

Best of Business AI

DHL case study



Managing a complex supply chain is difficult even in the best of times. But this past year, the COVID-19 pandemic has wreaked havoc on supply chains, with frequent disruptions and unpredictable demand often causing products to go out of stock or deliveries to be delayed. Many brick-and-mortar businesses were forced to abruptly pivot to e-commerce, putting additional strain on supply chains.

For DHL Supply Chain, anticipating and overcoming these challenges is key to its mission of helping customers thrive, no matter the circumstances. As a division of DHL, the global market leader in the logistics industry, DHL Supply Chain provides logistics services for businesses around the world. That means it manages supply chain logistics for corporate customers, from sourcing and warehousing goods to delivering them to businesses and consumers. It is by far the largest third-party supply chain operator on the planet, with around 1,500 warehouses and 10,000 vehicles serving customers in 53 countries in industries ranging from pharmaceuticals to manufacturing.

DHL has achieved its position as the industry leader by continually pushing itself to innovate, and it has a vision to be the most transformative company in the logistics space. To realize this vision, DHL Supply Chain is digitizing operations in all its warehouses. AI-based robots simplify workflows and assist human employees, while other AI models recommend actions to improve daily operations. With data analytics and AI solutions, DHL is boldly envisioning how logistics will look in the 21st century.

Markus Voss, Global CIO and COO of DHL Supply Chain says, "I think we are pushing the boundaries in terms of innovation and driving the supply chain into the next era."

A journey to AI success

Laying the foundation for AI with data

When DHL embarked on its mission to transform supply chains with AI, the first step was to aggregate its massive amounts of existing data on the cloud. Then the team needed to ensure it had the right kind of data to meet its goals.



Strategy

Voss says it's important to collect and organize data with a business outcome in mind. "Initially there were some attempts to just get some smart people in the room, let them operate our data and see what they come up with. I've never seen anything useful coming out of those initiatives. The data needs to have a purpose. It needs to have a very specific thing that it's driving."

Voss continues, "If you have no data to operate on, the best algorithm in the world will not be giving you any better results than just rolling the dice. You need to spend some time standardizing the way you operate so that you can collect the data. So educate yourself on how

it works and do your homework in collecting data and ensuring that you have it available for the algorithms to work on.”

Communicating to promote awareness and employee buy-in

It’s crucial to gain buy-in from stakeholders for an AI solution to take hold. Support from company leadership is essential and employee enthusiasm can be the difference between an AI solution that thrives and one that withers. For DHL, winning this buy-in isn’t an afterthought.



Because DHL Supply Chain warehouses operate independently, each warehouse manager has control over what technologies are used. DHL can’t order a warehouse to adopt a new solution – it has to demonstrate value to get buy-in.

“I do believe the cultural element is the most important part,” Voss says. “The algorithms are 10 percent of the decision to implement, and the IT is maybe at 20 percent, but the culture and the people will still be 70 percent. That’s the formula in terms of making a solution really stick and get adopted at a site.”

DHL has a team dedicated to internal communication about new digital initiatives. It has an internal website that acts as a knowledge hub for how new tools work, where they’re being utilized, and success stories from sites that have implemented them. The goal is to inform people about the business need, how the technology will address it, and what processes will be impacted. The result is a workforce empowered and excited to see how digitalization can impact their own workflows.

A key part of this communication strategy is to show employees how new technologies will benefit them. For warehouse managers, getting AI-generated recommendations about how to allocate resources makes their jobs easier. Gaining their trust is important, because if they don’t trust the AI recommendations, they won’t act on them. For warehouse pickers working alongside robots that move packages around, the benefit is to take some of the more mundane tasks off their plate.

“Robots take away the jobs you don’t really like to do,” says Fekko Roelofs, Program Manager for Resource Orchestration at DHL. “Or they aid in making your work lighter, more fun, easier. If a robot can move pallets around, you can do some more interesting work, you are happy with the fact that a robot is taking the more tedious work.”

Collaboration among different roles

Key to DHL’s AI success is collaboration among different roles. Training an AI model involves a lot of decisions that shape how it works and what its goals are – so warehouse operators need to be involved as much as data scientists. For its AI projects, DHL brings together people with different skillsets to develop an AI solution customized to the problem at hand. Data scientists, operations managers, and business experts bring their unique expertise to the table.



“It’s involving all the people that really deal with the problem on the ground,” says Stefan Rank, Director of Global Innovation for DHL Supply Chain. “It’s not something that we come up with out of a corporate entity. These are problems that are being solved together with everybody that is impacted by it.”

Fostering an innovative mindset across the organization

AI projects originate from the company’s innovative mindset. DHL Supply Chain has a team dedicated to continually examining trends—not just in the logistics industry but in technology and society at large. The resulting Logistics Trend Radar, published annually, helps identify projects to pursue so that DHL is never behind the curve on the latest innovation.



The culture of innovation also permits employees to take time out of their normal responsibilities to learn new things, which enabled some employees to teach themselves data science. DHL offers training on a wide variety of subjects for its employees.

Once a promising solution is identified, DHL Supply Chain has an established process for developing and testing it to prove that it’s beneficial. The pilot team determines and documents the requirements for success from both a technical and procedural perspective. This piloting process makes adoption low-risk and more enticing to warehouse sites.

Scaling AI by ‘productizing’ innovation

Once an innovative technology has been piloted and proven, DHL Supply Chain makes it easy for warehouse sites to implement it with a unique and effective strategy. It uses a “productization” approach, where the new technology is delivered to a site as a “product” along with a “starter kit” to guide deployment and use. Each innovative “product” also has a dedicated “product owner” that is the thought leader for that technology and provides support to sites as needed.



The sites also give feedback to the productization team to help them improve the technology and rollout process. As Voss explains, a site can say “Here I have some additional features or functions, which really worked well, or which you would like to bring into the global product.’ And that’s something which is then constantly further developing those solutions. So it’s an exciting give and take.”

The ‘productization’ strategy, together with the pilot team and the internal communications team, helps DHL Supply Chain move past pilot projects and scale solutions to many locations. Eventually, there’s a multiplication effect as success in one location spurs other locations to implement the new solution.

“We have more than 3,000 digital projects—and we have already implemented more than 1,500,” Voss says. “In almost every one of our facilities, we are deploying those mature digital solutions. It is my vision to have every customer, every site, and every one of our employees sensing that the world is changing in supply chain.”

Improving the AI over time

The work isn't over once DHL deploys a new AI solution. The company regularly tracks metrics to measure the success of each solution, including ROI, employee and customer satisfaction, and uses that information to adjust it as needed.



Scale

Another requirement for AI solutions is to continually maintain and improve the model itself. Implementing AI solutions is never a "set it and forget it" approach. AI models need to be regularly re-trained with new data to remain accurate and valuable. It requires careful monitoring to ensure algorithms are continuing to work appropriately.

As Voss puts it, "This is something that we have learned on this journey: You cannot just implement it once, go away, and think if you come back one year later, it's still going to work and everybody will still be happy. That is not the world we live in."

Using robots strategically

DHL warehouses make extensive use of robots, which use computer vision AI models to move around independently. These include robots that transport pallets or move alongside human pickers.



Strategy

To make the most of this resource, DHL re-envisioned the way they assign tasks to employees. They identified opportunities for employees to shift their time and attention to more complex activities, and adjusted workflows and processes accordingly. That way, they can focus on higher value tasks like making decisions based on their expertise, while machines take on more menial or physically demanding tasks.

AI in action: Optimizing resources and operations

DHL Supply Chain is creating an AI model to support more efficient "resource orchestration" in warehouses, which will run on Blue Yonder's Luminate platform on Azure. The AI model takes a host of variables into account—like inventory locations, distances between items, SLAs, and task priorities—to output a highly efficient plan for picking routes and task assignments for employees and robots. These numerous variables are constantly changing, making the AI support very helpful to warehouse managers.

In early deployments, the Robotics Hub, a key component in the upcoming resource orchestration model, has helped increase the number of picks per hour significantly. Early results show a 25% increase.

AI models on the Luminate platform will also help optimize truck arrival and departure schedules to ensure warehouse space is used in the most optimal way.

Big ambitions and a bright future

In seeking to transform the logistics space with the power of AI, DHL is forging ahead into uncharted territory. The company's ambitions are huge, with the goal of implementing AI innovation across thousands of warehouses.

By laying out a steady, incremental route, DHL has given itself the ability to scale quickly to meet its evolving needs, and the potential for future growth is limitless. "I think this is not a sprint. It's a marathon and you have to take the journey one step at a time," Voss says.

"Books have not yet been written on what we're doing," Roelofs says. "We already know what that final solution or product needs to be. But we don't always know the path towards it."

But DHL Supply Chain is a company whose employees are committed to forging ahead together to find those paths.

"One of our statements—the strategy statement—is 'Together Unstoppable,'" Voss says. "And that has really gone viral in our organization, that we are not only operating at one site, but really thinking a bit more broadly and saying, 'Okay, what is potentially something that can be used for the greater benefit of our customers, for the greater benefit of our industry?'"



Fekko Roelofs
*Program Mgr. for Resource
Orchestration, DHL*



Stefan Rank
*Dir. of Global Innov.,
DHL Supply Chain*



Markus Voss
*Global CIO and COO,
DHL Supply Chain*

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