

The Problem of Coupling Lot Streaming and Clearing Function Rules

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Abstract

Manufacturing and service companies, in general, work permanently with the view of continuous improvement. This improvement can be achieved by applying diverse methods and techniques in various areas of production and process steps, depending of the managers need in solving certain problem.

Besides, production planning and scheduling are forms of decision-making that are used regularly in many manufacturing and service industries. Also, the functions of planning and programming in a company depend on mathematical techniques and heuristic methods that allocate limited resources to the activities to be carried out. This allocation of resources must be made in such a way that the company optimizes its objectives and achieves its goals [1].

In essence, production planning tells you when and how much to produce (estimates of capacity, labor, materials, etc.), and scheduling tells you how to produce (production sequencing, for example).

Therefore, production planning and scheduling are important steps in the production process in a manufacturing system. To ensure that production planning and scheduling are coordinated and work smoothly, capacity forecasts must be as accurate as possible. And to guarantee this precision, it is necessary to use forecasting rules such as the clearing function rules, and those of lot streaming, as carefully as possible.

Estimating capacity accurately can ensure that production planning and scheduling are satisfactory for the problem presented, since capacity decisions have a major impact on all other production planning issues [2].

The capacity estimates provided by the clearing function come from the manufacturing system modeling as a network flow problem, studied and explored by [3] and recently by [4, 5, 6]. And the estimates provided by lot streaming techniques come from the use of techniques of subdivision of production lots into smaller sublots to be processed in overlap, according to [7, 8, 9].

Production planning and scheduling are usually performed in separate phases, which causes a delay in the exchange of information between operations at these levels. Therefore, linking these phases means creating a virtuous cycle between planning and scheduling, since the clearing function capacity forecasts, in the planning phase are sent to the programming phase that updates the subplot sizes, which in turn returns the feedback planning.

This research deals with the problem of linking planning with production scheduling, combining the predictions of capacity given by clearing function rules with those provided by lot streaming techniques.

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Keywords

Clearing Function, Lot Streaming, Production Planning, Scheduling.