CARRIER SHIPPING INTEGRATION GUIDE

Selecting the Best Solution to Integrate Shipping Functions in SAP with Parcel Carriers

A Blue Harbors White Paper

A guide to developing an integrated SAP shipping strategy, assessing needs, and understanding the basic functionality offered by various internet-enabled supply chain shipping solutions.

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Carrier Shipping Integration Guide

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Express Shipping: a Competitive Necessity

For companies with a shipping function, the Internet has become a critical tool for business integration. It fosters greater cooperation between trading partners and allows companies to work with their supply chain partners to better serve customers, increase profits and drive down costs.

However, with this capability comes some challenges. For many companies, selecting the right tools to drive cooperation and integration with partners can be a difficult choice. The selection must be made carefully with the ultimate goal in mind: to improve customer experience while also driving increased profitability and reduced costs, with minimal organizational risk.

The goal of this white paper is to help companies understand the need for an integrated shipping strategy, determine how to assess their needs, and to understand and compare the basic functionality that is offered by various internet-enabled supply chain shipping solutions. As part of this, we will discuss how the Blue Harbors Express Shipping Solution can help organizations better serve their customers, while also increasing profits and driving down costs.

Finding the right tool to achieve these goals means taking a hard look at the systems currently in place, and determining what pieces are missing. The good news for many companies already running SAP is that the pieces may already exist to drive more efficiency from the supply chain function. They may simply not be in use or are not configured to drive maximum business results. Blue Harbors has developed the Express Shipping Solution to ensure shipping activity yields optimal benefits for your organization.

Today’s Shipping Environment

Today’s supply chain management technology has come a long way since Walmart first installed electronic scanners at cash registers and linked them to inventory planning systems in the 1970’s. Walmart, and the many companies that followed, quickly learned that by minimizing costs in the supply chain, logistics could contribute as a major source of competitive advantage and profitability.

Now, sophisticated supply chains connect suppliers and customers in tightly knit business processes, enabled by e-commerce tools such as XML, WSDL and SOAP. These tools allow supplier, shipper and customer systems to communicate and provide visibility into the status of transactions at any point in the supply chain - from initial order through to final delivery.
The world has changed for parcel shipping companies as well. As the flow of goods within the supply chain becomes more critical to company profit, customers increasingly depend on their shipping partners not only to deliver packages on time, but to provide real-time details about the shipping status of a package.

The parcel carriers have responded. Since the 1970s, parcel companies have made their technology available to customers, first by delivering PC-based shipping solutions, then moving to an Internet-based model. Today, all major carriers make their shipping technology available to business customers and end consumers via the cloud.

This enables companies to partner with their shippers to provide customers real-time visibility and control into their shipments. The question is no longer whether to give customers access to information, it is how to use the available technology to increase market share, reduce costs, improve customer experience and loyalty, and most importantly - stay competitive.

**Integrated Shipping – Why it Matters**

There are several compelling arguments for connecting your organization’s shipping and warehouse management systems directly to your express carrier’s hosted shipping solution. In brief, the arguments include:

- Meeting customer expectations,
- Optimizing operational efficiency and reducing costs,
- Leveraging parcel carriers’ technology; and,
- Customer retention.

We will expand on these ideas in the following section.

**Meeting customer expectations**

Today’s customers - whether businesses or end consumers - have come to expect increased visibility into the status of their shipments and to have greater control over their shipping options. Meeting these expectations allows companies to remain competitive.

Meeting customer expectations is key, because even the largest multinational corporations are punished in the marketplace if they fail to deliver superior value to their customers. According to Eduardo Porter’s December 2004 *New York Times* article “Innovation and Disruption Going Hand in Hand,” of the 50 largest companies on the New York Stock Exchange in 1964, only six were still on the list in 2009. This churn has been more or less constant over the last 40 years, with 13 to 14 companies dropping out of the top 50 every five years.
To remain relevant and competitive, not only must businesses constantly innovate to deliver products and services that outperform the competition, they must also adapt to changing business trends. Business customers now expect suppliers to provide the same features which express carriers have made commonly available to consumers, such as scheduled deliveries, parcel tracking and hassle-free returns processing. Integrating your SAP back end systems with your parcel shipper’s cloud-based shipping systems helps organizations meet this expectation.

**Optimize operational efficiencies and reduce costs**

As supply chain partners interconnect their business processes, the technology enabling these partnerships requires more access to real-time information. This extends into the shipping processes, where greater emphasis is placed on real-time status details about in-transit packages.

Logistics has also become more externally focused, incorporating suppliers and customers into business processes with all the supply chain functions playing an important role in the business model. By minimizing the costs in the value chain, logistics acts as a major driver of competitive advantage and profitability.

The goal of implementing supply chain management techniques is to drive down the cost of doing business and to increase operational efficiency. Information technology is an essential tool to reach these goals. According to Claudia Deutsch in her July 2007 *New York Times* article, “Still Brown, but Going High Tech,” UPS and FedEx are each pumping more than $1 billion a year into research to keep up with the demands of providing e-commerce enabled functionality and information to their customers.

This investment has led to impressive cost savings. FedEx CIO Rob Carter has stated that it costs FedEx $2.40 to track a package for a customer who calls by phone, but only four cents for one who visits its website. This encourages the shipping companies to make more services available online to their customers, and the customers have responded by taking advantage of the services offered to them. Per the Economist September 13, 2003, FedEx now gets about three million on-line tracking requests a day, compared with only a few tens of thousands by phone.

**Leverage parcel carrier’s technology**

Even with the commitment that UPS and FedEx make on the technology front, your business cannot utilize this technology without connecting your SAP system to the express carrier’s shipping server. To realize supply chain management’s full potential, all trading partners that constitute the ‘extended’ supply chain must be integrated electronically, including carriers.

A UPS-sponsored survey of US business executives found that most companies still believe supply chains are inefficient, with 65% stating that the ‘next frontier’ would be synchronizing the entire interaction between vendors, customers and suppliers, and not just optimizing small pieces of the
process. This is what Gunnar Adalberth, director of e-commerce marketing at UPS Europe, calls ‘visibility – or the real-time ability to view the movement of goods and funds as products move through the supply chain.’ (“Competition takes FedEx and UPS to the forefront of technological innovation” RETHINK IT 2004)

Since 1998, SAP has provided the Express Ship Interface, or XSI, a complete interface to communicate with express ship companies’ IT systems. To take advantage of the feature-rich content available from their express ship partners, companies running SAP must implement the Express Shipping Interface (XSI) which is bundled into ECC and EWM packages.

Retain customers

Today’s customers have more choices and control than ever. If they don’t have a good experience working with their suppliers, they may look to the competition for solutions.

Customer complaints are costly for both suppliers and customers. Because of this, only 5% to 10% of all dissatisfied customers decide to complain. Instead, according to Beck, Roman and Jochen Franke’s 2008 “Designing Reputation and Trust Management Systems” in the Journal of Electronic Commerce in Organizations, they are instead more likely to switch providers. This usually leads to future revenue losses higher than the costs caused by complaints in the first place.

To reduce risk of customer loss, it is important to avoid giving customers a reason to look for suppliers elsewhere. One way to ensure their need for cost control and visibility is met is by enabling integration and communication between supply chain participants, including shipping companies. Madan Birla, in his 2005 book FedEx Delivers, notes, ‘The new economy, revved by e-commerce, is fast, global and ultra-competitive. So we must innovate, particularly in ecommerce technology, by giving customers information about their goods in transit, enabling them to make up-to-the-second business decisions.’

Selecting a Shipping Solution

As we have seen, the arguments in favor of integrating your shipping function with your carriers’ system via the cloud are compelling.

Once your company decides to pursue integrating its shipping and warehouse system with parcel carriers, you will be faced with a wide array of options from third party providers of shipping solutions. The easy part will be matching your current shipping needs against the list of features provided by each third party vendor. The more challenging task is understanding how the decision will impact your organization over the long haul.

Questions to ask about current requirements include:

- Do I have complex shipping needs - international, dangerous goods, parcel, freight, customer returns, rate shopping, real-time tracking, POD, department policies, etc.?
Do I need to support multiple carriers?

Does my existing shipping solution integrate well with SAP?

But equally important are the long term impacts of your shipping solution once you have it up and running.

Are there annual maintenance or licensing fees?

How easily can the solution be reconfigured to meet changing business requirements?

When I upgrade SAP, how does this impact my shipping solution?

We will now look at the most common shipping solutions with an eye towards both current and long-term needs of your company.

**Connecting SAP to the Parcel Carrier**

The benefits of connecting your SAP system to parcel carriers using SAP’s XSI solution include the following:

**Customer Service:** Integration with the parcel carrier allows you to provide your customer with the level of logistics service that they have grown to expect from their consumer transactions: time-definite express transportation and peace-of-mind created with positive package tracking. The customer expects you to know exactly where their product is in-route and when it will arrive. By incorporating these capabilities directly into your SAP ECC or EWM systems, your customer perceives that your company is in command of the entire fulfillment process — from the time the customer places an order until the goods arrive at their door.

**Real-Time Information:** To make supply chains function effectively and efficiently, all trading partners within the external supply chain must contribute real-time, accurate information to the other trading partners. Implementing a shipping solution that works with your SAP system will allow you to view transportation details, such as tracking numbers and POD details, electronically via shipping notifications or other event handling mechanisms.

**Leverage Carrier Information:** FedEx and UPS are able to provide a wealth of information about each package traveling through their network free of charge. Connecting your shipping engine to SAP allows your organization to make the most of the information that is available.

You work hard to gain customers and retain their patronage. Once the product leaves your door, the customer becomes anxious about their package in-transit. Put their mind at ease by delivering insight into the status of the shipment. Implementing an integrated shipping solution is an easy way to generate repeat business and keep customers happy.
Considerations when Evaluating a Shipping Solution

When evaluating a shipping solution to connect SAP to an express ship carrier, look for following features:

1. **Native SAP** – Ideally, the solution should use native SAP functionality. No custom transactions or programs should be required. This ensures that you need not rely on the company that implemented your shipping solution to maintain it going forward.

2. **Carrier Independence** - Confirm the solution is carrier-independent. You should be able to switch between carriers easily.

3. **Hosted by Carrier** - Ensure that the 'shipping engine' is hosted by the carrier, so that the carrier is responsible for generating labels that meet their requirements, providing tracking numbers, and updating shipping rates.

4. **Fully Integrated** - The shipping solution should be fully integrated with the other SAP components, such as sales and delivery transactions. Customer service representatives and sales need visibility to parcel details directly from sales orders and deliveries, especially when they have a customer on the phone.

5. **Real-Time Visibility** - Real-time updates of parcel tracking details should always be at your fingertips. To demonstrate that you are in control of the entire order process, from the time your customer places an order until the product arrives at their dock, your customers must feel secure that you know where the product is located, even when it is in transit.

6. **Minimal IT Footprint** - The shipping solution’s footprint should be minimal within your IT landscape. There is no need to introduce ‘failure points’ into the system landscape by adding a separate application for generating shipping labels.

7. **Minimal Support Required** - Minimize the support requirements of the solution as much as possible. Ideally, the solution is supported by SAP and certified by the carriers.

8. **Low Maintenance Costs** - Make sure there are no maintenance costs associated with the shipping solution. Annual support fees - licensing fees and the like – can unnecessarily burden your IT budget.

Shipping Solutions for Express Ship Carriers

When preparing to integrate your SAP system with an express carrier, there are a number of choices available.

- **Blue Harbors Express Shipping Solution**: This is a full-featured shipping solution built from components already included with SAP's ECC and EWM software. No additional licenses are needed, and it is maintained with standard configuration settings. It supports multiple carriers. Because the shipping details are provided by the FedEx and UPS hosted server,
there is no need to update shipping rate tables or be concerned about generating compliant shipping labels.

- **Carrier-Specific Solutions**: FedEx and UPS have applications available for purchase that can be implemented on a server within your network. The FedEx application is called Ship Manager; the UPS application is ConnectShip. Drawbacks include: the shipping applications and packing stations are carrier-specific; the additional application and server adds complexity to your system landscape; interfaces are required to transfer shipping data between SAP and the shipping application; and the shipping software requires maintenance and support.

- **Third-party Stand-alone Applications**: These require an interface to connect with SAP. While these applications typically support multiple carriers, they also require additional hardware and staff to support and maintain them.

- **Third-party ‘bolt-on’ applications**: Bolt-ons are additional programs that are added to your SAP system to run the third party’s shipping solution. Even though the programs are running on your SAP system, you still incur licensing fees, and must support and maintain this third party solution. Additional work may be needed during SAP upgrades to ensure that the third-party solution functions properly in the upgraded environment.

The following table illustrates a side by side comparisons of the options.

<table>
<thead>
<tr>
<th></th>
<th>Blue Harbors Express Shipping Solution</th>
<th>FedEx / UPS</th>
<th>Third Party Stand-alone</th>
<th>Third Party Bolt-on</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Native SAP</strong></td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
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<td><strong>Licensing Fees</strong></td>
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<td><strong>Supported by SAP</strong></td>
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<td>No</td>
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<td>No</td>
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<td><strong>Multi-carrier Support</strong></td>
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<td>No</td>
<td>Yes</td>
<td>Yes</td>
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<tr>
<td><strong>Integrated with SAP Logistics</strong></td>
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<td>Maybe</td>
</tr>
<tr>
<td><strong>Included with SAP Upgrade</strong></td>
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<td>No</td>
<td>No</td>
</tr>
<tr>
<td><strong>OSS Support</strong></td>
<td>Yes</td>
<td>No</td>
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</tbody>
</table>

**The Blue Harbors Express Shipping Solution**

Blue Harbors has partnered with SAP and the major carriers to develop a solution that allows companies to link their own SAP systems directly to their carrier’s hosted shipping servers. This solution is called the Express Shipping Solution, which is based on SAP’s Express Ship Interface
(XSI). XSI is included in the SAP ERP Central Component (ECC) and Extended Warehouse Management (EWM) applications.

If your company uses SAP and regularly ships packages via UPS or FedEx, the Express Shipping Solution utilizing the XSI interface will allow you to connect SAP with your carrier.

The following sections provide information around Blue Harbors’ Express Shipping Solution functionality and benefits:

**Overview of Express Shipping Solution**

Provides a comprehensive, powerful and easy to use solution that simplifies all aspects of packing and shipping:

- Designed using standard SAP tools and functionality to seamlessly integrate with all leading parcel carriers;
- Delivers complete visibility to all aspects of order fulfillment, from the warehouse to the customer;
- Supports multiple carriers simultaneously.

**Solution Details**

- Express Shipping Solution is based on XSI, an R/3 component released by SAP in version 4.6;
- Provides seamless integration of parcel carriers into the SAP business shipping process;
- Functionality includes generating tracking numbers, parcel tracking, label printing, and delivery data exchange via IDocs (Intermediate Documents);
- Supports ‘hosted’ solutions offered by FedEx and UPS: shipping data is sent directly between SAP and the parcel carriers over the web via XML;
- Supports all common express carriers, including: UPS, FedEx, USPS and DHL;
- Available in SAP ECC environment as well as the next generation WMS environment, EWM.

**Solution Features**

- Allows real-time tracking of individual parcels as they proceed through the express delivery company’s distribution network;
- Enables real-time rate selection and cost comparison for shipping services offered by multiple carriers to help minimize shipping costs.
- Able to exchange data between SAP and the express delivery company using IDoc and XSI function modules;
- Enables carrier’s system to generate tracking numbers and rate;
- Prints compliant shipment labels which are defined by the carrier’s system, including special data fields;
- Supports day-end closing activities (i.e. manifest, delivery list, end-of-day list);
- Compatible with all carrier service levels / shipping methods;
- Supports dangerous good shipments and international shipments;
- Enables packing station to solicit weight from integrated scale, print packing slips and print carrier compliant shipping labels;
- Supports direct billing, third-party billing and collect on delivery (COD);
- Many reverse logistics options - schedule pickup of returned product at customer’s site; fax your customer an image of the return shipping label; generate a return label when creating the outbound shipping label and put it the shipping carton. No need to mail return labels to the customer.
- Enforces shipping policies across departments and manages cost centers.

**Maintenance and Support**

- Express Shipping Solution requires no new shipping application to support — all activity happens on SAP in ECC or EWM;
- Shipping for any carrier can be performed from any workstation;
- Easy maintenance with carrier-hosted solution: no rate tables to update or label formatting;
- Real-time tracking information available directly in SAP sales orders, deliveries and shipments;
- Express ship interface (XSI) is included in SAP upgrades;
- Support notes and patches for bug fixes are provided by SAP via OSS.

**Cost Savings**

- Reduces interface costs in supply chain;
-Eliminates third-party software and maintenance costs and licensing fees;
- Enables your organization to standardize processes and tools, using one logistics system and one set of processes across sites.
**Flexibility**

- Quickly meet business transformation goals using standard configuration settings;
- Supports rapid roll out of new or closure of unneeded warehouses;

The Blue Harbors Express Shipping Solution resolves the following issues commonly found with third-party shipping solutions:

**Less Maintenance:** Third-party applications require a lot of maintenance, meaning a lot of time and money. Usually, a special team is needed in-house that understands the software and can maintain it. In addition, the software requires constant servicing: upgrades, patches, loading carrier-specific requirement (label specifications, rates).

**Fewer Integration Failure Points:** Many third-party shipping applications are not tightly integrated with the primary ERP system (SAP). Customer service representatives and sales executives cannot directly track parcels from within their SAP documents, like sales orders and deliveries. Users have to jump between SAP, legacy shipping software and tracking websites to obtain tracking status — so accessing real-time shipping data is a challenge.

**Less complexity:** Third-party shipping applications introduce an additional layer of complexity into the IT landscape. It is an additional ‘failure point’ that leads to down time in the warehouse. This impacts operations, causing overtime and sometimes even delayed shipments to customers.

**System Architecture**

The basic components that constitute the Blue Harbors Express Shipping Solution are shown in Figure 1:

![Diagram of data exchange between SAP and express ship carriers.](image)

*Figure 1: Depiction of data exchange between SAP and express ship carriers.*
Outbound Messages When a package is created in SAP (either ECC or EWM), data is fed to the Express Shipping Solution / XSI that contains all the details necessary for the small parcel carrier to create a label. These details are converted into XML format using Web Services, a component in ECC. From there, the XML message is sent to the carrier’s shipping application over the web.

Inbound Messages When the carrier’s shipping application receives the XML message, it generates an image of a shipping label, a tracking number and the shipment cost, in addition to other shipping details. This information is captured in an XML message which is sent back to ECC or EWM, and stored in the delivery on the ‘parcel tracking’ tab. The image is sent to a printer, which is typically a label printer with 4x6” stock.

Blue Harbors Express Shipping Solution Process Overview

The actual steps and transactions used to perform the order and shipping vary according to each company’s needs, however the following general tasks should provide you with a good understanding of how the Express Shipping Solution fits into your particular implementation of SAP. This process flow is depicted in Figure 2:

1. Enter a sales order in SAP. At this stage, the shipping service (overnight, Saturday delivery, etc.) is determined via one of four possible triggers in the sales order: the shipping condition, route, delivery priority or special processing indicator. The carrier is selected and then the shipping point is determined.
2. **Pick product for sales order.** Deliveries are created for sales orders. In turn, pick tickets are created for the deliveries and warehouse staff physically pick items in the warehouse. *Note: it is not mandatory to use SAP’s warehouse management (WM) module to work with the Express Shipping Solution.

3. **Pack product into a shipping carton.** Next, the items are brought to a packing station and placed in a shipping carton. The carton is weighed on a scale that is directly integrated with SAP.

4. **Send details to small parcel carrier.** Information about the shipping container and the items in the container are captured in the Express Shipping Solution and sent to the express carrier (FedEx, UPS, DHL, etc.) via XML.

5. **Receive shipping label details.** A XML message is received from the express carrier and processed in SAP. This includes an image of the shipping label, the cost of shipping the parcel and the tracking number. This data is saved in the delivery; the image of the shipping label prints at the packing station.

6. **Post goods issue / End-of-day close.** A goods issue is posted for the delivery. When the carrier’s truck picks up the packages an end-of-day close transaction is performed.

7. **Parcel tracking.** While the parcel is in transit current details about its tracking status are available in numerous documents in SAP, including the sales order, delivery and shipment.

**Frequently Asked Questions**

**Question:** What happens if the carrier upgrades or changes their mapping schema? Will I still be able to generate shipping labels?

**Answer:** Periodically, a carrier may update their WSDL/API maps to add shipping functionality to their web services offerings. When this is done, the changes are backwards compatible, meaning that the older mapping is still supported by the carrier.

**Question:** Is it necessary to communicate with the carrier over the internet each time a shipping label is generated? Does this lead to network performance issues? What is the average response time for generating a shipping label?

**Answer:** A call is made to the carrier each time a shipping label is required in SAP. Since no middleware exists between the SAP and the carrier’s server (we use direct encrypted peer to peer communication), the round trip time for the call is quick - under two seconds on average. It may take an additional 2-3 seconds to route the image of the shipping label to the printer and print the label. This approach has been successful in high volume warehouses, where shipping volume exceeds 10,000 packages per day; still, no performance related issues were detected.
Question: What happens if a carrier’s server goes down? How often does this happen?
Answer: The carriers maintain near 100% uptime in their production environment. Cloud-based computing allows the carriers to maintain multiple server clusters and server farms, giving them the ability to perform updates, add storage or new servers and never have a down time window.

Question: Since SAP is communicating outside the corporate firewall, is the communication secured?
Answer: Messages to and from the carriers are routed through an encrypted SSL connection, and can additionally be routed through a proxy server if needed. Communication is always initiated from inside the firewall (from SAP), and never by the carrier. As a result, the data and systems are secure.

Question: Which carriers are supported?
Answer: All leading parcel carriers, motor freight companies and freight forwarders are supported. The partial list includes UPS, FedEx, DHL, USPS, TNT, Purolator, Expeditors International, JAS, CEVA Worldwide, Swiss Post, Deutsche Post, Chronopost and DPD.

Contact Blue Harbors

To learn more about Blue Harbors and the Express Shipping Solution, please contact Josh Riff, CEO of Blue Harbors at +1 (415) 799-7769, or via email at josh@blueharbors.com. Solution details are online at www.blueharbors.com/xss.

About Blue Harbors

How can we help your business?

Since 2001, Blue Harbors has helped customers maximize the value of their SAP systems so that they can make more strategic, better informed decisions, achieve and maintain compliance, and save time and money through aligning and optimizing technology and business processes.