Atlas Air's efficiency takes off with SOA-enabled business process management.

Overview

■ **Business Challenge**

After a decade of rapid growth, it was becoming an increasing challenge for Atlas Air Worldwide Holdings to adapt its operations to the dynamism and variability that are endemic to the air freight business. Atlas needed to become more agile by making its business processes more flexible.

■ **Solution**

Atlas worked with IBM to create an architecture that provides a foundation for Atlas to redesign and optimize its processes by mapping business functions to IT services. This Business Process Management (BPM) solution allows Atlas to be more responsive and nimble in meeting customer demands.

Based in Purchase, NY, Atlas Air Worldwide Holdings is the leading provider of outsourced freighter aircraft and operating solutions to the global air freight industry. Serving Asia, Europe, the Middle East, South America and the United States, Atlas manages and operates the world's largest fleet of Boeing 747 freighter aircraft.

■ **Key Benefits**

— *80 percent reduction from the expected cost of integrating operations with strategic delivery partners*

— *50 percent reduction from the expected time required to integrate operations with strategic delivery partners*

— *Significant expected reduction in operational costs*

— *Improved time to market with new business services*

— *Expected 30 percent reduction in application development costs*

The most basic mission of air freight carriers is to ensure that their aircraft and their cargo get to their destination safely and on time. That's the standard by which carriers are ultimately judged. Although this dimension of the business may be the most visible, below the surface it is guided by a complex operational plan whose components need to be intricately coordinated for the business to succeed. If air freight were a game of strategy, the board on which it is played is each operator's worldwide delivery and support network, which chiefly include the facilities and business services—ranging from maintenance and fueling for aircraft to catering and hotel layovers for crews—that

Business Benefits

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- Significant expected reduction in operational costs

- Improved time to market with new business services

- Stronger decision support through increased transparency into key performance indicators (KPIs)

- Decreased application support costs associated with integration

- Potential for market differentiation via agility

- Expected 30 percent reduction in application development costs

"We have a lot of messages flying around in our operations, with a lot of them generated manually. We wanted to automate the routing and reuse of these messages to create a realtime environment—a digital nervous system for the operation of the company."

— Jim Barrecchia, Sr. Director, Business Solutions Architecture, Atlas Air Worldwide Holdings

operators rely on to keep cargo moving. The greater the number of destinations each operator covers, the larger and more complex the required network of providers and potentially disparate systems to interface.

Perpetual motion

However, the real challenge for air freight operators is in choreographing the movement and availability of their most strategic assets—their aircraft and flight crews—as they move within their worldwide networks. What makes this challenge the most complex of all is that these networks are always in motion, usually according to plan, but sometimes not. The other defining characteristic of air freight operations is a high level of interdependency in terms of flight scheduling, the sequences of supporting processes, and a physical location of planes, people and cargo. If one of these elements goes out of sync with the others—a plane is delayed or a flight crew isn't in the right place—the ramifications tend to cascade into other parts of the operation. That's why, in such cases, operators need the capacity to refigure their plans, on-the-spot and on-the-fly, to mitigate the impact of unpredictability and to do their best to optimize the overall efficiency of their operational plans.

Atlas Air Worldwide Holdings, Inc. (www.atlasair.com), a leading provider of global air cargo assets and services serving over 300 destinations worldwide, saw one of its biggest challenges as achieving "dynamic optimization" by maximizing the efficiency and profitability of its operations in the face of changing inputs (e.g., new customer delivery requests) and operational constraints (e.g., flight crew rest requirements). Determined to prevent the growing complexity of its business processes from dragging down its efficiency, profitability and growth, Atlas realized it needed a business process management (BPM) capability to fundamentally change the way it translated information from across its operations into the best possible business decisions. It turned to IBM to help in this transformation.

To manage its business, Atlas relies on a large and diverse group of applications that handle highly specialized functions. Aircraft monitoring and cargo tracking systems provide critical telemetry data, while Atlas's commercial scheduling and crew scheduling systems determine where its planes and people need to be to meet delivery requirements. Its Maintenance, Repair and Operations (MRO) procurement system manages the repair and overhaul of its 37 aircraft, while its ERP system handles finance functions. The ongoing exchange of information with customers, vendors and governmental entities—such as U.S. Customs, the Transportation Security Administration (TSA) and air traffic controllers—is also central to its operations. For Atlas to run most efficiently, it ideally needed to matrix together all these critical and interdependent systems to work toward a common operational plan. But the reality was that the sheer number and diversity of its systems make

robust integration a major challenge. Because of this, Atlas relied on a mix of makeshift integration approaches and human intervention, in which case staff would manually triangulate information from different systems and attempt to make the right decision.

Grounded by growing complexity

In the 15 years since its founding, the strength of its core business model has enabled Atlas to grow in spite of its reliance on human judgment in its optimization decisions. But with Atlas entering a new phase of its evolution as a business, the inherent shortcomings of this approach were becoming more evident. Because of the multidimensional nature of air freight scheduling and routing decisions, the growth of the business leads to an exponential growth in the complexity of these decisions—making optimization much more of a challenge going forward. This issue also has a direct bearing on operational costs, from which Atlas was seeking to trim $100 million as part of its growth strategy.

Atlas realized that while traditional cost control methods could get it part way there, it could only fully succeed by fundamentally changing its business and decision-making processes—and the systems it relied on. At the project's outset, Atlas and IBM established the high-level goal of making its business processes more auto-mated and data-driven. IBM's key role was to design and deploy a service-oriented architecture (SOA) that would provide the foundational capabilities necessary for BPM. Process automation was, in and of itself, not the goal. Atlas instead wanted what it called "managed flexibility," an architecture through which it could create or adapt workflows, decision-support tools and business processes as situations changed—a condition which, in the air freight business, means most of the time.

IBM's answer was to create an architecture that abstracted Atlas's core backend applications into services that can be reused to create entirely new applications via SOA. On a practical level, this means Atlas can take functions that had been spread across multiple platforms—requiring each to be accessed separately—and unite them into a "composite" application workflow. This SOA was built on Atlas's existing IBM System x™ servers using WebSphere® Integration Developer for tooling, as well as a diverse range of other technologies. IBM WebSphere Enterprise Service Bus (ESB) is used to provide a common connectivity platform between applications, handling the routing, mediation and transformation of infor-mation. IBM WebSphere MQ provides the basic connection messaging protocol between applications. The solution also uses IBM WebSphere Service Registry and Repository software to manage the various business services in a policy-driven SOA governance framework.

Targeting process improvement

On top of this SOA foundation, Atlas created a full BPM solution. The team used IBM WebSphere Business Monitor to create dashboards to track key performance indicators within each process, and WebSphere Business Modeler to create detailed maps of its process flows to identify targets for deeper process improvements, a task beyond the capability of any employee. Once such targets have been found, Atlas can use IBM WebSphere Process Server and IBM WebSphere Portlet Factory to rapidly assemble abstracted services into new business services. This literally opens the door for a new level of operational efficiency, with realtime data—such as telemetry readings from a cargo door opening at an airport halfway around the world—triggering a cascade of other, dependent processes. It also means Atlas can get an immediate and comprehensive view of the financial impact of an operational decision—such as holding up a flight (and risking late charges) in order to accommodate a last-minute shipping request—a degree of decision support the old system could have never achieved.

With its BPM architecture in place, Atlas is poised to achieve a much deeper level of process optimization, helping it to strengthen its margins by achieving significant cost savings. Atlas's increased business agility will also enable it to seize market opportunities rapidly and—by significantly reducing its application development costs—more cost effectively. A key example is its recent partnership with DHL Express (the world's leading express and logistics company), which was contingent on Atlas's ability to mesh its systems with those of DHL Express. Because both companies used IBM WebSphere MQ—a key element of Atlas's SOA strategy—Atlas was able to cut the time and cost of integrating with DHL by 50 percent. To Jim Barrecchia, Sr. Director of Business Solutions Architecture, one of the most telling signs of the success is the way Atlas was able to shift much of its resource focus of supporting applications to targeting business process improvements. "Our BPM solution enables us to constantly target opportunities for process improvements and gives us the flexibility to realize them," says Barrecchia. "We're now better aligned for growth and profitability—and IBM helped us get there."

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