

Real-Time ... All The Time

Real-time data integration across an airline's respective businesses enables it to more effectively carry out business initiatives that can enhance customer relationships, boost revenue and resource management, and shrink operational costs.

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The airline industry is facing a host of external and internal challenges, now and in the coming years. External events and trends, such as skyrocketing fuel costs, economic uncertainty, intense competition and consolidation, and ever-present concern of terrorism have caused enduring changes in how airlines conduct business, such that airline executives are constantly assessing how to do more to stay aloft, and in the end, remain profitable. Within the industry, airlines have undergone major restructuring and continue to struggle to win and maintain customer loyalty. Low-cost carriers, such as Southwest Airlines in the United States, Ryanair in Europe, as well as a host of Asian carriers, have disrupted the pricing power of major network airlines and are pushing them to compete and stop the flow of red ink, or face the consequences of their stakeholders: merger, takeover or perhaps eventual bankruptcy.

There are certainly no lack of hurdles in the path of making an airline successful in today's global economy and geopolitical landscape. One big hurdle the more nimble and forward-looking corporations are trying to address is the enormous data challenges facing today's modern airline business.

From their early days, airlines developed information systems to deal with the complexities of their business across several critical areas, such as reservations, maintenance and engineering, crew scheduling, aircraft capacity planning, flight scheduling, fuel requirements, seat inventory, airfare pricing, food/beverage, frequent flyer programs, and numerous other functions. These systems have enabled airlines to process huge data volumes to support multimillion-dollar business decisions. However, as difficult economic conditions continue, and technology innovations emerge, airlines also need information technology infrastructures that support thousands of the "thousand-dollar" business decisions faced on a daily basis by operational staff.

The past several years have been a struggle for airlines. To survive and grow, they must continue to take innovative approaches to effectively answer their unique business challenges. To do so, every airline must:

- Build customer loyalty,
- Manage revenue effectively for a perishable service,
- Reduce operational costs.

Building Customer Loyalty

The airline industry has reached an age of diminishing customer loyalty. The current situation is grimly stated in a Forrester research study that shows 29 percent of business travelers are actively disloyal to any one travel provider. Earning customer mindshare and brand loyalty requires personalized offerings and simplified online purchasing processes. Complete, accurate and timely

information about dynamic customer purchasing behavior and preferences is a critical factor in turning around the declining perceptions toward air carriers.

Solution: A Single View Of The Customer

As airlines work diligently to differentiate from a service perspective and build brand loyalty, a single view of the customer is important to clearly understand buying habits and how he or she responds to service changes, pricing and special promotions. But this is not a small technical task. To achieve this single view, airline personnel throughout the organization need access to passenger name records, customer profiles and other information in real time.

Offering customized services is impossible without the historical context of a customer's dealings with the airline. Equally important is the most current information in the customer's profile, current and planned purchases, profitability, and the impact his or her requests or needs may have in terms of the airline's profits. Therefore, an airline that employs a central data warehouse using historical and near real-time data together enables accurate and timely decision making to improve customer relationships in three key ways:

- Mitigate service disruption — Airline employees can mitigate the impact of service disruption, such as a cancelled flight, in a timelier manner using up-to-date passenger information.
- Target customers more precisely — Targeted marketing campaigns can be designed based on information that the customer

has asked for/looked at but has not yet purchased.

- Build brand loyalty — Real-time access to a single customer view can facilitate other proactive services to high-value customers. Recognizing that a frequent flying executive didn't receive an upgrade, for instance, a gate agent can continue to build loyalty with that customer by quickly issuing coupons for free drinks, meals or a discount off the next flight.

Managing Revenue For A Perishable Service

The airplane seat is unique since it represents a highly perishable service. While revenue is contingent on selling seats prior to a specific time, after that time, those spots cannot generate revenue. An airline incurs a cost for an individual seat whether it is occupied or not. Once the aircraft door is closed, that unoccupied seat has zero value.

The additional challenge in managing perishable services in the airline industry is that the highest yield in revenue comes just before inventory value drops to zero. Last-minute flight tickets are priced much higher than the tickets purchased months in advance. Typically, airlines adjust the inventory level available in each class (price) category at specific time intervals before the flight, in an attempt to increase the margins and the revenue as the price sensitivity decreases for travelers that are inflexible on flight dates.

Therefore, close monitoring of the rapidly fluctuating supply and demand and the resulting timely demand re-forecasting are



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Because an airline sustains a cost for an individual seat whether it is occupied or not, managing revenue for this perishable service is of critical importance.



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Real-time access to a single customer view enables airline personnel to offer specific services to high-value travelers, helping build loyalty and retain the most important customers.

critical for optimizing the revenue for perishable services. This is a common, yet difficult, data management conundrum for which airline IT departments invest large sums of financial and human capital, using existing, legacy systems and tools to solve — yet they struggle to succeed.

Solution: Real-Time Demand Analysis For Revenue Management

By leveraging real-time information, airlines can recalculate class-of-service inventory levels based on sales thresholds instead of the less-profitable pre-set time intervals system prior to the flight. This gives airlines the opportunity to capture incremental revenue when demand is unexpectedly high. It also provides the opportunity to spur incremental sales when demand decreases. The clear advantage is that an enterprise data warehouse or revenue management system that has access to real-time booking information enables identification of any unusual demand trends. By delivering these unexpected changes in customer purchasing behavior in real time to the revenue management system, airlines can recalculate inventory levels based on the event (observed unusual sales activity) versus a static scheduled date, allowing for dynamic inventory adjustment.

Near instantaneous information access also enables carriers to respond to competitors' pricing changes with more accurate analysis. When a competitor makes a price adjustment, airlines typically react by making their own pricing change based on assump-

tions and historical data. By having real-time information on how competitors' pricing is impacting current demand, the airline can assess the competitive threat more accurately. Using outdated information can result in the airline responding either too strongly or leaving money on the table by not responding aggressively enough.

Reducing Operational Costs

The airline business is inherently very expensive when considering the high capital and operational expense needed to run operations, including the costs of planes, fuel, labor and related infrastructure, which are massive. Proper utilization of aircraft and management of labor and fuel costs enables airlines to operate more efficiently. Through the years, airlines have worked with IT providers to develop systems to help control and manage these expenses. Access to real-time data can help drive costs down even further.

Solution: Real-Time Decision Support For Operational Efficiency

Managing these infrastructure challenges and keeping costs down begins with identifying the expenses that can be controlled or acting quickly to mitigate cost increases caused by market conditions.

By having concurrent access to different functions such as crew scheduling, airlines can benefit tremendously from an expense and employee morale perspective because crew assignments can be optimized based on overall fleet demand. After monthly work

schedules are distributed, schedule disruptions and crew member illnesses cause changes to the hours and number of trips flown by a crew member. Decisions made by operations personnel in staffing flights have a great impact on operational efficiency and crew member satisfaction. If a more-rested crew is located in another region, for instance, the airline must then fly them to the city needed instead of selling those tickets to customers and collecting the additional revenue.

By maintaining real-time visibility into the number of hours flown as well as the desired trip trades of crewmembers, the operational flight scheduler can assist operations personnel in making these staffing decisions. Airlines are also looking at their IT infrastructures for operational cost reductions to improve profitability. The key factor in improving profitability for airlines is to lower IT costs while improving IT effectiveness.

To handle the three identified business challenges, airlines' chief information officers face several technology challenges that must be resolved to enable carriers to compete in the future. Legacy systems for most major airlines were built around the mainframe. While highly effective for many years, these systems are a source of many of these challenges, including:

- Overcoming a batch-oriented infrastructure,
- Keeping up with the rate of change in technology,
- Having the scalability required for doing business on the Internet.

Escaping The Batch World

The airline industry was an early pioneer of automating data movement between systems through batch processing. Having originated from mainframes that were very expensive to operate, batch processing was once the only economically feasible option for migrating transactions to an offline analytical environment. This distributed the computing resources and enabled the execution of commands without human intervention. While batch processing has worked well for decades, tremendous data growth, high costs and unrelenting demand for more immediate data access has rendered it ineffective in many environments.

Continuing to live in the batch world is a liability for airlines seeking operational excellence because of their constant demand for business-critical data. For these environments, batch processing has outlived its usefulness because operations no longer run 9 a.m. to 5 p.m. High degrees of latency caused by moving large amounts of data with today's shrinking batch windows will continue to adversely affect IT's ability to support the airlines' customer-related initiatives. Knowing the needs of their business now and in the near future, airline executives should challenge technology providers to move beyond batch processing and share data across the enterprise in near real time to enable timely and accurate decision making.



Solution: Real-Time CDC Technology Decreases Data Latency

Some change data capture, or CDC, technologies provide continuous, real-time feeds of changed data to the enterprise data warehouse or operational data store and eliminate the batch window while decreasing data latency. With their transformation capabilities, they can be used to directly load a data warehouse from the source production system. Some real-time CDC vendors can also work with existing extract, transform, load, or ETL, tools, which enable airlines to continue to use their existing ETL processes while decreasing data latency to minutes or seconds. While not a complete overhaul, this helps eliminate batch-window dependency through capturing changed data in real time and delivering that data to the ETL tool instead of directly loading the data warehouse in real time.

Migrating And Consolidating Legacy IT Systems

Because of their highly specialized applications and demanding performance requirements, airlines have deployed transaction processing facility, or TPF, systems across several business areas, many of which have not changed much in the last 15 to 20 years. These legacy systems remain in use because their high performance and high availability capabilities hold considerable value to airline operations. As airlines look to modernize their IT operations, it is possible to retain the value of stability and performance inherent in a TPF system by moving to a mixed-platform solution. A mixed-platform solution combines TPF mainframe systems, traditional open systems

and service-oriented architecture to create a flexible, accessible solution with a high-availability core.

Regardless of the modernization strategy, significant amounts of airline data are held in specialized TPF systems, making it difficult to migrate to other systems. Migrating from legacy IT systems — even if it is to newer and more efficient technology — can present difficulties for any business. The “rip-and-replace” migration model introduces great risk into the IT strategy, not to mention the cost involved. The process can be especially disruptive when factoring in the airlines’ relentless availability demands.

Solution: High Availability Solutions Enable Migration/Consolidation and “Hot Standby” Without Downtime

Migrating applications, such as pricing systems, from traditional mainframes to open or mixed-platform systems requires a phased migration approach with high availability solutions that will minimize any downtime to the business. Airlines need to invest in high availability data migration solutions that eliminate database downtime during these projects as well as for upgrades and maintenance activities. Deploying these technologies that offer real-time, bidirectional data movement provides critical data synchronization between source and target systems and can eliminate any planned downtime.

Rather than continuing to delay a migration to open or mixed-platform systems, airlines can evaluate high-availability technology solutions that offer live (also known as “hot”) standby capability that provides failback con-

tingencies among systems and the ability to verify data among the systems.

Scaling Systems To Meet The Demands Of Online Shoppers

The advent of online travel Web sites created high look-to-book ratios. This ratio is defined by the amount of time spent looking up and sorting through flight possibilities compared to the time spent actually booking travel.

Inevitably, as that look-to-book ratio continues to affect system performance, degradation and availability issues occur either through sluggish response times or — even worse — error messages. When competitor Web sites or other options are just a click away, availability issues can lead to lost business. To support increased performance and uptime, airlines can either add more expensive production database and server infrastructure, or offload or partition that lookup-type activity to other lower-cost systems.

Solution: Database Tiering Helps Boost Performance As Demand Grows

Because Web-based travel booking is here to stay, airlines need to support these systems that have high look-to-book ratios while keeping IT costs from spiraling out of control. Database tiering can help this effort by enabling airlines to scale out their growing databases to open, less expensive IT infrastructures. It helps offload the burden of high-performing production systems since these lower-cost databases and servers can be kept synchronized with the production systems and be used for read-only access by users looking for that travel bargain or last-minute flight.

The airline industry faces some significant business and technical challenges both within and outside its control. Implementing long-term solutions to these industry issues will depend upon the ability of all parties across the airline industry to think beyond current business practices and to implement innovative processes that leverage real-time information.

By taking advantage of real-time data integration across their respective businesses, airlines place themselves in a better position to execute business initiatives that can build (or repair) customer relationships, improve revenue and resource management, and reduce operational costs. Airline executives, crewmembers, operations personnel and customers alike can agree that at no time in the history of the industry are these technology issues of a more critical nature than now. **F**

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A recent industry study found that 29 percent of business travelers are disloyal to any one travel provider. Complete, precise and timely data about active customer purchasing behavior and preferences is essential in turning around the declining perceptions about airlines.

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