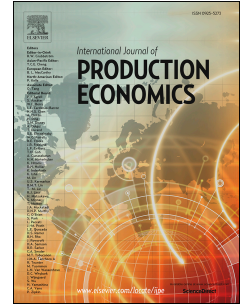


Accepted Manuscript

Evaluation of solution approaches for a stochastic lot-sizing and sequencing problem

Kseniya Schemeleva, Xavier Delorme, Alexandre Dolgui



PII: S0925-5273(18)30112-9

DOI: [10.1016/j.ijpe.2018.02.017](https://doi.org/10.1016/j.ijpe.2018.02.017)

Reference: PROECO 6967

To appear in: *International Journal of Production Economics*

Received Date: 25 May 2015

Revised Date: 21 February 2018

Accepted Date: 25 February 2018

Please cite this article as: Schemeleva, K., Delorme, X., Dolgui, A., Evaluation of solution approaches for a stochastic lot-sizing and sequencing problem, *International Journal of Production Economics* (2018), doi: 10.1016/j.ijpe.2018.02.017.

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Evaluation of solution approaches for a stochastic lot-sizing and sequencing problem

Abstract

A stochastic multi-product lot-sizing and sequencing problem is studied. Two kinds of uncertainties are integrated into the model: defective items due to the process imperfections and random lead times because of randomly arising machine breakdowns and uncertain repair times. There are also sequence-dependent set-up times between two items of different types. The objective is to find a sequence of lots and lot sizes maximizing the probability of demand satisfaction for all products. A decomposition approach has been proposed in the literature to reduce this problem to a sequence of known optimization problems with different algorithms available for each of them. However, a proper evaluation of the practical performance of the whole method has never been presented. The goal of this paper is to analyze and compare the behavior of different solution frameworks (with and without decomposition) and techniques for the considered problem.

Keywords: Stochastic production lines, Lot-Sizing, Sequencing, Decomposition, Dynamic programming, Genetic Algorithms

1. Introduction

We study a lot-sizing and sequencing problem under uncertainty. The goal is to find optimal sequence of lots and lot sizes maximizing the probability to satisfy the whole demand, i.e. the demand for all product lots. [In the literature the problem of demand satisfaction is often considered from cost point of view with the objective to minimize total backlog and holding cost. But in practice it is very difficult to accurately calculate the backlog cost because of indirect consequences of stock-outs such as potential losses of clients. When the average cost evaluation is not possible, or average cost criterion cannot be used for decisions, the service level criterion is often applied.](#)

The impetus for this research initially came from the design of a fully automated production facility in the electronics industry that processes different conductor patterns and assembles them into printed circuits. However, the conclusions drawn by our study could be of interest for other similar situations where the same random phenomena arise and the same objective function of service level maximization is used.

The facility considered is composed of (see figure 1): 1) a manufacturing line that processes items of several types; 2) an automatic storage device that stocks processed items; 3) an assembly line assembling final products with previously stored items. As shown in figure 1, the manufacturing line consists of m sequentially placed machines and is a paced

متن کامل مقاله

دریافت فوری ←

ISIArticles

مرجع مقالات تخصصی ایران

- ✓ امکان دانلود نسخه تمام متن مقالات انگلیسی
- ✓ امکان دانلود نسخه ترجمه شده مقالات
- ✓ پذیرش سفارش ترجمه تخصصی
- ✓ امکان جستجو در آرشیو جامعی از صدها موضوع و هزاران مقاله
- ✓ امکان دانلود رایگان ۲ صفحه اول هر مقاله
- ✓ امکان پرداخت اینترنتی با کلیه کارت های عضو شتاب
- ✓ دانلود فوری مقاله پس از پرداخت آنلاین
- ✓ پشتیبانی کامل خرید با بهره مندی از سیستم هوشمند رهگیری سفارشات