LIS Belgian-Dutch Research Seminar on Logistics Management
Antwerpen University Antwerpen
June 2nd, 2005
12h20 – 17h15.

PROGRAM

1220-1300 hrs - Lunch
1300-1305 hrs - Welcome, Nico Vandaele
1300-1345 hrs - Eric Porras, Rommert Dekker
“Generalized solutions for the joint replenishment problem with correction factor”
Erasmus University Rotterdam
Discussant: Per Agrell

1345-1430 hrs - Susan van Zelst, Karel van Donselaar, Tom van Woensel, Rob Broekmeulen and Jan Fransoo
“A Model for Store Handling Potential for Efficiency Improvement”
Department of Technology Management, Technische Universiteit Eindhoven
Discussant: René de Koster

1430-1515 hrs - Jean-Christophe Van den Schriek, Philippe Chevalier
“Optimizing the staffing and routing of small size hierarchical call-centers”
Université Catholique de Louvain
Discussant: Rommert Dekker

1515-1600 hrs - Roelof Kuik, Chia-Shin Chung and James Flynn, Piotr Stalinski
“A single period inventory placement problem for a supply chain with the profit attainment objective and lost sales costs”
Rotterdam School of Management, Erasmus University
Discussant: Philippe Chevalier

1600-1605 hrs - Break

1605-1650 hrs - Mengfei Yu and René de Koster
“Makespan minimization at Aalsmeer flower auction”
Rotterdam School of Management, Erasmus University
Discussant: Xavier Brusset

1650-1700 hrs - René de Koster
Closing words, date for next seminar in Rotterdam
Rotterdam School of Management, EUR
Summary of Abstracts

Generalized solutions for the joint replenishment problem with correction factor
Eric Porras, Rommert Dekker

Abstract
In this paper we give a complete analysis of the joint replenishment problem (JRP) under constant demands and continuous time. We present a solution method for the JRP when a correction is made for empty replenishments, and we test the solution procedures with real data. We show that the solutions obtained differ from the standard JRP when no correction is made in the cost function. We further show that the JRP with correction outperforms independent ordering. Additional numerical experiments are presented.

A Model for Store Handling Potential for Efficiency Improvement
Susan van Zelst, Karel van Donselaar, Tom van Woensel, Rob Broekmeulen and Jan Fransoo

Abstract
In retail stores, handling of products typically forms the largest share of the operational costs. The handling activities are mainly the stacking of the products on the shelves. While the impact of these costs on the profitability of a store is substantial, there are no models available of the different drivers influencing store handling. In this paper, a study of the shelf stacking process is presented. First, a conceptual model based on warehouse operations is derived. It is shown that handling costs are non-linear with the number of consumer units stacked. Secondly, by means of a motion and time study, data has been collected in four grocery stores of two different European retail companies. The model clearly demonstrates the impact of the most important drivers for handling efficiency: case pack size, number of case packs stacked simultaneously, and the stacking regime. Efficiency gains of 8-49% by changing the driver parameter value are identified. Based on the presented insights both retail companies have decided to structurally change their current operations.

Optimizing the staffing and routing of small size hierarchical call-centers
Jean-Christophe Van den Schriek, Philippe Chevalier

Abstract
Multiple skill call centers propagate rapidly with the development of telecommunications. An abundant literature has already been published on call centers. Here we want to focus on centers that would typically occur in B2B environments, these are on call centers that handle many types of calls but where the arrival rate for each type is low. In order to find an optimal configuration, the integrality of the decision variables is a much more important issue than for larger call centers. The present paper proposes an approach that uses elements of combinatorial optimization to find optimal configurations. We develop an approximation method for the evaluation of the service performance together with a Branch and Bound algorithm to obtain a minimum cost configuration to meet a given service level requirement. This is making the right balance between gains resulting from the economies of scale of pooling and the higher cost or cross trained agents. The article shows that in most cases this method allows to decrease the staffing cost significantly compared to configurations with only cross trained or only dedicated operators.

A single period inventory placement problem for a supply chain with the profit attainment objective and lost sales costs
Roelof Kuik, Chia-Shin Chung and James Flynn, Piotr Stalinski

Abstract
This article addresses the inventory placement problem in a nonserial, N-stage, supply chain facing a stochastic demand for a single planning period for a single product—a specialty item with a very short selling season. Each stage is a stocking point, which can contain raw materials, subassemblies, and finished products at various locations. Thus stages are not necessarily time related. Customer demand can be satisfied from any stage, and the processes that transform the material at a stage into finished products at the customer's location vary. Stocking decisions are made before demand occurs. All unsatisfied demand is lost. Because of delays, only a known fraction of demand at a stage will wait for shipments. The revenue, salvage value, ordering, shipping, processing, and lost sales costs are proportional. There are fixed costs for utilizing stages. The objective is to select the stock quantities that should be placed at the different stages so as to maximize the probability of achieving a budgeted profit level $B$. We prove there always exists an optimal stock vector with at most three positive components (i.e., all but three stages have zero stock levels). We also characterize its properties, and provide an algorithm for its computation.

Makespan minimization at Aalsmeer flower auction
Mengfei Yu and René de Koster

Abstract
Bloemenveiling Aalsmeer (VBA) is the second largest flower auction in the world. Growers supply flowers on trolleys to VBA. After the auction process, the auctioned flowers are distributed to customer aisles, which are the locations for customers’ carts. Throughput time (or makespan) of the distribution process is essential for VBA because it deals with perishable products. VBA faces several problems. First, the growing order volume causes it to recruit more distributors, which aggravates the congestion in the distribution area. Second, turnover rate of distributors is high, which leads to low work productivity. Due to these problems, the required distribution makespan can not be realized. To improve makespan, this paper investigates two kinds of measures. The first measure introduces teamwork. Distributors work in self-organized teams. Each team is only responsible for the distribution of flowers for a specific group of customer aisles. Second, we investigate the impact of variable customer-to-aisle assignments. All measures are evaluated by simulation. The results show that in the current distribution process, makespan can hardly be improved by changed customer-to-aisle assignments. Teamwork improves makespan about 40 percent by reducing congestion in the distribution process. Further analyses reveal that combining teamwork and smart customer assignment methods have additional advantages such as saving the number of distributors.