Avantor Services

avantor™

Lab & Production Services
Comprehensive Lab Inventory Management

Today, tomorrow and for the future: Sustainable progress through people and technology

WHITE PAPER

Scientific discovery in the lab depends on having a range of materials and consumables available when researchers are ready to start their studies. If the right materials aren't available, discovery can stop in its tracks, costing valuable time, losing research productivity and making lab operations inefficient.

Whether it's flasks, protein assay kits, gloves or safety garments (or thousands of other products), lab consumables and a broad array of research equipment are essential tools for every lab. Regardless of the science they conduct, labs make regular, demanding use of these resources, necessitating ongoing replenishment and support.

However, many scientific operations have difficulty tracking and managing the inventory of these materials in an accurate and timely manner. Without the right resources at the right time and place, science stops. As the COVID-19 pandemic has demonstrated, there can be outside forces that wreak havoc on global supply chains.

Lab operations dependent on in-house or department-level inventory management quickly discovered just how much risk these kinds of disruptive events can cause. In the early months of the pandemic, many research and clinical labs halted all research when materials such as reagents, pipettes and other consumables simply could not be found or shipped.

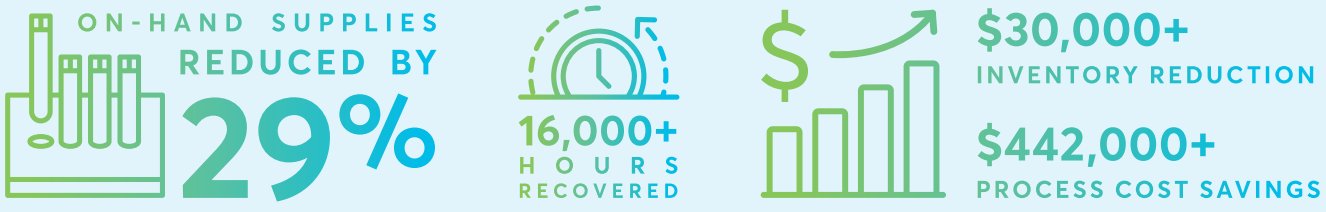
More and more scientific operations are discovering that there can be significant value in implementing full-scale inventory management programs and processes.

KEY INVENTORY MANAGEMENT ISSUES AND CHALLENGES

It is difficult to broadly measure how poor inventory management practices can impact scientific productivity or increase costs. However, Avantor® Services has completed multiple projects that demonstrate the advantages of professional lab inventory management:

- Scientists at a Fortune 500 pharmaceutical company spent significant amounts of time away from science to manage lab inventory. Avantor helped the company implement a point-of-use inventory management program that recovered 16,077 hours per year for scientific research while reducing on-hand supplies by 29%.
- A global consumer product company's procurement team estimated it was overstocking lab supplies three to four times more than necessary. Avantor helped the company save over $30,000 through inventory reduction and $442,000 in process cost savings through new lab supplies delivery and point-of-use systems.

THE ADVANTAGES OF PROFESSIONAL LAB INVENTORY MANAGEMENT



There are several factors limiting the ability of many labs to effectively conduct inventory management:

Lack of inventory visibility: This dynamic nature often leads to limited visibility about the status, availability and cost of laboratory consumables. Not enough time, resources and inventory management tools are provided to understand what materials were inventoried, who ordered them, for what purpose or project they were ordered and the related costs.

And because science is so dynamic, it's possible that a scientist won't determine what type of research or assay they want to undertake far enough ahead to cost-effectively order materials.

There has been an intense push in pharmaceutical and biopharmaceutical market segments to reduce drug costs. In response, many of these companies attempted to adapt lean manufacturing processes to lab inventory management. Lean manufacturing uses statistical process control and control charting and assumes a highly predictable and stable set of conditions for managing its supply chain.

Labs operate differently — results of studies come in and future studies are either cancelled, expanded or new directions and areas of research need to be implemented. It is not uncommon for entire labs with hundreds of researchers to be suddenly tasked with a whole new research project, requiring top-down shifting of personnel, equipment, facilities and consumable materials.

Given these dynamics, a consistent lack of inventory visibility makes it difficult to measure the impact of poor inventory management on the ability of scientists to complete planned projects in a timely manner. If materials aren't available, there are rarely methods for measuring lost research time or the associated costs. Conversely, if multiple labs order the same or very similar products, each for their own purposes, the cost of excess inventory is also difficult to measure.

Scientists doubling as inventory managers: In many labs, scientists are often tasked with managing the consumables inventory for their specific labs. For many, it is an unwanted responsibility and, since they are not trained in inventory management, two common inventory issues constantly arise:

- Stock-outs of needed products, interfering or forcing cancellation of research work: This can happen when a rarely used product is suddenly needed and hasn't been reordered, or when high-demand products used by multiple research teams in one lab use up the available stock.
- Over-ordering and slow inventory turnover: Many labs end up protecting themselves from stock-outs by over-ordering and maintaining supplies of products that turn in months or even years. This creates a culture of hoarding supplies, wasting both money and forcing labs to find storage space for excess materials.

The other major cost is time. Asking scientists to handle the essential but mundane tasks of inventory management is time away from science — which is why Avantor Services uses "time returned to science" as a key metric to evaluate the effectiveness of all its management programs.

Procurement facing persistent obstacles: Purchasing organizations face challenges implementing the kind of control that would solve many of these issues. One is consumables' relatively low cost — getting purchasing departments to invest in full-scale inventory management of these types of materials can be hard to cost-justify.

Also, many labs are complex organizations with thousands of scientists working in dozens or even hundreds of research teams, often operating in multiple locations or large campus environments.

These complex organizations develop their own purchasing practices and preferences, which leads to siloing, making it difficult for lab management to get purchasing and inventory under control. It can also lead to poor record keeping with little historic purchasing and inventory data available to assess what levels of products are really needed. Purchasing may not be able to keep needed materials in stockrooms and delivered to laboratory workstations when needed.

Poor service levels have a feedback effect: If a lab is left hanging or unable to proceed with scheduled work, researchers may continue following their own purchasing processes rather than work with a central organization. This can also lead to multiple vendors supplying the same or similar products to different labs within the same organization, with little control over pricing, delivery terms and other issues crucial to the organization's strategic sourcing efforts and to effective inventory management.

IMPACT OF COVID-19: FROM JUST IN TIME TO JUST IN CASE

The COVID-19 pandemic has caused significant and ongoing supply chain disruptions, impacting life sciences research labs worldwide. It's leading to a reassessment of the ways inventory management can mitigate risk and keep labs from shutting down when macro-events disrupt the normal flow of needed materials.

While well-intentioned, the efforts to apply Just in Time (JIT) inventory management practices adapted from manufacturing operations led to major disruptions across the global research establishment — both during the most critical months in the spring of 2020 and with lingering complications that remain unresolved. Many researchers were forced to reach out via social media channels to see if colleagues could help them find scarce reagents, specialty tubes and other materials needed to keep their research projects on track.

The impact continued to be felt across a wide range of common testing kits and culture and transport media, swabs, pipettes, pipette tips and collection tubes, both to support research and clinical trials work related to COVID-19 as well as nonpandemic related research programs.

It is clear that two major changes are called for in light of these vulnerabilities. First, there needs to be a shift from an extremely lean JIT approach for supplying lab inventories to a more adaptable and better-resourced approach called Just In Case (JIC).

A JIC approach calls for a deep understanding by suppliers and procurement managers of the existing and potential supply needs each lab establishment has, based on location-specific consumption rates and stocking requirements. It also requires having enough slack within a supplier's manufacturing and distribution capacity to be able to flex delivery based on circumstances — including macro-events like COVID-19 or Brexit, as well as more supply-chain specific events such as natural disasters impacting vital production facilities.

CASE STUDY

Challenge
Managing inventory created unnecessary costs, depleted manufacturing time and exposed an FDA-certified facility to the risk of shut-down

Solution
Avantor Services implemented an adaptable inventory system to manage the efficient delivery of production supplies from receiving to the production floor, a solution with the capacity to "flex" in response to macro-disruptive events such as COVID-19

Result
Delivered a $707,000 reduction in on-hand inventory value and recovered 2,900 hours for internal management and technician teams

REAL-TIME DATA—DIAGNOSTIC & PREDICTIVE—IS CRUCIAL

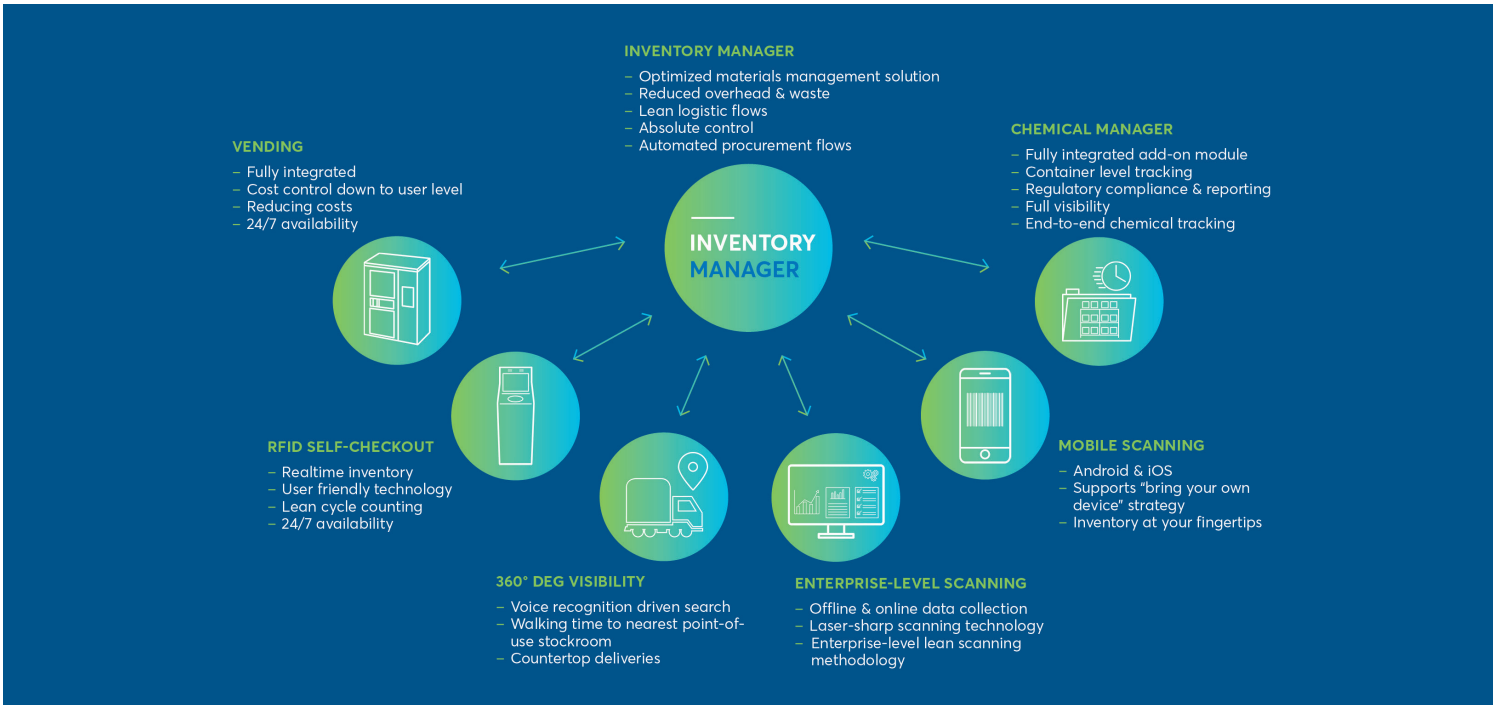
In addition, there needs to be a quantum leap in data visibility into lab inventories and supply chains. The next time there is a macro-event impacting research materials, scientists shouldn't have to reach out through LinkedIn or email chains to find out if the reagents they need are available somewhere else within their company.

Labs, distributors and the suppliers of lab consumables need closer, more collaborative relationships that provide accurate, real-time data about what is stored where and what is available to be shifted or surged when disruptive events occur.

To do this requires investments in cutting-edge inventory management tools, designed for easy use and able to comprehensively capture and communicate critical supply chain data. For example, the Avantor Services Inventory Manager is a cloud-based, web-accessible tool with a customizable dashboard and multiple configuration options.

It's designed for easy integration with a lab customer's procurement systems and delivers metrics at the SKU level addressing overhead, usage, turns, no-move and more. Details by lab location or research unit on consumption, replenishment, product expiry date and notifications, as well as activity logs to track all transactions and built-in consignment billing processes provide more than just an information tool: they structure the data to guide analytics and decision-making for each lab across the organization being served by Avantor Services.

This data — both historic and predictive — can be used to implement a Just in Case inventory management model that balances risks and costs: cost of maintaining higher levels of inventory of given materials against the risk of significant research disruption should supply chain issues like COVID-19 develop.



THE SOLUTION: COMPREHENSIVE INVENTORY MANAGEMENT

While there may be some benefit to piecemeal inventory management best practices, while continuing to let scientists double as procurement managers, the most productive path forward is through a comprehensive, all-in-one inventory management solution from an organization such as Avantor Services.

As experts in scientific supplies inventory planning, stocking, delivering and cost management, Avantor Services has worked with multiple leading life sciences and advanced technology companies to design, implement and operate inventory management across multiple laboratory and production sites.

A well-designed and properly implemented inventory management system handled by experts will build confidence and trust with scientists. It will enable them to let go of past tendencies to silo and keep control of their purchasing activities, by giving them the right materials at the right place and time to move their research forward.

Purchasing and procurement departments will equally benefit through centralized control and data-drive forecasting and cost management essential to effective laboratory purchasing.

Working with individual lab departments and with purchasing, a comprehensive inventory management program should be an analytics-driven solution that continually gathers supplies usage and storage data — to create inventory baselines, then to update those baselines based on real-world usage requirements. This requires implementing a state-of-the-art inventory management software platform that has the same user interface and operating processes for all labs being served.

The most effective way to achieve these goals is to include third-party lab service personnel who work on-site and develop insights into each labs' needs and operational and research rhythms.

On-site personnel learn first-hand how science works and how the products they supply — through on-site stockrooms, from warehouse supplies or third-party vendors — make it possible for scientists and researchers to be as productive as possible. With these insights, they can help prevent stock-outs as well as prevent over-ordering, hoarding and stocking of materials with low turn rates, contributing to overall cost savings.

SETTING THE STAGE FOR THE LAB OF THE FUTURE

Comprehensive inventory management can provide a key stepping stone toward realizing a major goal that many companies and research operations have and implementing the "Lab of the Future."

The Lab of the Future leverages advances in the latest technology and couples those advances with science and management professionals skilled at using those technologies to dramatically reduce wasted time, effort and resources to accomplish scientific goals, as well as provide new pathways to transform how labs operate.

One vision for the Lab of the Future is built on four key pillars:

Data & analytics: New tools such as AI and machine learning will leverage both historic and real-time data at the lab, at the supplier and distribution level and from lab consumables manufacturers to implement actionable, predictive analytics that can provide a new foundation for planning, purchasing and long-term decision-making on cost management and resource allocation.

These tools enable much more effective insight into the ebb and flow of lab inventory requirements, insights that are more advanced than those provided by more common statistical process controls used in manufacturing. Deep dives into the data can identify patterns that aren't normal and forecast out how to respond to those patterns with inventory planning and distribution choices that better mitigate risk.

Automation: Many routine testing and analysis tasks are now accomplished much faster with the latest generation of automated lab tools. Similar to the application of Internet of Things (IoT) concepts in many manufacturing segments, these tools can be networked to provide vital data and efficiently schedule preventative maintenance and calibration programs, based on data generated by the machines and delivered automatically to equipment management systems.

Automation can also provide a powerful tool to simplify and enhance how lab consumables are distributed within an organization. One solution is to have "smart shelfs," stockrooms where all inventory is on electronically connected storage units. Replacing less accurate paper-based or handheld barcode reader audits, any time an item is removed from a smart shelf, that removal is documented, including which lab or unit removed it. That enables real-time tracking of both demand and materials stored locally to further automate both stockroom replenishment and analysis of demand for consumables.

Sustainability: A growing number of scientific leaders are working to make the research lab more sustainable, reducing paper, chemical and electronic waste streams and improving water consumption and energy use.

They need better ways to quantify how their specific activities and changes can be scored and rolled up through their organizations to demonstrate progress toward becoming more sustainable — with verifiable, repeatable data. Strategic sourcing efforts should begin to prioritize "greening the supply chain," not just when it is the lowest cost alternative at the item level.

A crucial first step is the development of effective sustainability metrics to enable cost-benefit comparisons that consider sustainability equally alongside item-level cost. Working within a comprehensive lab inventory management solution, a research organization can develop these metrics then work with supply chain experts to incorporate sustainability into purchasing and inventory management practices and measurements of success.

The Human Element: The real success of the Lab of the Future will be measured by how well researchers at every level can use these new tools and processes to eliminate bottlenecks and create research programs that deliver results faster.

The Lab of the Future should dramatically improve communications and collaboration — between scientists on the same team and scientists on other teams, as well as collaborating with inventory management and logistics professionals. With the right, real-time inventory data that all parties can trust, as well as more advanced analytics, decisions on a wide range of inventory management issues can be more reliable, timelier and more completely aligned with the actual needs of each research project.

Since the current generation of scientists entering the labs are accustomed to daily use of tools like online video calling, smartphones and powerful visualization tools commonly used in their research, they will expect that these same kinds of tools will be at their disposal for inventory management decision-making.

Avantor Services

MOVING FORWARD WITH INVENTORY MANAGEMENT

The basic tools and consumables used by researchers in labs every day should benefit scientific initiatives — not delay it. And if a lab's supply management is not at its most efficient level, valuable scientific time and resources are just spent trying to get the products they need.

While some lab managers and science staff prefer to keep control of supply management and ordering (because they don't want to risk running out of vital supplies), more and more lab managers, procurement and purchasing departments and upper-level management are seeking to establish organization-wide processes and provide resources to manage these kinds of products. This saves scientists time and gets them back to doing science.

A comprehensive inventory management solution, designed and operated by experts in supply management, distribution and purchasing, can provide the most effective and successful way to accomplish the most important goal: making sure every scientist and research team has the right materials and tools at the right place and time, every time, so they can move their science forward.

Do you need help streamlining scientific workflows?

Visit avantorsciences.com/lab-production-services or email services@avantorsciences.com for more information.

Avantor Services helps scientific organizations solve complex challenges, resulting in improved productivity, increased efficiency, and accelerated innovation.

AVANTORSCIENCES.COM

30421-CM-RB

1220 Lit. No. 931242 ZPROAVTR30421-EN