

# DHL breaks new ground with RFID-based real-time tracking of sensitive shipments.

## Overview

### ■ Business Challenge

*Under pressure from the U.S. FDA to guarantee the temperature integrity of their drug shipments in transit, DHL's pharma customers were clamoring for a more reliable and cost-effective option. This required DHL to track container temperature in real time at every stage of delivery.*

### ■ Solution

*Together with IBM and its partner Infratab, DHL developed an advanced temperature tracking solution that combines sophisticated sensing and RFID technology to enable the real-time monitoring of temperature-sensitive shipments while in transit.*

### ■ Key Benefits

- *Ability for pharma customers to proactively respond to shipment problems in transit*
- *Improved customer satisfaction and loyalty*
- *Overall net improvement in delivery reliability*
- *For DHL, a strong basis for sustained competitive differentiation and a significant new source of revenue growth*



*A unit of Deutsche Post World Net, DHL is the global market leader of the international express and logistics industry, providing express, air and ocean freight, overland transport and contract logistic solutions, as well as international mail services. DHL's international network links more than 220 countries and territories worldwide with over 285,000 employees.*

The rapid rise of world trade spurred on by globalization has elevated the importance of transportation service providers to the world economy. It's now increasingly common for supply chains to extend not just over time zones but also into different hemispheres. It is a reflection of how companies have enjoyed more flexibility in their sourcing practices, and perhaps even more so, of the reliability that companies have come to expect—and increasingly demand—from their transportation service providers.

*“The DHL Innovation Initiative is a key part of how we are transforming ourselves as a business. It shows how good ideas – and the right mix of partners – can create a whole new market opportunity.”*

– Dr. Keith Ulrich, director, technology and innovation management group, Deutsche Post World Net

## Bringing new levels of transparency and control to the distribution chain

### Business Benefits

#### End-customer benefits

- Ability to proactively respond to shipment problems in transit
- Overall net improvement in delivery reliability at significantly lower costs

#### DHL benefits

- Improved customer satisfaction and loyalty
- Strong basis for sustained competitive differentiation
- Significant new source of revenue growth

*“We want to make a joint effort to develop solutions that haven’t yet entered our customers’ minds.”*

— John Allan, president of logistics division, Deutsche Post World Net

Over the past decade, customer expectations for excellent service delivery have risen in parallel with the infusion of new technologies and the optimization of delivery processes that these technologies have allowed. Thus, differentiation is no longer simply about getting goods from point A to point B as fast as possible—a dimension of the delivery business that has indeed become a commodity. Instead, the true source of value and differentiation is the ability to provide customers with rich information about their deliveries, which in turn gives them more control over how deliveries affect their business. If a key process depends on the shipment arriving on time, that customer needs to know it’s going to be there or needs the flexibility to make contingency plans if it isn’t.

### Keeping it fresh

But time is not the only dimension of concern to customers. Many companies also have highly specialized delivery requirements that relate to the properties of the items they are transporting. Pharmaceutical companies, which often ship drugs or vaccines over large distances, are a prime example. The vast majority of drugs and vaccines need to be shipped within a prescribed temperature range to maintain their potency or freshness. Any break in this chain can render an entire shipment worthless by “denaturing” complex compounds such as proteins, or can drastically shorten the product’s shelf life. Further complicating the challenge of temperature-sensitive logistics are the complex pathways many of these deliveries follow, which may involve handoffs between different transit and temporary storage points along the way. The more links there are in this chain, the greater the chance that unforeseen factors can adversely impact the temperature of the shipment.

Partly in response to a mandate from the U.S. Food and Drug Administration to validate the integrity of shipments, logistics giant DHL ([www.dhl.com](http://www.dhl.com)) had received requests from many of its pharmaceutical customers to expand the range of temperature-controlled logistics services it offered. The standard method of dealing with temperature-sensitive shipments has been to use specialized, highly insulated containers to maintain the desired temperature range that are retrieved after each shipment. While highly effective in maintaining the proper temperature range, they are costly in both added weight and the time required to pack them, making them economically impractical on a large scale. The other, lower-priced option was to ship products in Styrofoam boxes that also contained temperature logging devices, which monitor temperatures at set intervals from departure to arrival. When the shipment reaches the destination, these devices are retrieved and sent back to the customer.

### Too little, too late

While the information generated by the logger approach was accurate, the fact that it took some time from the arrival date for the data to become available severely diminished its usefulness. Because this information was delivered after the fact, neither the customer nor DHL, could take any kind of preventative and corrective actions if a temperature deviation occurred. Deutsche Post World Net (DPWN), the parent company of DHL, took notice of this capability gap and saw opportunity. The driving force was DPWN's Technology and Innovation Management (TIM) Group, which had been formed to seek out opportunities to leverage its business and technology expertise by creating fresh, new solutions for its customers' real-world problems. As an outgrowth of these activities, the DHL unit had recently entered into a strategic alliance with a small group of top technology companies known as the DHL Innovation Initiative. Its aim was to bring together complementary technology and process expertise to develop leading-edge logistics solutions that would help DHL expand its portfolio of offerings, thereby strengthening its competitive differentiation. The TIM Group together with the internal business unit saw the inability to access condition monitoring data of temperature-sensitive shipments in a timely manner as a prime opportunity for the DHL Innovation Initiative.

Led by its director, Dr. Keith Ulrich, the TIM Group formulated a plan to use RFID technology to track the temperature of shipments at various points from departure to arrival. It engaged IBM, a member of the DHL Innovation Initiative, to help design the solution and to translate the functional requirements into a technically feasible solution design. The hallmark of the project was close cooperation between IBM, DPWN and a major pharma company that agreed to take part in a pilot. Working closely with the pilot company, IBM Global Business Services mapped out the process framework, which would determine the services' key functional parameters, such as where and when readings should occur. For RFID expertise, the team turned to the IBM Sensor and Actuator Solutions organization, which helped to design the architecture of the solution, and IBM Business Partner Infratab ([www.infratab.com](http://www.infratab.com)), whose Freshtime™ products use RFID technology to track the freshness and temperature integrity of goods.

The goal of the pilot was to create a solution that would enable DHL and the customer to track shipment conditions in near-real time using RFID tags within shipping containers and readers located at critical stages of their shipment.

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### Key Components

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#### Services

- IBM Global Business Services
- IBM Sensors and Actuators EBO

#### Business Partner

- Infratab, Inc.

#### Time frame

- Process evaluation: three months
  - Solution design: three months
  - Implementation: six months
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### Why it matters

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*In today's hyper-competitive transportation services market, the bar for differentiation is set high. As an outgrowth of its efforts to incubate innovation, parent Deutsche Post World Net developed a first-of-a-kind RFID-based system to monitor temperature-sensitive shipments for its pharma customers. By enabling shippers to detect temperature problems while in transit, it provides shippers and customers with an unprecedented level of information transparency and control. Leveraging the inherent adaptability of the solution, DPWN plans to create a family of similar services that will drive future revenue growth.*

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It proved to be an unqualified success. With the new solution nearly ready for commercial introduction, DHL expects it to provide an unprecedented level of supply chain efficiency for pharma companies that adopt it. The best way to illustrate this is through contrast. Envision the path of a pharma shipment as a line that leads from the customer's factory to the product's ultimate destination. Dotting this line are supply-chain "checkpoints," where the shipment can either change its mode of transportation (e.g., from road to air), go into storage or some other change of status. As it moves from one segment of the journey to the next and the environment around the package changes, some fluctuation is expected—as long as it stays within a tolerable range. But suppose that, for whatever reason, the temperature rose above this range on the road from the factory to the airport. Under the logger system, the customer wouldn't know about the shipment problem until days after it had already arrived, forcing the customer to wait weeks for a "good" shipment to come in. By comparison, because the RFID system checks and reports the temperature of the shipment at every supply chain checkpoint, DHL knows if there is a problem before the shipment even reaches the airport. This enables the company to stop the shipment and initiate a new one, thus producing only a minimal impact on the customer.

### **Sensing unbound**

While the transportation services industry as a whole is moving toward providing more transparent shipping information to customers, DHL's new RFID temperature monitoring solution has introduced a whole new level of transparency. With shipments of biotech and pharmaceutical products expected to soar in the coming years, real-time temperature monitoring provides manufacturers with a greater degree of control and flexibility of their distribution processes. For DHL, the first-of-a-kind solution provides a fresh source of competitive differentiation, can be delivered at relatively low cost and delivers strong value to the customer. Moreover, it can easily be adapted to handle other sensing requirements, such as the need to detect humidity in the clothing and textile industries or shock levels in the transportation of micro-electronics. Overall, TIM Director Keith Ulrich views the project as a validation of DHL's active innovation strategy, and a perfect example of how targeted innovation efforts can strengthen the foundation of the business. "The DHL Innovation Initiative is a key part of how we are transforming ourselves as a business," says Dr. Keith Ulrich. "It shows how good ideas—and the right mix of partners—create a whole new market opportunity."

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