



White Paper

When Aging Automation Becomes the Risk

How a safety-net health system is replacing
an end-of-life central fill platform

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Executive Summary

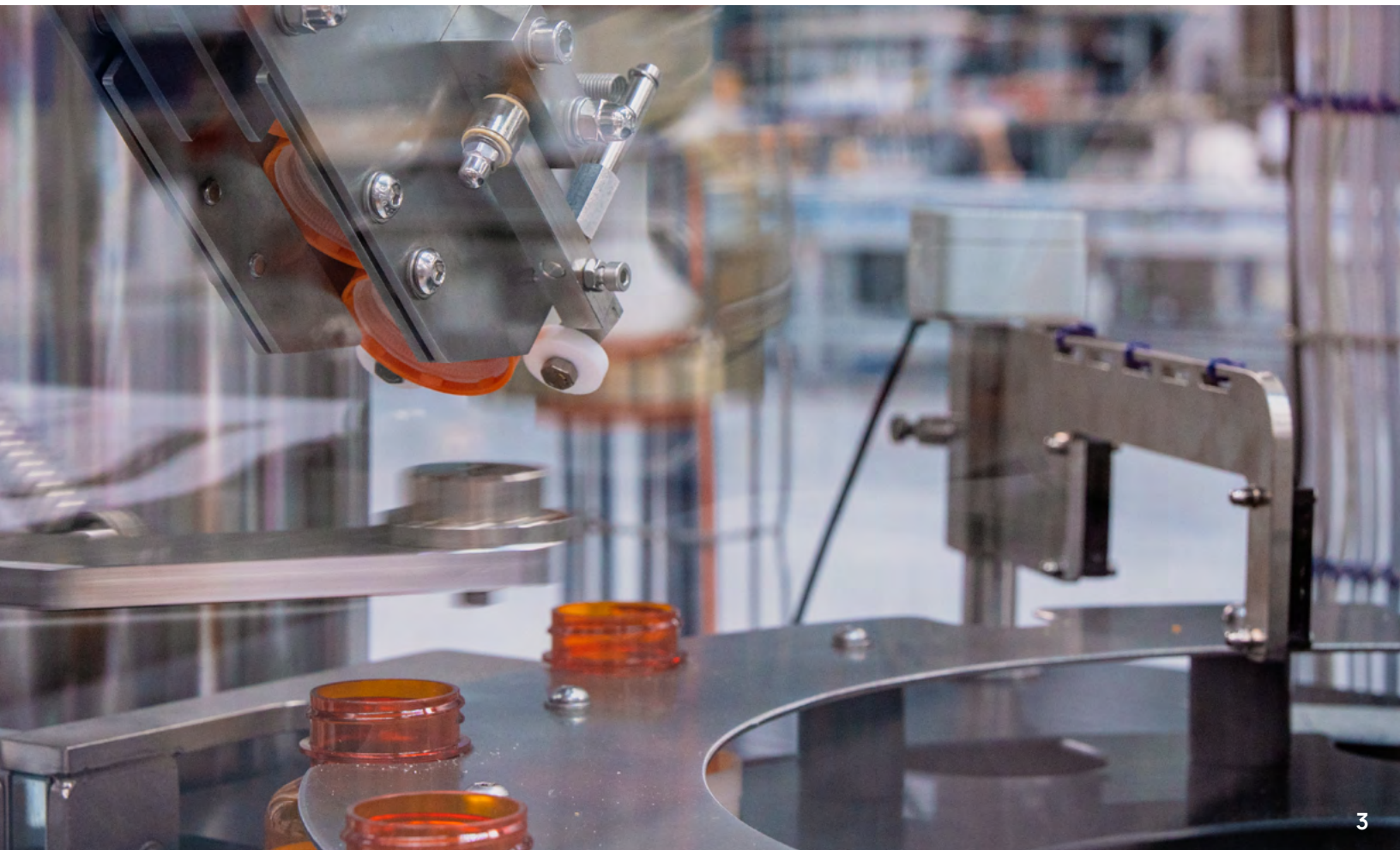
Prescription demand is rising while the pharmacy workforce contracts, and the two trends pull in opposite directions. Safety-net health systems, which operate with limited financial margin and serve high-need populations, absorb this pressure with the least room to maneuver.

Many of these systems centralized prescription fulfillment years ago. What fails now is the platform underneath: automation installed a decade ago reaches end-of-life, vendor support lapses, and the operation falls back on manual workarounds that consume staff capacity and fragment compliance oversight.

Harris Health is the largest safety-net provider in Texas, serving nearly 5 million residents across Harris County through more than 2 million patient visits a year. In 2025, its central fill pharmacy filled nearly 1 million prescriptions while operating on a 12-year-old, end-of-life platform. Even with a centralized

operation in place, Harris Health was preparing more than half of its oral solid, unit-of-use, and cold-chain medications by hand, because the installed automation could not manage them. Dr. Michael Nhadi, Chief Pharmacy and Lab Officer at Harris Health, has led the system's response.

Harris Health's response is a platform replacement inside an existing centralized model, engineered to raise the share of automated fulfillment from roughly half toward 90%, and to return clinic-based pharmacy staff to patient care.



When Aging Automation Becomes the Risk

A central fill operation is one of the most important strategic levers a health system can use to optimize costs and drive value. Harris Health made that move more than a decade ago, consolidating production into a central fill pharmacy that supplies its clinic-based outpatient pharmacies. The centralization worked, but as volume grew and the platform aged, existing automation was not able to meet demand.

The crux is what happens when that platform ages past vendor support. Harris Health's central fill system was more than 12 years old and formally declared end-of-life. No upgrade path remained, replacement parts were no longer available, and

component failures could not be resolved through supported channels. Each failure fell to a manual workaround, and the workarounds compromised patient access. Dr. Nnadi described the effort as “reshaping our operating model to improve patient access, regulatory integrity, workforce efficiency, and sustainability for our public health system.”

More than half of the system's oral solid, unit-of-use, and cold-chain volume was moving through people rather than machines, inside an operation that had been centralized precisely to avoid that. At that scale, hand-preparation amplified the pressures impacting pharmacies nationwide.

WORKFORCE.

Pharmacists and technicians spent time on production tasks automation should absorb, capacity lost to higher-value work.

INVENTORY.

Each clinic had to stock and prepare what the hub could not produce, tying up working capital in redundant inventory across 15 sites.

COMPLIANCE.

Manual steps distributed across the system fragmented oversight and made traceability and audit readiness harder to guarantee, a material exposure for a public system.

Three forces are converging on pharmacy operations nationally.

7.1 billion

Demand keeps rising: of the 7.1 billion prescriptions filled in 2024, more than 3 billion went to chronic conditions that refill on a schedule, the work a hub is built to absorb.

14,200

The workforce is moving the other way, with roughly 14,200 pharmacist and 47,400 technician openings a year through 2033 that the pipeline is not filling, straining a workforce where about 3 in 4 hospital pharmacists report burnout.

1 in 3

And the retail network that once carried the overflow is contracting: nearly 1 in 3 pharmacies had closed by 2021, and about 1 in 7 Americans now live in a pharmacy desert.

Centralization is the most powerful response health systems have to these mounting pressures. Systems without central fill are exploring how to implement it quickly, and those that have centralized are replacing aging systems and optimizing for volume. A centralized operation that automates only half its volume carries the cost of centralization without the full return. Harris Health is closing that gap.



More Than Components: Forging a Partnership

Harris Health faced headwinds in two directions. While their existing central fill automation system was end-of-life and out of support, the pharmacy was filling more prescriptions, had fewer people to fill them, and was facing a shift toward mail order fulfillment. **A one-for-one replacement that solved only the first problem wasn't enough.**

So the most pressing vendor selection question was not which machine to buy. It was which partner could build for the operation Harris Health runs today, keep building as the market moves, and stand behind the system the whole way. In Dr. Nnadi's words, "Capsa Healthcare was selected for its alignment with our requirements ... to support these three areas of throughput, scalability, and regulatory compliance."

Harris Health's hub-and-spoke structure was already in place. What it replaced was the automation inside the hub, and with it the ceiling on how much of the daily load the hub could carry. Dr. Nnadi was direct about where the system stands: "We are currently in the implementation phase, moving from an outdated automation platform toward a purpose-built, enterprise-grade central fill operation." Full go-live is targeted for early spring 2027, in a new facility built for the system.

The goal is to automate the categories the old platform could not: unit-of-use, cold chain, and a far higher share of oral solids, moving the hub from roughly half of production toward 90%, with bulk inventory consolidated at the hub and the clinic pharmacy holding dispensing stock only. The work that stays at the spoke is the work that needs a pharmacist: counseling, clinical review, patient interaction. Pharmacists move from overseeing manual production to practicing at the top of their license.

Three components carry the load, each purpose-built for central fill rather than adapted from retail dispensing. Capsa engineers purpose-built central fill technology, which is where the system's scalability and throughput come from.

The first is the RoboPharma HV Wall, the hardware that produces the fills:

- Each modular wall holds 20 to 120 HV Cells running independently, covering roughly the top 80 percent of dispensing volume.
- Because the cells run independently, dispensing continues while any one is serviced or replenished, so there is no single point of failure.
- Each cell handles most oral solid doses on the market across a wide range of pill sizes and shapes, and auto-calibrates on-site, with no service call.
- The wall produces up to 3.5 prescriptions per square foot in up to 50 percent less floor space, which matters inside a fixed facility footprint.

Alongside the HV Wall, RoboPharma Unit of Use handles packaged medications:

- The unit dispenses medications including unit-of-use packs, 30/60/90-day bottles, blisters, pens and inhalers, automating up to 80 percent of dispensing in that category.
- One unit dispenses up to 10,800 packages per hour and stores up to 18,900 packages per cabinet across up to 1,800 SKUs.
- Capacity expands by adding a cabinet, without interrupting operations.
- The unit is engineered to run in refrigerated 2-8°C rooms on customer-supplied refrigeration, so cold chain is handled inside the same automated footprint instead of a manual operation running alongside it.

Axona, Capsa's cloud-native pharmacy platform, runs the operation. It prioritizes urgent orders, routes each to the appropriate fill location, balances workload in real time, and supports compliant pharmacist verification. It maintains real-time inventory at every level and traces each order from intake through shipment, including DSCSA tracking and integration with the Pharmacy Management System, consolidating the compliance monitoring a partially manual operation leaves scattered.

Every buyer replacing an end-of-life system asks what keeps the replacement from aging out the same way. The answer is in how it is built. The RoboPharma architecture is modular, and its components are designed for in-place replacement, so capacity expansion and component upgrades do not require halting or rebuilding the system. It grows by adding to the installation and upgrades by replacing pieces within it. A platform that expands

and upgrades in place is a different proposition from one that has to be replaced whole, and it is why the modernization Harris Health began with centralization does not have to restart on a fixed clock.

Durability depends on more than the hardware. The platform Harris Health replaced had reached the point where its vendor could no longer support it, and that gap did as much damage as the aging machine itself. **The partnership Harris Health chose is built to last.** Capsa stays engaged across the life of the system, from design and installation through the staged go-live and the operating model that follows. For Harris Health, that presence is concrete: the engagement includes a dedicated Capsa Onsite Systems Manager, embedded with the operation rather than reached through a support ticket. And because the architecture upgrades in place, that support carries forward through each change rather than ending at the next replacement cycle.



Implementation: Discipline Before Scale

A platform decision of this scale depends on the process behind it, and Harris Health treated vendor selection as a discipline in itself. The evaluation ran in four stages: market exploration, site visits to see automation in operation, a formal request for proposal (RFP), and validation against the three requirements that mattered most, throughput, scalability, and compliance, all of which Capsa's solution met.

Implementation follows a similarly structured sequence:

initiation, planning, build, execution, transition, and closure. Each phase is managed to limit risk and protect patient access, and the team adjusts the plan as feedback returns from the sites. Go-live is staged rather than activated all at once, which keeps service continuous while the operation reaches full capacity.

The lessons apply to any health system contemplating a similar replacement:

01.

Standardize and document workflows before scaling them, because automating an undefined process compounds its inefficiencies.

02.

Capture that documentation in full within the RFP, where it prevents gaps that otherwise surface after installation.

03.

Validate staffing and activation plans through phased go-lives rather than a single cutover.

04.

Treat communication, training, and clinical engagement as continuous activities rather than launch-period events, because adoption determines whether the model holds.

Dr. Nnadi framed the point with a familiar principle: **technology enables transformation, but operations deliver it.** The platform provides the foundation; the discipline of implementing it determines whether that foundation becomes a functioning operation.

That discipline extends into how the operation is monitored. Metrics roll up through monthly

operating reviews to senior leadership, where pharmacy reports alongside the rest of the system, and patient satisfaction, which Harris Health currently holds between 92% and 94%, is tracked through the transition. As Dr. Nnadi put it, “pharmacy is on display ... via the dashboard.”

Planning for Aging Automation

Health systems running decade-old central fill automation face a familiar trajectory. Support lapses, upgrade paths close, parts grow scarce, and the system maintains infrastructure it can no longer extend while volume keeps rising. The systems most exposed are often the ones that centralized earliest, because their platforms are the oldest, and the timeline arrives regardless of any single budget cycle. Harris Health's experience shows the response can be planned rather than forced. Centralizing was the right

decision. Replacing retail-adapted automation with a platform engineered for central fill volume and built to extend rather than expire is what makes that decision pay off: the hub fills the categories it could not manage before, inventory and compliance oversight consolidate, and the clinic pharmacy returns to patient care.

The systems that manage this best start early. The time to design a replacement is while the current one still runs, when there is room to weigh options and stage the change without a crisis setting the schedule.

Dr. Nnadi's own summation captures the stakes. End-of-life systems, in his words, "pose hidden risks to patient access and safety," while the model Harris Health is building toward "enables scale without proportional labor and cost increases."

Capsa Healthcare builds central fill automation purpose-built for this work and collaborates with pharmacy leadership on system design

from the first conversation. To discuss what a modernized central fill operation could achieve for your organization, **Schedule a Consultation.**



Let's design your central fill operation.



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