# Real-Time Database Sharing: What Can It Do for Your Business?
## Smarter Data = Smarter Decisions

# Data Sharing: Top Management Issues

Senior managers expect IT teams to deliver consistent, high-quality data that creates a single view across the business. But with data stored across multiple databases and platforms, where does this single view reside? Attempting to combine all data into one "logical" database presents major data formatting, transformation and consistency challenges.

What if you could effortlessly replicate data from DB2 databases into Oracle®, Informix® and MicroSoft® SQL® databases, and back again, without custom programming or large-scale integration costs?

What if you could share data from one application to another in real-time and be assured that the data would be in the exact format each application and user needed?

Would it help if you could add a new customer, update an inventory balance or delete a stock item, and have all of these applications share the same information in real-time?

What would your business gain if you could break down isolated silos of user data and give everyone across the enterprise the same effortless access to accurate, current and complete data?

What if you could accomplish this without discarding or changing your investment in existing systems and databases? How much more productive could your database staff be if a single-solution could be used to manage data sharing across all databases across all platforms?

Would it help you to handle data security, auditing, and compliance with government mandated regulations using a standardized, enterprise-wide tool?

What if you could be confident that the right data is reaching the right people so you could spend your time on other pressing IT/business alignment issues?

## *Do These Situations Sound Familiar?*

- Your company recently merged with a rival. Your centralized applications have used the same standards for years and are consolidated onto an IBM® System p™ platform running AIX® and Oracle/SAP®, along with several Windows® servers. The newly acquired company relied on IBM System i™ DB2® databases to run critical applications. How do you integrate these organizations without undertaking a costly, year-long integration effort?

- An end user community needs real-time query access to selected IBM System i production data kept in a DB2/400® database. But they would like this data rendered to a MS SQL Server database that hosts GUIs and applications that they are familiar with.

- A distributor of health care products is deploying an eBusiness web portal using Windows/SQL Server to allow customers to track and update orders. The application needs to pull and push data real-time to the backend JDE ERP tool running DB2 on IBM System i.

- A general ledger system using MS SQL Server databases needs current data from the HR payroll system running on Oracle, as well as from the MS SQL Server-based accounts payable, billing, and accounts receivable applications, and also the manufacturing supply chain application using Sybase®.

- The marketing and sales departments use an application that was never designed to share information with the new CRM and ERP applications. The custom programming required to provide real-time data sharing between and among these applications will require a costly budget increase to bring in outside consultants.

- Health care personnel need to have access to patient information records that reside in an IBM System z™ DB2 database. They are using an application that deploys multiple, mobile workstations across the hospital floor using a back-end Windows SQL Server database to manage and record daily patient care details.

- Your company invested in a high-end Teradata® data warehouse. You need to feed data into this centralized data store from several other databases and systems in your organization, which include AIX and Windows running DB2 and MS SQL Server. Your executives expect extensive dashboard access with real-time updates.

## The Technical Challenge

In today's IT environment, critical business information often resides across a variety of operating systems and databases within the enterprise. The reasons leading to this configuration are many, but the result is often silos of information that cannot be shared with other silos. Frequently, portions of the data contained in each of these silos is redundant, but not necessarily in-sync across platforms. This puts the business at risk of making decisions based upon divergent, inaccurate data sources. Isolated information silos simply do not work well in the real-time, on-demand business world.

Populating data across different databases has traditionally been done with ad hoc manual processing. This requires DBAs and application owners to develop and maintain customized procedures, commonly referred to as ETL processing:

- **Extract:** Pull the data from the source database into a flat file

- **Transform:** Do any formatting changes to the data required for proper input to the target database

- **Load:** Load the data from the flat file into the target database. (Note: This step often also includes copying the flat file over to a separate, potentially remote, target system before loading.)

## The Total Cost of Ownership of ETL

In a large enterprise, numerous ETL processing events can occur weekly, all of which must be scheduled and monitored. Since ETL processing is often done daily during off-hours, data concurrency among the target databases may still lag by as much as 24 hours. Also, there is usually no centralized means to identify all of the ETL scripts and processing that occur across an enterprise, so keeping track of scripts and updating them as needed can be a tedious task, and is prone to oversight.

Custom, home-grown scripts are costly to develop and maintain. As databases grow, upgrade, or change, more work is required to link them using traditional integration techniques, especially one-to-one programs or scripts. This solution is difficult to scale in a dynamic environment.

As an alternative to ETL script processing, another common solution considered for doing data integration are replication products. Many products exist for replication, however these typically support only like-to-like source and targets, and most do not offer database data extraction or transformation features. Most RDBMS vendors offer replication products, but to add support for heterogeneous databases, the solution may need an add-on gateway product. Often these vendor-provided solutions are difficult to manage and may not even be able to support replication between different releases of the same product, so their scope is very specialized and very limited.

Another approach often considered is use of an application integration product or message oriented middleware (such as MQSeries™) between databases. This provides a general application framework to send and receive data, but requires significant application rework and additional staff expertise to support the added messaging layer, which can be a complex and significant investment.
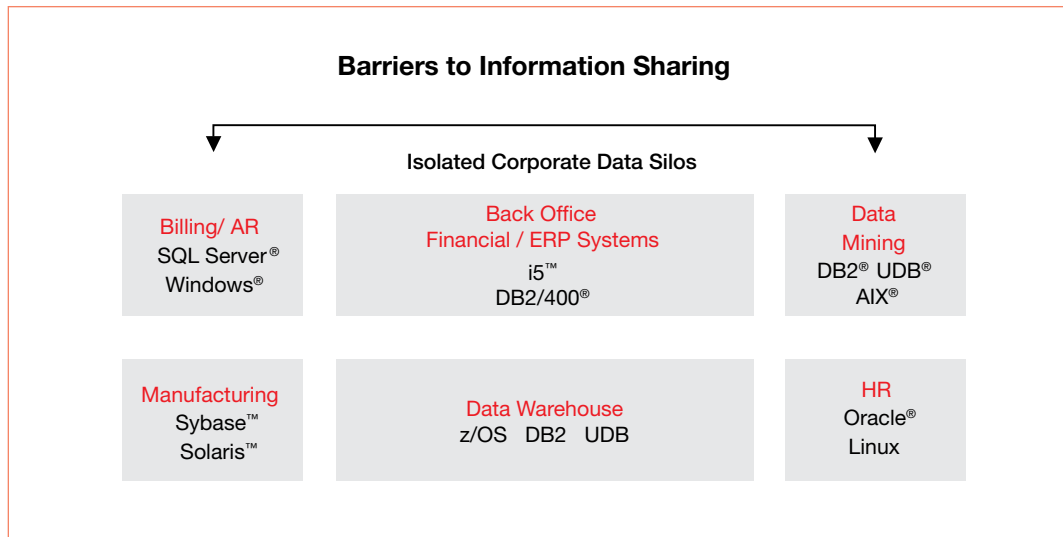
## Make versus Buy: The Quest for Return on Investment

IT has come under increasing scrutiny because of the costs of data integration projects. Any ROI calculation must account for the following costs, using a fully burdened labor rate of US $125–150K per year:

- **Development Costs:** Each data-sharing source and target must be treated as a separate project. As requirements change each source and target pair will become a separate development project.

- **Cost for Test Systems:** These include RDBMS licensing, LPAR resources, storage, and additional RDBMS add-on products such as gateways that may be needed to implement an internally developed solution.

- **Maintenance Costs:** The cost of maintaining an internally developed data sharing solution that requires ongoing coding changes to adjust to new or altered data schemas, along with monitoring the running and accuracy of the supporting processes and testing with new DBMS/OS releases. Turnover in your IT department, which results in fewer people who are fully familiar with your data and application structures, can dramatically increase the costs of all of these activities.

- **Opportunity costs.** There are costs in missed opportunities when IT staff has been dedicated to developing and maintaining an internal replication solution versus working on other internal projects.

## Barriers to Information Sharing

**Isolated Corporate Data Silos**

| Billing/ AR<br>SQL Server®<br>Windows® | Back Office<br>Financial / ERP Systems<br>i5™<br>DB2/400® | Data<br>Mining<br>DB2® UDB®<br>AIX® |
|---|---|---|
| Manufacturing<br>Sybase™<br>Solaris™ | Data Warehouse<br>z/OS  DB2  UDB | HR<br>Oracle®<br>Linux |

A mixed environment like this adds complexity and creates data sharing and data synchronization challenges for IT professionals.

# The Alternative: Real-Time, Standardized, Data Sharing

*"The need for ever fresher information is accelerating... this in turn puts increasing pressure on data integration to operate faster and more frequently so that information freshness is measured in hours or minutes instead of days."*
— Forrester Research

Acquiring a standardized data sharing solution fits your needs if you want to quickly solve pressing data integration issues between critical applications that use databases such as Oracle, DB2, Informix, MS SQL Server, Sybase, or Teradata. A standardized solution can provide access across the enterprise to accurate, real-time data, regardless of where it is created or resides, while saving you the cost of expensive and complex data integration projects.

A standardized software-based data sharing/replication solution can work well in your environment if you want to spend a minimum amount of time setting up and managing the data sharing process. These tools save time and money because they are database driven rather than programming driven.

### Meet the Challenges with Replicate1

Vision Solutions Replicate1™ is a robust yet flexible solution for data sharing. It gives you a simple, on-demand way to share data across your enterprise, leveraging every piece of data in your organization and making it available in real-time to all of your applications. It ensures high data quality and zero data loss. And it is standardized, meaning that it uses the same management interface to define the extraction, transformation, and replication processes across all database types, across any operating system platform.

The easy to use Replicate1 GUI management console enables administrators to define models easily which are converted by Replicate1 into XML files for its replication/data movement model, rather than special programming, so it can quickly implement a standardized, table-based approach for data sharing/replication. And that model can then be quickly and easily changed or expanded to include other databases as your databases grow or change.

This flexible modeling approach also enables to you to deliver information bi-directionally between source and target databases, without disrupting normal operations. For example, you can quickly and transparently enable information distribution from a central office to remote locations, with just a few clicks. Updates from the remote offices can then be immediately applied back upstream to the centralized database for designated transactions.

Replicate1 recognizes data changes as they happen, so it can replicate data between databases as easily in real-time as on a scheduled basis. Advanced replication options include broadcast and cascade configurations.

Replicate1 works with most RDBMSs in the marketplace, including Oracle, DB2/UDB, DB2/400, DB2/VMS, Informix, MS SQL Server, Sybase and Teradata. Replicate1 provides administrators with a one-stop console for managing data sharing across all databases, and across all operating systems. For example, you can set up Replicate1 to transform Oracle data into the exact format needed for DB2 or MS SQL server databases and applications. Simultaneously, it can transform DB2 and MS SQL Server data into Oracle data types. And when moving data between mainframe and open systems databases, it even performs the required EBCDIC/ASCII conversion automatically, while the data is in flight.

### Data Sharing: Oracle and Geo-Spatial Data

**Challenge:** To make continuous, real-time data available to its stakeholders via the internet, this US-based land management company, serving large and small non-industrial private forestland owners, investors, conservation organizations and forest industry businesses, needed an information availability tool that could cost-effectively and efficiently deliver data where, when, how users needed it. Its use of large-format, geo-spatial data posed a significant integration challenge. The company needed to make this data easily available to customer applications as well as to multiple databases, like Oracle, within its own business groups.

*"We were able to see a high level of productivity and greater IT efficiency with Replicate1 because it was able to handle our large geo-spatial files easily without programming."*

**Solution:** The company realized that only Replicate1 was robust enough to take on its critical geo-spatial data and make it available to customer and user applications. The company was attracted to the solution's ability to drive all of the data sharing processes at the database level, while the management console made installation easy. Its table-based structure easily adapted to accommodate the unique needs of its internally developed application and its business processes without custom programming, saving time and money. The built-in automation saved administrative effort and could be quickly customized and managed with only a few clicks.

### Operating System

| Database | AIX | HP-UX | Linux SuSE | Linux redHat | i for Business | SOLARIS | Windows | IBM z/OS |
|---|---|---|---|---|---|---|---|---|
| IBM DB2 | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| IBM Informix | ✓ | ✓ | | | | ✓ | | |
| SQL Server | | | | | | | ✓ | |
| ORACLE | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | |
| SYBASE | ✓ | ✓ | | | | ✓ | | |
| TERADATA | ✓ | ✓ | | | | ✓ | ✓ | |

Replicate1 Compatibility Matrix

## Replicate1 Features

- Robust operations console—minimizes DBA tasks and monitoring chores, which lowers the total cost of ownership.

- Set it and forget it— automatically notifies administrator of any errors via email.

- Model-based set up and configuration—works at the database level with total application independence. Replicate1 includes extensive defaults so installation can be as simple as just a few clicks.
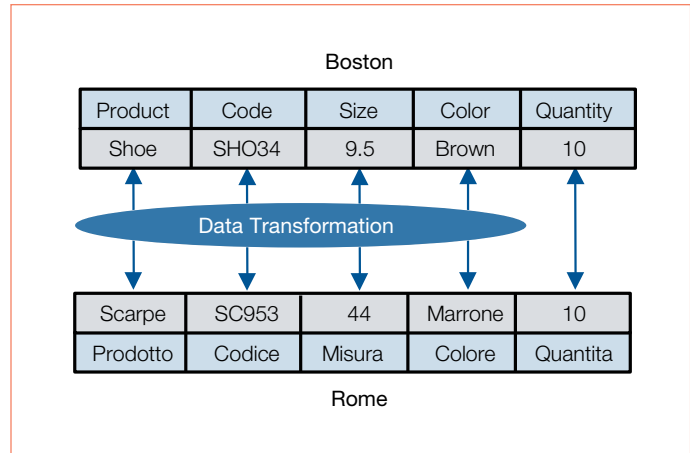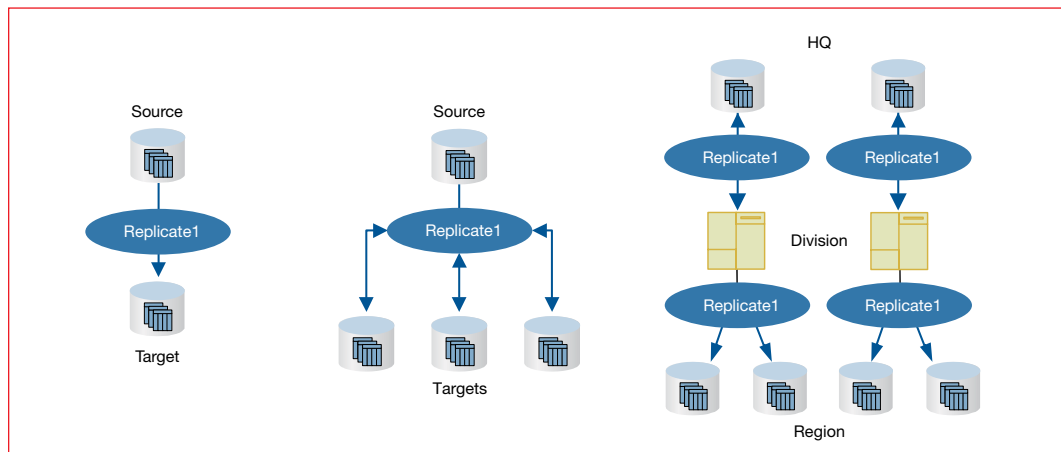


The business-rules based tables ensure data is transformed as needed and reaches targets in the required format and language without custom programming.

- Business rules-driven—over 60 pre-built, click-and-go data transformation functions are included to eliminate setup chores. Customization tools provide further options and control. For example, if a formerly independent business unit needs to share information with your finance department, you can easily change the business policies using the Replicate1 console, setting up the appropriate replication processes for a one-time event, or for ongoing data sharing.



Flexible replication methods can solve data challenges regardless of source or target database. For example, the "Paths" mode allows you to specify how data will reach targets using intermediate hosts, which do not require a resident database server. This supports cascade replication as well as replication through firewalls and gateways.

- Flexibility—leverages Java-based, open standards technology to quickly and inexpensively support new platforms and operating systems while maximizing ROI. Replicate1 uses JDBC database connectivity and XML, eliminating the cost of building and maintaining code unique to each database and writing one-to-one scripts, and ensuring adaptability to future changes in database technology.

- Audit Journal mapping—captures the details of any update activity occurring on a table and records them on a target table (journal) or flat file for auditing purposes. This standard process helps you meet Sarbanes-Oxley Section 404 compliance regulations automatically

*"You can still hand-code an extract, transform and load system, but in most cases the self-documentation, structured development path and extensibility of an ETL tool is well worth the cost."*

— Joy Mundy, Kimball University

By establishing a data trail when financial information changes, including before–and–after values of every column, the type of transaction, and the sending DBMS type, table name, user name, and transaction information.

- Data integrity—ensures that only committed transactions on the source replicate to target(s) and are applied in the order they were processed on the source. Replicate1 resolves any conflicts when two updates hit simultaneously, ensuring that all sites are kept in sync for complete data consistency. Replicate1 automatically re-applies any uncompleted transactions, should any interruption occur. The result is assured zero data loss, which means consistently reliable information for users and executives.

- Modeling tools—enable you to test changes to your replication model before you implement them. This acts as a safety net to prevent any potential problems from affecting production databases. This feature can automatically detect and fix any errors as well. Not only does Replicate1 validate models before they are committed to production, it also provides automatic versioning to assist in the control of what is in production.

### *Replicate1 Expanded Roles: A Powerful, Multi-purpose Data Tool*

In addition to its primary purpose of providing real-time data sharing, Replicate1 has also emerged as a tool that can play more than just one role in your organization. Below are some examples of different ways Replicate1 can be leveraged in your environment:

> #### *Data Sharing: DB2/400 and Oracle Data*
>
> **Challenge:** A South American-based cable television provider, serving more than 1.5 million subscribers, faced the daunting challenge of a heterogeneous IT environment. Its operational systems run on IBM® System i™ servers and DB2/400®databases, but its marketing, sales and web applications run on Sun® and Oracle®. Sharing data between these differing technologies was difficult and made marketing analysis a heavy drain on computing resources. Consequently, the company was reluctant to provide marketers with direct access to operational data.
>
> *"The installation was quick and painless . . . we estimated that it would have taken three months without Replicate1."*
>
> **Solution:** Replicate1 now simply and transparently integrates information across the different DBMS, operating systems and hardware platforms. The company easily replicates data between any source and an LPAR–based target and between the System i™ and Sun platforms. Marketing users now have on-demand access to data for analysis and other purposes via the replica without impacting production performance. IT staff using the Sun/Oracle platform gain easy access to data that originates in DB2/400 on System i™.

- **Smooth integration challenges:** Replicate1 gives you the ability to efficiently integrate systems after a merger or acquisition by eliminating the need to immediately migrate and convert to a common database or operating system. It provides a fast and easy solution to integrate applications that are acquired, without the need to dig into the detailed code to make extensive changes right away.

- **Address corporate governance information protection and access requirements:** Replicate1 auditing capabilities help executives understand what happened to data. The journal itself can be saved for as long as required, so it can provide an archived audit trail. Also, queries can be run against the journal archive for ad hoc questions arise, without affecting the production database. The fast real-time translation and replication features mean you can also move disparate data to one repository in one format to satisfy HIPAA regulations as well.

- **Support data warehouse strategies quickly, effectively:** The table-based structure can be adapted to fulfill data warehousing needs, including moving information from multiple locations to a standard format within a central warehouse, keeping the warehouse up-to-date with real-time data feeds.

- **Solve the "make versus buy" dilemma with a cost-effective solution.** The table-based structure and non-application specific nature means there are no costly, time-intensive integration projects. The modeling functions enable you to test new data sharing strategies quickly, or make changes to existing strategies, without impacting users or production.

- **Offload production.** Replicate1 can replicate real-time data from production to a second database located on a "reporting" server. Business users can then run real-time queries and analytics against the "reporting" target, keeping ad hoc queries off of the production copy of the database, avoiding performance impact.

- **Database migration.** Replicate1 enables real-time replication from a current or legacy production database to a new target database running on a different host or database platform. Ongoing testing can occur on the target before cutover. Resulting cutover windows are short and minimally intrusive because your data has already been moved and tested on the new target.

- **Save disk space.** The need to extract and FTP or copy files, as part of "legacy" ETL processes, frequently requires large "holding areas" on disk to hold files prior to loading. This is no longer needed with Replicate1, instantly giving you back valuable storage capcity.

- **Make better use of DBAs.** Multiple, manually developed "legacy" ETL processes require significant time to implement, track, monitor, repair, and verify. This effort is eliminated with a single, standardized tool for implementing database data sharing.

## Smarter Data = Smarter Decisions

As businesses strive to be more effective and efficient, there is a greater need to have access to accurate, real-time information for making informed business decisions. Real-time access to information is now seen as a necessary competitive advantage. Without it, businesses large and small face greater risks from decisions made with data that is less than 100% current and accurate. Replacing legacy processes with dynamic data sharing makes your data smarter, resulting in a smarter business model.

Replicate1 provides a central, standardized, easy-to-manage, click-and-go capability for sharing data between disparate databases and application silos, without programming changes or integration projects. Replicate1 fully leverages the flexibility of open standards technology into your database sharing strategy. That can result in fast adaptability to IT changes and future growth plans, and suits companies that need a cost-effective solution with a fast ROI.

# Easy. Affordable. Innovative. Vision Solutions.

## *About Vision Solutions*

Vision Solutions, Inc. is the world's leading provider of high availability, disaster recovery and data management solutions for IBM® Power Systems. With a portfolio spanning the industry's most innovative and trusted HA technologies, including EchoStream™, EchoCluster™, iTERA™, MIMIX® and OMS/ODS™, Vision keeps critical business information continuously protected and available, wherever and whenever it is needed.

Vision's Replicate1™ enables sharing of data between incompatible applications and databases, regardless of database format or operating system, enabling faster and more complete collaboration across the enterprise, simplified supply chain coordination and more timely and accurate BI analysis.

As IBM's largest high availability Premier Business Partner (NYSE: IBM), Vision Solutions oversees a global network of partners and professionals to help customers achieve business goals. Vision Solutions is a proud member of IBM's Smart Business and Smarter Planet initiatives. Privately held by Thoma Bravo, LLC., Vision Solutions is headquartered in Irvine, California with offices worldwide.

For more information, visit www.visionsolutions.com or call 800.957.4511

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