

# Integration of Just In Time (JIT) Inventory in Outpatient Pharmacy Information Systems

*Bhushan Kapoor, Department of Information Systems and Decision Sciences, California State University, Fullerton, Fullerton, CA, USA*

*Timothy Mullen, California State University, Fullerton, Fullerton, CA, USA*

---

## EXECUTIVE SUMMARY

*With the implementation of the recent Healthcare Reform Act and the increased scrutiny on the soaring costs of healthcare, medical plans are looking for ways to optimize workflows and reduce costs. Titan Healthcare is a large non-profit integrated healthcare company located in Arizona, New Mexico, Nevada, Colorado, and Texas. They provide health insurance coverage, and a broad range of comprehensive health care services. Titan Healthcare is engrossed to employ the best strategies to close performance gaps and efficiently manage their operations. To help improve their pharmacy operations, they are seeking to design and implement a new Outpatient Pharmacy Information System which will handle both dispensing and inventory functionality. From a pharmacy inventory perspective, expectations for the system are to significantly reduce inventory costs and increase service levels to their members. Titan Healthcare is currently exploring options for designing the right Outpatient Pharmacy Inventory Management System for its operations.*

*Keywords: Bullwhip Effect, Healthcare Reform Act, Just in Time Inventory, Outpatient Pharmacy Information System*

---

## ORGANIZATION BACKGROUND

### The Company

Titan Healthcare was founded in 1975 by a group of doctors who wanted to do healthcare differently. They realized that the Fee-For-Service model of providing healthcare was inefficient and didn't accurately address the total healthcare needs of the patient. Rather, it increased the costs by encouraging doctors to perform more services than necessary, and to

not pay close attention preventative medicine which reduces patient visitations. Titan wanted to provide a system of healthcare that linked the health care provider with the insurance plan, so that both were incentivized to manage costs by keeping people healthy. As a result, they decided to become a Vertically Integrated Managed Care Organization, which is an all-in-one system where the insurance plan, doctors, hospitals, clinics, pharmacies, and other care providers belong to the same company. They have 22 major hospitals located in various cit-

DOI: 10.4018/jcit.2012100103

ies in the region, and have over 200 outpatient hospitals. Titan is compensated by receiving a flat fee from members' insurance premiums, and members receive all care that is needed regardless of the cost. Internal policies, as well as state and federal laws, provide a high degree of assurance to members that Titan doctors will not forego necessary treatments to cut costs for the company; providing balance to the approach.

Titan's current pharmacy system was developed in the 1980's, and currently lacks any comprehensive inventory functionality or business intelligence capabilities. It is truly an antiquated transaction processing system that only supports dispensing functions. Inventory is manually managed locally at the pharmacy, and ordering is performed by pharmacy technicians. They manage the stock of, roughly, 4,000 different items per store, representing an average of \$450,000 in Monthly COGS and \$500,000 in inventory per store.

The technician's inventory management process is fairly straight-forward. They walk through the stock room and visually inspect the shelves. There is a reorder point written on each container, and when the items are below the reorder point, the technician places an or-

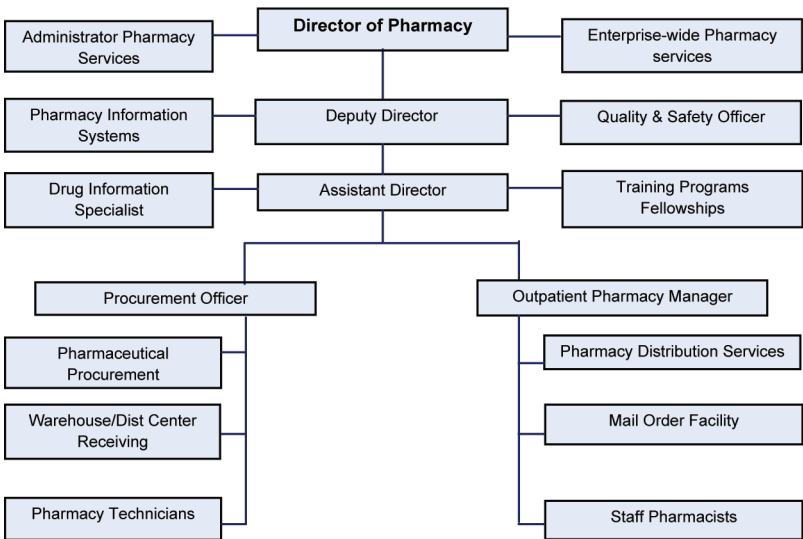
der to the distributor through the distributor's system installed in the local pharmacy. When the goods arrive, they are manually received, and stocked onto the shelves. Every day they receive about 200 different line items.

Since inventory purchases are performed electronically, financial reporting can be tracked at Titan's pharmacy headquarters. However, Titan management lacks the ability to electronically know how much inventory of a specific item is in a store at any point in time. This is considered a major blind spot.

Titan receives its goods through daily shipments from a large distributor, known as AmerisourceBergen Corporation (ABC). ABC has several large distribution centers located within the Titan network and also has placed smaller warehouse sites within 1 hour driving distance of each of Titan's 22 major pharmacies.

If a member is willing to wait for their prescription to arrive in the mail, then the pharmacy can send the prescription to Titan's Mail Order Facility, where the item will be filled and shipped by mail overnight. The transaction costs half of what it costs to fill in the Outpatient Pharmacy, so it is the preferred method for Titan. The only limitation is that not all items that the

Figure 1. Titan Rx outpatient pharmacies: organizational structure



12 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage: [www.igi-global.com/article/integration-just-time-jit-inventory/77293](http://www.igi-global.com/article/integration-just-time-jit-inventory/77293)

## Related Content

---

### Legal and Technical Issues of Privacy Preservation in Data Mining

Kirsten Wahlstrom, John F. Roddick, Rick Sarre, Vladimir Estivill-Castro and Denise de Vries (2009). *Encyclopedia of Data Warehousing and Mining, Second Edition* (pp. 1158-1163).

[www.irma-international.org/chapter/legal-technical-issues-privacy-preservation/10968](http://www.irma-international.org/chapter/legal-technical-issues-privacy-preservation/10968)

### Data Mining in Security Applications

Aleksandar Lazarevic (2009). *Encyclopedia of Data Warehousing and Mining, Second Edition* (pp. 479-485).

[www.irma-international.org/chapter/data-mining-security-applications/10863](http://www.irma-international.org/chapter/data-mining-security-applications/10863)

### Storage Systems for Data Warehousing

Alexander Thomasian (2009). *Encyclopedia of Data Warehousing and Mining, Second Edition* (pp. 1859-1864).

[www.irma-international.org/chapter/storage-systems-data-warehousing/11072](http://www.irma-international.org/chapter/storage-systems-data-warehousing/11072)

### Evolutionary Computation and Genetic Algorithms

William H. Hsu (2009). *Encyclopedia of Data Warehousing and Mining, Second Edition* (pp. 817-822).

[www.irma-international.org/chapter/evolutionary-computation-genetic-algorithms/10914](http://www.irma-international.org/chapter/evolutionary-computation-genetic-algorithms/10914)

### Clustering Categorical Data with k-Modes

Joshua Zhexue Huang (2009). *Encyclopedia of Data Warehousing and Mining, Second Edition* (pp. 246-250).

[www.irma-international.org/chapter/clustering-categorical-data-modes/10828](http://www.irma-international.org/chapter/clustering-categorical-data-modes/10828)