

ARC: Financial Performance Soars on Dual Active Wings

A dual active environment from Teradata helps ARC reduce operating costs, improve service, increase availability, and enhance disaster recovery capability.

The Customer

Airlines Reporting Corporation is a carrier-owned service bureau that provides financial settlement and sales reporting services for the air travel industry. The company originated in 1964 as a department of the Air Transport Association, established to operate that trade group's newly created Area Settlement Plan.

"Think of us as a financial clearing house that serves and connects the airline

carriers and the general travel agency community," explains Randy Black, director of technical architecture. "As agents sell tickets on behalf of the carriers, we operate a settlement process that allows the agencies to report those sales. Then we move the payment funds on a scheduled basis to the agency bank accounts and the airline bank accounts, leaving behind any service fees or commissions that the agencies are entitled to."

Results

- > ARC's Teradata system has helped the air travel industry to significantly reduce the issuance of expensive paper tickets by providing carriers and agents with a shared repository of ticket sales and payment records.
- > Operating expenses have been reduced by \$12.5 million to date, due to the reduced use of expensive, pre-printed ticket forms.
- > Through improved sales audit processes and data mining made possible by the Teradata system, ARC has reduced ticket fraud by 78.2 percent to a level now considered insignificant.
- > ARC has introduced more than 40 new revenue-producing business intelligence products that enable air carriers, travel agents, and other industry participants to understand the fast-changing business environment.
- > By moving to a data warehouse with dual active architecture, ARC reduced operating expenses by \$2.24 million over three years while improving query response performance, availability, and disaster recovery capabilities.

With the deregulation of the U.S. airline industry in 1984, ARC was incorporated as an airline-owned financial clearinghouse. Today the firm serves 147 air and rail carriers and more than 21,000 accredited travel agencies and corporate travel departments. It processes more than 190 million ticket sales transactions annually, with an aggregate value in excess of \$70 billion.

The firm's services have also expanded far beyond the basics of transaction support. "Our services extend beyond ticket processing and settlement to a full range of analytical and historical reports aimed at providing the entire industry with the most accurate and thorough picture of itself and the trends that affect it," says John Kyle, vice president of marketing and general manager of ARC's Data and Analytical Products division. "We provide the information and reporting tools that our customers need to manage and grow their businesses."

Business Objectives

Early in 2000, ARC launched a major modernization and cost-reduction initiative aimed at simplifying and streamlining some of the industry's most venerable and labor-intensive business processes. By developing an advanced data management infrastructure, the firm hoped to streamline operations, reduce costs, and provide greater visibility into the settlement process for all participants.

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In particular, the company had three objectives:

1. *Reduce industry reliance on expensive paper-based ticketing*

Despite the low cost and convenience of electronic tickets, many travel agencies remained wedded to the industry's antiquated paper-based process, primarily because it let them print extra file copies of each ticket for record-keeping and audit documentation. As part of its ticketing support services, ARC provided the blank ticket stock used throughout the industry, spending millions of dollars annually on printing, warehousing and distribution.

2. *Reduce ticket fraud*

Fraudulent ticketing was a significant cost both for carriers and consumers, and detecting it was greatly complicated by the time-consuming process of auditing paper records. ARC wanted the ability to spot suspicious trends and activities as they developed, not weeks or months after the fact.

3. *Develop a shared business intelligence capability*

To say that the travel industry was badly in need of better business intelligence in 2000 is to seriously understate the obvious. "Look at the leisure market alone," says Kyle. "There's been an absolute revolution in the way people plan travel and purchase tickets. It's critical that our customers be able to analyze that information in as close to

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– John Kyle, vice president of marketing and general manager, Data and Analytical Products division, ARC

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Eventually, ARC realized that only an enterprise data warehouse could provide the technical infrastructure necessary to address all three business challenges – a central repository for ticket sales and settlement data, enough history and detail to support trend analysis and data mining, and enough processing power to support access and reporting by the entire carrier and agent community. Such breadth and depth was necessary because, unlike enterprise facilities that provide decision support for a single company, this data warehouse would support the operations of an entire industry.

The Teradata Choice

As ARC began evaluating potential platform solutions for its new data warehouse, the issues of scale and capacity quickly narrowed the field. "We knew that we would be building a multi-terabyte warehouse right out of the door," recalls Black. "What you have to understand is that our warehouse is

very atypical in that it's not a decision-support warehouse. Because ARC is really an industry service bureau, our warehouse is storing data that belongs to, and is used by, the entire air travel industry.

"So we knew that this would immediately be a multi-terabyte solution, which significantly simplified our platform selection decision. We could not afford to get our owners and our industry to sign off on a multi-million dollar investment, only to have the thing run out of gas at the next application. So from our standpoint the evaluation was basically a matter of proving that Teradata could really do what they said they could do, because they were about the only ones who could do it."

By early 2001, ARC had installed a 10-node 5250 Teradata system in its Louisville, Kentucky data center, loaded 39 months of sales and settlement data (about 4.5 terabytes), and launched its new industry data warehouse – ARC COMPASS®. Three new applications provide data access and analytical services to ARC customers.

TERADATA
Raising Intelligence

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- > **ARC Document Retrieval Service** is a secure, paperless, Web-based reference system that allows free online access to more than three years' worth of ARC ticketing data. Users can sort ticket information by date, passenger name, credit card number, and a variety of other parameters. This patented application eliminates the need for paper ticket copies as a historical transaction record.
- > **ARC DataXpert** is a fee-based, Web reporting tool that lets users generate reports from the ARC Origin and Destination Sales Summary. Users can create, schedule, and view transaction reports for individual agency locations and corporate travel departments by individual city pairs served. ARC DataXpert reveals trends, creates comparisons, summarizes and sorts data, graphs the information, and exports it to other programs such as Microsoft Excel®.
- > **ARC Data Analysis Reports** provide more than 80 reporting products, including origin and destination reports, agency performance summaries, carrier reports, tax summaries, and sales and revenue summaries.

Business Impacts

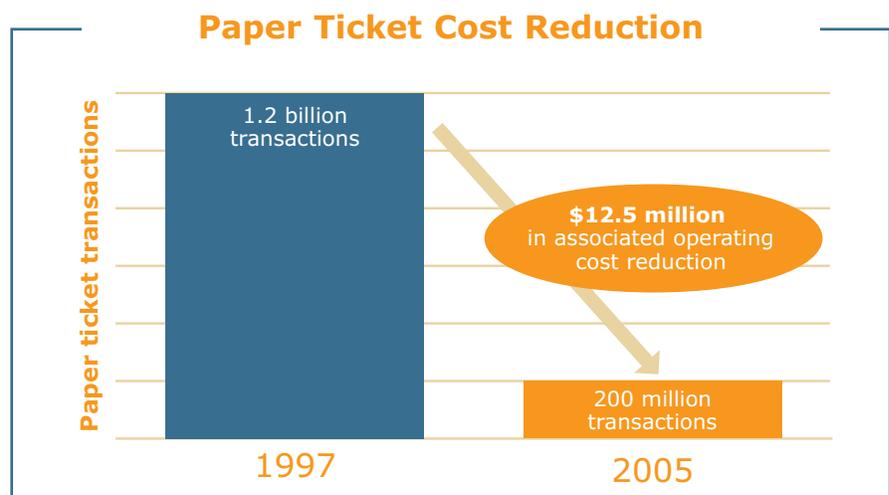
In each of its principal business objectives, the Teradata-based ARC COMPASS solution has proven remarkably successful. First and foremost, it has enabled an industry-wide transition from an obsolete and expensive paper-based ticketing process to the vastly more efficient electronic ticket.

In 2005, ARC processed 200 million paper ticket transactions, compared with 1.2 billion as recently as 1997. A full 92 percent of the tickets issued by ARC customers are now electronic, and the implementation of the Document Retrieval System has generated a \$12.5 million reduction in operating costs directly related to the reduced use of paper tickets for agency support documents.

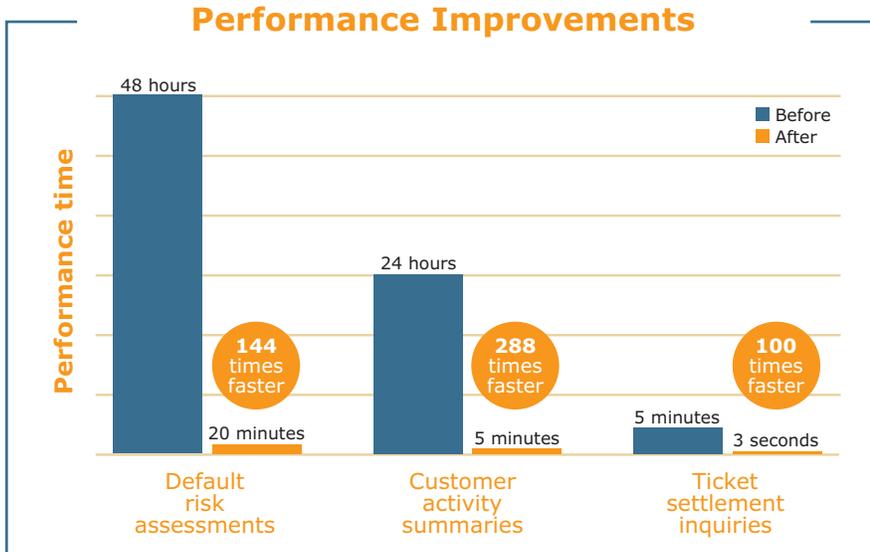
Agents who were once dependent on paper copies of document ticketing transactions now have instant, secure, Web-based access to more than three years of sales and settlement history – nearly a billion ticket records at any given time, each appropriately encrypted. The Web-based Document Retrieval Service receives more than 40,000 queries every month as agents and carriers research sold-ticket disposition. Average response time is less than three seconds, an impressive improvement over the five minutes or more required for paper-record retrieval.

With the phase-out of paper ticketing and the availability of electronic transaction records for daily analysis, fraud detection has become more sophisticated, automated, and effective. Potentially fraudulent activities can now be identified in 24 hours, instead of weeks or months. In fact, industry-wide ticket fraud has been reduced to the level of “insignificance” due to business intelligence enabled through the centralized data warehouse.

Business intelligence has also become a major business center for ARC. The firm now offers more than 40 different reports to its carrier and agent customers, and it adds an average of five new reporting products every year. “We’re constantly growing the data and analytical services we offer,” says Kyle. “Our reports now range from daily sales and tax summaries to origin and destination analyses, agency performance summaries, carrier reports, and more.”



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Agents and carriers also use the newly accessible data to extract granular insights, discovering, for instance, the top 500 agencies offering travel to specific Mexican destinations, or determining the impact of fare increases, promotions and other marketing efforts. ARC's expanding service capabilities have opened significant new revenue opportunities, which in turn reduce the cost of core services to the company's carrier-owners.

Other process improvements made possible by the ARC COMPASS Teradata system:

- > ARC's bonding and risk management group can now assess default risks in as little as 20 minutes, instead of 48 hours.
- > Internal auditors can summarize the activity of any airline or agent in just five minutes, instead of 24 hours.

- > Many useful internal reports that were previously difficult, if not impossible, to create – such as the ratio of e-tickets to paper tickets, or of cash to credit – are now routinely prepared in just minutes.

The Dual Active Decision

Since the initial implementation of ARC COMPASS in 2001, ARC's Teradata system has undergone two significant upgrades, the most significant by far being a complete technology refresh in 2005 that gave the firm a fully redundant, dual active platform. The seeds of that transition were sown at the 2003 Teradata PARTNERS User Group Conference and Expo, where Black attended one of the first presentations on dual active architecture by Teradata CTO Todd Walter.

On the plane home, Black wrote a long memo describing how a dual active environment for their data warehouse could

significantly enhance ARC's disaster recovery capabilities, improve reporting performance, and reduce overall operating costs.

Over the next 18 months, that memo evolved into a detailed business plan to dramatically enhance the data warehouse's technical and financial performance by redesigning its architecture. The decision to proceed was based on three specific objectives:

1. Reduce operating costs

"Our paramount objective was to reduce the operating costs charged to our Data and Analytical Service product line, which bears all expenses related to the data warehouse," Black recalls. "We aimed to reduce their expense levels while improving the quality of service we provided to them."

2. Improve the return on ARC's data warehouse investment

The primary target here was a substantial monthly expenditure for disaster recovery services that provided insurance against a major warehouse outage, but offered no usable processing capacity under normal operating conditions. ARC hoped to reinvest that expense in additional capacity that would improve performance and support new applications.

3. Enhance disaster recovery capabilities

"At the end of the day, I still had to protect the company in the event of a disaster," Black explains. "Whatever we did, I had to have a viable disaster recovery strategy."

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A careful analysis revealed that ARC could achieve all of these objectives by deploying a second data warehouse platform and transitioning to dual active operation in conjunction with a technology refresh scheduled to coincide with the end of its existing lease agreement. So in March 2005, the company performed a complete warehouse platform upgrade, replacing the existing Teradata system with two new ones, each with six Teradata 5400 Server nodes and 22TB of spinning disk. One system was deployed at ARC's primary Louisville data center; the other co-located with the Data and Analytical Products division in Arlington, Virginia.

Designing for Dual Impact

A key decision in the implementation design was to split internal and external workloads, using the Louisville system to support all customer-facing applications and dedicating the new Arlington system to the Data and Analytical Product division's ad hoc analysis. Daily data loads are executed sequentially, loading first at Louisville to meet an 8 a.m. update agreement, and then at Arlington to meet a later 11 a.m. agreement.

The two data warehouse platforms are sized so that either can handle the combined workload. Should the Louisville system, which supports all customer-facing applications, experience an extended outage, its workload can be redirected and resumed on the Arlington system, which is kept in synchronization. In the event that all workloads shift to one system, new processing

A Dual Active Environment

A dual active environment from Teradata consists of two or more fully-utilized production systems, which can be full or partial mirrors of each other. The systems are preferably placed at different physical locations in order to provide the highest possible levels of availability and disaster recovery. A dual active architecture:

- > Allows no single point of failure
- > Eliminates planned and unplanned downtime
- > Provides a single view of the business
- > Is transparent to users and applications
- > Offers consistent performance and guaranteed response time
- > Uses all assets and workload balancing for a cost-effective solution

priorities will be implemented to maintain performance and ensure continuous service level agreement compliance.

In all respects, the dual active implementation has allowed the ARC team to meet its financial, performance and strategic objectives.

Operating costs have been reduced

By eliminating the monthly disaster recovery outsourcing expense, leveraging new technology performance gains, and taking timely advantage of lower finance rates, ARC was able to reduce overall data warehouse-related costs by \$580,000 in the first year of its new three-year lease contract, and by \$830,000 in each of the following years.

Execution performance has been significantly improved

ARC COMPASS users at the company's Data and Analytical Products division in

Arlington had long suffered substandard query response times caused primarily by network congestion on the WAN link to the data warehouse in Louisville. With a high-speed local link to what is now, essentially, a dedicated data warehouse system, those delays are a thing of the past.

Data warehouse ROI has been increased

The expense that ARC previously incurred for the security of its off-site disaster recovery solution has been replaced with additional processing capacity that is available for day-to-day workloads. This goal was achievable since both systems in a dual active environment actively process work.

An enhanced test environment

"We now have the ability to use the Arlington system to test new applications in a full-scale production environment, using a complete copy of the warehouse

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– Randy Black, director of technical architecture, ARC

database, with no risk to our customer-facing applications,” Black explains. “If we break something it will affect our internal users but not our customers.”

Availability and disaster recovery capabilities have been strengthened

“Our final objective for the dual active transition was to improve our disaster recovery capability, and we’ve certainly done that,” Black continues. “Our previous restore process involved pulling tapes from our off-site storage, sending those to the recovery facility, and putting someone on a plane to supervise the recovery. All those steps would inevitably involve some downtime. Now we have two live copies of the warehouse available at all times.”

Information and Insight Transform the Travel Industry

As a core element of shared infrastructure for data management and business intelligence, the Teradata-based ARC COMPASS data warehouse has provided

the air travel industry with a potent infusion of transformational insight and operational efficiency. It has helped ARC and its customers reform their business processes to improve performance, reduce costs, and eliminate fraud. It has delivered badly needed visibility for an industry

experiencing rapid structural and environmental change. It has proven its ability to continually deliver new business value over time, and it has cemented ARC’s position as an indispensable service provider to its industry partners.

“ARC provides the ticketing industry with the world’s best settlement engine,” says Kyle in summation. “Then we maintain the information from those transactions accurately and thoroughly, letting us serve as the industry’s data store. By applying analytics and data services and making reports from those services easily accessible, we become nothing less than the premier provider of knowledge and insight to the travel industry.”

| Teradata Solution | |
|--|---|
| <p>> Warehouse Platform Two 6-node Teradata 5400 Server systems Teradata Database V2R5.1</p> | <p>> Professional and Customer Services Data warehouse system installation and start-up Data model development and ETL design Business-critical support</p> |
| <p>> Tools and Applications Teradata MultiLoad Teradata FastLoad Teradata Query Manager Teradata Visual Explain Teradata Priority Scheduler Teradata Warehouse Miner</p> | |
| | <p>> Partner Products MicroStrategy SDK Ab Initio ETL tools Protegrity Data Security Management™ software</p> |

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