Driving healthcare supply chain resiliency, efficiency, and sustainability through value stream mapping Cook Medical 2025-2026 Supply Chain Fellowship

The 2025–2026 Supply Chain Fellowship was focused on developing a more collaborative approach to supply chain planning between provider and supplier. The process began with the development of detailed, data-rich, cross-organizational value stream maps (VSMs) and culminated in a series of projects aimed at bolstering resiliency, realizing efficiencies, and promoting sustainability between this year's participating fellowship organizations, Cook Medical and Indiana University Health (IU Health). By empowering the fellow with access and support from key supply chain leadership, as well as equipping them with the resources to implement supply chain projects that impact upstream and downstream processes at both organizations, this year's fellowship projects have the potential to generate significant operational efficiencies while supporting progress in resiliency and sustainability efforts for both organizations.

Company backgrounds and fellowship overview

About the fellow

Paul Vang, the 2025–2026 Supply Chain Fellow, is focused on advancing healthcare supply chain resilience and operational efficiency through a continuous improvement mindset. With an MBA in supply chain management and a BS in chemistry, both from the University of Wisconsin-Madison, Paul is deeply interested in how healthcare supply chains can directly support patient care continuity by ensuring that critical supplies and life-saving treatments are made available through point-of-use alignment. To this end, his projects have underscored the importance of end-to-end supply chain visibility for supply resiliency, value creation, and sustainability.

About Cook Medical

Cook Medical, a manufacturer of medical devices for minimally invasive procedures, stays true to its passion: making unique, high-quality medical products and connecting with people to improve lives on both sides of the device. Serving providers for 60+ years in 135 countries has given Cook a deep understanding of successes and challenges in the healthcare industry.

As a private company, Cook prioritizes innovation of its products and processes. Its agile nature provides the opportunity to serve as a pioneer among suppliers, and Cook is excited to dive beyond the status quo to find solutions that will truly improve patient lives.

Cook Medical's passion for care extends beyond patients to the communities in which they live. Headquartered in Bloomington, IN, Cook continuously supports local and global organizations while employing thousands of team members worldwide.

About Indiana University Health

IU Health is the largest health system in Indiana with nearly 40,000 team members, 15 hospitals, and $8.64 billion in operating revenue. The system's programs in cancer, cardiovascular, neuroscience, orthopedics, pediatrics, and transplants have received national recognition for quality patient care. IU Health, in partnership with the Indiana University School of Medicine, brings together highly skilled physicians, researchers, and educators into close collaboration to provide world-class care for children and adults and improve the health of patients and communities across Indiana.

Supply Chain Fellowship model

Why was the fellowship created?

Throughout the past decade, the team at Cook Medical has faced a common challenge in the healthcare industry: the lack of collaboration between suppliers and providers. When ideating ways to close this gap, a supply chain fellowship was considered. Not only could this improve supplier-provider relationships, but it would simultaneously facilitate the development of the future leaders of healthcare. After years of planning (and yes, paperwork), the first fellow was onboarded in 2023.

How does the fellowship function?

Each fellowship begins with the identification of a provider partner who is willing to work alongside Cook Medical to combat current industry challenges. Once this relationship has been developed, Cook Medical and the provider discuss opportunities and areas of interest to select a mutually beneficial project. This is a year-long undertaking, providing a longer timeline in which a complex problem can be faced—highlighting the difference between this role and a shorter supply chain internship. Upon consensus of the task, the fellow is selected. The pool of candidates includes recent MBA graduates with an interest in healthcare supply chain, the selected fellow stands out as someone who can drive analysis and articulate results. The fellow is expected to complete a whitepaper on their findings and present at various conferences to engage other industry experts.

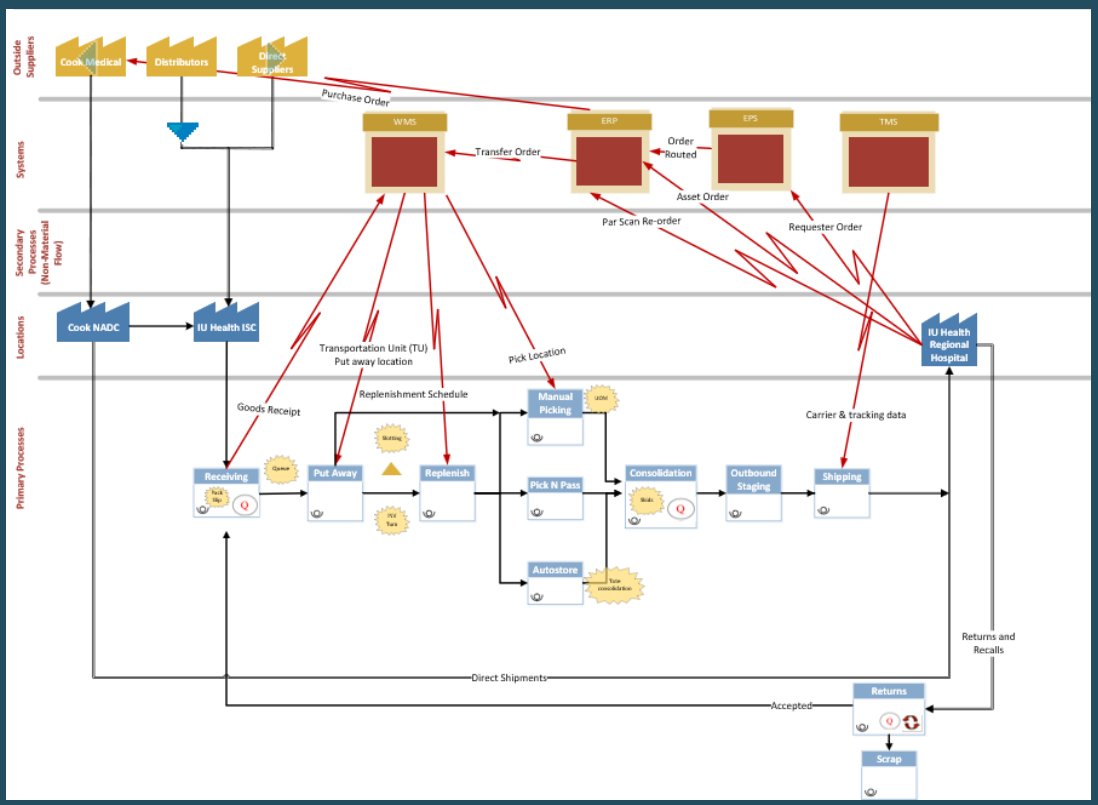
Extended value stream mapping: visualizing supply chain processes from supplier to end user

Due to capacity constraints, many healthcare organizations understandably limit the scope of their VSMs to the organization itself. Extending the scope of their analysis to include suppliers or other external partners might necessitate the sharing of proprietary data, resources, or staff capacity, all of which might not be feasible for the organization. However, extended VSMs across organizations can help illuminate potential bottlenecks, pain points, and opportunities for value creation throughout the supply chain that may otherwise remain hidden, thus providing a valuable benefit for both provider and supplier. This is where the Supply Chain Fellowship fits in: by integrating the Supply Chain Fellow as a valued team member of both organizations, the fellow is granted significant access to observe end-to-end supply chain processes, collect and analyze data, and learn directly from experienced colleagues and supply chain leadership, all of which can serve as crucial inputs for a cross-organizational VSM.

Prior to the fellowship, Paul Vang had no professional experience in creating VSMs. While familiar with Lean methodology, the practice of visualizing material and information flow throughout an interconnected supply chain was a completely new experience. To start, Vang began upstream at

Cook Medical, where he documented the value stream from production, sterilization, packaging and labeling, and outbound logistics. Further downstream at IU Health's Integrated Service Center (ISC), Vang recorded material and information flow processes for a typical Cook product from dock to dock. The value stream then led Vang to three IU Health hospitals (University, North, and Bloomington) where processes leading from dock to stock and ending at point of use were carefully documented. At every step of the process, Vang collected operational data and conducted informational interviews with supply chain leaders and front-line staff at each business unit.

Once current state processes were visualized and documented in an extended VSM, the opportunities to streamline processes and realize efficiencies throughout the supply chain became apparent. Vang then prepared to present his findings to supply chain leadership at both organizations with the goal of coming to a consensus on which projects to collaboratively pursue.



VSM of IU Health's ISC operations (with data and system names omitted)

Current opportunities and implementation

The extended VSM analysis revealed several interconnected processes at Cook and IU Health that presented longer process times, potential improvements in material handling, and opportunities to reduce packaging and emissions. Vang presented the extended VSM findings to IU Health and Cook Medical Supply Chain leadership and secured their support to implement a set of continuous improvement and operational excellence (CI OpEx) projects to address the root causes for the opportunities identified.

At the outset of implementation, it was critical for Vang to consider the strategic business objectives of both organizations. As a manufacturer of medical devices for minimally invasive

procedures, Cook was especially keen to ensure that IU Health, an important local customer, would continue to experience high levels of service, and the inclusion of the fellowship partnership presented an opportunity to create additional value in the form of operational efficiencies for both parties. IU Health focused on increasing the utilization and efficiency of their Integrated Service Center (ISC), which effectively served as a centralized distribution center (DC) for their widespread hospital network. For Cook products stocked in the ISC, re-orders from hospitals were triggered at pre-set periodic automatic replenishment (PAR) levels and could be expected to arrive the following business day from the ISC. For Cook products not stocked at the ISC, hospitals ordered directly from Cook with a lead time of one to two business days. This current arrangement meant that IU Health hospital staff were receiving Cook products through multiple channels (distributed vs. direct), resulting in potentially redundant touchpoints, increased process time, and additional inventory holdings. It also suggested an opportunity to increase ISC utilization through enhanced demand planning and inventory slotting. Both organizations were also undergoing significant IT implementations and process improvements, and so the time was opportune for a more collaborative approach to strategic planning and operations between Cook and IU Health.

Pursuing resiliency and efficiency: order consolidation and slotting optimization

Over the course of Vang's VSM analysis, one consistent theme that emerged from interviews with the receiving staff at the ISC and IU Health hospitals was the additional process time required to receive Cook parcels, as compared to other parcels. IU Health staff were accustomed to receiving a single pack slip that listed the items and quantities (by purchase order) within a given box, as Cook had done in the past. This meant that, depending on order volume, some Cook boxes may have contained a smaller quantity of items, resulting in boxes shipped with additional capacity. To reduce packaging waste, Cook began consolidating orders across fewer boxes, and while this may have reduced the total number of packages sent, it also meant that some boxes reached capacity before all the items in a certain PO could be packed, and so the remaining balance of products would be shipped in an additional box. IU Health staff would then have to open other Cook boxes to track down the remaining product quantities that were specified in the pack slip,

On the left, the current state of Cook pack slips received at IU Health, which resulted in multiple touchpoints for ISC staff. On the right, Cook pallet content slips that list all items and quantities in a pallet, which would reduce touch points for ISC staff.

resulting in additional touchpoints before an order could be fully received in their system.

At the same time, there were other factors that may have added processing time. Inventory control at some IU Health hospitals remained a challenge, and reorder points based on existing PAR levels

resulted in a higher frequency of reorders than optimal in many scenarios. The ISC, up until the implementation of its new WMS, did not have slotting optimization capabilities, which meant that it was difficult to precisely determine the optimal SKU mix and quantities to stock at the ISC. To ensure a reliable supply of products, IU Health and their regional hospitals would place orders with Cook multiple times daily, which translated downstream to additional touchpoints and increased processing time at receiving.

This current state suggested that IU Health could achieve both greater efficiency and resiliency by consolidating ordering to route a greater share of their Cook orders through the ISC. To this end, Vang proposed transitioning IU Health to ordering Cook products in case quantities. Cook would then aggregate IU Health case orders into pallets and ship them out once a week. Pre-set case quantities would streamline receiving at the ISC by resolving the previous issue of order item quantities being split among multiple boxes. Cook would also be able to apply master pack slips to each pallet, thus reducing additional touchpoints associated with the previous pack slip configuration. Taken together, these process improvements would reduce Cook parcel receiving time at the ISC by 62%, saving approximately one hour and thirty-eight minutes of processing per week at the ISC receiving dock.

While order consolidation was underway, Vang took several measures to ensure that the transition would enable IU Health to increase capacity utilization of their ISC while minimizing any potential disruptions from the transition. The first measure was a two-way data-sharing arrangement, win which Cook would share product dimensions data while IU Health shared Cook product usage data. Vang, in collaboration with IU Health demand planners, utilized usage data to smooth out demand signals and forecast weekly order volume for ISC-stocked Cook products. This would be crucial in preparing IU Health's transition to the weekly order cadence and for Cook's palletized shipping workflows at its DC. Examining monthly product usage data for Cook products not currently stocked at the ISC, Vang identified 12 Cook products that could serve as promising pilot item candidates for inclusion into the ISC's stocked inventory. At the same time, IU Health demand planners were able to feed Cook product dimensions data into their new WMS and enable slotting optimization at the ISC. The combined effect of case quantity ordering, collaborative demand planning, and slotting optimization meant that the ISC would be able to handle both a higher volume and larger SKU mix of Cook products at a future state, which is estimated to increase ISC capacity utilization by approximately 1.1%, a non-trivial improvement at its current operating scale.

IU Health currently receives Cook products in quantities known as "each" or EA, as pictured on the left.To consolidate shipments, Cook will be sending one week's supply of product in pallets of case quantities, which will further streamline receiving at the ISC.

From the perspective of IU Health, increasing the general utilization of the ISC would bolster supply resiliency while also enabling economies of scale to be realized throughout the IU Health system. By strategically increasing the volume and mix of products stored, the ISC could more effectively serve as a source of safety stock for IU Health hospitals, while hospitals would retain the ability to place overnight delivery orders from Cook. In this way, multiple layers of supply resiliency are maintained. In addition, efforts to further consolidate material flow, storage, and distribution through the ISC would realize economies of scale by leveraging the ISC's strong capabilities in inventory management and logistics to reliably supply IU Health hospitals at more efficient cost, compared to the direct model of Cook shipping multiple parcels to each hospital daily.

From the vantage point of Cook, shipping a higher proportion of IU Health's orders to the ISC via pallets once weekly is operationally more efficient than sending multiple parcels daily to both the ISC and direct to hospitals. Consolidating more of Cook's outbound shipments to the ISC also presented new opportunities for sustainability in transportation.

Sustainability in the healthcare supply chain: emission reductions via backhaul route

With order consolidation resulting in a once-a-week shipping cadence to IU Health's ISC, the prospect of further reducing the environmental impacts from shipping (as well as associated costs) presented itself in the form of a potential backhauling logistics route. IU Health owns and operates a small fleet of box trucks that make daily drop-offs at each IU Health hospital. One box truck in particular makes twice-daily drop offs at IU Health Bloomington Hospital, which is a mere 15-minute drive from the Cook Medical North American Distribution Center (NADC). After unloading the second daily delivery at IU Health Bloomington Hospital, the box truck then makes the one-hour return trip back to the ISC with an empty load. Vang posited that this return trip could represent an opportunity to ship Cook pallets from the Cook NADC direct to the ISC, thus saving on carbon emissions and freight costs, of which the value created could be realized between the two organizations.

For the proposed backhaul idea, Vang prepared a business case analysis, showing the potential savings on miles, fuel, and emissions. In the current state, Cook ships on average 30 parcels to the ISC across 5 shipping days per week. Those carrier routes accrue additional miles from making stops at other pick-up and drop-off locations, compared to the direct route the IU Health box truck makes from the ISC to IU Health Bloomington. Based on conservative assumptions regarding carrier miles and fuel efficiency, the proposed future state backhaul arrangement would save 325 miles driven per week, or 13,520 miles per year. On the fuel side, 23.64 gallons of diesel fuel would be saved weekly, which translates to 1,229 gallons per year. In terms of emissions, 530.5 lbs of CO^2 would be spared, which equates to 13.8 metric tons of CO^2 emissions avoided annually. Given that the timeline for implementing this future state project would exceed the fellowship timeline, IU Health and Cook agreed to implement a standalone pilot on a limited scale to study the impacts on both organization's operations and logistics.

Project takeaways and lessons learned

At the time of the writing of this whitepaper, the fellowship projects detailed above are currently undergoing implementation and change management at both organizations, involving multiple stakeholders and many interconnected processes. While the exact financial and operational impacts are still being measured and documented, there are several valuable takeaways and lessons learned that can apply to providers and suppliers who wish to emulate this model of collaboration and create value for both organizations.

The first takeaway is the importance of bringing in an independent party, in this case the Supply Chain Fellow, and giving them the access and support from supply chain leadership at both organizations to observe any and all processes, ask questions, collect and analyze data, and meaningfully lead projects that will have an impact at both organizations. The background of fellows, who are recent MBA graduates, means that both organizations benefit from receiving a fresh perspective on their current operations. Fellows are not necessarily constrained by what organizations may perceive to be their own limitations or what is considered possible. This fellowship arrangement can be managed effectively through contracts, NDAs, project management processes, and most importantly, the involvement of enthusiastic managers at both organizations who enjoy developing early-stage healthcare supply chain talent. At the same time, because fellows are professionals with graduate-level training, the amount of immediate supervision and support will be significantly less than the traditional intern model used for undergraduates.

The second takeaway would be for both organizations to be open to creative and previously unconsidered ideas that the fellow may bring. This is, in the author's opinion, the primary benefit of this shared-talent model, and the outputs from these projects may surprise or even understandably be met with skepticism by some supply chain leadership. However, with a little guidance and well-conceived project controls, fellowship ideas have the potential to bring transformative projects that make a meaningful impact on an organization's operations and bottom line.

And lastly, for any supplier and/or provider looking to scale their collaborative projects, the following insights could be of benefit. At the outset of the collaboration, it is critical for both organizations to clearly share their strategic business priorities with one another and prioritize the top 2–3 areas of alignment between them. This is crucial because the timeline for project implementation is limited by the 12-month period of the fellowship tenure, which means that, realistically, only the 2–3 highest priority projects shared by both organizations should be pursued. When too many project ideas are prioritized, the fellow risks not being able to make meaningful progress on any given project. The second reason is that projects which reflect shared priorities are more likely to receive buy in from supply chain leadership, who can then help the fellow successfully navigate each organization's project management process and secure critical resources for their projects. Without supply chain leadership support, fellowship projects risk getting stuck in the project management process of one or both organizations for longer than necessary.

When it comes to scaling project implementation, identifying any dependencies between projects is crucial, and any implementation should begin as a limited pilot. Because of the interorganizational nature of fellowship projects, mapping out dependencies will inform stakeholders of all business units and processes which might potentially be impacted, while also adding clarity to project sequencing, timelines, and resources required. This is why the extended VSM exercise is critical. Once those dependencies are accounted for, limited pilot projects allow both parties to study the impact of any process changes and adjust as needed, thus minimizing potential disruptions while enabling progress on project objectives. From there, whether four months or four weeks remain for project implementation, it is critical for the fellow to document their project processes in the form of reports, SOPs, presentations, notes, or any other content vehicle that will inform implementation handoff after the fellowship is complete. That way, team members at both organizations can continue implementation until the projects achieve their intended scale.