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Section A. Planning, Budgeting and Forecasting

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Section A. Planning, Budgeting and Forecasting

Section A.1 – Budgeting Concepts

Prelude

Strategy

1. Roadmap to reach the long term goals/aspirations/vision; also called strategic roadmap, strategic plan
2. Interplay of various external and internal factors

External Factors:
1. Economic conditions / Environment / Macroeconomic Parameters
2. Industry Situations: Demand / Supply / Competition
3. Opportunities & Threats

Internal Factors:
1. Organizational Strengths / Weakness
2. Assets / Liabilities
3. Resources and their allocation

A. Role that budgeting plays in the overall planning and performance evaluation process of an organization

A Budget:
1. Derives its linkage from strategy/strategic plan/strategic roadmap
2. States the goals and objectives of an organization quantitatively – aligns the strategy and goals
3. Drills down the organizational goals to departmental goals and ultimately to managerial goals –
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All these goals should feed into the balance scorecard (comprising of financial outcomes, business process outcomes and customer outcomes) of individual HODs and Managers

4. Lays downs means to achieve the goals – allocates resources, anticipates challenges and provides for resolution

5. Helps an organization plan its journey from current state to desired state

6. Helps an organization to plan for different time horizon: from short term to long term

7. Encompasses nearly all the departments of an organizations

8. Ensures communication, interaction and involvement of all the levels and departments of an organization

9. Sets measurable expectations and measures achievements against them

10. Measures organizational, departmental and individual performance

11. Leads to measurement of variance between planned and actual and opens path for variance analysis

12. Forces management to think towards corrective action and improvement plans

13. Leads to its own up-dation and revision

B. Interrelationships between economic conditions, industry situation and a firm’s plans

1. A budget/strategy is not an internal document or plan prepared in isolation

2. Ideally it should be an outcome of interplay of lot many factors – external as well as internal

External Factors impacting budget/strategy

1. Economy wide factors:
   a) Prevailing policy environment
   b) Regulatory oversight governing industries

2. Industry Situations impacting budgeting process
   a) Investment plans of the major players in the industry
   b) Demand-supply factors
   c) Price trends
   d) Changes in technology
   e) International/domestic competitive factors in the industry
   f) Entry barriers
   g) Capital intensity
   h) Business cycles

As an example, budget should not:

1. Be based on increasing sales price in this period if prices are showing no growth/decline

2. Depict an increase in volumes if the product is suffering a decline on account of technological obsolescence

3. Be dependent too much on external fund infusion if fund raising scenario is grim for the company (poor credit rating, already in default etc)

4. Forecasts this year’s volumes targets based on last year’s growth rate if competition is expected to intensify
C. *Role played by budget in formulating short term objectives, planning and controlling operations*

A budget helps management break down a strategic goal or objective into a series of smaller objectives; develop plans around them and control operations to achieve them.

Let’s look at the example below:

Alpha Beta Corporation hired R.cKinsley and Co. for their strategy formulation. After studying macroeconomic variables, industry dynamics, economic factors and external environment, the consulting firm prepared a strategy to achieve the long term plan of securing a market share of 20% by 2025 from the current 8% level. The strategy document is so complicated that CEO of Alpha Beta is clueless about its implementation. Sitting in his cabin, with a cup of coffee in his hand, he is continuously staring at Shashi (the moon) through the window. Will Shashi (the moon) come to his rescue?

**Steps the CEO should follow:**

1. Pull out the five year planned revenue figure from the operating plan and send it to Business Development and Sales & Marketing Department.

2. Sales Department should translate the revenue figure into a sales budget:
   a) Price points that can be charged
   b) Expected sales volume
   c) Shortfall, if any

3. Shortfall should then be communicated to Business Development Department by the CEO.

4. Business Development Team should then translate the shortfall and lay out their own plan for making up the shortfall. Their plan at high level should contain:
   a) New customers that will be covered
   b) Planned conversion ratio
   c) Expected sales price point and the corresponding volumes

5. The Sales budget and business development budget should then be sent to production/Operations department and purchase department.

6. Purchase department should lay down their plan that should broadly contain:
   a) Inventory holding policy of the company and hence the desired inventory levels
   b) Payment policy to suppliers
   c) Materials purchase plan factoring in lead time/delivery time

7. Production/Operations department should lay down their plan incorporating sales budget and inventory levels:
   a) Production volumes
   b) Plant uptime/downtime – scheduled and unscheduled
   c) Quantum of direct labours
   d) Labours productivity

And So On...
D. Roles played by budget in measuring performance against established goals

A budget differs from a simple forecast or a plan primarily in the aspect of measuring and monitoring actual performance.

How a forecast is different from a budget?

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Parameter</th>
<th>Forecast</th>
<th>Budget</th>
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</thead>
<tbody>
<tr>
<td>1.</td>
<td>Who prepares it?</td>
<td>Can be prepared by anyone – an insider or even an outsider (research analysts, industry analysts etc)</td>
<td>Necessarily prepared internally by an organization (support of external consultants/advisors may be sought)</td>
</tr>
<tr>
<td>2.</td>
<td>Ownership</td>
<td>May or may not be prepared in consultation with all departments; may not be owned by all levels and departments; may not have buy ins from all concerned</td>
<td>In ideal state, it should be prepared in consultation with all levels and departments concerned; should have buy ins from all the HODs and managers; completely owned by the management and the organization</td>
</tr>
<tr>
<td>3.</td>
<td>Performance measurement</td>
<td>A simple forecast doesn’t have any in built features to measure performance</td>
<td>An effective tool for performance measurement, variance reporting, corrective action and revision of itself</td>
</tr>
</tbody>
</table>

A budget should present
1. Quantifiable, well defined and measurable goal/target
2. Clear responsibility on department/individual
3. Actual performance against expected goal/target
4. Targets across Controllable cost and limited or no targets across Non controllable costs (explained subsequently)
5. Targets agreed on participative basis and not necessarily on authoritative basis (explained subsequently)

A budget will be able to measure performance effectively only if expectations/goals/targets set at the beginning of the time period were agreeable, realistic and achievable in normal course of business

Benchmarks should be appropriate and proper:

1. A small FMCG company operating in just one geography should not have sales volume targets benchmarked against the sales volume of global/international firms
2. A start up should not have margins benchmarked against stable, long time operating firms

When actual results are documented against the budgeted figures, performance can be measured:

1. How achievements compare to plan?
2. Extent of achievements and failures?
3. Failures at what level – organizational or departmental or managerial levels; a manager’s underperformance need not always be equated to failure to perform or lack of skill set, this may also be due to organizational challenges beyond his control
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4. Resources Allocation & Utilization – Planned vs. actual
5. Variance analysis
6. Root cause analysis – controllable or uncontrollable factors
7. Improvement plans – Budget should motivate employees to improve performance
8. Overall learning and development plans for the organization, department and managers
9. Balanced scorecard evaluation of managers, departments and organizations
10. New plans, budgets and targets for next time period

E. Characteristics that define Successful Budgeting Process

A successful budgeting process should

1. Facilitate communication among organizational units and enhance coordination of organizational activities
2. Focus primarily on controllable costs and assign targets and benchmarks for the same
3. Lead to efficient allocation of resources to different departments/SBUs/units
4. Assign an appropriate time frame to the entire budget, when it’s up for revision, when it will be rolled over and when it will be started again and so on
5. Clearly lay down the teams, levels and individuals participating in the entire budgeting exercise along with their roles and responsibilities
6. Clearly outline the role of top management in the entire budgeting exercise
7. Lay down the process for defining and using the appropriate standards and benchmarks

F. Budgeting process facilitates communication among organizational units and enhances coordination among them

1. The budgeting process should not be conducted in isolation. It should be considered as a part of strategic thinking and planning:
   a) Accordingly, a budget should not be a standalone document. It should derive its linkage from strategy/strategic roadmap/strategic plan.
   b) A budget should be aligned with organizational goals and objectives. These goals and objectives should be communicated to everyone in the organization during the budgeting process. This sets the uniform platform for everyone to work towards achievement of goals.
2. It should be created by interplay of various departments concerned. It should not be dictated by one department and imposed on others:
   a) All the concerned departments should be forced to plan towards achieving the organizational goals (planning)
   b) There should be a joint discussion and consensus: Different departments such as Sales, Marketing, Business Development, production, Purchase etc must communicate their requirements and plans to each other during the budgeting exercise so that each one can evaluate the impact of others plans on their own.
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c) No blame game: Each department must coordinate the effort with others for best results.
d) This should highlight any operational challenges or departmental friction at the onset itself for resolution

Recall the exercise on the previous slides where CEO of Alpha Beta Corporation involved different departments in making the budgets

G. Controllable costs as it relates to both budgeting and performance evaluation

Budget should enable discussions, benchmarks and targets around controllable costs mostly.

Two types of costs:
1. Controllable Costs: Whether to incur and the quantum (how much) to incur is under the control of manager; typically variable costs; examples – material, labour, supplies, commissions etc.
2. Uncontrollable/Discretionary/Committed Costs: Whether to incur and the quantum is not under the control of manager; typically fixed costs; Once authorized, discretionary spending budgets are committed or fixed; they do not vary with level of production or service; examples – salary, administrative expenses, office power bills, rent etc.

Since a manager doesn’t have any control or say over uncontrollable expenses, ideally a budget should benchmark controllable costs and set targets for them. This also ensures where the maximum benefit can be derived by an organization through the process of budgeting.

H. How the efficient allocation of organizational resources are planned during the budgeting process

1. An organization has multiple objectives but limited resources to achieve them
2. Using the same resource, different departments of an organization may plan their output or goals
3. Budgeting process should reflect in quantitative terms allocation of financial resources to each part of an organization, based on the planned activities and short-run objectives of that part of the organization so that maximum economic value can be derived from the resource
4. Efficient allocation of resources based on needs and benefits rather than history

Examples:
1. Capital budgeting; limited funds but multiple projects to be completed.
2. Should you invest in short term organic growth or a long term inorganic acquisition?
3. Whether to target short term market share enhancement or a long term organizational transformation?

I. Appropriate Time Frame for various types of budgets

Different types of budgets will have different time frames associated with them:
1. Capital Budget: Will be over multi period further split into annual budgets
2. Sales, Production, Purchase Budgets: Can be monthly, quarterly, half yearly and annual budgets
3. Rolling/Continuous Budgets: If sales are dynamic in nature; a company should follow rolling/continuous budgets
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a) Let’s consider an example of three month rolling sales budget
b) A budget will be rolled out for say, Jan, Feb and March
c) ON expiry of Jan; the budget will be rolled over for next three months to include now the month of April and exclude the month of January
d) Feb and March budgeted figures to be revised based on actual performance in Jan and so on

4. Typically, corporates go for annual budget with budget time frame coinciding with their annual fiscal time frame

J. Who should participate in the budgeting process

The budget and the budgeting process should have a buy in at all levels and departments. Three common approaches of budgeting:

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Authoritative</th>
<th>Participative</th>
<th>Consultative</th>
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</thead>
<tbody>
<tr>
<td>1.</td>
<td>Top down approach, targets are defined and communicated from top to bottom</td>
<td>Targets set after discussion between and agreement of all parties involved</td>
<td>Seniors enter into a discussion process with the subordinates, understands their views and opinions but determine the final budget alone</td>
</tr>
<tr>
<td>2.</td>
<td>Superior tells subordinates what their budget will be without requesting inputs; hardly any discussion on achievability</td>
<td>Done jointly between a superior and subordinates; highest level of buy in</td>
<td>Buy in can vary anywhere from zero to very high level</td>
</tr>
<tr>
<td>3.</td>
<td>Efficient, nearly zero time taking</td>
<td>Can be a long drawn processes; may require multiple rounds of discussion</td>
<td>Requires more time than authoritative but less than consultative</td>
</tr>
<tr>
<td>4.</td>
<td>May be driven by whims and fancies of an individual or a group of individuals</td>
<td>Based on inputs, information, expertise and experiences provided by subordinates and local operations teams; informed decision making</td>
<td>Inputs, information, expertise and experiences provided by subordinates and local operations teams may or may not be incorporated</td>
</tr>
<tr>
<td>5.</td>
<td>Complete control</td>
<td>Expertise in lieu of control</td>
<td>Both expertise and control</td>
</tr>
<tr>
<td>6.</td>
<td>May be unrealistic, unachievable; highly ambitious and unattainable</td>
<td>Likely to be realistic, achievable in normal course; ambitious but attainable; may have slack</td>
<td>In between Authoritative and participative; stretch targets</td>
</tr>
<tr>
<td>7.</td>
<td>Employees are likely to be demotivated, aggrieved</td>
<td>Highly motivated employees</td>
<td>Employees feel involved and to some extent empowered</td>
</tr>
<tr>
<td>8.</td>
<td>Zero to low ownership of the final budget</td>
<td>High level of ownership and buy in</td>
<td>Medium</td>
</tr>
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</table>
9. Likely to work in a start up; small set up where discipline and focus in initial years is required

Highly recommended for stable and mature companies where success is not dependent upon an individual or a group of individual but rather a team

Likely for local divisions of a big set up; activity centres; SBU levels

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Participants</th>
<th>Role Played</th>
</tr>
</thead>
</table>
| 1.      | Board of Directors | 1. Responsible to Shareholders; ensures company functions for their welfare  
          |                                             | 2. Don’t make the budget but appoints the budget committee to conduct the budgeting process  
          |                                             | 3. Reviews the budget to ensure they reflect the overall goals, objectives and strategy of the organization  
          |                                             | 4. Approves the budget and reviews the performance against them |
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<table>
<thead>
<tr>
<th>2. Budget Committee/Top Management</th>
<th>1. Appointed by Board and comprises of top management (CXO level people)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2. Overall responsibility for timely budget formulation and implementation</td>
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<tr>
<td></td>
<td>3. Reviews the budget before presenting it to Board of Directors</td>
</tr>
<tr>
<td></td>
<td>4. Ensures budget is tight and slacks have been removed</td>
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<tr>
<td></td>
<td>5. Monitor actual performance against budget</td>
</tr>
<tr>
<td></td>
<td>6. Approves the subsequent revision in the budget, if required</td>
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<tr>
<th>3. Budget Team</th>
<th>1. Generally headed by the Controller of the organization and may comprise of multiple members</th>
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<tbody>
<tr>
<td></td>
<td>2. Communicates the overall goals to the entire organization and lays guidelines for formulation of budget at department, division and/or SBU levels</td>
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<tr>
<td></td>
<td>3. Ensures coordination and interaction between different units/departments/divisions/SBUs during budgeting exercise</td>
</tr>
<tr>
<td></td>
<td>4. Aggregates departmental, divisional or SBU level budgets into organizational/Master budget</td>
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</table>

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<thead>
<tr>
<th>4. Departmental, Divisional or SBU Heads</th>
<th>1. Runs the budget formulation for their respective department, division, unit or SBU</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>2. Interact with and communicate their plan to other department, division, unit or SBU</td>
</tr>
<tr>
<td></td>
<td>3. Ensures their respective budget is in line with principles, goals and objectives laid down from the top management</td>
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<thead>
<tr>
<th>5. Lower &amp; Middle Management</th>
<th>1. People at ground levels who actually make budget</th>
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<tbody>
<tr>
<td></td>
<td>2. Puts up the draft budget for discussion; incorporates revision</td>
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<tr>
<th>6. Process Experts/Consultants/Advisors</th>
<th>1. Typically external to organization but experts in the field of budgeting</th>
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<tbody>
<tr>
<td></td>
<td>2. Appointed by top management/budget committee to help budget team, divisional/departmental/SBU Heads formulate the budget</td>
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<tr>
<td></td>
<td>3. Provide specific inputs, competitive landscape and commentary about external factors</td>
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</table>

Key Steps in Budgeting

1) Draft proposal
   a) Budget is put together by lower & middle management in line with:
      i) Guidelines issued
      ii) Overall strategy, goal and objectives communicated to them from top
      iii) Prevailing internal and external factors
   b) Draft is discussed with heads
   c) Changes suggested are incorporated and draft is released

2) Discussion & Negotiation
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a) Draft budget is put up for discussions and negotiations
b) Interdepartmental reviews and comments
c) Resource allocation might be reviewed and revised in line with company’s objectives
d) Heads may review the feasibility, attainability of the budgets
e) Revisions may be required

3) Review & Approval
a) Review by Budget Committee to ensure guidelines have been followed and it fits with overall goals and objectives
b) Approval for presentation to Board of Directors
c) Similar review of Board of Directors
d) Final Approval for execution and implementation

4) Revision, if Required
a) Revisions if required in line with:
   i) Changing economic conditions
   ii) Changing industry dynamics
b) Unexpected patterns and events

K. Role of top management in successful budgeting

Already discussed but further elaborated here:
1. Appointed by Board and comprises of top management (CXO level people)
2. Acts as a linkage between Board of Directors and the Managerial Staff
3. Overall responsibility for timely budget formulation and implementation
4. Appoints the budget team and communicates to them the overall goals, objectives and strategy of the organisation in short and medium terms
5. Gives broad guidelines for budget formulation and formally sets in the budgeting process
6. Reviews the budget before presenting it to Board of Directors
7. Ensures budget is tight and slacks have been removed
8. Ensures budget is not an isolated document but a step towards long term goals and objectives
9. Monitor actual performance against budget
10. Approves the subsequent revision in the budget, if required

L. Best practices and guidelines for budget process

This topic can’t be seen and discussed in isolation. In fact this is summary of everything discussed so far. Some additional points are mentioned below:
1. Budget process should enable an organization anticipate its operational and/or financial challenges in advance. For examples:
   a) Cash budget should identify beforehand any working capital gaps, short term funding needs so that bank limits can be secured well in advance
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b) Need for capacity creation should be assessed beforehand and capital funding tied up

2. Budget and the formulation process should help organization identify weaknesses, bottlenecks etc at all levels of the organization:
   a) Improvement areas must be identified and worked upon
   b) Recruitment, skill set and capacity building well in advance

3. Should be motivational and encompass all in the organization – superior performance must be rewarded while underperformance must expose areas for improvement

4. Should be unambiguous and efficient; must yield a quantifiable, measurable budget

5. Benchmarks and standards should be set appropriately – stretch targets to be avoided or limited

M. Understanding the use of cost standards in budgeting

What is a standard? Say standard performance, standard price, and standard material and so on?

A standard is a:

1. Goal or benchmark or a level we (individual as well as organization) aspires to achieve
2. Measure of what should happen, what should occur in normal course (everything goes as per plan and expectation)
3. Benchmark against which actual performance is evaluated (how we actually performed when we know how we should have performed in normal course)

There is a standard for almost all the things:

1. Quality standard: Overall quality of the product should achieve a mark or level probably specified by the client or customer
2. Quantity Standard: How much of a resource should be used to produce a certain level of output
3. Cost Standard: How much the resource should cost? A cost that should have been incurred rather than the cost actually incurred. Budgeting should be done using this cost (may be a per unit cost or total cost)
4. Service standard: Minimum level of service desired by the client/customer and so on...

N. Differentiate between ideal (theoretical) standards and currently attainable (practical) standards

We mostly talk about two categories of standards:

Category 1: Ideal (Theoretical) Standards vs. Currently Attainable (Practical) Standards

1. Theoretical (ideal) standard
   a) What can be achieved under perfect conditions when best possible outcomes occur
   b) Achievement under idealistic situation says production when entire capacity operates at its full efficiency without any breakdown, stoppages, production delays and wastages...
   c) Unrealistic, seldom used in budgeting – mostly talked about in quality management concepts
   d) May be used to motivate employees to improve performance, but if used as a goal, they are demotivating
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2. **Currently attainable (normal) standard**
   a) Standard that can be achieved with reasonable effort
   b) Allows for normal inefficiencies, delays, wastages, downtime etc.
   c) Attainable under normal conditions and historical levels of interruptions, breakdowns, delays and wastages

O. **Differentiate between authoritative standards and participative standards**

Category 2 – Authoritative vs. Participative Standards

1) **Authoritative standard**
   a) Set by Top Management
   b) Without any discussions and seeking inputs/opinion from people responsible for achieving
   c) Quick because no discussion or negotiation is required
   d) May be in line with company’s overall goal and objective as it comes from top
   e) But may not be acceptable as it may be a very stretch standard

2) **Participative standard**
   a) Jointly set by all the parties involved
   b) Agreeable and acceptable by all
   c) Incorporates practical problems and issues – more informed decision making is involved
   d) Takes time as involves discussions and negotiations
   e) Achievable and practical

P. **Steps to be taken in developing standards for direct material and direct labour**

Standard Cost of Direct Material per unit of output = Direct material standard quantity per unit of output x Direct material standard price per unit of input

1. Dependent upon quality, price and quantity
2. Quality standard should be determined first in line with market or customer expectations
3. Once quality standard is fixed, then standard quantity and standard price should be applied; price and quantum of input materials are affected by the quality desired

**Direct materials Standard Price (price per unit of input)**

1. Cost per unit that should be incurred (in normal course)
2. Is based on an industrial engineer’s estimated use of materials and the purchasing department’s best estimate of the cost of materials
3. Inclusive of associated costs such as logistics, insurance, transportation, handling, storage etc.

**Direct materials Standard Quantity (per unit of output)**

1. Quantity of direct materials that should be used per unit of finished goods
2. Reflects both the quantity and quality of materials required
3. Allowances for unavoidable waste, spillage, spoilage etc. should be incorporated
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**Standard Cost of Direct Labour per unit of output = Direct Labour standard hours per unit of output x Direct Labour standard rate per hour**

1. Dependent upon quality, complexity, finishing, labour skill sets, manufacturing process etc.
2. Direct labour Standards are affected by cost accountants, shop floor engineers, production managers etc.

**Direct Labour Standard Rate (per hour)**

1. Rate per hour incurred for direct labor
2. Derived from current wage rates, bonuses, inflation and normal allowances towards cost of living
3. Gross basis and not net basis: Includes employer payroll taxes and fringe benefits

**Direct Labour Standard Quantity (per unit of output)**

1. Time that should be required to make one unit of the output
2. Highly important and a critical variable in labour-intensive companies
3. Allowances should be made for normal disruptions such as rest periods, takeovers, changeovers, machine & equipment clean up, machine setup, and machine downtime

**Q. Techniques used to develop standards such activity analysis and use of historical data**

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<tr>
<th>Sl. No.</th>
<th>Technique</th>
<th>Approach</th>
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<tbody>
<tr>
<td>1.</td>
<td>Activity Analysis</td>
<td>1. Identifies and analyse all the activities and steps required for completion of a particular job</td>
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<td>2. Evaluates who perform these activities and steps; what resources and ingredients are used; how much they cost to an organization</td>
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<td></td>
<td>3. Evaluates the skill sets of the people involved in the activities; their cost to organization</td>
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<td>4. Engineering analysis, cost accounting, allocation of indirect costs (administrative, power, rent etc), time and motion study are the popular approaches</td>
</tr>
<tr>
<td>2.</td>
<td>Historical Data</td>
<td>1. Statistical analysis on historical data to figure out best case, worst case, likely case, mean, median and exceptions</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Best case results can be taken as ideal standards or stretch targets</td>
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<td></td>
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<td>3. Long term mean and median can serve as attainable benchmarks</td>
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<td></td>
<td></td>
<td>4. Not suitable if circumstances or technology has changed significantly</td>
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<tr>
<td></td>
<td></td>
<td>5. If care is not taken, past inefficiencies and practices continue to be cumulated in future as well</td>
</tr>
</tbody>
</table>
### Section A
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| 3. | Benchmarking | 1. Setting the performance standard  
| | | 2. Highlights gap between how an organization does an activity and how the best one does it  
| | | 3. Own performance vs. best in class performance  
| | | 4. Benchmark itself should change if continuous improvement is desired  
| 4. | Target Costing | 1. Is the cost eventually that will be incurred; current cost levels may be higher but continuous improvements will bring the cost down to targeted levels  
| | | 2. Should be used only when product is likely to be sold at target sales price  
| | | 3. Can lead to stress if target costs are used as standards in the early stages  

### R. Importance of a policy that allows budget revisions that accommodate the impact of significant changes in budget assumptions

Why Budget Revisions are Required? Multiple Reasons:

1. If assumptions used in budgeting are dynamic, they might undergo a change while the budget period is still in progress (example: inflation considered while budgeting is significantly lower what it is say 4 months in to the budget)

2. Economic conditions, macroeconomic variables or industry situations at the time budget was formulated may undergo significant changes in the course of budget period (example: sudden rise of a competitor, new regulatory measures introduced, interest rate changes etc)

3. Actual performance and variances in the first few months of a budget period may warrant an interim period corrective measure

What should be done?

1. An organization should have a policy that allows budget review and revisions periodically or as and when desired

2. The policy should accommodate corrective actions and impact of significant changes in budget assumptions

3. Revised benchmarks, targets and budgets should be followed for the pending period

4. If revision policy is not in place, morale at all the levels of on organization can suffer due to a feeling that performance is measured against something not achievable
S. Role of Budgets in Monitoring and Controlling Expenditures to meet strategic objectives

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<tr>
<th>Sl. No.</th>
<th>Steps</th>
<th>Monitoring &amp; Controls</th>
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<tbody>
<tr>
<td>1.</td>
<td>Establish Standards</td>
<td>1. Standards are set after careful study and analysis of data, information, benchmarks</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. First step towards control – only acceptable limits of costs allowed</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. Unwanted and non-value adding costs removed at budgeting step itself</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Each cost tracked and reported</td>
</tr>
<tr>
<td>3.</td>
<td>Variance Analysis</td>
<td>1. Why there is a variance between budgeted and actual?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Root cause analysis; split into controllable and uncontrollable factors</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. Third step in monitoring and control</td>
</tr>
<tr>
<td>4.</td>
<td>Corrective Actions</td>
<td>1. Corrective actions for controllable factors</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Examine the impact of corrective actions</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. Report the performance after implementation of corrective actions – further monitoring</td>
</tr>
<tr>
<td>5.</td>
<td>Review and Revise Standards</td>
<td>1. After all review, monitoring and control, there may be a need to review or revise standards</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Further monitoring and controlling under revised standards</td>
</tr>
</tbody>
</table>

T. Budgetary slack and its impact on goal congruence

1. Padding and/or cushioning while budgeting
2. Budgeting excess; over and above what is required
3. Excess of resources budgeted over what is necessarily required to achieve organizational goals
4. Created by overestimating the cost, underestimating the revenues or distorting information

Why?
1. A manager in general fears underperformance; so he/she may aim at setting a lenient benchmark or target at the time of budgeting itself so as to avoid embarrassment in future
2. If budget slack is created, they find it easy to meet or exceed their budgeted objectives
3. Sometime each department build contingencies for unwanted/unexpected events. When budget is aggregated contingencies get compounded and slack is introduced
Section A
Section A.1 – Budgeting Concepts

Remedial Measures
1. Thorough review and in depth discussion at the time of budgeting
2. Review and elimination of slack by the experienced top management and Board of Directors
3. Budgeting games can probably never be eliminated, but methods must be devised to decrease the amount of budget slack
Section A Planning, Budgeting and Forecasting

Section A.2 – Forecasting techniques

Prelude
Planning involves forecasting key revenue and cost drivers. Forecasting can be done using qualitative (market research, anecdotes, opinions from experts, historical analogy) and quantitative methods. Here we are focusing on following quantitative methods of forecasting:

1) Linear Regression Analysis
   a) Single variable and
   b) Multi variable
2) Learning Curve Analysis
   a) Cumulative Average Time Learning Model and
   b) Incremental Unit Time Learning Model
3) Moving Averages
   a) Weighted Average and
   b) Exponential Smoothing
4) Time Series Analysis
5) Expected Value Techniques and Sensitivity Analysis

A. Understanding of a simple regression equation and the measures associated with it

What is a Linear Regression Analysis?
1. Statistical tool / model to establish relationship between one variable (called dependent variable, Y) with another (or a group of another) variable (called independent variable(s), Xi)
2. The relationship is then translated into a linear regression equation and used to predict / forecast the value of dependent variable (Y) given the values of independent variable(s)

1) Types of Regression Analysis:
   a) A simple regression analysis uses / involves only one independent variable
   b) A multiple regression analysis uses / involves multiple independent variables
2) A simple linear regression line has an equation of the form $Y = a + bX$, where
   a) $X$ is the explanatory variable
   b) $Y$ is the dependent variable
   c) $b$ is the slope of the line and measures change in $y$ w.r.t unit change in $x$
Section A
Section A.1 – Budgeting Concepts

d) as is the intercept (the value of y when x = 0)

3) A linear regression is fitting a straight line to data and explaining the change in one variable through changes in other variables. This is based on following assumptions:
   a) Linearity: Linear relationship between X and Y (Y varies directly with first power of X)
   b) Constant Process: Process relating the variables is constant or stationary
   c) No auto correlation: Dependent variable is not auto-correlated – this implies the errors measured by Y(actual) – Y(predicted) are normally distributed with zero mean and a constant standard deviation
   d) No multi-collinearity: The independent variables are independent of each other. They are not correlated with each other

4) In real life, we hardly come across a situation where these assumptions are met. We nevertheless perform regression analysis. So, it’s likely that analysis doesn’t yield efficient results. We therefore have various measures to test the efficiency of a regression analysis or model:
   a) R Squared: Also known as coefficient of determination; takes a value between 0 and 1; explains the extent to which changes in dependent variable can be explained by changes in dependent variables; a statistical measure of how close the data are to the fitted regression line;
      i) 0 indicates that the model explains none of the variability of the response data around its mean.
      ii) 1 indicates that the model explains all the variability of the response data around its mean.
   b) T value: Measure of strength of relationship between the independent and dependent variable:
      i) A value of 0 means no significant relationship between the two and hence the independent variable should be removed from the regression analysis
      ii) Should be more than 2 to indicate a strong relationship between the dependent and independent variables
   c) Standard Error (SE): A measure of the accuracy of predictions; a measure of dispersion around the regression line
      i) ~68% of observations should fall within ± 1 x SE
      ii) ~95% of observations should be within ± 2 x SE
B. A multiple regression equation and when it is an appropriate tool to use for forecasting

Multiple Linear Regression Equation: \( y = \alpha + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \beta_4 x_4 \)

Interpretation of the variables and measure of efficiency of the regression model remain as per single linear regression equation (intercept, slope, R squared, T value, standard error)

When Multiple Regression is an appropriate tool to use for forecasting:
1. When a single independent variable is not able to explain the dependent variable in entirety. This implies the entire change in dependent variable is not explained by a single independent variable (R squared less than 1)
2. When the dependent variable is not expected to be impacted by seasonality, cyclicality or unexpected trend
3. When we know that an outcome is actually impacted by more than one input / variable

C. Calculate the result of a simple regression equation

Better explained by an example.

A marketing research firm has undertaken regression analysis on the historical sales data of Alpha Beta Corporation and has come up with following linkage between the monthly quantity sold (Q) and the sales price (P): \( Q = 25000 - 10 \times P \). Sonali Sundaram is preparing the sales budget for the company. What will be the budgeted annual revenue for the company if the sales price is budget at Rs. 50 / unit?

Solution:
Monthly quantity as predicted by regression equation @ price of Rs. 50 / unit = 25000 – 10 x 50 = 24,500. Hence, Annual Quantity = 12 x 24500 = 2,94,000.
Budgeted Revenue = Sales Price x Annual Quantity = Rs. 1,47,00,000 = Rs. 1.47 Cr

D. An understanding of learning curve analysis

1. As an individual, group or organization completes a job, task or an activity; he /she / it tends to gain experience and learning. As a result when the same task is performed for the second time, the time and the cost involved should be lower than what they were previously.
2. This is the effect of learning and hence a plot of time/cost required per unit of production against cumulative units of production is called learning curve.
3. Learning curve analysis is thus a tool that helps us estimate the time / cost of production at different production levels.
Learning curve analysis is thus a tool that helps us estimate the time/cost of production at different production levels.

The graph on the right hand side depicts the time taken to complete the nth unit. For example, if time required to make 1st unit was 10 hours then time required to complete the 4th unit should be 8.10 hours as per 90% learning curve.

The curve levels off after a certain point.

E. Calculate the results under a cumulative average-time learning model and under an incremental unit-time learning model

Two models used to capture different forms of learning are:

1. **Incremental unit-time learning model**: The incremental time needed to produce the last unit declines by a constant percentage each time the cumulative quantity of units produced doubles. Example: Calculate the time required to produce the nth unit at a cumulative production level of “n” assuming the learning rate of 90% and 10 hours requirement to make the first unit.

<table>
<thead>
<tr>
<th>Cumulative Production Level (n)</th>
<th>Time required to produce nth unit (hours)</th>
<th>Formula</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>10.00</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>9.00</td>
<td>= 10.00 x 90%</td>
</tr>
<tr>
<td>4</td>
<td>8.10</td>
<td>= 9.00 x 90%</td>
</tr>
<tr>
<td>8</td>
<td>7.29</td>
<td>= 8.10 x 90%</td>
</tr>
<tr>
<td>16</td>
<td>6.56</td>
<td>= 7.29 x 90%</td>
</tr>
</tbody>
</table>

2. **Cumulative average-time learning model**: The cumulative average time per unit declines by a constant percentage each time the cumulative quantity of units produced doubles. Example: Calculate the total time required to produced “n” units, assuming the learning rate of 90% and 10 hours requirement to make the first unit.

<table>
<thead>
<tr>
<th>Cumulative Production Level (n)</th>
<th>Average Time required to produce “n” unit (hours)</th>
<th>Total time required to produce “n” units (hours)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>10.00</td>
<td>10.00</td>
</tr>
<tr>
<td>2</td>
<td>9.00</td>
<td>18.00</td>
</tr>
<tr>
<td>4</td>
<td>8.10</td>
<td>32.40</td>
</tr>
<tr>
<td>8</td>
<td>7.29</td>
<td>58.32</td>
</tr>
<tr>
<td>16</td>
<td>6.56</td>
<td>104.98</td>
</tr>
</tbody>
</table>
Section A  
Section A.1 – Budgeting Concepts

Inferences from learning Curve Models:
1. Resource (Time or cost) required to make the next unit is lower than that required to make the previous unit
2. Rate of reduction is faster to begin with and slows down subsequently
3. The curve levels off ultimately implying learning and experience don’t lower the quantum of resource required significantly after a point.

F. Understanding of Moving Averages, Weighted Moving Averages & Exponential Smoothing and Calculate Forecasts

- A time series data is a compilation of behaviour of a variable at a particular time interval (say daily, monthly, quarterly, hourly etc.) over a period of time
- An analysis of time series tells us many underlying behaviour of the variable but also exposes many noises (cyclicality, seasonality, irregularity etc. – explained in the subsequent LOS)
- Smoothing techniques are used to reduce irregularities (random fluctuations) in time series data. They provide a clearer view of the true underlying behaviour of the series. Smoothing is usually done to help us better see patterns, trends for example, in time series. One should generally smooth out the irregular roughness to see a clearer signal.

Techniques of Smoothing:
1. Moving Averages: Average of recent most set of data for the given fixed time frame. With every time period, last data point moves out and the recent most data moves in. Example: Three months moving average of Sales
2. Weighted Moving Averages: Similar to moving average method, but higher weights are assigned to recent data than the older data; assumes that recent observation will be a better predictor.
3. Exponential Smoothing: Forecast value is a weighted combination of the observed value at time t and the forecasted value at time t as shown by equation below:
   \[ F_{t+1} = \alpha \times D_t + (1 - \alpha) \times F_t \]
   where \( \alpha \) is the smoothing constant
   Although the method is called a smoothing method, it’s principally used for short run forecasting.

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Parameter</th>
<th>Moving Averages</th>
<th>Exponential Smoothing</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Effective</td>
<td>Effective in smoothing out sudden fluctuations in demand pattern in order to provide stable estimates Useful if forecast is assumed to stay fairly steady over time</td>
<td>Work well when the time series is stable without any significant trends, cyclical or seasonality. Good for forecasting large number of dependent variables,</td>
</tr>
<tr>
<td>2.</td>
<td>Data Requirement</td>
<td>Requires maintaining extensive records of past data; requires historical data</td>
<td>Requires little record keeping of past data; minimal data requirement</td>
</tr>
</tbody>
</table>
3. **Weights**  

Equal or more weightage to recent data  
Smoothing constant ranges from 0 to 1; subjectively chosen; Smaller constant gives more smoothing, larger constant gives less smoothing.

Actual Sales of Alpha Beta Corporation in first 3 months of the years were as tabulated alongside. Sales forecasts for March was Rs. 108 Cr. Calculate the sales forecasts for April based on moving averages, weighted moving averages (use weights of 20%, 30% and 50% for Jan, Feb and March data respectively) and Exponential Smoothing with constant of 0.92.

**Solution:**

Moving average forecast = \( \frac{(100 + 106 + 98)}{3} = 101.33 \)

Weighted Moving average forecast = \( \frac{(20\% \times 100 + 30\% \times 106 + 50\% \times 98)}{3} = 100.80 \)

Exponential Smoothing Forecast = \( 0.92 \times 98 + (1 – 0.92) \times 108 = 98.80 \)

**G. Understanding of Time Series Analysis including objectives and patterns**

1. A time series data is a compilation of behaviour of a variable at a particular time interval (say daily, monthly, quarterly, hourly etc.) over a period of time.
2. An analysis of time series tells us many underlying behaviour of the variable but also exposes many noises / patterns:

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Pattern</th>
<th>Remarks</th>
</tr>
</thead>
</table>
| 1.      | Trends  | 1. Depicts a gradual shift to a higher (upward sloping) or lower (downward sloping) values  
          |         | 2. Due to change in population, technology, customer preference, pricing, competition etc.  
          |         | 3. Forecasts for dependent variable can be made based on trend line using regression analysis (time as independent variable)  
          |         | 4. Informed decision-making on expansion related decisions |
| 2.      | Cyclical | 1. Repetitive pattern of data points lying above or below the trend line  
          |         | 2. Can last for more than a year  
          |         | 3. Result of macro-economic conditions  
          |         | 4. Improved decision-making in the light of macro-economic conditions |
| 3.      | Seasonal | 1. Peak and Trough pattern during a year  
          |         | 2. Can occur due to seasonal change in preference and activities  
          |         | 3. Assists in inventory management |
| 4.      | Irregular Variations | 1. Any outlier data points which don’t form a trend, seasonality or cyclical pattern  
          |         | 2. Can occur due to non-recurring, extraordinary event  
          |         | 3. Such factors cannot be accounted for in the forecasts |
### H. List the benefits and shortcomings of regression analysis, learning curve analysis and time series analysis

<table>
<thead>
<tr>
<th></th>
<th>Regression Analysis</th>
<th>Learning Curve Analysis</th>
<th>Time Series Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Benefits</strong></td>
<td>1. Simple and most frequently used tool for forecasting</td>
<td>1. Important technique for predicting how long it will take to undertake future tasks.</td>
<td>1. A time series analysis clearly depicts all kinds of trends and noises and help managers take informed decision</td>
</tr>
<tr>
<td></td>
<td>2. Can be used to trace the relationship and the strength of relationship with multiple variables at a time</td>
<td>2. Helps you take into account the impact of learning for resource planning, staffing, control and decision-making.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3. Can handle large set of data as well to derive conclusions</td>
<td>3. Emphasises the fact that initial resource requirements usually do not accurately represent future requirements.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4. Forces user to look at the relationship between the variable graphically and predict the trend intuitively</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Shortcomings</strong></td>
<td>1. Outliers can distort the results of regression analysis. Should be checked to ensure that any data recording error or an extraordinary event is not impacting the analysis</td>
<td>1. Applies only for labor-intensive operations</td>
<td>1. Uses historical data for forecasting. Past patterns are expected to occur in future</td>
</tr>
<tr>
<td></td>
<td>2. May not be a suitable tool if assumptions (linear relationship, stable process, no multi collinearity, no autocorrelation) don’t hold true</td>
<td>2. Assumption of constant learning rate may not be valid and hence induce errors in forecasting</td>
<td>2. Extraordinary or non-recurring events cannot be factored for forecasting</td>
</tr>
<tr>
<td></td>
<td>3. Regression analysis should not be used for forecasting if independent variable lies outside the historical data set</td>
<td>3. Productivity improvement can be due to factors other than learning so unreliable conclusions</td>
<td></td>
</tr>
</tbody>
</table>
I. Expected Value of Random Variables

1. For sake of simplicity, a random variable is a variable that can take any possible value. There always exists a finite probability for every possible outcome it can show.
2. For such a probabilistic situation, a random variable is quantified by its expected value given by sum total of its probability weighted values:
   \[ X = p_1 x_1 + p_2 x_2 + p_3 x_3 + \ldots + p_n x_n \]
3. Where \( X \) is the expected value of the variable; \( x_1, x_2, \ldots, x_n \) are “n” different outcomes / values it can take and \( p_1, p_2, \ldots, p_n \) are the respective probabilities of these outcomes / values.

Example:
Sales of Alpha Beta Corporation can take any of the three values depending upon the state of economy. Calculate the expected value of sales forecasts?

<table>
<thead>
<tr>
<th>Economic Condition</th>
<th>Sales Estimate (Rs. Cr)</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good</td>
<td>5,000</td>
<td>0.15</td>
</tr>
<tr>
<td>Bad</td>
<td>2,000</td>
<td>0.15</td>
</tr>
<tr>
<td>Average</td>
<td>4,000</td>
<td>0.70</td>
</tr>
</tbody>
</table>

Expected value of sales forecasts = 5,000 x 0.15 + 2,000 x 0.15 + 4,000 x 0.70 = Rs. 3,850

J. Benefits and Shortcomings of Expected Value Techniques

Benefits
1. A method to forecast a variable even if it has too much of uncertainties associated with it
2. Aids in decision making – to do or not do
3. Considers all the possible states / outcomes / before decision making

Key Issues:
1. Estimation and probabilities assigned under different conditions can be subjective
2. Decision cannot be made in case of unreliable estimates
3. Expected value method assumes the decision maker is risk neutral. Will not be suitable for risk-taker or risk-averse decision makers

K. Use probability values to estimate future cash flows

Alpha Beta Corporation is planning to introduce a new product in its portfolio. The cost of introducing the product is Rs. 50 Cr. The product once introduced can fetch different level of revenues depending upon the state of economy next year. The gross margin is roughly 50% and fixed operating costs will be Rs. 10 Cr per annum. What is the expected break even period for this product?

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>State</th>
<th>Probability</th>
<th>Revenue (Rs. Cr)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Highly buoyant</td>
<td>10%</td>
<td>50</td>
</tr>
<tr>
<td>2</td>
<td>Buoyant</td>
<td>20%</td>
<td>40</td>
</tr>
<tr>
<td>3</td>
<td>Most likely</td>
<td>30%</td>
<td>30</td>
</tr>
<tr>
<td>4</td>
<td>Pessimistic</td>
<td>40%</td>
<td>20</td>
</tr>
</tbody>
</table>
Solution: All financials in Rs. Cr

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>State</th>
<th>Probability</th>
<th>Revenue</th>
<th>Variable Cost</th>
<th>Fixed Costs</th>
<th>Total expenses</th>
<th>Cash Flow</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Highly buoyant</td>
<td>10%</td>
<td>50</td>
<td>25</td>
<td>10</td>
<td>35</td>
<td>15</td>
</tr>
<tr>
<td>2.</td>
<td>Buoyant</td>
<td>20%</td>
<td>40</td>
<td>20</td>
<td>10</td>
<td>30</td>
<td>10</td>
</tr>
<tr>
<td>3.</td>
<td>Most likely</td>
<td>30%</td>
<td>30</td>
<td>15</td>
<td>10</td>
<td>25</td>
<td>5</td>
</tr>
<tr>
<td>4.</td>
<td>Pessimistic</td>
<td>40%</td>
<td>20</td>
<td>10</td>
<td>10</td>
<td>20</td>
<td>0</td>
</tr>
</tbody>
</table>

Expected cash flow per annum (Rs. Cr) = 15 x 10% + 10 x 20% + 5 x 30% + 0 x 40% = 5
Expected payback period = 50 / 5 = 10 years

L. Uses of sensitivity analysis

An output or a dependent variable is typically dependent upon several independent / input variables. Sensitivity Analysis tells us:
1. How sensitive the outcome / output is to a particular input?
2. The outcomes corresponding to different values of inputs?
3. Identify the variable(s) which significantly or weakly impact(s) the output / outcome

M. Perform a sensitivity analysis with different values for the probabilities of the states of nature and / or the payoffs

Example:
Alpha Beta Corporation has assigned different probabilities to the sales estimates under three macroeconomic scenarios. However two other estimates of probabilities are also available as depicted below. Find out the sensitivity of sales w.r.t economic conditions.

<table>
<thead>
<tr>
<th>Economic Condition</th>
<th>Sales Estimate (Rs. Cr)</th>
<th>Expected Probabilities</th>
<th>Alternate Probabilities 1</th>
<th>Alternate Probabilities 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good</td>
<td>5,000</td>
<td>0.15</td>
<td>0.65</td>
<td>0.10</td>
</tr>
<tr>
<td>Bad</td>
<td>2,000</td>
<td>0.15</td>
<td>0.10</td>
<td>0.65</td>
</tr>
<tr>
<td>Average</td>
<td>4,000</td>
<td>0.70</td>
<td>0.25</td>
<td>0.25</td>
</tr>
</tbody>
</table>

- Expected sales under expected probabilities will be (Rs. Cr) = 5,000 x 0.15 + 2,000 x 0.15 + 4,000 x 0.70 = Rs. 3,850
- Expected sales under alternate probabilities 1 will be (Rs. Cr) = 5,000 x 0.65 + 2,000 x 0.10 + 4,000 x 0.25 = Rs. 4,450
- Expected sales under alternate probabilities 2 will be (Rs. Cr) = 5,000 x 0.10 + 2,000 x 0.65 + 4,000 x 0.25 = Rs. 2,800
- The significant variations in the sales forecast under three scenarios shows that it is highly sensitive to the economic conditions of the country.
N. Benefits & Shortcomings of Sensitivity Analysis

Benefits:
1. Allows a manager to do a what if / scenario analysis
2. Helps managers identify the most crucial / critical / sensitive variables in decision making and thus guides them to be very realistic and cautious in forecasting / projecting them

Shortcomings
1. Independent variables may be correlated and may not impact dependent variable individually but mutually result in substantial different outcome.
2. Independent variables may be correlated; hence all of them need to be changed if forecasts are to be accurate. A manager must understand this; otherwise forecasts will be grossly inaccurate.