Unlock the
True Potential
of your Warehouse

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Brownfield Automation to strengthen your intralogistics operations in the age of labor shortages and market fluctuations

ADDVERB

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About Addverb

Addverb is a global robotics company which provides innovative end-to-end intralogistics automation solutions using Industry 4.0 technology, Internet of Things (IoT), Artificial Intelligence and other modern technologies. Started in 2016 in India, Addverb has expanded its presence in a very short time across the globe with offices in the Netherlands, Germany, the USA, the UAE, Singapore, and Australia.

Addverb adds value for its customers looking to scale their businesses by strengthening their intralogistics operations. With an extensive product portfolio comprising of mobile robots, picking technologies, ASRS and other automation systems, powered by configurable and robust warehouse management and execution software, Addverb adds much needed efficiency, reliability, and accuracy, needed for any business to survive and thrive in a highly competitive business environment. With a unique combination of innovative fixed and flexible automation systems, Addverb delivers the modern warehouses of the future, today!

The company is proud to have manufactured, installed, and commissioned modern and complex automation solutions for businesses across various industries like FMCG, Food & Beverages, Third Party Logistics (3PL), Grocery, Apparel, Petrochemicals, Pharmaceutical, Automotive and so on. Addverb's customer portfolio consists of renowned names like Coca Cola, PepsiCo, Johnson & Johnson, Unilever, Siemens, DHL, Colgate Palmolive, Diageo, Reliance, Volvo Eicher, Flipkart, Marico, and more.

"With a unique combination of innovative fixed and flexible automation systems, Addverb delivers the modern warehouses of the future, today!"

About this Report

In recent times, businesses around the world have recognized the need to automate their warehouses and intralogistics processes for one reason or the other. These reasons range from labor shortage, rising real estate prices, reducing profit margins, changing consumer preferences, rising consumer expectations, and e-commerce growth. These factors have caused businesses to reevaluate the way they handle their intralogistics processes.

Companies have traditionally been operating with either manually operated warehouses, or have installed some automation or the other, varying from basic automation comprising of conveyors to highly automated operations comprising of AMRs, AGVs, and picking technologies. However, with razor thin margins eating into the profits of businesses around the world, businesses have realized the growing need for automation which ensures efficient, reliable, and accurate material handl operations, and continually fine tune the warehouse processes. Additionally, to keep the unpredictable consumer satisfied, they will have to keep their operations flexible, to either scale up the existing operations, or modify the existing operations to satisfy new demands.

Potential disruption in operations, high cost of dismantling existing infrastructure and setting up new infrastructure, and longer installation time - these are few of the reasons why automation might seem like a challenging task for many companies wanting to upgrade their intralogistics systems and technologies. Brownfield automation is the practical solution offered by automation solutions providers for achieving this upgrade. Unlike greenfield automation, it utilizes the automation of an existing warehouse and builds additional automation systems over and around it, instead of having to build a new automated facility from scratch.

Based on inputs from a high-focus group consisting of key decision makers including personnel from the supply chain management vertical from companies around Europe, this report intends to explore facets of brownfield automation, in terms of cost, convenience and pressing challenges like labor shortage and keeping up with the ever-changing requirements of the domain. This study also attempts to gain a deeper understanding of what industry professionals think about various aspects of automation, the challenges they face, and what they aim to benefit from warehouse automation.

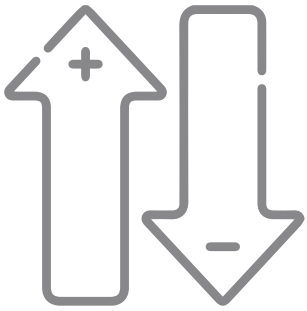
What is Brownfield Automation?

"Brownfield" refers to a facility with an existing infrastructure built for the required operations. Speaking in terms of automation, "Brownfield Automation" refers to the process of automating such facilities which have existing and running operations. Usually, such facilities have already installed heavy infrastructure such as racks and conveyors, which are collectively designed to be more or less operated manually. The goal of brownfield automation is to modernize these facilities by implementing automation solutions to improve efficiency, accuracy, safety, and the ability to proactively handle market fluctuations while reducing operational costs and dependency on labor.

By retrofitting and modernizing existing systems, brownfield automation assists a business to keep speed with the competitive business landscape. Automating can help overcome a host of challenges faced by warehouses in today's world of labor shortages, increasing order volumes, increasing customer expectations, rising SKUs and complex inventory management, new fulfilment channels, etc.

Generally, automation providers may be hesitant in delivering brownfield automation because of multiple reasons. Firstly, it may be difficult to demonstrate a need for automation in existing systems, which may in fact be well functioning with the current demand, but may not be prepared for tough times or the future. Warehouse managers may also not realize the need for automation until they experience the tangible empirical differences that an efficient automation brings to warehouse operations. There is an inherent reluctance in repairing or modifying legacy systems until they are 'broken'. What is often ignored is that only a constant 'process improvement' will keep them ahead of the curve. Secondly, many of the equipment present in such brownfield projects may be built a decade or more ago. As a result, the supporting source codes, CAD designs, blueprints, may not be readily available. Additionally, the equipment may have degraded over time, and installation of new automation over the same, may suffer because of the weaker foundation. Also, legacy hardware and software may not be responsive to new technologies like IoT devices and sensors.

> "There is an inherent reluctance in repairing or modifying legacy systems until they are 'broken'"



> "It is critical that automation providers find the perfect balance between 'Retrofitting' and 'Upgrading'"

To address this, it is critical that automation providers find the perfect balance between 'Retrofitting' and 'Upgrading'. Retrofitting means adding features to the legacy systems to make them suitable for the current requirements. On the other hand, upgrading refers to addition of new modern equipment to the entire solutions. Only an automation solutions provider which has both hardware and software skills, capable of breaking down the existing system into atomic elements, and carefully dividing the tasks of Retrofitting and Upgrading, shall be able to deliver a brownfield automation that is operationally as well as cost-efficient.

Most importantly, it must be ensured that the transition to an automated facility is smooth and seamless with no hindrance to the existing operations.

The Need for Brownfield Automation

Brownfield Automation allows companies to implement scalable and flexible automation solutions to cope with ongoing challenges and ensure growth. At the same time, it ensures that the initial investment you made into your warehouse, and which seemed valuable at one time, does not entirely go in vain.

Let's take a quick look at some of the challenges brownfield automation helps tackle:

Labor Shortage

Hiring and retaining labor is getting an exceedingly difficult task. The general unavailability of manpower and high turnover is invariably affecting operations. Parts of the world are facing an ageing population with little workforce to perform manual material handling. On the other hand, there are other parts of the world which are in totality scarce in terms of population. On top of it, people around the world are looking to be engaged in more skilled and analytical work which involves their cognitive abilities. Understandably so, people are moving away from performing mundane repetitive tasks, which may also cause physical strains in the longer run.

Unpredictable Market Dynamics

Global commerce is witnessing unpredictable events which affect the market economics of demand and supply, such as pandemics, geopolitical events like war and embargoes, etc. Additionally, we are also experiencing unpredictable consumer behavior such as frequent change in preferences, rising demand during unexpected times like the pandemic, etc. To be able to cope with both such changes, companies must be equipped with the right technologies. Businesses still need to handle growing volume of orders despite staff shortage in times of peak demand.

E-Commerce Growth

The rise of e-commerce has brought about higher customer expectations, particularly with regards to fast and even same-day delivery expectations. Meeting these expectations requires careful planning and the latest technology. Due to the small

order sizes typically placed by customers, piece-picking and carton handling become necessary, adding to the complexity of operations. Furthermore, managing reverse logistics/returns handling presents additional challenges for companies to operate efficiently. Errors in order fulfilment lead to increased returns, loss of revenue, and pressure on the reverse logistics. On top of it, the order may have to fulfilled again at no extra revenue.

"Errors in order fulfilment lead to increased returns, loss of revenue, and pressure on reverse logistics. On top of it, the order may have to fulfilled again at no extra revenue."

Investment fear

Companies are wary of making significant investments, given the uncertainty lurking in the economy these days - think Covid, wars, and recessions. Organizations need reassurance that they will get their money's worth in measurable terms and are extremely cautious while making investment decisions. Automation is backed by intelligent software, which through interactive dashboards and AI-driven decision making, shall be able to demonstrate their ROI to companies by not just reducing operational costs, but also driving revenues.

Rising real estate prices

Warehouses need real estate to be built upon and store maximum goods. With growing industries and population around the world, land is becoming a rare commodity, hence an expensive one. As a result, companies are looking to exploit the vertical space available over their existing land. Access to such heights is obviously restricted due to human limitations, and machine-assisted access for humans can be safety hazard. As a result, automation solutions which are not limited by vertical heights helps businesses optimally utilize the real estate available to them.

Lack of scalability

Businesses are looking to grow without having to invest every year in new solutions. Flexibility is a great advantage - it not only means they have the option to scale up for business growth but also the option to scale down depending on market fluctuations. Additionally, as they scale, they will have the need for better inventory visibility, management, and planning. AI-powered software shall be able to predict demands and keep business prepared the upcoming peak seasons.

With automation, companies can operate with efficiency and competitiveness, reduce their dependency of labor and ensure smooth running of their operations irrespective of changes in the market. In the context of the e-commerce boom, automation solutions facilitate companies to handle large volumes of orders in a timely manner and manage order returns in a hassle-free manner. Automation also makes scalability achievable and sustainable, including keeping up with growth objectives, handling the ever-changing market requirements, and flexibility during seasonal peaks.

As the survey captured in this report suggests, 64% of the respondents in the UK, 76% in the Netherlands, and 76% in Germany already have minimal to a hybrid automation installed in their warehouses. Most likely, this was the first step towards modernization that they took, and they would not like to tear it down. Irrespective of such automation in place, each of them answered to have been facing some challenges with their logistics and warehousing processes. Brownfield automation is the response to such concerns.

> Brownfield automation is the solution for optimizing existing operations in a cost-effective manner. Its benefits include, but are not limited to, quick implementation, reduced capital expenditure, seamless integration into existing processes, customized solutions and minimal disruptions, and overall making expansion possible without the need to invest in a brand new warehouse and new systems.

Methodology

This quantitative research was conducted during the months of January and February, 2023 with the contribution of 300 respondents spread across Germany (100), the United Kingdom (100), and the Netherlands (100). The target group consisted of decision makers including supply chain/ logistics managers, Vice Presidents (VPs), Founders, and Chief Executive Officers (CEOs) from retail/wholesale trade (55%), manufacturing (33.33%), and shipping/ distribution (11.66%) verticals.

The group belonged to different industries ranging from Food & Beverages (F&B), FMCG, Electronics, E-Commerce, and Apparel. Across all the three countries, those who worked at organizations with around 500 employees were in the majority.

Majority of the respondents belonged to the age bracket 30-44.

Key areas of focus for the research were as follows:

- Logistics and Warehousing Challenges
- Newer Challenges due to rise of E-Commerce
- Benefits of brownfield automation
- Focus areas in automation

Qualified respondents answered 21 questions covering the following themes:

- Generic questions for context
- Questions on labor resources related issues
- Questions on changing industry landscape
- Questions on automation and brownfield automation
- Some follow up questions on automation

Findings

Out of the respondents, a majority (42%) in Germany reported a very minimal level of automation adopted by their organization's warehouses until now, whereas a majority in the Netherlands (42%) and the UK (36%) responded that it's a "hybrid of manual and automated" at theirs. Those who marked "highly automated" came up to 11% (Germany), 10% (Netherlands) and 7% (UK).

Rising costs and constantly changing consumer expectations are among the most pressing issues faced by the industry right now.

Rising costs is the most pressing issue faced by the logistics and warehousing sector for both the Netherlands (34%) and the UK (59%) today. This percentage is also not too low for Germany where 23% of the respondents are concerned about rising costs. Though constantly changing consumer expectations didn't feature as the most pressing concern in any of the three countries, an overall analysis shows that 17% of all our respondents marked it as a worrisome issue. While the participants from Germany are most concerned about the constantly changing market landscape (27%), only 5% of respondents from the UK marked the constantly changing market landscape as a pressing issue.

> Labor shortage is an issue in the Netherlands and the UK alike, but is comparatively less of a concern for German warehouses

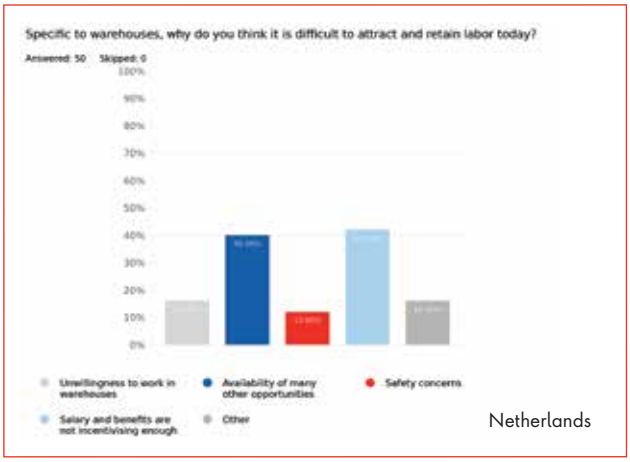
Lack of qualified human resources pose challenges for warehouses in the Netherlands and Germany while the UK warehouses face high turnovers.

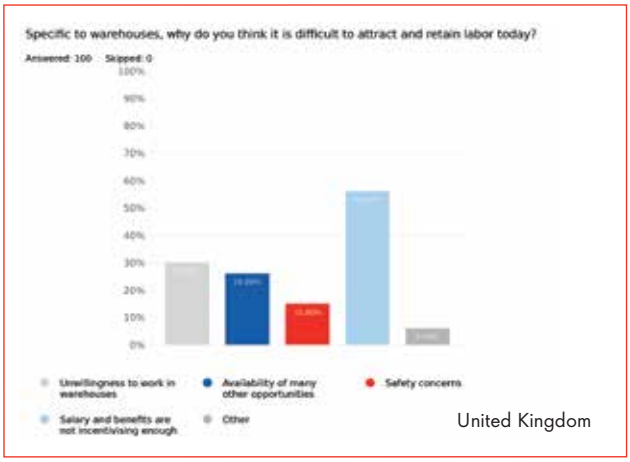
The lack of qualified personnel is the most challenging issue regarding human labor resources in the Netherlands (36%) and Germany (24%), whereas in the UK (26%), high turnover tops the list. General unavailability of labor is also a common factor affecting the human resources issue in the UK as well as the Netherlands.

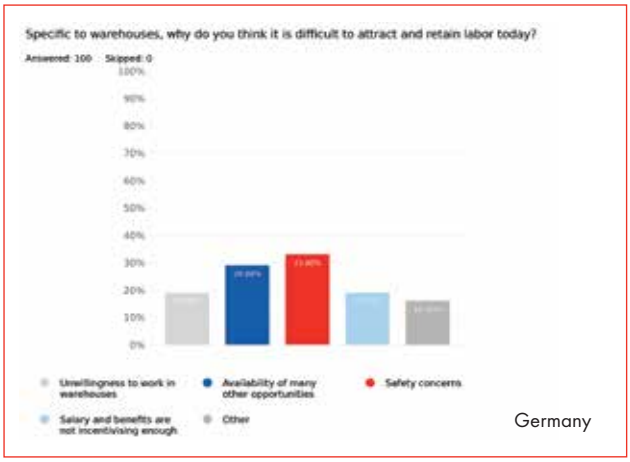
From salaries and benefits that aren't incentivizing enough, to safety concerns and unwillingness, staffing in warehouses is equally challenging for all three countries.

Warehouses face unique challenges in attracting and retaining labor today. It's interesting to note that more than half of the respondents in the UK think that salaries and benefits are not incentivizing enough for this field. The same situation is true for the Netherlands too, as 42% state the same reason to explain this specific difficulty. 30% in the UK think that there exists an unwillingness to work in warehouses.

In Germany, safety concerns make attracting and retaining talent a challenging task for warehouses. At the same time, in the Netherlands, safety concerns are not seen as a significant problem in this respect.







Availability of many other opportunities also make warehouses less attractive as an employment opportunity in Germany (29%) as well as in the Netherlands (40%).

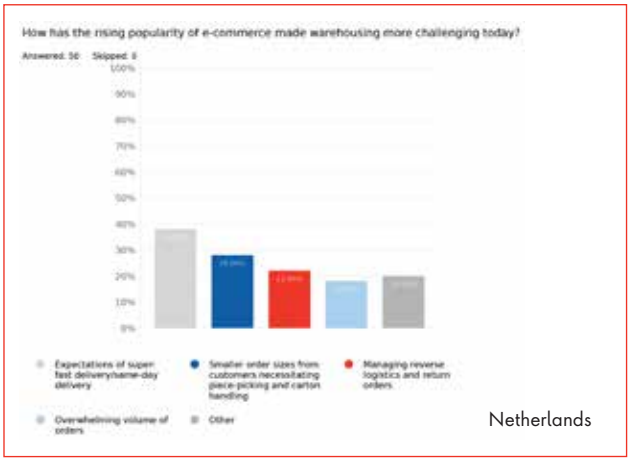
The presence of multiple sales channels makes things more challenging.

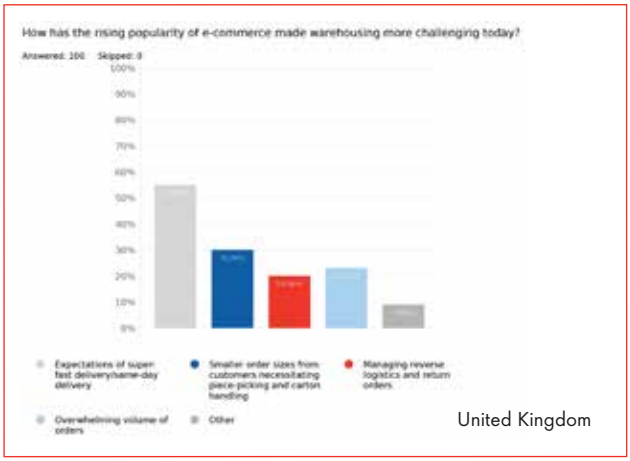
Apart from labor shortage, the presence of multiple sales channels is one of the most challenging factors standing in the way of efficiently meeting the changing demands and requirements of the industry across the UK, Germany and the Netherlands. Whereas outdated systems and equipment is a pressing challenge for warehousing in the UK (28%), it's comparatively less of a challenge in Germany (11%) and the Netherlands (6%). Fragmented systems are also a cause of concern for 12.33% of all the respondents across three countries.

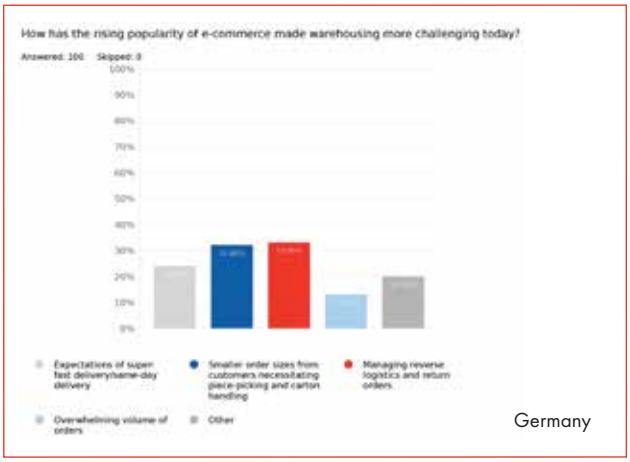
E-commerce has set a new standard for expectations when it comes to delivery speed.

Amidst rapidly changing consumer and commercial landscapes, the rising popularity of e-commerce has undeniably made warehousing even more challenging today. In the UK, more than half of the respondents are of the view that expectations of super-fast delivery/same-day delivery are challenging to meet. This is also the major concern among the Netherlands respondents (38%) regarding the e-commerce induced transformations in the industry.

E-commerce has made purchases easy with the click of a button, irrespective of the size or price of the product. It's not surprising that options that make super-fast deliveries possible have also incentivized consumers to make purchases that make up for smaller order sizes. A common challenge faced by all three markets alike is the prevalence of smaller order sizes from customers that necessitates piece-picking and carton handling- that's 32% in Germany, 30% in the UK and 28% in the Netherlands. Managing reverse logistics and return orders is also a pressing challenge for an average of 25% of the respondents across three countries with regard to the changes brought about by e-commerce.







Seasonal peaks are challenging amidst tight labor availability.

Holiday seasons and periods of peak demands present lucrative yet extremely demanding times for warehouses. While hiring seasonal workers may provide some degree of assurance in managing tasks; recruiting and training new staff involves expenses, training, and additional procedures for wages and legal safety sanctions. And all this additional effort during the busiest times of the year escalates the challenge further.

Unavailability of labor during seasonal peaks is a matter of concern in both the Netherlands (30%) and the UK (37%), while training seasonal staff is an issue shared by Germany (24%), the Netherlands (22%), and the UK (43%) alike. As a country that is home to a tight labor market, the Netherlands has its share of concerns regarding existing warehouse staff being unable to meet demands during seasonal peaks.

Personnel related issues aside, limitation in storage space is also a major issue across all the three countries – 30% in the UK, 28% in the Netherlands, and 30% in Germany.

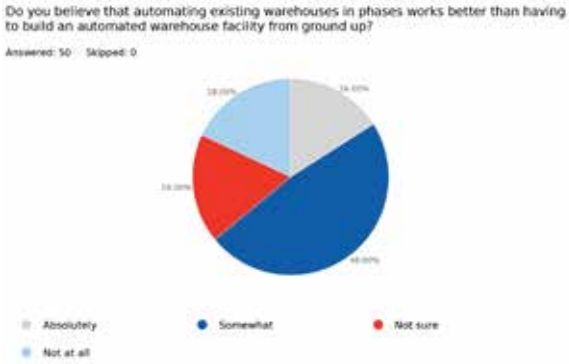
Costs involved is a common concern regarding automation.

When asked about the concerns or apprehensions they have regarding automation, for respondents across the UK (54%), the Netherlands (40%) and Germany (29%), the costs involved in automation emerged as the most significant concern. Such concerns are understandable as earlier in the survey, rising costs was also a common concern expressed by all three countries for the logistics and warehousing sector. Human-robot interactions with regard to skill, training, and adaptability is also a common concern amongst them all. 20% of the respondents from the Netherlands and 25% from the UK are also worried that implementing automation may disrupt their existing operations. 27% of respondents from Germany also have apprehensions regarding the age of the warehouse being adaptable to such significant transformations.

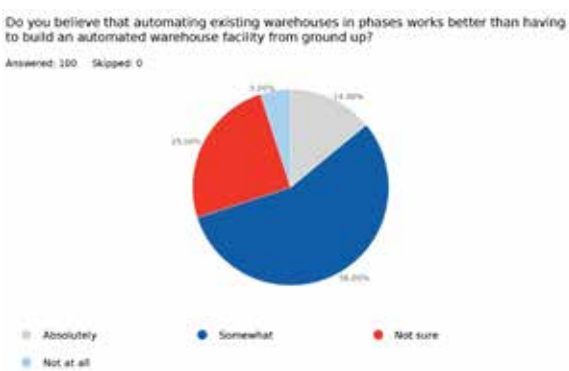
One phase at a time than building from scratch.

Most of respondents across all three markets responded that they "somewhat" believe that automating existing warehouses in phases works better than having to build an automated

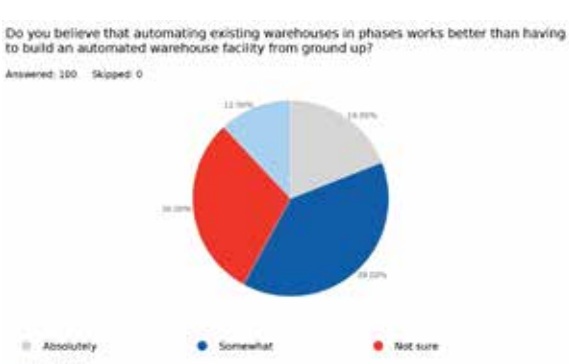
warehouse facility from scratch.



Netherlands



United Kingdom



Germany

The advantages of Brownfield Automation cuts across space, time, and costs.

The two most beneficial aspects of automating an existing warehouse (brownfield automation) vis-a-vis building a new automated facility from scratch (greenfield automation) across the three markets are (a) Optimizing existing space and equipment without the need for expansion; and (b) Less time to implement automation. Reduced capital costs and minimal disruption to daily operations are also acknowledged as important benefits of brownfield automation.

Order picking and packaging is an area that requires automation the most.

Existing studies highlight order picking as the most time consuming among warehouse functions, taking up about 70% of the operating time and about 55% of operating costs. In line with this, the one aspect of warehousing that requires automation the most according to participants in both the Netherlands and the UK is order picking and packing, whereas in Germany, shipping takes the top spot. Inventory management and tracking are also equally important areas of action for the Netherlands and the UK.

Reducing processing time and incorporating flexibility to face fluctuations are perceived as the most beneficial advantages of automation.

Out of the many advantages of automation, the most beneficial according to respondents in both the Netherlands (22%) and the UK (26%) is reducing processing time. For Germany, flexibility to face fluctuations is perceived as the

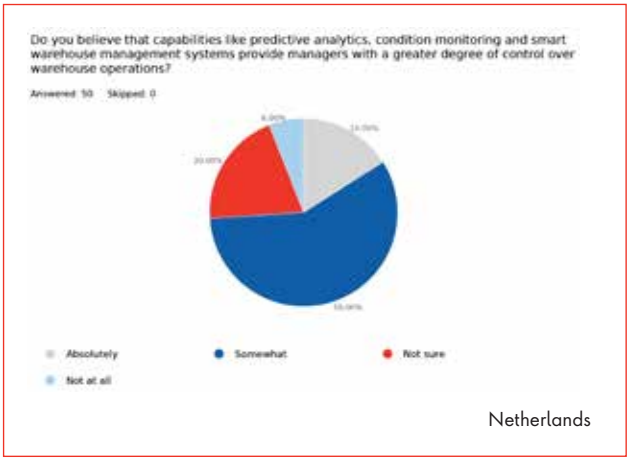
most beneficial. The benefit of scaling up fast is acknowledged by respondents from Germany (18%) and the Netherlands (18%) alike. Interestingly, achieving storage density is among those aspects which are not perceived as an important advantage of automation as some other aspects. Design solutioning through applications such as automated dense racking is among automation's lesser-known advantages.

Some problems are believed to be beyond what even automation can solve.

When asked about the problems that cannot be solved with automation, mistakes, and inaccuracies (Germany), supply chain inefficiencies (NL) and coping with staff shortage (UK) were the most selected responses. Interestingly, across all three markets, safety issues and risks were also considered as something that cannot be solved with automation. This could be an indication of concerns and preconceptions associated with human-robot interactions.

Benefits of automation also extend to a greater degree of control for managers in warehouse operations.

When it comes to their belief that capabilities like predictive analytics, condition monitoring, and smart warehouse management provide managers with a greater degree of control over warehouse operations, the UK (22%) respondents were the most optimistic, followed by the Netherlands (16%) and Germany (13%).



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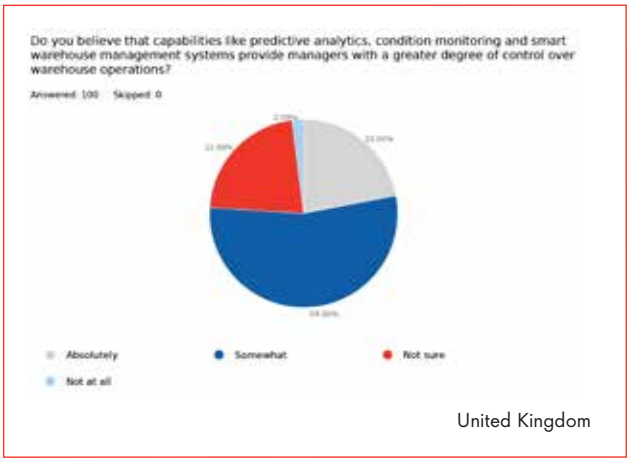
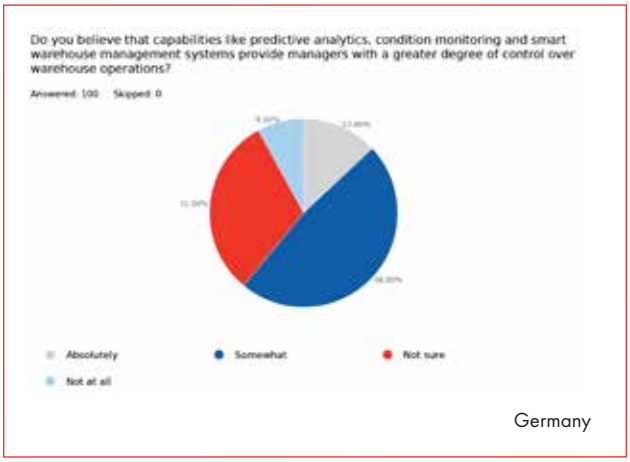


United Kingdom



Germany

Majority of respondents "somewhat believe" that automation comes with good ROI.

18% of respondents in Germany, 22% in the Netherlands and 21% in the UK "absolutely" believe that automating warehouses guarantees a good Return on Investment (ROI). Majority of respondents from across these three regions - 44% in Germany, 50% in the Netherlands and 52% in the UK "somewhat" believe in automation's potential to reward them in terms of good returns for their investments.

There is optimism around automation's contribution towards a sustainable future.

When it comes to their thoughts on automation's role in reducing environmental impact and contributing towards a more sustainable future, 30% of the UK respondents "absolutely" believe in the idea, followed by 22% in the Netherlands and 16% in Germany. For instance, automation and robotics significantly reduce the need and consumption of electricity in warehouses by making processes like order picking more energy efficient.

There is a perceptible level of inclination towards automation efforts in the near future.

34% of the respondents from the Netherlands consider investing in warehouse automation within the next 3 years whereas in Germany 26% of the respondents consider doing so within the next year. In the UK, 30% of respondents are unsure of investing in warehouse automation with 21% considering investing in it in the next 3 years. Slowly but surely, many warehouses have already made the move towards automation recently. This is evidenced by the optimism seen in the survey where a total of 45% of the respondents in Germany, 44% in the Netherlands, and 39% in the UK are considering investment in automation within the next year to three years.

Conclusion

This study has attempted to understand the challenges and requirements of the warehousing and logistics industry with regards to cost and convenience, labor shortage, and the ever-changing requirements of the domain. Respondents expressed these concerns even though they have already made investments in automation. This means that consumers are demanding more, and businesses are looking to scale up their operations quickly.

As observed, there is evident interest among respondents from all three countries in investing in warehouse automation, with many responses also indicating recent investments by their organizations in warehouse automation. More than a quarter of the respondents from the Netherlands and 21% from the UK consider investing in warehouse automation within the next 3 years, whereas in Germany 26% of the respondents consider doing so within the next year.

Considering the challenges of each country, means of flexible automation such as Autonomous Mobile Robots (AMRs) and Sortation Robots seem to have prime importance. With the adoption of AMRs, warehouses can significantly reduce their labor needs. AMRs can transport goods as autonomously as humans, constantly sensing obstacles and mapping their environment. Additionally, they can offer much higher efficiency with non-stop operations and the capability to transport higher payloads. Similarly, Sortation Robots

can be a boon for any e-commerce business struggling to satisfy their order fulfilment needs and strengthen returns handling processes. These robots can sort several thousands of parcels every hour with a much higher accuracy and efficiency than manual sortation, helping the e-commerce industry to meet the heightened consumer expectations like same day delivery. Such fleet of robots can also be easily scaled up without any added infrastructure to meet seasonal peaks.

When we speak of order fulfilment, picking processes also gain significant importance as they constitute over 50% of any warehouse's operating costs. Advanced picking technologies guided by light, voice, or vision, can exponentially increase the picking rate. Apart from labor shortage, multiple sales channels were considered the most challenging factor standing in the way of efficiently meeting the changing demands and requirements of the industry. Outdated systems and equipment coupled with fragmented systems make things more challenging in this evolving business landscape. Omnichannel fulfilment systems through interoperable modern automation equipment which eradicates information siloes without warehouses and across different levels of the supply chain, is the answer to such challenges.

Across all three markets, the respondents acknowledge the advantages of automating existing warehouses in phases over having to build an automated warehouse facility from scratch. Many of their concerns regarding automation revolved around the costs involved, which can in fact be solved with Brownfield Automation to a great extent, given the relatively lesser initial costs required in comparison to Greenfield Automation.

According to the responses received, order picking and packing, shipping, inventory management and tracking are some of the aspects that require automation the most. Reducing processing time and flexibility to face fluctuations are perceived as the most beneficial advantages of automation. Considering how the constantly changing requirements unique to the industry is a concern for many, automation certainly holds the key to meeting and even exceeding these changing expectations.

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