OPRE 6398.001 Prescriptive Analytics

Reading 10*

L. L. Bean is a widely known retailer of high-quality outdoor goods and apparel. Roughly 10 percent of its sales are derived through retail stores, 20 percent through mail orders, and 70 percent through telephone orders at the company's call center. Customers call one of two toll-free numbers to place orders or to contact customer service. Customer service agents are specially trained to handle a wide variety of customer issues, whereas sales agents are trained primarily to take orders.

To plan its staffing needs effectively, it is important for L. L. Bean to forecast accurately the number of daily telephone calls for sales and for customer service. Staffing schedulers use the forecasts to create weekly employee schedules for the coming three weeks. Inaccurate forecasts are very costly to L. L. Bean. Forecasting too high results in excess direct labor cost. Forecasting too low results in understaffing, which causes dissatisfied customers, lost sales, and high telephone -connect charges from longer waits. Further complicating the forecasting and staffing challenge is the erratic nature and extreme seasonality of L. L. Bean's business. The company receives nearly 20 percent of its annual calls in the three weeks before Christmas, during which time it usually doubles the number of agents and quadruples the quantity of telephone lines.

In an effort to improve forecasting accuracy, new forecasting models were developed using the autoregressive integrated moving average (ARIMA or Box-Jenkins) methodology. The improvements were substantial. One L. L. Bean manager described the improvements as follows: "We have been using the new forecasting system to make our call-center staffing schedules for about five months now and have benefited greatly from its improved precision. In the past, we forecasted call volumes using a less statistically sophisticated approach that was based primarily on order forecasts provided by marketing.

"The recurring annual savings derived from switching to the new forecasting system is estimated to be $300,000. This does not include the substantial ongoing savings derived from reducing the labor required to prepare the forecasts every week."

* Adapted from Andrews, B. H., & Cunningham, S. M. L. L. Bean improves call-center forecasting. *Interfaces*, 1995, November-December, pp.1-13.