Service Level Optimization in a Large Office Equipment Manufacturing Company

Background

A large office equipment manufacturing company has a service division that is responsible for offering high-quality support to the company's customers by promptly repairing the machines when required. The company's service representatives, called tech reps, do this work on the customer's site. Each tech rep is given responsibility for a specified territory. This enables providing personalized service.

Challenge

Each tech rep's territory should be assigned sufficient machines so that the tech rep will be engaged in repairing machines (or traveling to the repair site) approximately 80% of the time. Each tech rep should be able to repair an average of 4 machines per day (an average of 2 hours per machine, including travel time).

Under this policy, the company now has nearly 9,500 tech reps, with a total payroll (including benefits) of approximately $600 million per year. The number of customers in each territory is approximately 150. On average, the machines require repair once in 50 days.

The company had a long history of very successful products that maintained its position as a market leader in the past. Moreover, its latest product has been a particularly big winner. However, this success also has brought some issues. Since the latest product performs several key functions, this makes it a vital part of the customer's office.

The customer has great trouble in getting along without it for even a few hours when it is down requiring repair. Therefore, although the tech reps are offering the same level of service as they did in the past, complaints about intolerable wait times for repairs have skyrocketed.

Solution

After considerable discussion with the company, we suggested the following three-step approach to deal with the problem: 1. Agree on a tentative new standard for the level of service that needs to be provided. 2. Develop some proposals for alternative approaches that might achieve this standard. 3. Evaluate the effectiveness and cost of each one. We modeled the service request arrival distribution and service time distribution. We built a customized waiting line model to suit the service request arrival distribution and service time distribution of the company to optimize the service level. The implemented optimization solution reduced the average waiting time of customers before the tech rep begins the trip to the customer site to repair the machine to 2 hours.