pivotree™

Mastering Fulfillment in the Digital Age:

Unlocking the benefits of a microservices-based WMS for warehouse automation

Introduction

What if the future of warehousing operations wasn't a single warehouse management system (WMS), but rather an integrated ecosystem of technology and strategic partnerships with the customer at the core.

Right now, this much is clear — maintaining the status quo in fulfillment isn't working for many product businesses. Why? Traditionally, warehouses planned and executed to timelines days or weeks in the future. With today's compressed delivery windows, everything from entering orders to getting shipments out the door must be optimized, and most businesses are struggling.

The inability to solve for something as basic as inventory availability during the pandemic led to major impacts. For example, retailers failed to realize 7.4% of sales due to out-of-stock items in 2021, which cost them a staggering $82 billion. Additionally, inventory missteps — like overbuying, buying incorrect products, or misallocating inventory — account for an estimated 53% of unplanning markdown costs.[1]

To solve inefficiencies, organizations need more than a standard WMS. They need a technology-enabled strategy to integrate disparate systems, optimizing efficiency and meeting evolving needs. This approach fosters innovation, promotes sustainable practices, and encourages adaptive resilience within the ecosystem.

One path to accomplish this is by leveraging more holistic warehouse automation, which can push optimization to new levels by reducing labor demands, improving inventory and fulfillment accuracy, and boosting warehouse efficiency. But to properly leverage warehouse automation, systems must be sufficiently flexible to adapt to the new normal.

Is your current system agile enough to keep up with the pace of change, or could a nimble WMS with modular capabilities be the right fit for your business?
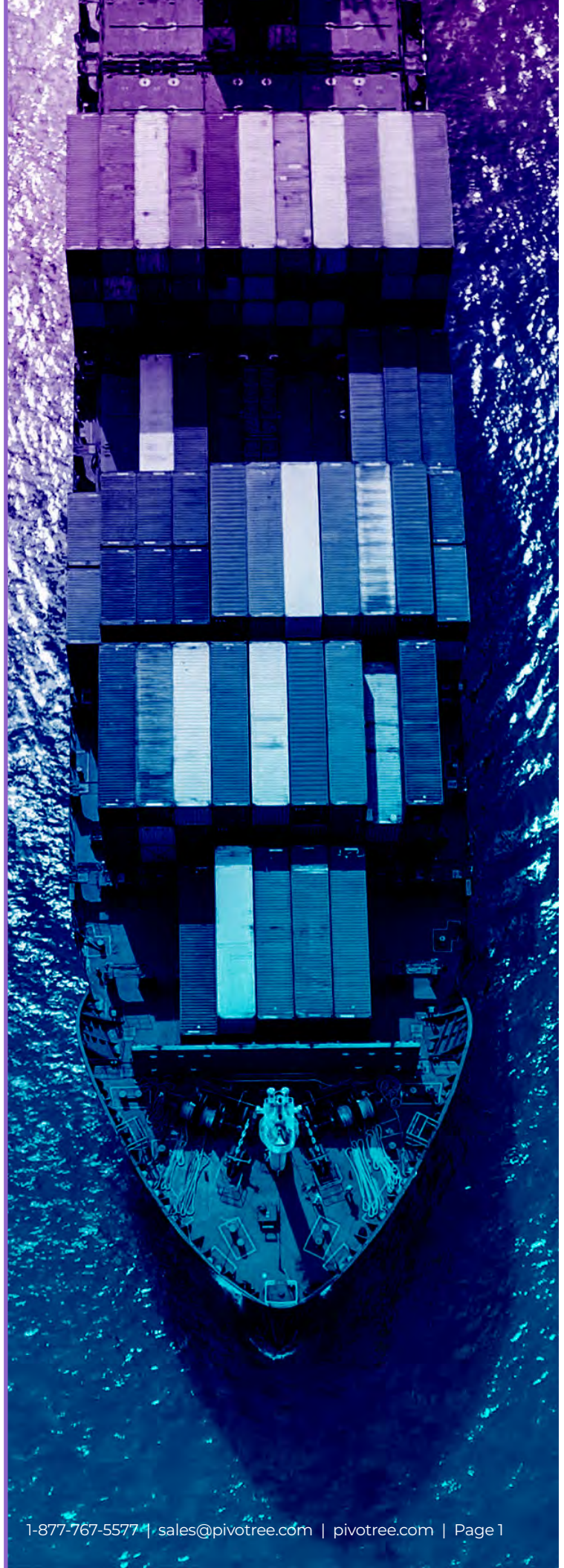
Automation is Essential to Omnichannel Fulfillment

Why is automation a necessary step for modern omnichannel businesses to compete?

As businesses scale, warehouse operations adopt layers of complexity they're not prepared for. Most existing warehouses were not set up to address frequent market disruptions and rapidly evolving customer expectations. So when the pandemic accelerated the explosion of omnichannel e-commerce, it exposed a lack of scalable processes.

Organizations have tried to adapt to this new commerce landscape, but without well-planned automation, they encounter six primary frictions points:

Inventory accuracy

Maintaining accurate inventory records is crucial for effective warehouse management, but it can be difficult to achieve. Inaccurate inventory records can lead to stockouts, overstocking, and other issues that impact efficiency and customer satisfaction.

Order fulfillment

Managing orders is a complex process that involves many different steps — such as picking, packing, and shipping. Fulfilling orders accurately and on time is critical for customer satisfaction, but it can be challenging to do so consistently.

Space utilization

Effective space utilization is essential for maximizing warehouse efficiency, but it can be difficult to achieve. A recent survey of warehouse and operations managers revealed that 47% of respondents cited "insufficient space" as their biggest concern.[2] Poor space utilization leads to inefficient workflows, wasted space, and safety hazards.

Labor management

Warehouse labor costs are a significant concern, and costs are only increasing. In fact, the hourly cost of warehouse staff has risen almost 38% since 2017.[3] In addition to costs, overseeing the staff's scheduling, training, and motivation is a challenge.

Technology

The use of technology is practically essential for warehouse management. However, implementing and managing these technologies can be cumbersome — and outdated, misaligned, or malfunctioning systems cause headaches for warehouse managers.

Returns management

As e-commerce expands, return rates are exploding. 2022 saw a return rate of 16.5% of total retail sales, more than double the 2019 rate.[4] This poses a problem for brands, as handling returns requires careful tracking and management.

These friction points present both challenges and opportunities for forward-thinking companies. Companies that can adjust quickly, respond to market disruptions, and maintain customer satisfaction and loyalty will emerge as new leaders in the modern fulfillment marketplace. This is where automation can be a key differentiator for organizations.

Using Automation to Meet Customer Expectations

As omnichannel demand grows, customers expect a seamless shopping experience across all channels, including online, in-store, and mobile. Warehouse automation enables businesses to manage inventory more efficiently and fulfill orders faster (and more accurately), regardless of the channel through which they are received.

Companies are clearly embracing technology to usher their organizations into this new era of warehousing. WMS adoption topped 90% for the first time in 2018, and that was also the first year the use of paper-based picking fell below 50%.[5]

But even with widespread WMS adoption, companies still see a gap between their current level of automation and the level they want to attain. Organizations using automation to help with business processes struggle because they lack real-time data to make timely decisions. In the physical automation space, autonomous mobile robots (AMRs) are gaining popularity, but companies are still struggling to adopt the technology. A materials handling survey showed 39% cite compatibility with existing systems as a major roadblock.[6]

Companies know the business functions they want to implement, but they don't know how to deploy these solutions within the framework of their current systems. Unfortunately, most monolithic platforms have built-in limitations and functionality.

Recent Disruptions: Inflation and Recession

With these dual disruptions either here, or on the horizon, companies should prioritize reducing OPEX and CAPEX. But how?

- Reduce tech spend by maximizing system efficiencies.

- Reduce overhead spend using automation for better productivity and performance.

- Reduce labor costs by automating labor-intensive tasks (picking, packing, etc.).

- Reduce labor turnover by training and incentivizing existing strong performers.

Warehouse automation can fast-track these initiatives and help companies prepare for what's ahead.

The Limitations of Monolithic Platforms

In the past, utilizing a monolithic WMS or ERP made sense. Companies could manage all operations through a single system, and employees learned how to use the functions their roles necessitated. However, as market conditions change more rapidly, using the monolithic platforms of yesterday becomes less feasible. These all-in-one systems simply can't handle the ever-shifting demands of omnichannel commerce or fulfill the requirements of a high-performing warehouse with multiple geographies and modes of distribution.

Traditional monolithic platforms fall short in a number of ways:

Poor integration - Monoliths don't integrate well with non-native solutions. They were designed to be all-encompassing, so adding capabilities from third-party applications isn't really an option.

Rip and replace requirement - If companies do want different functionality, they must replace the entire platform. Starting fresh with a new platform is arduous for small companies, and the bigger the enterprise, the more pain it causes. If a company has hundreds of warehouses, migrating each one to a new system is a major undertaking.

Prolonged migration timeline – Ultimately, some companies decide they need to innovate and must replace their monolithic system. This decision requires intense planning because the typical time period to completely integrate the new platform is 5-7 years.
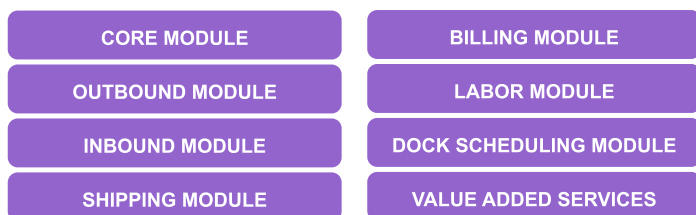
Prohibitive costs - Aside from the elongated migration timeline, it's also prohibitively expensive the switch to a new platform. For this reason, organizations often delay a migration even if one is sorely needed.

Companies with monolithic platforms either continue with antiquated technology or spend years converting their operations to a new system. They settle because there has never been a third choice to achieve effective warehouse automation.

What if companies weren't required to *replace* their existing monolithic WMS?

Fortunately, companies now have a viable alternative to the settle or replace conundrum. Organizations can actually push their automation capabilities forward while retaining the WMS platforms into which they've sunk so many resources.

Today, companies have the ability to deploy standalone business processes that lay directly on top of their current monolithic systems. With composable WMS solutions, organizations can fully separate business functions into truly consumable services via modular applications.

wms
Only what you need as your primary system

CORE MODULE	BILLING MODULE
OUTBOUND MODULE	LABOR MODULE
INBOUND MODULE	DOCK SCHEDULING MODULE
SHIPPING MODULE	VALUE ADDED SERVICES

OR

ERP
As microservices to optomize your current environment

RECEIVING	wms OUTBOUND PACK MICROSERVICE
PUTAWAY	SHIPPING
CONTAINERIZATION	TASK MANAGEMENT
wms OUTBOUND PICK MICROSERVICE	LABOR

Modern WMS platforms provide a faster path to innovation

Why is a composable WMS solution so game-changing for a logistics operation? It all comes down to its innovative architecture, which enables exciting new capabilities without the effort, time, and expense of a complete system migration.

Here are a few ways a modern WMS is superior to the traditional monolithic model.

MACH Architecture
MACH stands for Microservices-based, API-first, Cloud-native, Headless.[7] What do each of these mean?

Microservices-based
Microservices is an architecture pattern comprised of loosely-coupled services, each handling specific business or technical functions. This structure allows independent development and deployment, supports efficient large-scale applications, fosters adoption of best-of-breed SaaS solutions, and avoids vendor lock-in.

API-first
The API-First approach treats APIs as primary conduits for business functionality through a well-defined set of contracts, enabling interaction between two or more systems and allowing greater collaboration. This strategy supports efficient API development across devices, platforms, and applications in multi-channel environments.

Cloud-native
Cloud-native is a modern way to make and run software applications that fully use the cloud. It uses new methods like agile, DevOps, continuous updates, and Microservices, making apps more flexible, scalable, and reliable.

Headless
Headless systems use API-first services to build applications with separate user interfaces and back-end operations. They replace typical interfaces with APIs, allowing various services to easily access and use their content.

Essentially, MACH architecture allows businesses to deploy an ecosystem of pluggable, scalable, and replaceable third-party solutions to solve discrete business problems.

Modules
These third-party solutions are delivered in the form of modules. Say a warehouse is using a monolithic platform and wants to improve its dock scheduling, but the scheduling function on the current system is antiquated.

Utilizing a composable WMS with modular capabilities, the company can integrate a best-of-breed dock scheduling module into its existing system. There's no need to rip and replace just to add additional functionality. Plus, thanks to composability, it's possible for developers to create a variety of SaaS microservices that integrate well with the main platform.

The Latest Capabilities
What's infeasible today could be table stakes tomorrow. So deploying a composable WMS with modular capabilities gives companies the flexibility to keep pace with the latest technological developments. With tools like artificial intelligence, machine learning, and robotics evolving so rapidly, it's essential that organizations future-proof their operations. If a revolutionary robotics application enters the market 12 months from now, the right WMS will allow companies to quickly update their operations with that capability.

MACH
ALLIANCE

Benefits of Modern WMS Platforms

The latest technology is always attractive, but operations and logistics managers can sometimes find it difficult to make a business case for a new platform. In the case of a composable WMS, the bottom-line benefits aren't difficult to explain.

Extends Life of the Current System
The buying cycle for a monolithic WMS has historically been seven to twelve years because of the aforementioned time and costs spent during a full migration. Instead of attempting to speed up that life cycle, a modern WMS allows companies to remain on their monolith longer without sacrificing operational effectiveness.

Provides Rapid Access to Business Outcomes
Sometimes a new warehouse application is urgent. If a company doesn't have it, they just fall too far behind the competition. Instead of being forced to settle for a middling option from their monolith, operations managers now have the option to add the capability as a microservice, fast-tracking the path to the desired outcome.

Allows Better Spend Utilization
By delaying a rip and replace event and adding only necessary microservices, organizations can avoid major IT spend and do more with less.

Reduces OPEX
Heading into an uncertain market, most companies are looking to reduce operating expenses. By using microservices to create labor efficiencies, they can create less overhead and reduce expenses.

Creates Cost Savings Across the Board
By adding microservices to beef up deficient areas of warehouse operations, companies can select what capabilities are most urgent and then give managers and supervisors immediate tools to solve business problems. The rapid problem-solving creates cost savings throughout every step of the warehouse operations process.

Pivotree's Composable WMS Solution

In our conversations with clients at Pivotree, we noticed that many either had an ERP system lacking in features for receiving and outbound operations, or their technology stack was outdated, making it difficult to keep up with contemporary warehousing practices. We saw a clear path to adding immense value by creating a composable, modular WMS platform.

We also drew on our decades of expertise in systems integration best practices to develop a comprehensive solution that guides companies through every phase of planning and deployment. Some areas that differentiate our solution from other composable offerings include:

A robust microservices ecosystem – our technology ecosystem consists of long-standing best-of-breed partners that support diverse business functions.

A data-driven supply chain – data drives critical decision-making, so we include features like a vendor scorecard and dock rescheduling to provide up-to-date data for clients.

A people-first approach – of course you'll optimize labor for productivity and performance, but we'll also guide you on how to train your existing staff to redeploy in other areas. Plus, our mobile-ready systems feature an intuitive user interface, which gives employees usable, real-time data from any location in the warehouse.

Connect – Pivotree's Integration Platform bridges the gap between difficult-to-integrate legacy systems and our WMS — a problem our competitors still haven't solved.

Control Tower – this feature provides executive dashboards to C-levels so they have visibility into crucial operational analytics, enabling decision-making with accurate real-time data.

Other composable WMS platforms on the market feature expensive support models, complicated migration processes, or poor out-of-the-box functionality. We designed our WMS with a depth and breadth of capabilities, enabling us to support the majority of mature enterprise warehouse operations in whatever configuration they are running. And perhaps more importantly, the microservices nature of our product means we can parachute in with an individual functionality to fix a problem within the customer's existing ecosystem.

High-Impact Out of the Box Modules

The following modules typically provide a rapid time to value for organizations struggling with inventory visibility and tracking, expedited shipments, and lack of data about their inventory:

CORE
The base module, which includes features such as Location Inventory, Cycle Counting, and Inventory Movement and Tracking

INBOUND
Optimizes receiving and includes features like smart tagging and LPN generation

OUTBOUND
Creates efficiencies in picking, packing, sorting, wave management, and task management

> Pivotree WMS is a true microservices-based WMS solution that also has enterprise-grade capabilities built-in. This differentiates us because it allows us to solve point problems with point solutions, and accelerate time-to-value by 3-4x against the average WMS deployment.

James Brochu
GM Supply Chain Pivotree

Are Your Warehouse Operations Future-Proof?

A modular, microservices-based WMS gives organizations the flexibility to automate operations, address business needs, and optimize systems one capability at a time. At such an evolving and uncertain period, the flexibility it provides over traditional monoliths is invaluable.

Pivotree augments the capabilities of composable WMS technology with our large, dedicated engineering team, time-tested delivery methodology, and proven workflows and processes.

Want to know more about our innovative WMS platform?

LEARN MORE

Why Pivotree

Pivotree designs, builds, and manages frictionless commerce experiences for brands and their customers around the world. When customers trust they can find, buy, and get the products they want, when and how they want — we call that experience frictionless commerce and Pivotree is leading the charge.

Contact us for more information on how we can help solve your data challenges.

sales@pivotree.com
1-877-767-5577
www.pivotree.com

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