PAPER – 17 - STRATEGIC PERFORMANCE MANAGEMENT

The following table lists the learning objectives and the verbs that appear in the syllabus learning aims and examination questions:

	Learning objectives	Verbs used	Definition
LEVEL C	KNOWLEDGE What you are expected to know	List	Make a list of
		State	Express, fully or clearly, the details/facts
		Define	Give the exact meaning of
	COMPREHENSION What you are expected to understand	Describe	Communicate the key features of
		Distinguish	Highlight the differences between
		Explain	Make clear or intelligible/ state the meaning or purpose of
		Identity	Recognize, establish or select after consideration
		Illustrate	Use an example to describe or explain something
	APPLICATION How you are expected to apply your knowledge	Apply	Put to practical use
		Calculate	Ascertain or reckon mathematically
		Demonstrate	Prove with certainty or exhibit by practical means
		Prepare	Make or get ready for use
		Reconcile	Make or prove consistent/ compatible
		Solve	Find an answer to
		Tabulate	Arrange in a table
	ANALYSIS How you are expected to analyze the detail of what you have learned	Analyze	Examine in detail the structure of
		Categorize	Place into a defined class or division
		Compare and contrast	Show the similarities and/or differences between
		Construct	Build up or compile
		Prioritize	Place in order of priority or sequence for action
		Produce	Create or bring into existence
	SYNTHESIS How you are expected to utilize the information gathered to reach an optimum conclusion by a process of reasoning	Discuss	Examine in detail by argument
		Interpret	Translate into intelligible or familiar terms
		Decide	To solve or conclude
	EVALUATION How you are expected to use your learning to evaluate, make decisions or recommendations	Advise	Counsel, inform or notify
		Evaluate	Appraise or asses the value of
		Recommend	Propose a course of action

Paper – 17 - Strategic Performance Management

Full Marks: 100 **Time Allowed: 3 hours**

This paper contains 10 questions, divided in three sections Section A, Section B and Section C. In total 7 questions are to be answered.

From Section A, Question No.1 is compulsory and answer any two questions from Section A (out of three questions - Questions Nos. 2 to 4). From Section B, Answer any two questions (i.e. out of Question nos. 5 to 7). From Section C, Answer any two questions (i.e. out of Question nos. 8 to 10).

Students are requested to read the instructions against each individual question also. All workings must form part of your answer. Assumptions, if any, must be clearly indicated.

Section –A

[Question 1 is compulsory and answers any 2 from the rest]

1 Read the following case study and answer the following questions:

The Royal Bank of Canada (RBC) is one of Canada's largest banks as measured by assets and market capitalization, and is among the largest 20 banks globally by market capitalization. RBC provides personal and commercial banking, wealth management services, insurance, corporate, investment banking and transaction processing services on a global basis. The bank currently employs some 74,000 full- and part-time employees who serve more than 15 million personal, businesses, public sector and institutional clients through offices in Canada, the US and 56 other countries. RBC holds strong market positions in the following business segments: Canadian Banking, Wealth Management, International Banking, Capital Markets and Insurance. RBC has long been regarded as a leading pioneer and best-practice exemplar in CRM.

RBC's business philosophy focuses on always earning the right to be its clients' first choice. In the competitive world of financial services, RBC knew that it needed to have a vision and methodology to drive its customer first mission and meet the ever-changing business needs of its customers. When it was looking at methods for improving customer experience, RBC focused on making it easier for clients to get rapid and predictable responses to their inquiries and requests.

This initiative focused on increasing the productivity and improving the efficiency of RBC's inquiry management processes. Client requests arrive in RBC's service centers through multiple channels, including phone, branch, fax, e-mail and mail. Within RBC's Canadian Operations, requests are sent in from staff in eight different geographic regions to 14 different service fulfillment groups. Each group uses different systems and processes to manage its work, which raises the question of 'which operations team do I need to contact to help resolve this issue and how do I best engage them for a quick turnaround?' With such a complex web of fulfillment options, customer service representatives were challenged to find the right path for specific client inquiries, how to accurately set client expectations on response times, and provide updates on existing requests.

A key business issue for RBC was that its large, diverse customer support staff, distributed over diverse geographies, had to address the high service experience demands of its customers. This needed to be achieved while reducing operational costs, increasing organizational transparency and complying with regulatory mandates

Management is using the CRM system tools. RBC identified Smart BPM as the key technology to deliver an end-to-end rebuild of their client inquiry and problem resolution process, creating a single system across channels and lines of business. Smart BPM would serve as the backbone for their 'new client action and request tool' (CART).

This was delivered so successfully that when the system was first rolled out there was no need for any formalized end-user training. The field service staffs were able to click on the 'create a new client request' button and successfully drive the process through to resolution. Additionally, it helped to determine that many cases were requests that could be resolved right at the point of contact and also avoided doubling effort. Once requests were captured into, the system, the process automation capabilities of the Smart BPM start it's servicing. This involved:

- **automatically looking up supporting customer information to enrich the request with required data to help resolve it;**
- **automatically determining the correct support group, location and even individual for routing and presentation;**
- **automatically generating supporting forms and correspondence as well as receiving inbound materials supplied by the customer or other support groups.**

Required:

(a) Define the Customer Relationship Management.

(b) What are the steps taken by the Bank to face the challenge?

(c) If you are appointed as a CEO of this Bank, would you agree to the implementation of the systems?

(d) Mention the objectives of using the CRM applications. [5+5+4+6]

Solution:

(a) There are as many definitions for CRM and opinions, at its more formal definition. CRM is a business strategy comprised of process, organizational and technical change whereby a company seeks to better manage its enterprise around its customer behaviors. It entails acquiring and deploying knowledge about customers and using this information across the various customers touch points to increase revenue and achieve cost reduction through operational efficiencies.

CRM is often thought of as a business strategy that enables businesses to:

- Understand the customer
- Retain customers through better customer experience
- Attract new customer
- Win new clients and contracts
- Increase profitably
- Decrease customer management costs

CRM is an integrated approach to identifying, acquiring and retaining customers. By enabling organizations to manage and coordinate customer interactions across multiple channels, departments, lines of business and geographies, CRM helps organizations maximize the value of every customer interaction and drive superior corporate performance.

(b) RBC identified Smart BPM as the key technology to deliver an end-to-end rebuild of their client inquiry and problem resolution process, creating a single system across channels and lines of business. Smart BPM would serve as the backbone for their 'new client action and request tool' (CART).

This was delivered so successfully that when the system was first rolled out there was no need for any formalized end-user training. The field service staffs were able to click on the 'create a new client request' button and successfully drive the process through to resolution. Additionally, it helped to determine that many cases were requests that could be resolved right at the point of contact and also avoided doubling effort. Once requests were captured into, the system, the process automation capabilities of the

Smart BPM servicing backbone drove higher rates of straight-through-processing. Once requests were captured into, the system, the process automation capabilities of the Smart BPM start it's servicing.
This involved:
- automatically looking up supporting customer information to enrich the request with required data to help resolve it;
- automatically determining the correct support group, location and even individual for routing and presentation;
- automatically generating supporting forms and correspondence as well as receiving inbound materials supplied by the customer or other support groups.

(c) As a C.E.O, I agree with the changes. Before, Customer request are processing in manual and began prone to error. It gives following benefits:
significant reduction in time to resolution of basic inquiries; predictable, accurate and consistent client service commitments at point of service and reduction in user training time, With the automated processes in place, the support staffs were able to focus their time, on just the steps that required their skills and judgment, not the menial tasks that added little value to the process. As a result, reduction in total elapsed time to resolve core processes, reduce headcount in the support organization.

(d) Objectives for using CRM applications
(i) To support the customer services
(ii) To increase the effectiveness of direct sales force.
(iii) To support of business to business activities.
(iv) To support of business to consumer activities.
(v) To manage the call center.
(vi) To operate the In- bound call centre.

2.(a) Kitchen King Company makes a high-end kitchen range hood "Maharaja". The Company presents the following data for the Year 1 and 2.

	Particulars	Year 1	Year 2
1	Units of Maharaja produced and sold (in units)	40,000	42,000
2	Selling Price per unit	₹ 1,000	₹ 1,100
3	Total Direct Material (square feet)	1,20,000	1,23,000
4	Direct Material Cost per square feet	₹ 100	₹ 110
5	Manufacturing Capacity (in units)	50,000	50,000
6	Total Conversion Cost	₹ 1,00,00,000	₹ 1,10,00,000
7	Conversion Cost per unit of Capacity (5) ÷ (6)	₹ 200	₹ 220
8	Selling and Customer Service Capacity	300 customers	290 customers
9	Total Selling and Customer Service Cost	₹ 72,00,000	₹ 72,50,000
10	Cost per customer of Selling and Customer Service Capacity (9) ÷ (8)	₹ 24,000	₹ 25,000

- **Kitchen King produces no defective units, but it reduces Direct Material Used per unit in Year 2.**
- **Conversion Cost in each year depends on production capacity defined in terms of Maharaja units and can be produced.**
- **Selling and Customer Service Cost depends on the number of customers that the Selling and Service functions are designed to support. Kitchen King has 230 customers in Year 1 and 250 customers in Year 2.**

Required:

(i) Describe, the key elements that would be included in Kitchen King's Balanced Score Card.

(ii) Calculate the Operating Income for the Years Year 1 and Year 2.

(iii) Calculate the Productivity Components that explain the change in Operating Income from Year 1 to Year 2.

(iv) Was the Company successful in implementing its strategy? Comment. [4+6+3+2]

Answer:

(i) The key elements that would be included in Kitchen King's Balanced Score Card are as under -

(a)	Financial Perspective	Increase in Operating Income (Profits) by virtue of higher prices & lower costs.
(b)	Customer perspective	Increase in Market Share of high-end kitchen range products, customer satisfaction & loyalty.
(c)	Internal Business Perspective	Increased Quality of products, value addition/additional features of products, on-time delivery of products.
(d)	Learning and Growth perspective	Development time for new end-product version, improvement in manufacturing processes, simplification of processing activities and elimination of NVA activities.

(ii). Computation of Operating Income and Changes therein

	Particulars	Year 1	Year 2	Change
(a)	Production and Sales (in units)	40,000 units	42,000 units	+2,000 units
(b)	Sale Revenue at ₹1,000 and ₹1,100 p.u.	₹ 4,00,00,000	₹ 4,62,00,000	+₹ 62,00,000
(c)	Cost: (i) Materials	₹ 1,20,00,000	₹ 1,35,30,000	- ₹ 15,30,000
	(ii) Conversion	₹ 1,00,00,000	₹ 1,10,00,000	-₹ 10,00,000
	(iii) Selling and Customer Service	₹ 72,00,000	₹ 72,50,000	-₹ 50,000
	Total Costs	₹ 2,92,00,000	₹ 3,17,80,000	-₹ 25,80,000
(d)	Operating Income (b – c)	₹ 1,08,00,000	₹ 1,44,20,000	+₹ 36,20,000

(iii). Computation of Cost Effect of Productivity Component

Particulars	Computation	₹
Cost Effect		
(a) Direct Material	=(Standard Inputs for Year 2 – Actual Inputs for Year 2) × Costs of Year 2 = (1,26,000 – 1,23,000) sq ft × ₹ 110 per sq. ft	3,30,000 F
(b) Conversion Cost	= (50,000 – 50,000) units × ₹ 200 p.u.	Nil
(c) Customer Service	= (300 – 290 customers) × ₹ 25,000 per customer	2,50,000F
	Cost Effect of Productivity Component	**5,80,000 F**

Standard Input of Year 2 = [1,20,000 × 42,000/40,000] = 1,26,000

(iv) Comment: The above analysis shows that the Company was able to successfully implement its Product Differentiation Strategy, since Operating Income has substantially increased due to that factor. The Company was able to increase its market share. It has also been able to increase its Operating Income by improving its productivity.

2. (b) Explain the role of the Management Accountant in Value Chain Analysis. [5]

Answer :

The Management Accountant's role will be scant in the following areas-

(i) Need for education, training and awareness:

Management Accountants should bring the importance of customer value to the forefront of Management's strategic thinking. They should take the initiative to bring the Value Chain message to major players in the Firm through seminars, articles, Value Chain examples and Company- specific applications.

(ii) Exploring for information:

VCA requires expertise in internal operations and information and also remands a great deal of external information. Management Accountants must seek relevant financial and non-financial information from sources outside the Firm.

(iii) Creativity:

Management Accountants must integrate databases and potential sources of timely information on competitive forces confronting the business. This calls for innovation and creativity in gathering and analysing information for management decisions.

(v) System design:

Designing internal and external information systems to assist managers in planning, monitoring and improving value-creating processes is another challenge of Management Accountants.

(vi) Cooperation:

Management Accountants should solicit support from all senior managers for allocating resources to develop and improve Value Chain-oriented Information Systems. The Management Accountant should ensure that the Top Management is committed to Value Chain Analysis and the organizational changes necessary for its successful implementation.

3. Formulate the following game as an LLP and obtain its solution:

B's Strategy

		b_1	b_2	b_3
A's Strategy	a_1	**8**	**9**	**3**
	a_2	**2**	**5**	**6**
	a_3	**4**	**1**	**7**

[20]

Answer:

The given problem can be formulated as an LLP from A's and B's point of view as follows:
Let x_1, x_2, and x_3 be the probabilities with which A chooses respectively the strategies a_1, a_2, and a_3, and y_1, y_2, and y_3 be the probabilities in respect of B choosing b_1, b_2, and b_3.

From A's point for view, we have to
Thus, the problem is

Minimise $\frac{1}{U} = X_1 + X_2 + X_3$

Subject to $8X_1 + 2X_2 + 4X_3 \geq 1$

$9X_1 + 5X_2 + X_3 \geq 1$

$3X_1 + 6X_2 + 7X_3 \geq 1$

$X_1, X_2, X_3 \geq 0$

Where U represents the value of the game, and $X_i = x_i/U$. We have to determine the values of U, x_1, x_2, and x_3.

From B's point of view, we have to

Maximise $\frac{1}{V} = Y_1 + Y_2 + Y_3$

Subject to $8Y_1 + 9Y_2 + 3Y_3 \leq 1$

$2Y_1 + 5Y_2 + 6Y_3 \leq 1$

$4Y_1 + Y_2 + 7Y_3 \leq 1$

$Y_1, Y_2, Y_3 \geq 0$

Where V is the game value and $Y_i = y_i/V$.

To obtain the required values we can solve either of these LPPs, and read the solution to the other from it as each one is the dual of the other. We shall solve the game from B's point of view.

Introducing the slack variables, we have

Maximise $\frac{1}{V} = Y_1 + Y_2 + Y_3 + 0S_1 + 0S_2 + 0S_3$

Subject to $8Y_1 + 9Y_2 + 3Y_3 + S_1 = 1$

$2Y_1 + 5Y_2 + 6Y_3 + S_2 = 1$

$4Y_1 + Y_2 + 7Y_3 + S_3 = 1$

$Y_i \geq 0, S_i \geq 0, i = 1, 2, 3$

Simplex Tableau 1: Non-optimal Solution

Basis		Y_1	Y_2	Y_3	S_1	S_2	S_3	b_i	b_i/a_{ij}
S_1	0	8*	9	3	1	0	0	1	1/8 ← Outgoing variable
S_2	0	2	5	6	0	1	0	1	½
S_3	0	4	1	7	0	0	1	1	1/4
C_j		1	1	1	0	0	0		
Solution		0	0	0	1	1	1		
Δ_j		1	1	1	0	0	0		
		↑							
		Incoming variable							

Simplex Tableau 2: Non-optimal Solution

Basis		Y_1	Y_2	Y_3	S_1	S_2	S_3	b_i	b_i/a_{ij}
Y_1	1	1	9/8	3/8	1/8	0	0	1/8	1/3
S_2	0	0	11/4	21/4	-1/4	1	0	3/4	1/7
S_3	0	0	-7/2	11/2*	-1/2	0	1	1/2	1/11 ← Outgoing variable
C_j		1	1	1	0	0	0		
Solution		1/8	0	0	0	3/4	1/2		
Δ_j		0	-1/8	5/8	-1/8	0	0		
				↑					
				Incoming variable					

Simplex Tableau 3: Non-optimal Solution

Basis		Y_1	Y_2	Y_3	S_1	S_2	S_3	b_i	b_i/a_{ij}
Y_1	1	1	15/11	0	7/44	0	-3/44	1/11	1/15
S_2	0	0	67/11*	0	5/22	1	-21/22	3/11	3/67 ← Outgoing variable
Y_3	1	0	-7/11	1	-1/11	0	2/11	1/11	-1/67
C_j		1	1	1	0	0	0		
Solution		1/11	0	1/11	0	3/11	0		
Δ_j		0	3/11	0	-3/44	0	-5/44		
			↑ Incoming variable						

Simplex Tableau 4: Optimal Solution

Basis		Y_1	Y_2	Y_3	S_1	S_2	S_3	b_i
Y_1	1	1	0	0	29/268	-15/67	39/268	2/67
Y_2	1	0	1	0	5/134	11/67	-21/134	3/67
Y_3	1	0	0	1	-9/134	7/67	11/134	8/67
C_j		1	1	1	0	0	0	
Solution		2/67	3/67	8/67	0	0	0	
Δ_j		0	0	0	-21/268	-12/268	-19/268	

Substituting the values of Y_1, Y_2 and Y_3 in the objective function, we have,

$$\frac{1}{V} = \frac{2}{67}+\frac{3}{67}+\frac{8}{67}=\frac{13}{67}$$

Therefore V, the game value = 67/13.

Since $Y_i = y_i/V$, we have $y_i = Y_i \times V$. Thus,

$$y_1 = \frac{2}{67}\times\frac{67}{13}=\frac{2}{13}; \qquad y_2 = \frac{3}{67}\times\frac{67}{13}=\frac{3}{13}; \qquad \text{and} \qquad y_3 = \frac{8}{67}\times\frac{67}{13}=\frac{8}{13}.$$

We can read the values of the dual variables X_1, X_2 and X_3 from the Δ_j row of the Table 15.4. These are, respectively, 21/268, 12/268, and 19/268. From these,

$$\frac{1}{U} = \frac{21}{268}+\frac{12}{268}+\frac{19}{268}=\frac{52}{268}=\frac{13}{67}$$

Thus, U = 67/13 (same as shown earlier).

Now, we have

$$x_1 = \frac{21}{268}\times\frac{67}{13}=\frac{21}{52}; \qquad x_2 = \frac{12}{268}\times\frac{67}{13}=\frac{12}{52}; \qquad \text{and} \qquad x_3 = \frac{19}{268}\times\frac{67}{13}=\frac{19}{52}.$$

Thus, the optimal strategy for A is (21/52, 12/52, 19/52); for B it is (2/13, 3/13, 8/13) while the game value is 67/13.

4. (a) (i) If 'n' be the no. of workers employed the average cost of production is given by

$$\mathbf{C = 24n + \left[\frac{3}{2(n-4)}\right]}$$ **Show that n = $4^1/_4$ will make C minimum.**

(ii) A firm has revenue function given by R = 8D, where R = Gross Revenue and D = Quantity sold, production cost function is given by C = 15000 + 60$\left(\frac{D}{900}\right)^2$. Find the total profit function and the number of units to be sold to get the maximum profit. [5+4=9]

Answer:

4(a) (i)

$C = 24n + \left[\frac{3}{2(n-4)}\right] = 24n + \frac{3}{2}(n-4)^{-1}$

$\frac{dc}{dn} = 24 + \frac{3}{2} \times -1 \times (n-4)^{-2} = 0$

$24 - \frac{3}{2}(n-4)^{-2} = 0$

$(n-4)^{-2} = 16$

$\frac{1}{(n-4)^2} = 16$

$(n-4)^2\ 16 = 1$

$(n-4)^2 = \frac{1}{16}$

$N - 4 = \frac{1}{4}$

$N = \frac{1}{4} + 4 = 4\frac{1}{4}$

$\frac{d^2c}{dx^2} = 0 + \frac{-3}{2} \times -2\ (n-4)^{-3}$

$= 3(n-4)^{-3}$

$= 3\ (\frac{17}{4} - 4)^{-3}$

$= \frac{3}{\left(\frac{1}{4}\right)^3}$ Which is Positive

Hence condition is satisfied and cost will be minimum at $n = 4\frac{1}{4}$.

(ii) R = 8D

$C = 15000 + 60\left(\frac{D}{900}\right)^2$

Profit = $8D - 15000 - 60\left(\frac{D}{900}\right)^2$

To find number of units to get the maximum profit

$\frac{dp}{dD} = 0$ and $\frac{d^2p}{dD^2}$ should be – ve

$\Rightarrow \frac{dp}{dD} = 8 - \frac{60.2D}{8,10,000} = 0$

$$\Rightarrow 8 - \frac{120D}{8,10,000} = 0$$

$$\Rightarrow -\frac{120D}{8,10,000} = -8$$

$$\therefore D = \frac{27000 \times 8}{4} = 54000$$

$$\frac{d^2p}{dD^2} = \frac{-4}{27000} \text{ which is –ve}$$

P is maximum at D = 54,000.

4. (b) Explain about the term "Normal Profit" and "Supernormal Profit". [6]

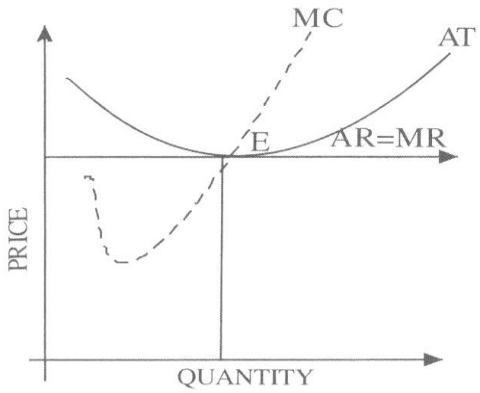
Answer:

Normal Profit

It refers to that amount of earnings which is just sufficient to induce the firm to stay in the industry. Normal profit is, thus, the minimum reasonable level of profit which the entrepreneur must get in the long run, so that he is induced to continue the employment of his resources in its present form.

Normal profit is the opportunity cost of entrepreneurship. It is equivalent to the transfer earnings of the entrepreneur. That means, if the entrepreneur fails to earn the normal rate of profit in the long run, he will close down the operation of his firm and quit the industry in order to shift his resources elsewhere.

Normal profit is considered as the least possible reward which in the long run must be earned by the entrepreneur, as compensation for his organizational services as well as for bearing the insurable business risks.

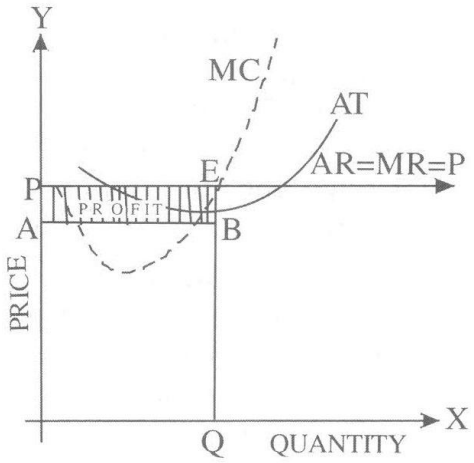


Supernormal Profit

Profits in excess of normal profit are considered as supernormal. Since normal profit is included in the cost of production, supernormal profit is obtained when total revenue exceeds total costs (i.e., TR > TC). It is also called pure business profit or "excess profit."

Supernormal profit depends on the demand conditions in the businesses, which are uncertain and unpredictable. Thus, supernormal profit is the reward for bearing uncertainties and unpredictable risks of business. Sometimes, in a competitive market, supernormal profit is also earned due to extraordinary efficiency on the part of the entrepreneur.

When the existing firms earn supernormal profit, new entries will be attracted to the industry, so the equilibrium of the industry is threatened.



4. (c) Explain the term "Market Price – Based Methods" in the context of Transfer pricing. [5]

Answer:

Market Price-based Methods

Another approach to transfer pricing is the market price based approach. There are three ways to arrive at the market price.

First, through the prevailing market price if there is an active market for the goods/services transferred between divisions. The prevailing price would require adjustment for discounts as well as for certain selling cost that are not involved in inter-divisional exchange. The merits of this basis of transfer price are:

(i) Market prices represent the alternatives to the divisions. That is to say, if the selling division sells the outside customers, or if the buying division purchases the goods from outside suppliers, the market price will be the basis.

(ii) They are neither arbitrary nor artificial; rather they reflect the collective values of buyers and sellers. In operational terms, a market price-based approach implies that the selling division will receive equal to what it would get by selling the goods to outside customers, while the purchasing division will pay what it would pay to outside suppliers.

Secondly in cases where easily identified market prices are not available, costs plus a normal profit will be a reasonable approximation of the market price.

Finally in a situation in which market price is not readily available, bids from several different manufacturers form the basis. The low bid may be taken as the market price and used for internal transfer pricing.

Section – B

5. (a) List the Advantages of Data Envelopment Analysis[DEA]. [5]

Answer:

Some of the Advantages of DEA are:

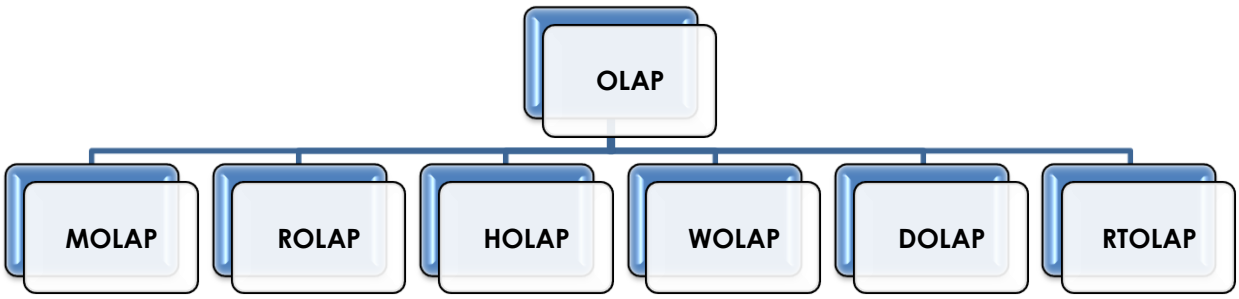
- No need to explicitly specify a mathematical form for the production function.
- Proven to be useful in uncovering relationships that remain hidden for other methodologies.
- Capable of handling multiple inputs and outputs.
- Capable of being used with any input-output measurement.
- The sources of inefficiency can be analyzed and quantified for every evaluated unit.

5. (b) Discuss the different types of One – Line Analytical Processing [OLAP]. [5]

Answer:

Types

OLAP systems have been traditionally categorized using the following taxonomy.



MOLAP:

MOLAP is a "multi-dimensional online analytical processing".'MOLAP' is the 'classic' form of OLAP and is sometimes referred to as just OLAP. MOLAP stores this data in optimized multi-dimensional array storage, rather than in a relational database. MOLAP tools generally utilize a pre- calculated data set referred to as a data cube. The data cube contains all the possible answers to a given range of questions. MOLAP tools have a very fast response time and the ability to quickly write back data into the data set.

ROLAP

ROLAP works directly with relational databases. The base data and the dimension tables are stored as relational tables and new tables are created to hold the aggregated information. This methodology relies on manipulating the data stored in the relational database to give the appearance of traditional OLAP's slicing and dicing functionality. ROLAP tools feature the ability to ask any question because the methodology does not limit to the contents of a cube. ROLAP also has the ability to drill down to the lowest level of detail in the database.

HOLAP

There is no clear agreement across the industry as to what constitutes "Hybrid OLAP", except that a database will divide data between relational and specialized storage. For example, for some vendors, a HOLAP database will use relational tables to hold the larger quantities of detailed data, and use specialized storage for at least some aspects of the

smaller quantities of more-aggregate or less- detailed data. HOLAP addresses the shortcomings of MOLAP and ROLAP by combining the capabilities of both approaches. HOLAP tools can utilize both pre-calculated cubes and relational data sources.

Other types

The following acronyms are also sometimes used, although they are not as widespread as the ones above:

- **WOLAP** - Web-based OLAP
- **DOLAP** - Desktop OLAP
- **RTOLAP** - Real-Time OLAP

6. Define the following term in the context of Supply Chain Management:
(a) Capacity Utilization;
(b) In source vs. Outsource;
(c) Logistics Management;
(d) Strategic Alliance;
(e) Supplier Performance Evaluation. **2×5=10**

Answer:

(a) Capacity Utilization
This is a measure (usually expressed as a percentage) of how intensively a resource is being used to produce a good or service. Utilization compares actual time used to available time. Traditionally, utilization is the ratio of direct time charged (run time plus setup time) to the clock time available.

(b) In source vs. Outsource
The act of deciding whether to produce an item internally or buy it from an outside supplier. Factors to consider in the decision include costs, capacity availability, proprietary and/or specialized knowledge, quality considerations, skill requirements, volume, and timing.

(c) Logistics Management
Logistics management is the process of strategically managing the procurement, movement and storage of materials, parts and finished inventory (and the related information flows) through the organization and its marketing channels in such as way that current and future profitability are maximized through the cost-effective fulfillment of orders.

(d) Strategic Alliance
A relationship formed by two or more organizations that share (proprietary), participate in joint investments, and develop linked and common processes to increase the performance of both companies. Many organizations form strategic alliances to increase the performance of their common supply chain.

(e) Supplier Performance Evaluation
The main objective of the supplier evaluation process is to reduce purchase risk and maximize the overall value of the purchaser. It typically involves evaluating, at a minimum, supplier quality, cost competitiveness, potential delivery performance and technological capability. Some of the other criteria used in the preliminary evaluation of suppliers include financial risk analysis, evaluation of previous performance, and evaluation of supplier provided information.

7. (a) What do you think, would be the impact on the different levels of management due to computers and MIS? [5]

Answer:

Potential Impact of Computers and MIS on different levels of management:

The potential impact of computers on top-level management may be quite significant. An important factor which may account for this change is the fast development in the area of computer science. It is believed that in future computers would be able to provide simulation models to assist top management in planning their work activities. For example, with the help of a computer it may be possible in future to develop a financial model by using simulation technique, which will facilitate the executives to test the impact of ideas and strategies formulated on future profitability and in determining the needs of funds and physical resources. By carrying sensitivity analysis with the support of computers, it may be possible to study and measure the effect of variation of individual factors to determine final results. Also, the availability of new class of experts will facilitate effective communication with computers. Such experts may also play a useful role in the development and processing of models. In brief, Potential impact of computers would be more in the area of planning and decision making.

Futurists believe that top management will realize the significance of techniques like Simulation, Sensitivity Analysis and Management Science. The application of these techniques to business problems with the help of computers would generate accurate, reliable, timely and comprehensive information to top management. Such information would be quite useful for the purpose of managerial planning and decision-making. Computerized MIS will also influence in the development, evaluation and implementation of a solution to a problem under decision - making process.

Potential Impact of Computers and MIS on middle management level will also be significant. It will bring a marked change in the process of their decision-making. At this level, most of the decisions will be programmed and thus will be made by the computer, thereby drastically reducing the requirement of middle level managers. For example, in the case of inventory control system, computers will carry records of all items in respect of their purchase, issue and balance. The re-order level, re-order quantity etc., for each item of material will also be stored in computer after its predetermination. Under such a system, as soon as the consumption level of a particular item of material will touch reorder level, computer will inform for its purchase immediately. The futurists also foresee the computer and the erosion of middle management as the vehicles for a major shift to recentralization. The new information technology will enable management to view an operation as a single entity whose effectiveness can only be optimized by making decisions that take into account the entity and not the individual parts.
The impact of Computers and MIS today at supervisory management level is maximum. At this level, managers are responsible for routine, day-to-day decisions and activities of the organization which do not require much judgment and discretion. In a way, Supervisory manager's job is directed more towards control functions, which are highly receptive to computerization. For control, such managers are provided with accurate, timely, comprehensive and suitable reports. A higher percentage of information requirements of executives is met out at this level.

Potential impact of computers and MIS on supervisory level will completely revolutionize the working at this level. Most of the controls in future will be operated with the help of computers. Even the need of supervisory managers for controlling the operations will be substantially reduced. Most of the operations/activities now performed manually will be either fully or partially automated.

7. (b) Describe about the Fuzzy Sets and discuss the role of Fuzzy sets in HR Management. [5]

Answer:

This project specializes in the implementation of the Microsoft Dynamics NAV information system. The evaluation of employees is based on multiple criteria evaluations. The criteria are derived from typical competencies of the employees. A competency model has been created for any given role with different normalized weights assigned to various competencies. The evaluation proceeds in the following manner: Firstly, the appointed evaluators fill in a questionnaire indicating to what extent, in their view, the tested employee meets his/her competencies. These evaluations are expressed using fuzzy scales. Normalized weights assigned to the evaluators of any given employee are set based on the intensity of cooperation between the employee and his/her evaluators. The level of fulfillment of each competency by the given employee is calculated as a weighted average of the fuzzy evaluations, conducted by each of his/her evaluators. Then, the overall fulfillment level of the employee's working role, again as a weighted average of fuzzy numbers, is calculated according to a specified model. This produces an overall evaluation of the employee. The evaluation process is followed by an interview where the employee is informed of his/her evaluation results, the employees gaps are discussed, and possibilities for improvement are proposed.

Section – C

8. (a) Discuss about the Risk Retention. Describe the guidelines to be followed for risk Retention. [5]

Answer:

This denotes acceptance of the loss or benefit arising out of a risk when it takes place. In short, it is also termed as self insurance. This strategy is viable when the risks are small enough to be transferred at a cost that may be higher than the loss arising out of the risk itself. On the other hand, the risk can be so big that it cannot be transferred or insured. Such risks will have to be phased out when the eventuality occurs. War is an example as also are 'Acts of God' such as earthquakes and floods. The reasons for risk retention can be cited as follows:

(i) While risk in a business is taken to increase its return, risk retention relates to such risks which have no relation to return but are part of an individual's life or organization or a company operational risk can be cited as such a risk that is inherent and needs to be accepted for retention.

(ii) Sometimes, such risks are so small that they are ignored and/or phased out when they surface.

(iii) This method is also useful when the probability of occurrence is very low and a reserve built within the system over a period can take care of such losses arising out of risk retention. This is normally resorted to in businesses against credit risks that are inherent due to marketing on credit basis.

(iv) In some cases, the subject, who is susceptible to risk, also becomes fully aware of the nature of risk. In these situations, there is a certain amount of preparedness in the system due to risk retention.

Certain guidelines relating to risk retention should be followed:

(1) Determine the risk retention level through proper estimation of risk using sales projections, cash flows, contracts, liquidated damages, and guarantees.

(2) Though there is no precise formula for estimation of risks to be retained, statistical averages of such losses over a period of time give an indication to estimate such losses. For instance, bad debts occurring over a period of time are taken into consideration as an estimate to create a reserve for doubtful debts.

(3) It is also necessary to ascertain the capacity for funding a loss arising out of retained risk that is the measure for transferring the risk beyond that level.

Risk retention as an exercise and a strategy is attempted mainly in the case of operational risk in business.

8. (b) Explain the Genetic Algorithm under the Corporate Bankruptcy Prediction Models. [5]

Answer:

Based on the idea of genetic inheritance and Darwinian theory of natural evolution (survival of the fittest), GAs work as a stochastic search technique. GAs perform their search for optimal solution to the problem posed from a large and complicated space of solutions.

GAs execute this search process in three phases: genetic representation & initialisation, selection, and genetic operation (crossover and mutation). Genetic representation that is normally in binary alphabet (0 and 1) creates an initial population of solutions. After the initialisation, each string is evaluated with the help of a user-defined fitness function. Over time, such a selection process is likely to result into best performing strings only. Straightforward reproduction of selected strings entails no benefit in terms of exploration of solution space, as this will only reproduce the identical off springs from the parent strings. Genetic operations of Crossover and Mutation are introduced for this purpose. The process continues until the actual population converges towards increasingly homogeneous strings. In general, the process is stopped when we are satisfied with a certain level of homogeneity.

In order to solve a classification problem like bankruptcy, researchers extract a set of rules or conditions using GAs. These conditions are associated with certain cut off points. Based on these conditions, the model would predict whether or not a firm is likely to go bankrupt.

9. (a) State the objectives of Risk Management. [5]

Answer:

Risk management basically has the following objectives:

(i) Anticipating the uncertainty and the degree of uncertainty of the events not happening the way they are planned.
(ii) Channelizing events to happen the way they are planned.
(iii) Setting right, at the earliest opportunity, deviations from plans, whenever they occur.
(iv) Ensuring that the objective of the planned event is achieved by alternative means, when the means chosen proves wrong, and
(v) In case the expected event is frustrated, making the damage minimal.

9. (b) Describe about the Dr. L. C. Gupta's Sickness Prediction Model under the corporate failure. [5]

Answer:

Dr. L.C. Gupta made an attempt to distinguish between sick and non-sick companies on the basis of financial ratios. He used a simple non-parametric test for measuring the relative predicting power of different financial ratios. A mixed sample of sick and non-sick companies was made and the companies in the sample were arranged in a single ordered sequence from the smallest to the largest, according to the financial ratio that is tested for its predictive power. Let [profit after tax ÷ Net worth] is a financial ratio that is to be tested for its predictive power. The companies in the sample are arranged in increasing order of this particular ratio. Let the sick companies be denoted by the letter 'S' and the non-sick ones by the letter 'N'. Let us assume that 8 sick companies and 8 non-sick companies are taken for building up the sample. When arranged in a sequential order as stated above, the

sequence may result in any pattern as shown below:

1. S-N-S-N-S-S-N-S-N-N-S-N-S-N-S-N
2. S-S-S-S-S-S-S-S-N-N-N-N-N-N-N-N
3. S-S-S-S-N-N-N-N-N-N-N-N-S-S-S-S
4. S-S-S-N-S-S-N-N-S-S-N-N-S-N-N-N

Observing the pattern of occurrence of 'S' and 'N' a cutoff point is chosen to separate the sick group from the non-sick group. Companies that fall to the left of the cutoff point lie in the sick group while companies that fall to the right of the cutoff point lie in the non-sick group. The cutoff point is so chosen that the number of misclassifications are minimised. The ratio that showed the least percentage classification error at the earliest possible time is deemed to have the highest predicative power. Referring to the four patterns shown above, the pattern of sequence shown in (B) is the most accurate one since the cutoff point will be located exactly midway in the sample group and the percentage of classification error will be zero since there are no misclassifications. Pattern shown in (C) is bound to have a higher error since the sick companies are concentrated on both the extreme ends.

Dr. L.C. Gupta used Indian data on a sample of 41 textile companies of which 20 were sick companies and 21 were non-sick companies. He studied the predictive power of 63 financial ratios and observed that the following two ratios have comparatively better predictive power.

(a) (Earnings before Interest and Taxes) ÷ Sales

and

(b) (Operating cash flow) ÷ Sales

[Note: Operating cash flow = profit after tax + depreciation]

10. Following is the Balance Sheet of a company as on 31st March, 2015:

Equity & Liabilities	₹	Assets	₹
(1) Shareholder Fund:		**(1) Non – Current Assets**	
(a) Share Capital (@₹ 100 each)	**4,00,000**	**(a) Fixed Assets**	**10,00,000**
(b)Reserves & Surplus	**2,00,000**	**(b) Non Current Investment**	
		- Trade Investment	**2,00,000**
		(2) Current Assets	
		(i) Inventory	**1,25,000**
(2) Non – Current Liabilities:		**(ii) Book Debts**	**75,000**
- 12% Debentures	**3,00,000**		
- 10% Bank Loan	**2,00,000**		
(3) Current Liabilities	**3,00,000**		
	14,00,000		**14,00,000**

Additional Information:

(i) Net sales for 2014-15 were ₹20,00,000.

(ii) Price-Earnings Ratio is ₹10.

(iii) Dividend Pay-out Ratio is 50%.

(iv) Dividend per Share in 2014-15 is ₹20.

(v) Corporate Tax Rate is 50%.

Using Altman's Model, calculate the Z-score of the company and interpret the result.

[10]

Answer:
As per Altman's Model of Corporate Distress Prediction
Z-score = 1.2 X_1 + 1.4 X_2 + 3.3 X_3 + 0.6 X_4 + 1.0 X_5

Here, the five variables are as follows:

X_1 = Working Capital to Total Assets = $\frac{(1,00,000^{1})}{14,00,000^{2}}$ = (0.07143)

X_2 = Retained Earnings to Total Assets = $\frac{2,00,000^{3}}{14,00,000^{2}}$ = 0.1428

X_3 = EBIT to Total Assets = $\frac{3,76,000^{4}}{14,00,000^{2}}$ = 0.2686.

X_4 = Market Value of Equity to Book Value of Total Debt = $\frac{16,00,000^{5}}{8,00,000^{6}}$ = 2

X_5 = Sales to Total Assets = $\frac{20,00,000}{14,00,000^{2}}$ = 1.4286

Therefore, Z-score = {1.2 × (-) 0.07143} + (1.4 × 0.1428) + (3.3 × 0.2686) + (0.6 × 2) + (1 × 1.4286)
= -0.0857 + 0.1999 + 0.8864 + 1.2 + 1.4286 = 3.6292

Working Notes

(i) Calculation of Working Capital
Working Capital = Current Assets – Current Liabilities
Here, Working Capital = (Stock + Debtors) – Current Liabilities
= (1,25,000 + 75,000) – 3,00,000
= (₹ 1,00,000)

(ii) Calculation of Total Assets
Total Assets = Fixed Assets + Investments + Current Assets
Here, Total Assets = 10,00,000 + 2,00,000 + (1,25,000 + 75,000) = ₹ 14,00,000.

(iii) Calculation of Earnings before Interest & Tax (EBIT)

Dividend Payout Ratio = $\frac{\text{Dividend per Share (DPS)}}{\text{Earnings per Share (EPS)}}$

Here, Dividend Payout Ratio = 50% and DPS in 2014 - 15 = ₹ 20.

Hence, EPS = $\frac{\text{DPS}}{\text{Dividend payout Ratio}}$ = $\frac{₹20}{50\%}$ = ₹ 40

Here, Number of Equity Shares = $\frac{₹4,00,000}{₹100}$ = 4,000

Particulars	₹
∴ Earnings available to equity shareholders = 4,000 × ₹ 40 =	1,60,000
Add: Corporate tax added back ($\frac{50}{50}$ × 1,60,000) =	1,60,000
Earnings Before Tax (EBT)	3,20,000
Add: Interest on loan added back:	
On Debentures (12% on 3,00,000) = ₹ 36,000	
On Bank Loan (10% on 2,00,000) = ₹ 20,000	56,000
Earnings Before Interest & Tax (EBIT)	3,76,000

(iv) Calculation of Market Value of Equity Shares

$$\text{Price Earnings Ratio} = \frac{\text{Market Value per Equity Share (MPS)}}{\text{Earnings per Share (EPS)}}$$

Here, Price Earnings Ratio = 10 and EPS in = ₹ 40

Hence, market Value per Equity Share (MPS) = Price Earnings Ratio × EPS

= 10 × 40 = ₹ 400

Market Value of Equity Shares = 4,000 shares × ₹ 400 = ₹ 16,00,000

(v) Calculation of Book Value of Total Debts

Book Value of Total Debts = Long–term Debts + Current Liabilities

Here, Book Value of Total Debts =12% Debentures + 10% Bank Loan + Current Liabilities

= 3,00,000 + 2,00,000 + 3,00,000 = ₹ 8,00,000

Comment:

As the calculated value of Z-score is much more greater than 2.99, it can be strongly predicted that the company is a non-bankrupt company (i.e., non-failed company).