IIT ROORKEE

NPTEL ONLINE CERTIFICATION COURSE

Project Management for Managers

Lec – 13

Market and Demand Analysis - I

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Methods of Demand Forecasting

I Qualitative Methods : These methods rely essentially on the judgment of experts to translate qualitative information into quantitative estimates. The important qualitative methods are :

- **Jury of executive method**
- **Delphi method**

II Quantitative Methods: These methods generate forecasts on the basis of an analysis of the historical time series . The important time series projection methods are :

- **Trend projection –method**
- **Exponential smoothing method**
- **Moving average method**

III Causal Methods : More analytical than the preceding methods, causal methods seek to develop forecasts on the basis of cause-effect relationships specified in an explicit, quantitative manner. The important causal methods are :

- **Chain ratio method**
- **Consumption level method**
- **End use method**
- **Leading indicator method**
- **Econometric method**

IV Simulation

Qualitative Methods

Jury of Executive Opinion Method

This method involves soliciting the opinion of a group of managers on expected future sales and combining them into a sales estimate

Pros

- It is an expeditious method
- It permits a wide range of factors to be considered
- It appeals to managers

Cons

- The biases cannot be unearthed easily
- Its reliability is questionable

Qualitative Methods

Delphi Method

This method is ?????????????

Delphi Method

This method is used for eliciting the opinions of a group of experts with the help of a mail survey. The steps involved in this method are :

1.A group of experts is sent a questionnaire by mail and asked to express their views.

2. The responses received from the experts are summarised without disclosing the identity of the experts, and sent back to the experts, along with a questionnaire meant to probe further the reasons for extreme views expressed in the first round.

3. The process may be continued for one or more rounds till a reasonable agreement/disagreement emerges in the view of the experts.

Fig. 3.2 Composition of a DELPHI panel with initial responses.

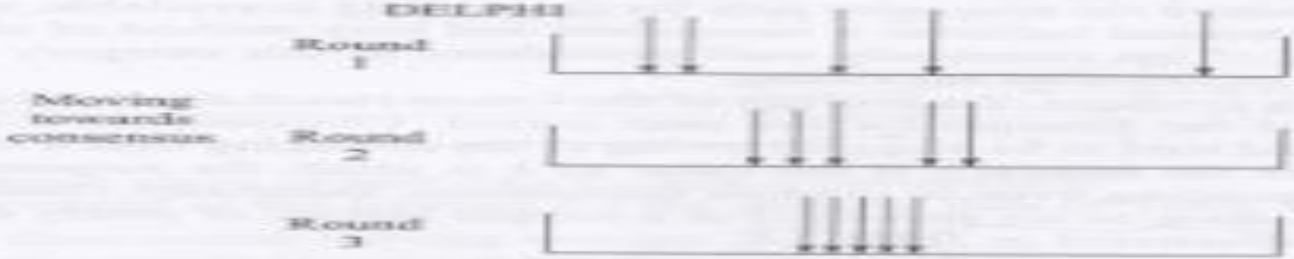

Fig. 3.3 DELPHI panelists moving successively towards consensus.

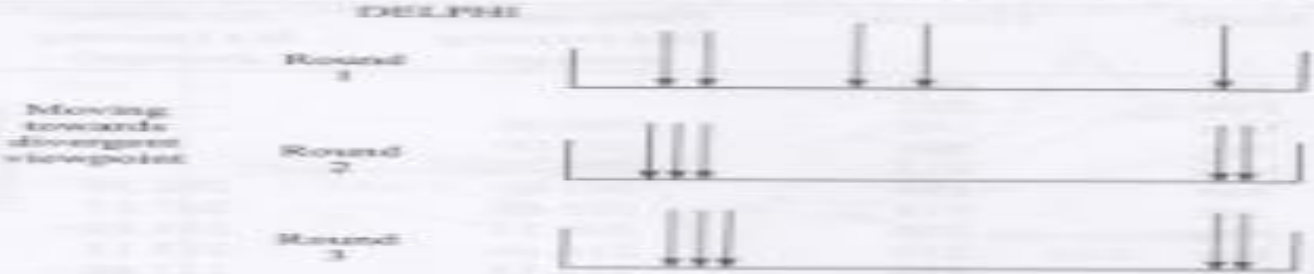

Fig. 3.4 Emergence of diverging viewpoints in DELPHI.

Pros

- It is intelligible to users
- It seems to be more accurate and less expensive than the traditional face-to-face group meetings

Cons

There are some question marks: What is the value of the expert opinion? What is the contribution of additional rounds and feedback to accuracy?

Quantitative Methods

Trend Projection Method

The trend projection method involves:

(a) determining the trend of consumption by analysing past consumption statistics and

(b) projecting future consumption by extrapolating the trend.

Trend Projection Method

Linear relationship: $Y_t = a + bt$

Exponential relationship: $Y_t = ae^{bt}$

Polynomial relationship: $Y_t = a_0 + a_1 t + a_2 t^2 \ldots\ldots a_n t^n$

Cobb Douglas relationship: $Y_t = at^b$

Age (x)	Repair expenses (y)
5	7
3	7
3	6
1	4

What would be expenses for a 4 years old truck.

	Age (x)	Repair expenses (y)	xy	x^2
	5	7	35	25
	3	7	21	9
	3	6	18	9
	1	4	4	1
Total	12	24	78	44

$\overline{x}=3$, $\overline{y}=6$

$a = \overline{Y} - b\overline{X}$ = 3.75

$b = \frac{\sum XY - n\overline{XY}}{\sum X^2 - n\overline{X^2}}$ = 0.75

$$Y=3.75+0.75\ (4) = 6.75$$

Moving Average Method

As per the moving average method of sales forecasting, the forecast for the next period is equal to the average of the sales for several preceding periods.

In symbols,

$$F_{t+1} = \frac{S_t + S_{t-1} + \ldots + S_{t-n+1}}{n}$$

Where F_{t+1} = forecast for the next period

S_t = sales for the current period

n = period over which averaging is done

Moving Average

Year	Demand	4 MA
2010	32	
2011	36	
2012	40	
2013	35	
2014	32	35.75
2015	35	35.75
2016	45	35.5
For 2017		36.75