An Improved Heuristic for Staffing Telephone Call Centers with Limited Operating Hours *

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Abstract

Many service operations, such as telephone call centers, experience cyclic and random customer demand and adjust their staffing over the day in an attempt to provide a consistent target level of customer service. The standard method, which we call *standard independent period by period* (SIPP) approach, divides the workday into planning periods and use a series of stationary independent queueing models - one for each planning period - to estimate minimum staffing needs. This research evaluates and improves upon this commonly used heuristic in the context of telephone call centers with limited operating hours. We show that SIPP often suggests staffing levels that are substantially too low to achieve the customer service target (probability of customer delay) during critical periods. A major cause of the shortfall is that, due to the time lag between the peak in customer demand and when system congestion actually peaks, SIPP assigns servers before they are needed and decreases staffing just as congestion peaks. The service shortfalls in practical situations can be quite substantial. We identify sets of parameter values for which SIPP tends to suggest inadequate staffing. Based on the analysis of the factors that affect the magnitude of the lag, we propose and test two simple "lagged" SIPP modifications that, in most situations, consistently achieve the service target with only modest increases in staffing.

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