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Optimized Fulfillment

2096

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Using scalable robot solutions to increase order productivity

Retail is being fast-forwarded into the future

Retailers have been using technology to reshape the structure of their entire business model including sales, customer service, warehousing, distribution, store operations, and staffing. Prior to the pandemic, these changes were on a 5- to 10-year plan with phases easing the businesses into a digital future. Now these plans have been consolidated into urgent 6-months to 1-year plans.

Innovations have introduced both permanent and temporary changes for businesses, but the effects of these decisions will change consumer behavior and expectations going forward. Brick-and-mortar stores are being converted into micro-fulfillment centers to support the fast-shipping expectations of consumers. Ambitious retailers are creating temporary pop-up fulfillment spaces to support the higher demand of certain items without disrupting the rest of the operation.

Peak conditions have been pushing retailers to set up fulfillment models using proven automation technologies that require little training, significantly increase throughput compared to manual fulfillment, and decrease the time to fulfill orders. This eBook outlines the methods used to improve order fulfillment using a scalable robot solution for fulfillment centers that have limited capital and reduced labor.

Installation

The provider works with the retailer to determine goals and align the solution with business objectives. In a brownfield development, the solution can often be installed without halting current operations or revenues. In a greenfield development, the installation ensures maximum fulfillment productivity and often exceeds expectations.

Instant Training

An intuitive interface and human-centric features reduce the time-to-productivity, increase labor retention, and increase employee satisfaction.

Reliability

The size and agility of a robot solution reduces cycle times and requires fewer pickers to reach maximum productivity. AI-enabled features organize orders and adjust tasks automatically to optimize both robot and worker efficiency.

Flexible Scalability

The Robots-as-a-Service purchasing model replaces large fixed capital expenses with flexible operational expenses. Robots may be added or removed at any point to reflect changes in demand and operations pay only for assets that are needed.
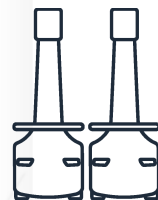
Multi-Bot Solution

Locus Robotics offers an award-winning and record-breaking multi-bot solution of mobile robots designed for flexible operations and scalability.

Aspects for Consideration

Versatile and flexible deployments

There are two categories of installations for robotics solutions: brownfield and greenfield developments. Robot solutions may be added seamlessly to existing fulfillment areas in brownfield installations. This multiplies the productivity of a facility without halting operations or conducting significant reconstruction. Retailers that are building new facilities can take advantage of maximizing their fulfillment operations by including robot solution providers early in design planning. Providers have the experience and tools to develop strong business cases for fulfillment workflow layouts that often exceed expectations.

The installation of a robot solution consists of 3 main factors: systems integration, solution design, and implementation. A comprehensive integration connects the retailer's systems to the provider's solution. Solution design optimizes the retailer's fulfillment workflow and outfits robots with the right accessories like containers or printers that drive greater efficiencies. Implementation conducts thorough testing of navigation, connectivity, and picking workflows. Managers are trained on the management platform and employees are introduced to the robots and executing tasks.
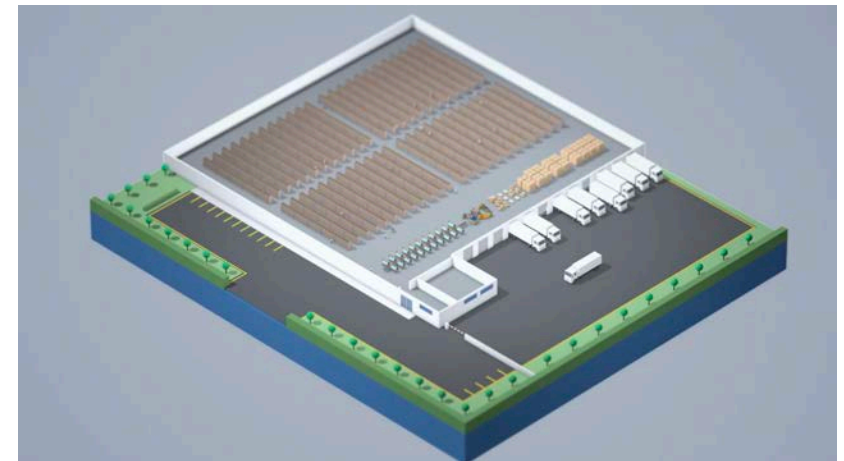
Brownfield Developments

In a brownfield development, robot solutions may be added seamlessly without halting current operations or revenues.
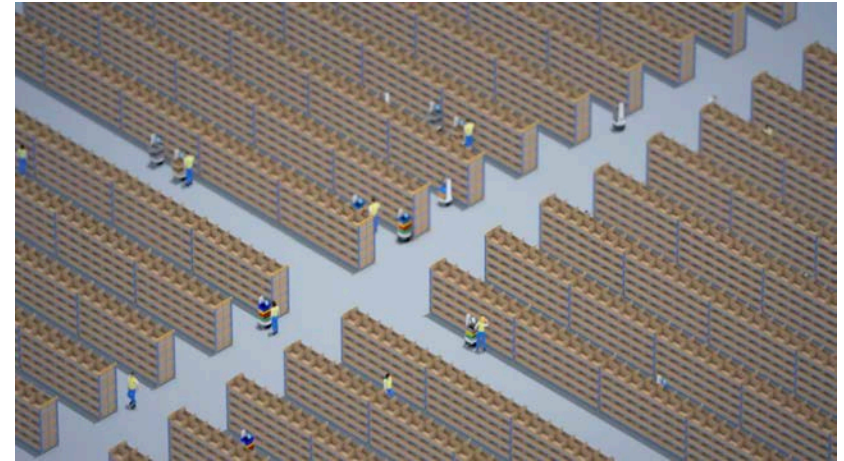
Greenfield Developments

In a greenfield development, the installation ensures maximum fulfillment productivity and often exceeds expectations.

The labor benefits of collaborative robots

The labor market is volatile for retailers that hire hourly workers. Training for manual picking is time-consuming and often inconsistent as seasonal workers are trained in large groups. It relies on memorization and learning processes intended to avoid human error. Robot solutions are designed to alleviate these stresses of training new associates and get them up-and-running within half an hour. New employees are now productive from Day 1/Hour 1 at the site.

For example, one executive compared the way he trains new employees working with robots to the traditional way used before robots. During training, the worker is told to enter an aisle and walk up to a robot, pick the item shown on the robot's display, press a button to confirm the correct pick, and move on to find the next robot. In contrast, in traditional pick training the worker is taught how to operate an RF device, codes to memorize for different situations, contingency plans, and the numbering scheme of aisles. Training was reduced from an average of 40 hours to just 8 hours for new employees, with just 30 minutes of robot training.

100%
IMPROVED PICKER PRODUCTIVITY

25%
REDUCED ORDER ERRORS

50%
REDUCED STAFF SUPPORT SPENDING

80%
REDUCED NEW HIRE TRAINING

15%
REDUCED OVERTIME SPEND

✓ REDUCED COSTS TO TRAIN NEW HIRES

✓ REDUCED COSTS TO ACQUIRE SEASONAL LABOR

Source: Forrester

An intuitive interface doubles worker productivity

An intuitive user interface is the key to doubling worker productivity. It is designed to harness the concepts of human behavior to enhance cognitive recognition and information processing so workers can make error-free decisions quickly. The user interface is so intuitive, it is capable of leading workers through various picking styles including directed picking
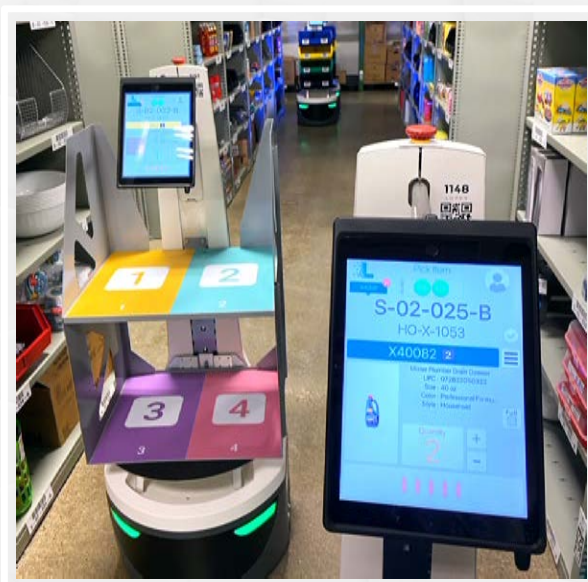
Simplified, minimalistic design

Shape- and color-coding

Lights are located on the robot for visual cues

Proximity-based identification (no badge scans)

Hierarchical text sizes and layout

Product image and description details

Integrated multi-language display (automatically displays commands in the worker's preferred language)

Reward is a powerful incentive

Combining work with intuitive game-like features engages workers in a fun and competitive way. Goals and progress are visible, visually displayed, and updated in real-time. Workers are more in control of their workday and workflows, while management has real-time transparency and reporting tools to drive best practices, address opportunities for improvement, and monitor progress towards business goals. Gamification is an attractive feature that increases employee retention, especially during seasonal temporary hiring.

Train	Motivate	Engage	Optimize	Attract & Retain
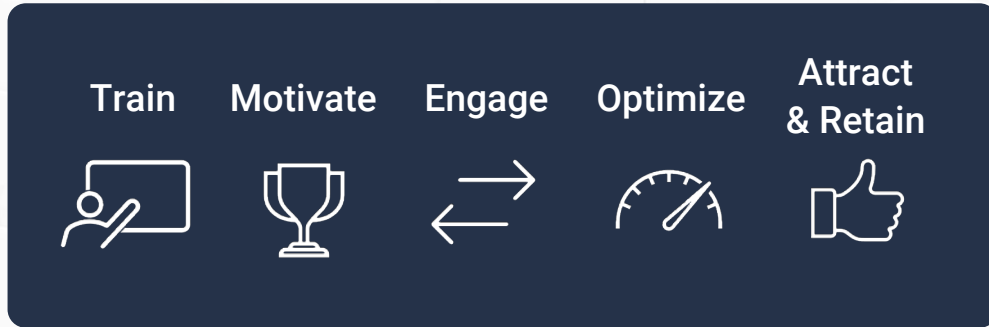
Features

- Badges
- Levels
- Points
- Scores
- Leaderboard
- Challenges

Worker satisfaction ensures successful adoption

Employees concerned for their well-being will perform at lower levels due to stress and fear. Retailers restructuring for omni-channel fulfillment will be adopting many technologies that upskill workers and increase morale if executed correctly. This not only provides job security; it also eases the recruiting process as robots attract workers that are looking for a more modern work experience.

In current pandemic conditions, employees are concerned for their health as well as the health of their coworkers and families. An automation solution like the multi-bot solution provides social distancing measures as part of its design, maintaining a retailer's high productivity while complying with health safety guidelines.

Robots also reduce the physical demands on workers compared to traditional picking models where workers are pulling carts through pick locations. There has been a reduction in injury claims for workers picking to robots compared to cart-based processes.

Technology providers have the experience to guide new technology implementations that will be successfully adopted by employees. In the case of a multi-bot solution, warehouse workers expressed positivity and excitement about their robot coworkers and experience improved personal job performance as their order accuracy reached near-perfect rates.
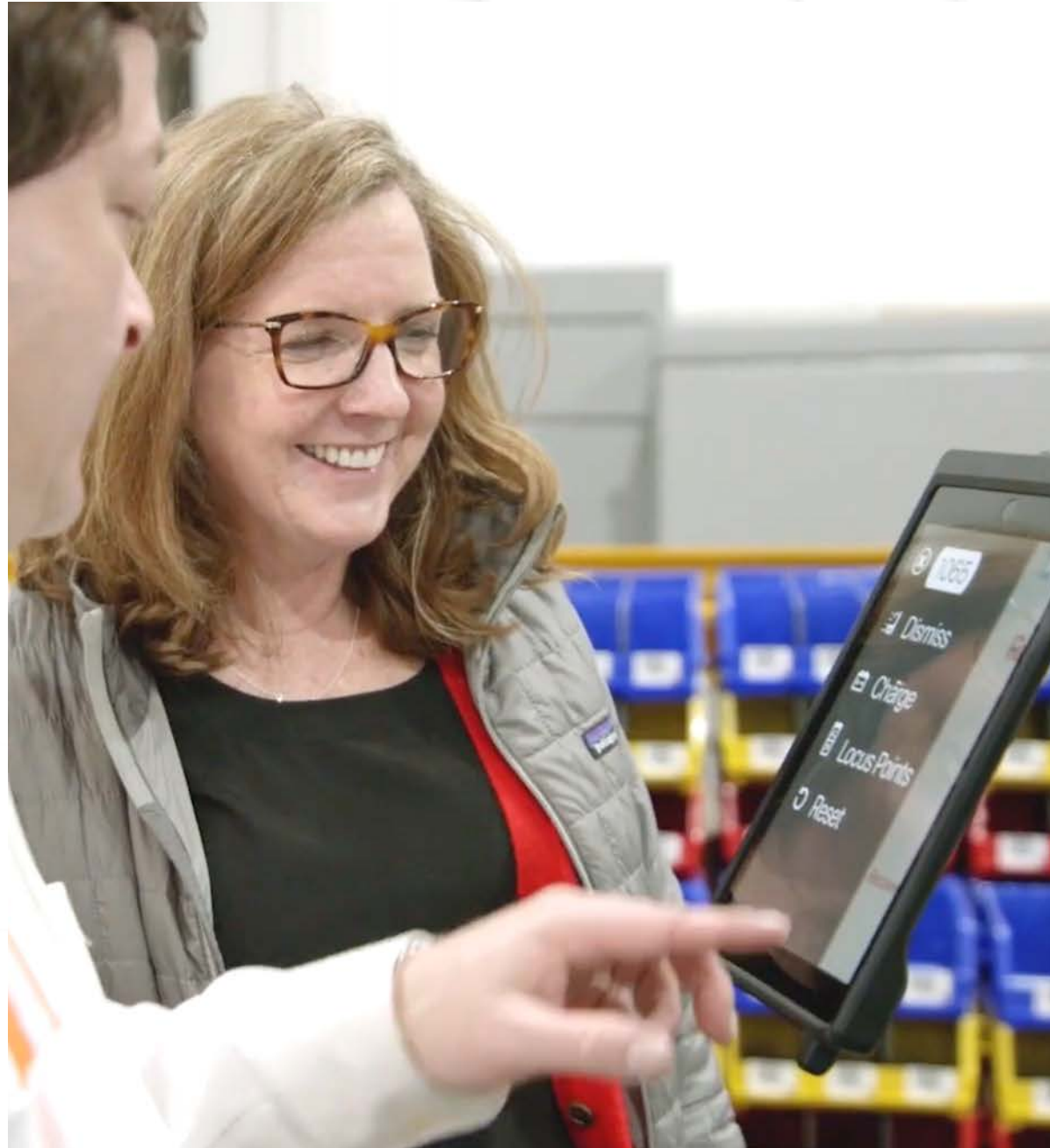
Design: an incremental advantage for ROI

Robots are designed to speed up task execution by reducing the time between picks for workers. To achieve a higher throughput, order cycles must be reduced. For example, a robot will receive an item and carry it to the next pick location while the worker steps over to the next robot waiting for a pick in the same zone. The travel between pick locations traditionally done by a worker pulling a cart is now done by a mobile robot, completely separate of a worker.

To maximize throughput, robots need to travel, maneuver, change direction, and avoid obstacles efficiently. In a pop-up fulfillment area where space is extremely limited, the size and shape of a robot is very important in optimizing order cycle time.

Circular robot designs are nimble, able to pivot in-place, and can pass each other bidirectionally in confined spaces. They are also designed to carry a lighter load than mobilized rectangular carts so orders may be fulfilled immediately rather than waiting for all the orders on a cart to be picked before arriving at a packing station.

### Circular-shaped mobile carts

Maximizing throughput is not only dependent on efficient workflow processes; it's also dependent on the best use of available fulfillment space. Carts featuring a circular shape are designed to travel efficiently around corners, in narrow aisles, and bidirectionally by turning in-place.
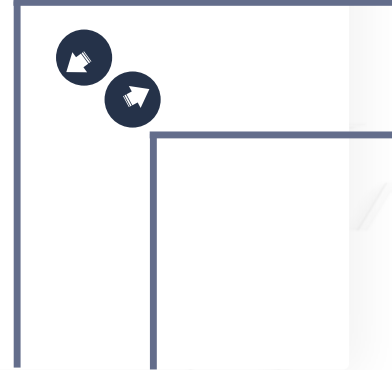
Rectangular-shaped mobile carts

Carts that are rectangular require a significant amount of space to travel for several reasons.

- Rectangular carts are unable to change direction in-place, requiring more space
- Rectangular carts may require a large section of space near the packing station simply to turn around after delivering fulfilled orders
- Rectangular carts are unable to move bidirectionally in narrow aisles, requiring more space or restricting the possible routes it can take. This requires them to travel longer distances which increases cycle times
- Rectangular carts often limit facilities to one-way aisles and one-robot-per-aisle workflows
- Rectangular carts have greater difficulty maneuvering around obstacles than circular ones
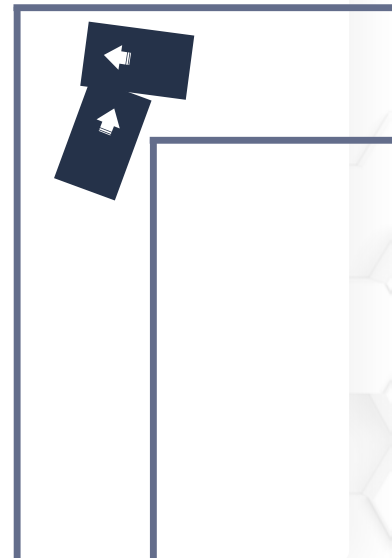
Actionable insights for high performance

One of the most powerful features of a robot solution is the ability to harness data in real-time to make operational decisions. Performance data about worker and robot pick rates allows managers to identify areas of concern and opportunity before the matter becomes an issue. Managers can monitor aisles with greater congestion to consider alternative placement so high-volume items are not placed near each other.
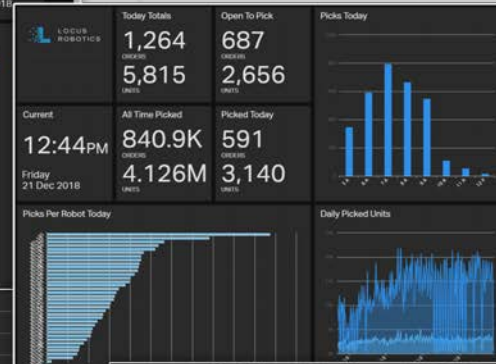
Daily/Monthly/All-time Pick Rates

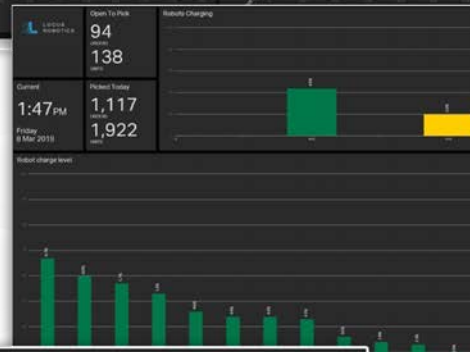Realtime view of volume and performance data

Worker + Robot Pick Rates

Units picked per hour and total units picked per resource

Robot Charging Status
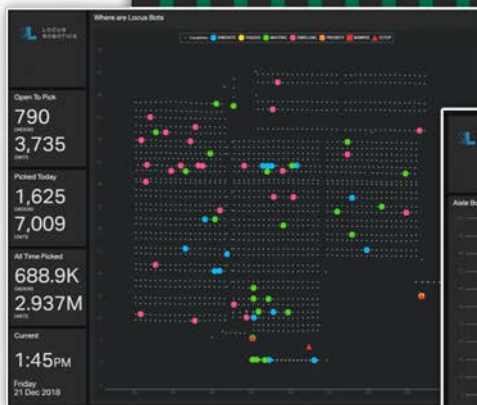
Robots charging and their charge levels

Pick Location Heat Map

Locations available for picks and locations with completed work

Robot Map

Locations including status such as waiting, traveling, picking, and stopped

Robot Aisle Concentration

Aisle sections with congestion or robots waiting to enter

Flexible Scalability

Retail fulfillment sites require a level of flexibility to be profitable as they manage fluctuations in product and volume demand. Instead of purchasing large fixed capital, retailers find relief in minimizing both infrastructure changes and other financial burden by choosing a robot solution. A no-infrastructure solution also allows retailers to adapt to changes in product mix and changing approaches to picking and putaway.

Autonomous mobile robot deployments do not require large and costly infrastructure changes. They navigate environments using sensors, lasers, and cameras located on each robot. This makes it easy to add more robots, reduce the fleet, or move them from one location to another to support demand while avoiding capital-intensive solutions.

Additional benefits include:

- Robots eliminate the need for traditional hardware like carts and RF devices. This makes scale ups and downs easier
- Robots function with traditional storage mediums and do not require expensive or customized solutions
- Less maintenance and replacement of physical assets
- Quickly launch new sites with ease

Robots-as-a-Service

The Robots-as-a-Service (RaaS) purchasing model is a simple, value-based pricing approach that reallocates the large capital expense into recurring smaller operational expenses. With RaaS, organizations may avoid the financial burden of a fixed capital purchase to obtain stakeholder buy-in earlier in the purchase process.

Support increasing demand with more robots at any point
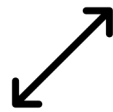
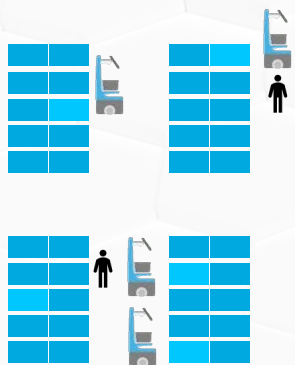Scale during demand spikes to require less workers to maintain throughput

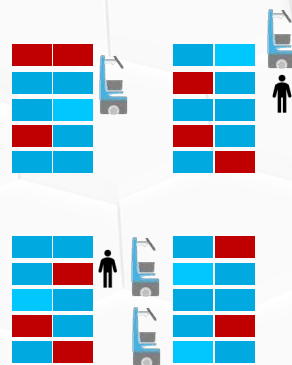Send back robots at any point to avoid unproductive capital
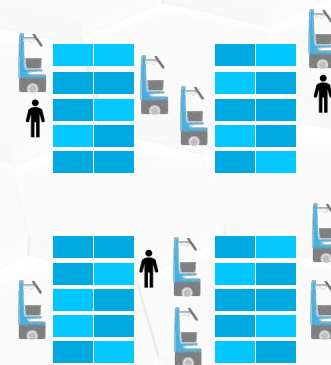
24/7/365 remote customer support
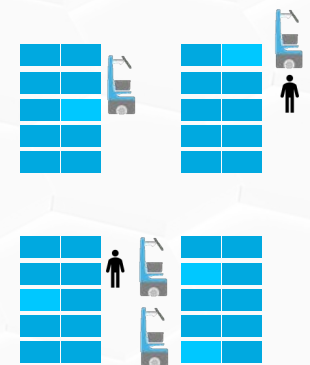
Baseline Volume

Demand Increase

Peak Volume

Return to Baseline

The award-winning Multi-Bot Solution

Traditional picking approaches involve workers pulling carts around a fulfillment site between pick locations. A multi-bot solution separates the cart from the worker by assigning workers to a zone while robots complete the travel between pick locations. This allows each agent to complete tasks independently. It also allows for a greater ratio of robots to workers, the key to maximizing productivity.

For example, a fulfillment site employs 5 workers that manually travel between pick locations with a cart. When a surge of orders occurs, management can hire 5 more workers that manually travel between pick locations with a cart. The new employees are taught how to operate an RF device, codes to memorize for different situations, contingency plans, and the numbering scheme of aisles. Now the operation has 10 workers with 10 carts; that's 20 agents doing the work of 10 as the workers and carts are essentially tied together.

Alternatively, management can choose to maintain labor with 5 workers and meet the surging demand by renting 15 robots that operate as an extension of the 5 workers. These workers remain in their respective zones while the robots travel between pick locations. Workers approach a robot at a pick location, complete the pick, and walk over to the next nearest robot to complete that pick, and so on. Now the operation has 20 agents doing the work of 30+ because workers that don't spend time walking a few miles each day are able to pick at faster rates.

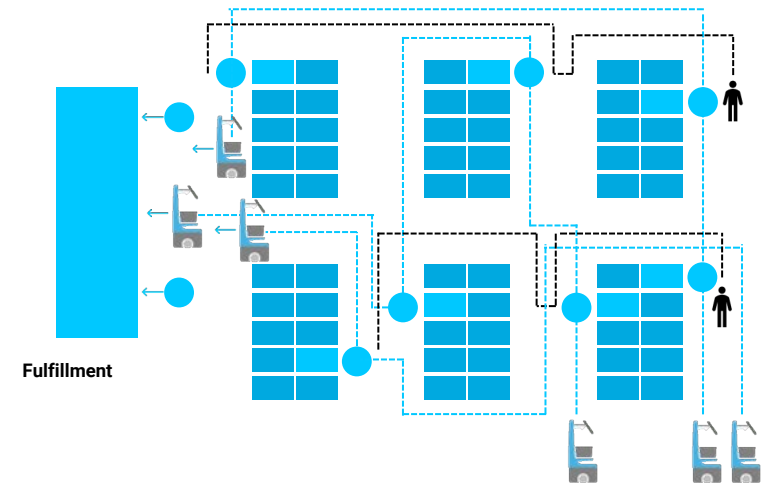This is the core differentiation of the award-winning and record-breaking Locus Robotics Multi-Bot Solution.

Current

- Travel duplicated
- Resources doubled
- Productivity dependent on increase in labor
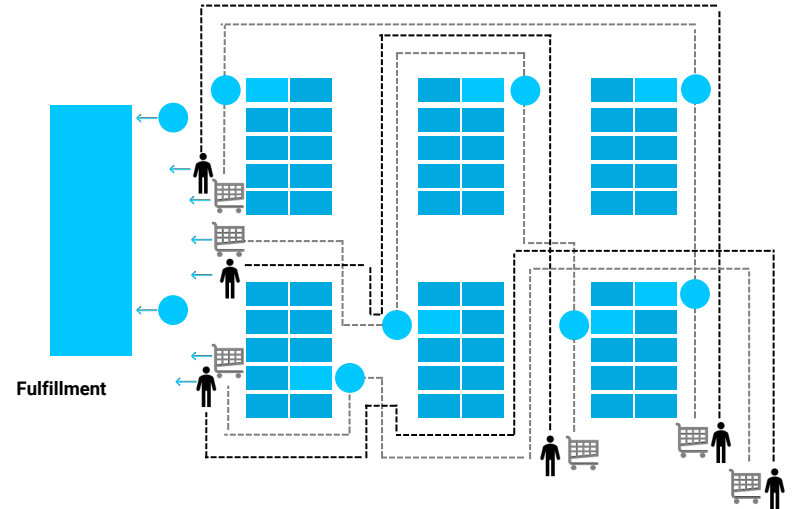
Optimized

- Travel reduced
- Maximized productivity
- Strategic use of labor resources

Locus Robotics

Warehouse operators are turning away from traditional fulfillment solutions that are capital-intensive, expensive, and difficult to change when product demand changes. They're seeking flexible and scalable solutions that can keep up with the dynamic changes of the retail industry so they can keep up with customer success and profitable revenues. The answer for future-proof growth is in digitizing the warehouse.

Locus Robotics powers the digital warehouse with a proven robotics-enabled warehouse execution platform that coordinates labor resources and robots to achieve maximum order fulfillment throughout.

It is often more cost-effective to provide workers with tools that allow them to perform at higher levels than to spread margins thin with a larger workforce. Locus's unique multi-bot approach empowers workers to get more orders shipped by reducing cycle times and prioritizing productivity.

Managers have access to real-time operational performance data through dashboards and reporting tools, built by logistics experts, that provide actionable insights to help them make critical data-backed decisions, even when the unexpected occurs.

Retail leaders are already using intelligent automated solutions in their warehouse to optimize order fulfillment operations and capture market share before their competition joins the race to automate. A determining factor of success for all other retailers will be how quickly they automate, too.

Click here to get started

Watch how Locus works
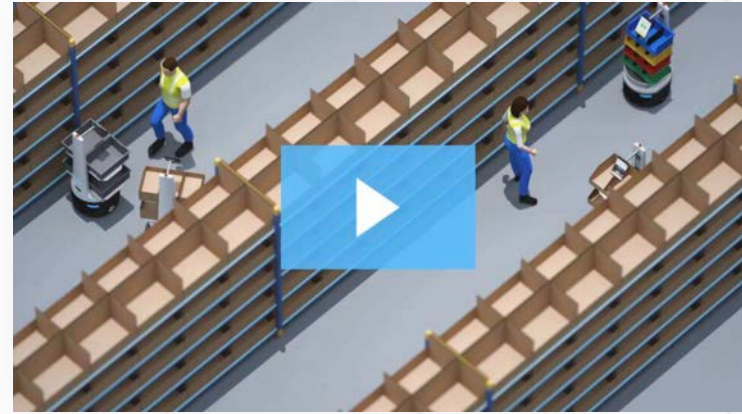
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