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Taking your airline to new heights

The Jewel

A Conversation With … Muhammad Ali Albakri, Chief Information Officer, Saudi Arabian Airlines,

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SPECIAL SECTION

THE CONNECTED AIRLINE

The "Joined-Up" Airline

Connect real-time data across the enterprise to generate extra revenue

The airline business is growing in complexity and competitiveness. Carriers are introducing ancillary sales and new services, and many low-cost carriers are growing into a more complex hybrid model. Joining data sources from across the enterprise, in real-time, can create additional revenues and maintain operational excellence.

By Alan Walker I *Ascend* Contributor

Decision-support systems, in conjunction with the organizations and departments within the airlines that use them, often create islands of information with minimal exchange between them. Much as the Internet connects more and more people today, airlines will use these technologies to connect their systems and departments in real time. Information sharing will become the norm, leading to greater efficiencies.

For example, the "joined-up" airline will track assumptions and plans from the early planning stages of the schedule, then identify variances as actual data arrives and down-line systems refine their forecast accuracy. When one group learns something new about the marketplace and adjusts its assumptions and plans, this information is immediately available to other groups and systems within the airline. This continual refinement continues all the way through to passenger check-in and travel.

When exploring the concept of the joined-up airline, look at three phases of implementing the concept:

1. We must understand the planning processes and begin to extract the data.
2. The data must be gathered and joined.
3. The joined-up airline can implement systems that take actions based on this data, often in real time, to improve revenues and operational excellence.

Gathering Data

When an airline enters a new market, the initial analysis is macroeconomic, using a variety of industry data sources. The key point is that the decision to add new service relies on assumptions, such as forecasts of passenger demand, price points, traffic and revenue. These high-level forecasts cover a broad time range such as several seasons. Myriad data sources are available to an airline, from day-to-day operational detail to macro-level economic forecasts.

Following the decision to add service, the airline uses sophisticated tools to create a timetable, plan the schedule, assign aircraft to routes, and manage prices and seat availability. These systems refine the forecasts as they model connecting traffic, network interactions and other complex effects. Again, the joined-up airline will store this information, so down-line systems can track what is actually happening and refine the overall plan.

When the scheduling department adds capacity to a route, such as larger aircraft or additional frequency, the overall yield (RASK) will typically decrease. This occurs when the revenue management system takes advantage of the additional capacity and allocates additional space for some of the lower-priced demand. The scheduling system needs to balance capacity assignment and revenue management effects. At many airlines, different departments manage these functions and the interaction of schedule management and revenue management illustrates the connectedness and complexity of the problem.

Each of these systems may also use different models of passenger demand and propensity to book or consume ancillary services. For example, a joined-up airline will use common definitions so the scheduling and revenue management departments agree on the probability of up-sell for a customer.

The check-in systems, including self-service systems, can also use this data. The process of joining up an airline begins with identifying key data sources. Several key data sources provide data that can feed key performance indicators (KPIs). These data sources include:

- Bookings and tickets from the CRS, including ancillary sales,
- Check-in and baggage information from the DCS,
- Aircraft schedule,
- Aircraft movement,
- Crew,
- Fuel.

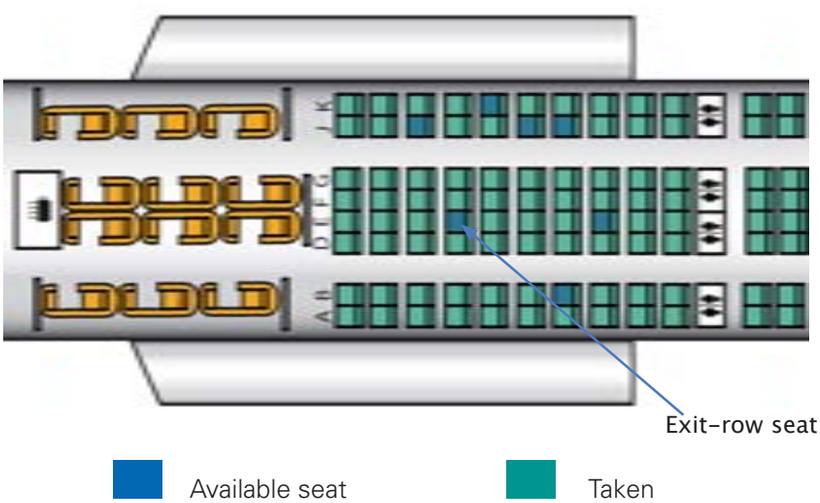
Next, consider additional data sources that can lead to insights about customer behavior and identify critical situations as they occur. The airline can collect shopping behavior as well as the information the customer reviewed prior to making a choice, such as the seat map at the time of offering a premium seat. Using this data, an airline can better understand customer demand and adapt its merchandizing strategy.

Data collection normalizes the data to a set of common interfaces and standards. A data dictionary and/or library of standard XML types provides a common language for talking about data. For example, a standard definition of customer address is used so the data warehouse and operational systems can actually join the data and correlate information.

There are several industry initiatives working toward common vocabularies and means for exchanging data and information about that data. For example, the Open Travel Alliance (OTA) OpenTravel 2.0 initiative is a new approach to XML schema architecture. This approach will use common vocabularies and means for exchanging data and information about that data. As standards progress, the industry will develop ontologies for exchanging information about data, leading to extensible and unambiguous means to exchange information.

Joining The Data

Many airlines start with a data warehouse to connect data, providing a common



Customer Behavior And Demand The customer paid for an exit-row seat. Did he want the leg room? Or would he have preferred an isle seat if it were available? And what effect would price have on the choice?

Real-Time Data Processing As departure approaches, there is even greater value in processing events in real-time.

view of that data across the company. Data warehouses excel at analyzing large volumes of information and creating policy. For example, there may be a cluster of airline customers that are likely to buy an upgrade or a premium seat. Campaign management tools can create offers, sending and tracking them via email or other communications methods.

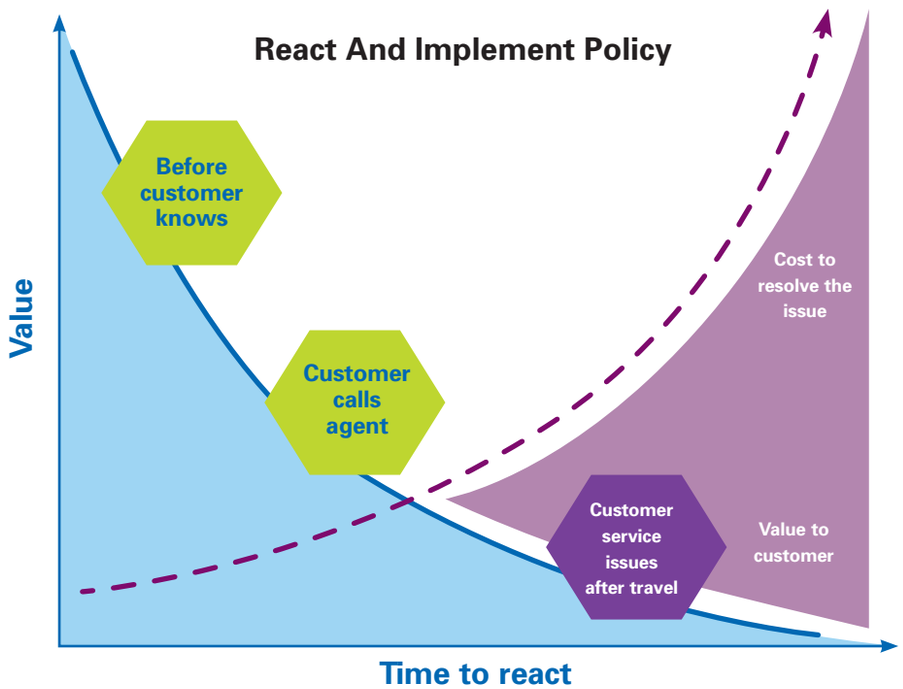
A more sophisticated approach, using an operational data store (ODS), can find linkages in real time. This provides the opportunity to react to changes immediately, rather than knowing about a situation after the customer has traveled. Simple linkages such as duplicate bookings or anomalies in reservations and ticketing are traditionally the domain of revenue integrity. New systems will extend these processes and glean additional information from each PNR, ticket or other data element as it flows through the system in real time. Statistical models can then forecast the probability that each customer might cancel or if they might use miles for an upgrade and who might pay for a premium seat.

As the ODS begins to integrate more and more data elements, the airline can begin to find situations that traditional "data silos" could not identify and react to, including:

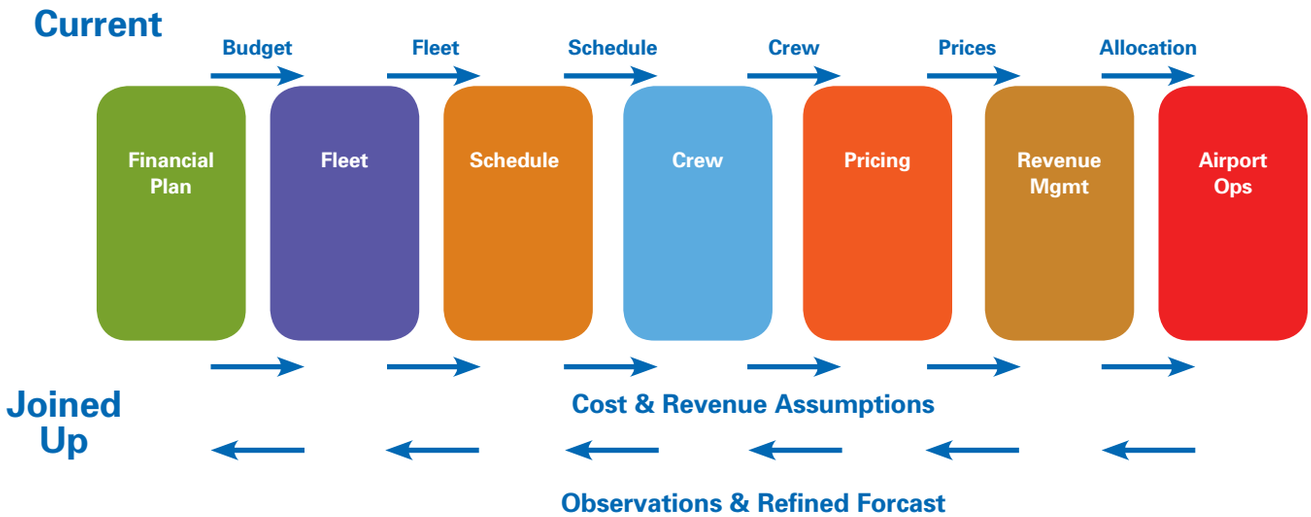
- Aircraft movement data can be linked to bookings, indentifying which passengers will likely misconnect well in advance of arrival at the connecting airport.
- The additional lead time allows an airline to adjust. If misconnecting passengers reduce the load, then the airline can relocate some of the space to cargo, so the later flight does not have a weight restriction. Customer service can better fulfill premium services, such as seats and meals, so passengers flow more easily through the system and do not require a refund when the service is unavailable.
- The core systems then push alerts and information to customers in real time. This data push reduces the load on reservations centers and airport agents.

The system monitors each plan's KPIs and tracks where anomalies occur. In markets tracking below plan, various levers provide the opportunity to react. Each lever touches multiple departments, and the common view of the data provides a means for consistent decisions, in the event, for example, there's a number of markets where the bookings are a little low:

- Demand Driven Dispatch (D3) can adjust the capacity by swapping crew-compatible aircraft. For an airline to take advantage of capacity swaps, the scheduling system needs to create a schedule compatible with swapping. When the swap happens, the revenue management system immediately re-optimizes the flights to have a more optimal mix of booking classes available.
- Price promotion can stimulate demand in certain markets. The system will make recommendations and can use models of customer demand and the network effects of revenue management to find



Early Detection The joined-up airline will use its single view of customer and operations to resolve issues in real time, often before the customer perceives the problem.



Bi-directional Information Flows Events feed back to update all steps of the planning process.

the best markets for promotions. The optimal candidates are markets where demand is elastic, meaning that the price changes lead to demand changes and that there is capacity in the network to accommodate this demand.

- Schedule adjustment occurs over a longer period. This lever applies to cities and regions that may have experienced a demand shift. Competitor actions, such as adding or removing service from a market or long-term demographic changes, result in demand shift.

React/Implement Policy

Now that policy is in place, it needs to be implemented and action taken. Policy can often take the form of written procedures but is often a set of rules or controls implemented in computer systems. Rules engines provide flexibility and can customize policy at a finer level of detail than traditional systems. For example, an airline can create special offers tied to specific airports and facilities such as lounges, restaurants or even spa treatments.

Now it's Tuesday morning, and as reservations have built over time, the system has developed a picture of what is likely to happen today as travelers show up at the airport. Flight 473 has a larger number of travelers that may pay for an upgrade, so the system has placed limits on the automatic upgrade clearance, saving space to sell more upgrades. In the case where fewer passengers might pay for an upgrade, the system removes these limitations and clears the standby lists early. This alleviates workload at the gate.

Later in the day, flight 84 is arriving late due to a weather delay. Data from the flight planning system, air traffic control, and aircraft routing and movement all flows into the ODS. Rules now trigger and find passengers who will misconnect more than an hour before they land at the hub. Alerts to the inventory analyst recommend immediately protecting space on later flights, and the system recommends alternate itineraries. The analyst now spends time reviewing and implementing the decision instead of looking for data and searching for alternate itineraries.

Now the airline can reaccommodate these customers and send them updated itinerary details before they arrive at the gate. This results in better customer service and reduces the work for agents handling the reaccommodation workload.

Measure And Feedback

Finally, the data needs to close the loop to measure the effects of the policy and make any necessary changes. The system measures KPIs and metrics, leading to a continuous learning process.

These systems and processes are interconnected. Suppose an airline wants to measure the effectiveness of self-service check-in. An initial measure might be to count the number of boarding passes issued by Web, kiosk and mobile applications and then divide it by the total number of boarding passes issued. However, all that's really known is the percentage of passengers that initially checked in with self service. It's not known if they needed to see an agent afterward to take care of an issue.

When a customer selects a flight on a website or checks in at the kiosk and chooses to pay for a premium seat, what drove that decision? Perhaps the bulkhead aisle seat was the only aisle seat left so the choice was this or a center seat. Alternately, perhaps, the customer actually wanted the bulkhead seat. If an airline collects data based on what was actually available at the time the customer chose the seat, it can use some mathematical techniques to find which seats can command a premium.

Additionally, the airline can estimate the value that customers place on this service. These parameters provide feedback to adjust the pricing structure of premium seating.

The joined-up airline isn't an idea that needs to be worked out. It's a reality. Technology, such as *Sabre® ASx℠ Airline Services Exchange*, *SabreSonic® Customer Sales & Service* and various other solutions can be used to join data across multiple systems. *Sabre Airline Solutions®* continues to invest in this vision, driving efficiency for the industry.

Alan Walker is vice president of architecture for Sabre Airline Solutions. *He can be contacted at alan.walker@sabre.com.*