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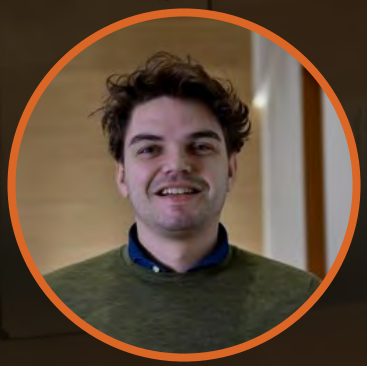
5 common mistakes & misconceptions made when starting with a robot depalletizer



Product Manager at AWL

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Robot depalletizers are becoming increasingly popular in automated logistics and distribution processes. With the ability to perform repetitive, heavy tasks efficiently, robots offer businesses the opportunity to increase productivity and ease employees' workloads. But despite the promised benefits, you will not get the most out of your robotic depalletizer if you do not consider the proper use beforehand. These are five common mistakes and misconceptions you might encounter in implementing a robot depalletizer.

1. **Not reconsidering or expanding the business case**
2. **Completely replacing employees**
3. **Focusing only on uptime of robot**
4. **Lack of attention to acceptation & adoption process**
5. **Overlooking robot gripper trade-off**

1 | Not reconsidering or expanding the busines case

Given the current state of technology and logistic processes, a **common mistake is to think that robots can automate everything.** The true power of automation lies in leveraging the strengths of robots, allowing them to handle the repetitive or heavy tasks they excel at while letting humans manage the complex, flexible decisions that require intuition and creativity.

Seemingly straightforward manual tasks, like unfolding polybags before placing them on the sorter, may appear simple when handling manually. However, ensuring a robot's ability to manage all possible product variations in the years to come, demands a substantial investment in developing the development of this single feature. This often has a direct impact on the overall business case. Everything starts with an understanding of both the robotic integrator and the company that wants to automate. The robotic integrator needs information about day-to-day business and its challenges. This insight allows for a clear evaluation of how robotization can significantly impact business continuity. On the other hand, the company can make better decisions when it knows all the possibilities and limitations of the technologies currently available.

2 | Completely replacing employees

When starting with robotic automation, people see the robot as a replacement for an employee's job. However, **a direct one-on-one replacement won't maximize the robot's potential.** Often, we see that the robot needs to perform every possible task, even if some of these tasks only happen 0.001% of the time. For example, when looking at a robot depalletizer, we have seen requests where robots need to be able to pick up boxes to a height of 2 meters, with a weight of 35 kg, all at lightning speed.

As packages become larger and heavier, the robot's speed decreases, handling fewer packages. To maximize the robot's efficiency, it is essential to clearly specify which packages should and shouldn't be handled by the robot. By defining the borders of the specifications, you make sure the robot operates at its best while employees can handle the exceptions. If these exceptional situations happen multiple times a day and form bottlenecks in a current process, it makes sense to create a design tailored to the situation. But if it only happens twice a year, it will save a lot of development costs and floor space to leave the feature out.

3 | Focusing only on uptime of robot

On multiple occasions, we've observed that many focus only on finding a solution that maximizes the robot's uptime. However, looking beyond the uptime, you will discover **a trade-off between components, costs and performance.** To demonstrate this, below is a list of multiple machine layout options for a single purpose.

Concept designs

Concept 1
Here you see a layout featuring two available pallet locations and one robot in between, which was specifically requested. The advantage of two pallet positions is that one can be used for pallet swapping and preparation during robotic depalletizing. This setup allows high robot uptime since there is always a pallet available.

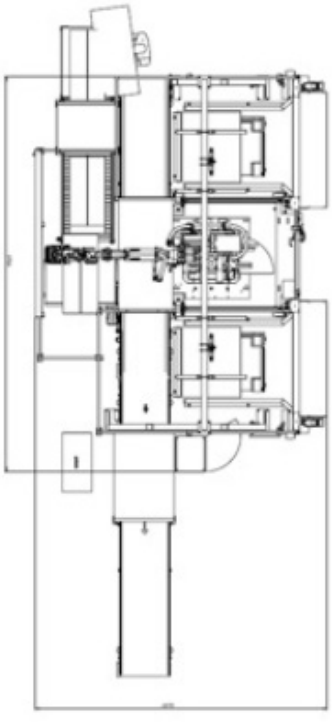
Downside: This layout requires two camera systems to determine the grasping poses for both pallet stations. Additionally, it requires a double amount of safety systems and SpaceClaim to ensure safe operation. As a result, the arrangement of picking and placing is less than ideal, as it involves too many compromises.

Concept 2
In this concept, pallets are supplied using a chain conveyor, providing a buffer functionality similar to the first concept. However, this design utilizes only one camera system and requires a single safety system while maintaining high robot uptime.

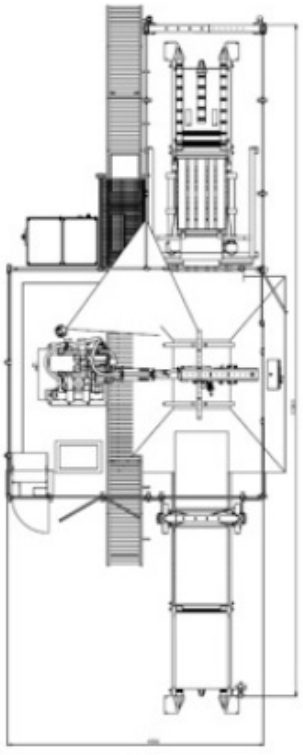
Downside: Additional equipment is required for conveying and automatic pallet stacking, which results in increased costs and a larger footprint then necessary.

Concept 3
The last concept features a design where two non-standard robot depalletizers are placed side by side. A 'less is more' design has been chosen to maximize efficiency. This design is optimized for performance and limited floorspace, allowing for an output of 1.5-2 times that of traditional setups, as it uses two robotic arms. It is designed with a low-level entry price in mind, and using two robotic arms can exceed the performance of the other machines while also being redundant when one robot requires service.

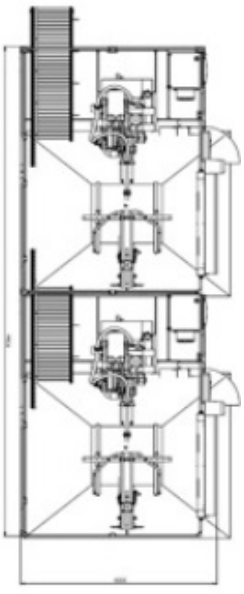
Downside: Since the design prioritizes limited floor space and a low entry price, it employs a single manual loading pallet position.



Concept 1



Concept 2

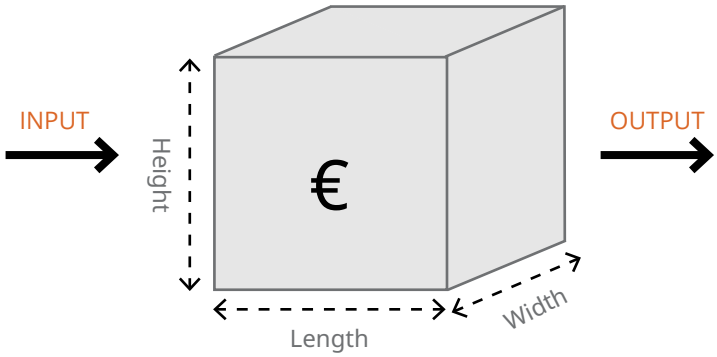


Concept 3

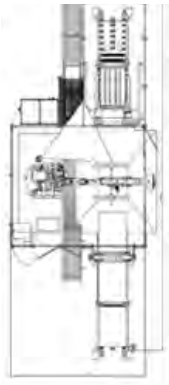
Different perspectives on the solution and KPIs

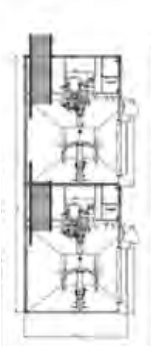
Looking back on the concepts we have developed so far, we see that viewing the solution as a black box (more abstract) often makes sense. When starting robotic automation, there are mainly four key areas of interest:

- **Input:** parcel/item characteristics, daily operations based on data, etc.
- **Available dimensions:** the floor space available for the solution
- **Expected cost:** anticipating pricing to validate business case
- **Output:** Key Performance Indicators (KPIs) and performance rate



Another approach is to rethink how we view KPIs. Instead of only focusing on price, performance or floorspace, consider price per performance or performance per square meter. This perspective can provide valuable insights into a machine's performance, especially when installed in expensive regions with high prices for floor space.





	Concept 1	Concept 2	Concept 3
Price indication (EU)	€395,000	€350,000	€450,000
Performance (PPH)	600 - 700	700 - 800	1,200 - 1,600
L x W in MM	4,950 x 7,600	4,300 x 11,4000	3,325 x 8,300
€ per PPH	€607	€466	€321
PPH per m²	19.6	15.3	50.7

4 | Lack of attention to the acception & adoption process

Another mistake often made is not paying attention to the adoption process of employees. Implementing a robot requires more than just the actual implementation on the floor. There is often too much focus on the idea of "we need a robot to relieve our employees and deploy it when the workload is high."

Not enough consideration is given to the acceptance and adoption process, which is necessary in order to experience the benefits of automation. It's often forgotten that operators have to work side by side with the robot every day. **Acceptance by operators is, therefore, the key to success, but it requires attention.**

5 STEPS
to give attention to the acceptance & adoption process

1. Inform on time
Acknowledge that employees are facing a significant change in their daily tasks. Providing timely information allows them to process it and read up on the topic. Clearly explain the purpose of implementing robots to light their workload. For example, explain that the machine eliminates the need to lift heavy packages, which allows employees to engage in lighter tasks and other jobs. This way, they understand no one is being replaced and work only gets more comfortable. When necessary, engage in one-on-one conversations and make the implementation a standard part of the team's agenda.

2. Invest a lot of time in training
Training is crucial because it enables employees to understand how the machine operates and raises awareness of safety procedures. It is essential to start with a general training session that not only covers the technical aspects of the machine but also provides clear explanations of safety measures. This hands-on training allows employees to engage directly and gain practical experience. As a result, it becomes clear who are the quick adopters and who may need more time and support.

Following this beginner's training, customized training can be tailored to each employee's stage. Everyone learns by doing and for those who require more time, additional guided hands-on training can be organized. This approach allows each employee to learn at their own pace and it prepares them for their role optimally.

3. Built trust
Often, there's fear of employees not operating the machine correctly. This may lead to concerns about the quality of their work. It is important to let them know there may be a temporary decrease in process speed – and that that's ok – as they learn how to utilize the robot depalletizer effectively. As employees gain more confidence, they will also feel a greater sense of ownership over their roles and may even become ambassadors for their new machine.

4. Just start
Start by simply getting to work; you need to begin the process and start collecting data. The machine will provide insights into data that you previously didn't have. Then, with these insights, you can take steps to implement improvements.

5. Listen and give a voice
Employees are ultimately their own greatest trainers and have the best understanding of what the robot can or cannot handle effectively. It's essential to continue to listen and to allow them to provide feedback. They may know better than you how the machine operates, as you're not operating it on a daily basis. Encourage them to share their insights and involve them in discussions about how to optimize the machine's performance. By fostering an environment where employees' voices are heard, you empower them to contribute to the operation's success, leading to better outcomes for everyone involved.

5 | Overlooking robot gripper trade-off

One of the trade-offs that has been overlooked is the relationship between the gripper and the robot, which is crucial. Below, you find the reasons why.

Robot
Robots come in various sizes, primarily determined by their payload capacity and reach. In today's market, robots are often designed with a focus on precision, high repeatability and accuracy. However, in markets like intralogistics, being able to pick up an item within a 10-micron tolerance is irrelevant. The current designs of robots show that as the payload capacity and reach increase, the robot's build must become sturdier to handle these demands. This sturdier build adds weight, eventually leading to reduced speed. In simple terms, it's like comparing a tennis ball to a 14-lb bowling ball – throwing the lighter ball faster than the heavier one is much easier.

When selecting the right robot for the application, there is always a trade-off between payload, reachability and required floorspace. When setting up your specifications, remember to leave out exceptional cases; this will often result in better, more cost-effective solutions.

Gripper
"Can't we just build a gripper that covers the complete pallet?" is a question that is often asked. At first glance, this idea might seem like a practical solution. But if you think one step further, you may see the robot's and the gripper's connection. Larger grippers, typically heavier, require larger, slower robots and more floor space. Additionally, the robot must be capable of using the gripper in all situations. For example, imagine needing to pick up a small box from the top left corner of a pallet that's 2.3 meters high. The size and weight of the gripper directly affect which robot can be used. In many cases, the potential advantage of a large gripper may not justify the trade-off in speed, space and flexibility.

In conclusion, while robot depalletizers hold great potential for boosting efficiency and relieving employee workloads, their benefits can only be exploited through proper planning and execution. You can ensure a more successful integration by understanding and addressing the five common mistakes – failing to reconsider the business case, treating robots as direct job replacements, focusing solely on robot uptime, neglecting the adoption process, and overlooking the critical relationship between the robot and gripper. Thoughtful preparation and attention to these areas will help you fully unlock the potential of robot depalletizers in your operations.

Want to know more about AWL's robot depalletizers? Request a demo at our Experience Center in Harderwijk (NL), and our experts will tell and show you everything you want to know.

More information about **robotic depalletizing** for random mixed packages

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