

Managing Response Time in a Call Routing Problem with Service Failure

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December 2004

Abstract

Traditional research on routing in queueing systems usually ignores service quality related factors. In this paper, we analyze the routing problem in a system where customers call back when their problems are not completely resolved by the service customer representatives (CSRs). We introduce the concept of call resolution probability, and we argue that it constitutes a good proxy for call quality. For each call, both the call resolution probability (p) and the average service time ($1/\mu$) are CSR dependent. We use an MDP formulation to obtain analytical results and insights about the optimal routing policy that minimizes the average total time of call resolution including callbacks. In particular, we provide sufficient conditions under which it is optimal to route to the CSR with the highest call resolution rate ($p\mu$) among those available. We also develop efficient heuristics that can be easily implemented in practice.

Subject classifications: Dynamic programming/optimal control: Markov: Infinite state. Probability: Stochastic model applications. Queues: Markovian; Multichannel.

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