THE FUTURE OF SMART LOGISTICS AUTOMATION

Geek+
Moving the world intelligently

INTERACT ANALYSIS

Introduction

Geek+ is implementing a new type of automation in warehouses around the world

Geek+ is one of the world's fastest growing logistics automation companies. Its technology offering, which is based around a core product range of four smart robotic systems – picking, moving, forklift and sorting robots; all underpinned by a highly intelligent AI-enabled software platform – offers a scalable alternative to traditional fixed automation machinery for eCommerce, industrial and manufacturing customers to invest in. Perhaps one of the most notable features of the Geek+ solution is its extreme scalability – both within a single fulfilment center or across a network of facilities – which can move in lockstep with business needs to meet rapid customer growth, or to meet sudden peaks and troughs caused by seasonal trends or unexpected crises.

Ash Sharma
Senior Research Director of Interact Analysis – a global market intelligence company specializing in supply chain automation

Kai Liu
Co-founder, VP Picking & Smart Warehouse, at smart logistics provider Geek+

Who is Decathlon?

Decathlon is one of the world's largest retailers of sporting goods. The company is present in 57 countries and has 1,647 stores globally. Warehousing – both eCommerce warehouses that deliver direct to the consumer, and retail warehouses that keep their high street stores supplied – is a vital part of their business. Decathlon's retail warehouses need to run highly efficiently because the company operates with individual stores holding no inventory at all – stores receive daily deliveries and 100% of what they receive needs to go out on shelves.

Why did Decathlon need robots?

Decathlon's recent growth has been rapid. To continue to grow and compete globally in the highly demanding retail and eCommerce sector, Decathlon needs to ensure its warehouses are underpinned by an automation solution that delivers in terms of cost, reliability, efficiency, flexibility and – crucially – scalability.

Decathlon began its cooperation with Geek+ in China – where a highly competitive labor market makes hiring and retaining team members one of the biggest challenges for many local businesses. It was the challenge of finding enough teammates that initially made Decathlon decide to initiate a search for a radical new automation solution.

The key search criteria was scalability: Decathlon needed an automation partner and solution that could cope with the rapid underlying growth in their business, but that also had the flexibility to manage the unpredictable demand-cycle faced by modern retailers; while adapting to a punishing pace of change management. The ideal scenario would be to select the right partner in China, perfect the solution at a number of sites, and then scale it up on a global basis.

The challenges retailers face

Automation is creeping into almost every sector imaginable. Whilst manufacturing has relied on robotics and automation for decades, logistics – up until now – has remained reliant on a human workforce. This is all likely to change. A number of drivers have aligned to create the perfect environment for robot adoption in warehouses.

Challenges for Retailers	Impact
Proliferation of eCommerce	Retailers need to be able to deliver more products direct to consumers
Expectation of faster & cheaper delivery	Two-day, next-day and even same-day delivery options have become a consumer expectation. It can be a competitive advantage for retailers – but it comes at a cost
Labor	A shortage of available labor to manage this growing demand in warehouses At the same time labor costs are increasing and there is an on-going desire to transition employees away from manual and strenuous tasks
Changing buying habits & higher returns	Consumers buying multiple variations of products, and return rates as high as 70%, put massive strain on supply chains

The results Geek+ delivered

Technology from Geek+ delivered impressive results for Decathlon, including a tripling of the average productivity of warehouse teammates, as well as increasing inventory capacity by 40%. The 'goods-to-person' solution, using P800 robots from Geek+, introduced a flexibility that was simply not available to Decathlon from other, more traditional, automation set-ups. According to Bruno Thellier, Transformation Leader at Decathlon: "It's not so much that Geek+ solved a specific existing problem, but more that they gave us totally new capabilities, offering us efficiencies and improvements that were simply not on the table before we worked with them."

The scalability of the Geek+ solution also matched the investment strategy of Decathlon. In the past, Decathlon was able to invest in complex, fixed automation solutions with an RoI of five or ten years. But in today's volatile business environment, this is not possible. Retailers can no longer predict what the market will be like in five years, let alone ten years; so, solutions that scale up in line and in time with business growth have become the only option. Goods-to-person fulfilment, like the Geek+ solution, can provide an RoI of 3 years.
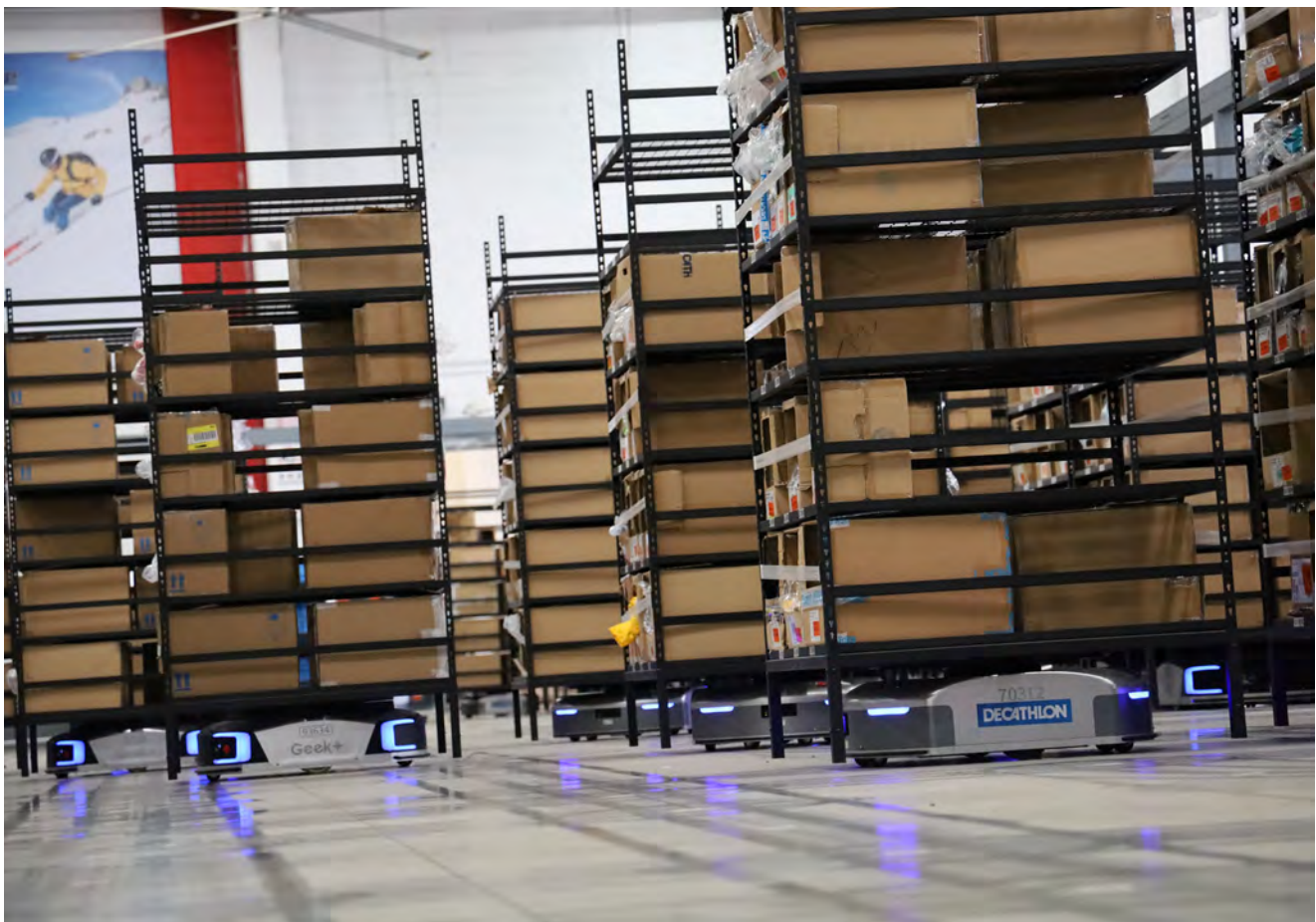
Intensification – from eCommerce to retail

The results of the initial Decathlon project were impressive, and so the Geek+/ Decathlon cooperation was rapidly intensified.

Decathlon/Geek+ China scale up:

JUNE 2018	**500m²** proof of concept with **12 P800 Geek+ robots**
NOVEMBER 2018	Geek+ assists Decathlon eCommerce with a rapid scale up for the 11/11 shopping festival, one of the world's largest 24hr shopping events
MAY 2019	The eCommerce project is expanded to **3,500m²** and **70+ robots**
JULY 2019	The project scales out to Decathlon's retail operation with a Geek+ customization project. Phase one of the Shanghai retail warehouse project initially goes live with **70+ robots**
FEB 2020	Shanghai retail phase two goes live with **111 robots**. Remote implementation enables successful roll-out during COVID-19
MARCH 2020	Beijing Decathlon retail project goes live with **70+ robots**. Again, remote implementation is required due to COVID-19
APRIL 2020	Dongguan retail project goes live with **70+ robots**

Working through COVID-19

Ash Sharma, Senior Research Director, Interact Analysis

One interesting element of the Geek+/ Decathlon partnership is how they deployed the automation solution through the coronavirus crisis. There is no doubt that the crisis hit Decathlon hard – during the height of the virus in China all its stores were closed. And yet, throughout, the company was able to keep many warehouses operating. During this challenging time, Decathlon actually pushed ahead with its goods-to-person roll-out, with remote support from Geek+. Decathlon was able to deploy a full automation solution in a Shanghai warehouse at the peak of the virus in China in just two weeks.

Another example was in Beijing, where Geek+ was able to implement a system in a 5,000 sqm warehouse with 72 robots. This was done even though the project leader was in Shanghai, and many other staff were working remotely too. The company made strong use of collaborative applications, such as using Zoom for communications, and WeChat for Business for online training. This was something they had never done before, but it worked extremely smoothly.

Additionally, the newly implemented Geek+ solutions that had come onstream before the virus hit made a big difference to Decathlon's ability to manage the huge peak in eCommerce orders that hit when lockdown happened. The sudden lack of warehouse staff was mitigated by the fact that the Geek+ solution had tripled employee productivity.

Additionally, the extreme flexibility of Geek+ robots was a major benefit during the epidemic. COVID-19 caused an order explosion at Decathlon's eCommerce warehouses. To deal with this at a time of labor shortages, Decathlon was able to transfer robots from their retail to their eCommerce warehouses almost overnight. This was possible because the AI-enabled mobile robot solution is highly portable, and very easy to reprogram. It would have been out of the question if Geek+ had been using traditional, conveyor-based, fixed automation solutions.

Remote working techniques allowed implementation of the Geek+ solution in various warehouses at the height of the pandemic

"

Decathlon was able to transfer robots from their retail to their eCommerce warehouses almost overnight during the COVID-19 crisis. "

Ash Sharma
Senior Research Director,
Interact Analysis

A Decathlon teammate
at a picking station

> **An AI-enabled software solution is at the core of the Geek+ offering.**
>
> **Kai Liu**
> Co-founder,
> VP Picking & Smart
> Warehouse, Geek+

Part 1: The Geek+ difference

Kai Liu, Co-founder, VP Picking & Smart Warehouse, Geek+

How the Geek+ solution works

The Geek+ picking solution is based on the principle of eliminating the need for teammates to walk vast distances around the warehouse. In a traditional warehouse, employees spend up to 70% of their time walking to find goods. Whereas, in a Geek+ enabled warehouse, sorting staff stay at stationary picking stations, while robots bring the goods to them. The result is a new generation of automated warehouses which massively increases the productivity and throughput possible.

The Geek+ system consists of P800 picking robots that work in conjunction with a bespoke shelving system, powered by an AI-enabled software system. The robots pick up entire shelving racks and carry them to warehouse pickers who remain at individual picking stations and are guided through the picking process by rack-mounted Pick-to-Light displays.

Proprietary AI algorithms mean that the system is highly intelligent; indeed, the AI-enabled software offering is at the core of the value of the Geek+ solution, enabling the smartest possible workflow in the warehouse. The software is able to analyze all orders, and automatically optimize warehouse storage; managing how and where products are stored in warehouses, and guiding robots to follow optimal journey routes.

Teammates then assign items manually to the correct orders. The process also works in reverse, managed by a different category of putting staff on dedicated putting stations from where they assign required goods to shelving racks, which are then returned to the storage areas by robots. The robots require minimal human intervention and are able to autonomously charge themselves to ensure they can keep running 24/7.

The Geek+ solution in action
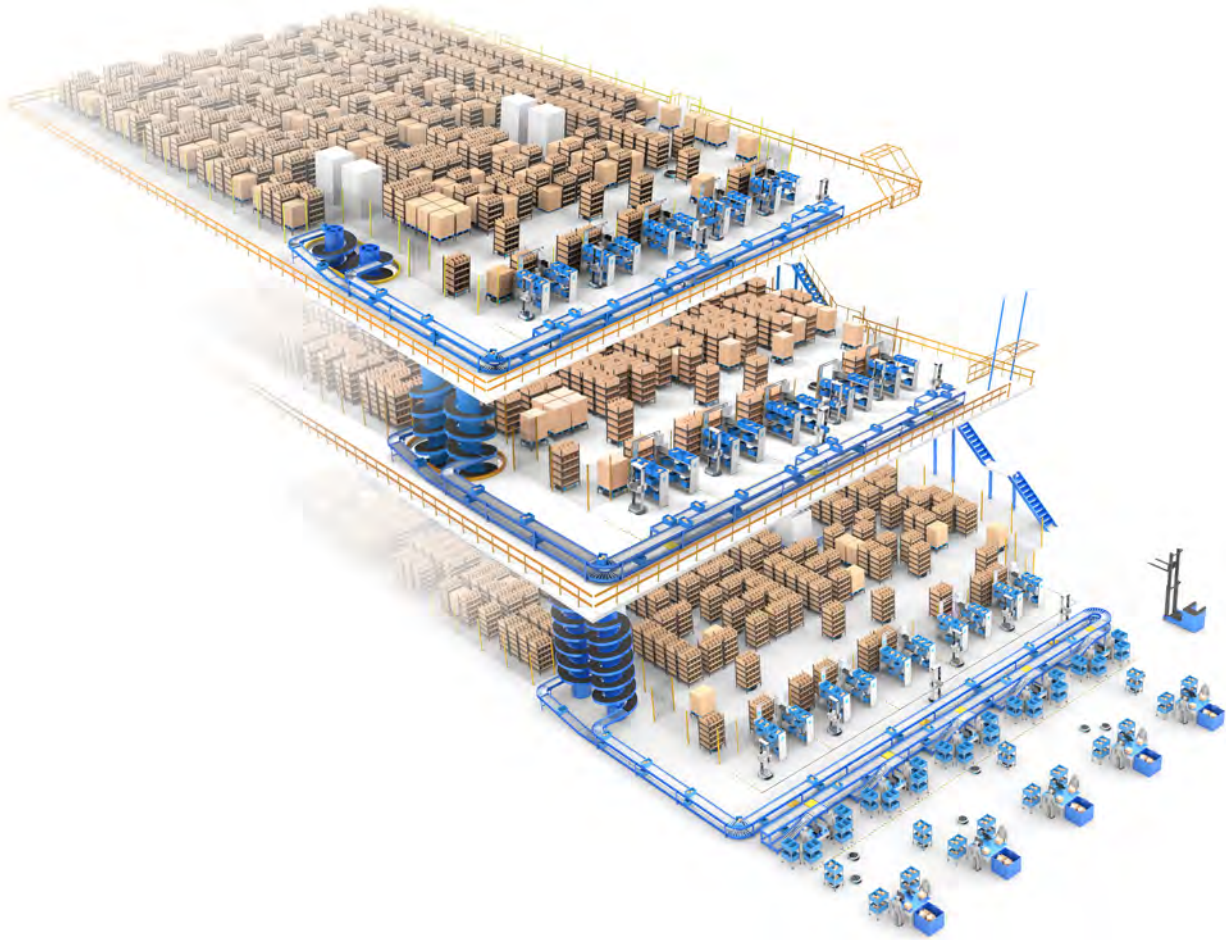
Applying RFID – a bespoke solution for Decathlon

Kai Liu, Co-founder, VP Picking & Smart Warehouse, Geek+

Decathlon is a pioneer at using RFID technology in the retail industry, and Geek+ engineers have worked closely with the company to develop an RFID solution that operates in tandem with the standard picking solution to improve the picking process. Previously, every time a rack arrived at a workstation; bar codes needed to be scanned manually to confirm the correct items had been selected. RFID allowed this to be done automatically, reducing the per-item sorting time from 12 seconds to 3 seconds on average. The technology also allowed Decathlon to improve their inventory collection system. Robots carry the shelves to dedicated RFID inventory stations which scan all products and compare them with the inventory logged on the warehouse management system's software, automatically detecting any errors.


RFID solution

The benefits of Geek+

The benefits of the solution to Decathlon were very quickly evident.

+40%

x3

Redeployed

Storage capacity up 40%
Storage space within existing warehouses increased by an average of 40% due to the ability to stack the robot-compatible shelving racks very densely. At the retail store warehouse in Shanghai, storage capacity went up from 500,000 items to 700,000 items. At the Shanghai eCommerce project, storage increased from 300,000 to 500,000 items.
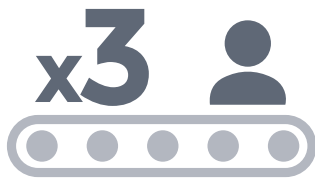
Warehouse teammate productivity more than tripled
Meanwhile, teammate productivity was more than tripled on average. This was safely achieved by using Geek+ technology to reduce the walking time required of each teammate. A side benefit was that this radically improved the working environment for all employees. In the same Shanghai examples, the retail warehouse average picks per employee increased from 125 to an average of 450 per hour, boosting throughput from 75,000 to 100,000 items per day. At the eCommerce warehouse, average picks per employee per hour went from 95 to 285 – pushing daily throughput from 22,500 to 35,000 items on average.

Huge decrease in labor added value
The shortage of potential employees in China's highly competitive labor market had been a primary initial reason for Decathlon looking for new automation solutions, and the Geek+ solution led to a huge reduction in required labor at Decathlon's Chinese warehouses. In the Shanghai eCommerce operation, teammates went from 35 to 17, while at the retail operation numbers dropped four-fold – from 100-24.

> **This project was not about firing people. Decathlon's growth was heavily constrained by lack of teammates. Now they can redeploy large parts of their workforce to help them manage their overall growth.** **Kai Liu** Co-founder, VP Picking & Smart Warehouse, Geek+

Scalability
The solution requires almost no traditional fixed infrastructure such as conveyors. And the robots have no need of fixed guidance systems on warehouse floors (other than simple QR code stickers). It is this that makes the solution so easily scalable, with robots and shelving racks deliverable to almost any location at short notice; and Geek+ engineers able to quickly implement solutions – remotely if necessary.

Part 2: Deployment

Ash Sharma, Senior Research Director, Interact Analysis

The proof of concept project was established at an eCommerce facility in Shanghai, where Decathlon was able to set up a 700 sqm project employing 15 Geek+ robots and two workstations. Decathlon allocated one project leader and one IT developer. Geek+ allocated a small team and, in a single month, the project was ready to go. After one more month, Decathlon had the working experience and data they needed to make the decision to work with Geek+ going forward.

Deployment: setting up a retail project in Taipei City

One of Decathlon's early retail projects was set up in Taipei, to supply all Decathlon's retail stores in the city. Here again, a proof of concept project was completed, this time a 1,500 sqm project with 17 robots and four workstations. Implementation was more complex because the Decathlon team could not be on site – with members of the IT team working from France, the project leader working from Shanghai, and another key team member working from Beijing. Even so, total set up time from the decision to do the project to the completion of the assessment and the decision to roll it out more widely was just three months. This included the time needed to deliver the Geek+ robots to Taipei. Once the robots were installed, it took only a single day of tests to make the project run smoothly, so that Decathlon could then start to run the system and collect the data they needed to make their decision.

Deployment: rapid transfer times

Recently, Decathlon made a major change in its logistics park in Shanghai: enlarging its automated eCommerce space from 3,300 sqm to 5,500 sqm – taking the total number of Geek+ robots in operation on the site to 71. Decathlon reported that this was an extremely quick transfer by ordinary standards – taking a total of three weeks from conception to getting it up and operational. The warehouse teams were running the new system with complete efficiency within 24 hrs.

> "
> **The fact that with the proof of concept project it took us two months to go from having never worked with Geek+ before, to having an established project and enough data to make a decision about whether to work with Geek+ in future was, for me, highly impressive. "**

Bruno Thellier
Transformation Leader
at Decathlon

**geek+
deployment
in progress**

The KPIs

Forward projections & scalability:

Decathlon has a strategy of not over-investing in automation solutions. While the company has anticipations of big increases in sales volumes in future, the uncertain business and international climate makes it impossible to make forward projections with any confidence. Thellier says, "We wanted to play the game sensibly, and not over invest. With Geek+ robots, we don't need to forecast a year in advance. We can make huge increases to automation capacity within just a couple of months – based either on short term projections or in response to sudden increases in demand."

Even more investment flexibility is provided by the ability to lease robots from Geek+ for temporary periods. This is particularly useful for big eCommerce events – or other temporary demand peaks. Geek+ maintains a fleet of leasable robots that Decathlon can call on only for the time it needs them.

The human factor: Humans were possibly the most important KPI for Decathlon. They wanted to know how Geek+ could help them with their labor shortage problem. A tripling of labor productivity, in many cases even more than tripling – for example, at the Shanghai retail warehouse, average picks per teammate increased from 125 to 450 per hour – significantly exceeded Decathlon's expectations. At Decathlon, skills development, well-being and security for all teammates, are considered to be equally as important as productivity. Such strong productivity gains meant that teammates could transfer their time to working on higher value-added tasks.

Shrinkage: In retail, shrinkage is when actual inventory levels are lower than the levels that were recorded by accounting. It is almost always an indication of error or of theft. With the Geek+ solution, the shrinkage rate has been massively reduced, and accuracy has reached 99.99%.

Storage capacity: Improving storage capacity was not a key criterion that Geek+ was being judged on – warehouse capacity is simply something Decathlon monitor so that they can anticipate when to build new capacity. Nevertheless, Decathlon found that every warehouse they fitted out with Geek+ robots had effectively increased in size by 40% overnight due to the improved density of shelving racks – significantly delaying the need for future investment in new storage capacity.

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Bruno Thellier
Transformation Leader
at Decathlon

Storage capacity
+40%

Part 3: future scale-out

Kai Liu, Co-founder, VP Picking & Smart Warehouse, Geek+

At a corporate planning event toward the end of 2019, Decathlon's strategy teams widely discussed the growing difficulties of predicting future demand. Thellier says, "looking back at those meetings now, in light of Coronavirus, the arguments about future uncertainty are even more pertinent than we realized at the time. I think companies have an ever-growing need for scalable systems to allow them to manage ups and downs in their businesses. This is a particularly marked trend in the retail sector – and it will only continue. In today's retail environment, the only certainty is uncertainty – and the Geek+ solution helps us manage uncertainty really well." Ultimately, Decathlon cannot invest now in large, fixed automation solutions that will not pay off for five years – it is simply too big a risk. Mobile robots are the only solution that fit their strategy.

For Decathlon, with their global business model - which currently sees 1,647 stores and associated eCommerce operations located across 57 countries - scalability at the international level was also really important. The extreme simplicity and portability of Geek+ robots mean that automation solutions can be shipped around the world with ease and arrive in any country, in any warehouse, and be in action in a few short weeks.

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> **Bruno Thellier**
> Transformation Leader
> at Decathlon

Decathlon: a global presence

57 COUNTRIES
1,647 STORES

1,647 stores and associated eCommerce operations located across 57 countries

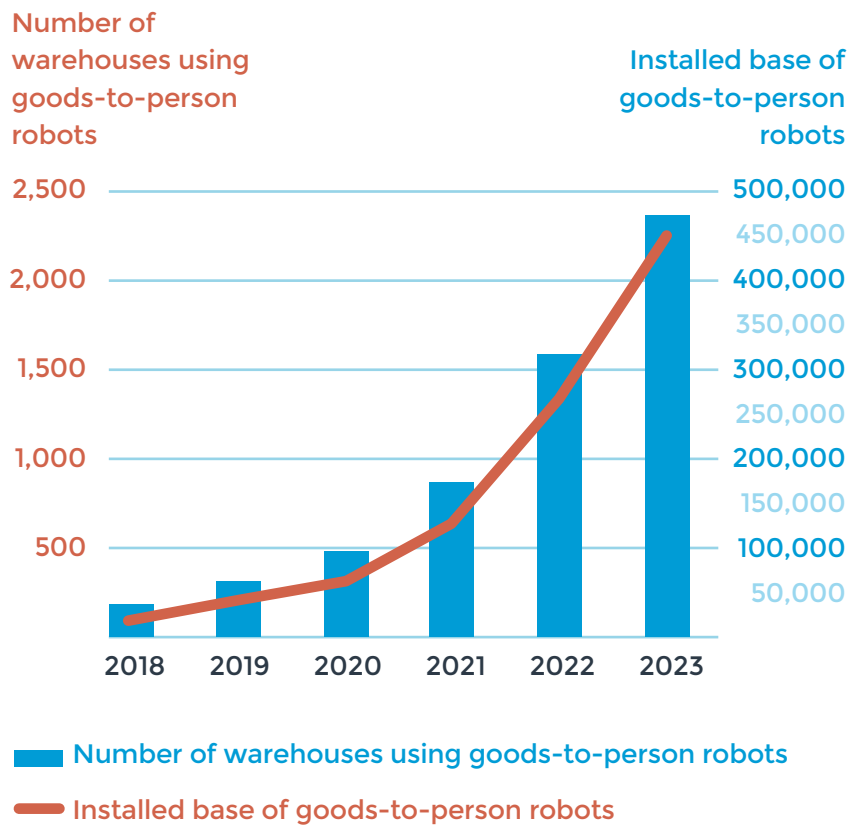Each store is supported and supplemented by retail and eCommerce warehouses

Decathlon plans to scale out the Geek+ automation solution to many of its global locations

The potential number of customers/warehouses with similar problems that could be solved by Geek+-type solutions

There are close to 100,000 distribution and fulfilment centers around the world. Today fewer than 5% of those are fully automated. Amazon aside, goods-to-person robotics have only been implemented in a few hundred warehouses so far, but we expect that to change massively in the next five years and the potential is huge.

Number of warehouses using goods-to-person robots

Installed base of goods-to-person robots

■ Number of warehouses using goods-to-person robots

— Installed base of goods-to-person robots

Source: Interact Analysis
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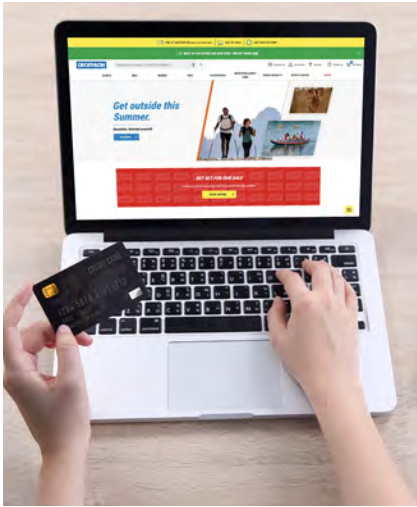
The future of eCommerce

Ash Sharma, Senior Research Director, Interact Analysis

Interact Analysis predicts that Coronavirus will have significant and long-running impacts on the future of eCommerce. Our data showed that eCommerce got a major short-term boost almost everywhere that went into lockdown. But our prediction goes beyond this to argue that many people will switch to online shopping in the crisis, and then stick with it forever. Ten years ago, it was widely predicted that 40% of the UK's grocery market would be online by 2025. Last year, this number was reduced to 7.7% by 2024. But now it looks as though the original prediction will come true, or even be exceeded – helped along by COVID-19.

Retailers will face multiple challenges – such as improving efficiency of online marketing and sales practices, as well as offering new products – in particular items purchased mainly by the elderly – who have traditionally been ignored by online sellers. Elderly people are very relevant in this story as they represent a large demographic who have not traditionally used eCommerce at all. They are now converting in droves, and it is unlikely they will switch back when this is over. Retailers may also need to look at how to improve processes so that younger people can order goods for very elderly relatives and have them successfully delivered. As retailers adapt to this new world, they will rely heavily on warehouse automation vendors to help them prepare.

2019	2024
91,000	120,000
Number of warehouses globally	

2019	2024
6 million	8 million
Number of manual employees required	

2019	2024
$1.9Tr	$3.1Tr
Ecommerce sales	

2019	2024
5%	9%
% of warehouses that are automated	

Source: Interact Analysis
© Interact Analysis

Interact Analysis predicts that eCommerce sales globally will increase from $1.9Tr in 2019 to $3.1Tr by 2024. Elderly people are very relevant in this story

Our research shows that high levels of automation will be vital for successful eCommerce warehousing operations. There are three key drivers for warehouse automation. The first is increasingly complex networks of distribution channels, which see products moved around the country, often travelling between multiple warehouses of sizes that would have been unheard of just a few short years ago, before they even reach the consumer. Managing such distribution channels manually is complex. Smart algorithms can increasingly manage these networks far more efficiently than people. The second driver is the highly competitive nature of eCommerce. Changing consumer demands are forcing eCommerce companies to deliver to ever more exacting time slots, while also cutting costs. The extreme logistical challenges this presents (locating an individual product in a vast warehouse at a specific time, packaging it correctly and loading it on the correct truck) are uniquely suited to management by AI-enabled software.

The third and final driver is labor shortages. If complex warehouses are not automated, they are highly labor intensive. And the main markets for warehouse automation in Europe, North America and China have extremely tight labor markets. Finding employees willing to take on warehouse jobs is both increasingly difficult and increasingly expensive. Additionally, the uncertainty of eCommerce demand, with its sudden seasonal spikes mean that the requirements for additional labor fluctuate wildly in a way that is not conducive to hiring people. Warehouse automation providers are finding that the best way to retain labor is to automate the repetitive elements of it, using new technology to make a smaller labor force both happier with their jobs and more productive. As a side benefit, increased productivity indirectly leads to wage increases for the employees concerned, meaning that when highly automated warehouse operations do need to find additional teammates, they are easier to attract.

To continue the conversation about the future of smart logistics automation, contact

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