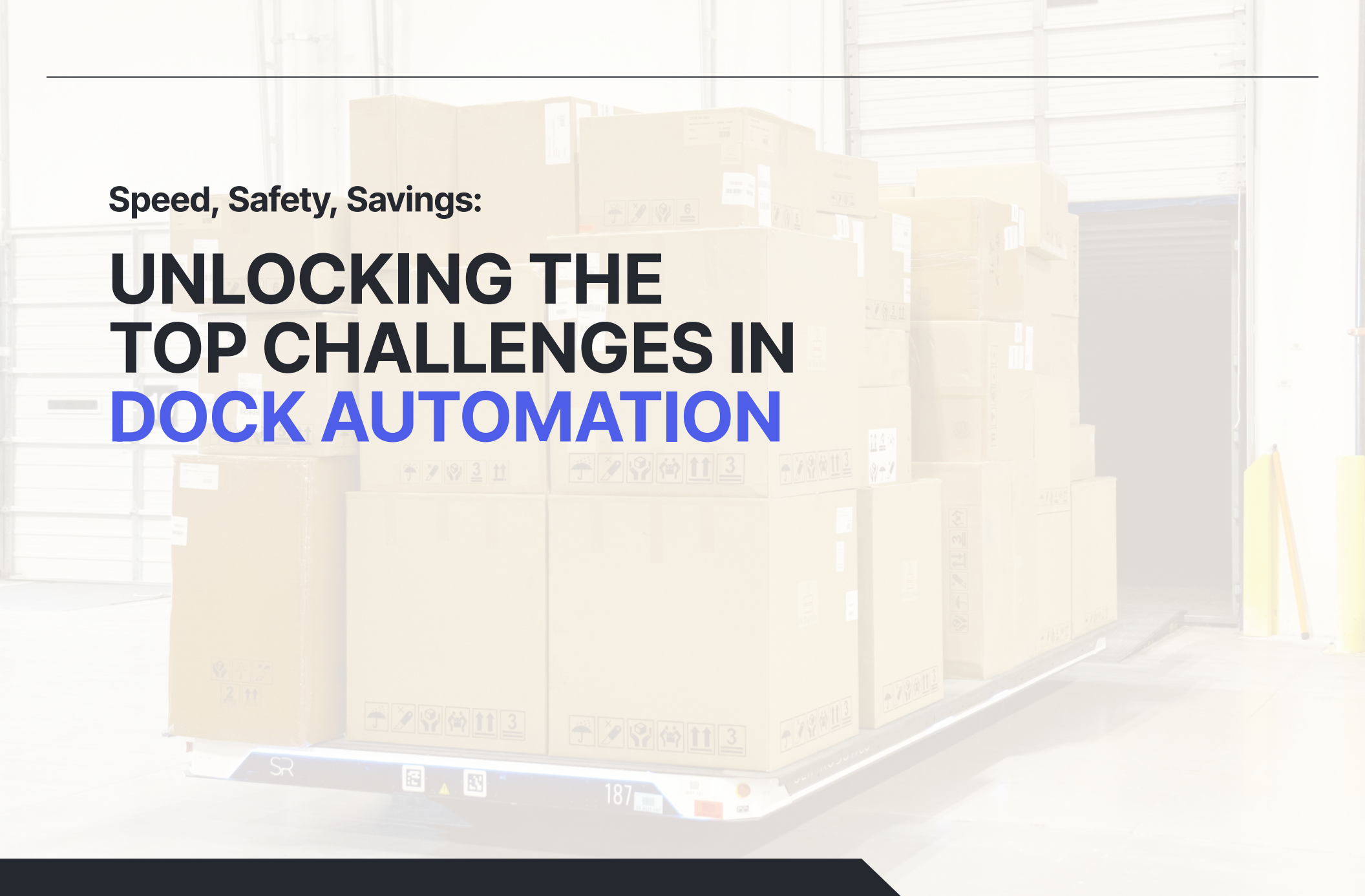


A white autonomous mobile robot (AMR) is shown in a warehouse setting, carrying a large stack of cardboard boxes. The robot is positioned in the center of the frame, moving towards the right. The boxes are stacked high and are secured with straps. The warehouse floor is polished and reflective. In the background, there are white metal shelving units and a large open bay door. The overall scene is brightly lit, with a clean and organized appearance.

Speed, Safety, Savings:

UNLOCKING THE TOP CHALLENGES IN DOCK AUTOMATION



Your warehouse may be a lean, efficient machine overall, but if you experience major bottlenecks at the loading dock, much of that efficiency is wasted. The problem is that loading-dock solutions often fall into two main categories: faster loading times that jack up your costs or cheaper solutions that slow down the dock.

And there's a third factor often overlooked in the quest for more speed or more savings: better safety for your dock team. A quarter of industrial accidents happen at the dock, thanks to forklifts and people working in the same tight spaces. And a quick glance through [dock accident reports](#) from the Occupational Safety and Health Administration (OSHA) shows that some of these injuries are deadly.

These three major challenges — loading speed, costs and worker safety — create a knot that's hard to untangle with traditional dock solutions. The most common (and one of the least costly) solution is forklifts — but since those account for between 32,000 and 62,000 injuries every year, according to OSHA, they definitely don't cover the safety leg of the tripod. And many automated solutions offer safety at the cost of both speed and price.

That's where automated loading robots come in, delivering major results in all three areas. Read on to learn how robotics can solve your biggest dock challenges.



THE CHALLENGE TO ACHIEVING SPEED, SAFETY, AND SAVINGS

So how do you manage all three results: speed up dock operations, improve worker safety and save money? That question hasn't been properly answered by traditional dock operations — or by many automated solutions. Two scenarios usually play out in dock operations:



Savings at the cost of speed and safety

While some operations may think they're saving money by using their existing forklift fleet instead of investing in automation, the truth is a forklift isn't the safest or most efficient dock solution. Sure, it's faster than loading by hand (which can take up to two hours), but a forklift can still take an hour to load each truck.

Forklifts also introduce several major safety risks — and not just for pedestrians. Cross-traffic incidents, trailer floor fall-through or incidents in which the truck pulls away while the forklift is still in the trailer all cause serious injuries, or worse, every year.

So while forklifts may seem like the most inexpensive option, the resulting losses in terms of driver wait time, labor and costs associated with injuries on the dock can quickly wipe out any expected cost savings from sticking with forklifts.

The slow loading speed with forklifts can also limit your ability to grow your operation and revenue. You can grow only as fast as you can move materials in and products out of your facility, so even minor bottlenecks create issues far beyond the dock.

Speed at the cost of savings (and, again, safety)

The next phase after forklifts for many organizations is to add some form of automation to the dock. Typically, these solutions require modifications to the dock, trailers or both. One example of this modification is a skate-loading system, where materials are placed on an automated track that then “pushes” pallets into the truck. Similarly, a trailer-skate involves modifying the trailer to speed up loading and unloading.

Depending on the mix of modifications required (for example, having to modify an entire fleet of trailers), this can cost upward of \$2 million per dock door.

“It makes it really hard to get good savings,” said Chris Smith, CEO of Slip Robotics. “If you’re modifying your whole trailer fleet, that’s prohibitively expensive. And if you’re putting a big piece of equipment on your dock at \$1 million to \$2 million per dock door, it’s difficult or impossible to see ROI from that investment.”

Smith pointed out another issue with these dock solutions: flexibility. “A lot of these solutions are fixed equipment installed on a trailer or dock. When that equipment goes down, your dock is down until it’s fixed.” If you have limited dock doors, like many facilities, equipment downtime has a serious effect on production.



So how do you find a dock solution that delivers speed, savings and safety?

Automated loading robots are the answer for many, if not most, organizations.





CASE STUDY

VALEO ACHIEVED 6X DOCK SPEED

“

Slip Robotics is in the top three innovations I've seen in my 40+ years in manufacturing and logistics.

Lou D'Allura | APU Manager at Valeo Lighting Systems North America

”

It's easy to see where D'Allura's enthusiasm comes from. By implementing Slip Robotics to automate its dock, Valeo achieved ROI in just six months.

A busy manufacturer of automotive parts, Valeo needed to reduce trailer loading and unloading times to keep up with demanding production schedules. Forklift loading could no longer keep up with their needs, taking 30 minutes to load each truck.

After implementing SlipBots, Valeo saw a 6X reduction in loading and unloading time — from 30 minutes per truck to five minutes. And it accomplished it without long installation times or complicated systems for employees to learn.



AUTOMATED LOADING ROBOTS SPEED UP LOADING AND UNLOADING TIME

Manual loading takes a lot of time for each trailer. Forklifts typically take 30 to 50 minutes per trailer. If a load involves individual boxes loaded by hand, that time jumps to at least 90 minutes. And both of these scenarios require either forklifts or workers on foot entering the trailer, introducing lots of opportunities for accidents and injuries.

Even automated forklifts don't solve all three problems. With their sensors and programming, they may reduce safety incidents, but the trade-off for that safety is forklift operation that is much slower than manual. They're also more expensive to run than manual forklifts.

And solutions such as skate systems can be prohibitively expensive for many organizations and introduce new problems, such as shutting down an entire dock door if something breaks.

Automated loading robots (ALRs), on the other hand, don't require expensive and permanent equipment installation on your dock or trailer.

Even better: They can reduce your loading time from at least 30 minutes (or up to two hours with hand-loading) all the way down to five minutes per trailer.

In a traditional dock operation, workers stage materials at the dock, then move them onto the trailer as each truck arrives. Using ALRs, workers can instead stage materials directly onto the robot, which is then ready to load the trailer as soon as it arrives. This removes a touchpoint for materials, along with that final manual step that causes bottlenecks at the dock.

Again, dock loading and unloading speed is critical to meeting more demanding production schedules, along with your ability to grow your business. You can only grow your facility to the dock's handling capacity, so even a 30- to 5-minute reduction has a dramatic effect.



CASE STUDY

FOUR HANDS ACHIEVED 4X DOCK THROUGHPUT

Furniture designer and wholesaler Four Hands had a unique loading-and-unloading scenario that didn't lend itself to traditional solutions. Because its furniture comes in various sizes, shapes and weights, it's difficult to impossible to load with forklifts. Instead, 10 to 15 loading dock workers had to hand-load each truck to move product from storage buildings to shipping buildings. This process involved multiple touches, with loaders traveling roughly 90 feet with the product in the building, then entering a 53-foot trailer. At the shipping facility, they had to reverse the process to unload products.

This made the whole process slow — up to 15 man-hours per trailer, creating bottlenecks and increasing the risk of damage to products. "It contributed to increased wear and tear on both the products and our employees," said Michael Lueckemeyer, process engineer at Four Hands. "It also impacted our operational efficiency."

Slip Robotics was up to the challenge of moving bulky and oddly shaped products to help streamline Four Hands' dock operations. With slight modifications, SlipBots took over loading and unloading trucks at the storage buildings, cutting load times from 15 man-hours to just 30 minutes per trailer.

“

We were using contract labor for loading, and we were able to cut that by 50% within the first quarter — while scaling by 40%!

Michael Lueckemeyer | Process Engineer at Four Hands

”

AUTOMATED LOADING ROBOTS IMPROVE DOCK SAFETY

OSHA has reported that 25% of industrial accidents happen at the dock. From forklifts navigating tight spaces, forklifts and humans sharing the same spaces, and often overlooked issues such as summer heat inside a trailer, manual loading and unloading create many potential risks for workers.

For loads that require hand-loading, there's the additional wear and tear on human backs from having to handle each box, often multiple times to stage and load it. With internal trailer temperatures reaching upward of 120 degrees in the summer and frigid cold in the winter, environmental conditions also put added stress on workers. This can even become dangerous as workers spend up to two hours in those conditions for each load. Robots eliminate the need for humans to enter the trailer.



Using automated loading robots also eliminates over 50% of dock traffic, which results in dramatic reductions in accidents and injuries. For example, you can load a 53-foot trailer in just three robot movements, rather than the dozens of trailer entries and exits required with a forklift.

ALRs also incorporate many sensors to spot issues and immediately reduce risk. These sensors spot people and objects to not only avoid injuries but also prevent product damage.

Where forklifts have the potential to run into people, freight, building columns, etc., robots and their sensors prevent all those collisions and improve your facility's safety record (and associated costs).





AUTOMATED LOADING ROBOTS IMPROVE COST SAVINGS

Using robots to automate your loading and unloading reduces driver wait time and labor costs while eliminating bottlenecks that stifle your ability to grow. Cutting out these bottlenecks has another advantage: It can reduce the number of dock doors you need in a facility by keeping trucks moving more efficiently.

One of the biggest cost savings from implementing automated loading robots is labor-related expenses. First, it reduces the potential for worker injuries, which can quickly add up to major expenses.

According to the National Safety Council (NSC), work injury costs in 2022 alone reached \$167 billion, including wage and productivity loss, medical expenses, and administration costs. The cost per injury that required medical consultation was \$40,000.

While those numbers include workers across all industries, incidents specific to transportation and material moving make up a large percentage of the categories counted by the NSC:

29% OF ALL FATALITIES.

**22% OF INJURIES RESULTING IN
DAYS AWAY FROM WORK.**

**25% OF INJURIES THAT RESULTED IN
DAYS OFF, TRANSFER OR RESTRICTION.**

With such a high percentage of accidents happening at the dock, reducing loading and unloading risks can create major and immediate cost savings.

Getting workers out of trailers has another advantage: It can reduce your employee turnover. Loading trucks all day is uncomfortable and often stressful when bottlenecks form. Switching from driving an uncomfortable forklift in and out of trailers over and over to loading a robot improves employee work experience and helps you save money on constantly training new hires.

Another area where robots have the advantage is in reducing damage. If you have a forklift entering and exiting a trailer 26 times each way to complete a load, that's 52 opportunities for damaged freight. A forklift driver also doesn't have the benefit of sensors helping to avoid cross traffic and objects.

And while the focus for many organizations is on the cost savings at the dock, there's another benefit often overlooked: the increased revenue potential from speed. If you can load product faster, you can produce more product without overwhelming the dock. That makes it far easier to grow your business to meet demand.

Another factor in revenue generation is in being able to reuse facility space. If you can get material from the warehouse to the plant faster, you don't have to hold as much material at the plant. That means you can reduce the warehousing space at the plant and put that into production, increasing your revenue.

“It's not just about lowering costs. It's about enjoying all of the benefits that come from increased speed.”

Chris Smith, CEO of Slip Robotics



SLIP ROBOTICS SOLVES ALL THREE DOCK CHALLENGES

All automation solutions are not the same, and not all of them can address all three of the big dock challenges: speed, savings and safety.

Slip Robotics' SlipBots are the exception. By allowing your team to stage materials directly on the bots, then sending those bots into the trailer to load in five minutes, you:

SAVE TIME

up to a 10X improvement in loading speed.

SAVE MONEY

with a robots-as-a-service model, SlipBots typically deliver 2X to 5X ROI, with less than six months for break-even.

SAVE WORKERS

with the ability to load a trailer in just three trips instead of dozens, all without a human ever entering the trailer, SlipBots dramatically reduce your risk of injuries at the dock.

SlipBots can also be deployed much faster than fixed solutions installed on the dock, reducing the disruption to your operation and allowing for faster ROI.

Speed, savings and safety: Getting all three right is crucial to remaining competitive in an increasingly demanding environment. Automated loading robots deliver all three, with the added benefit of increased revenue opportunities.



SLIP ROBOTICS

Slip Robotics enables anyone to autonomously load/unload any truck in 5 minutes – any dock, any freight, zero Wi-Fi or IT integration.

Truckers spend 23% of their workday idling at a dock waiting for forklift operators to load and unload their trailer, while forklift operators rush to carry freight between the trailer and staging area despite the high risks of damage and injury. Until now. **Slip drives 10X speed, safety, and simplicity across the supply chain.**

SPEED

5 minutes to load/unload all types of freight (floor-loaded boxes, pallets, racks, etc.).

SAFETY

0 forklifts or people rushing in and out of trailers.

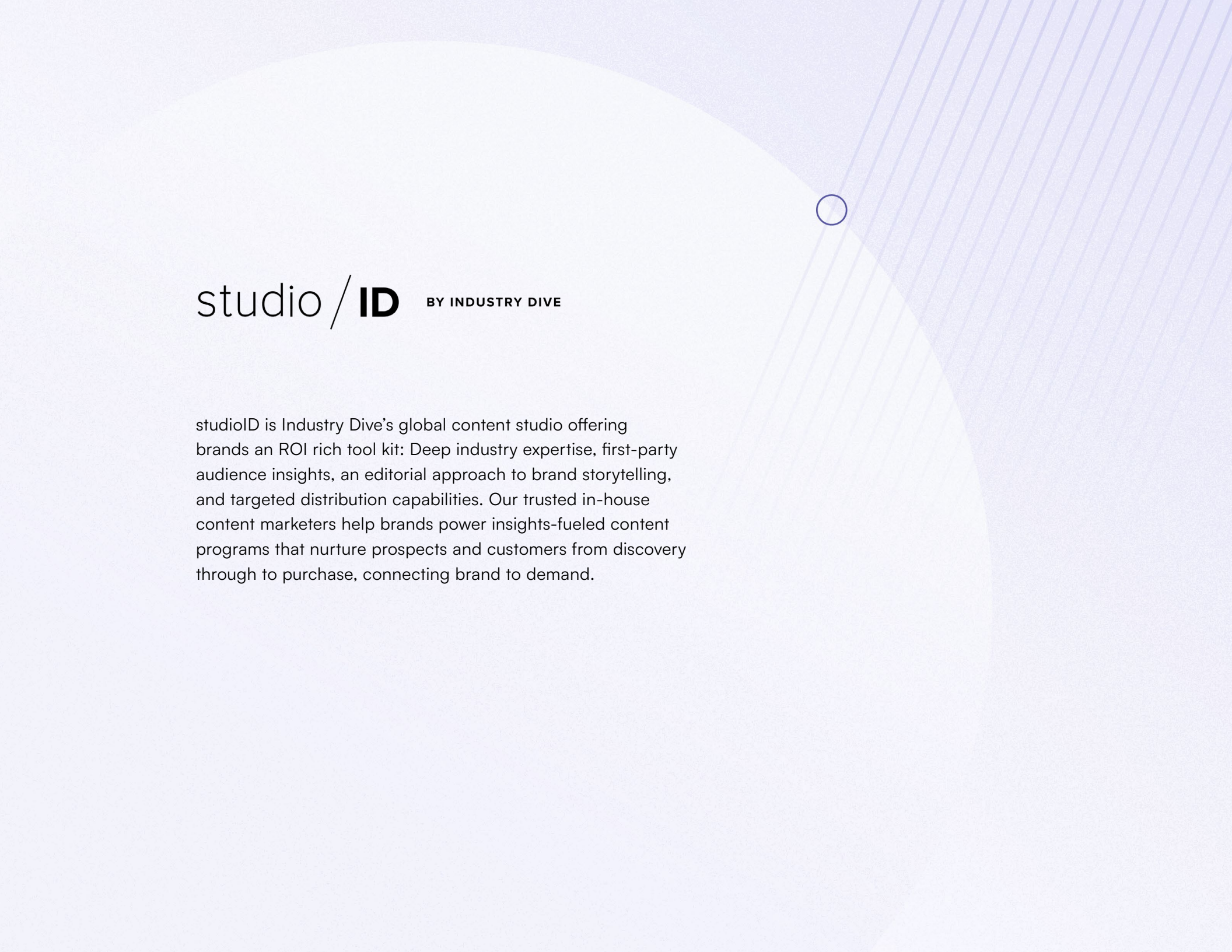
SIMPLICITY

0 Wi-Fi or IT integration required, and no need for custom trailers, dock modifications, or other infrastructure changes

Slip's robots-as-a-service network is transforming bottlenecked docks at companies throughout North America, including John Deere, GE Appliances, Nissan, Valeo, and other Fortune 500 corporations.

[LEARN MORE](#)

SLIP ROBOTICS



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