IBM

e-business case studies

DHL Worldwide Express:

Using e-business to speed delivery

e-business

Putting e-business to Work

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e-business case studies: DHL Worldwide Express

DHL Worldwide Express (*www.dhl.com*) is the world's largest international air express network with service to 675,000 cities in more than 225 countries. The DHL Worldwide Express network includes DHL Airways, Inc. (serving the U.S. market) and DHL International (serving markets outside the U.S.) composing 2,400 offices worldwide.

This case study addresses DHL Connect, DHL's Internet-based platform for advanced service delivery that integrates IBM's MQSeries messaging middleware and the ES/9000 server.

DHL Worldwide Express serves 225 countries with 2,400 offices worldwide.

DHL Worldwide Express

The Company

- International air express network
- 2,400 offices worldwide

The Web Site

www.dhl.com

- Customer service automation

The Benefits

- Expected cost savings of over $4 million in first year
- Increased loyalty and expansion of customer base

The Technology

- IBM MQSeries®
- Lotus® Organizer®
- IBM ES/9000® Servers
- IBM Global Services

BUSINESS DRIVERS

> ***"The goal was to provide access to and assist with, the business processes that are required for shipping something internationally."***
>
> *— Alan Boehme, DHL Director of Strategic Planning*

When DHL first began planning the system that was to become DHL Connect, it established a high-level goal of becoming the easiest international express carrier with which to do business. Specifically, in the case of DHL Connect, "the goal was to provide access to and assist with, the business processes that are required for shipping something internationally," according to Alan Boehme, DHL's director of strategic planning and a key figure in the system's development.

As the shipping business has become more competitive, strategic IT investments have assumed a central role in helping large shipping service providers differentiate themselves to potential customers, as well as increase loyalty within their existing customer base. (DHL, which estimates its overseas market share at 40 percent, sees its main competitors in this arena as FedEx and UPS). Consistent with this IT-centric trend, DHL established increased customer loyalty as one of its strategic goals for the DHL Connect system. Although DHL initially targeted small businesses as their primary audience, Boehme notes that a number of alternative user models have emerged, including technology-savvy employees within larger corporations who seek to bypass department "admins."

ADOPTION STRATEGY

When originally conceived in late 1995, DHL Connect was envisioned as a dial-up system. This vision proved short-lived as the rapid rise of the Internet made it increasingly clear that a fundamentally different approach would be required – one which would take advantage of the Internet's core capabilities. DHL's revised vision was to develop an entirely new set of services and to use IBM's MQSeries middleware to seamlessly integrate the new services with their legacy systems.

> ***"We changed more business processes with this one implementation than had been changed in the company in five years — because we had to."***
>
> *— Alan Boehme*

Adoption Timetable

The DHL Connect initiative was initially driven by the marketing organization, but was soon shifted to a special group within DHL that concentrates on electronic commerce. After its initial conception, DHL's first step in the development stage was to create a Windows prototype of DHL Connect, followed by rapid prototype testing and focus group research, which was done in parallel (Figure 1). After initial testing, it became clear that switching to a Web-centric approach would require a financial investment considerably higher than was originally planned. Specifically, what had been seen as a 10,000 man-hour project had become to a 46,000 man-hour project, comprised mainly of development work to be performed by DHL and IBM Global Services.

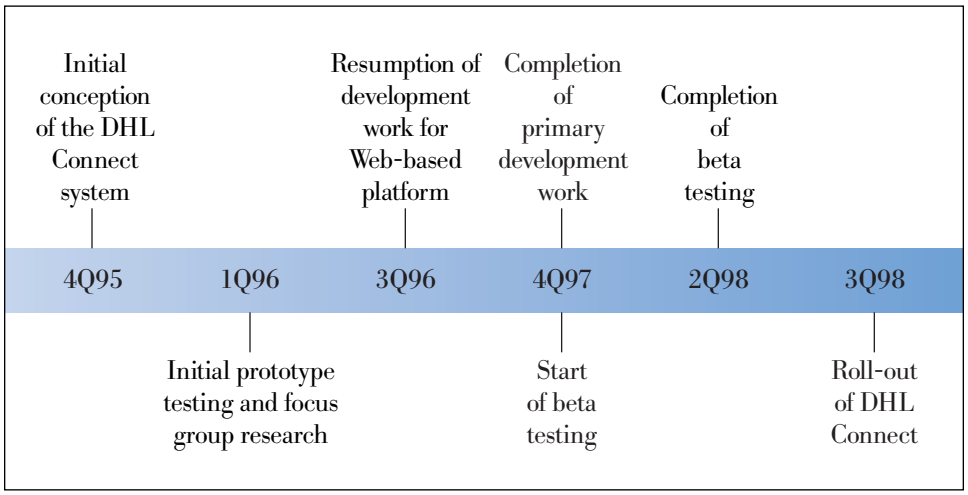
After its retrenchment, DHL took approximately six months to reestablish the project's momentum. Primary development work for DHL Connect was completed in November 1997, after which the system entered a six-month beta test. The scale of the test was initially held down by the testing companies' reluctance to test a new system during the holiday season. By the end of the beta period, in late May 1998, approximately 800 large, medium and small companies were testing the system. DHL rolled out the completed system in mid-July 1998. As of late October 1998, there were approximately 7,000 users on the DHL Connect system.

Architecture and Applications

The main software/hardware elements of the DHL Connect system include an IBM ES/9000 server (which contains DHL's rating data), IBM MQSeries middleware (which links applications to legacy data) and an interface with Lotus Organizer on the client side.

The DHL Connect system was developed as a series of modules, with each module thoroughly tested before it was introduced. In constructing DHL Connect, the company also built what it called "customer APIs" as well as "shared services APIs."

According to Boehme, the real value of MQSeries middleware was its ability to separate DHL's legacy systems – and all the business functionality that is stored there – from any of DHL's new services. Because the system is now purely message-based, DHL's developers are able to change business rules either in its legacy systems or in the new services without impacting the connectivity between the system's components. DHL decided to use MQSeries in 1995 based on its unique ability to provide the necessary message-based functionality.



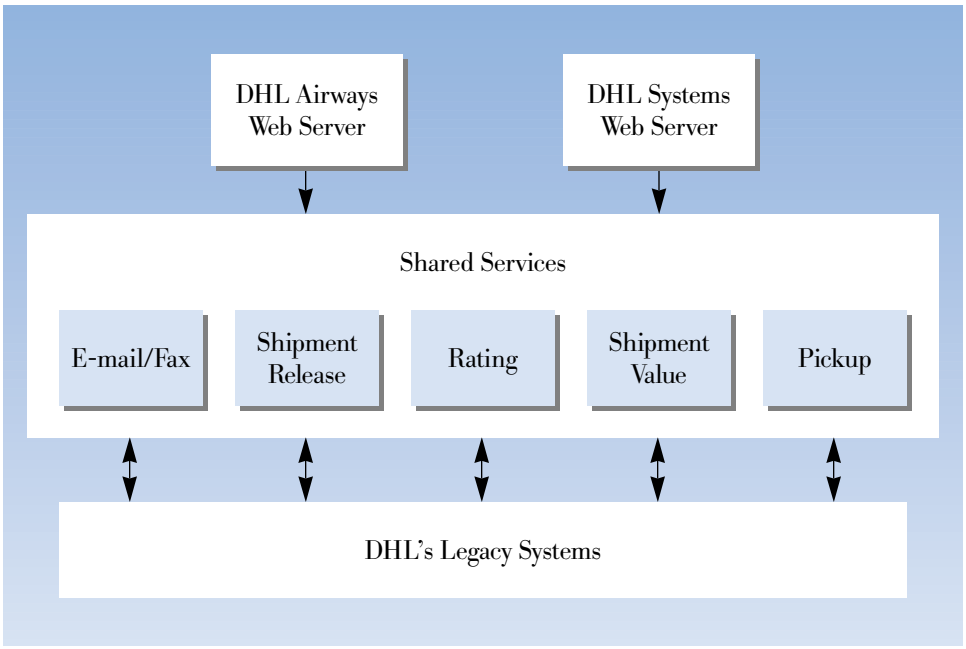
Source: DHL Worldwide, 1998

Figure 1. e-commerce Implementation Timetable for DHL Worldwide Express

DHL's server, also a key element of the DHL Connect platform, is located in Houston, Texas and includes all ratings data. DHL's customer service system, used mainly for pickup requests, is a client/server application. DHL's Web-based tracking is run off a UNIX server. Within the overall architectural model, DHL's shared services rest atop its legacy system, which are located on the bottom of the hierarchy.

DHL Connect users enter the application through the Web server, which takes them past DHL's firewall and back to one of the customer APIs allowing them, for example, to schedule a pickup. Within this transaction, MQ's function is to send messages back to various systems, which then pass the responses back to the appropriate services. The services then pass messages back to DHL's back-end database, which reformats messages to HTML and passes them back to the customer. Figure 2 illustrates DHL Connect's basic system architecture.

The DHL Connect system provides customers with links to Web sites that facilitate their transaction processing. These sites include government data such as "harmonized codes," which are descriptions of goods in numeric form that every country requires to process transactions through customs. At present, the system for importing harmonized codes is based on traditional "cut and paste" Windows technology. In the future, however, DHL may fully automate the product classification using agent technology, subject to its ability to overcome liability issues associated with delivery shipments (*i.e.*, liability for misclassified products).



Source: DHL Worldwide, 1998

Figure 2. Basic System Architecture: DHL Connect

Business Process Changes

During DHL Connect's development, the company was extremely aggressive in changing its core business processes. "We challenged every business process that got in the way, " said Boehme. "We changed more business processes with this one implementation than had been changed in the company in five years – because we had to." While Boehme points out that "every touch point in a DHL transaction got changed," DHL identifies the following areas as the most significant manifestations of process change:

•Courier practices

•Processing methods at export gateways

•Customer service

Under previous practices, the courier, after receiving an airway bill, would have to check to ensure that the address and routing codes matched. DHL Connect automates this process by verifying that the address is deliverable and that the routing code is valid. Likewise, by automating the forms process at exporting gateways (where deliveries are checked for compliance), DHL saves time and increases accuracy by eliminating data entry, while gaining the further benefit of immediate data feedback into DHL's billing system.

In the customer service area, DHL Connect has reduced the company's reliance on customer service representatives to field calls to schedule pickups. Other similar customer service process changes were enabled by providing customers with the ability to automatically check the last delivery time in a given area and to order shipping supplies electronically.

Featured IBM Technology

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IBM ES/9000

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"DHL Connect is based around messaging, and without MQ, there's no way we could have done it."

—Alan Boehme

While Web-based package tracking has become a fairly standard offering for delivery companies, DHL Connect has the unique ability to track packages sent through other couriers (UPS, FedEx, etc.), all with a single query. DHL traces the value of this functionality to the fact that most companies will use one carrier for domestic air, one for ground, and one for international. Thus, if a company is shipping through multiple carriers, tracking can become complex and time consuming. DHL Connect eliminates this problem by presenting tracking data in a consistent format, regardless of which company is performing the delivery.

One of the company's main goals in designing DHL Connect was to make it as easy and convenient to use as possible, thus lessening the chance that complexity would limit usage of the platform. An important manifestation of this approach is DHL Connect's integration with many commonly used personal identification numbers (PINs) for applications including Lotus Organizer. By allowing users to pull data directly from its database, DHL Connect eliminates the need to rekey data in the course of a transaction.

RETURN ON INVESTMENT

DHL sees the strategic benefit of the DHL Connect platform as increased productivity (Figure 3). In fact, as a result of studies conducted by DHL – including time and motion studies – the company calculates that it is saving between $.75 and $1.00 on every transaction that is booked electronically. In general, the extent of cost savings per transaction is dictated by the range of functions the customer chooses to perform electronically; electronic scheduling of pickups generates the most substantial savings. DHL reports that its productivity increases are translated into hard cost savings through reductions in the number of couriers required, higher delivery route density, and other efficiencies.

DHL's adoption goal for DHL Connect calls for the system to account for 10 percent of all U.S. shipments within one year. Given that DHL performs approximately 40 million shipments per year in the United States, its cost savings related to DHL Connect are expected to approach $4 million in its first year, just short of breaking even for its entire $4.6 million investment in the platform. Over the long term, says Boehme, "payback on this [investment] should be phenomenal. Indications are that we are heading in that direction."In addition to cost savings, DHL sees other, less quantifiable strategic benefits, such as increased customer loyalty and an increase in the size of its customer base. The latter scenario recently unfolded when a large bank switched its contract from FedEx because DHL took half as much time to complete a bill (three minutes versus six minutes). "Because DHL Connect is a productivity tool, it helps us gain accounts," says Boehme.

> ***"Payback on this [investment] should be phenomenal. Indications are that we are heading in that direction."***
>
> *— Alan Boehme*

Overall ROI Benefits	
Function	**Benefit**
Courier practices	Time savings Increased accuracy Increased route density
Export gateway processing	Time savings Increased accuracy
Customer service	Lower costs
Sales and marketing	Increased loyalty Increased revenues/customer base
DHL customers	Increased tracking convenience Time savings

Source: DHL Worldwide, 1998

Figure 3. IBM e-commerce benefits of the DHL Connect System.

PLATFORM DEVELOPMENT STRATEGY

DHL decided to split the functionality between the client PC, within a 6.4 MB application, and the server. In the future, Boehme says DHL plans to convert the DHL Connect platform to a "pure" Web-based system. "Over time, the client will get thinner and thinner, until it becomes basically a browser." Planning for this conversion is currently underway, with IBM's new Java Beans product as one of the technologies being considered.

DHL notes that IBM was instrumental in helping them optimize the performance of its MQSeries, as well as server integration that was required to make the platform work. DHL also gives IBM high marks for seeing the problem from a DHL customer perspective, as well as their knowledge of the transportation business. But DHL has the most to say about MQSeries: "DHL Connect is based around messaging, and without MQ, there's no way we could have done it," declares Boehme.

For more information, please contact your IBM marketing representative or IBM Business Partner.

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