

# Business Intelligence and Data Warehousing (BIDW)

Transform raw data into business results.

A Business Brief  
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# Table of Contents

Executive Summary.....	4
Introduction/BIDW Overview.....	5
BIDW Drivers/Trends.....	7
Sun’s BIDW Infrastructure.....	9
Design and Implementation Made Simple.....	15
Customer Success/Case Studies.....	17
Summary/Next Steps.....	20

## Chapter 1

# Executive Summary

This paper briefly explains what business intelligence and data warehousing (BIDW) systems are, how they transform raw data into useful information, and the major trends driving businesses' need for BIDW systems today. The paper describes key user requirements for successful BIDW solutions and the infrastructure and technology Sun offers that empower organizations to build cost-effective BIDW solutions. In addition, the paper highlights Sun's leadership in providing world-class BIDW implementations and Sun's unique approach to helping organizations design and deploy BIDW solutions—by providing proven designs, testing facilities, and the necessary information, training, and services. Several real-world case studies are presented, illustrating the success of Sun's BIDW implementations worldwide.

## Chapter 2

# Introduction/Overview

The rapid pace of today's business environment has made Business Intelligence (BI) systems indispensable to an organization's success. BI systems turn a company's raw data into useable information that can help management identify important trends, analyze customer behavior, and make intelligent business decisions quickly. Over the past few years, business intelligence systems have been used to understand and address back office needs such as efficiency and productivity. Now organizations are increasingly using BI to analyze customer behavior, understand market trends, and search for new opportunities.

BI relies on Data Warehousing (a data repository designed to support an organization's decision making), making cost-effective storing and managing of warehouse data critical to any BIDW solution. Without an effective data warehouse, organizations cannot extract the data required for information analysis in time to facilitate expedient decision-making. The ability to obtain information in real-time has become increasingly critical in recent years because decision-making cycle times have been drastically reduced. Competitive pressures require businesses to make intelligent decisions based on their incoming business data—and do it quickly. Simply put, the ability to turn raw data into useful information in a timely manner can add hundreds of thousands—up to millions—of dollars to an organization's bottom line.

### BIDW Overview

- **Analyze** internal business activities to improve processes, increase efficiency, and reduce costs
- **Track** external market trends to understand customer behavior, improve relationships, identify opportunities, and increase competitiveness

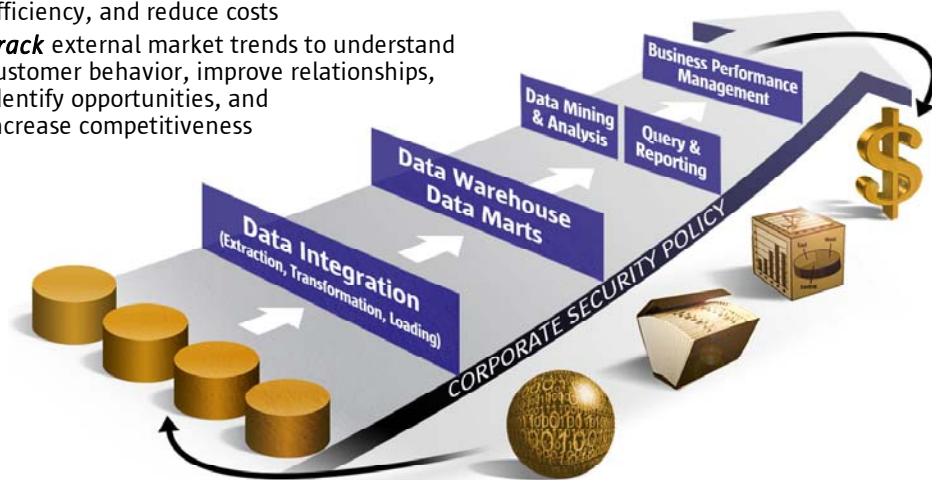


Figure 1. BIDW Overview

Figure 1 illustrates the major components of a BI system and the process of generating business results from raw data (the operational data that is used to run the business). A brief overview of the general functions involved in the process follows.

The BIDW process can be broken down into the following steps:

- Raw data is stored
  - Raw data is typically stored, retrieved, and updated by an organization’s on-line transaction processing (OLTP) system. Additional data that feeds into the data warehouse may include external and legacy data that is useful to analyze the business.
- Information is cleansed and optimized
  - The information is then cleansed (for example, all duplicate items are removed) and optimized for decision support applications (i.e. structured for queries and analysis vs. structured for transactions). It is usually “read only” (meaning no updates allowed) and stored on separate systems to lessen the impact on the operational systems.
- Data mining, query and analytical tools generate intelligence
  - Various data mining, query and analytical tools generate the intelligence that enables companies to spot trends, enhance business relationships, and create new opportunities.
- Organizations use intelligence to make strategic business decisions
  - With this intelligence, organizations can make effective decisions, and create strategies and programs for competitive advantage.
- The system is regulated by an overall corporate security policy
  - Information in a data warehouse is typically confidential and critical to a company's business operations. Consequently, access to all functions and contents of a data warehouse environment must be secure from both external as well as internal threats and should be regulated by an overall, corporate security policy.
- Business performance management applications track results
  - A well-run BIDW operation also includes Business Performance Management (BPM) applications, which help track the results of the decisions made and the performance of the programs created.

## Chapter 3

# BIDW Drivers/Trends

The world is changing and the need for accurate and timely business intelligence is ever more pressing. Key drivers that are making BIDW solutions mission critical include:

- Rapid increase in “information democracy” —that is, business is putting BI tools and data in the hands of large numbers and types of users, not just an elite few. More people are getting more information in more detail on more devices.
- Businesses are required to make more decisions, more frequently and more accurately in shorter time periods. The amount of time between when a decision is made and when feedback is received (requiring a new decision) is becoming shorter and shorter. The ability to make intelligent business decisions quickly is imperative to remain competitive.
- Data is being customized on a mass scale. Personalized information such as portals, digital domains, recommendations, and news feeds are commonplace – all of these require that data warehouses be flexible enough to provide different views to different people.
- New legislation and compliance regulations have made BIDW mission critical. Regulatory requirements (such as Sarbanes-Oxley, HIPAA, Gramm-Leach-Bliley, etc., and non-U.S. equivalents) put greater demands on determining and maintaining business intelligence and have made access to and analysis of information critical. Data must be captured, retained, and managed in a way that will satisfy courts and regulators.
- The diversity of data is enormous. Organizations must store and manage data from multiple different sources such as ERP and CRM systems, and in a variety of formats such as text, images, voice, video, unstructured data, and more.
- The increased need for better security due to wider data access availability and a larger number of users. Organizations around the world are looking for ways to reduce the risk associated with managing growing and disparate forms of data.

In addition, there are a number of industry-specific drivers (listed in figure 2). Taken all together, it’s clear that the need for timely business intelligence has become critical in today’s business world.

GOVERNMENT	FINANCIAL SERVICES	RETAIL	TELCO
Service to the Citizen	Compliance Reporting	Store Operation Analysis	Fraud Analysis
Homeland Security	Portfolio Analysis	Customer Loyalty Programs	Churn Analysis
E-Government	Customer Statements	Collaborative Planning and Forecasting	Improving Response Times
Enforcement & Regulation	Customer Profitability	Loss Prevention	Traffic Analysis
Human Capital Management	Wire Transfer Alerts	Supply Chain Optimization	Product Affinity/ Bundling
Information Dissemination	Branch Office Scorecards		
	Customer Acquisition, Retention, Profitability		

Figure 2. Industry Needs Driving BIDW

This diagram highlights some of the major reasons customers are implementing BIDW systems in four major vertical industries—Government, Financial Services, Retail, and Telecommunications.



## Chapter 4

# Sun's BIDW Infrastructure

Major challenges all types of organizations indicate they must address when implementing a BIDW system are:

- Ensuring users have access to information when they need it by providing solid **business continuity**
- Reducing cost and complexity of systems and operations through IT **consolidation** and other means
- Enabling the BIDW environment to grow and change along with the business by providing efficient **content management** –effectively managing data throughout its lifecycle
- Focusing on legal requirements and securely protecting the data warehouse with rock-solid **compliance** and security solutions

Sun offers a wide range of solutions that pull the products, technologies, partners, and services together to address these key BIDW customer challenges:

- High availability systems help ensure business continuity
- Scalable, industry-leading servers, storage, and software help reduce cost and complexity through consolidation
- Content management and compliance solutions provide cost-effective information management
- Sophisticated storage subsystems and storage software enable production data to be copied and moved for mining, query, and analysis

In addition, Sun's open approach allows organizations to choose from a wide range of best-in-class platforms, middleware, and applications—making it easier to find the package that's right for their environment. This enables solutions to be developed and deployed with little risk and with very little cost.

Some of the industry-leading features and products Sun offers to help create uniquely competitive BIDW solutions are listed below.

### Industry-Leading Performance and Scalability

Performance and scalability of the BIDW system are essential to ensure that information is provided to multiple users from disparate locations using a variety of access methods—regardless of the demands and workloads on the system. The architecture of the solution, along with the servers and storage systems involved, have a significant effect on performance and scalability. Given the primary function of a BIDW system (mining information from a large amount of data), the throughput of the system is key to achieving high performance. Sun offers industry-leading systems as part of the overall BIDW infrastructure, to help ensure high performance and scalability. Some highlights of Sun's unique offerings:

- Sun is the only vendor to provide a seamless, scalable 64-bit architecture for servers from 1 to 100+ CPUs, for end-to-end compatibility and support.
- Sun's unique crossbar centerplane technology provides unmatched system bandwidth for high performance, throughput computing power
- Sun's UltraSPARC IV processors offer nearly two times the scalability of single core chips, providing nearly double the compute density and thereby lowering total cost of ownership.
- Sun's massively scalable storage systems are capable of more than 300 terabytes in a single system, saving valuable data center space and helping to lower environmental costs.

- Sun enables a tiered storage architecture for online, nearline, and tape optimization that scales to multi-petabyte sizes, to help effectively manage data throughout its lifecycle.
- Sun's architecture allows organizations to quickly grow incremental storage capacity to meet business demands, and helps ensure capacity and performance always scale in parallel

### **Built-In Security**

Security concerns are critical when developing a BIDW system. Once information is made widely available, there is a risk of it falling into the wrong hands if proper controls are not put in place. If customer information such as credit card data is compromised, it can cause irreparable harm or damage to the people whose information was stolen as well as to the company itself. An overall corporate security policy is needed to minimize risk—securing access from both external and internal threats. Sun offers industry-leading security and identity management tools to help minimize the risk of corporate data getting into the wrong hands. Examples include:

- Multiple layers of high-grade security to meet stringent security requirements
- Tools to help businesses build in security to meet business needs and protect data assets
- Sun consulting services for security assessment and security management, to help ensure proper security policies and management controls are in place
- Security best practices, which help to reduce the complexity, costs, and risks of deploying new technology.

In addition, Sun's security solutions are built into the Solaris Operating System (OS). They are not another layer of software like many other vendor and third party products are. Integrated robust privacy features that create a trusted environment include:

- Military-grade secure OS
- Hardware-based isolation with dynamically reconfigurable domains
- Secure communication channel for system controller admin
- Role-based access control (RBAC)
- Secure Sockets Layer (SSL) encryption
- Firewall technology

### **Availability Made Simple**

In today's global marketplace, 24x7 availability is critical for most businesses—users must have access to information when they need it. As organizations increasingly incorporate analytic activities into their daily work flows, their reliance on and expectation for data availability increases. Sun offers a wide range of technologies and capabilities to enhance Sun's systems availability including:

- Redundant, hot-swappable components on both server and storage systems to help ensure continuous availability
- Live system upgrades and on-line maintenance to help minimize downtime
- Auto diagnosis and recovery, to help deconfigure faulty components out of a system and automatically restore the system
- Remote monitoring 24 x 7 on both server and storage systems for proactive problem avoidance and increased system availability
- Optional 100% Data Availability Guarantee for Sun StorEdge™ 9900 series systems
- High availability cluster technology to help ensure continuous availability, even in the event of a system failure
- Solaris Resource Manager to assure resource availability and provide better resource utilization

- Sun StorEdge™ SAM-FS/QFS software for policy-based storage tiering, to help simplify administration and reduce management costs
- Non-disruptive, point-in-time snapshot capability on low to high-end Sun StorEdge™ systems, to enhance application performance and improve operational efficiencies
- Near and distant data replication capability on low to high-end Sun StorEdge systems, to help maintain enterprise-wide data consistency and facilitate quick disaster recovery
- Physical and logical partitioning of both server and storage resources for end-to-end application optimization

An overview of Sun’s industry-leading BIDW infrastructure:

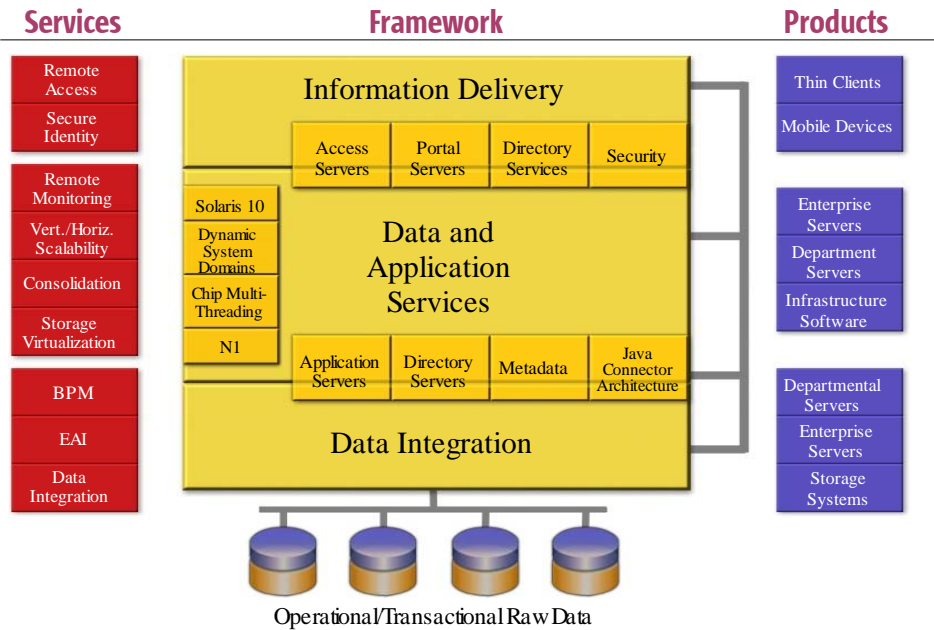


Figure 3. BIDW Infrastructure Overview

Sun’s BIDW infrastructure offerings, along with best-in-class partner solutions, provide a comprehensive BIDW infrastructure that can essentially be divided into three layers: data integration, data and application services, and information delivery.

- The Data Integration Layer provides data extraction, transformation, and loading; metadata and connection management; and data synchronization, consolidation, and archiving.
- The Data and Application Services Layer provides application management, and resource utilization and provisioning.
- The Information Delivery Layer provides information aggregation and formatting; content caching and delivery; and user authentication.

## It's All About the Data

With effective data management an essential component of any BIDW solution, storage is key. Sun offers a number of storage systems, data services, and tape automation products to help ensure successful BIDW implementations that do not disrupt an organization's production environments. The following are a few of Sun's key storage products that lead the industry and have been used by numerous organizations around the world to help derive the business benefits of effective BIDW systems.

### **Sun StorEdge™ 9990 System**

The Sun StorEdge™ 9990 system provides the ultimate storage platform for enterprises with the most demanding data management needs. This system provides unprecedented scalability, capacity and connectivity, allowing enterprises to consolidate massive amounts of data - up to 330 terabytes - onto one single system. The system also has the ability to attach and virtualize multiple classes of external storage - up to 32 petabytes - from multiple vendors such as IBM, EMC and HDS. The attached systems simply appear to the hosts as volumes on the Sun StorEdge 9990, while gaining all the performance benefits the Sun StorEdge 9990 system has to offer. This means that organizations not only can protect their existing storage investments, they can actually add value to them.

All of the internal and external capacity is managed from a single console, allowing organizations to manage their data more efficiently and effectively. Sun StorEdge 9990 copy, replication, migration and virtualization software gives customers great flexibility in designing data warehouses and data marts. For example, the Sun StorEdge 9990 system can be divided into 32 Virtual Private storage machines (logical partitions) so BIDW applications can utilize lower cost storage arrays without impacting mission critical applications. In addition, the Sun StorEdge 9990 system is so reliable that Sun offers a 100% data availability option.

### **Sun StorEdge™ 6920 System**

The Sun StorEdge™ 6920 system helps reduce costs and improve service levels through consolidated management of applications and segmented distribution of storage resources. With centralized data services, multi-dimensional scalability, and heterogeneous server and storage support, this system offers data center functionality at mid-tier prices. An application-oriented interface simplifies management by pooling storage resources, enabling quick and precise provisioning based on application workloads. This enables administrators to reduce cost and complexity and improve operational efficiencies. As an organization's data environment grows, N-way scalability enables predictable, seamless scalability of performance, availability, capacity, and connectivity to maintain application performance and service levels. Purpose-built to host multiple applications, the Sun StorEdge 6920 system provides dedicated compute resources existing outside the data path and host server to deliver system-wide data services without disruption of application workload performance.

### **Sun StorEdge™ 5000 NAS Family**

Designed for multi-protocol environments, the entire Sun StorEdge 5000 family of NAS appliances is easy to use and simple to manage. The family combines file system journaling, checkpointing (file copy), remote mirroring (file replication), remote monitoring, clustering, and fault-tolerant backend RAID arrays to deliver very high levels of availability and performance in almost any open, file-based environment. Each appliance includes CIFS and NFS licenses and typically installs in less than 15 minutes, thanks to a highly intuitive wizard.

**Sun StorEdge™ SAM-FS and QFS Software**

Sun StorEdge™ SAM-FS Storage Archive Manager software and QFS shared file system software enable organizations to share, manage, and protect data based on its value to the business, to meet the access and performance requirements of its users. The software provides a shared file system infrastructure that automatically protects file data with policy-driven data automation, allowing vast amounts of data to be managed across tiers of storage and to be quickly recovered using fewer resources. This helps solve many of the problems businesses face, while reducing the total cost of ownership (TCO) of the data itself. By enabling tiered storage architectures, the software helps IT organizations contain the cost of storage by optimally matching business data to the appropriate class of storage throughout its lifecycle. For example, most recent and constantly accessed data is stored on enterprise-class disks while the oldest and least-accessed data is stored on tape. Sun StorEdge SAM-FS software supports Sun's complete product line — from the high-end to the low-end — offering a choice of FC or SATA disk and a wide range of tape options. The software also integrates easily with widely utilized third party disk, tape, or optical offerings. File sharing and policy-based archiving automates data management and movement through tiers of storage, making it completely transparent to users. The software is integrated into a number of Sun's solutions for content management and compliance, helping to reduce cost and complexity.

**Sun StorEdge™ Enterprise Storage Manager Advanced Applications Software**

Sun StorEdge™ Enterprise Storage Manager Advanced Applications is a suite of open, integrated, heterogeneous storage area management solutions designed to enable SAN management, storage resource management, and storage provisioning. The software enables IT organizations to discover, visualize, monitor, report on, chargeback on, and provision complex multi-vendor storage networks from a single Web-based enterprise platform with unprecedented simplicity and speed. Its automated capabilities eliminate the need for manual, error-prone and inefficient point tools such as spreadsheets and whiteboards commonly used to manage storage operations. The software's flexible development tools and customizable policy and reporting engines can be used to create an internal storage utility that aligns storage infrastructure with business objectives. Sun StorEdge Enterprise Storage Manager Advanced Applications software accurately measures utilization by Line of Business (LoB), allowing customer to charge LoBs for actual consumption. Tiered storage enables different price points, and standards-based architecture allows for quick implementation.

**Sun StorEdge™ Tape Automation**

The Sun StorEdge™ family of backup and restore solutions provides an efficient, reliable and cost-effective way for organizations to back up and protect enterprise data. From high density business-critical systems for large enterprises to desktop or rackmount systems for growing businesses, the Sun StorEdge tape product line offers flexible configurations, mixed media support, excellent scalability, and transparent error recovery. In addition, the entire line is backed by Sun's world-class service and support to help ensure continuous availability. Sun StorEdge data protection products and customized professional services help organizations build effective backup, archive, and disaster recovery solutions to protect digital assets and enable quick recovery with minimal disruption to critical business operations.

Of course one solution does not fit all—organizations need a choice of platforms, applications, and services based on their business needs. Sun enables these choices by supporting availability of best-in-class solutions, making it easy to develop the best solution to meet an organization’s particular needs. There are literally hundreds of partners providing a wide range of BIDW applications and utilities on Sun systems. Software and service packages from Sun partners address a wide range of customer requirements—from data extraction, report generation and data analysis, to monitoring and managing the BIDW environment. Sun has always been committed to open standards that allow customers to design Sun’s systems into their heterogeneous environments.

Sun’s BIDW expertise is extensive. It extends to virtually every industry— Sun implementations can be found in finance, government, transportation, telecommunications, manufacturing, media, retailing, and many other industries. Sun solutions are a key component of government security measures, HIPAA compliance, and IRS-related applications. In addition, Sun’s BIDW solutions impact all major aspects of business operations including customer service, sales and marketing, financial reporting, and administration.

Sun’s BIDW infrastructure, integrated with best-in-class partner solutions, can help save businesses time, data center space, and money.

Sun’s BIDW Leadership
<ul style="list-style-type: none"><li>• Over 2000 BIDW implementations worldwide</li><li>• Ranked top 10 in DM Review BIDW Top 100 (source: dmreview.com)</li><li>• World’s largest data warehouses run on Sun (source: wintercorp.com)</li><li>• The world’s largest verified data warehouse benchmark runs on Sun</li><li>• Four Sun customers were able to realize business gains from \$1.1 to \$7.8 million—adjusted for net present value—on deployment of their BIDW projects over a three-year period.</li><li>• Sun offers four BIDW reference architectures</li><li>• Sun maintains a dedicated BIDW Competency Center</li><li>• Sun has achieved 8 world record TPC-H price performance benchmarks (2003-2004)</li></ul>

Figure 4. Sun’s BIDW Leadership

## Chapter 5

# Design and Implementation Made Easy

Sun's customers have created the largest and most heavily used data warehouses in the world. Sun offers a number of resources to organizations to help simplify the design and implementation of BIDW solutions. These resources include:

### Reference Architectures/Methodologies

Sun Reference Architectures define the hardware and software components needed to build end-to-end solutions that meet specific business needs. All reference architectures have been designed, tested, and documented, so users can reduce the complexity, costs, and risks of deploying new technology in their enterprises. Sun's Reference Architectures combine:

- A documented multi-tiered architecture
- Recommended technology products from Sun and other vendors
- Architecture, sizing, and implementation guides

Reference Architectures are designed to rigorous quality standards and specifications, to deliver the highest levels of service to customers. Before choosing to implement a Reference Architecture, customers can test a proof-of-concept system at Sun iForce<sup>SM</sup> Centers. Reference Architecture implementations are supported by Sun Client Solutions Practices or Sun's iForce partners, and components can be ordered through the Sun<sup>SM</sup> Customer Ready Systems program.

### iForce Centers

iForce Centers provide organizations with a unique environment to develop, test, and evaluate solutions — risk free. Using reference architectures with their own workload, businesses can try out their own design concepts, size their systems, test performance, see working prototypes, and do Proof-of-Concepts on Sun's equipment. Sun's methodologies leverage our vast experience architecting, implementing and managing solutions — capturing our field-proven intellectual property, and documenting it in blueprints, white papers and books. Sun shares these "best practices" during design and tuning phases so organizations can benefit from proven best practices and deploy their BIDW system without continued outside sourcing.

### Sun Client Solutions

Sun offers a comprehensive portfolio of consulting services and workshops to help simplify the implementation of end-to-end BIDW solutions. Business Impact Analysis (BIA) services and TCO/ROI assessments can help determine the type of BIDW solution needed. BIDW workshops concerning Planning & Configuration, Architecture Design, Migration, Performance Tuning, and Delivery help ensure flawless execution. Brief descriptions of Sun's BIDW workshops and consulting services are below.

### BIDW Workshop

Provides a technical discussion for BIDW initiatives with focus on "best practices" and customer challenges and needs. Large data warehouse deployment design concepts are provided.

### **BIDW Planning & Configuration**

Aligns BIDW deployment with business strategies. Analyzes current technologies and skills to build a conceptual infrastructure solution.

### **BIDW Architecture Design**

Working session that identifies end-to-end solution. Organizations design an open architecture solution that provides best price/functionality value.

### **BIDW Migration**

Focuses on construction activities including design, build, migration, testing, and post-production review.

### **BIDW Performance Tuning**

Assesses current BIDW environments to identify performance gaps and provides recommendations to address them.

### **BIDW Delivery**

Provides BIDW deployment by involving BIDW-centric systems integration partners. Sun's comprehensive planning, configuration, and architectural services help integrate hardware, software, and design options for an effective BIDW deployment.

## **BIDW Management**

To help organizations reduce storage TCO, Sun offers Sun Managed Storage Services whereby Sun handles day-to-day management of SAN storage environments remotely. The service provides data and recommendations to help organizations drive continual improvements in storage management efficiency. All storage hardware remains at the customer site, in the customer's possession. Although best suited to SANS of 25 terabytes or greater, the service can accommodate any SAN installation of one terabyte or more. Sun's service helps reduce TCO via the following benefits:

- Economies of scale created by Sun's dedicated storage specialist labor pool – all Storage Networking Industry Association (SNIA) certified.
- Efficiency of pre-integrated automation software, such as Storage Resource Management (SRM), Business Process Management (BPM), Service Level Management, and more.
- Reduced time-to-production – customers avoid the schedule risks, execution risks and costs of implementing unknown software and processes.



## Chapter 6

# Customer Success

The world's largest and most heavily used data warehouses run on Sun. With more than 2000 global business intelligence/data warehouse installations and the world's two largest data warehouses by number of rows and the world's largest audited BIDW benchmark at one trillion rows, Sun's experience leads the industry. In fact, four Sun customers were able to realize business gains from \$1.1 to \$7.8 million – adjusted for net present value—on deployment of their BIDW projects over a three-year period.

Here are just a few examples of organizations that Sun has helped to save time, data center space, and money with effective BIDW solutions.

### Transportation/Entertainment

A cruise line required a smooth migration of their operating system and applications to coincide with a hardware upgrade. The applications affected included mission-critical revenue management systems, supplier management, logistics, data warehouse, and financials. The cruise line could not accept any downtime— systems needed to run in parallel with no loss of data, and continuous access to data had to be maintained on a daily basis.

Sun's solution involved an upgrade to Sun Fire™ servers and Sun StorEdge™ 3310 SCSI arrays. This enabled the cruise line to access more reservations, faster. Now, mission-critical revenue management systems and logistics applications allow timely delivery of reservations and bookings data to executives for analysis. Cycle times have been reduced by over 50%, the migrated applications ran flawlessly, and there were no conversion costs due to 100% binary compatibility.

### Services/Online Marketing

An online marketing organization servicing over 43 million consumers and more than one thousand advertisers was unable to support a growing volume of data and increased user requirements. Jobs weren't completing in time for user reports and data loads were failing frequently and/or were inaccurate due to incomplete or missing data loads. The company was missing critical deadlines and losing market opportunities.

Sun's BIDW infrastructure included a huge 28TB Oracle data warehouse, Sun's Solaris™ OS, a Sun Fire 15K server, a Sun StorEdge 9980 system, Veritas software, and Sun's integration, installation, and BIDW implementation services. No major issues were encountered during the entire enterprise-wide migration process. The data warehouse is now refreshed daily without disruption or misplaced information and the company has continuous access to data— including Web traffic logs, statistical data, and client-collected information. The company has achieved 20-fold volume increases and the ability to scale incrementally.

### Government

A County Government's Offices of the Auditor, Recorder, and Controller needed to administer taxes, records, and municipal finances for almost two million residents. Specifically, the county needed to store .tif file record images, which differed by topic, format, and length. These files included birth, death, and property deed records that required frequent updating. In addition, the number of physical record documents was growing by approximately 6000 per day— each document ranging from one to several

hundred pages. It was necessary to scan and store all records so that they could be easily accessible to county residents.

Sun's solution was a single NAS appliance that was simple to manage and could scale quickly, as needed. After just a few months, it was estimated that the county saved two man-years in storage administrator costs alone (approximately \$200,000).

### **Government/Canadian Province**

A Canadian province needed to provide integrated information and reporting functionality to numerous public entities that managed their finances using SAP R/3 enterprise resource planning (ERP) applications. They wanted a SAN environment that would help them minimize TCO.

Sun helped the province migrate multiple SAP R/3 systems to Sun servers and deployed Sun StorEdge 9900 series systems in a SAN using Sun Cluster 3.0. Sun also provided training, security administration, and service and support. The results were impressive — 25% savings on hardware costs, 100% ROI within three years, and 400% ROI on their migration investment. In addition, they achieved 100% system availability while providing faster responses and the scalability to support up to 10,000 users.

### **Media Research**

Nielsen Media Research was facing mountains of business data generated by ERP, SCM, CRP, and OLTP applications that had to be integrated, managed, and analyzed by hundreds to thousands of concurrent users demanding 24x7 access via various clients. Competitive pressures were shrinking decision cycle times from data collection to response action.

Sun's Enterprise Data Warehouse Reference Architecture provided the needed solution. Nielsen's data warehouse is now the world's second largest, by number of records. The company experienced storage savings of 75% and installation/setup time was reduced by 80%. Query speeds are up to 1000 times faster and they have linear scalability up to 108 CPUs. According to Nielsen, "We load almost 10 billion rows a month, a terabyte a quarter, or 300 million rows a day. It just flies. We have a big enough backbone from Sun to handle that kind of data. Our mainframe, which feeds the data warehouse, can't produce the data fast enough."

### **Manufacturing/Electronics**

Solectron, a leading electronics manufacturing services company, needed to retrieve and coordinate business-critical information—they required a global BIDW solution robust and scalable enough to cope with enormous data inputs.

Sun helped Solectron consolidate servers and storage onto a Sun Fire 12K server and a Sun StorEdge 6320 array-based SAN. Prior to the proof-of-concept at the Sun iForce BIDW Global Competency Center, Sun professionals presented to Solectron the iForce Enterprise Data Integration (EDI) Reference Architecture with Informatica as a solution to its challenges. Based on experience and best practices from the EDI Reference Architecture, the Sun team was able to help Solectron set up a highly scalable data warehouse in days instead of months, while minimizing costs. Sun's iForce BIDW Global Competency Center was used for proof-of-concept, design, and testing, and Sun also provided architectural design and implementation services. Sun StorEdge Remote Response service provides offsite monitoring of the storage environment.

Now, a 2.5TB global BIDW system handles 220 concurrent users for inventory management, order fulfillment, capacity reporting, and lead-time reporting. Data transfer processing was reduced from 1-2 days to just 5-12 *minutes*. The solution was deployed on time, 10% under budget, and is currently achieving 100% availability. Senthil Rajamanickam, Enterprise Integration Leader at Solectron, had this to say, “It is my experience that not all capabilities advertised by vendors work in complex environments. However, in the case of Sun, everything worked tremendously well — just as advertised. Thanks to Sun and [Sun’s iForce partner] Eakins Open Systems, we have accelerated our data reporting mechanisms, increased performance of our data warehouse by 200 percent, reduced the footprint in our data center by 60 percent, and reduced our operational costs by 40 percent.... Not only did we achieve our goals with this solution, but we also achieved benefits beyond our initial scope, including our ability to deliver Sarbanes-Oxley compliance information to our executives, as well as to have a complete global view of our employees and a global view of the various enterprise performance metrics.”

## Chapter 7

# Summary/Next Steps

Ensuring business success means operating your organization as effectively and as efficiently as possible. To achieve better business intelligence, you must understand how the entire organization's processes are impacting one another; for example, sales demographics and customer buying patterns. Effective BIDW systems enable organizations to be proactive - not reactive - to market demands.

Sun's customers have created the largest and most heavily used data warehouses in the world. Sun offers an integrated environment of systems, services and partner applications that enable organizations to create the solutions that meet current and future business needs.

Sun's extensive BIDW experience and unique approach allow organizations to develop and deploy cost-effective solutions that help provide savings in three dimensions: time, space, and money. Sun's solutions are versatile enough to meet the needs of a broad range of industries and business applications and powerful enough to help companies address increasingly complex business demands. In addition, Sun offers a number of unique resources to help organizations design and deploy BIDW solutions— proven designs, testing facilities, even a BIDW competency center, as well as the necessary information, training, and services.

With Sun's help, organizations can transform their raw business data into useful, intelligent information, enabling them to make strategic decisions and create competitive advantages.

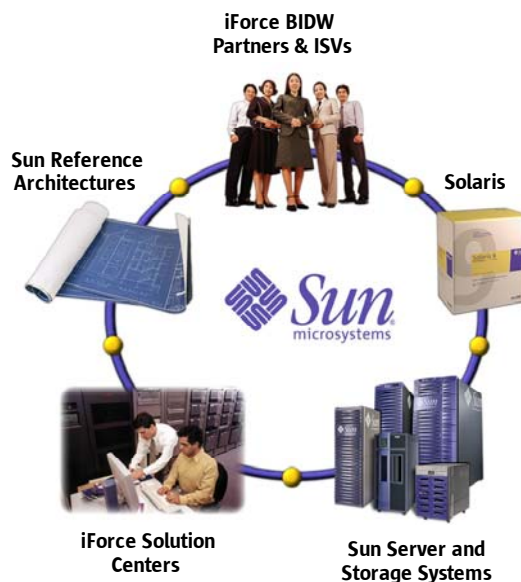


Figure 5. Sun's Unique Customer Value

To find out more, sign up for a Business Analysis, TCO/ROI Assessment, BIDW workshop, or schedule a proof-of-concept (POC) evaluation at Sun's iForce Competency Center for BIDW. Go to [sun.com/bidw](http://sun.com/bidw), or contact your Sun Sales or Sun Partner Representative.