

Managing learning and turnover in employee staffing

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Abstract

We study the employee staffing problem at a call center. The employees experience learning and turnover on the job, and we develop a Markov Decision Process (MDP) model which explicitly represents the stochastic nature of these effects. Theoretical results show that the optimal hiring policy is of a state-dependent “hire-up-to” type, similar to an inventory “order-up-to” policy. For two important special cases, a myopic policy is optimal. We also test a linear programming (LP) based heuristic, which uses average learning and turnover behavior, in stationary environments. In most cases, the LP-based policy performs quite well, within 1% of optimality. When flexible capacity-in the form of overtime or outsourcing-is expensive or not available, however, explicit modeling of stochastic learning and turnover effects may improve performance significantly.

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