

The rise of robotics and automation in the supply chain

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SCALA

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Chairman and CEO at SCALA Consulting
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Foreword



John Perry
Chairman and CEO
at SCALA

Supply chains are having to contend with a wide spectrum and number of unprecedented challenges.

These range from geopolitical turmoil, stemming from crises such as the conflict in Ukraine and escalating tensions between the West and East, through to dealing with the implications of Brexit, the recovery from the Covid pandemic and inflationary prices.

Fittingly, Collins Dictionary's 2022 word of the year was 'Permacrisis', defined as, 'a term that perfectly embodies the dizzying sense of lurching from one unprecedented event to another'.

To cope with prolonged uncertainty, supply chains are having to adapt to provide resilience throughout the chain together with the flexibility needed as consumer spending and demand expectations constantly flux.

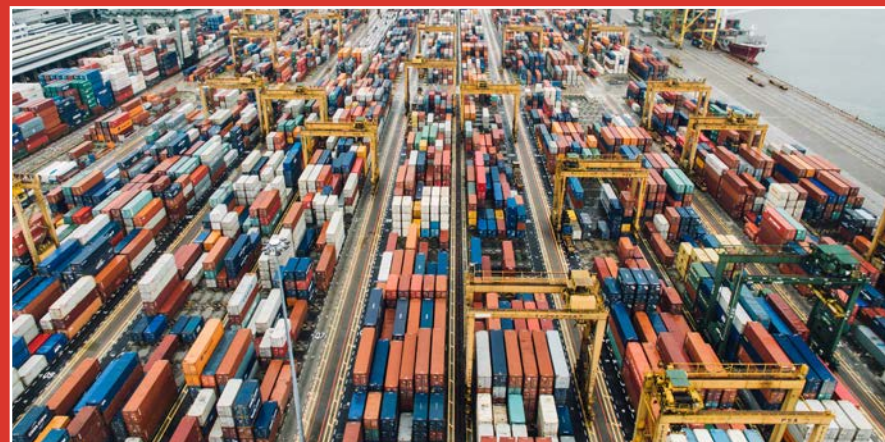
At the same time there is a significant shortage of labour with consequent increases in costs and in warehouse space. Post pandemic, people left the work force in droves.

This, combined with the labour constraints resulting from Brexit, have caused very acute staff shortages in the transport and warehousing sector. In addition, with significant global uncertainties, many companies have increased their contingency safety stocks, increasing the need for warehousing space.

Another major factor is e-commerce, where a huge shift took place during Covid and while there has been some drop off in some sectors, there is a long-term continuing growth.

The nature of e-commerce is causing a significant increase in warehouse work content. While many warehouses are used to handling the majority of throughput in full pallet quantities, with a proportion at case level, e-commerce requires products to be picked, packed and labelled at individual item level.

This requires both a major increase in staffing and the need for greater flexibility to help tackle the challenge of scaling to handle the volatility associated with seasonality and peak periods such as Black Friday and Christmas.





Combined with sky high inflationary pressures these factors are making supply chain operations increasingly expensive and unpredictable. At the same time, logistics and supply chains are under increasing pressure to become more sustainable and make strides towards carbon reduction or net zero targets, despite the setbacks caused by the ongoing disruption.

More than ever, historical thinking and ways of working are no longer fit for purpose for future supply chains.

While these challenges are undoubtedly piling the pressure on supply chains, it has also challenged them to find alternative, more efficient ways of doing business.

Agility and flexibility are key to survival and, as part of measures to help them navigate the new business landscape, many organisations have been implementing, or are planning or exploring increased investment in levels of automation and robotics.

To gauge the extent to which this technology is currently playing a role within supply chains, and to understand how this is set to change in the foreseeable future, SCALA has commissioned new research with over 50 manufacturers, retailers and 3PLs across a range of sectors.

Respondents range from global food manufacturers to national retailers and e-commerce providers with responsibilities ranging across factory stocking warehouses, distribution centres, and e-fulfilment centres. They represent a current combined turnover in excess of £25 billion, annual warehouse spend of £520 million and investment of £360 million in current automation.

This report will set out the key findings, exploring what types of automation and robotics organisations have invested in already, the impact this is having on their business, and their future plans and priorities. The research also highlights some of the common perceptions and challenges of automation, and potential roadblocks for organisations considering it.

ABOUT SCALA

SCALA Consulting was founded in 2001 and has earned an excellent industry reputation for providing high quality supply chain and logistics expertise.

The company now has an executive board of directors, all of whom have senior level business experience.

SCALA consultants work with many leading international companies.

It is our approach to create partnerships with clients, combining our external experience and expertise with our clients' own business knowledge to deliver practical solutions in order to meet future commercial requirements and drive real tangible benefits.

SCALA's experienced team is passionate about innovating supply chain improvements and providing independent objective expertise with professionalism, diligence, and integrity.





Executive summary

SCALA has commissioned new research with over 50 manufacturers, retailers and 3PLs across a range of sectors to understand the role robotics and automation technology is currently playing in supply chains and how this is likely to change and develop in the foreseeable future. Key findings include:

Some organisations are only scraping the surface with automation, while others are already full steam ahead deploying a range of automation and robotics

37% have invested less than £1m in automation to date. 35% currently have between £1m and £5m invested and 28% over £5m invested.

14
%

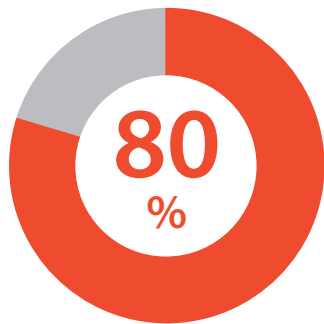
At the top end 14% of companies have already invested in excess of £20 million.

The most common forms of automation already in place are the well established ones such as pallet wrapping (58% have implemented), full pallet put away and retrieval (52%) and product movement within the warehouse using conveyors (47%).

The more advanced automation is less prevalent with just 38% of respondents having some case or item putaway and retrieval automation, 37% using individual case or item picking systems and 36% moving products around the warehouse using robotics.

The benefits are wide-ranging

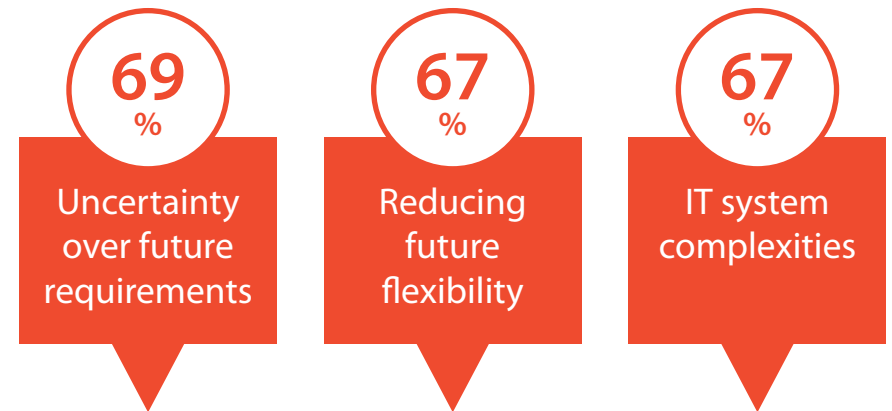
The most common benefits recognised as a result of existing automation were greater productivity (66%), better ability to meet customer demand (66%) and cost savings (62%).



Significant reasons for future automation include three key drivers all scoring over 80% - Warehouse staff availability/costs, increasing operational efficiency and increasing capability to meet future growth.

Barriers to automation remain

Top of the list of automation concerns were level of investment required (82%) and return on investment achievable (73%).



were other major concerns amongst respondents.





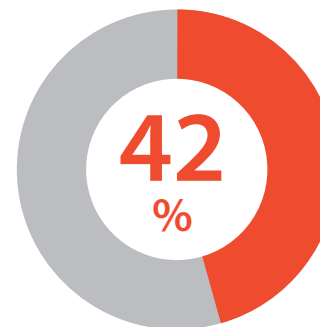
Future investment in automation is set to soar

Considering the total annual warehouse operations cost of those surveyed is £520m, and the expectation that the equivalent of £470m will be invested in automation over the next five years, if replicated across the industry, this represents a huge investment.



in the foreseeable future.

At the opposite end of the spectrum 31% said they were planning to spend less than £1m with 11% saying they expected zero investment.

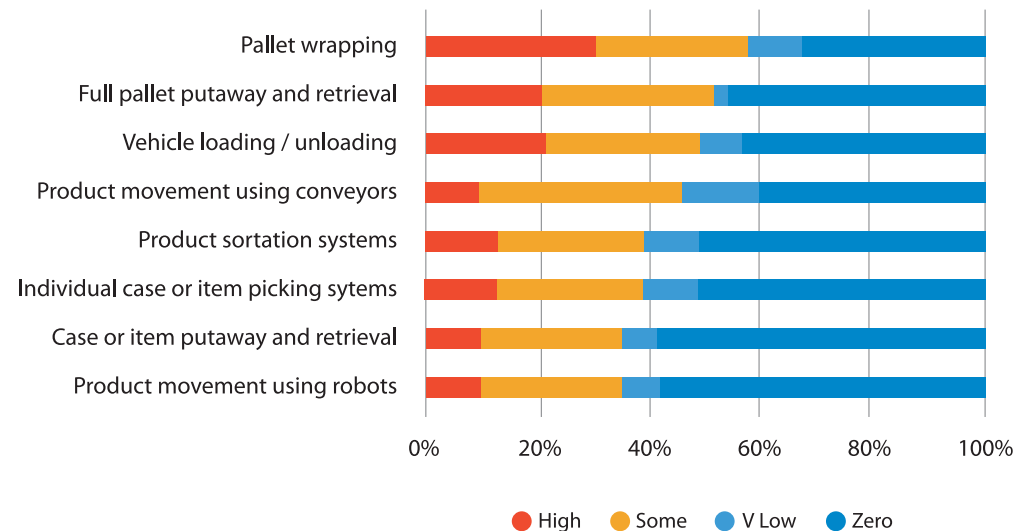


42% said they were planning on investing **equal to or more** than their annual warehousing costs on automation over the next five years.

Robotics and automation: a current snapshot

To gauge the extent to which organisations are currently using automation and robotics in their supply chain, we asked our survey respondents which operations they have automated to date, and to what level.

Warehouse automation already in operation

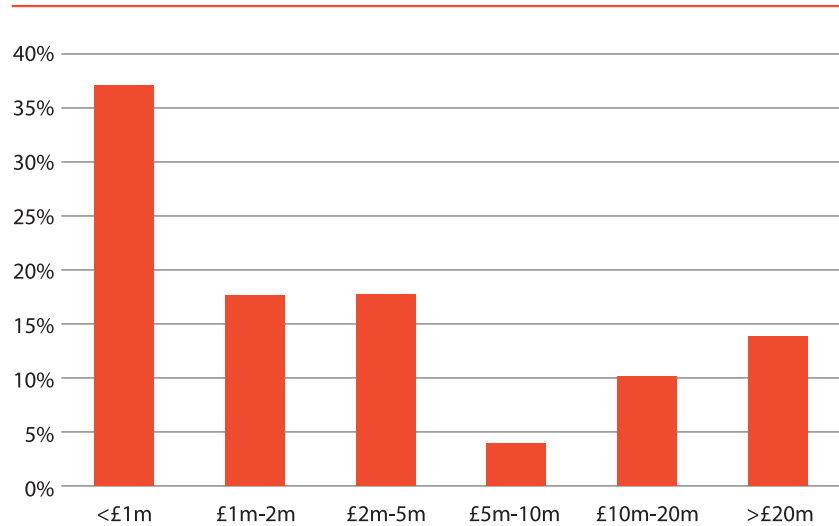


We found that the most common forms of automation currently appear to be the well-established, lower-level areas such as pallet wrapping (58% have implemented, including 31% at a significant level), full pallet put away and retrieval (52%, including 21% at a significant level) and product movement within the warehouse using conveyors (47%, including 10% at a significant level).

This automation is relatively straightforward to implement, removes very manual tasks and has a very clear ROI. The less common forms appear to be the more sophisticated, relating to individual case or item picking, movement and sortation, as well as the use of robots for movement around the warehouse.

68% of respondents have zero or very little product movement around the warehouse using robotics, 65% have no case or item putaway and retrieval automation, and 63% have no individual case or item picking systems.

Capital already invested in automation



The research highlights that the majority of respondents are in the early stages of investing in automation or operating it on a small scale, with 37% having invested less than £1m in automation to date, and 35% currently having between £1m and £5m invested.

While the amount invested and scale of deployment is relative to the size and type of organisation, over a quarter of respondents appear to already be at an advanced stage of their automation journeys. 14% said they have invested between £5m - £20m to date, and a further 14% have already invested more than £20m.

While the research shows a huge range of different levels of investment and stages of automation the findings showed that respondents were largely in agreement about the positive impact automation technologies and robotics are having on their business.



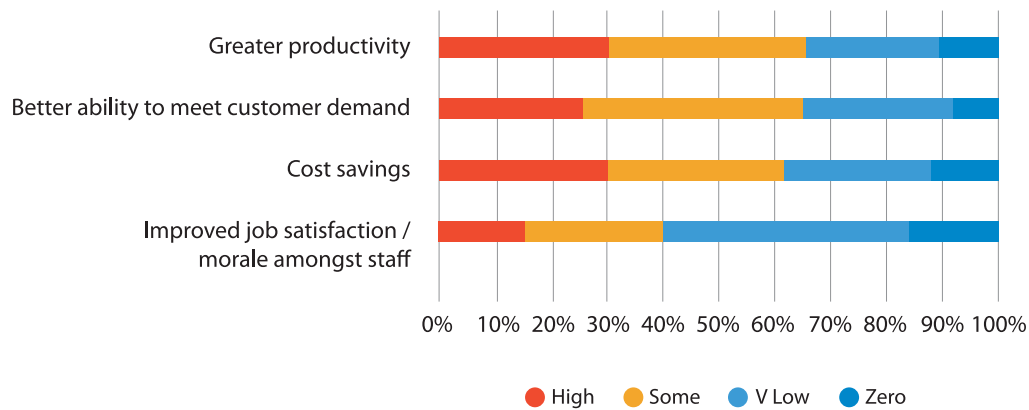
14
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have invested
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14
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have already
invested more
than £20m

Benefits from current automation



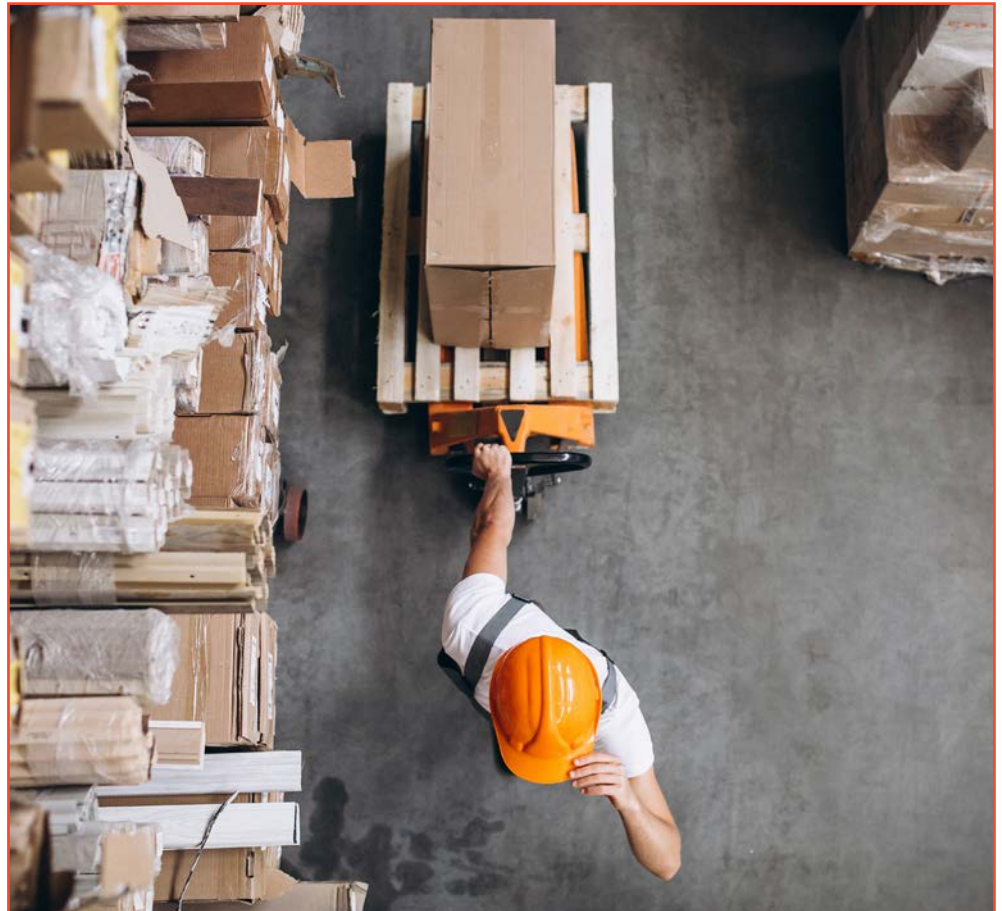
The most common benefits recognised were greater productivity (66%, including 30% that noted this to have high significance), better ability to meet customer demand (66%, including 26% that said high significance) and cost savings (62%, including 29% that said high significance).

It's clear that many organisations are using the technology to be able to fulfil high order volumes and demanding delivery terms to remain competitive in the changing landscape without having to drastically increase their employee count.

Warehouse operative safety was also outlined by some respondents as a recognised benefit, with one global safety lead outlining how it has enabled them to increase safety in busy MHE operating areas.

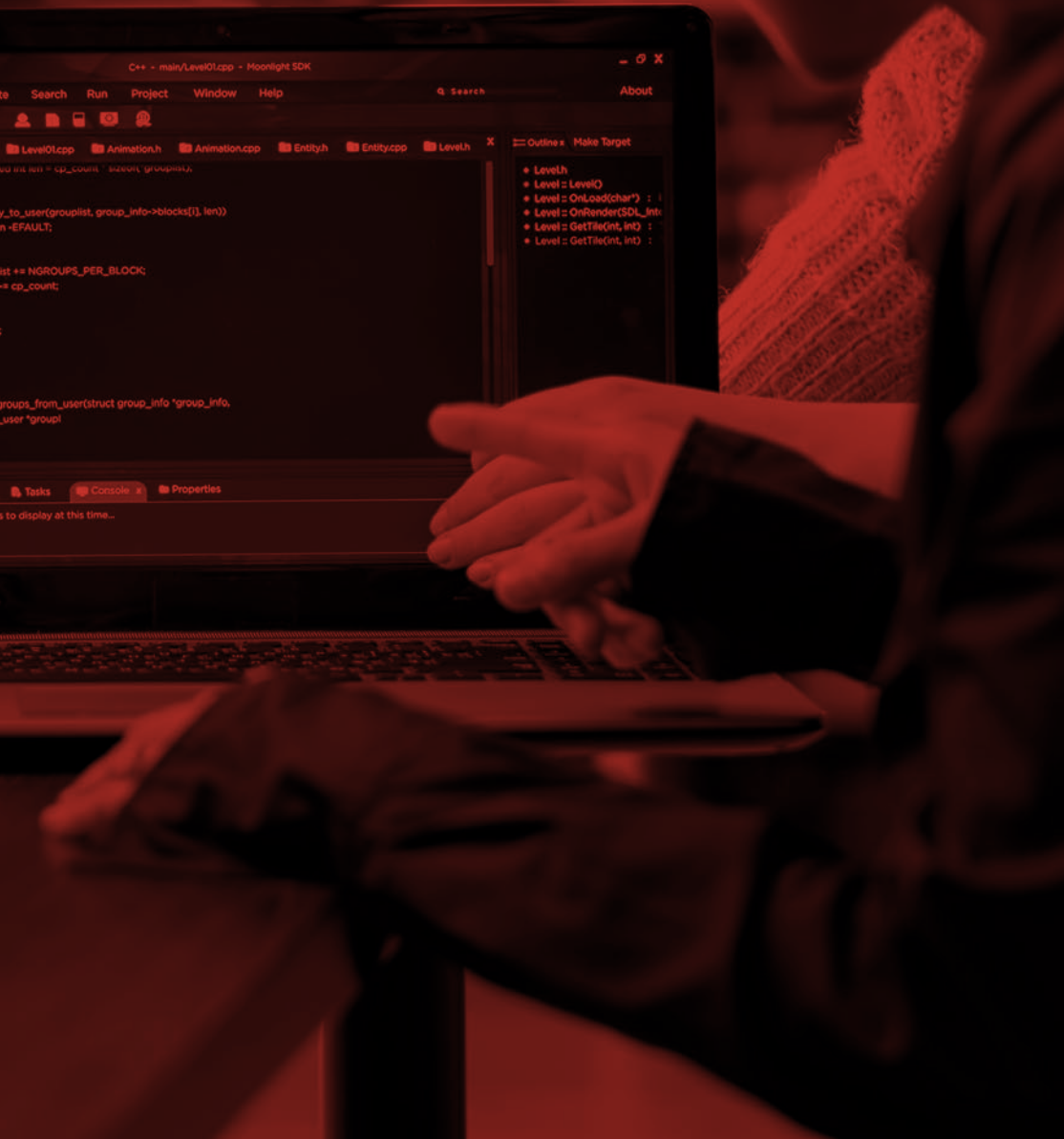
Another respondent shared how automation has meant they're less exposed to staff absence, ensuring continuity and consistency of operations when operative numbers are reduced.

Considering the plethora of challenges supply chains are facing today, automation appears to be filling a lot of the necessary gaps both efficiently and cost effectively.



It's clear that many organisations are using the technology to be able to fulfil high order volumes and demanding delivery terms to remain competitive in the changing landscape without having to drastically increase their employee count.

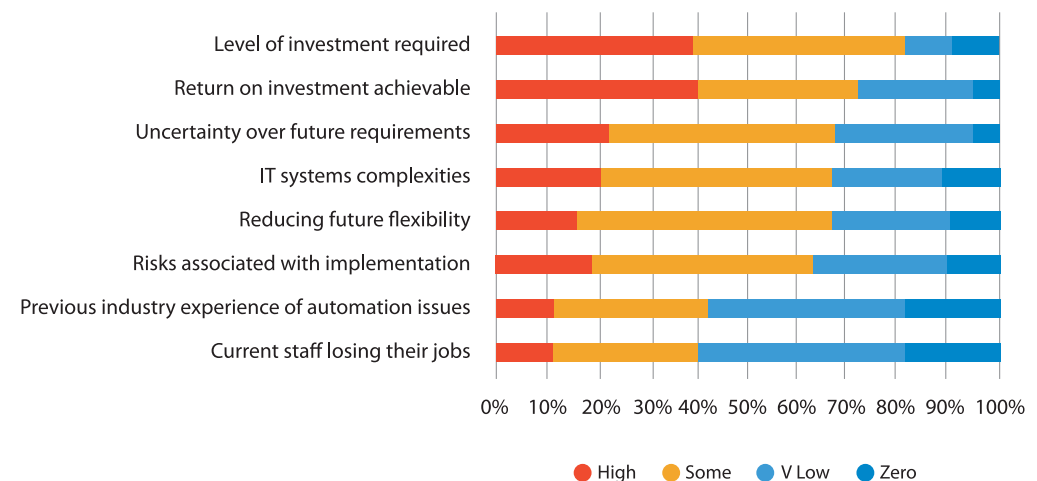
Perceived barriers and challenges of automation



When respondents were asked about their concerns relating to automating more of their operations, expense topped the list.

82% were apprehensive around the level of investment required, including 38% that categorised this as a high concern. Meanwhile, 73% cited the return on investment from increased automation as being a concern, 40% of which said that this was a high concern.

Key concerns in making future investment



Other significant concerns were uncertainty over future business requirements (69%), IT systems complexities (67%), future flexibility (67%) and implementation risks (63%).

The research also identified some concern around the future of automation and investing in solutions that will continue to suit and serve them, even when future demand remains relatively uncertain.

69% of respondents noted uncertainty over future requirements as a key concern, while 67% admitted they were concerned about reducing future flexibility.

One respondent shared concerns around the longevity of the technology once deployed, fearing it will quickly become outdated or redundant citing the pace of change required vs the time needed to implement and likening it to a 'mobile phone state of flux' when 'what's current today is obsolete tomorrow'.

IT system complexities were also identified as a concern around increased automation by respondents (67%). The supply chain, by its very nature, must co-ordinate many different operations and work in harmony with a range of systems and technologies and there is a fear interfacing new automation solutions with existing systems.

Meanwhile, concerns relating to staff losing their jobs due to increased automation were relatively low. 17% of respondents said they had zero concerns that automation would replace staff, while 60% considered this to be a low concern.

Given the scale of staff shortages across the industry, this doesn't appear to be as much of an issue as it once was.

While the 'robots taking human jobs' was a narrative long associated with automation, recent research suggests that automation is not necessarily pushing humans out but coming in to fill gaps where organisations cannot recruit and retain employees.



In fact, [research by HSBC](#) found that a third of UK businesses are planning to invest in automation as a priority in the face of staffing shortages.

Meanwhile, 17% of our respondents said they had no concern relating to any previous issues with automation, and 58% categorised this as a low concern.

Despite the benefits, it appears that many organisations are put off by the initial outlay for automation solutions and 'taking the risk' with a new investment. This is not surprising given the current economic and market uncertainties and cashflow.



Concerns around implementation disruption, which very often have systems issues at their core, and concerns around whether the automation/robotics solution will become redundant are both valid concerns and should be evaluated.

However, many of these solutions are now not new hat and there have been widespread implementations - for instance, ASRS technology is more than twenty years old.

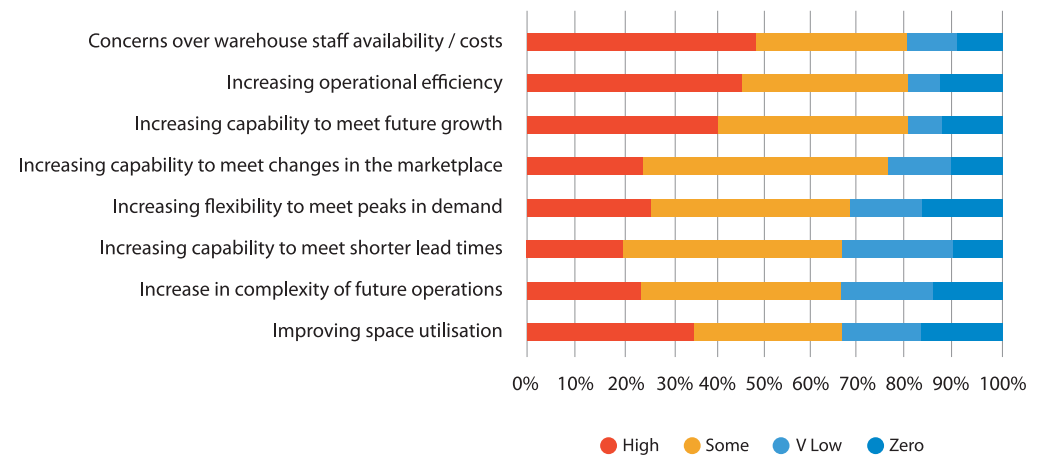
In terms of today's technology becoming tomorrow's history many businesses are looking at hybrid solutions such as driverless FLT's which can switch from manual to automated operation and back again enabling a more flexible approach with lower levels of investment.

Dave Howorth – *SCALA Executive Director*

The acceleration of automation

As automation and robotics technologies constantly evolve and transform operations as we know them, their role in optimising and driving efficiencies across supply chains is only likely to increase.

Significant reasons for future investment



Respondents were optimistic about the future capabilities of automation with the research highlighting the expected key benefits of future automation.

There were a wide range of significant factors with three key drivers all scoring over 80% - Warehouse staff availability/costs, increasing operational efficiency and increasing capability to meet future growth.

With no end in sight for the skills shortages across the industry, it's perhaps not surprising that concerns over staff availability topped the list of reason for considering future investment in automation, cited by 81% of respondents including 48% that consider this to be a high concern.

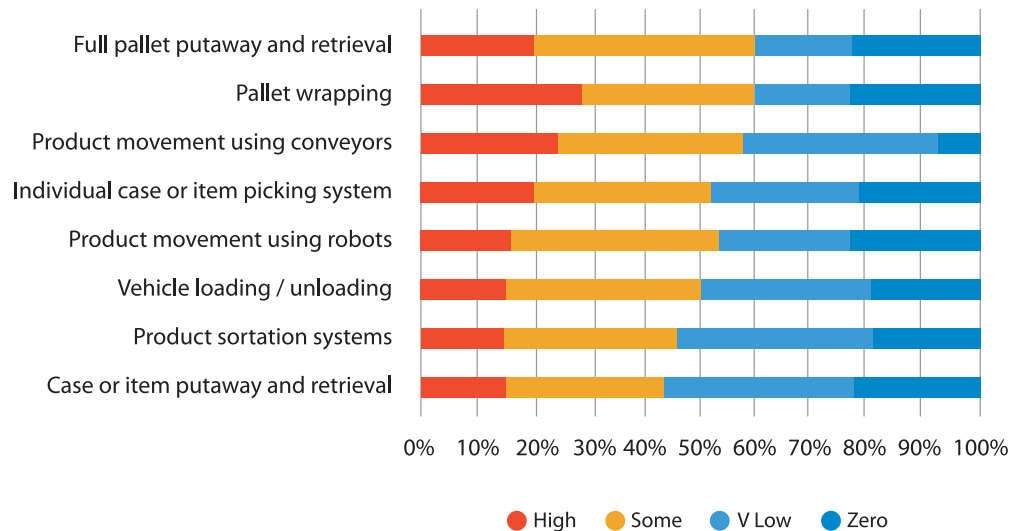
It appears that many organisations are planning on turning to increased automation to help overcome the challenges caused by labour shortages.

While there will undoubtedly be instances where organisations have replaced employees with automation in the past for cost savings and efficiency, demand is currently outstripping supply in the industry with [some studies estimating](#) that for every one qualified supply chain manager there are six available jobs.

There is also ample opportunity for warehouse operatives to work alongside automation and robotics, fulfilling tasks that benefit from a human touch and experience, such as controlling technology and inventory.

Not only can this boost job satisfaction and retention for the workforce, but it can also improve health and safety, taking employees out of the more accident-prone areas of the warehouse.

Main areas for future investment



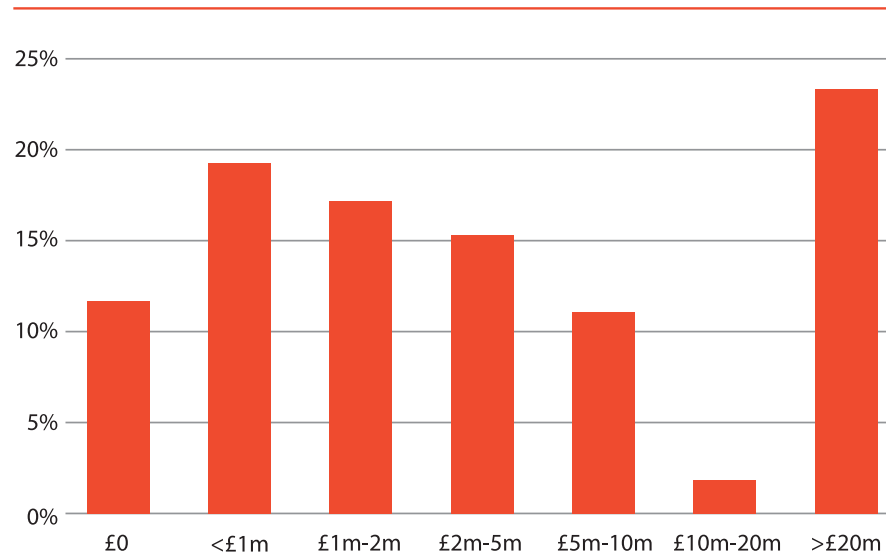
When asked about investment plans for automation in the foreseeable future, it was a continuation of the current with full pallet putaway and retrieval automation and pallet wrapping topping the list with 60% and 59% respectively.



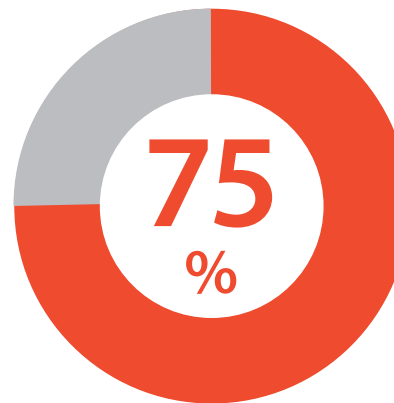
Yet, as we'd expect with the e-commerce boom and technological advances the big movers growing in importance are individual case or item picking systems and product movement using robots, growing to 52% each compared with current implementations of 38% and 36% respectively.

In fact, [according to Gartner](#), by 2026 75% of large enterprises will have adopted some form of intralogistics smart robots in their warehouse operations. However, once again, the research shows that organisations are at varying stages. While some companies appear to be making their first serious steps towards automation, others are building on and extending the automation they already have.

Expected investment in automation in next 5 years



Although priority investment areas for future automation are wide-ranging, the research shows that its adoption is set to accelerate significantly. A third (33%) are planning to spend between £1m - £5m and 13% are planning to spend between £5m - £20m, while almost a quarter (23%) are planning to invest more than £20m in the next five years.



75% of large enterprises will have adopted some form of intralogistics smart robots in their warehouse operations.

This is especially significant when comparing current annual warehousing costs to the amount that respondents are planning to invest in automation and robotics.

An impressive 42% said they were planning on investing **equal to or more than** their annual warehousing costs on automation over the next five years. What's more, 6% said they're planning on spending **more than double** their annual warehousing costs on automation over the same period.

This, very possibly, makes robotics and automation the biggest capital outlay for many of these businesses over the next five years.

For an industry not renowned for being at the forefront of investment and cutting-edge technology, this is significant.

The pandemic-driven e-commerce boom, requiring higher warehouse labour requirements, coinciding with labour shortages and cost increases, has created the perfect storm for the surge in automation and robotics.

Yet, among the organisations embracing the technology, there is still a small segment of the market that remains steadfast in its current approach.

12% of respondents said they were not planning to invest in automation at all in the foreseeable future, suggesting they're already content with their warehouse set-up and believe it will meet their future requirements, or simply don't see the value automation holds for their organisation.



Recent developments in the business criticality of logistics over the last few years have changed mindsets with regards to investing.

Whether you're a retailer trying to compete with delivery leadtimes, handle exceptional peak volumes such as Black Friday, or effectively manage large volumes of online returns, or whether you're a manufacturer who, due to the lack of labour availability, misses out on delivering the peak season in an environment where every sale counts, then ensuring an effective logistics capability has risen as a corporate priority.

Dave Howorth – *SCALA Executive Director*





Online demand and home delivery is a huge challenge facing companies operating in the order fulfilment and e-commerce sectors, especially when considering, in fashion for example, that there can be tens or hundreds of thousands of different products, in different sizes and colours.

These providers need to establish the most efficient way of handling, picking and packing these products for delivery to the consumer, and deciding on the right approach for the next five to 10 years.

This can be difficult to gauge, resulting in many businesses having to either take a bold step with investment or adopt a more conservative approach and build an automated solution in a modular fashion.

The alternative approach we're seeing is a joint investment between logistics providers and clients, with the client seeing cost saving improvements or increased handling capability as automation is introduced.

Automation and robotics are advancing rapidly with new suppliers and technology seemingly coming to market all the time.

There is a plethora of automation and robotics options to suit complex picking operations ranging from miniload and shuttle systems to 'goods to man' robotics, which putaway and retrieve bins or shelving, bringing products to pick stations and potentially automated packing stations.

However, the answer doesn't always lie in increased adoption of robotics and automation alone.

SCALA recently worked with an e-fulfilment client to consider the pros and cons of picking from mezzanine floors vs installation of automation and robotics.

Rob Wright – SCALA Executive Director

	Pros	Cons
Mezzanine floors	<ul style="list-style-type: none"> - Good utilisation of space - Doesn't require any change to WMS - Easy to train staff / more of the same 	<ul style="list-style-type: none"> - Labour hungry - Reliance on getting product up and down - Not future proofed - Higher service costs - Heavy engineering and not flexible to change - Goods lift maintenance
Robotics	<ul style="list-style-type: none"> - Better efficiency with higher productivity - Reduced headcount - Health and safety benefits - Sales PR / Greater credibility - Larger opportunity to leverage investment - Easy to phase implementation - Lower running costs - Easier installation 	<ul style="list-style-type: none"> - Increased technical complexity - Unable to use all available height in some warehouses - Accepting and educating operational staff - Manufacturing lead time



Conclusion

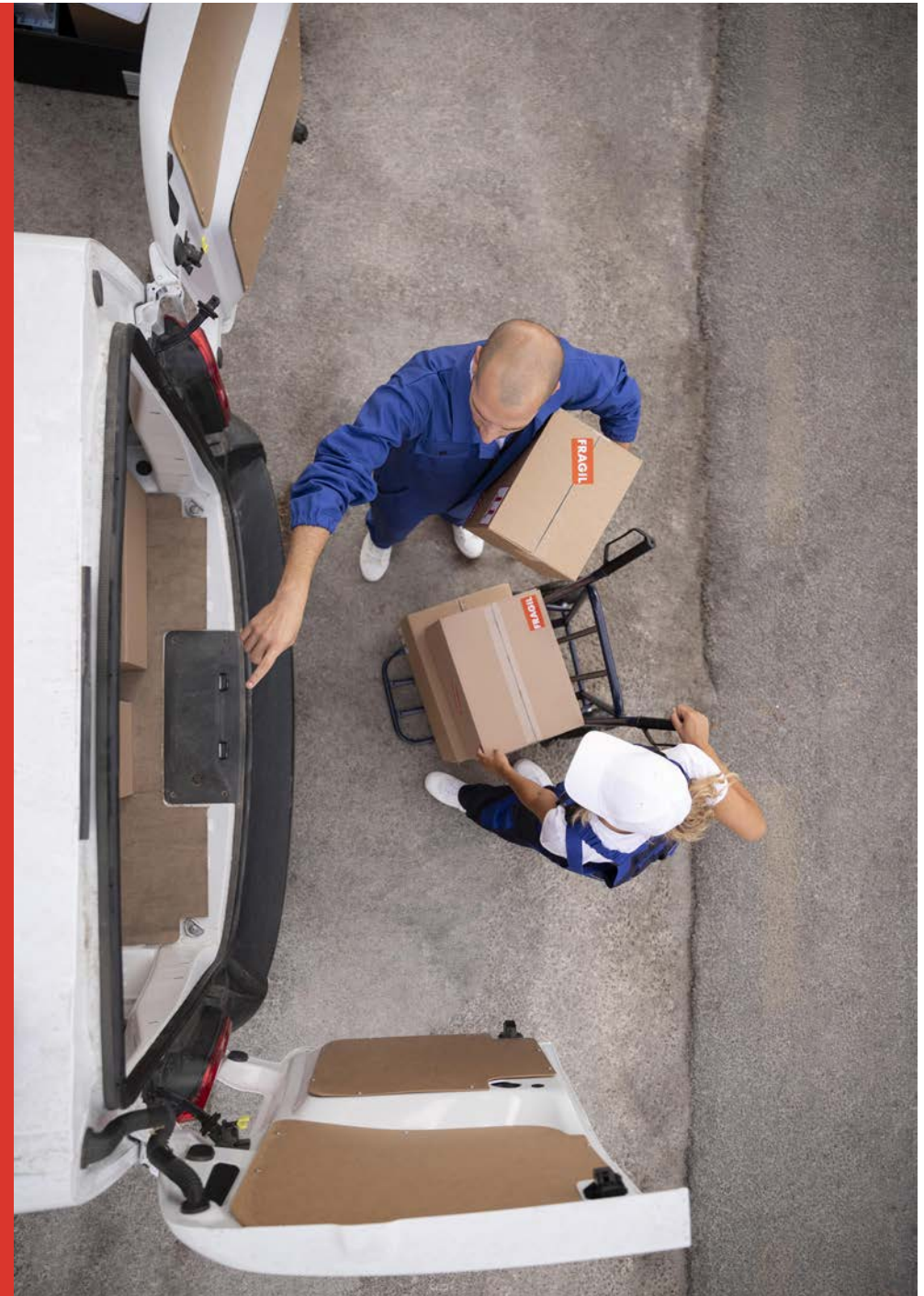
The research clearly shows a real divergence of companies from those who have invested in only the basic levels of automation and who do not envisage a change in that strategy to those who are seeking to embrace the opportunities and benefits that robotics can bring.

Despite the ongoing economic and geopolitical uncertainty, organisations that have already invested in automation and robotics are clearly seeing their value, and as a result, plan to invest significantly in the foreseeable future.

What's more, the scale and significance of these plans is remarkable, and is likely to contribute to a huge shift in the way warehouse and fulfilment facilities look and operate over the next five years.

However, there remains a segment of the industry that still appears reluctant to fully embrace automation, whether it's due to the investment required, fears around its impact on the existing workforce, or concerns around its compatibility in the wider IT infrastructure.

There also remains some misconceptions and clear barriers to adoption for some organisations, primarily around flexibility and investment.



Conclusion continued...

The ongoing development of e-commerce together with the continued labour shortage, and the benefits already realised by organisations plugging skills gaps with automation, suggests that we'll see more technology being deployed to meet demand.

Although a solution to a significant problem, automation could also result in a broader upskilling of the human workforce as they reallocate their time to manage value-adding tasks and take on supervisory roles.

While technology has proved its worth, people remain key in monitoring threats and opportunities, and ensuring supply chains remain agile and reactive.

Moving forward, alongside increased automation and adoption of more sophisticated robotics, it's also likely that we'll see artificial intelligence play a bigger role.

Not only is its greater involvement set to drive further efficiencies across the supply chain, it's also expected to derive greater insights from existing data and processes and provide proactive, predictive, and even prescriptive guidance and functionality for organisations.

While supply chains have undoubtedly had a tough time, with more to come, the agility and widespread use of automation and robotics to rise to challenges and drive innovation is testament to the industry's resilience.

We look forward to monitoring how it continues to develop and evolve.



CONTACT US

If you would like to discuss these findings in greater detail, please contact:

e: clientservices@scalagroup.co.uk

t: 0330 133 2692

w: scalagroup.co.uk

