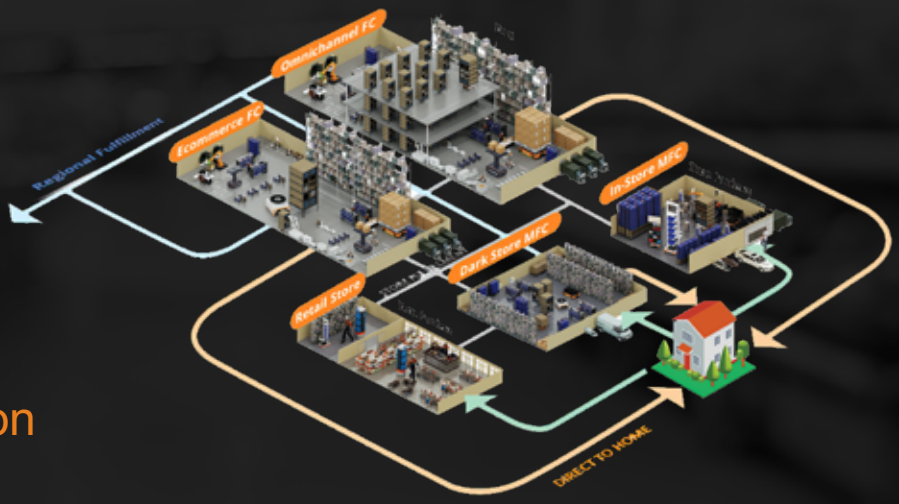
GreyOrange

Anatomy of a Micro-Fulfillment Center

The Technology Behind Micro-Fulfillment Automation



Micro-Fulfillment automation is a fulfillment solution that uses robotic systems and automated technology to process online orders in a small-scale, highly efficient facility. This approach can help retailers solve several common issues related to **time, team, task, and space.**

$2.1 Billion
Value of the global micro-fulfillment market size **in 2021**[1]

$88.3 Billion
Projected to reach **by 2031**[1]

CAGR 44.8%
From 2022 to 2031[1]

What does Micro-Fulfillment solve?

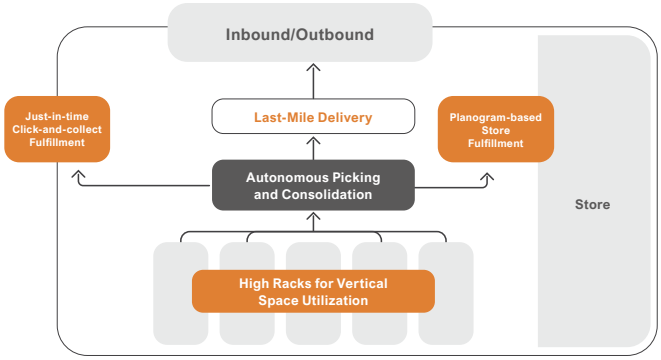
	TIME	TASK	TEAM	SPACE
Need	Speed up fulfillment	Improve accuracy and efficiency	Optimize the workforce	Utilize retail space better
Results	Automation enables retailers to pick, pack and ship orders faster, thereby improving customer satisfaction and loyalty in the process.	Automation reduces the errors in orders and inventory management, delivering superior quality customer experience with a diminished need for order corrections or returns management.	Automation eliminates repetitive, time-consuming tasks, and enables the workforce to concentrate on value-led activities, such as customer service, employee retention and more.	Automation helps retailers create more efficient facilities by making better use of the available space and increasing orders per square feet, enabling overhead cost savings.
	96% of customers consider "fast delivery" to mean same-day delivery.[2]	The average order fulfillment time will decrease from **4 hours to 30 minutes** by 2028.[3]	The warehouse and transportation industry had a record **521,000** openings in **September 2022**, a gap predicted to widen in coming years.[4]	Each incremental **$1 billion** in growth in e-commerce sales, requires an additional **1.25 million** square feet of distribution space.[5]

How are Micro-Fulfillment Centers organized?

01 Small Scale In-Store Micro-Fulfillment

This nearly human-less center reduces last-mile delivery costs while mitigating the risk of damaged or lost parcels.

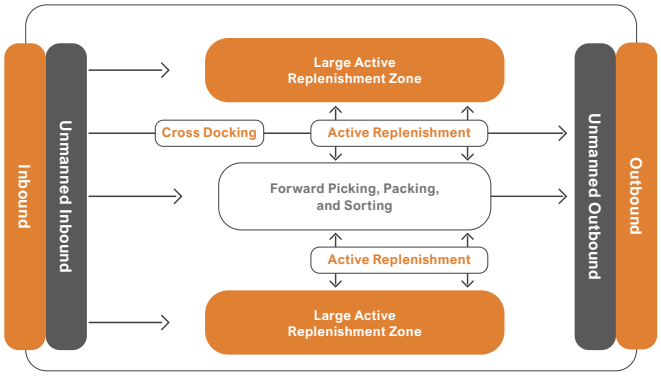
Automated picking	24/7 availability
Intelligent fulfillment orchestration platform	End-to-end order and inventory management
Fully automated click-and-collect and store replenishment solution	



02 Large Scale In-Store Micro-Fulfillment

This center is capable of handling complex business rules, and workforce shortages while optimizing storage space, and helps enable same-day/next-day deliveries.

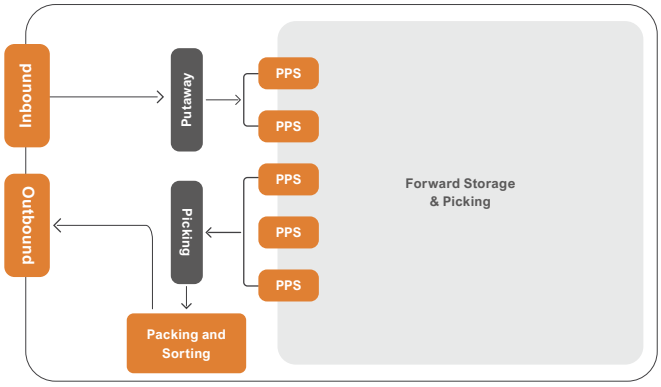
Multi-agent orchestration	Quick order consolidation
Store replenishment	Last-mile deliveries
Temperature-controlled vertical space utilization	



03 Dark Store Micro-Fulfillment

A dark store is a brick-and-mortar location that has been shut down and turned into a center for fulfillment operations only.

Allows more space for store inventory	Enables quick and accurate fulfillment of orders
Functions as click-and-collect centers	Immediate replenishment
Reduction in order-to-dispatch time	



What kind of Micro-Fulfillment Center investment you need?

	Small In-Store	Large In-Store	Dark Store
Fulfillment Channel	Store Replenishment, Curbside Pickup	Direct to Consumer, Curbside Pickup, Store Fulfillment	Direct to Consumer, Store Fulfilment
Warehouse Area	Small (5K-10K sqft)	Medium (10K-25K sqft), Large (25K+ sqft)	Small (5K-10K sqft), Medium (10k-25K sqft)
Order SLAs	Same/Next-Day	Same/Next-Day	Same/Next-Day
Order Volume	Low-Medium	Medium-High*	Medium-High*
SKU Variability	Medium	High	High
Omnichannel	Limited	Yes	Yes
Time to Implement CoBot Automation	4 Weeks	4-12 Weeks	4 Weeks
Time to Implement High Rack Totes to Person Automation (TTP)	4-12 Weeks	4-12 Weeks	4-12 Weeks

*Low-Medium: 5K-20K units per day (outbound) | High: > 20K Units per day (outbound)

What is your Micro-Fulfillment automation use case?

PRINT THIS E-FORM

Find the right robotics micro-fulfillment fit that can work hand in hand with you to meet your fulfillment objectives. Here is a quick worksheet of use cases against which you can map your requirements:

Inventory storage

MFCs require the ability to store a large quantity of inventory in the back store or retail area which is an expensive real estate.

Assess your inventory requirements to help determine the scale and storage configurations of operations to be built.

What is your order volume?

What is the SKU variability you get across orders?

Do you have any special storage needs?

Orders per square feet

Due to the expense involved in using the MFC real estate, throughput per square unit area from the solution needs to be very high so as to make the operations efficient and financially viable.

What is your throughput per square unit area?

What are your overall throughput requirements?

What is the category of orders?

How many orders need to go out?

How many lines per order?

What is the SLA you offer for your deliveries?

Quick turnaround time for orders

Retailers need the MFC to fulfill orders with delivery SLAs of 1 hour to 24 hours and hence the solution needs to offer a quick turnaround time.

What percentage of units needs to be delivered in express mode?

Ability to stage and consolidate orders for a route

Since different orders for the same route with varying SLAs might be picked through the day, the solution needs to be able to stage and consolidate orders by route to avoid having to expend significant manpower and storage for picked orders.

Are you staging and consolidating orders by route?

How are you managing orders with different SLAs for the same route?

Carbon footprint and sustainability

MFCs are emerging as a viable solution for reducing the carbon footprint of the e-commerce industry. MFCs utilize automation and robotics to efficiently pack and dispatch orders, optimize space usage and reduce the need for additional warehouses and transportation, thus minimizing the use of energy and resources.

Does the automation take into consideration the environmental impact, and does it provide sustainable operations?

End-to-end operations management

The entire operation inside the MFC needs to be managed by a single software (including automation) so that the software is able to take care of inventory management, order processing and picking, replenishment, consolidation, and outbound.

Which software platform do you intend to install to manage your complete operation?

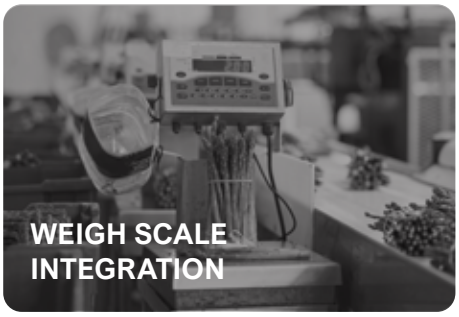
Do you have a WMS? ☐ Yes ☐ No

Do you have different upstream and downstream programs? ☐ Yes ☐ No

Special use cases for the Grocery vertical

ABILITY TO MANAGE CONSOLIDATION

Frozen items are stored outside automated systems and hence picked separately. The software should be able to manage such order consolidations and picking.



WEIGH SCALE INTEGRATION

Retailers require the ability to weigh perishable items that are picked (fruits and vegetables) in order to accurately invoice their end customers at the time of payment.

PUT-AWAY VELOCITY

Orders arrive early in the morning, each day, requiring immediate put-away to reduce perishable waste and maintain product quality for inventory and customer orders.

What **works for you** works for us!

Have a Deeper Coversation

Let's set up a call or virtual conference to explore more specifically how we can help you achieve your goals.

Connect Us

Introduce our experts to those on your team who might want to know more.

Show Us Your Site

We'll come to your site to evaluate how you can improve operations with us.

Sources

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3. https://www.conveyco.com/blog/warehouse-automation-statistics/
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