Starbucks Case Study

Starbucks has a large, global supply chain that must efficiently supply over 17,000 stores. Although the stores might appear to be very similar, they are actually very different. Depending on the location of the store, its size, and the profile of the customers served, Starbucks management configures the store offerings to take maximum advantage of the space available and customer preferences.

Starbucks' actual distribution system is much more complex, but for the purpose of our exercise let's focus on a single item that is currently distributed through five distribution centers in the United States. Our item is a logo-branded coffeemaker that is sold at some of the larger retail stores. The coffeemaker has been a steady seller over the years due to its reliability and rugged construction. Starbucks does not consider this a seasonal product, but there is some variability in demand. Demand for the product over the past 13 weeks is shown in the following table.

The demand at the distribution centers (DCs) varies between about 40 units, on average, per week in Atlanta and 48 units in Dallas. The current quarter's data are pretty close to the demand shown in the table.

Management would like you to experiment with some forecasting models to determine what should be used in a new system to be implemented. The new system is programmed to use one of two forecasting models: simple moving average or exponential smoothing.

Week	1	2	3	4	5	6	7	8	9	10	11	12	13
Atlanta	33	45	37	38	55	30	18	58	47	37	23	55	40
Boston	26	35	41	40	46	48	55	18	62	44	30	45	50
Chicago	44	34	22	55	48	72	62	28	27	95	35	45	47
Dallas	27	42	35	40	51	64	70	65	55	43	38	47	42
LA	32	43	54	40	46	74	40	35	45	38	48	56	50
Total	162	199	189	213	246	288	245	204	236	257	174	248	229

1. Consider using a simple moving average model. Experiment with models using five weeks' and three weeks' past data. The past data in each region are given as follows (week −1 is the week before week 1 in the table, −2 is two weeks before week 1, etc.). Evaluate the forecasts that would have been made over the 13 weeks using the overall (at the end of the 13 weeks) mean absolute deviation, mean absolute percent error, and tracking signal as criteria.

Week	−5	−4	−3	−2	−1
Atlanta	45	38	30	58	37
Boston	62	18	48	40	35
Chicago	62	22	72	44	48
Dallas	42	35	40	64	43
LA	43	40	54	46	35

2. Next, consider using a simple exponential smoothing model. In your analysis, test two alpha values, 0.2 and 0.4. Use the same criteria for evaluating the model as in part 1. When using an alpha value of 0.2, assume that the forecast for week 1 is the past three-week average (the average demand for periods −3, −2, and −1). For the model using an alpha of 0.4, assume that the forecast for week 1 is the past five-week average.

3. Starbucks is considering simplifying the supply chain for their coffeemaker. Instead of stocking the coffeemaker in all five distribution centers, they are considering only supplying it from a single location. Evaluate this option by analyzing how accurate the forecast would be based on the demand aggregated across all regions. Use the model that you think is best from your analysis of parts 1 and 2. Evaluate your new forecast using mean absolute deviation, mean absolute percent error, and the tracking signal.

4. What are the advantages and disadvantages of aggregating demand from a forecasting view? Are there other things that should be considered when going from multiple DCs to a DC?