Advancing Automation in Retail and Manufacturing for Supply Chain and Logistics Mastery

BlueYonder

# Expanding Scope of Automation in the Unified Supply Chain

A comprehensive understanding of supply chain automation is paramount in today's industry. Recognizing automation as a multifaceted concept, far beyond the realm of robotics, is critical for developing effective strategies for its adoption and practical application.

- **Beyond Robotic Boundaries:**
  Automation transcends robotics, merging multiple technologies for smart, independent decision-making. This shift marks a new era in supply chain management, where machines and algorithms work harmoniously to streamline processes.

- **Data-Driven Intelligence:**
  The true value of automation comes from intelligence powered by enterprise data. When combined with interoperable solutions and Blue Yonder Mobility & Automation, this intelligence enables organizations to connect systems, orchestrate actions, and act on information with greater speed and confidence.

- **Focused on Exceptional Outcomes:**
  The ultimate goal of automation is to enhance business outcomes. Through a combination of software, hardware, and hybrid systems, automation empowers businesses to make smarter decisions, driving efficiency and growth.

For more details on this topic, we recommend reading our Industry Brief Navigating the Future: The Essential Role of Multi-Faceted Automation in Modern Supply Chains

Automation Maturity Framework
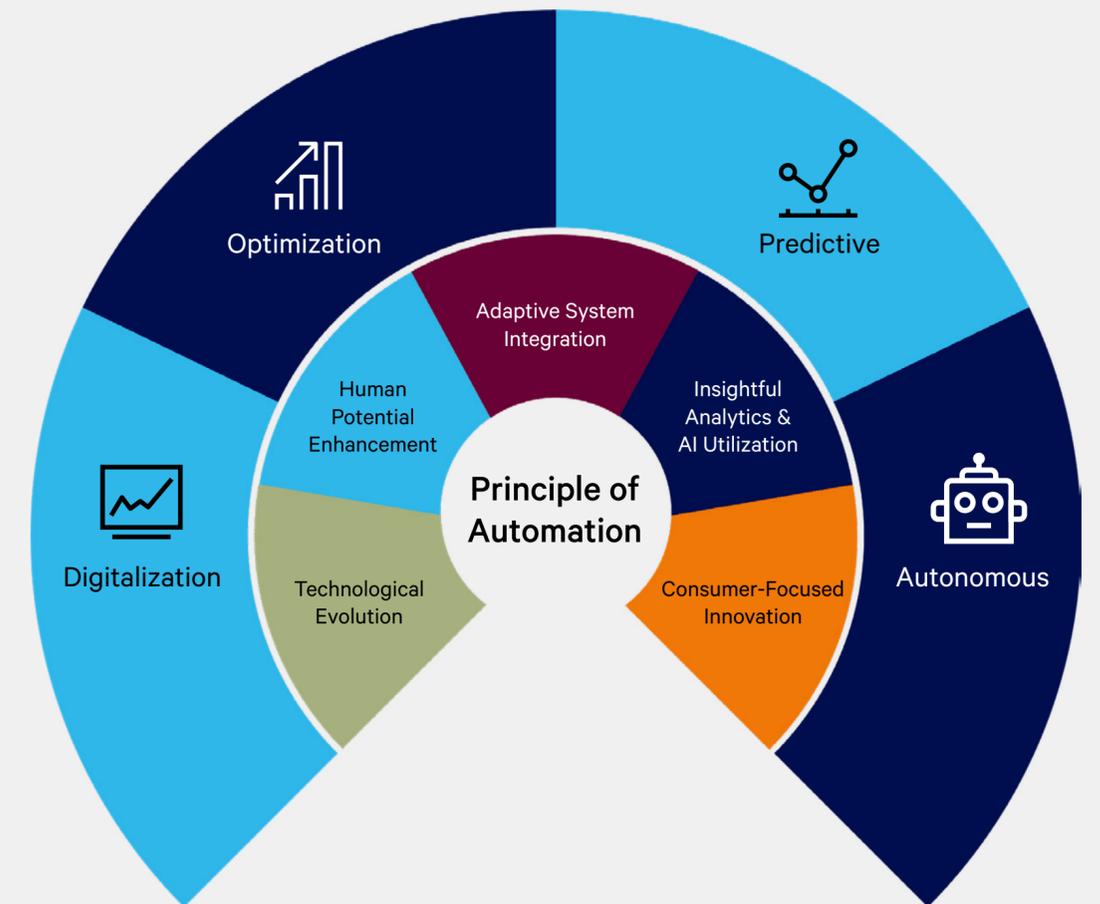
Automation Maturity Framework

This Automation Maturity Framework provides enterprises a roadmap of various stages of automation, underscoring the importance of rethinking automation as a multi-faceted pursuit.

Digitalization

Transforming traditional processes into streamlined digital ones, going beyond simple data conversion to enhance tasks like data-entry and record-keeping.
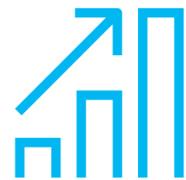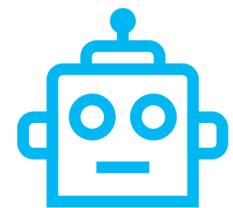
Optimization

Employing software to identify and implement the most efficient operational options and outcomes, leveraging intelligent systems for enhanced logistics management.

Predictive

Using historical data and near real-time data to forecast future needs and scenarios, enabling proactive decision-making and strategic planning.

Autonomous

Implementing self-operational technologies such as decision-making software for selecting transportation carriers and scheduling tasks for labor and robots.

Crucial Need of Automation in Retail and Manufacturing Supply Chains and Logistics

Automation is not just an advanced concept for the retail and manufacturing sectors but a necessity in modern supply chains and logistics operations, leading to increased efficiency, sustainability, and market competitiveness. Integrating automation is crucial for these industries to boost operational flexibility and customer satisfaction, thus leading to market innovation.

- **Competitive Edge Through Automation:** In retail and manufacturing logistics, automation is essential for enhancing efficiency and enabling strategic decisions. It accelerates processes, reduces operational costs, and delivers valuable insights for competitive advantages.

- **Seamless Supply Chain Integration:** The integration of automation across manufacturing and retail supply chains ensures consistent operations and the ability to respond to market changes, significantly and swiftly improving customer satisfaction.

- **Innovation and Sustainability Through Automation:** Automation has become a benchmark for innovation and environmental sustainability for these sectors. It enables the workforce to concentrate on strategic growth, innovation, and sustainability, heralding a new era of industry advancement.

Advancing Retail and Manufacturing with Multi-Faceted Automation in Supply Chains and Logistics

Automation as a Transformative Force in Retail and Manufacturing Logistics

In retail and manufacturing supply chains, automation reshapes processing operations beyond transportation and warehousing enhancements. This shift involves the integration of advanced technologies for optimizing manufacturing processes, data management, and workflow efficiency. The focus is on transforming core operational processes, resulting in heightened efficiency, precision, and productivity across these industries' production and management facets.

Revolutionizing Retail and Manufacturing Through Advanced Logistics

Imagine a world where retail and manufacturing logistics are revolutionized. In retail, introducing automated inventory systems profoundly uplifts customer experiences and brings unparalleled agility to supply chain decisions and customer interactions. Conversely, manufacturing enters a new era of efficiency with technologically advanced warehouses and refined distribution methods. This comprehensive optimization in logistics processes, encompassing material handling to product distribution, ensures increased efficiency, resilience, and sustainability, thereby remolding the business operations landscape.

The Future of Retail and Manufacturing Growth Through Automation

The automation journey in retail and manufacturing logistics operations is a testament to the impact of integrated, holistic technological advancement. It is about creating a cohesive, strategic approach that drives both sectors toward a future marked by significant innovation and sustainable growth.

Exploring a Pathway of Multifaceted and Interoperable Automation Across a Unified Supply Chain
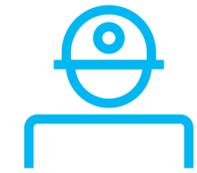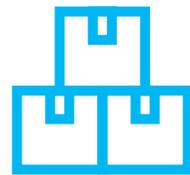
Order Management

Why: Accuracy in order lifecycle, maximized fulfillment, omni-channel commerce

How: Interoperability, real-time inventory visibility, system integration

When: Order processing, inventory control phases

Warehouse Management

Why: Inventory accuracy, optimized throughput, maximized fulfillment

How: Barcode scanning, real-time tracking, robotics

When: Order processing, inventory control, labor management

Warehouse Execution System

Why: Operational synchronization, labor-robotics efficiency

How: Task prioritization and optimization, dynamic workflow coordination

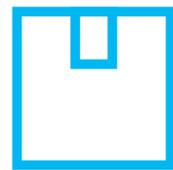**When:** Real-time task management, proactive resource planning

Labor and Workforce Management

Why: Optimal staffing, labor cost and retention management

How: Digital timekeeping, scheduling systems

When: Efficient shift planning, performance monitoring

Exploring a Pathway of Multifaceted and Interoperable Automation Across a Unified Supply Chain

Micro-Fulfillment

Why: Dynamic inventory management, agile fulfillment

How: Digital tools, mobile-ready frameworks

When: Adapting to market changes, inventory needs

Transportation Management and Optimization

Why: Improved costs, sustainability, carrier management

How: Digitalization, optimization, predictive analytics

When: Real-time tracking, efficient routing, transportation modeling

Yard Management

Why: Enhanced yard efficiency, reduced idle times

How: Digital tracking, automated entry/exit, predictive analytics

When: Automating arrivals and departures, managing dock assignments and turnaround times

Returns and Reverse Logistics Management

Why: Reduced returns costs, increased customer lifetime value

How: Digital returns initiation, orchestration platform, self-service drop-off hardware

When: Automating policy enforcement, intelligent returns routing and processing

Connected hardware and automation

Why: Real-time data processing, decision-making capabilities

**How:** Blue Yonder Mobility & Automation computing devices and advanced analytics

When: Immediate data analysis and action

Overview: Order Management

Streamline Order Management for Seamless Customer Fulfillment

Order Management streamlines every phase of an order's journey, from inception through fulfillment and delivery. It ensures order accuracy, timely processing, and customer satisfaction. Integrating systems such as Warehouse Management allows for real-time inventory control, efficient resource allocation, and a smoother flow of goods to customers.

Business Values of Automation:
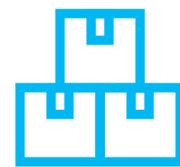
Enhanced Precision and Expediency

Streamlined Customer Experience

Reduced Cost to Serve

Use Cases in
Order Management
by Maturity Stages

Digitalization

Transforms manual and paper-based operations into streamlined, digital processes, enabling more efficient order handling and real-time inventory tracking.

- **Interoperability:**
  With open APIs and out-of-the-box adapters, enables end-to-end visibility of your supply chain by connecting key capabilities to your existing technology stack

- **Electronic Order Processing:**
  Streamlines order entry and processing through digital solutions, improving accuracy and efficiency.

- **Real-Time Inventory Management:**
  Tracks inventory levels across multiple channels and locations to accurately fulfill orders and reduce stockouts.

Optimization

The refinement of digital systems for maximum efficiency, ensuring supply chain alignment, and utilizing intelligent routing for order fulfillment.

- **Supply Chain Synchronization:**
  Aligns manufacturing and retail operations, synchronizing supply with demand to optimize stock levels and reduce carrying costs.

- **Smart Order Routing:**
  Automatically determines the best fulfillment locations for orders based on proximity, inventory availability, and customer preferences.

Predictive

Utilizes data analytics and machine learning to forecast future demands and inventory requirements, allowing for proactive adjustments to production and stock levels.

- **Customer Demand Prediction:**
  Utilizes historical sales data and trend analysis to forecast customer demand and adjust manufacturing and stocking strategies accurately.

- **Smart Replenishment:**
  Predicts stock replenishment needs using sales velocity and lead times to prevent overstocking and understocking scenarios.

Autonomous

Employs artificial intelligence (AI) and IoT technologies to facilitate independent order management and enhance customer service, minimizing the need for human intervention.

- **AI-Enhanced Customer Service:**
  Uses artificial intelligence (AI) to provide personalized customer service, including order updates and handling returns, improving the overall customer experience.

- **Intelligent Rebalancing:**
  Machine Learning (ML) powered engine that can re-sequence open demand based on dynamic and configurable business rules – like customer priority, first in first out etc. React to disruptions in microseconds.

Overview: Warehouse Management

Enhance Inventory Management and Distribution Efficiency in Warehouse

Warehouse Management manages inventory, optimizes warehousing, and coordinates order fulfillment and returns, ensuring product availability, efficient distribution, and reduced waste.

Business Values of Automation:
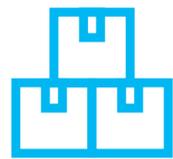
Inventory
Accuracy

Efficient
Throughput

Order
Fulfillment Speed

Use Cases in
Warehouse Management
by Maturity Stages

Digitalization

Utilizes electronic tracking for inventory management, monitoring returns to enhance accuracy in stock levels, order processing, and return handling.

- **Automated Inventory Management:**
  Streamlines complex inventory challenges, from product lifecycle to stock rotation and freshness, ensuring operations focus on execution, not just management.

- **Labor Management Efficiency:**
  Automates scheduling and real-time activity tracking, allowing staff to engage in value-adding activities and strategic oversight.

- **Precision Inventory Tracking*:**
  Integrates RFID and cameras to maintain accurate stock levels, critical for timely order fulfillment.

Optimization

Improves warehouse layout and automates picking processes, crucial for both expedited order fulfillment and efficient processing of returned goods, thereby reducing errors.

- **Workflow Automation:**
  Drives comprehensive work management automation, maximizing efficiency in warehousing operations.

- **Technological Synergy*:**
  Harnesses robotics to refine logistics, ensuring seamless operation and continuous improvement.

Predictive

Leverages sales data and return trends to forecast inventory and return volumes, ensuring optimal stock levels and preparedness for fluctuating demands in both sales and returns.

- **Responsive Logistics:**
  Enables proactive adjustments to logistical variances,maintaining operational continuity and meeting market demand.

- **Real-Time Transportation Visibility:**
  Transportation Management integration enables proactive inventory adjustments based on real-time changes in delivery ETAs and statuses.

Autonomous

Integrates robotic systems for storage and retrieval tasks and handling returns, progressively moving towards a fully automated warehousing environment that efficiently manages outbound and inbound logistics.

- **Mobility Solutions:**
  Utilizes mobility solutions to automate previously manual intensive warehouse tasks such as picking and sorting items and loading and unloading goods.

- **Robotic Process Advancements*:**
  Leverages modern robotics to replace labor-intensive tasks, advancing operational capabilities.

*Mobility & Automaton use case

Overview: Warehouse Execution System

Enhance Warehouse Synchronization with Real-Time Execution Control

Warehouse Execution System streamlines warehouse operations by synchronizing robotics and human tasks, using machine learning for efficient inventory management, process optimization, and enhanced fulfillment speed.
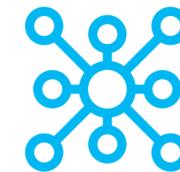
Business Values of Automation:

Enhanced
Operational Efficiency

Improved Fulfillment
Speed and Accuracy

Greater Scalability
and Adaptability

Use Cases in
Warehouse Execution System
by Maturity Stages

Digitalization

Automates task allocation based on current inventory and orders, streamlining warehouse workflows.

- **Workflow Precision:**
  Warehouse Execution refines task distribution between human workers and robots, ensuring precision and speed in retail and manufacturing settings.

- **Expert Robotics*:**
  Collaborations with elite robotics firms lead to task efficiency and innovation in fulfillment and logistics operations.

Optimization

Balances automated and manual tasks, ensuring efficient resource utilization and minimizing delays.

- **Resource Efficiency:**
  Warehouse Execution optimizes and prioritizes tasks, and interleaves labor and robotics management, crucial for just-in-time manufacturing and on-demand retail stocking.

- **Optimized Onboarding:**
  Increases the speed to onboard robotics from various vendors allowing for rapid ramp-up and seasonal adjustment.

Predictive

Uses real-time sales and inventory data to adapt workflows and meet changing demand patterns.

- **Demand-Driven Workforce Planning:**
  Warehouse Execution predictive analytics inform staffing needs, aligning with consumer demand cycles and production peaks.

- **Strategic Forecasting:**
  Provides foresight into resource and workload planning, essential formaintaining inventory flow and meeting market demand.

Autonomous

Employs advanced artificial intelligence (AI) to manage and optimize warehouse operations autonomously, responding instantaneously to operational changes.

- **Seamless Robotic Deployment:**
  Supports the agile introduction of robotics, vital for adapting to seasonal retail rushes or manufacturing surges.

- **Integrated Task Management:**
 Synchronizes labor and robotics, automating complex warehouse tasks between resources.

*Mobility & Automaton use case

Overview: Labor and Workforce Management

Maximize Workers Efficiency with Smart Labor and Workforce Management

Labor and Workforce Management optimizes staff scheduling and labor allocation, improving employee retention, operational performance and supporting sustainability by ensuring workforce efficiency and reducing resource overuse.
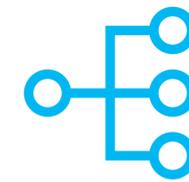
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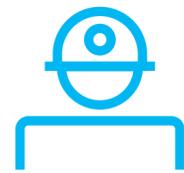
Labor Efficiency and Flexibility

Cost Management

Employee Satisfaction and Retention

Use Cases in

Labor and Workforce Management

by Maturity Stages

Digitalization

Implements digital scheduling and labor tracking, improving workforce planning and efficiency.

● **Seamless Schedule Access:**
Empower workforce mobility with digital access to schedules and personal preferences, ensuring information and managerial decisions are at the fingertips of employees on the retail and manufacturing floors.

Optimization

Analyzes labor requirements against production schedules and retail demands, ensuring optimal staffing.

● **Employee Preference Scheduling:**
Enable workforce customization by allowing employees to express scheduling preferences, improving morale and reducing turnover with more personalized shift planning.

Predictive

Projects future workforce needs based on production cycles and sales forecasts, enabling proactive labor management.

● **Predictive Workforce Planning:**
Anticipate labor demands with advanced forecasting, preparing for shifts in operational needs and enhancing workforce allocation in line with predictive analytics.

Autonomous

Integrates AI for automated workforce planning, reducing the need for manual scheduling and oversight.

● **AI-Driven Resource Allocation:**
Adopt AI-driven workforce distribution to fill resource gaps intelligently, benchmarking employee performance to uphold standards and optimize operational efficiency without extensive managerial oversight.
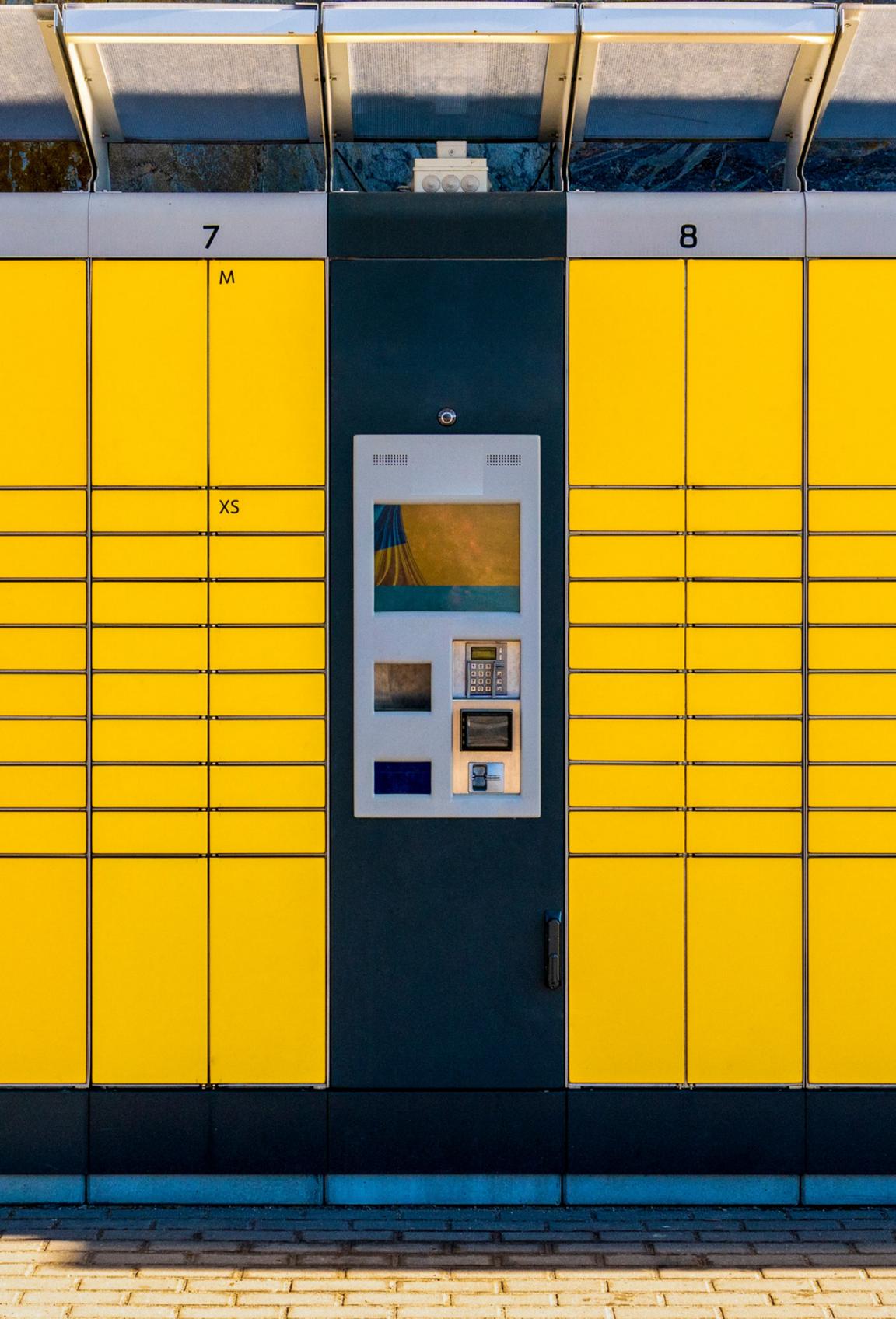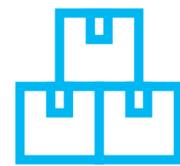
Overview: Micro-Fulfillment

Optimize Warehouse and Store Fulfillment for Agile, Sustainable Delivery

Micro-Fulfillment enables automation in warehouse operations, and store and direct-to-customer fulfillment, facilitating real-time decision-making and workflow optimization. It supports seamless last-mile delivery, curbside pickup, and buy online, pickup in-store (BOPIS), and adapts to changing consumer demands by customizing services through a microservices architecture.

Business Values of Automation:

Dynamic Inventory Management

Agile Fulfillment and Cross-Dock Strategies

Waste Reduction and Sustainable Operations

Use Cases in
Micro-Fulfillment
by Maturity Stages

Digitalization

Enhances warehouse and store fulfillment by digitizing operations, enabling comprehensive real-time tracking and efficient management of orders and inventory.

- **Seamlessly Transition to Mobile Operations:**
  Enables a smooth shift from manual workflows to mobile-enabled processes, fostering greater agility in operations.

- **Specialized Workflows:**
  Unlocks the ability to craft custom workflows through an expansive API suite, accelerating the deployment and delivery of value.

- **Streamlining Omni-Channel Fulfillment and Visibility:**
  Digitalization enables flexible omni-channel options such as BOPIS and curbside pickup, combined with efficient picking methods and clear visibility into store micro-fulfillment activities.

Optimization

Refines fulfillment strategies by adapting to real-time sales and inventory data. This ensures responsive and streamlined order processing, crucial for efficient micro-fulfillment operations.

- **Dynamic Warehousing Strategies:**
  Adapts warehousing strategies dynamically based on ongoing sales data for optimal inventory levels and efficient order processing.

Predictive

Employs advanced analytics to foresee shifts in consumer behavior and market trends, allowing for proactive adjustments in fulfillment plans. This anticipates the needs for both warehouse operations and store fulfillment.

- **Market Trend Analysis:**
  Employs predictive analytics to anticipate market trends for proactive inventory and fulfillment strategy adjustments.

Autonomous

Leverages AI to automate key aspects of inventory management and order processing, aligning operations with realtime market dynamics for seamless lastmile delivery and adaptive response to consumer demands.

- **Advanced Cross-Docking:**
  Facilitates a range of scenarios such as Consignee, Opportunistic, and Planned, enhancing customers' ability to expedite product handling until outbound shipment.

- **Inbound and Outbound Processing:**
  Empowers the quick turnaround of products through automated handling of inbound shipments and proactive order management, streamlining the distribution process.

Overview: Transportation Management and Optimization

Boost Transportation Efficiency and Sustainability Through Digital Innovation

Transportation Management and Optimization in Retail and Manufacturing optimizes transportation and freight costs, ensures timely deliveries, enhances sustainability through route optimization, and efficiently handles returns and reverse logistics.

Business Values of Automation:

Customer Service

Cost and Cash-to-Serve Efficiency

Delivery Reliability

Sustainability

Use Cases in
Transportation Management and Optimization
by Maturity Stages

Digitalization

Focuses on process improvement and workflow automation, streamlining the transportation lifecycle and enabling efficient management across multiple modes and regions.

- **Digitized Document Management:**
  Converts paper documents to digital for efficient order processing and compliance management.

- **Centralized Data Repositories:**
  Uses data lakes like Snowflake within the Blue Yonder platform to unify logistics data, improving strategic decisions and analytics.

- **Tender Management Systems:**
  Incorporates advanced software to automate tender processes, boosting load acceptance and execution.

- **Real-Time Visibility Systems*:**
  Employs IoT and Mobility & Automation solutions for real-time shipment tracking, vital for accurate inventory and planning.

Optimization

Analyzes shipping patterns, costs, modes, carriers, sustainability and other factors to optimize route planning and carrier selection, balancing cost-effectiveness, delivery speed, and efficient handling of returned goods.

- **Algorithmic Route Planning:**
  Utilizes algorithms for smart route planning, optimizing delivery schedules, reducing costs, and minimizing transit times.

- **Enhancing Load Optimization in Logistics:**
  Manufacturers, retailers, and logistics providers use data management and optimization for higher quality, efficient load creation, leading to quicker tender acceptance.

- **Data-Driven Load Optimization:**
  Applies analytics for effective load planning, promoting resource efficiency and sustainable operations.

Predictive

Employs data analytics and near real-time tracking to forecast transportation needs, adapting strategies in response to seasonal demand, supply chain disruptions, and return volume fluctuations.

- **Predictive Tracking and Alerts:**
  Incorporates IoT, Mobility & Automation devices for near-real-time monitoring of in-transit goods, enabling proactive measures to address potential delays or disruptions.

Autonomous

Utilizes AI for dynamic transportation management in retail and manufacturing, allowing real-time route adjustments, carrier selection, and mode optimization.

- **Automated Carrier Selection:**
  Deploys AI algorithms for autonomous selection of carriers, aligning shipping needs with carrier capabilities and cost-efficiency.

- **API-Led Transportation Management Interaction:**
  Uses APIs for integrating transportation management with ERP, order management, and warehouse management systems, automating end-to-end logistics workflows.

Mobility & Automation Related use case

Overview: Yard Management

Streamline Yard Operations with Advanced Management and Technology

Yard Management entails orchestrating logistics in facility yards, managing vehicle movements, automating and centralizing gate activities, and optimizing dock scheduling for enhanced operational efficiency.

Business Values of Automation:

Streamlined
Vehicle Handling
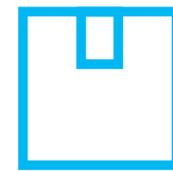
Enhanced Inventory
Management

Reduced
Turnaround Time

Use Cases in

Yard Management

by Maturity Stages

Digitalization

Implements electronic scheduling, gate-check and monitoring for vehicles in the yard, improving loading and unloading efficiencies.

- **Vision-Based Gate Check:**
  Implements computer vision with object recognition and machine learning to tag and monitor equipment at yard gates, providing accurate and faster throughput.

- **Digital Asset Identification:**
  Digitally monitors equipment, vital for reduced fees and fewer lost loads.

- **Dynamic Yard Mapping:**
  Maintains updated yard maps with equipment locations and statuses, enabling faster logistics turnaround.

Optimization

Automates yard tasks such as dock assignments and trailer moves to enhance operational flow and reduce dwell time.

- **Targeted Dock Scheduling:**
  Optimizes dock assignments, crucial for the rapid movement of finished goods and raw materials.

Predictive

Employs analytics to anticipate and avoid unnecessary fees and frustration.

- **Detention and Demurrage Forecasting:**
  Uses analytics to monitor equipment status and preemptively signal detection and dwell times, minimizing delays insupply chains and reducing unwanted fees and frustrations.

Autonomous

Integrates autonomous vehicle technology for self-managed yard operations, reducing manual processes.

- **Self-Sufficient Gate Check:**
  Employs camera-based gate check, backed by ML to autonomously check in equipment, speeding up vital entry and exit processes.

- **Automated Camera-Based Data Capture*:**
  Captures real-time visual data at yard entry and exit points to support autonomous identification, tracking, and decision-making.

*Mobility & Automaton use case

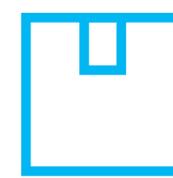Overview: Return and Reverse Logistics Management

Revolutionize E-Commerce Returns and Reverse Logistics with Advanced Solutions

Returns Management transforms e-commerce returns and reverse logistics with an intelligent, automated approach, providing businesses with cost-effective, value-maximizing solutions for complex return processes.
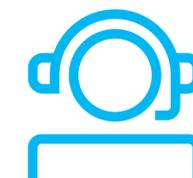
Business Values of Automation:
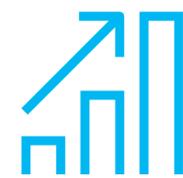
Efficient Returns Processing

Inventory Reintegration

Enhanced Customer Experience

22

Use Cases in

Return and Reverse Logistics Management

by Maturity Stages

Digitalization

Provides advanced digital platforms to simplify the initiation and processing of returns, reducing manual workloadand enhancing data accuracy.

- **Digital Returns Initiation:**
  Transforms returns initiation by allowing customers to self-serve through an intuitive digital journey that ensures returns policy is automatically enforced, rather than calling customer support, cutting costs and enhancing the consumerexperience for retailers, while ensuring efficient supplier returns for manufacturers.

Optimization

Employs configurable returns intelligence to automate optimal decision making for returns based on pre-sort data from initiation, enabling operational efficiencies and greater value realization.

- **Returns Route Optimization:**
  Optimizes returns logistics for cost-effective rerouting and faster restocking in retail and minimizes waste in manufacturing supply chains.

- **Item-level Customization:**
  Automates intelligent decision-making on an item-by-item basis using custom configurable rules drawing on data like item SKU, category, dimensions, return reason and location, ensuring the optimal shipping destination and service is used to maximize value recovery and efficiency.

Predictive

Implements analytics tools to effectively predict volumes of returns, enabling retailers and manufacturers to manage return flows and resource allocation strategically.
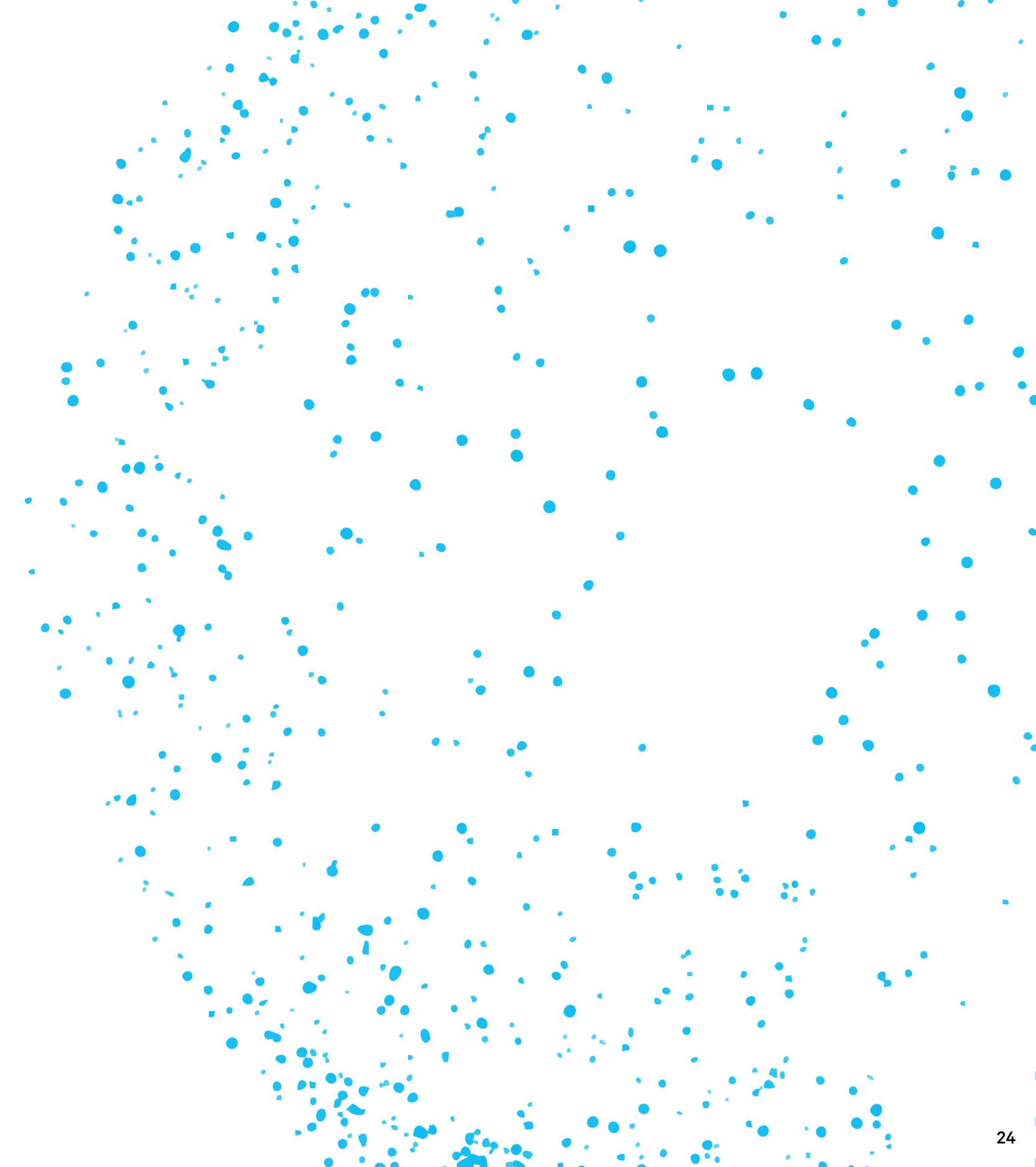
- **Predictive Returns Forecasts:**
  Understands incoming returns volumes before they reach the warehouse, allowing for precise resource allocation for processing and real-time inventory visibility to avoid over-replenishment.

Autonomous

Features self-service return kiosks and extensive pick-up, drop-off (PUDO) networks, simplifying operations and enhancing customer experience in retail and manufacturing.

- **Autonomous Returns Processing:**
  Introduces self-service kiosks for hassle-free retail returns and automated sorting for manufacturing, improving speed and customer satisfaction.

In the fast-paced world of retail and manufacturing, embracing automation in logistics operations is key to staying ahead. This transformation goes beyond just adapting; it is about leading the industry towards greater efficiency and stronger customer focus. Businesses in these sectors are paving the way to a future where innovation, adaptability, and customer-centricity define success.

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