

- 1) This question concerns new product sales forecasting using Trial and Repeat model and Bass model.
- a) Yoplait is planning to introduce a new flavour of yogurt in Australia. To evaluate consumers' purchase intentions and to project sales, Yoplait has conducted a survey among 5000 shoppers in Melbourne. The survey responses on purchase intentions are given below.

Response category	% of customers responding
Definitely will buy	30%
Probably will buy	30%
May or May not buy	20%
Probably won't buy	15%
Definitely won't buy	5%

Yoplait expects its advertising campaign to create awareness about its new product in about 60% of its target audience of 20 million and Yoplait is planning to distribute the new product to 50% of grocery stores in Australia. If a typical consumer in yogurt category purchases 10 times a year and buys 2 units of yogurt per occasion, calculate the projected total sales volume of the new product in the first year of operation, assuming that 40% of the trial consumers will repeat their purchase.

- b) What does the parameter A_t in a Bass diffusion model represent? Explain the difference between sales and adoption. Under what scenario will sales be equal to adoption?
- c) For a new product, the estimates of Bass diffusion model parameters are as follows. Coefficient of innovation = 0.05
Coefficient of imitation = 0.35
Size of target population = 100,000

If the cumulative adoption at the end of year 4 is 28,878 units, calculate the projected number of adoptions for years 5 and 6 using Bass diffusion model.

(10 + 4 + 6 = 20 marks)

Answer:

a)

$$\text{Trial rate} = 0.8 * 30\% + 0.3 * 30\% = 0.33 \text{ or } 33\%$$

$$\begin{aligned} \text{Adjusted trial rate} &= \text{Trial rate} * \text{Awareness} * \text{Availability} = 33\% * 60\% * 50\% \\ &= 9.9\% \end{aligned}$$

$$\text{Trial population} = 20 \text{ million} * 9.9\% = 1,980,000$$

$$\text{Trial volume} = 1,980,000 * 2 = 3,960,000 \text{ units}$$

$$\text{Repeat population} = 1,980,000 * 40\% = 792,000$$

$$\text{Repeat volume} = 792,000 * 10 * 2 = 15,840,000 \text{ units}$$

$$\text{Total sales volume} = 15,840,000 + 3,960,000 = 19,800,000 \text{ units}$$

b) In a Bass diffusion model, $A(t)$ represents number of first time adopters of a product at year t . Adoption in BDM refers to first time adoption of a new product. It is different from sales because it doesn't take repeat purchases and quantity purchased into account. When all consumers buy one unit of the product and when there is no repeat purchase, adoption will be equal to sales.

c) $Q_4 = 28,878$

$$\begin{aligned} \text{Sales in Year 5} = A_5 &= (M - Q_4) \left[p + q \frac{Q_4}{M} \right] = (100,000 - 28,878) (0.05 + \\ &0.35 * (28,878 / 100,000)) = 10,744. \end{aligned}$$

$$Q_5 = 28,878 + 10,744 = 39,622.$$

$$\begin{aligned} \text{Sales in Year 6} = A_6 &= (M - Q_5) \left[p + q \frac{Q_5}{M} \right] = (100,000 - 39,622) (0.05 + \\ &0.35 * (39,622 / 100,000)) = 11,392. \end{aligned}$$