Innovations in Omnichannel Fulfillment*

Emerging Strategies for Inventory Handling, System Design, and Application of Software and Automation Technology

invata™
intralogistics

Omnichannel Challenges

One of the biggest challenges for the omnichannel retailer today is the need to keep pace with both the growing demand for low line count orders and the unpredictable and fluctuating velocity — or day-to-day rate of change — of the stock keeping units (SKUs) that are needed to fill orders on any given day.

As more retailers are selling whatever they can to consumers whenever they can, they are not only increasing the number of stock keeping units on hand, but are also selling deeper into their SKU bases than ever before at all times of year. This translates to a near constant rate of change in the SKUs that are used for order fulfillment each and every day. For while SKU variations existed across seasons in the past, the variations conformed to more consistent seasonal profiles. But with the emergence of e-commerce, flash sales, and inventory repositioning strategies, retailers are facing the near equivalent of a 365 season year.

Couple this with increasing consumer expectations for faster delivery, order customization, and product personalization at the lowest cost possible, and many retailers are finding that the conventional approaches to omnichannel fulfillment are no longer providing the advantages they once did and are instead becoming inhibitors to business growth.

** The innovations discussed in this white paper were recognized by the Council of Supply Chain Management Professionals (CSCMP) which named Invata as a finalist in its 2016 Supply Chain Innovation Award™ competition for its innovations in omnichannel fulfillment. The Supply Chain Innovation Award is today's most prestigious recognition of innovation in supply chain management, highlighting innovations in process, technology, and/or application that create quantifiable and sustainable results in cost savings, revenue, and customer satisfaction.*

The Conventional Approach

Conventional approaches in use in many omnichannel operations today are built on fulfillment strategies that predate the emergence of e-commerce. They employ inventory strategies that utilize reserve storage to feed forward pick areas designed to accommodate fast moving SKUs. They rely on forecasted replenishment and reslotting practices to maintain the forward picking effort. And they depend on manual picking and batching of SKUs to feed wave-based operating concepts.

Such approaches were a boon to retailers when the primary challenge of a retailer-driven push-based distribution model was to find the most efficient way to fulfill a predictable pool of orders from a fixed number of reliably consistent inventory SKUs. But when it comes to fulfilling an ever-increasing pool of low line count orders from an ever-expanding SKU base with fluctuating and unpredictable velocities — all while fulfilling larger retail store orders and custom assembled wholesale orders — these approaches leave much to be desired:

Conventional approaches not only necessitate numerous inventory touches, transactions, and intra-facility moves, they also often require dozens, if not hundreds, of people to:

- Pick and replenish enough product to keep pace with order fulfillment.
- Reorganize/reslot the forward pick areas to accommodate constantly changing SKU velocities, fluctuating item requirements, and variations in inventory handling units.
- Deal with the exceptions that arise from the error prone batch picking process.

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Conventional approaches were designed to reduce worker travel times in the picking process, but the challenges of low line count order processing and the fluctuations in SKU demand inherent in today's pull-based distribution model create an environment in which efficiencies gained in worker travel paths are more than offset by the need for constant reslotting and replenishment of the forward pick area.

In today's consumer-driven pull-based distribution model, a different tool set is needed to adequately address the challenges faced by omnichannel retailers — a tool set that will enable them to turn inhibitors to growth into strategic market advantages.

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The Invata Approach

Realizing that traditional approaches to omnichannel fulfillment would not give our clients the strategic advantage they sought for their omnichannel distribution solutions, Invata has pioneered new and innovative ways to rethink fulfillment and distribution strategies in order to minimize inventory touches, increase order accuracy, enhance productivity, and decrease labor demand.

We accomplish this by taking a whole system approach to optimizing process flows that embraces “Lean” engineering techniques in the physical layout of our systems, the architecture in our software, and the application of advanced technology that maximizes the efficiency of human interaction, while eliminating toilsome labor requirements.

In doing so, we eliminate as much manual and planned push-based processing as possible and replace it with pull-based, self-regulating, self-maintaining systems that utilize common flow paths, work from a single inventory stream, minimize variations in handling units, and make allocation decisions at the last moment in time in order to enable homogeneous handling methodologies across channels.

We are able to do this because of our relentless pursuit of data as the driver of nearly all decisions made in the pursuit of our client solutions. From pre-concept to proof of concept, and from operational optimization to continuous improvement over the life of the system, Invata uses the intelligence derived from the data sciences of analytics, modeling, simulation, emulation, and optimization to empower our system design, system performance, and system improvement processes.

By building flexibility into our systems design, automating processes based on handling commonalities, and using data science as our guide, we enable the use of smaller equipment infrastructures, the multi-tasking of equipment across channels, and the simultaneous processing of channels on the same equipment.

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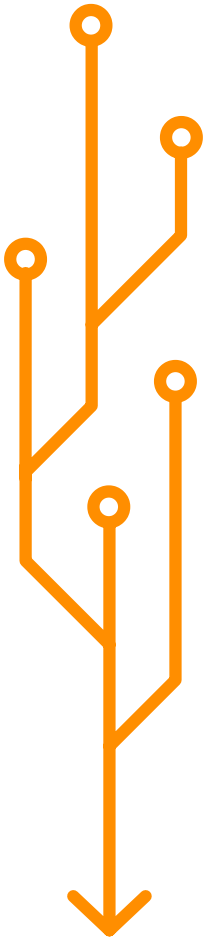
How it Works

Invata's experience with omnichannel clients ranges from greenfield projects to modernizations. As each Invata system is tailored to the unique business requirements of the client that uses it, the particulars of the Invata approach vary widely between clients. There are, however, commonalities to all Invata omnichannel solutions that can be seen in the approach we take to developing each Invata system:

Beginning with inventory strategy, we focus on:

- Minimizing the movement of inventory from receiving through shipping by diminishing the number of intra-facility moves for activities like replenishment and reslotting of inventory to forward pick areas.
- Enable demand-based inventory pull from storage versus forecasted push methods.
- Utilize storage methodologies that accommodate put-away and residual storage with equal efficiency.
- Minimizing the fracturing of inventory to avoid creating multiple broken cases of SKUs scattered about the warehouse.
- Minimizing the variation in handling units to avoid creating multiple flow paths to accommodate cases, pallets, and single items.
- Minimize inventory transactions to diminish the need for cycle counts or inventory adjustments.



To do this, we concentrate on reducing the number of flow paths required to fulfill orders and find ones that support variations in handling unit storage sizes and still move them efficiently.

Where possible, we eliminate the manual batch picking and wave-based operating concepts inherent to traditional omnichannel fulfillment, as well as all the strategies and systems required to support those processes, like reserve inventory, forward pick areas, and the practices of forecast replenishment, and reslotting.

We then replace those processes with automated processes that pull from a single stream of inventory to fill multiple channel orders at the same time, often on the same equipment, while dynamically deploying in-motion inventory and algorithmically adjusting the system order pool on a real-time basis. We use automation to not only eliminate costly inventory touches, but to enhance the efficiency of processes like receiving, put away, picking, and induction that require human interaction, and, in the process, elevate the performance of the remaining workforce.

We even multi-task equipment systems in ways that enable them to be used for such divergent processes as order fulfillment and reverse logistics, enabling our clients to maximize their capital investment, while minimizing the size of their infrastructure.

Whatever the configuration, all Invata systems are controlled by our own Intralogistics Software that combines the full range of functionality needed to address all omnichannel warehouse automation and processing challenges. While traditional approaches patch together disparate software applications that increase the critical time it takes to move data between systems and ultimately create ongoing support issues, Invata provides a fully integrated Intralogistics Software platform designed around a single, unified database that includes the following functionality:

- Complete **Warehouse Management System (WMS)** functionality, including receiving, inventory storage, inventory management, picking, replenishment, order management, order fulfillment, packing, labeling, and shipping.

- Complete **Warehouse Control System (WCS)** functionality, including automation control, routing, sorting, in-motion

weighing and print apply, tracking, and PLC communications.

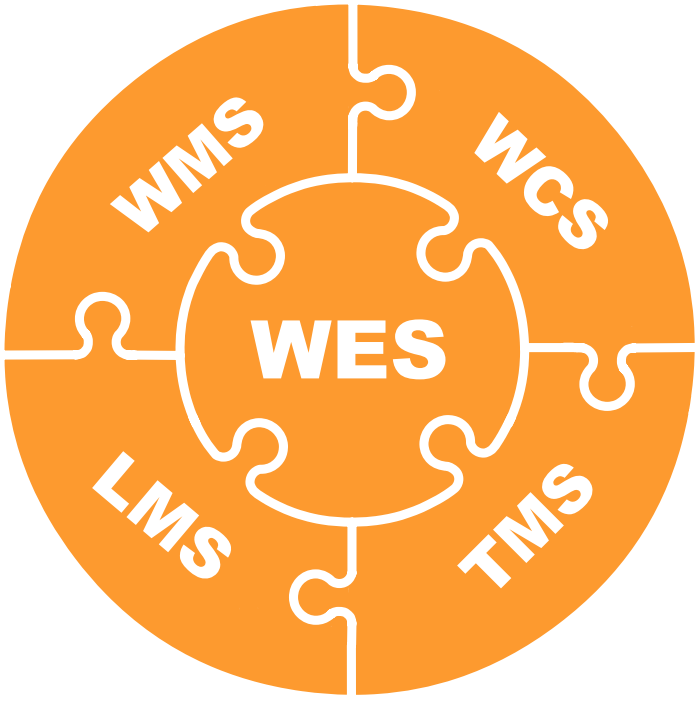
- Complete **Warehouse Execution System (WES)** functionality, including the optimization algorithms used to perform the calculations critical to load balancing and system performance.

Additional functionality includes:

- **Labor Management System (LMS)** functionality, including extensive performance metrics and visualization dashboards comparing hourly production output against operational and industry standards, in addition to real-time productivity alerts, and labor optimization and resource planning capabilities.

- **Transportation Management System (TMS)** functionality, including real-time, in-motion manifesting, service level upgrades/downgrades, service level switching, rate shopping, multi-modal shipping capabilities, and shipping analytics.

The result includes a truly waveless omnichannel fulfillment methodology that dramatically increases order throughput and diminishes labor requirements and shipping costs, while enabling omnichannel retailers to easily manage low line count order processing and fluctuating SKU demands.



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Benefits to the Omnichannel Retailer

Omnichannel retailers that have incorporated Invata innovations into their fulfillment centers have realized distinct strategic advantages to both their distribution operation and overall supply chain performance. Benefits have been realized in the areas of product development, product marketing, product personalization, product profitability and life cycle, in-store relations, and customer relations.

At the DC level, clients have seen dramatic increases in retail, wholesale, and e-commerce fulfillment capabilities (up to 240%). At the same time, they have realized dramatic reductions in labor requirements (up to 44%) along with significant decreases in shipping costs (between 5% and 10%). They've also seen improvements in receiving and put away capability (up to 100%) and have benefited from longer and more profitable product life cycles thanks to increased capacity in reverse logistics processing and the ability to repositioning inventory to markets with higher demand.

Clients have also enjoyed greater profitability at the DC level in being able to take advantage of modern ways to clear out slow moving inventory items. The ability to spontaneously plan and easily accommodate flash sales enables retailers to regulate inventory by discounting goods within the brand versus having to turn to off-brand resellers to clear slow moving SKUs at bottom dollar prices. This enable retailers to increase their profits even on discounted items.

Clients have also realized benefits at the DC level in their ability to accommodate special packaging or personalization requirements. Invata systems can seamlessly handle personalization requirements like tailored and branded pack lists and labeling compliance requirements requiring unique artwork, custom perforations, distinct information, and even different positioning on a shipping case. One Invata client requires 28

distinctive labels for its daily shipping requirements that are all handled in the same print apply process on the same flow path.

Beyond the DC, clients have reaped strategic benefits in their overall supply chain. This includes the ability to adopt a more agile and strategic approach to product sourcing. With greater confidence in their ability to receive product, fill individual orders, and ship them expeditiously, Invata's omnichannel clients no longer need to hold as much reserve inventory as safety stock for demand fluctuations. They can also take advantage of last-minute delivery for inbound shipments to the DC from product suppliers, which enhances their ability to:

- Cut supplier lead times.
- Make late-in-the-game changes in sourcing and production.
- Adopt a speed-to-market approach for selling seasonal or short-shelf-life products.
- Tie-up less cash in inventory holdings.
- Accelerate inventory turn for a faster cash conversion cycle.

As a result of enhanced distribution capabilities, Invata clients have also realized strategic advantages in their marketing efforts. Confident that product will arrive in-store in a timely manner, retailers can plan more effective product promotions, maximize the selling opportunity at the store level, and more efficiently coordinate marketing events. Greater flexibility and spontaneity in their marketing efforts have yielded greater precision in their marketing execution. Reliable store deliveries have also enhanced efficiencies at the store level as store managers are better able to efficiently plan in-store labor and execute marketing campaigns and promotions.

Invata omnichannel clients have also realized strategic benefits in regard to their most important customers, the end users that are so vital to maintaining retailer competitive advantage. Customer satisfaction for in-store shoppers has increased as reliable store replenishment ensures shoppers find desired products on store shelves. And customer satisfaction for online purchases has

increased, not just because their e-commerce orders are able to be picked, packed and shipped within hours from the DC, but also because promised deliveries dates (aka service level agreements) are being consistently met thanks to Invata's transportation management capabilities:

> Invata's transportation management capabilities include a wide variety of services designed not only to pre-manifest parcels for optimum shipping methods as orders are entered into the system, but to adjust those shipping methods, if needed, at the last possible moment to ensure promised delivery dates are met while parcels are shipped via the most economical means possible.
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> To do so, Invata omnichannel systems are set up to provide shipping service level upgrades and downgrades, rate shopping, and service level switching — all on a real-time, in-motion basis as parcels reach the outbound shipping dock or shipping sorter. Here's how the Invata transportation management services work:

- Service level upgrades are applied to parcels that may have been delayed in production and will no longer meet the customer delivery date if shipped in the manner originally manifested. Service level downgrades are applied to parcels that are slotted for premium shipping, but may not need it to arrive by the promised delivery and therefore can be downgraded to more a economical shipping method.

- Rate shopping is done on a parce-by-parcel basis that checks carrier rates against a multitude of criteria find the best pricing.

- Service level switching is applied to parcels that might be subject to assessorial charges due to dimension or weight overages or parcels that may not weigh as much as originally anticipated and can therefore be shipped at lower cost than the manner originally manifested.

For Invata's omnichannel clients, enhanced fulfillment capacity at the DC level has led to a longer window of opportunity for selling to the consumer, greater likelihood of repeat buying by both in-store and on-line customers and additional sales, and increased customer loyalty.

Conclusion

The ability for a DC operation to handle low line count orders and unpredictable and fluctuating SKU velocity, while optimally fulfilling orders simultaneously across all distribution channels becomes a strategic weapon in meeting increasing consumer expectations. In doing so, it eliminates the distribution center as a bottleneck and potential growth inhibitor in the omnichannel supply chain and instead positions it as a competitive advantage omnichannel retailers can use to build customer loyalty and increase market share.

This is the first installment in our multi-part series on Innovations in Omnichannel Fulfillment. In future installments, we will take a deeper look at innovations in inventory strategy, system design, and the application of technology, software, and the data sciences that are being used successfully to optimize omnichannel fulfillment and gain strategic advantage in the omnichannel marketplace.

To find out what an Invata omnichannel system can do for your distribution operation, call Jay Williams at (484) 539-1951, email us at **jay.williams@invata.com** or visit us our website at **http://www.invata.com**. We look forward to hearing from you.