



The e-grocery
automation playbook.

SWISSLOG

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INTRODUCTION

Grocers have learned two important lessons about automating e-grocery fulfillment in recent years:

1. E-grocery fulfillment is more complex than expected.

The process of filling orders for customers represents a fundamental shift in the traditional grocery model of customers fulfilling their own orders for free and introduces a number of new challenges grocers must address.

2. For a growing number, automation is the best path to e-grocery profitability.

E-grocery order volumes are reaching the level where manual picking is becoming unsustainable. Compared to automation, manual fulfillment is labor intensive, inefficient, more difficult to scale and struggles to keep pace with customer expectations for shorter deliver/pickup times.

Those two lessons are informing how grocers are moving forward with e-grocery automation – cautiously but steadily. In this playbook, we outline the path to automation and share how industry leaders have navigated the challenges as they implemented and expanded automated fulfillment to support e-grocery growth.



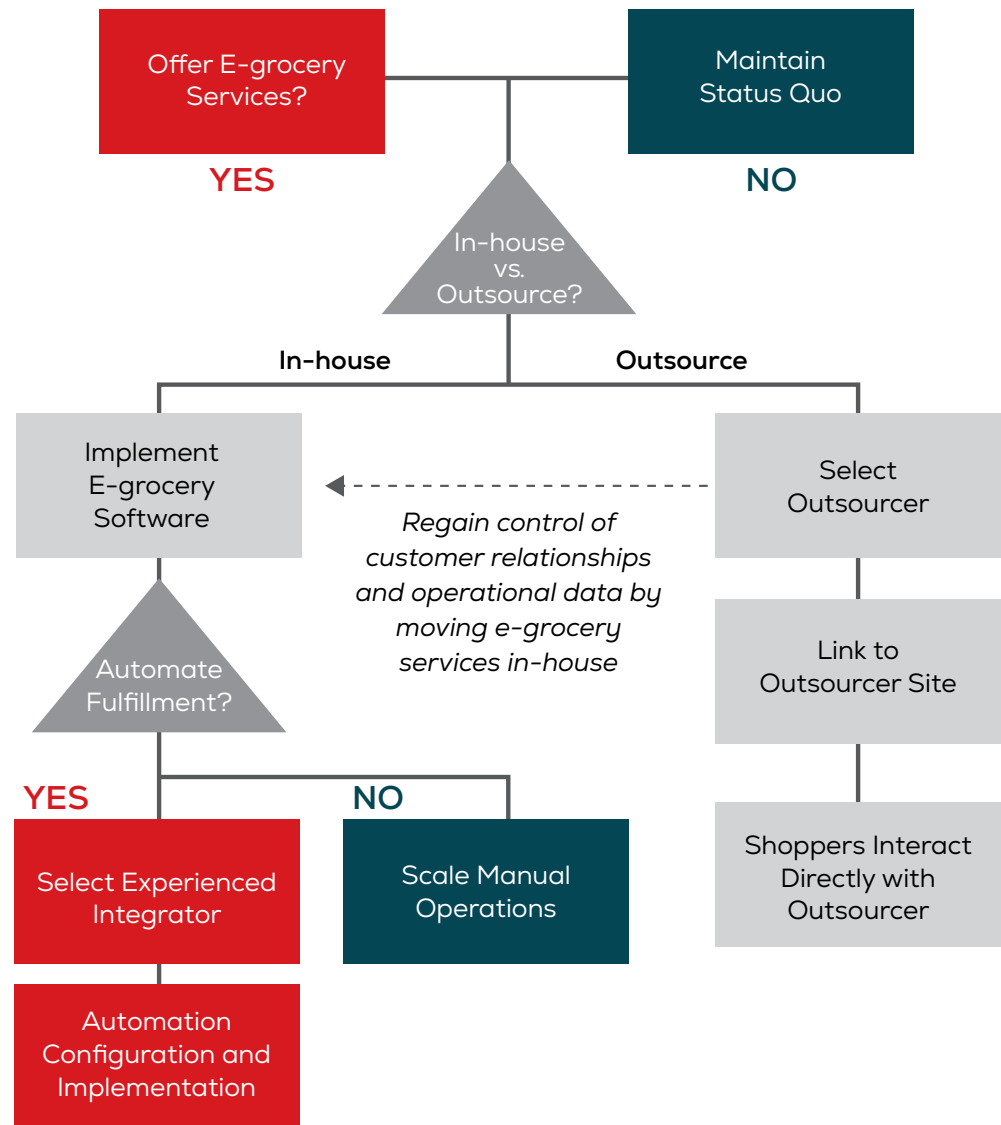
Choosing Your Path

As they launch and grow their e-grocery business, grocers must evaluate the costs and benefits of outsourcing fulfillment processes versus managing those operations in-house. And they must understand the long-term consequences of that decision.

Grocers who outsource to a fulfillment partner that controls the interface customers use to place orders risk losing control of the customer relationships they've worked hard to build. Customers order through the third-party site and interact with employees of the third party when they receive their orders. The more orders they place, the less they become the grocer's customer and the more they become customers of the third party.

Further, initial order volumes can easily be handled by in-store picking and then by process improvement. Those become visibly exhausted by stores becoming congested, driving towards dark stores which further highlight cost-to-serve being higher than margins.

E-grocery Decision Tree



Getting started

For grocers seeking to maintain control of their customer relationships as they roll out an e-grocery offering, the process can start in one of two ways:

- 1. Implement the software required** to support online ordering and manual picking and fulfill orders manually until order volumes drive fulfillment toward automation.
- 2. Connect with an integration partner with experience** in automated fulfillment center deployments. An experienced partner like Swisslog can work with you to help you select software that enables e-grocery while the automation system is being configured and deployed.

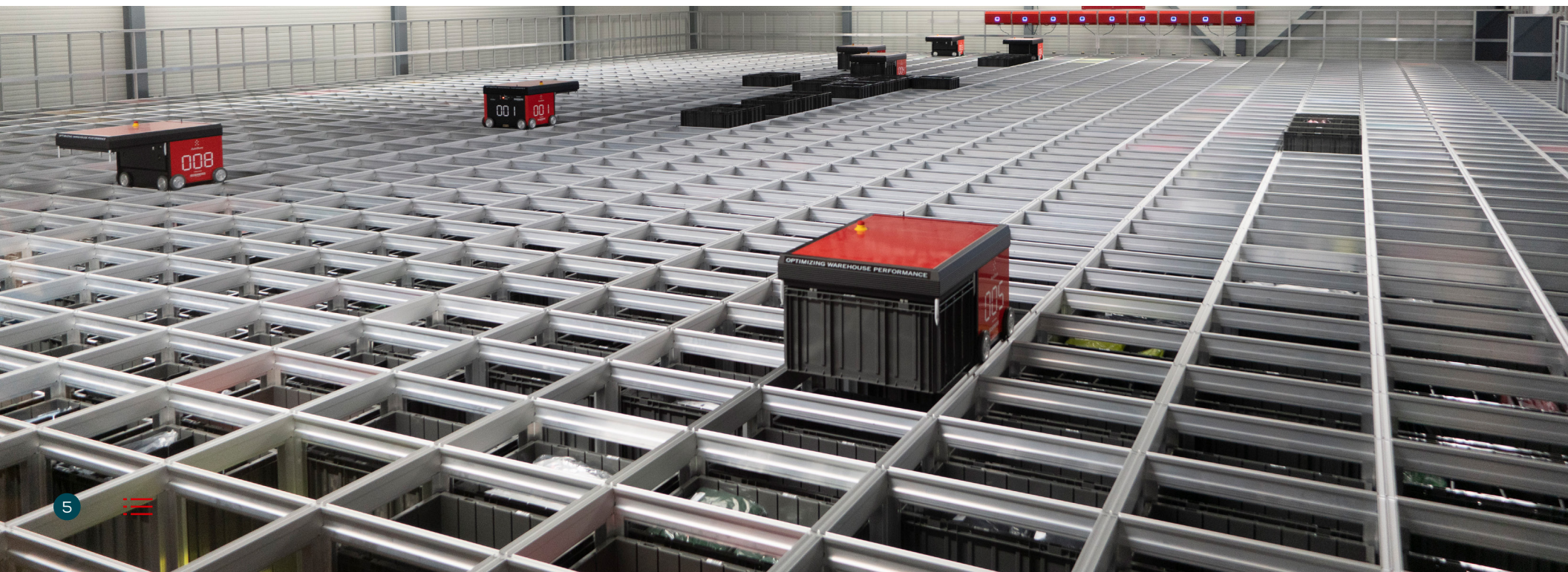
In either case, the software that supports e-commerce ordering, order management and in-store picking continues to play a vital role after automation is brought online.

Bringing fulfillment in-house

For grocers who have partnered with third parties to manage their e-grocery business and are now seeking to regain control of customer relationships and spiraling costs, the path to automation is similar to those just launching e-grocery services. You can work with an automation partner, or on your own, to deploy e-commerce and order management software, and then disconnect from the third party and begin filling orders manually to rebuild customer relationships while simultaneously planning for automation.

Deciding when to automate

If you've already made the investment in an e-commerce front-end and order management system and are fulfilling orders manually, the move to automated fulfillment becomes the next logical step in your e-commerce journey. Your automation partner can help you determine when order volumes reach the point where automation becomes cost effective.



Getting into the Automation Mindset

There are a number of important decisions to be made as you move through the process of offering, scaling and automating e-grocery services. But underlying those decisions are some mindsets that, when adopted, give your business the best chance to succeed. Here are three of the most important:

1. Omni-channel as integral to the retail brand experience

There's no denying that outsourcing can be attractive for grocers at the beginning of their journey. But outsourcing fulfillment doesn't just cede control of the e-grocery brand experience to a third party; it also sacrifices profitability.

Plus, a service that can be quickly bolted onto your operation can just as quickly be unbolted if the third party ever decides to cut grocers out of the process. If they do, your customer data has already become their data.

If you think e-grocery is a passing fad, it may make sense to simply connect into third-party systems for ordering and fulfillment. But if you believe it represents a permanent shift in the shopping habits of key segments of your market, as continues to occur in other retail sectors, integrating support for e-grocery into your operations is simply a better long-term strategy.



2. E-grocery as an expansion of the grocer's role

Grocers have always relied on customers to pick their own products. Now with e-grocery, that responsibility is in the hands of the grocer. That represents one of the biggest operational shifts the industry has ever experienced, with huge cost implications in a tight margin business.

Grocers have absorbed much of the early impact of this shift by manually fulfilling orders from store shelves, dark stores or dedicated fulfillment centers. But that strategy becomes less viable as order volumes grow. Aisle congestion, labor shortages and slower fulfillment times during peak periods are just some of the challenges grocers face as they attempt to scale manual order fulfillment.

Leading grocers have found that automating fulfillment is the most efficient and scalable approach to meeting growing e-grocery demand. Grocers should begin preparing for this possibility early in the process, paying careful attention to meeting customer expectations for selection and quality while significantly increasing the speed at which orders can be fulfilled.

3. E-grocery as a hybrid of e-commerce and manufacturing

When it comes to automation, some grocers (and automation suppliers) have modeled their solutions on those used to support e-commerce in other retail sectors. That strategy has had little success because it fails to account for the differences between e-grocery fulfillment and other forms of e-commerce.

E-grocery fulfillment is more complex than other forms of e-commerce. Where most e-commerce sites average one to three SKUs per order, online grocery orders average between 25 and 50 SKUs spanning three temperature zones plus other specialty products.

Another difference is the importance of order sequencing, which isn't that critical in most e-commerce applications. As long as you have a batch of orders ready when it's time to load the truck, it doesn't really matter when those orders are picked.

With e-grocery, sequencing and efficiency are more critical because you have more complex orders and a constant flow of pickups and deliveries throughout the day. It's not unlike an engine assembly line. Orders must move methodically through the process, with completed orders being ready for pickup and delivery with the predictability of engines coming off the line. Achieving that level of predictability and repeatability across the multiple pick zones common in grocery fulfillment centers requires an approach to automation system design, configuration and optimization that blends e-commerce and industrial engineering principles.

E-grocery also requires product storage, replenishment and handling considerations that don't exist in other e-commerce applications. Food safety, for example, needs to be considered in the design of e-grocery automation as does the short shelf life of products. Ensuring freshness of produce is especially critical to customer satisfaction and retention. Grocery applications also typically experience much faster turnover than products in other e-commerce applications.

Moving to automation enables a level of speed, efficiency and productivity that simply isn't possible with manual processes. And with the right mindset, you can navigate the inevitable challenges and put in place the foundation required to grow your e-grocery business.

Preparing Your Organization for Automation

The processes and systems that grocers have built and refined over decades to replenish store shelves don't support item picking. New systems, processes and perhaps even skills are required to enable receiving orders, picking products, managing inventory, and consolidating and staging orders for pickup and delivery.

Supporting manual picking

Developing experience fulfilling orders manually helps pave the path to automation. In addition to serving as the impetus to implement software systems that include shelf-level inventory tracking and substitution algorithms, picking orders manually allows you to implement fulfillment processes and begin offering e-grocery services in a way that keeps your brand at the center of the customer relationship.

While doing so, you are also generating valuable data that can be used to refine processes and understand customer expectations around quality and service levels. And these investments don't become obsolete if automation is ultimately deployed as automation systems require the same order management functionality as manual picking.

Channel values (£bn)

	2022	2023	2024	2025	2026	2027	% change	£bn change
Hypermarkets	16.3	16.9	17.0	17.2	17.3	17.5	+5.2	+0.9
Supermarkets	91.1	92.6	93.4	94.6	95.6	96.8	+6.2	+5.7
Convenience	45.1	46.3	47.4	48.6	49.7	50.9	+13.0	+5.9
Discount	29.7	31.2	32.6	34.1	35.5	36.8	+23.9	+7.1
Online	22.0	22.7	23.7	24.8	25.8	26.9	+22.6	+5.0
Other retailers	12.4	12.5	12.4	12.5	12.4	12.4	+0.3	0.0
Total	216.8	222.1	226.5	231.7	236.4	241.3	+11.3	+24.5

Source: IDG, Growth forecast across all retail channels, 20 June 2022

While e-grocery is projected to continue to grow as a percent of total grocery sales, that growth will not be distributed evenly across all grocers. Consumers will gravitate to grocers who meet their demands for convenience, selection, order accuracy and service. Building competence in order fulfillment—and relationships with e-grocery customers—puts grocers in the best position to capture share of this growing market.

Building your team

Determining when it makes sense to automate, selecting an automation partner and overseeing configuration and integration of the system requires a team with a diverse set of skills. In many organizations, most of those skills already exist across the e-commerce, IT and supply chain departments and it's simply a matter of bringing that expertise together. When you add the resources of an experienced automation partner, the skills that exist are generally sufficient to manage the system selection and deployment processes.

But, even in large organizations, there can be a gap that could limit your ability to get the full value from automation.

Small improvements in speed, efficiency and repeatability are more critical in e-grocery fulfillment than in other forms of e-commerce. Those improvements are, of course, the specialty of industrial engineers and having industrial engineers on your design and configuration team (through your automation partner) and your operations team has proven extremely valuable in optimizing automated fulfillment centers.

It's important to ensure your organization is prepared for automation before moving forward, but in most cases the experience gained fulfilling orders manually ensures most of the resources required to support automation are in place and an experienced partner can provide the expertise that doesn't exist internally.



Learning from Experience

We are now at the stage in the evolution of e-grocery automation where industry experience is available, although not widespread. A number of grocers have had success automating e-grocery fulfillment and the lessons they've learned can benefit the next wave of grocers adopting automation.

Evaluating available technologies

Grocers that have deployed successful automated fulfillment centers have gone through extensive technology evaluation processes and reached the same conclusion: the AutoStore system delivers the balance of density, sustained throughput, flexibility and reliability required for this application.

At Swisslog, we leverage the full capabilities of AutoStore through an integrated approach that optimizes the design flexibility, storage density and throughput of this system by enveloping it in an ecosystem of e-grocery-focused software, processes and experience. Industry leaders like **H-E-B**, **The GIANT Company**, **Rohlik** and worked with Swisslog to pioneer the use of this technology in the grocery industry and other grocers are now following suit.

System configuration

When working with an AutoStore integrator, make sure you select an integrator with experience in AutoStore e-grocery solutions. That includes having a refined process for determining which products should be picked from automation and which should be picked manually.

The goal is to maximize the number of products that can be picked through automation to maximize the benefit of the investment. Some grocers come into the process planning to use broad product categories to decide what to automate and this can exclude many products that are suitable for automation. The best practice is to evaluate each SKU based on criteria that include the size of the product, its temperature requirements and its **cubic volume velocity**.



Swisslog has successfully integrated the AutoStore system for The GIANT Company, H-E-B and other leading grocers. Watch this video to learn how AutoStore works.



Automation control software

With AutoStore having proven its suitability for e-grocery fulfillment, getting the hardware right has become the easy part of the move to automation. But there can be meaningful differences in the functionality and maturity of the software used to control the AutoStore system and those differences can make or break the success of your implementation.

A modular software platform, such as **Swisslog's SynQ**, provides the flexibility to be deployed as a single platform that encompasses WES and automation control capabilities or as an automation control system that is integrated with the existing WES. When operating as the WES, SynQ provides single-system control and orchestration of all the processes and systems within the fulfillment center.

E-grocery automation software also requires sophisticated inventory management and material flow capabilities that enable real-time inventory tracking and management of items by shelf life and "best-by" dates—capabilities that aren't included in all control platforms.

Also look for software that supports complete order tracking for automated and non-automated picking processes and enables easy integration of ancillary equipment, such as weigh scales for on-the-fly weighing of pre-packaged meat, for example. Another valuable capability is the ability to pre-pick orders during non-peak times and then re-enter them into the system for retrieval close to pickup/delivery times.

Integration and support

Effectively and efficiently integrating existing software systems with the automation control system is one of the most critical processes during automation implementation. Leading integrators are now using agile processes to streamline software integration, significantly reducing the time for testing. Integrators can also provide state-of-the-art IT managed services that reduce the demand on internal resources and support growth and optimization strategies that increase the performance of the fulfillment operation beyond design expectations.



Managing Consolidation and Staging

Where modular automation systems like **AutoStore** can be configured to the size and throughput requirements of a wide range of e-grocery fulfillment centers, order consolidation processes – and the degree to which they can be automated – are influenced by available space, order volumes and the last mile options a grocery is planning to support. The more complex the fulfillment operation, the more complex consolidation and sequencing becomes.

Manual consolidation

In an automated fulfillment center, you're likely to have components of an order coming from multiple pick zones, including chilled and ambient automation, and manual pick zones for products from frozen foods, fast-moving ambient, chilled, bulk and specialty items like bakery and deli.

For fulfillment centers with lower order volumes, products from each of these zones can be consolidated simply by having each picker transport their products on carts to a consolidation area. This may prove effective for grocers offering only curbside pickup, but it can be difficult to manage when multiple last mile options are supported. It also reduces the productivity of pickers, increases order cycle times and can be difficult to scale to support peak order periods. Grocers who employ this strategy will soon have automation options as this is a key pain point integrators are focusing on for the next level of automation.



Semi-automated consolidation

Where space is available, conveyors or autonomous mobile robots (AMRs) can be a cost-effective approach for consolidating products from different pick zones. With this strategy, pickers can stay in their zones and load their portion of an order onto the conveyor or an AMR, bringing products from all zones together for manual consolidation.

This strategy balances picker productivity with capital costs and is the approach used by The GIANT Company in their **Philadelphia fulfillment center**. Orders picked from ambient and chilled AutoStore systems, and three manual pick zones are brought together by conveyor to a merge point where they are manually consolidated and staged for loading onto delivery vehicles.

Automated consolidation

For fulfillment centers with high order volumes, automating order consolidation can be an effective strategy. Shuttle systems have proven to be an ideal consolidation engine for e-grocery automation and are being paired with AutoStore systems to support automated fulfillment and consolidation.

Systems such as **Swisslog's CycloneCarrier** provide the speed and flexibility to gather order components from multiple pick zones, consolidate the order and then release it on demand in the proper sequence for just-in-time pick-up by customers or delivery drivers. The automated sequencing provided by these systems helps improve order accuracy and enables more efficient delivery.

All pick zones are connected to the consolidation engine through order tote handling, both manual and automated operations can be applied, to integrate automated picking and consolidation. Ideally, control for both the picking and consolidation engines is provided by a single software platform, as is possible with **Swisslog's SynQ software**.

Getting it right the first time

One of the most important lessons that has been learned over the last several years is that treating consolidation whether manual or automated as a process that must be factored into fulfillment center design – and automated where appropriate – is critical to meeting cost, throughput and customer service objectives.



Watch to see The GIANT Company's automated fulfillment center in action.

Optimizing Operations

First and foremost, you want automation that meets design specifications without extended familiarization periods –and that hasn't always been a given with some technologies and vendors. But achieving initial design specifications should be the baseline for expected performance. It isn't unusual for grocers deploying well-designed automation to achieve 5-10% improvements over the metrics the system was designed to achieve – and that were used to justify it. Here are five common optimizations we've seen our customer employ:

1. Revisiting design assumptions and data

The timeline for deploying e-grocery automation is being compressed as the industry gains more experience, but it can still take more than a year to plan, configure and deploy an automated fulfillment center. With the e-grocery market continuing to evolve there is a good chance current order profile data is different than the data used in the system design. A SynQ-enabled AutoStore is very flexible and optimizations to the products stored in the automation system and the bin distribution can increase the percent of orders fulfilled through automation, increasing fulfillment speed and contributing to profitability.

2. Refining picking processes

It often isn't possible to simulate every variable in the picking process during the design phase, especially due to the ongoing complexity of e-grocery baskets. Observing how pickers work during the early stages of the deployment can often reveal subtle changes in the placement of grocery bags or labels or the ergonomics of the operator interface that create measurable improvements in productivity.



3. Fine-tuning restock frequency

Some grocers have found that increasing the frequency with which some items are restocked in the automation system has allowed them to reduce the inventory of these items, freeing up bins for more products to be added to the system. A reduction from restocking every 3 days to every 2.5 days can have the effect of reducing the number of longtail items picked manually or expanding the range of products offered to online customers.

4. Improving decanting processes

Decanting processes can easily be overlooked in optimization programs, but more efficient decanting can reduce fulfillment costs. Pushing some unpacking and sorting processes upstream may improve efficiency as can simple process improvements such as adding lift-assists to a decanting port.

5. Adding more robots

No one wants to pay for more than they need, and today's automation systems are designed to enable a "pay-as-you-grow" approach to automation. The **AutoStore system** used by Swisslog in our e-grocery solutions allows robots to be added on the fly. If order volumes are higher at startup than were projected in design or there is a need to increase bin presentation speed, additional robots can be added without shutting down fulfillment. In addition, item picking robots that work with e-grocery automation will become available and may represent a prime opportunity for future optimization.



Finding your opportunities

Optimization is opportunistic and can look different for each application. System designers at an experienced integrator like Swisslog are continually incorporating the learnings from previous implementations into the projects they are working on today. But there are almost always improvements to be realized. Here are three keys to finding your opportunities:

- **Define your metrics**

What metrics are most important to the success of your fulfillment center? In most cases, grocers are focused on increasing orders per hour and decreasing the cost per order fulfilled. It can also be valuable to monitor total units per hour (TUPH), which quantifies the number of items handled by the center per manhour across all processes, including receiving, decanting, stocking, picking, consolidation, and loading. These metrics can guide decisions on how to identify and prioritize the optimization opportunities.

- **Analyze the data**

Pay attention to order profile data and how it is changing over time. Ensuring the system is optimized to current order profiles – not those of six months ago – is key to maximizing the value of the automation system.

- **Observe and listen**

Grocers who have been most successful at maximizing the value of their automation systems have taken an industrial engineering approach to process optimization. Observe processes over time and look for opportunities for improvement. It's also beneficial to hold regular team meetings to get frontline feedback and ideas for improvements. In many cases, the people best positioned to recommend process optimizations are those doing the work.

From optimization to continuous improvements

The months following the startup of an automation system are where the low-hanging fruit of optimization is picked, and the greatest benefits can be realized. But the e-grocery market is dynamic and constantly changing, so in a sense the optimization process never really ends. Instead, it evolves into a continuous improvement program that identifies new enhancements as order volumes grow.



Partnering for Success

Choosing the right automation partner can simplify design and configuration processes, compensate for gaps in internal resources and result in fulfillment centers that enable e-commerce growth.

At Swisslog, we've worked with grocers just launching e-grocery services, transitioning away from third parties and moving from manual picking to automation. We have a track record for delivering e-grocery automation that meets or exceeds projected results within weeks of startup. And every grocer we have worked with has been able to build on that initial success and improve performance through various optimization strategies.

For grocers considering how to scale e-grocery fulfillment, Swisslog offers:

- E-grocery design and configuration expertise developed in collaboration with leading grocers
- A full portfolio of technologies that allow us to deliver complete solutions that encompass order picking and consolidation
- Unmatched experience configuring and installing AutoStore systems
- Mature WMS and automation execution software incorporating the specific functionality required by e-grocery fulfillment
- Agile processes for managing automation system integration
- Technical services and support for customers optimizing their systems

To connect with one of our specialists, **contact Swisslog**.

