

# I D C   E X E C U T I V E   B R I E F

## Event Processing in Transportation and Logistics

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### **Introduction**

Transportation and logistics (T&L) is a commodity business with strong competition along all classes of service. Because price competition factors so heavily into this sector, there is a constant need to drive down costs and at the same time invest in service differentiation to win new customers while maintaining existing business. Because profit is tied directly to utilization, there is also a constant need to improve techniques for revenue management.

Meanwhile, any number of factors outside the control of transportation and logistics providers affect costs and customer satisfaction. These factors include weather, unexpected in-transit repairs, conditions of roads and rails, and fuel costs. Transportation businesses also contend with price competition and changes to regulations that impact their ability to achieve consistent profitability.

Business event processing (BEP) technology is becoming increasingly important to T&L providers. They are beginning to use this technology to build innovative, new approaches to solving a host of long-term problems. This paper provides examples of how transportation and logistics providers are using BEP technology to achieve success in the following ways:

- Increase customer loyalty and generate revenue by evolving customer service
- Increase profitability by redefining the practice of revenue management
- Reduce costs by addressing known process inefficiencies

## **Customer Service Initiatives**

### ***Creation of Event-Driven Customer Services***

The use of an event-driven architecture to improve customer service is evolving in transportation and logistics. Event-driven customer service is unfolding in the following three key stages:

1. Inform the customer
2. Solve the problem in an optimal way and inform the customer about the resolution
3. Use situational promotions to increase loyalty and grow revenue

Most transportation and logistics providers are in the first generation of event-driven customer service, alerting customers in real time about changes to a flight's status, for example. When someone is flying, it is now common to receive a text message about a gate change, flight delay, or lost luggage. In shipping, customers are able to look up the status of their shipment on a Web site, and if the shipment's arrival time changes, they often receive status change notification. Any service provider that does not notify customers about changes to status is behind the norm of the market.

Depending on the status change, a customer may need to call the service provider to resolve the problem. From that perspective, this stage of event-driven customer service may be productive in that it removes customer uncertainty, but it does not generate loyalty or remove the cost of inbound customer service.

### ***Second-Generation Event-Driven Customer Service: Problem Resolution***

The second generation of event-driven customer service involves problem resolution prior to customer notification. For example, while previously an alert would notify customers that their luggage did not make the flight, in this generation, the notification explains the problem and how it is being solved. In this example, the notification lets the traveler know that the luggage will be delivered to a stated destination by a stated time.

Increasingly, airlines are automatically rebooking flights when the certainty of a late leg in the flight will cause problems for the traveler. The traveler then receives communications that he or she has been rebooked. In both cases, the traveler does not need to call into a call center to resolve a problem unless the solution the airline selected is not appropriate. The goal is to handle 80–90% of the problems without any inbound communications. In this generation of event-driven customer service, T&L providers have the opportunity to improve customer satisfaction while significantly driving down the cost of customer service.

On the business-to-business (B2B) side, remediation may need to be more sophisticated. For example, a decision to re-reroute a shipment through a different path because of weather conditions may need to be made much earlier in the logistics process. From that perspective, the ability to provide event-driven customer service really translates to the need to build an event-driven logistics process that, for all intents and purposes, is invisible to the customer.

### ***Third-Generation Event-Driven Customer Service: Loyalty and Revenue Generation***

Coupling the inevitable need to inform customers of bad news with event processing technology leads to the third generation of event-driven customer services. This generation improves the customer service experience by leveraging customer communications to include promotional offers that are situationally aware of customer needs.

An example is the ability to offer airline customers a meal coupon if their luggage was delayed and scheduled to arrive on the next flight. The airline could price the offer by comparing the cost of delivery to the designated address with the face value of the coupon that would be accepted by the traveler. If it is less expensive for the traveler to wait a couple of hours than for the luggage to be delivered, there is an opportunity to satisfy the customer while reducing cost.

By the same token, when there is a delay in departure, the notification could be accompanied by a coupon from an airport restaurant or bookstore, mitigating the effect of a bad customer experience while generating revenue through an arrangement with an airport service provider.

While the use cases described here involve airlines, a great deal of experimentation is being done with situational offers. Because service providers are continuously collecting information about their customers, the ability to make promotional offers to increase loyalty, coupled with the ability to generate revenue from advertising relationships, is a new area of opportunity.

Many transportation and logistics providers are building their core event-driven customer services using BEP because they want to be able to increase the number of data feeds that help them predict and mitigate problems. BEP can then be leveraged to develop and support promotional models that allow providers to improve customer loyalty as well as upsell and cross-sell services for revenue growth.

### **Revenue Management Initiatives**

Revenue management, or yield management, focuses on maximizing the revenue that can be achieved from a fixed, perishable resource. This is a critical discipline across all of transportation and logistics to achieve profitability. While many transportation providers make an effort to align costs with revenue, providers typically have significant underlying fixed costs, with highly variable revenue.

Whether a transportation company competes in an aggregated booking system or sells to business direct with short-term contracts, pricing is highly competitive within each segment of the industry and across segments. Airlines compete with each other plus railroads, trucking with rail, air with shipping. Customer loyalty is volatile, and pricing is a key asset in winning new business from incumbents, particularly when a provider makes an operational decision to go after particular customer segments.

But loyalty can also increase when a provider is uniquely able to meet a need. In some cases, the need becomes increasingly urgent as the departure or delivery date nears. A seat available on a flight or an urgent shipping request can generate more loyalty than the lowest-cost providers, when they are not able to meet the demand. Meanwhile, other customers may use this same time window to look for bargains. In other words, inelastic and elastic demand will compete for the available inventory, and the trick is identifying and matching the buyer with the buying motivation.

Therefore, the discipline of revenue management combines a need for an increasingly complex and high-speed understanding of patterns of customer requirements over moving time windows. Competitive advantage is found in refining revenue management techniques to include these factors in modern systems. As such, T&L providers are rebuilding or adding on to their revenue management capabilities to handle processing and analysis of data in real time from a variety of inputs, including current and historical customer transaction data, weather information, feeds from reservation systems, and robots that can capture pricing information from automated systems and other localized sources that impact demand, such as convention calendars.

These inputs can be leveraged with event processing for real-time pricing and capacity allocations, the ability to simulate pricing changes to better forecast revenue and to make offers based on the lifetime value of a customer.

## **Operational Efficiency Initiatives**

### ***Maintain Situational Awareness of Service Levels***

In B2B scenarios, transportation is a service that is increasingly contracted out to multiple service providers and measured by service levels. This is driving enterprises to invest in technology that provides them with visibility into the status of an order and enables them to measure the performance of service providers based on their ability to meet on-time and complete order commitments.

While end users are building monitoring systems using BEP and business activity monitoring (BAM) to identify potential problems with the arrival of their orders, transportation providers are building business navigation systems for problem detection and remediation to prevent delays.

This isn't isolated to B2B scenarios; it extends to protecting the reputation of the shipper. Consumers use free Web sites offered by shippers to track the status of their orders. During peak seasons, such as the Christmas holiday, consumers freely express their outrage using social media when they experience a shipping delay.

### ***Identify Gaps in Electronic Documentation to Reduce Delays and Idle Time***

Many aspects of arrival times, such as weather or road conditions, are outside the control of the transportation provider. But delays are also caused by paperwork, either because of a delay in examining documentation or because paperwork is missing.

An expected delay might occur during a border crossing or when goods are shipped between countries. In these cases, regulatory requirements necessitate inspection of the paperwork as well as the freight. Transportation providers are building BEP-based, event-driven systems in cooperation with regulatory agencies to align the required paperwork and forward it digitally, ahead of its arrival at the inspection point. These systems benefit the shippers because they are able to reduce idle time caused by inspection, and they also benefit the government agencies doing the inspection. Approving paperwork ahead of arrival reduces delays and backup at the inspection point.

Another common delay that can be rectified with BEP involves the departure of a delivery truck without its advanced shipping notice (ASN). When this happens, the truck sits idle while the supplier, transportation provider, and customer work to find or reissue the ASN. Meanwhile, the delay in delivery causes upstream problems as a customer waits to replenish store shelves or a manufacturing plant idles while waiting for the load from the truck. Given the prevalence of lean manufacturing and the widespread adoption of electronic data interchange (EDI)-based electronic documentation, this has evolved into a fairly significant problem in retail and manufacturing.

In these circumstances, BEP is used to identify gaps in documentation that can be solved while the truck is in transit.

### ***Support Rebooking and Rescheduling***

Schedules are critical for transportation, and when a schedule is not met, entities involved with the delivery are impacted. For example, a flight departure event will change the state of the flight status and cause the predicted arrival time to be recalculated. If the calculation indicates that the flight will be late, this event will be published out and trigger calculations for many other conditions, such as baggage handling scheduling, crew scheduling, and gate scheduling. In other words, a chain reaction has to be managed, affecting the airline and a number of outside contractors.

While handling a single flight and that flight's chain reaction is fairly straightforward, an airport or airline must handle hundreds of chain reactions that share significant interdependencies with each other.

This complexity only grows when one considers the union and labor regulations that must be accounted for when managing a delay or the urgent reactions needed to minimize customer frustration.

BEP is being adopted to address these scenarios in different ways. Some transportation companies are using BEP to feed status events into optimization systems that handle scheduling. Others are using BEP as a key component of event-driven rebooking and scheduling systems, with new events continuously updating the state of all of the entity models (e.g., crews: flight, ground, gate, baggage; and inventory: gates, airplanes, baggage) associated with the arrival and triggering changes to the members that can be associated with each model.

While this example looks at airlines, all other forms of transportation have similar issues and either are in production or are experimenting with the use of BEP to solve different aspects of rescheduling problems.

## **Conclusion**

Harnessing and organizing data into a systematic approach to identifying and managing problems and opportunities is not something T&L providers can wait to do. Many examples outlined here provide logical entry points for use of BEP to build and test new approaches for pilot business navigation systems. The business benefits can be found in one or more of the following areas:

- Improved customer satisfaction and improved loyalty
- Reduced staff required to interface with customers by reducing the need to have customer interactions
- Decreased costs involved with solving problems
- Decreased costs by making fewer last-minute changes that impact customers, personnel, and other operating costs

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