customer's fundamental architecture deficiency, and added not only complexity to the data mart environment, but helped fuel significant cost increases. The customer concluded that OLTP architectures were not appropriate for decision support, and could only result in generating additional complexity and costs.

Lack of Proper Data Warehousing Governance

Data governance consists of the policies and procedures that address discrepancies regarding which data elements do or should belong in the warehouse, the ownership of resources, data definition reconciliation (metadata), and which individuals can access the repository of knowledge represented in the data warehouse.

Due to lack of governance processes, many application systems were developed as stovepipes of information. The result is that the same terms are now used for different information (e.g., net revenue or volume, with or without various adjustments), or different terms are used for the same information.

Resolving these differences is not trivial since numerous business processes in the different stovepipes depend on their own definition of the information. Governance requires active participation from both the business and IT communities. Data rich enterprises must create an organization and governance structure wherein business and IT are integrated and can monitor that the data policies, procedures, and standards are met.

Despite the low initial investment required to implement a data mart, annual operating costs, (i.e., support and maintenance costs) are higher and become prohibitive when there are multiple instances running in a company.

Historically, data marts were implemented as tactical, point solutions to address specific business needs. The relative affordability of data marts often made them more compelling. The entry price for deploying a single application and/or subject area data mart and the perception that enterprise-wide data warehouses were more expensive and less risky have made data marts attractive solutions.

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The Teradata Approach to Solving Data Mart Proliferation: Data and Application Consolidation and Integration

To understand the numerous problems created by data mart proliferation, and evaluate the benefits of consolidating and integrating analytical silos (e.g., databases and applications), Teradata has developed a unique service offering called the Data Mart Consolidation Assessment. This analysis is based on a four-phase approach to inventory, analyze, prioritize, and cost justify the consolidation of targeted data marts.

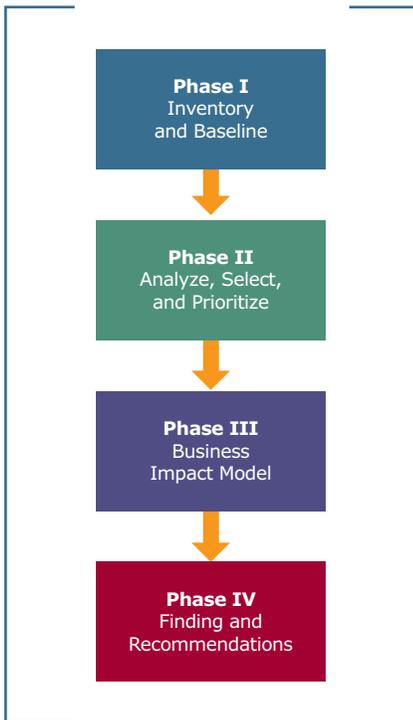


Figure 1 – Four-part phase approach to inventory, analyze, prioritize, and cost justify consolidating targeted data marts.

Phase I: Inventory and Baseline

Typically, during this phase, a series of interviews is conducted covering the business, technical, and financial (i.e., cost, revenue, and margin) aspects of the data warehouse/data mart environment. The Inventory and Baseline phase consists of nine sections:

- > Data Mart Business Direction and Rationale
- > Data Mart Business Requirements
- > Data Mart Profile
- > Technology (Hardware and Software)
- > Data Sources and Processes
- > Specific Database Demographics (RDBMS, Size)
- > Functions and Applications (User Groups, Business Functions)
- > Annual Support Costs
- > Other Annual Operational Costs

The purpose of this phase is to gather information about the current data mart environment. During this phase, data marts are physically counted (including analytical databases and applications), relevant cost metrics are gathered, business ownership is determined, technical characteristics are collected, and a picture of the company’s data warehousing strategy is taken. To determine actual annual operating spend, Teradata has developed a list of cost drivers. The cost drivers represent the cost of the various activities required to run and maintain a data mart/data warehouse

environment. The list identifying all relevant cost pools is technology agnostic, and really focuses on establishing baseline cost metrics for comparison and analysis purposes. Figure 2 is a comprehensive listing of these cost drivers.

- 1. Hardware**
Acquisition Cost if not “Sunk”
License Fees
Upgrades
Maintenance Agreements
External Customer Support
Depreciation Expense
Number of FTEs and Salaries
Data Center Department
- 2. Software**
Acquisition Cost if not “Sunk”
License Fees
Upgrades
Maintenance & Subscription Fees
External Customer Support
Number of FTEs and Salaries
Data Center Department
- 3. Network**
Acquisition and/or Expansion Cost
- Hardware
- Software
Maintenance Expense and Subscriptions
Number of FTEs and Salaries
Data Center and Department
- 4. Extract/Transform/Load (FTEs)**
Acquisition and/or Expansion Cost
Operational to DSS
Execute/Monitor
Maintain/Modify
DSS to Analysis Platform
Execute/Monitor
Maintain/Modify
- 5. Database Support (FTEs)**
ETL DBAs
Access/Qry Tuning DBAs
Business Requirements (DAs)
- 6. Business Support (FTEs)**
(Requirements Support)
Definition
System Modifications
Data Quality/Cleansing
- 7. Analytical Tool Support**
Software Purchase
Software License Fees
Support Costs (Salaries)
- 8. Other Development Costs**
- 9. Internal/Interdepartmental Charges**
- 10. Outside Contracting Costs**
Outsourcing Contracts
Specific/Targeted Support

Figure 2 – List of cost drivers.

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The key objective is to understand what core activities are performed and then to identify a set of cost definitions for each activity. The Teradata Business Value Consulting Team is often asked to assist in identifying these cost metrics, as most companies are unable to do so. One of the main barriers to getting an accurate budgetary picture of actual spend relates to the dissemination of these components across multiple P&L and cost centers.

Usually, one area of a company is responsible for all hardware and software expenses, while another is in charge of ETL or data quality. Having disseminated P&Ls makes it extremely difficult to know how much is spent annually to support and maintain each data mart.

Teradata's Data Mart Consolidation Questionnaires will assist in collecting and aggregating the various cost buckets into a meaningful budgetary metric.

Let's use an actual customer example to help illustrate this. A Teradata Data Mart Consolidation customer had a distributed architecture comprising a hub data warehouse, a staging environment, and eight satellite data marts. Upon completion of the questionnaires and the gathering of cost data, Teradata Business Value Consulting was able to show that this customer was spending more than \$22 million dollars annually to support, maintain, and

Role/System	Total Allocated Headcount	Staging	Hub DW	DM #1	DM #2	DM #3	DM #4	DM #5
Data Warehouse Organization								
Relationship Management	2.00	0.29	0.29	0.29	0.29	0.29	0.29	0.29
Special Projects	1.00	0.14	0.14	0.14	0.14	0.14	0.14	0.14
Release Management Process	3.00	0.43	0.43	0.43	0.43	0.43	0.43	0.43
Release Management	4.60	1.00	1.00	0.52	0.52	0.52	0.52	0.52
Project Management	2.00	0.33	0.33	0.33	0.33	0.33	0.33	0.00
Financial Analysis	4.00	0.57	0.57	0.57	0.57	0.57	0.57	0.57
Development – Data Acquisition	11.50	5.75	5.75	0.00	0.00	0.00	0.00	0.00
Development – Data Delivery	8.50	0.00	0.00	2.83	1.42	2.83	1.42	0.00
Development – Architecture	2.00	0.29	0.29	0.29	0.29	0.29	0.29	0.29
Quality Assurance/Testing	4.00	1.33	1.33	1.33	0.00	0.00	0.00	0.00
User Tech Support	1.00	0.14	0.14	0.14	0.14	0.14	0.14	0.14
Security Administration	1.00	0.14	0.14	0.14	0.14	0.14	0.14	0.14
Data Reconciliation/Quality	7.40	3.70	3.70	0.00	0.00	0.00	0.00	0.00
Metadata	4.00	0.67	0.67	0.67	0.67	0.67	0.67	0.00
Logical Data Modeling	2.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00
Customer Analytics	5.00	0.00	0.20	0.20	0.20	0.20	0.20	4.00
Production Reporting/Ad-hocs	5.00	0.00	1.67	1.67	0.00	0.00	0.00	1.67
Client Support Services	2.00	0.29	0.29	0.29	0.29	0.29	0.29	0.29
Data Warehouse Manager	1.00	0.14	0.14	0.14	0.14	0.14	0.14	0.14
Total Data Warehouse Org	71.00	15.21	19.08	9.98	5.57	6.98	5.57	8.62
Global Technology Services								
UNIX Administrator	3.00	0.43	0.43	0.43	0.43	0.43	0.43	0.43
Database Administrator	4.00	0.67	0.67	0.67	0.67	0.67	0.67	0.00
Logical Data Modeler	2.00	0.00	0.00	0.50	0.50	0.50	0.50	0.00
Total Global Technology Svcs	9.00	1.10	1.10	1.60	1.60	1.60	1.60	0.43
Production Operations								
Production Schedule Support	0.00	\$ -	\$ -	\$ -	\$ -	\$ -	0.00	0.00
Total Production Operations	0.00	\$ -	0.00	0.00	0.00	0.00	0.00	0.00
Total FTE Support Allocations	80.00	16.31	20.17	11.58	7.16	8.58	7.16	9.04

Figure 3 – FTE Support



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manage this environment. On average, the annual support and maintenance cost per analytical database instance was \$2.2 million. During the Inventory and Baseline phase, the Teradata team was able to collect the information in Figure 3 regarding the data marts.

Figure 4 shows non-FTE annual support and maintenance costs (such as licenses, maintenance, subscriptions, and allocations) derived using several allocation methods.

After analyzing these data marts, we concluded that six environments were good candidates for immediate consolidation, while the remaining four would be re-examined later.

Phase II: Analyze, Select, and Prioritize the Data Marts

The Analysis and Prioritization phase consists of a joint development of the technical, business, and financial criteria for establishing which data marts are optimal consolidation candidates and in what order consolidation should occur. Criteria are driven by the financial metrics, technical suitability, and business impact. The technical aspects included criteria such as security, network connectivity, data structures, software tools, availability requirements, and process requirements. The business impact includes rationale and requirements gathered from Phase 1.

To select candidate data marts/data warehouses, Teradata uses a process and methodology called a Decommissioning Strategy. The Decommissioning Strategy allows for the evaluation of multiple requirements such as technical characteristics, financial and cost metrics, business imperatives, legal, and organization/political considerations to select optimal environments for consolidation. It then prioritizes them for decommissioning over time.

A key driver behind consolidation is the recognition that there are multiple factors that can either enhance the urgency of the consolidation of a particular data mart, or inhibit it. In other words, a

Environments	Option #1 Total Cost Allocation (Separate Power/ Disk Ratios)	Operation #2 Total Cost Allocation (Based on Relative Number of Processors to Total Annual Cost)	Operation #3 Total Cost Allocation (Based on Relative Attached Storage to Total Annual Cost)	Computed Average Across All Options	Consolidation Candidate (Yes or No)	DW and DM Platform
Staging	\$1,369,385	\$1,362,016	\$1,254,052	\$1,328,485	No	Informix XPS
Hub DW	\$2,270,054	\$1,945,738	\$2,138,358	\$2,118,050	Yes	IBM Mainframe
DM #1	\$1,218,820	\$972,869	\$1,364,189	\$1,185,292	Yes	Oracle 8i
DM #2	\$977,952	\$778,295	\$987,180	\$914,476	Yes	Oracle 8i
DM #3	\$328,911	\$583,721	\$226,087	\$379,573	Yes	IBM EEE
DM #4	\$264,462	\$194,574	\$284,452	\$247,829	Yes	Oracle 8i
DM #5	\$659,880	\$778,295	\$884,305	\$774,160	Yes	Oracle 9i
DM #6	\$103,224	\$194,574	\$14,738	\$104,179	No	MSFT SQL
DM #7	\$285,111	\$486,434	\$312,673	\$361,406	No	Sybase IQ
DM #8	\$13,290	\$194,574	\$25,055	\$77,640	No	MSFT SQL
Totals	\$7,491,090	\$7,491,090	\$7,491,090	\$7,491,090		

Figure 4 – Non-FTE Annual Support and Maintenance Costs

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strong data mart consolidation approach should consider all relevant opportunities and barriers prior to selecting any particular environment. This will ensure alignment between IT and the users, funding availability, and a realistic implementation roadmap.

To help make these decisions, we capture the relevant parameters in a prioritization matrix called the Data and Application Consolidation Matrix. Teradata uses key opportunity factors ranked using a five-point scale.

A score of one indicates that a particular factor is poised to deliver significant, immediate improvements across this dimension while a score of five would indicate negligible or no benefit. Also, opportunity factors are weighted according to their relative importance in the consolidation motion. This weighting might be different for different clients and

may significantly affect the decommissioning strategy. The goal is to avoid looking at each value-driver in isolation and consider all opportunity factors multi-dimensionally, interdependently, and holistically. In other words, a data mart might be considered for immediate consolidation even though it might score high on a variety of factors. When the weighted scores are determined, the lower the score, the more immediate should be the consolidation, all other things held constant.

Figure 5 is an illustration of Teradata's Data and Application Matrix as applied to this customer example.

Current HW/SW Operational Costs represents the annual expenditure required to support and maintain hardware and software. A score of one is assigned if the client is spending more than \$2 million annually, while a score of five is attributed for annual spend less than \$250,000.

Everything else held constant, each score reflects the relative benefits that can be expected. The score of one for the Hub data warehouse here not only indicates this client spending a lot on hardware and software operations, but also that it would be relatively easy to generate substantial cost reduction from this metric. Let us illustrate. Saving 10% of \$3M, or \$300K, has a lot more impact to the bottom line than saving 10% of \$200K, or \$20K.

While some dimensions are quantitative in nature (Annual FTE Allocation Costs, Current H/W and S/W Operational Costs, and Potential Business Benefits), others are more qualitative. Ease of Migration, for example, is defined as follows for this client:

1. Significant degree of duplication and/or **all** physical data structures moved as is into a centralized environment.
2. Major degree of duplication and/or **most** other data structures moved as is into centralized environment.

Opportunity Factor	Assigned Weight	Staging Environment	Hub DW	DM#1	DM#2	DM#3	DM#4	DM#5	DM#6	DM#7	DM#8
Current HW/SW Operational Costs	10%	4	1	1	2	2	2	2	4	4	4
Current FTE Count Redeployment	10%	4	1	1	2	1	1	2	4	3	4
Data Governance	15%	4	1	1	2	2	3	2	3	3	3
Subject Area Overlap	5%	2	1	3	3	1	2	2	3	3	5
Ease of Migration	10%	3	1	2	2	3	4	3	3	3	4
Internal Organization Factors	5%	3	1	2	3	2	3	2	4	5	4
Dependent Application Factors	10%	2	2	1	1	2	2	3	5	5	4
Performance Considerations	10%	3	1	1	2	2	3	2	5	4	4
Potential Business Benefit	5%	2	1	2	1	2	2	2	3	4	5
Data Redundancy	5%	3	1	1	2	1	2	2	5	4	3
Data Gaps	5%	3	2	1	2	1	2	1	4	5	4
Roadmap Considerations	5%	2	1	1	2	1	3	2	5	4	4
Business Control	5%	1	1	1	2	2	2	1	3	3	5
Overall Feasibility Score	100%	3.00	1.15	1.30	1.95	1.80	2.45	2.10	3.90	3.75	3.95

Figure 5 – Teradata's Data and Application Matrix Example

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3. Moderate degree of duplication and/or **only certain** data structures moved as is into centralized environment.
4. Minimal data duplication and/or a **large** amount of data modeling are required to move data into centralized environment.
5. No data duplication and/or a **significant** amount of data modeling are required to move data into centralized environment.

As these two score definitions illustrate, some of the rankings use explicit and quantitative measures (current annual operational costs), while others rely on softer and more qualitative metrics (e.g., degree of duplication.) Additionally, the column indicating the Assigned Weight is client-specific. This value is usually determined through discussions and interactions with senior management, and reflects the relative importance put on the selected dimensions/opportunity factors. Note that not all opportunity factors have to be selected. Teradata recommends selecting the dimensions that are more relevant for each client. The larger the percentage, or weight, the more significant the opportunity factor will be in the ultimate score.

The purpose of the weighting itself is to provide direction as to the relative contribution each candidate data mart makes to the overall effectiveness of the consolidation effort. The lower the score, the more urgent it is to consolidate a data mart.

Urgency and financial desirability are evaluated interdependently across all data marts. Additionally, the weighted scores give some insight into how many phases will be required to complete the consolidation, how long each phase should take to complete, and to what extent the phases might overlap.

Finally, for this client, the cutoff score for a particular environment to be candidate for a consolidation was calculated to be 2.5. In other words, all environments with a score less than or equal to 2.5 would be deemed good candidates for decommissioning, while those with scores higher than 2.5 would need to be either postponed to a later date or excluded from the consolidation project. For this client, the current hub data warehouse and data marts one through five were selected for immediate decommissioning evaluation while the Staging environment and data marts six, seven, and eight were excluded, at least initially, from the scope of the consolidation initiative.

Phase III: Business Impact Modeling Phase

Teradata's Business Impact Modeling methodology evaluates the financial merits of data warehouse and analytical solution investments based on the after-tax and incremental cash flows generated. Value can be determined using cost savings or revenue enhancement opportunities, depending on customer requirements.

The Teradata Business Value Consulting Team typically forecasts these benefits over three, four, or five years, depending upon customer preferences.

For this client, we forecast the cost benefit to be expected from consolidating the six environments selected for possible decommissioning. One of the key features of Teradata's Business Value Consulting methodology is its flexibility. It allows for the analysis of the financial impact regardless of whether or not the customer owns the asset outright (i.e., buy vs. lease). Obviously, leasing and owning will have different implications. Typically, a data mart that has a lease on it will be more difficult to cost justify due to the contractual nature of the underlying obligation. Unless the asset can be redeployed elsewhere in the organization, the lease payment will act as a 'sticky cost' or barrier to consolidation, until the lease expires. At that time, the cost stickiness would be lifted, as this lease will not have to be renewed after its expiration date.

To present a complete and accurate financial picture of the cost benefits of consolidating the six data environments, The Teradata Business Value Consulting Team uses scenario analysis. This will allow for the depiction of the cost savings from multiple perspectives. In this example, the client and Teradata agreed to evaluate three distinct scenarios: conservative, moderate, and aggressive.

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The conservative scenario is based on a very modest support and maintenance headcount redeployment. This scenario relies on more support staff than necessary, which will tend to underestimate the cost savings since it will, in effect, over inflate the cost structure of the consolidated environment.

The aggressive scenario portrays the CFO's view of the world, which is an economically optimal level of staffing for the consolidated data warehouse. By relying on the minimal level of support, this scenario is built around a lower level of support and maintenance FTEs, and will, therefore, deliver higher cost savings.

The moderate scenario is a compromise between the conservative and aggressive scenarios, and represents a consensual, agreed upon, baseline target for investment purposes. It is noteworthy to point out that the FTE redeployment assumptions of the aggressive scenario are conservative based on Teradata's experience. Several Teradata customers that have consolidated data marts have seen their support and maintenance costs decrease by more than 50%. Bank of America, for example, was able to reduce operational spend from \$11 million per year to \$4 million, a 64% efficiency gain, after consolidating its IBM DB2 mainframe onto Teradata® Database.

Figure 6 shows a sample of the cash flow analysis performed for the actual client used as an example in this white paper.

Note that sticky costs reflect unexpired leases. In this customer example, the average remaining life of a lease was two years. To account for the fact that these leases represent contractual payment obligations until their expiration, the analysis took out 50% of the lease payment in the first two years. The reason 50%, and not 100%, of the lease obligation was taken out reflects the fact that the assessment concluded that at least 50% of the leased assets could be redeployed elsewhere in the organization. The net impact of the redeployment is to lift the payment constraint on some of these leases. In other words, the only marginal expense one would have to account for is that of the asset that cannot be redeployed. This unavoidable expense is labeled as sticky cost.

The analysis reveals that consolidating the six selected environments (hub data warehouse and five satellite data marts) will result in net pre-investment operating savings ranging from \$5 million (conservative scenario) and \$7.5 million (aggressive scenario), with the median (moderate scenario) being \$5.7 million per year. The operational cost savings delivered by the Teradata consolidated and integrated data warehouse represent 36% of the current, pre-consolidation spend.

This figure is at the low end of the savings spectrum (50% according to Teradata's experience) due to the conservative nature of the forecast.

The net after-tax cash flow savings, which include the required investment, varies from \$6.7 million (conservative scenario) to \$12.7 million (aggressive scenario) as measured by Net Present Value (NPV).

As this customer example illustrates, consolidating a set of disparate analytical databases and applications, or data marts, onto a Teradata solution, can deliver significant cost savings. The economies of scale pale, however, in comparison to the business benefits organizations will enjoy. Gartner Group estimates that while the savings resulting from consolidating data marts onto an application-neutral data warehouse will not only deliver "at least 50% cost savings," but also increased "business value will be at least 500%," or ten times the amount of savings.

Phase IV: Finding and Recommendations

Based on the analysis we conducted and the results of the sensitivity analysis performed on the variables in the base case, the conservative and aggressive scenarios, the assessment recommended the client move forward with the consolidation initiative. Furthermore, the study suggested the client measure the impact from the implementation of the consolidation initiatives by establishing the proper metrics prior to

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P & L and Cash Flow Statement	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Cumulative
Current Technology Architecture								
FTE Related Costs								
Enterprise Data Warehouse	\$3,076,506	\$3,168,801	\$3,263,865	\$3,361,781	\$3,462,635	\$3,566,514	\$19,900,102	
Data Mart #1	\$1,765,514	\$1,818,480	\$1,873,034	\$1,929,225	\$1,987,102	\$2,046,715	\$11,420,070	
Data Mart #2	\$1,091,973	\$1,124,732	\$1,158,474	\$1,193,228	\$1,229,025	\$1,265,896	\$7,063,326	
Data Mart #3	\$1,308,014	\$1,347,255	\$1,387,672	\$1,429,303	\$1,472,182	\$1,516,347	\$8,460,773	
Data Mart #4	\$1,091,973	\$1,124,732	\$1,158,474	\$1,193,228	\$1,229,025	\$1,303,872	\$7,101,303	
Data Mart #5	\$1,379,181	\$1,420,556	\$1,463,173	\$1,507,068	\$1,552,280	\$1,598,849	\$8,921,108	
Total Annual FTE Spend	\$9,713,161	\$10,004,555	\$10,304,692	\$10,613,833	\$10,932,248	\$11,298,192	\$62,866,681	
Non-FTE Related Costs (Leases, Maintenance,...)	\$5,619,380	\$5,619,380	\$5,619,380	\$5,619,380	\$5,619,380	\$5,619,380	\$33,716,283	
Less: Sticky Costs	(\$2,809,690)	(\$2,809,690)	\$0	\$0	\$0	\$0	(\$5,619,380)	
Total Relevant Budget	\$12,522,851	\$12,814,246	\$15,924,073	\$16,233,213	\$16,551,628	\$16,917,573	\$153,830,265	
Proposed Teradata Architecture								
FTE Related Costs								
Conservative Scenario	\$7,425,661	\$7,648,430	\$7,877,883	\$8,114,220	\$8,357,647	\$8,608,376	\$48,032,217	
Moderate Scenario	\$6,663,161	\$6,863,055	\$7,068,947	\$7,281,016	\$7,499,446	\$7,724,429	\$43,100,054	
Aggressive Scenario	\$4,985,661	\$5,135,230	\$5,289,287	\$5,447,966	\$5,611,405	\$5,779,747	\$32,249,297	
Non-FTE Related Costs								
Annual Maintenance and Subscription Expense	\$1,120,000	\$1,120,000	\$1,120,000	\$1,120,000	\$1,120,000	\$0	\$5,600,000	
Annual Customer Service Expense	\$185,000	\$185,000	\$185,000	\$185,000	\$185,000	\$185,000	\$1,110,000	
H/W Depreciation and S/W Amortization	\$1,120,000	\$1,120,000	\$1,120,000	\$1,120,000	\$1,120,000	\$1,120,000	\$6,720,000	
Total Non-FTE Related Costs	\$2,425,000	\$2,425,000	\$2,425,000	\$2,425,000	\$2,425,000	\$1,305,000	\$136,811,568	
Total Teradata Ongoing Support Costs								
Conservative Scenario	\$9,850,661	\$10,073,430	\$10,302,883	\$10,539,220	\$10,782,647	\$9,913,376	\$61,462,217	
Moderate Scenario	\$9,088,161	\$9,288,055	\$9,493,947	\$9,706,016	\$9,924,446	\$9,029,429	\$56,530,054	
Aggressive Scenario	\$7,410,661	\$7,560,230	\$7,714,287	\$7,872,966	\$8,036,405	\$7,084,747	\$45,679,297	
Consolidation Investment Costs								
Teradata Hardware & RDBMS Investment	(\$5,600,000)							
Application Software	\$0							
Professional Services	(\$1,360,000)							
Other Costs (Training, Installation, Education,...)	(\$200,000)							
Total Investment	(\$7,160,000)							
Pre-Tax Operating Savings								
Conservative Scenario	\$2,672,190	\$2,740,815	\$5,621,189	\$5,693,993	\$5,768,982	\$7,004,197	\$29,501,367	
Moderate Scenario	\$3,434,690	\$3,526,190	\$6,430,125	\$6,527,198	\$6,627,182	\$7,888,143	\$34,433,529	
Aggressive Scenario	\$5,112,190	\$5,254,015	\$8,209,785	\$8,360,247	\$8,515,223	\$9,832,825	\$45,284,287	
Federal Income Tax Expense								
Conservative Scenario	(\$908,545)	(\$931,877)	(\$1,911,204)	(\$1,935,958)	(\$1,961,454)	(\$2,381,427)	(\$10,030,465)	
Moderate Scenario	(\$1,167,795)	(\$1,198,905)	(\$2,186,243)	(\$2,219,247)	(\$2,253,242)	(\$2,681,969)	(\$11,707,400)	
Aggressive Scenario	(\$1,738,145)	(\$1,786,365)	(\$2,791,327)	(\$2,842,484)	(\$2,895,176)	(\$3,343,161)	(\$15,396,657)	
After-Tax Operating Results								
Conservative Scenario	\$1,763,646	\$1,808,938	\$3,709,985	\$3,758,036	\$3,807,528	\$4,622,770	\$19,470,902	
Moderate Scenario	\$2,266,896	\$2,327,286	\$4,243,883	\$4,307,951	\$4,373,940	\$5,206,175	\$22,726,129	
Aggressive Scenario	\$3,374,046	\$3,467,650	\$5,418,458	\$5,517,763	\$5,620,047	\$6,489,665	\$29,887,629	
Plus: Depreciation Expense	\$1,120,000	\$1,120,000	\$1,120,000	\$1,120,000	\$1,120,000	\$0	\$5,600,000	
Net Cash Flow of the Data Mart Consolidation Project								
Conservative Scenario	(\$7,160,000)	\$2,883,646	\$2,928,938	\$4,829,985	\$4,878,036	\$4,927,528	\$4,622,770	\$17,910,902
Moderate Scenario	(\$7,160,000)	\$3,386,896	\$3,447,286	\$5,363,883	\$5,427,951	\$5,493,940	\$5,206,175	\$21,166,129
Aggressive Scenario	(\$7,160,000)	\$4,494,046	\$4,587,650	\$6,538,458	\$6,637,763	\$6,740,047	\$6,489,665	\$28,327,629
Cumulative Cash Flow of the Data Mart Consolidation Project								
Conservative Scenario	(\$7,160,000)	(\$4,276,354)	(\$1,347,416)	\$3,482,568	\$8,360,604	\$13,288,132	\$17,910,902	\$30,258,436
Moderate Scenario	(\$7,160,000)	(\$3,773,104)	(\$325,819)	\$5,038,064	\$10,466,014	\$15,959,955	\$21,166,129	\$41,371,239
Aggressive Scenario	(\$7,160,000)	(\$2,665,954)	\$1,921,696	\$8,460,154	\$15,097,917	\$21,837,964	\$28,327,629	\$65,819,406
ROI Measures								
Adjusted Weighted Average Cost of Capital (AWACC)	13%							
5-Year Net Present Value								
Conservative Scenario	\$6,699,364							
Moderate Scenario	\$8,565,377							
Aggressive Scenario	\$12,670,606							
Expected Net Present Value	\$9,013,220							

Figure 6 – Sample Cash Flow Analysis

Data Mart Consolidation

implementation. Finally, the recommendation was to implement this consolidation in two phases starting with the hub data warehouse and data mart #1, and finishing with the remaining environments. The degree of cost savings is always contingent upon the company's relentless pursuit and discipline of implementing the recommended solutions.

The Teradata Business Value Consulting and Professional Services Organizations deliver highly professional executive reports and presentations to the client. A typical Data Mart Consolidation Assessment takes from four to eight weeks to complete.

Teradata focuses on helping customers get the most out of their investment in their Teradata solution by facilitating their understanding of the solution and their ability to determine how and where to deploy it most effectively in their business. Teradata moves beyond the technology by showing what the technology enables customers to do – very specifically, the new and/or better actions they can take, which in turn, drive higher profits for their business. This is a highly interactive process requiring full cooperation between various constituents (e.g., business users, technology group, finance, marketing, and operations) and Teradata to ensure that all requirements are captured, documented, and analyzed. We do this by understanding a customer's

business, technology, process, and financial landscape to identify areas of potential benefits and quantify the financial impact resulting from addressing these problems. The knowledge derived along with Teradata's experience and expertise allows for the development and quantification of meaningful and accurate value-statements, and the cost associated with implementing the new initiatives.

As Alex Veytsel of the Aberdeen Group said, "Teradata's business impact modeling (BIM) program not only employs full-time financial analysts to discover hidden costs and benefits of, for example, consolidating data marts, but also collaborates with the Kellogg School of Management on publishable research. With more than 100 assessments under its belt, the BIM team has seen 95% of its ROI estimates met or exceeded by clients."

The Teradata Business Value Consulting Team can do the same for you.

About Teradata's Business Value Consulting Team

The Teradata Business Value Consulting team has helped many companies drive millions of dollars to their bottom line – and we stand ready to help you do the same. The team draws on experience from more than 150 engagements worldwide (see accompanying box), applying senior-level

financial, business analytical, and technology skills to help customers understand the value of their data warehousing investments. Among the services the Business Value Consultant brings to the engagement is the ability to help each client objectively determine the financial impact of their prospective and past investments in data warehousing and analytical solutions as well as track and monitor key performance indicators and value throughout the implementation cycles.

The quantification of Return on Investment (ROI), expressed in terms of both revenue/profitability/business process enhancement opportunities and cost savings which can be reasonably expected to be achieved, requires an intimate understanding of a customer's circumstances including technology, strategy, business processes, people, and organization by the Teradata team. Because of the unique nature of every business, implementing a data warehouse solution will have different impacts on different prospects. Accelerating customer acquisition, improving customer retention, developing effective cross-sell/up-sell programs, improving operational effectiveness, building an enterprise-wide data warehouse to rationalize operating costs and optimize decision-making, and/or successfully implementing more efficient operating processes will affect ROI differently in

Data Mart Consolidation

different organizations. The Business Value Consulting team stands ready to collaborate with you as you quantify the ROI potential for your data warehouse solution. Please see the appendix for a more detailed exposition of our business case development process.

For Teradata to help clients understand how data warehousing and analytical solutions will affect their organization, we deploy a team of professionals to assist them in identifying an efficient plan enabling them to get from where they are today to where they want to be tomorrow. Equipped with a thorough understanding of their wants, needs, desires, and limitations, our professionals provide them the confidence to:

- > create a single and accurate view of their business.
- > make the necessary investment in Teradata to secure the desired results.

- > set achievable goals with intermediate benchmarks to help them monitor their progress.
- > more fully support and leverage their business strategies, initiatives, and tactics by removing limitations and enhancing capabilities to take new and/or better actions.

Our consulting staff works closely with your business-user community to identify strategies to capture value, to design processes to most effectively implement those strategies, and to help you develop your people so that they're properly equipped to successfully operate in a re-engineered work environment. We join with you to develop mutually agreed upon metrics to capture the value associated with the process improvements we've identified. By tracking the process improvement from operations, to the P&L, and ultimately to cash flow, we can help you identify clearly the value of a Teradata solution to your organization.

Endnotes

- 1 The AMR Research Report, "Five High-Value Infrastructure Projects for the 2003 Budget," September 2002.
- 2 Deena Amoto McCoy, Bank Systems and Technology Online, "Enterprise Data Solution Finds a Home at BofA," December 2002.
- 3 Kevin Strange, VP, Gartner Group, Inc. "Data Mart Consolidation: Strengthening Trend of 2002" March 2002.
- 4 Alex Veytsel, Aberdeen Group, "Selling IT to the CFO: The New Differentiator in the Analytics World" Perspective, August 2003.

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