PERSONNEL PLANNING OF A RETAIL STORE USING POS DATA

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Abstract

The competitiveness of retail stores depends heavily on the ability to handle the challenges of reducing control costs and increasing customer service levels. One element that affects cost significantly is labour costs. This paper addresses proposing a procedure of finding the optimal solutions of personnel planning, especially by making use of the actual Point of Sales (POS) data and considering several frequency patterns of customers entering a store. First, a simulation model of the payment process is designed to establish the conditions for an integer programming (IP) model. Second, this study proposes the IP model to find the initial optimal patterns of salesclerk allocation; that is, the allocation pattern is optimal at each interval. Finally, the simulation model is used to examine the service level. With the assistance of the simulation result, the optimal solution can be obtained to satisfy a predefined service level by repeating the simulation model. 14 refs.

SOLVING THE JOB-SHOP SCHEDULING PROBLEM
WITH A SIMPLE GENETIC ALGORITHM

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Abstract

The job-shop scheduling is concerned with arranging processes and resources. Proper schedules are very important for the manufacturers, but can cause serious problems because of the enormous solution space. Pressure from the competitive enterprises is the main reason why time is becoming one of the most important success factors. Scheduling tools allow production to run efficiently. The goal in this paper is the development of an algorithm for the job-shop scheduling problem, which is based only on genetic algorithms. Our intention is to prove, that even a relatively simple genetic algorithm is capable for job-shop scheduling. The effectiveness of the algorithm is demonstrated by solving practical problems. The first problem consists of 10×10 instances (10 jobs and 10 machines) and the second one of 20×5 instances (20 jobs and 5 machines). The scheduling efficiency is measured by the time required to complete all jobs (makespan). In case of the first and the second problem, the best obtained solution (i.e., deviation from optimal solution) was 1.2 % and 4 %, respectively. 18 refs.

MANUFACTURING ARCHITECTURE DESIGN USING DISCRETE MATERIAL FLOW
MANAGEMENT

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Abstract

The main problem treated in this paper is that if we want to optimize a network of manufacturing systems design using discrete material flow management we need a new algorithm different from the one used for a single manufacturing system. For a single manufacturing system we usually use discrete material flow simulation to identify and eliminate bottlenecks where the flow is slowed down or blocked in order to increase the productivity. For a network of manufacturing systems material flow concentrators could be the bottlenecks found in one of the manufacturing systems using this classical discrete material flow simulation but it also could be a new different one. We focus in this paper on the algorithm we propose to solve this problem of identifying and eliminating not the bottlenecks of each manufacturing system but of the entire network. A case study of multipolar synchronous simulation (as we named our proposed algorithm) is presented in order to illustrate across a tree nodes manufacturing network how this new algorithm works. 12 refs.

COMPARING FUNCTIONAL AND CELLULAR LAYOUTS: SIMULATION MODELS

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Abstract

The cellular layout has been compared to the traditional functional layout in numerous studies. Most of them are based on simulation modelling. Nevertheless, they generally suffer from the lack of detail in describing their simulation models. The exclusion or the lack of information of key parameters could be serious limitations to any simulation study. The main purpose of this work is the development of comprehensive FL and CL simulation models and their use for illustrating the dependence of the layout performance comparison on the settings of factors either overlooked or kept constant by several simulation studies. Simulation results clearly establish the influence of part type routings, cellular queuing strategy and job overlapping on the ranking of the two layouts. 18 refs.