Binary Stream

Whitepaper:

A guide to consumption-based supply chains in healthcare

Healthcare Materials Management

BY BINARY STREAM SOFTWARE

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Executive Summary

Healthcare organizations today face a myriad of challenges that can often seem overwhelming. Among these, the escalating costs of materials purchasing stand out, significantly impacting budgets. Despite this financial strain, it is imperative for management to operate efficiently, ensuring the lowest possible cost per patient without compromising quality.

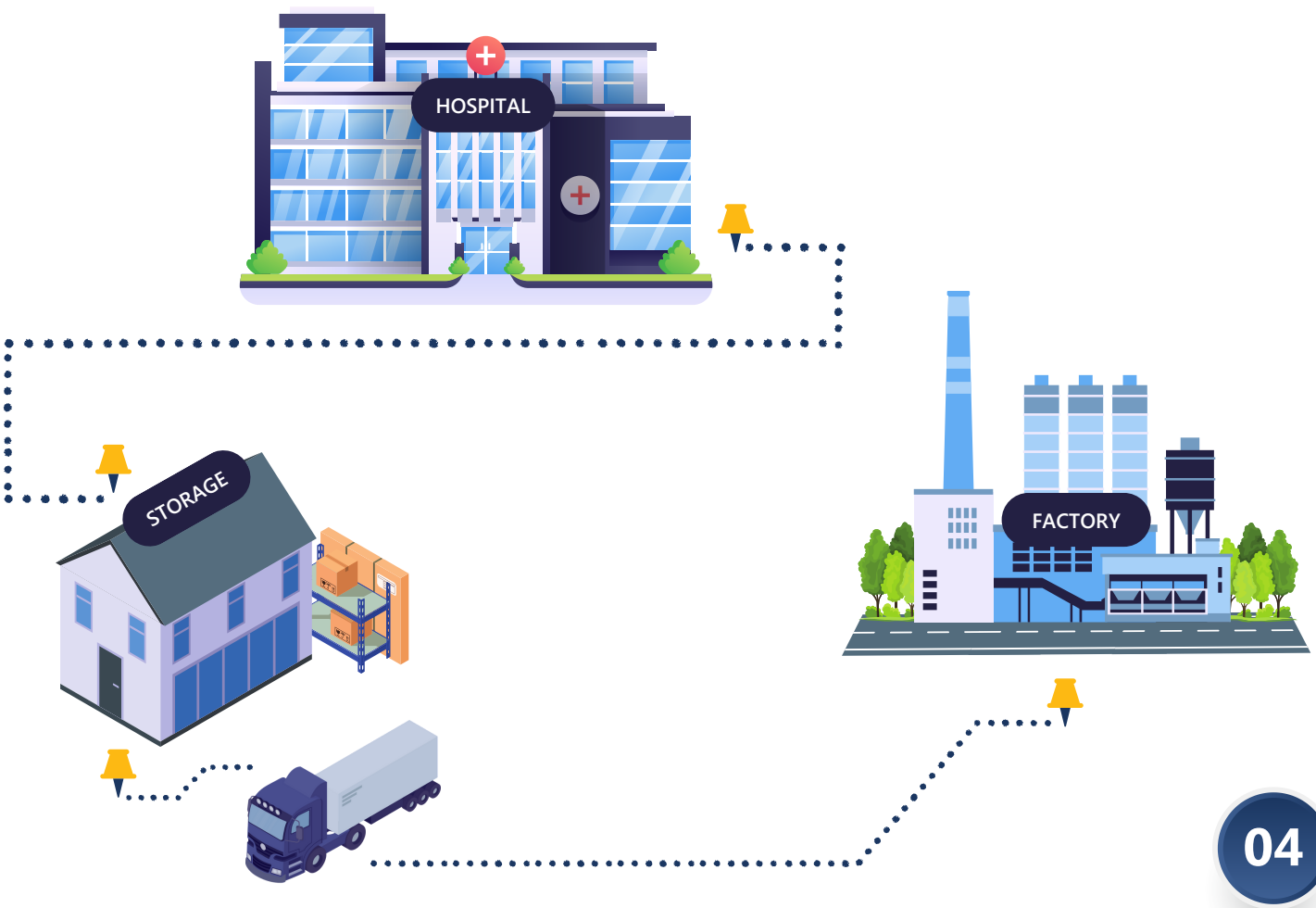
This whitepaper delves into the intricacies of consumption-based supply chains within the healthcare sector and addresses the most pressing challenges organizations face. We highlight strategic solutions to these complexities by identifying the core issues currently impacting healthcare. Furthermore, we detail the primary functional areas of material workflows, the common difficulties encountered, and best practices for optimizing and streamlining your healthcare supply chain.

Who should read this whitepaper?

This whitepaper is essential reading for healthcare organizations that make substantial investments in materials for their daily operations. Senior management, who often bear the responsibility of addressing many of the issues discussed, will find the insights particularly relevant. However, the paper is valuable to anyone interested in tackling the complexities of supply chain management in today's healthcare industry.

The business of healthcare

The healthcare landscape has undergone significant transformation over the past decade. While the primary mission of healthcare remains to alleviate the pain and suffering of others, it is also undeniably a business. To thrive amidst rising costs, healthcare organizations must adopt a business-oriented mindset. By maximizing resource utilization and minimizing overheads, both for-profit and non-profit organizations can ensure the delivery of the highest-quality care to the greatest number of patients.



Primary cost drivers in healthcare

The primary cost drivers in healthcare are comparable to those in other industries. Both human labor and materials consumption are essential to running operations and delivering the required services for patient care. The largest single expense is labor, encompassing wages and salaries. The second-largest cost category is materials, which includes daily consumables and items with long-term usage lifespans.

In recent years, the management of material resources has come under increased scrutiny, emphasizing the need for more efficient and effective supply chain practices.

> "85% of healthcare executives identify enhancing supply chain management as a top priority to improve operational efficiency and reduce costs."
>
> **Addressing supply-chain vulnerabilities in healthcare systems (McKinsey, 2022)**
>
> "79% of healthcare executives cite operational efficiency as a critical area of focus, with supply chain management being a key component of this initiative."
>
> **The future of health: How COVID-19 has accelerated the transformation in healthcare (Deloitte, 2020)**

Key questions in managing materials consumption in healthcare

At the core of effective materials management and supply chain optimization in healthcare are two critical questions:

1. **What is the necessary level of care that dictates the materials required by the organization?**
2. **How can this required level of care be achieved while minimizing the total cost of materials?**

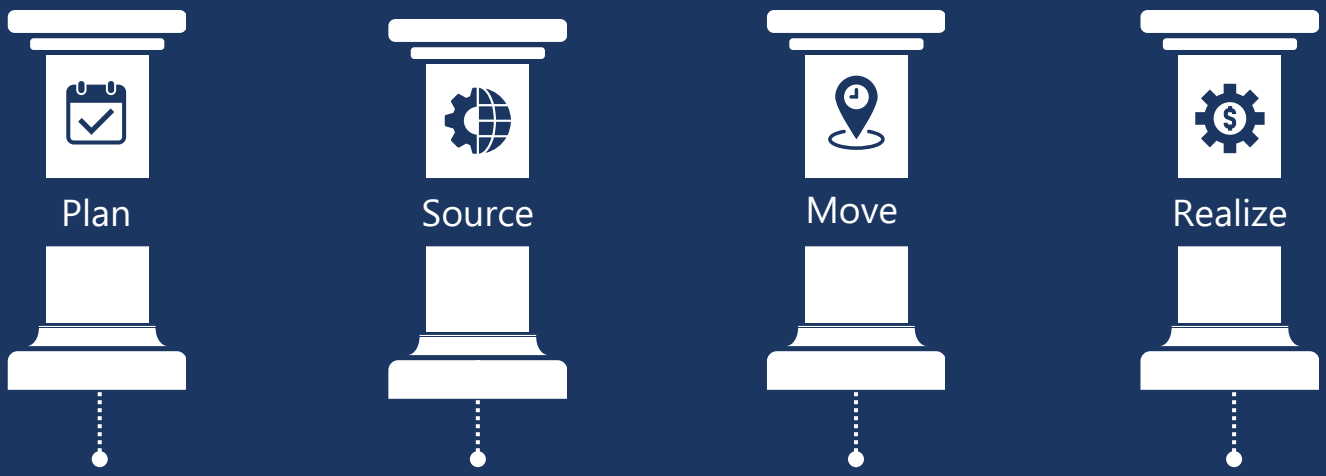
This whitepaper delves deeper into the second question, exploring strategies and best practices to reduce material costs without compromising the quality of care. We examine how consumption-based supply chains can be leveraged to achieve cost efficiencies and enhance overall operational performance.

Best practices in healthcare supply chains

Navigating supply chains in the healthcare sector presents unique challenges due to the varying types and levels of healthcare providers. For instance, the materials management strategies that are effective in a hospital setting might not be applicable to a physician's clinic.

Finding comprehensive guidance for healthcare materials practitioners can be difficult, as most resources tend to focus on specific strategic areas, requiring practitioners to piece together the optimal model for their unique environments.

One notable framework is outlined in the "Performance Metrics" report from the Association for Health Care Resource & Materials Management (AHRMM) published in 2023. This report proposes a 4-pillar vision for optimizing healthcare supply chains:



Enable informed decision-making through effective anticipation of product supply and demand.

Achieve excellence in strategic and transactional interactions with end-users and suppliers, facilitated by advanced supply chain tools and processes.

Ensure the right product is delivered to the right place at the right time, enhancing responsiveness and efficiency.

Drive supply chain efficiencies through integrated supply chain payables and eCommerce solutions.

These strategic pillars are fundamental to the functional areas discussed in the following section, providing a robust framework for enhancing supply chain performance in healthcare.

Functional areas in healthcare materials management

Healthcare materials management is crucial for delivering patient care at the desired level while minimizing costs. To effectively manage materials, it is essential to break down healthcare materials management into its functional, operational elements to identify the specific challenges and opportunities for improvement.

Understanding these functional elements helps in devising targeted solutions. In this context, we will examine how software applications like Binary Stream's Healthcare Materials Management solution can support and optimize a busy materials management environment.

				
Consumption areas	**Materials acquisition areas**	**Fulfillment areas**	**Distribution areas**	**Reporting and finance areas**
such as nursing units or clinical departments that need to requisition the materials they need.	that procure materials, such as the purchasing department.	where materials are received or fulfilled as required.	which organize how materials are issued and distributed to each consumption site for use in patient care.	that report on current inventory levels on a site-to-site basis, item usages, and forecast into the future using cost reports, determining the operations' financial implications.

Key healthcare supply chain requisitioning challenges

The requisitioning of materials to various consumption sites within a dynamic healthcare organization presents several challenges. These challenges include:

Challenge: High cost of licensing users for supply chain software

A large number of personnel within the organization need to requisition materials as required for patient care. These individuals often lack knowledge about the origins of these materials or the most efficient and cost-effective methods for obtaining them. Their primary concern is fulfilling immediate patient care needs. The sheer number of users needing access to the requisition system translates into significant software licensing costs, which organizations strive to minimize.

Solution: Minimize licensing costs through third-party integration

To mitigate the high costs associated with user software licenses, Binary Stream Software enables the integration of Healthcare Materials Management with best-of-breed, third-party, internet-based requisition applications. This integration allows numerous requisition users to request items through the system at a substantially reduced cost.

The impact of centralized requisitioning on process improvement and cost reduction

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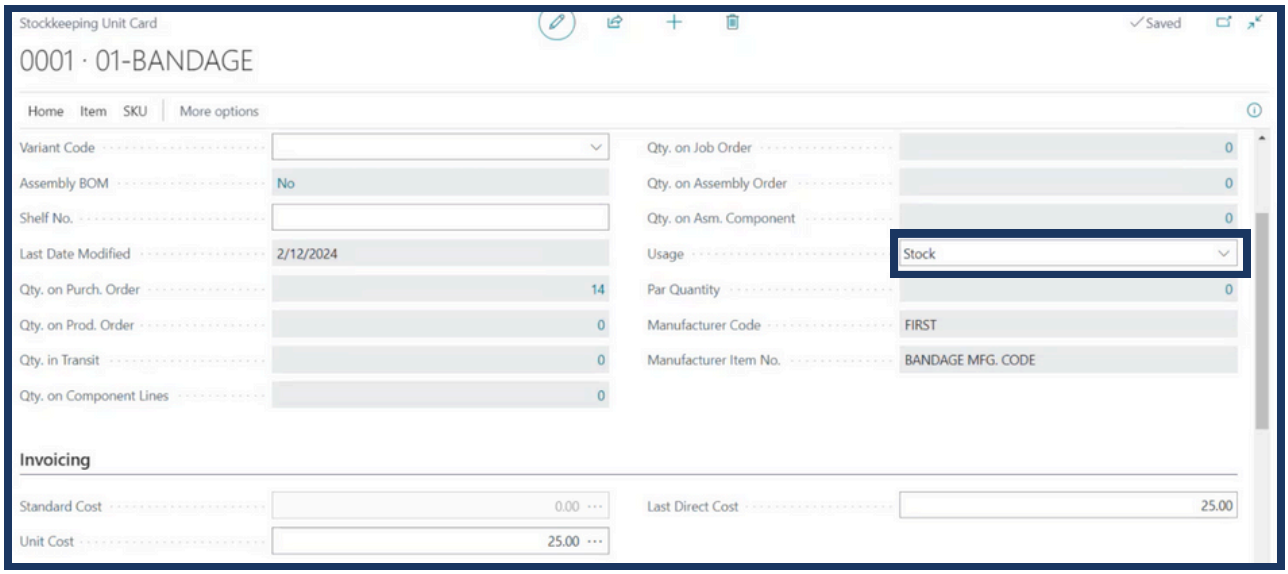
In a centralized mode, third-party requisition applications serve solely to forward “approved” requisitions to purchasing. In doing so, the system identifies whether the item is typically kept in stock (designated as a “stock” item) or if it must be sourced from a vendor because it’s not kept in stock (referred to as a “non-stock” item). This approach helps streamline processes and reduce costs.

Challenge: Decentralized systems can lead to supply chain bottlenecks

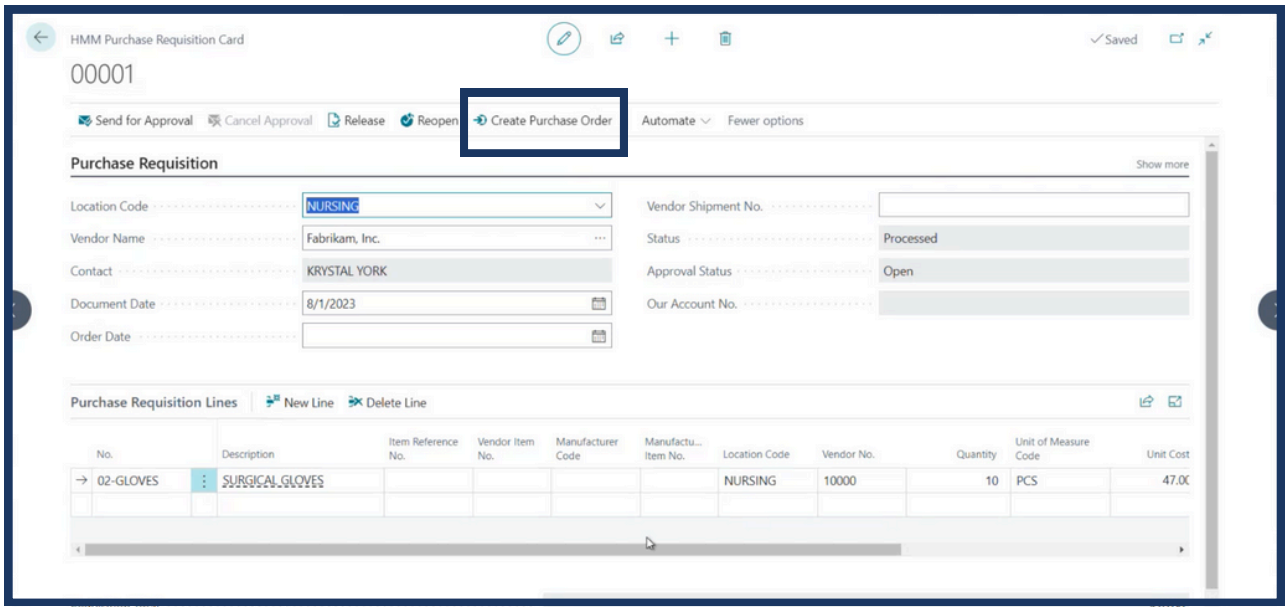
Many healthcare facilities operate around the clock and may require a blend of centralized and decentralized approaches to deliver materials to patients promptly.

Solution: Hybrid solutions that accommodate both centralized and decentralized processes

Healthcare Materials Management software can function in both centralized and decentralized modes. With the aid of a third-party requisition application, material requests can undergo swift procurement cycles. Users can order goods directly through these web-based applications, circumventing the more centralized procedures of centralized purchasing. The purchases made still integrate seamlessly into the rest of the system as required.



Stock items are routed from an inventory "site" within the organization with the item requested, disregarding the need to purchase them unless they are out of stock from the replenishment site. An approved requisition with a non-stock item— which is not kept in stock— gets sent immediately to a PO Preview queue that allows buyers to purchase it.



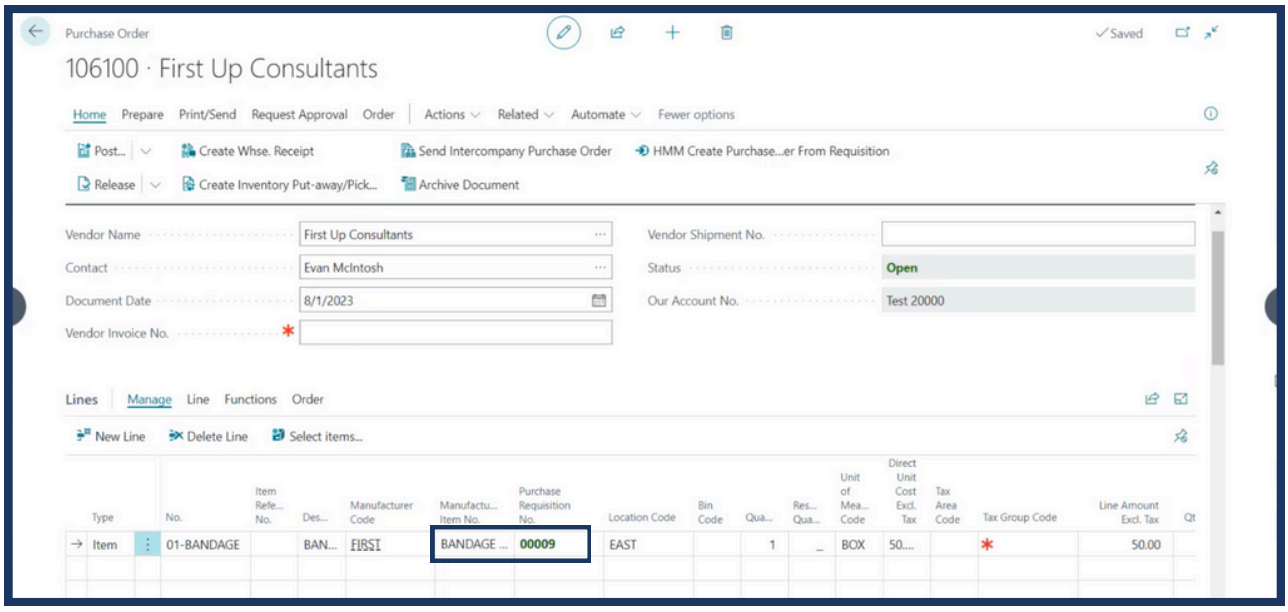
Due to the financial ramifications of the requests, approval processes may be needed before such materials requests can be fulfilled. The approval processes of the third-party requisitioning packages are embedded in each product. They send email notifications to each approver. The approval process works typically on dollar amounts/limits.

Procurement

Healthcare Materials Management can work in both a decentralized procurement mode or a centralized purchasing mode, as illustrated above. The remainder of this paper will focus solely on using Healthcare Materials Management in a centralized mode. Consumption-based procurement operates typically in two distinct workflows: order specific goods from a user requisition and order goods to replenish an inventory site. Let's take a closer look at each.

1. Ordering specific goods from a user requisition

Once an approved requisition reaches purchasing (for example, a non-stock item), it can either be purchased directly through PO Preview or procured through the PO Entry interface shown below.



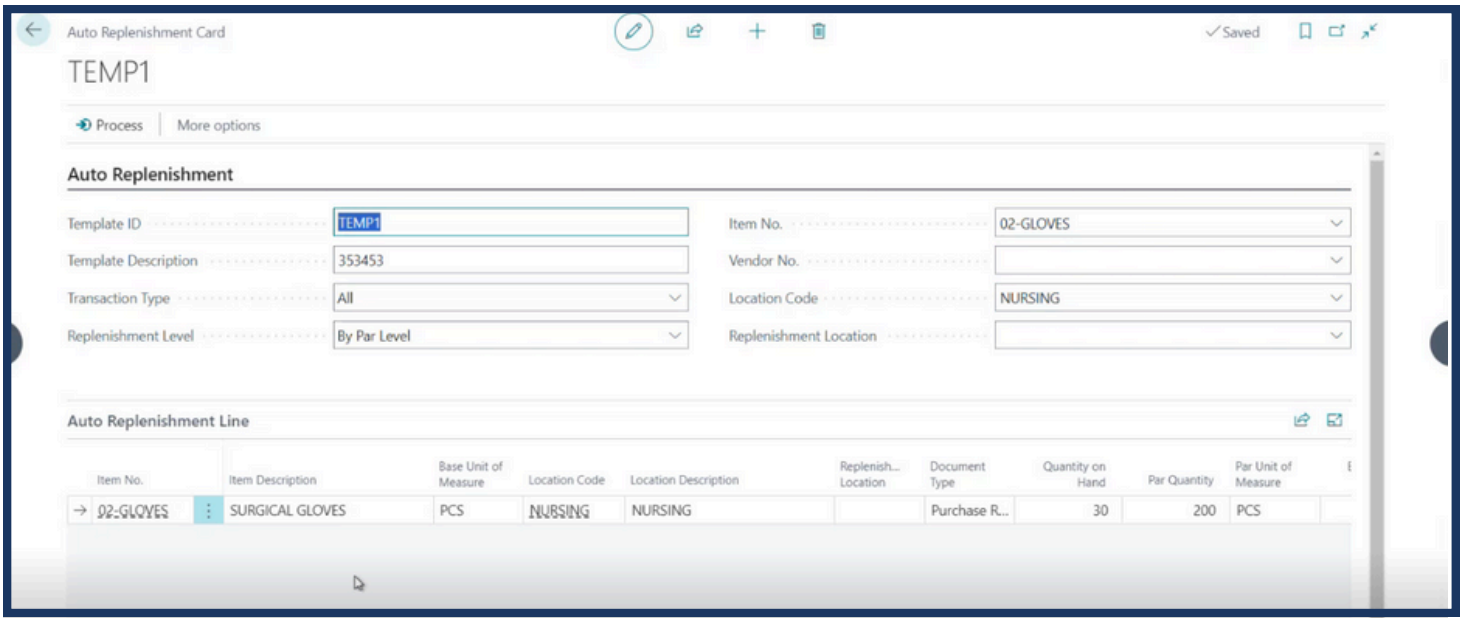
Note the following features specifically designed for busy healthcare situations

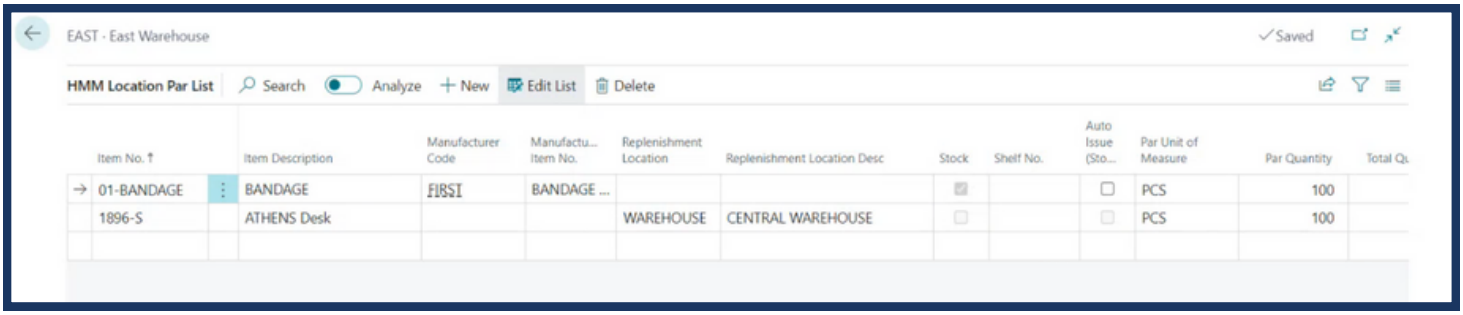
PO document types:	You can define different kinds of POs. For instance, you define a PO type for typical consumables, another for capital projects or maybe another for items that come from requisition requests as per the above example (a "REQ" PO type).
Site ID/facility:	The specific inventory "site" and specific facility associated with the PO project type, whether the PO should be assigned to a specific capital project or not.
Unit of Measure (U of M):	On every PO, the purchasing U of M is defaulted. In this example, a case with six boxes of six each (CS/6/6).

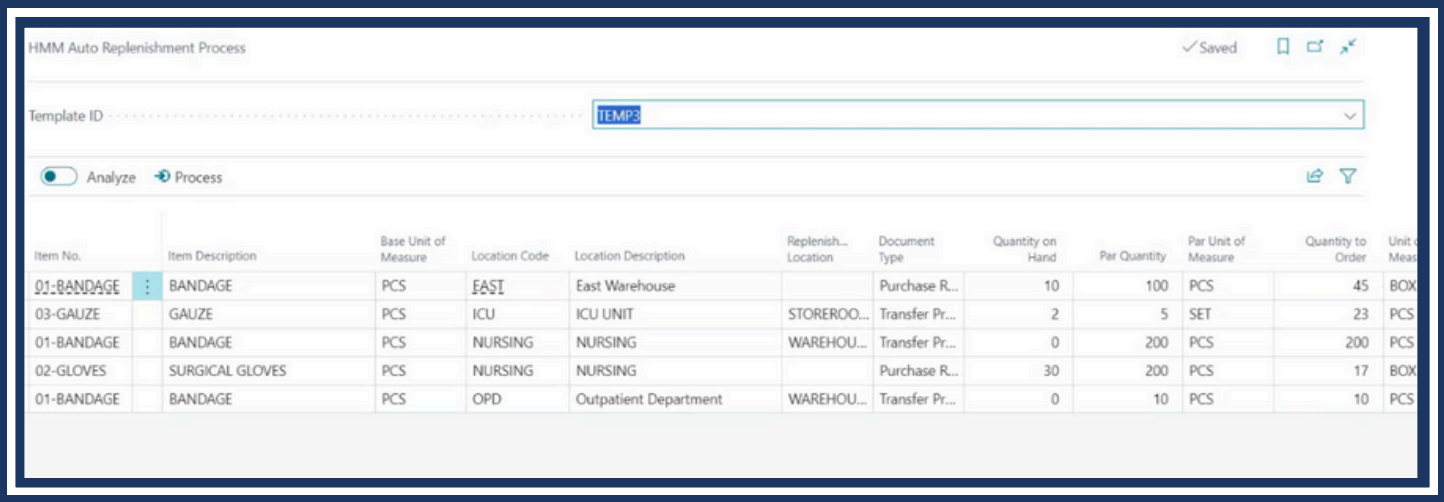
2. Ordering goods to replenish an inventory site

This is also known as site replenishment. Better materials systems should have an automated way to replenish sites from their existing stock levels to the desired level – whether it be minimums, maximums, par levels (which we will detail later), etc. Healthcare Materials Management provides this functionality and more. One inventory site can be replenished all at once or many times. Restock items from locations within the organization. Others must be purchased from outside vendors.

Once many POs have been generated during a heavy day of purchasing, and through the mass PO automation shown above, Healthcare Materials Management automates each PO generation.







Item No.	Item Description	Base Unit of Measure	Location Code	Location Description	Replenish... Location	Document Type	Quantity on Hand	Par Quantity	Par Unit of Measure	Quantity to Order	Unit ... Meas
01-BANDAGE	BANDAGE	PCS	FAST	East Warehouse		Purchase R...	10	100	PCS	45	BOX
03-GAUZE	GAUZE	PCS	ICU	ICU UNIT	STOREROO...	Transfer Pr...	2	5	SET	23	PCS
01-BANDAGE	BANDAGE	PCS	NURSING	NURSING	WAREHOU...	Transfer Pr...	0	200	PCS	200	PCS
02-GLOVES	SURGICAL GLOVES	PCS	NURSING	NURSING		Purchase R...	30	200	PCS	17	BOX
01-BANDAGE	BANDAGE	PCS	OPD	Outpatient Department	WAREHOU...	Transfer Pr...	0	10	PCS	10	PCS

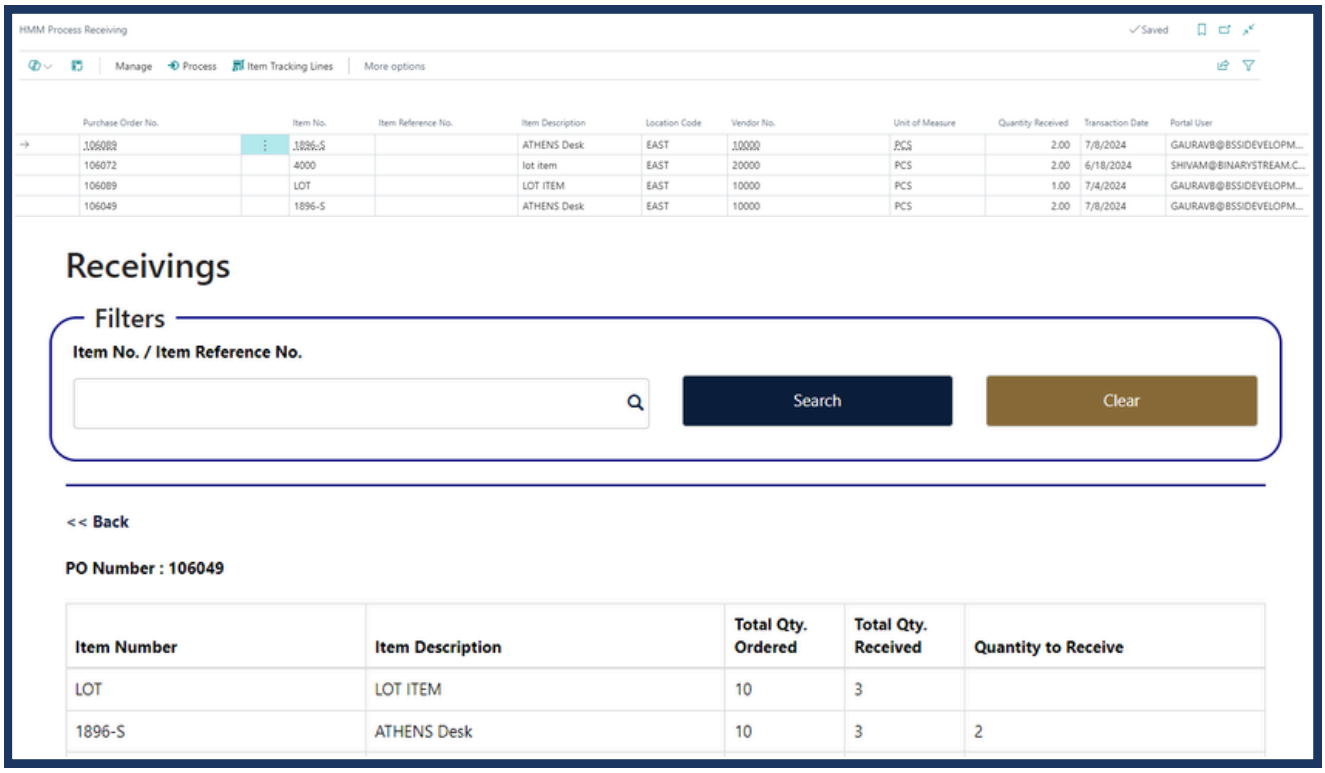
There are many different transmission methods from Email to Fax, EDI, etc. All selected POs will be sent off to the individual supplier(s)) by selecting the appropriate lines and processing. Once sent, the PO status changes from "New" to "Released" in Microsoft Dynamics 365 Business Central.

Fulfillment

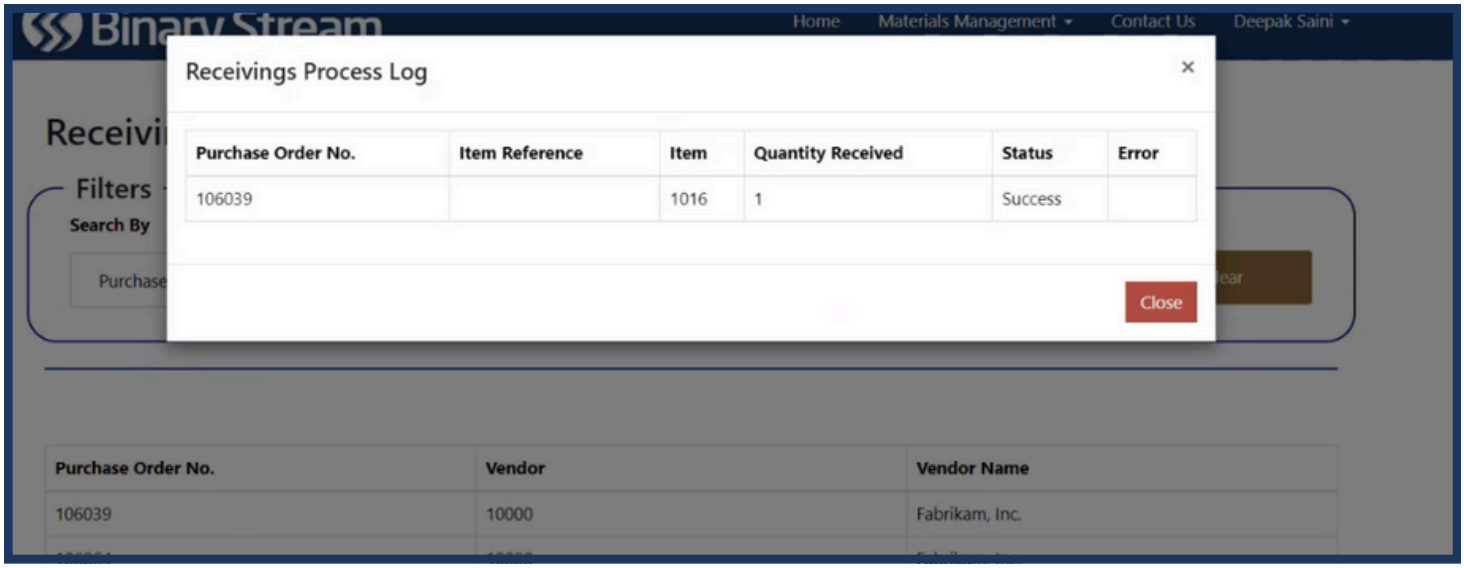
Fulfillment covers the receiving of goods into the organization and inventory site maintenance and par-level maintenance. It also utilizes handheld scanners as they are now prevalent in busier healthcare environments to streamline busier receiving areas.

1. Receiving

The receiving of goods in a typical consumption-based organization has two facets: the physical receiving of the goods and the delivery of such goods to specific consumption sites "on receipt" in some cases.

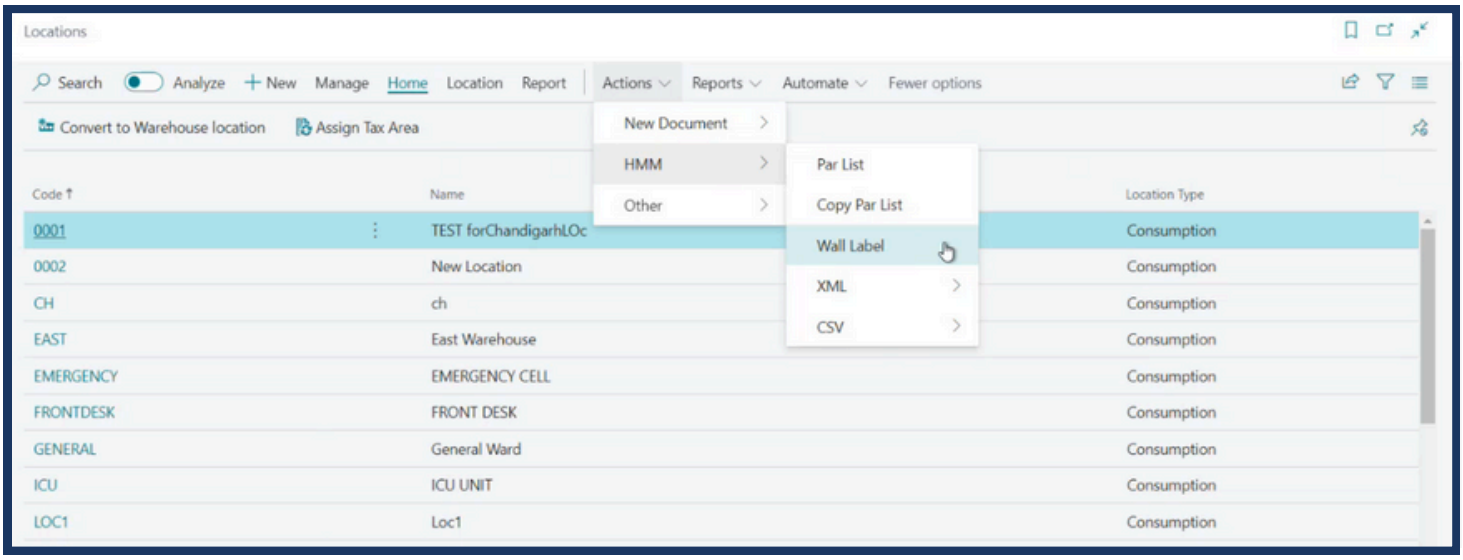


Auto-Receiving allows users to receive goods over many lines/many POs very quickly. Goods received but destined for immediate shipment to a consumption department can be instantly sent with a delivery ticket. Labels needed to put goods into central supply locations or to identify goods can be instantly run on demand during the receiving process.



2. Inventory site maintenance

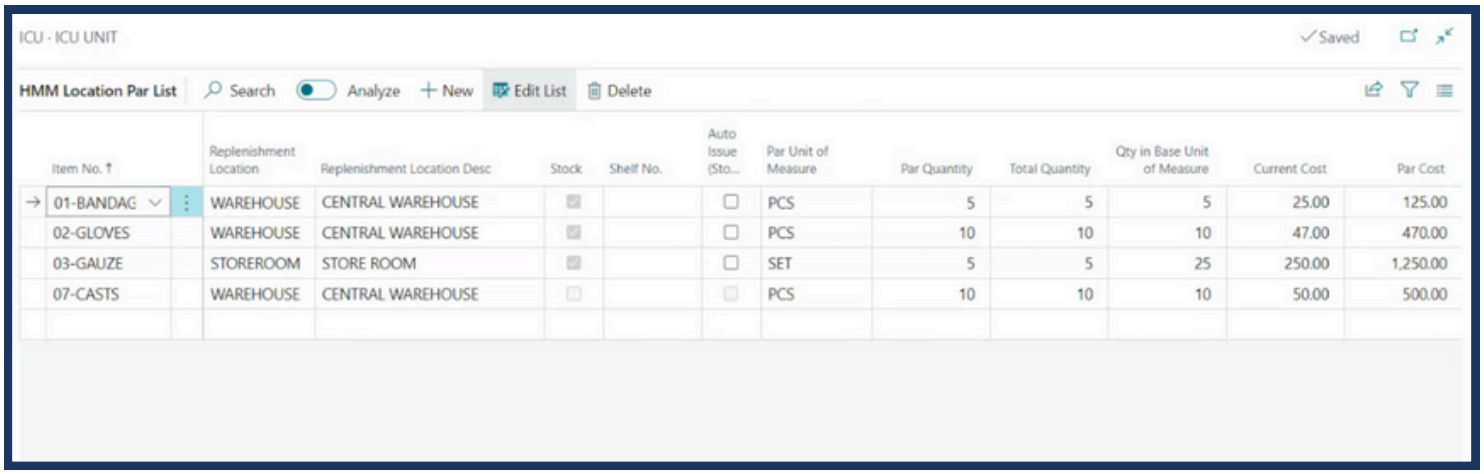
Inventory sites in healthcare have many functions. They can be as small as a nursing cart on a floor that only dispenses materials to patients. They can be used to both dispense and replenish materials.



Sites can have their items controlled at Par levels, can have the right to requisition goods in decentralized modes, to act as a replenishment site and to be replenished by a (default) replenishment site. Whether a site is a small nursing cart or a large central store, Healthcare Materials Management handles them through the same interface.

3. Par level maintenance

Par level is a concept used extensively in healthcare. It is an arbitrary amount/ inventory level of any item in stock and represents the desired inventory level for an item at a site. It may be different than a maximum number, a minimum number or an average. It is what the organization feels that they must carry to ensure proper patient care.



Item No.	Replenishment Location	Replenishment Location Desc	Stock	Shelf No.	Auto Issue (Sto...)	Par Unit of Measure	Par Quantity	Total Quantity	Qty in Base Unit of Measure	Current Cost	Par Cost
01-BANDAG	WAREHOUSE	CENTRAL WAREHOUSE	☑		☐	PCS	5	5	5	25.00	125.00
02-GLOVES	WAREHOUSE	CENTRAL WAREHOUSE	☑		☐	PCS	10	10	10	47.00	470.00
03-GAUZE	STOREROOM	STORE ROOM	☑		☐	SET	5	5	25	250.00	1,250.00
07-CASTS	WAREHOUSE	CENTRAL WAREHOUSE	☐		☐	PCS	10	10	10	50.00	500.00

Sites can control items at par levels, can have the right to requisition goods in decentralized modes, act as a replenishment site, and be replenished by a (default) replenishment site. Whether a site is a small nursing cart or a large central store, Healthcare Materials Management handles them through the same interface

Handheld devices and barcoding

One of the fastest-growing areas in hospital materials management today is handheld devices with barcode scanners. They make product recognition quick and straightforward while still reducing errors. While warehouse workers primarily use handheld scanning devices in central stores, many more are being used at the consumption site level to keep current inventories in balance and issue goods to patients.

Consumption/Issuance:

We've discussed the challenges associated with delivering materials to the patient's bedside. However, the process of "issuing" these goods presents its own set of difficulties for modern healthcare centers.

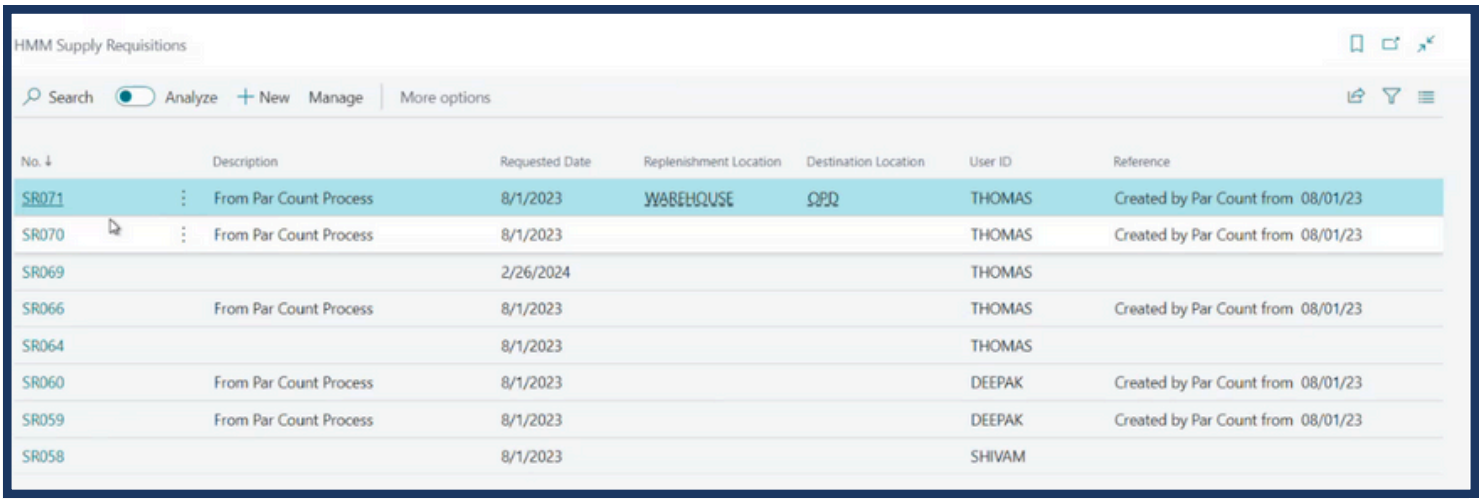
Many healthcare organizations grapple with the timing and method of expensing or relieving goods from inventory. The issue lies in control. Numerous healthcare organizations lack the workflows to immediately expense goods from a consumption site inventory to a patient, i.e., perpetual inventory control. The primary responsibility of staff at healthcare consumption sites is patient care, not inventory management.

Many healthcare organizations continue to manage smaller consumption site inventories on a periodic basis. In essence, unless an inventory count is taken and the difference is written off against the inventory in the financial system, the actual items in inventory versus what the computer indicates are almost always inaccurate.

Many healthcare organizations employ an "issue" transaction when they receive goods from either a supplier or another inventory site. An issue transaction implies that as soon as a consumption site receives the goods, they must be expensed—not recorded in the inventory valuation. This approach allows the organization to expense everything as quickly as possible, meaning they only need to conduct year-end inventory counts at each consumption site.

While this may seem like a straightforward and efficient solution, many healthcare organizations still demand greater control over their inventory. While the above solution addresses accounting issues, it does not tackle inventory control, shrinkage, or lost charges. These are areas where many healthcare providers still seek more control.

Binary Stream's Healthcare Materials Management can accommodate both scenarios—those using expensed "issue" transactions and those desiring inventories to be transferred to inventory sites and then expensed as they are consumed. This flexibility allows healthcare organizations to choose the approach that best suits their operational needs and control requirements.



No.	Description	Requested Date	Replenishment Location	Destination Location	User ID	Reference
SR071	From Par Count Process	8/1/2023	WAREHOUSE	OPD	THOMAS	Created by Par Count from 08/01/23
SR070	From Par Count Process	8/1/2023			THOMAS	Created by Par Count from 08/01/23
SR069		2/26/2024			THOMAS	
SR066	From Par Count Process	8/1/2023			THOMAS	Created by Par Count from 08/01/23
SR064		8/1/2023			THOMAS	
SR060	From Par Count Process	8/1/2023			DEEPAK	Created by Par Count from 08/01/23
SR059	From Par Count Process	8/1/2023			DEEPAK	Created by Par Count from 08/01/23
SR058		8/1/2023			SHIVAM	

Materials can be sent either as an expensed issue transaction to a site or a more typical inventory transfer, meaning that it can be expensed later in the consumption site.

Lost charges

Many healthcare organizations wrestle with inventory shrinkage. For example, your inventory should have ten in stock, but you only have five on the shelves.

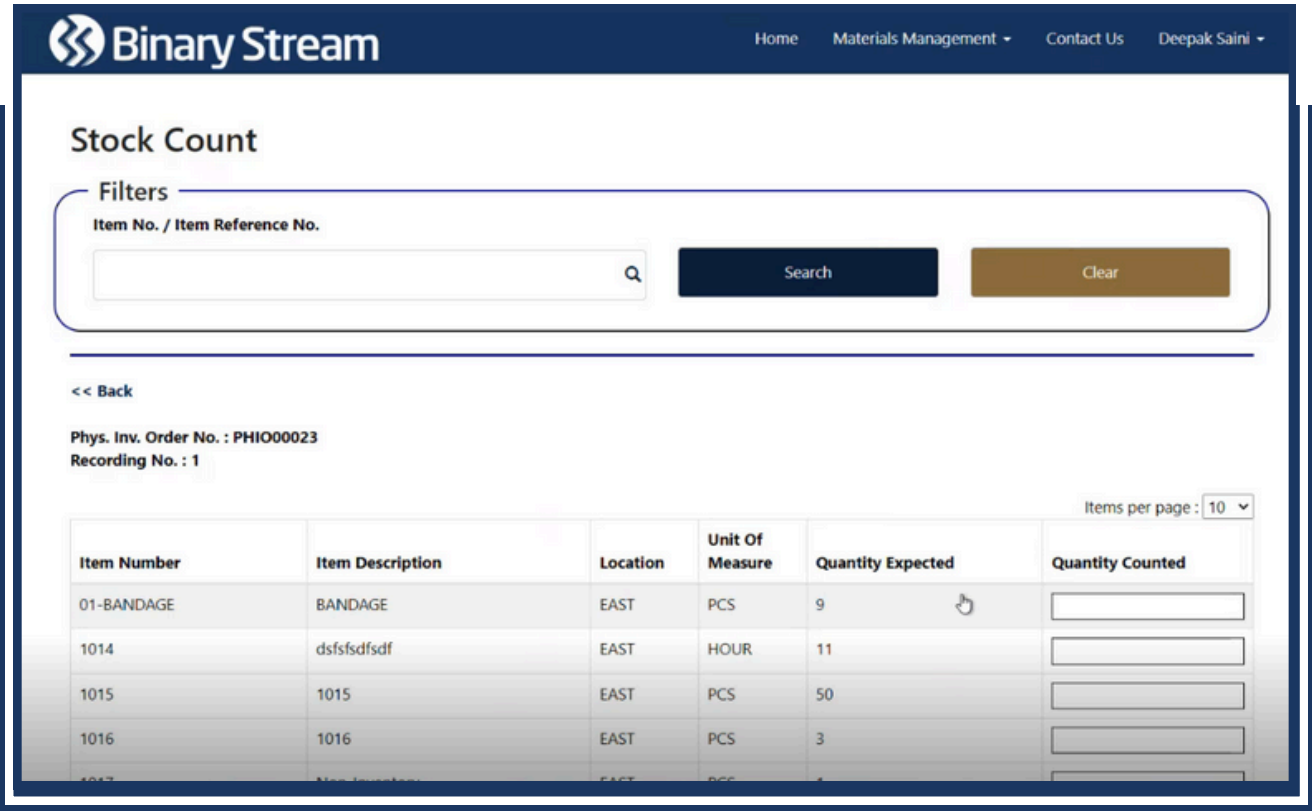
In many busy and for-profit healthcare environments, materials can get used in many ways and become unaccounted for. While theft is always a prevalent issue, defective items, spoiled or expired items sometimes get disposed of in consumption areas and do not get accounted for or relieved from computer inventory balances.

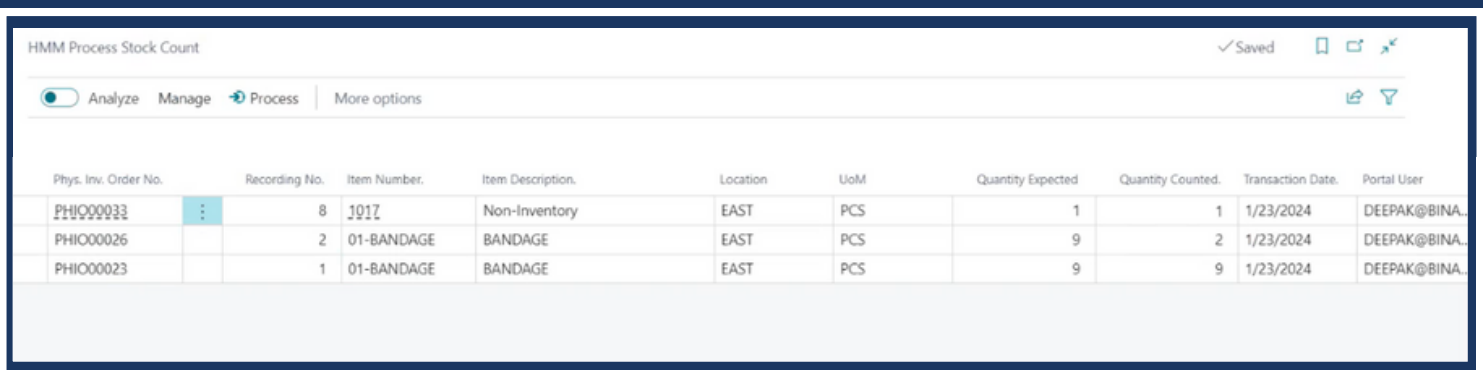
In for-profit healthcare situations, inventory shrinkage due to items physically consumed but not issued off computer item balances is called Lost Charges. For example, if we start with an inventory balance of ten units and three are billed out to patient care, we should balance seven remaining. If we do a stock count and find that only five remain, we have potential lost charges of two.

So, the question is then how healthcare organizations bring in data from a billing software package and blend it with materials data? While the data can be extracted manually when the amount of data is small, what happens when you need to analyze data over many items?

Completing an inventory count

Inventory counting in Healthcare Material Management typically involves the use of specialized handheld devices equipped with barcode scanners. The HMM portal allows users to log in, select a location and an item, scan inventory, verify count and submit count data back to MS D365 Business Central. To reconcile any discrepancies between the physical count and the recorded inventory levels, HMM will leverage Business Central functionalities by generating and posting Physical Inventory Orders.





Phys. Inv. Order No.	Recording No.	Item Number.	Item Description.	Location	UoM	Quantity Expected	Quantity Counted.	Transaction Date.	Portal User
PHIO00033	8	1017	Non-Inventory	EAST	PCS	1	1	1/23/2024	DEEPAK@BINA...
PHIO00026	2	01-BANDAGE	BANDAGE	EAST	PCS	9	2	1/23/2024	DEEPAK@BINA...
PHIO00023	1	01-BANDAGE	BANDAGE	EAST	PCS	9	9	1/23/2024	DEEPAK@BINA...

eCommerce and EDI

Recent materials management reports have demonstrated distinct financial benefits and patient care advantages in implementing eCommerce and EDI. As in requisition management, Healthcare Materials Management produces integration to eCommerce and EDI in a best-of-breed approach. eCommerce functionality is handled through the "punch-out" capabilities provided through our approved requisition management vendors. EDI functionality is dealt with through approved integration to best of breed EDI vendors.

"Matt Burns, Director eCommerce Solutions at Premier discusses the $200B explosion of health care supply chain e-commerce usage during the two years since the COVID-19 pandemic began and the variety of ways organizations are using it to increase revenue and improve transparency and operations management."

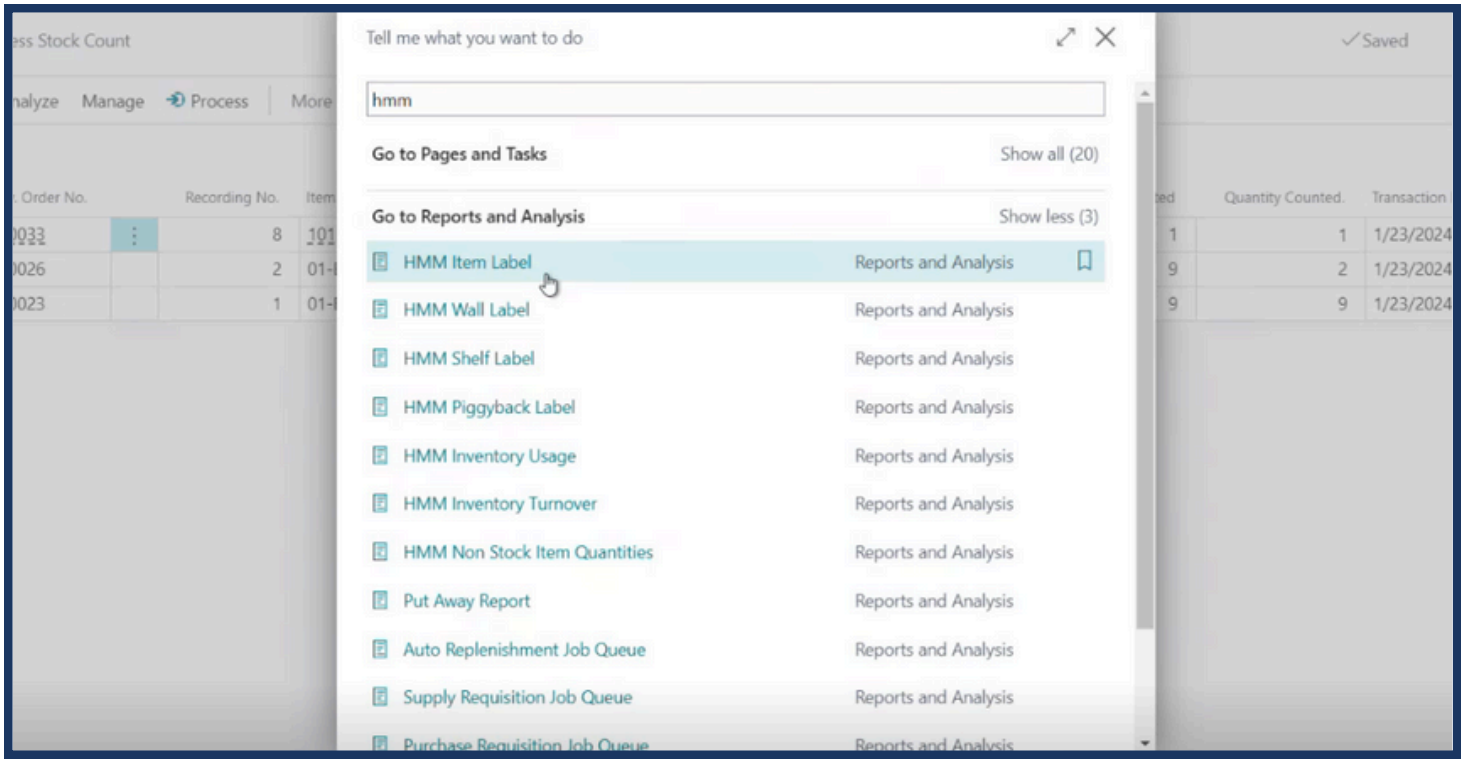
How e-Commerce is Transforming the Health Care Supply Chain, 2023

Reporting

The backbone of any materials management system is its capacity for comprehensive insights, a feature that is increasingly becoming a focal point in modern supply chains.

Effective analytics in materials management go beyond merely assessing past performance. It should serve as a predictive tool, enabling proactive management for the future. This concept aligns with the “Performance Metrics” report from the Association for Health Care Resource & Materials Management (AHRMM). The report’s first pillar, “functional vision,” emphasizes planning as "informed decision-making achieved through effective anticipation of product supply and demand.”

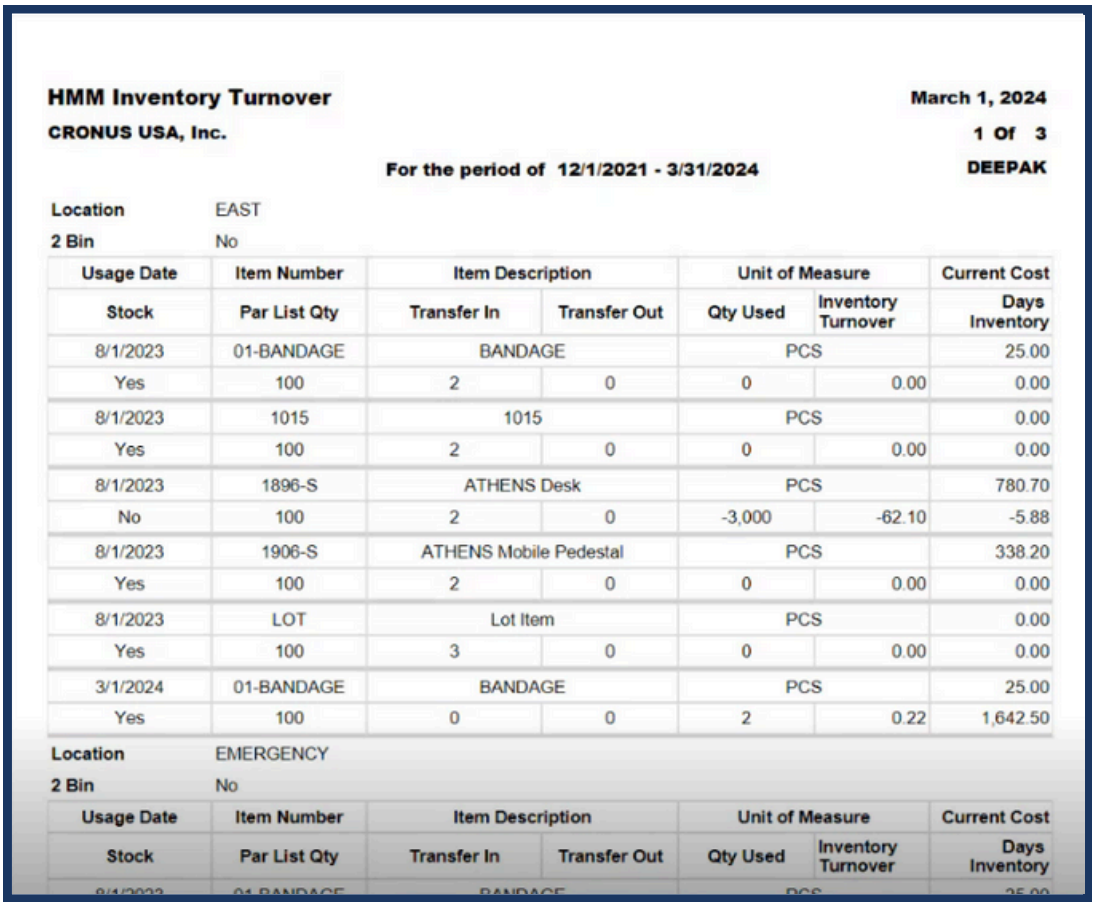
This statement underscores the importance of both supply and demand. While most of this discussion has focused on the supply aspect, what does the demand side involve? In healthcare, demand typically revolves around historical material usage or consumption patterns to predict future needs.



Item usage reports can be generated for a single site or multiple locations, based on specific time frames or across various items. The majority of reporting interfaces in Healthcare Materials Management can be seamlessly exported into Excel for in-depth analysis.

On the supply side, a versatile materials application will offer ready-made "canned" reports, along with the capability to swiftly create "queries" as needed.

One of the most substantial benefits of a Microsoft D365 Business Central application is its unparalleled data accessibility. Leveraging this feature, we can execute relevant, user-friendly queries in real-time, thereby enhancing decision-making and operational efficiency.



HMM Inventory Turnover — March 1, 2024

CRONUS USA, Inc. — 1 Of 3

For the period of 12/1/2021 - 3/31/2024 — DEEPAK

Location EAST

2 Bin No

Usage Date	Item Number	Item Description		Unit of Measure		Current Cost
Stock	Par List Qty	Transfer In	Transfer Out	Qty Used	Inventory Turnover	Days Inventory
8/1/2023	01-BANDAGE	BANDAGE		PCS		25.00
Yes	100	2	0	0	0.00	0.00
8/1/2023	1015	1015		PCS		0.00
Yes	100	2	0	0	0.00	0.00
8/1/2023	1896-S	ATHENS Desk		PCS		780.70
No	100	2	0	-3,000	-62.10	-5.88
8/1/2023	1906-S	ATHENS Mobile Pedestal		PCS		338.20
Yes	100	2	0	0	0.00	0.00
8/1/2023	LOT	Lot Item		PCS		0.00
Yes	100	3	0	0	0.00	0.00
3/1/2024	01-BANDAGE	BANDAGE		PCS		25.00
Yes	100	0	0	2	0.22	1,642.50

Location EMERGENCY

2 Bin No

Usage Date	Item Number	Item Description		Unit of Measure		Current Cost
Stock	Par List Qty	Transfer In	Transfer Out	Qty Used	Inventory Turnover	Days Inventory

The Quick Query feature was designed to display receipts that have exceeded their promised delivery dates. This is just one example of the many pertinent queries that come pre-packaged with the system. Additionally, the system provides the flexibility to create custom queries as per your specific requirements.

Works cited

1. "The future of health: How COVID-19 has accelerated the transformation in healthcare" (Deloitte, 2020).”
2. "Addressing supply-chain vulnerabilities in healthcare systems" (McKinsey & Company) (McKinsey & Company), 2022”
3. "Performance Metrics" report from the Association for Health Care Resource & Materials Management (AHRMM) published in 2023.
4. How e-Commerce is Transforming the Health Care Supply Chain, 2023