A Root Cause Analysis of Stock-outs in the Pharmaceutical Industry

By

Xuewen Sun and Bangqi Yin

Submitted to the Engineering Systems Division
in Partial Fulfillment of the Requirements for the Degree of
Master of Engineering in Logistics

Abstract

PharCo (an assumed name) is a leading global healthcare company with well-recognized brands of both pharmaceutical and consumer healthcare products. As PharCo continues to expand its global presence, product stock-outs in their pharmaceutical business unit have been consistently increasing. PharCo suspected that manufacturing quality defects were a major cause of stock-outs, reducing the production yield and preventing the company from meeting customer demand. To help test this hypothesis and address the stock-out challenge, we reviewed existing research on the subject of product stock-outs within the pharmaceutical industry. To understand PharCo’s manufacturing process, we conducted on-site visits and reviewed their quality control practices. Finally, we designed a mixed methods approach that combines qualitative and quantitative techniques to analyze the root causes of product stock-outs at PharCo. The analysis revealed that, instead of manufacturing quality defects, regulatory issues were the primary cause for stock-outs at PharCo. Regulatory challenges associated with developments such as new product launches, license renewals, and formulation modifications need to be addressed for PharCo to reduce their stock-out level.

Thesis Supervisor: Dr. Roberto Perez-Francos
Title: Research Director, MIT Center for Transportation and Logistics