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The seven biggest pitfalls when robotising your warehouse.

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Introduction.

Warehouse robotisation is set to take off over the next few years. This will largely be driven by the growth in e-commerce, according to a study conducted by market researchers ARC Advisory Group . Retailers, wholesalers and logistics services providers are increasingly investing in systems that allow them to process a large number of small orders with extreme efficiency. These systems include goods-to-man systems, such as small load carriers and pallet carriers and the warehouse control systems needed to control them. Other links in the chain are also expected to invest more in robotisation. Parcel carriers, for example, are having to handle an ever-increasing number of parcels. Manufacturers are, to one extent or another, being forced to explore robotisation by retailers who want to hold less stock themselves.

The increasing interest in robotisation of warehouses is easy to explain. Labour is the biggest cost in any warehouse, particularly when it comes to order picking, and robotisation can provide a substantial saving. Faced with an aging workforce and growing recruitment challenges, robotisation becomes of even greater importance. In addition, robotisation means fewer errors and shorter throughput times.

Interest in robotisation is also growing in industries not directly related to e-commerce. Those who opt for robotisation, however, must accept a complex journey that has a number of pitfalls. This white paper explores the seven main pitfalls.

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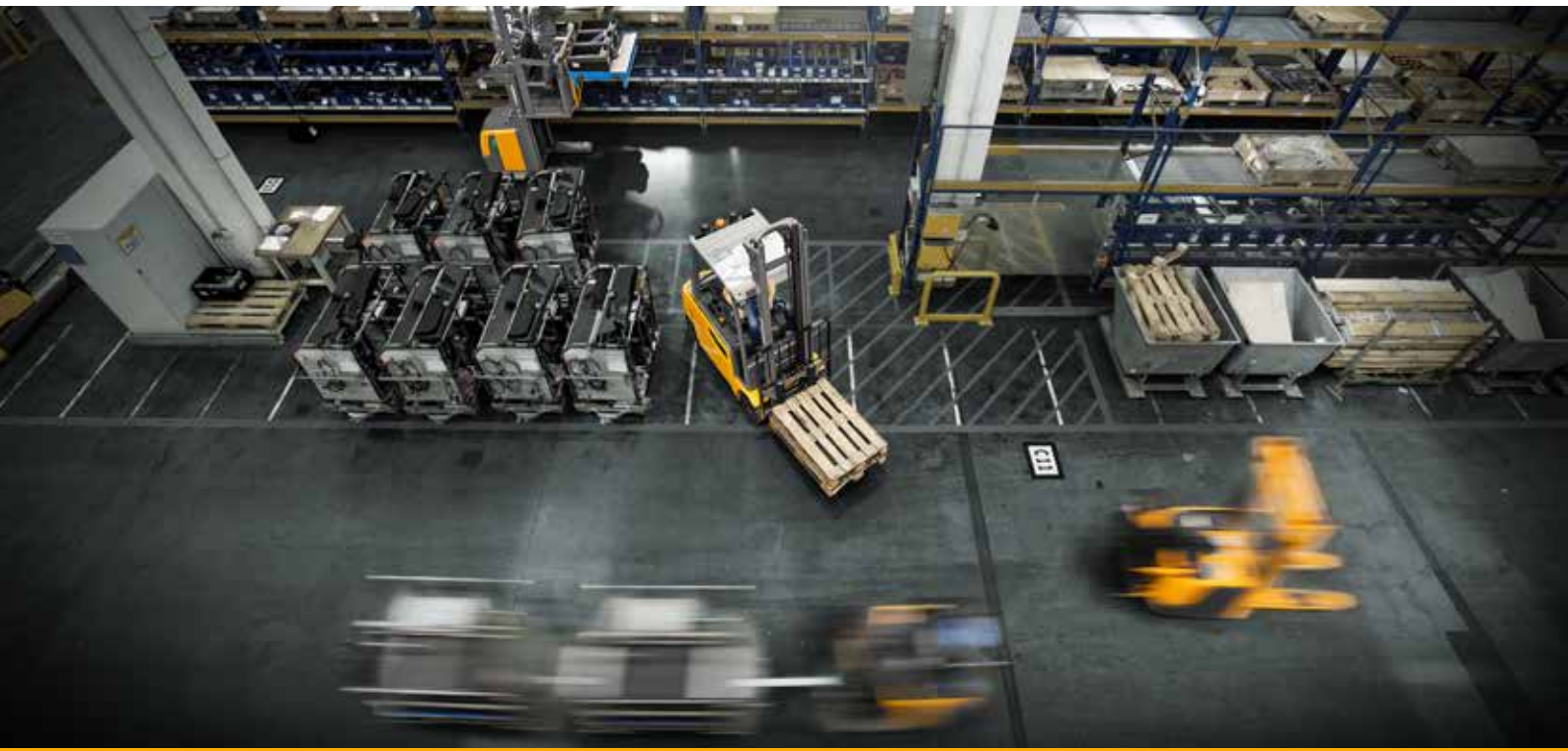
Pitfall 1:
Expectations set too high.

The media talk endlessly about the opportunities offered by robotisation. This can give rise to unrealistic expectations, not only within your own department, but elsewhere in the company. Consider the CFO, who now accepts an amortisation period of three or four years as the standard for large-scale investments. An amortisation period this short is not realistic for an automated warehouse, which can easily achieve a technical service life of 15 years. If the system is overhauled and the operating software updated after ten years, the system can last 20 years without difficulty. If you start a discussion with the CFO and accept a longer amortisation period, you broaden your investment options and unlock a much wider range of robotisation potential.

Expectations that are set too high can also affect the speed at which an automated warehouse can be commissioned. Installation of the hardware is quick. More time is required to design the system (and the control system) for the hardware. This latter element is often underestimated, particularly the time needed for testing. There is a risk of teething problems, particularly if the system has to cope with large volumes. Any issues should be resolved before the system is commissioned, so allow plenty of time for testing.

Do

- **Adopt realistic amortisation periods**
- **Reserve plenty of time for testing**



2.

Pitfall 2:
Too little insight.

With an automated warehouse, the first picture that comes to mind is often that of unmanned cranes automatically storing and removing pallets, containers and boxes. What is often forgotten is the way in which the goods are delivered and dispatched. How is that currently done in your organisation? Can it be automated with conveyors or Automated Guided Vehicles (AGVs)?
A thorough preliminary study is needed before deciding to opt for robotisation. This involves mapping all processes, from goods receipt to order dispatch. To what extent are these processes standardised? And to what extent is it possible to adapt processes so that they can be automated?

In the preliminary study, it's a good idea to take a critical look at stocks. Are the right articles in the racks in the right quantities? It would be a waste to invest in an automated storage system if it were to be filled largely with dead stock. Another important point for attention is how goods are packed. Are the pallets stacked stably and wrapped in foil? How well is that foil secured? Falling boxes or loose foil can cause faults which can, in some cases, be difficult to rectify due to the limited accessibility of the goods. Is the quality of the boxes sufficient for them to be stored in a small load carrier or pallet carrier system or do the contents need to be repacked into plastic containers first? If necessary, you should talk to suppliers about making improvements to the quality of pallets or boxes delivered.

Do

- **Inventorise your dead stocks and reduce them**
- **Map your intralogistics processes. Could they be standardised?**
- **Analyse packaging and load carriers in your warehouse. Is the quality sufficient?**

3.

Pitfall 3:
No clear strategy.

Cost saving is the most common reason for robotisation, but does building a cost-efficient system fit with your supply chain strategy?

Generally speaking, there are three strategic options:

- Operational excellence: Minimising operational costs is the aim. The focus is on efficiency.
- Product leadership: The range determines the capacity. This can give rise to a large number of stock keeping units (SKUs).
- Customer intimacy: All processes are focused on providing optimal customer service. Speed and availability are important.

The chosen strategy has a big impact on the design of the automated warehouse. If your company focuses on the cheapest possible product, a compact, efficient and simple system will be enough. By contrast, if availability of items has top priority, investing in additional warehouse capacity should be top of the agenda. That will allow you to split the most important items over several aisles so that you can continue to deliver, even if one part of the system fails. If speed is the most important aspect of your warehouse, you will need to invest in additional storage and removal capacity and in additional order picking and packing stations. This might be the case in warehouses containing time-critical spare parts or in warehouses for webshops that offer same-day delivery or late cut-off times. Determine the supply chain strategy beforehand, look at the role of the warehouse within it, and adjust the design to it.

Do

- **Determine the supply chain strategy and the role your warehouse has in it**

Pitfall 4:
Oversizing.

4.

It might sound like an appealing idea - a single automated storage system for the entire range - but is it realistic? Putting all your pallets in a crane warehouse is no problem but if you also try to accommodate your long goods, sofas, garden furniture and other items with different dimensions in the same system, you will soon find yourself with an oversized and unnecessarily expensive system. A thorough analysis of the characteristics of any product range will almost always lead you to the conclusion that the optimal solution is a combination of different storage methods. Consider a crane warehouse for pallets, with a small load carrier or vertical lift system for small goods adjacent to it, for example. Then, for the flow of items that can't be automated, you can often survive with a conventional reach-truck warehouse.

In addition to product characteristics, it's also important to analyse order patterns. The capacity of an automated warehouse should be coordinated with the volume that needs be processed at peak times. That might not be the best solution, however, if the peak is extreme and relatively short-lived, as you'll have invested in an expensive system that might only be used at half capacity for most of the year. An alternative solution for such situations is to consider renting external warehouse capacity as a temporary measure.

It's also important to look closely at daily peaks. In warehouses used for webshops, most orders arrive in the evening. If you can manage to flatten those peaks - e.g. with an extra shift or by moving orders that do not need to be delivered the next day - you can cope with reduced capacity.

Do

- **Analyse the characteristics of the range and categorise**
- **Use different storage methods for different product groups**
- **Don't focus solely on the peaks. Other solutions are available for these**

5.

Pitfall 5:
An unsuitable IT environment.

An automated warehouse cannot function independently. It needs commands from a higher-level system. While most companies have an enterprise resource planning (ERP) or warehouse management system (WMS), what is important is whether that system can control robot cranes, Automated Guided Vehicles (AGVs) and conveyors. Anyone who attempts to control an automated warehouse with an unsuitable IT system will fail to get the maximum return on investment. In many cases, an intermediate layer in the form of a warehouse control system (WCS) will be needed. A system like this converts the commands from the ERP or WMS system into specific tasks for the components that together form the automated storage system.

An important question is which system makes which decisions? For instance, does the WMS determine which pallet needs to go in which location, or does the WCS do that? These questions need to be answered before starting implementation. The most practical approach is to see the storage system as a black box. The WMS controls each order line for this system to the black box, within which the WCS ensures the most efficient and effective handling. This kind of approach will help you avoid having to contend with integration problems.

Do

- **Get the IT environment sorted before you start to automate**
- **Make well-considered choices: which IT system will have priority?**

6.

Pitfall 6:
Lacking project management.

When you make a costly investment in state-of-the-art technology, you want the best of the best. There is a temptation to select the best supplier for each component of the automated system, but this often causes significant problems. Each supplier will need to consult with one another to integrate their components. There only needs to be one (inevitable) mistake and suppliers will begin pointing fingers at each other.

That's the value of choosing a system integrator who offers all components and can integrate them together seamlessly. The system integrator doesn't necessarily need to have everything in house, but they will have a network of subcontractors with whom they have completed multiple projects. Another benefit of a single system integrator is that you only have one point of contact.

An important agenda item in the consultation with the system integrator is the schedule. There is a temptation to implement the entire system in one go, but that will have a major impact on your business, your employees and maybe even your customers. Those who opt to fully robotise a warehouse in one go are opting for a whole new working method in an organisation that may have very little experience with automation. Explore the possibility of dividing robotisation into phases. You can safely implement an automated storage system without immediately having to mechanise the infeed and removal of pallets. An automated loading and unloading system for trucks can easily be installed a year later. It is, of course, important to keep the desired end state in mind at each phase.

Do

- **Choose a system integrator, so you only have a single point of contact**
- **Limit the impact of teething problems and automate one part at a time**

7.

Pitfall 7:
No expansion options.

A robotic warehouse can last for fifteen to 20 years, but who can see that far ahead? All too often, turnover grows faster than expected or a merger forces consolidation of different operations into a single warehouse. In such cases, expansion is the preferred option but can the system cope with it? Expanding a storage system by adding an aisle with cranes or pallet carriers alongside is a good idea. In practice, however, that adjacent space often gets filled with hardware that is difficult to move. In the design, therefore, consider scale-up options that avoid enclosing the automated storage system. Instead, position it against an outside wall where there are opportunities for expansion.

Even though it is hard to see into the future and predict the growth of material flows in the warehouse, it is still worth trying to forecast. Use insights from sales and operations planning, for example, or ask the management team to jointly compile a vision for the future. Foresight is the essence of control.

Do

- **In the design, choose a location at which you can upscale**
- **Compile a forecast of your material flows**

8.

Conclusion

Lower costs, reduced space requirements, better quality, shorter throughput times: the benefits of warehouse robotisation are great. An ever-increasing number of companies are discovering that the business case is favourable and that investment in modern storage systems can pay dividends.

The overview of pitfalls in this white paper does, however, show that deciding to robotise is just the beginning of a complex project, the kind that you only really experience once every 15 or 20 years. With good preparation, however, you can avoid the pitfalls. To do so, it's worth engaging the support of an expert partner who is familiar with the pitfalls through their own experience and feels at home in the world of supply chain strategy and solutions.

Get the answers you need with our automation survey.

9.

Any warehouse automated system study should start by mapping the current situation. How is the warehouse set up? How effective are processes? What are the characteristics of the material flow?

With this inventory list, you can then map much of your operation by yourself. Your answers will give you a clearer picture of how things currently stand. In addition, the list will enable your supplier to give you some initial advice on points for improvement in your operation and on possible automated system solutions.

Take a few minutes to complete our online questionaire and take the first steps to optimising your operation.

Start survey ›

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Intralogistic Solutions

Jungheinrich Intralogistic Solutions is the division of Jungheinrich that is responsible for the design, sales and realisation of warehouse equipment projects. Jungheinrich is one of the largest suppliers of intralogistics solutions in the world. We are specialists in the equipment and optimisation of warehouse and distribution centre logistics; from installing warehouse racks through to warehouse software, warehouse automation and robotisation.

We not only offer a wide range of warehouse and transport systems, but also retain all expertise in house. We analyse existing processes, identify potential and develop optimised strategies, including for your future requirements. And we do all of this on the basis of your individual needs.

Want to know more?
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