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Simultaneous production planning of make-to-order (MTO) and make-to-stock (MTS) products using simulation optimization. Case study: Soren Restaurant

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Abstract

Currently, due to the high quality of foods and services, some restaurants are moving towards service development by increasing production capacity, restaurant salon capacity, and prepared productions for quick response. However, the investment priority sectors for development are not clear. Restaurant planning, due to the lack of stable demands, is very difficult and not possible by means of mathematical models. Accordingly, in this paper, a method based on discrete event simulation was used to simulate the processes of order receiving, raw materials warehousing, and production in the kitchen of a five-star restaurant in Tehran. Important parameters from the perspective of restaurant management were optimized using design of experiments. Numerical results showed that, in accordance with the geographical conditions and

public interests in traditional foods, the increase of restaurant salon capacity has higher priority and could lead to increased net profit. Additional studies revealed that to increase the overall profits without reducing the quality of provided services to customers, the proportion of production for outdoor customers must be increased. By by the restaurant management implementing these policies, the average rate of profit was increased by 9.3% during 6 months.

Keywords:

Discrete event simulation | optimization via simulation | design of experiments | production planning | process improvement

Notes

1. The decoupling point is also known as Order Penetration Point (OPP), Customer Order Decoupling Point (CODP), or Customer Order Point (COP).

2. Analytic hierarchy process.

3. Coefficient of variation.