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CAPITAL MANAGEMENT

Capital Budgeting

The term Capital Budgeting refers to the long-term planning for proposed capital outlays or expenditure for the purpose of maximizing return on investments. The capital expenditure may be :

(1) Cost of mechanization, automation and replacement.
(2) Cost of acquisition of fixed assets. e.g., land, building and machinery etc.
(3) Investment on research and development.
(4) Cost of development and expansion of existing and new projects.

DEFINITION OF CAPITAL BUDGETING

Capital budgeting is the decision making process by which a firm evaluates the purchase of major fixed assets including building, machinery and equipment.

From the above definitions, it may be concluded that capital budgeting relates to the evaluation of several alternative capital projects for the purpose of assessing those which have the highest rate of return on investment.

Importance of Capital Budgeting :

Capital budgeting is important because of the following reasons :
(1) Capital budgeting decisions involve long-term implication for the firm, and influence its risk complexion.
(2) Capital budgeting involves commitment of large amount of funds.
(3) Capital decisions are required to assessment of future events which are uncertain.
(4) Wrong sale forecast ; may lead to over or under investment of resources.
(5) In most cases, capital budgeting decisions are irreversible. This is because it is very difficult to find a market for the capital goods. The only alternative available is to scrap the asset, and incur heavy loss.
(6) Capital budgeting ensures the selection of right source of finance at the right time.

Objectives of Capital Budgeting

The following are the important objectives of capital budgeting:
(1) To ensure the selection of the possible profitable capital projects.
(2) To ensure the effective control of capital expenditure in order to achieve by forecasting the long-term financial requirements.
(3) To make estimation of capital expenditure during the budget period and to see that the benefits and costs may be measured in terms of cash flow.
(4) Determining the required quantum takes place as per authorization and sanctions.
(5) To facilitate co-ordination of inter-departmental project funds among the competing capital projects.
(6) To ensure maximization of profit by allocating the available investible.

Types of Capital Expenditure

A firm may have several investment proposals for its consideration. It may adopt after considering the merits and demerits of each one of them. For this purpose capital expenditure proposals may be classified into :

(1) Independent Proposals
(2) Dependent Proposals or Contingent Proposals
(3) Mutually Exclusive Prop

(1) Independent Proposals: These proposals are said be to economically independent which are accepted or rejected on the basis of minimum return on investment required. Independent proposals do not depend upon each other.

(2) Dependent Proposals or Contingent Proposals: In this case, when the acceptance of one proposal is contingent upon the acceptance of other proposals. it is called as "Dependent or Contingent Proposals." For example, construction of new building on account of installation of new plant and machinery.

(3) Mutually Exclusive Proposals: Mutually Exclusive Proposals refer to the acceptance of one proposal results in the automatic rejection of the other proposal. Then the two investments are mutually exclusive. In other words, one can be rejected and the other can be accepted. It is easier for a firm to take capital budgeting decisions on such projects.

Methods of Evaluating Capital Investment Proposals

There are number of appraisal methods which may be recommended for evaluating the capital investment proposals. We shall discuss the most widely accepted methods. These methods can be grouped into the following categories :

I. Traditional Methods:

Traditional methods are grouped in to the following :
(1) Pay-back period method or Payout method.
(2) Improvement of Traditional Approach to Pay-back Period Method.
      (a) Post Pay-back profitability Method.
      (b) Discounted Pay-back Period Method.
      (c) Reciprocal Pay-back Period Method.
(3) Rate of Return Method or Accounting Rate of Return Method.
II. Time Adjusted Method or Discounted Cash Flow Method

Time Adjusted Method further classified into:
(1) Net Present Value Method.
(2) Internal Rate of Return Method.
(3) Profitability Index Method.
I. Traditional Methods

(1) Pay-back Period Method : Pay-back period is also termed as "Pay-out period" or Pay-off period. It is defined as the number of years required to recover the initial investment in full with the help of the stream of annual cash flows generated by the project.

Calculation of Pay-back Period: Pay-back period can be calculated into the following two different situations :

(a) In the case of constant annual cash inflows.
(b) In the case of uneven or unequal cash inflows.
(a**) In the case of constant annual cash inflows** : If the project generates constant cash flow the Pay-back period can be computed by dividing cash outlays (original investment) by annual cash inflows. The following formula can be used to ascertain pay-back period:

Pay-back Period= (Initial Investment)/ Annual Cash Inflows

Illustration:

A project requires initial investment of Rs. 40,000 and it will generate an annual cash inflows of Rs. 10,000 for 6 years. You are required to find out pay-back period.

Solution:

Calculation of Pay-back period :

$$= \frac{\text{Cash Outlays (Initial Investment)}}{\text{Annual Cash Inflows}}$$

$$= \frac{\text{Rs. } 40,000}{\text{Rs. } 10,000} = 4 \text{ Years}$$

Pay-back period is 4 years, i.e., the investment is fully recovered in 4 years.

(b**) In the case of Uneven or Unequal Cash Inflows**: In the case of uneven or unequal cash inflows, the Pay-back period is determined with the help of cumulative cash inflow. It can be calculated by adding up the cash inflows until the total is equal to the initial investment.

Illustration:

From the following information you are required to calculate pay-back period :

A project requires initial investment of Rs. 40,000 and generate cash inflows of Rs. 16,000, Rs. 14,000, Rs. 8,000 and Rs. 6,000 in the first, second, third, and fourth year respectively.

Solution:

Calculation Pay-back Period with the help of "Cumulative Cash Inflows"

Year	Annual Cash Inflows Rs.	Cumulative Cash Inflows Rs.
1	16,000	16,000
2	14,000	30,000
3	8,000	38,000
4	6,000	44,000

The above table shows that at the end of 4th years the cumulative cash inflows exceeds the investment of Rs. 40,000. Thus the pay-back period is as follows :

$$\text{Pay-back Period} = 3 \text{ Years} + \frac{40,000 - 38,000}{6,000}$$

$$= 3 \text{ Years} + \frac{\text{Rs. } 2,000}{\text{Rs. } 6,000}$$

$$= 3.33 \text{ Years}$$

Accept or Reject Criterion

Investment decisions based on pay-back period used by many firms to accept or reject an investment proposal. Among the mutually exclusive or alternative projects whose pay-back periods are lower than the cut off period the project would be accepted. if not it would be rejected.

Illustration :

Rahave Ltd. is producing articles mostly by manual labour and is considering to replace it by a new machine. There are two alternative models X and Y of the new machine. Prepare a statement of profitability showing the pay~back period from the following information:

	Machine X	Machine Y
Estimate life of the Machine	4 Years	5 Years
Cost of machine	Rs. 1,80,000	Rs. 3,60,000
Estimated savings in scrap	Rs. 10,000	Rs. 16,000
Estimated savings in direct wages	Rs. 1,20,000	Rs. 1,60,000
Additional cost of maintenance	Rs. 16,000	Rs. 20,000
Additional cost of supervision	Rs. 24,000	Rs. 36,000

Solution:

Calculation of Annual Cash Inflows

Particulars	Machine X Rs.	Machine Y Rs.
Estimated saving in scrap	10,000	16,000
Add : Estimated saving in direct wages	1,20,000	1,60,000
Total saving (A)	1,30,000	1,76,000
Additional cost of maintenance	16,000	20,000
Additional cost of supervision	24,000	36,000
Total additional cost (B)	40,000	56,000
Net Cash Inflows (A) – (B)	90,000	1.20,000

$$\text{Pay-back Period} = \frac{\text{Original Investment}}{\text{Annual Average Cash Inflows}}$$

$$\text{Machine X} = \frac{Rs.1,80,000}{Rs.90,000} = 2 \text{ Years}$$

$$\text{Machine Y} = \frac{Rs.3,60,000}{Rs.1,20,000} = 3 \text{ Years}$$

Machine X should be preferred because it has a shorter pay-back period.

Advantages of Pay-back Period Method

(1) It enables the firm to select an investment which yields a quick return on cash funds

(2) It is simple to understand and easy to calculate

(3) It facilitates to determine the liquidity and solvency of a firm

(4) It used as a method of ranking competitive projects

Disadvantages of Pay-back Period Method

(1) It does not measure the profitability of a project

(2) It does not value projects of different economic lives

(3) This method does not consider income beyond the pay-back period

(4) It does not give proper weight to timing of cash flows

(5) It does not indicate how to maximize value and ignores the relative profitability of the project

(3) Average Rate of Return Method (ARR) or Accounting Rate of Return Method: Average Rate of Return Method is also termed as Accounting Rate of Return Method. This method focuses on the average net income generated in a project in relation to the project's average investment outlay. This method involves accounting profits not cash flows and is similar to the performance measure of return on capital employed. The average rate of return can be determined by the following equation:

Average Rate of Return (ARR)=(Average Income/ Average Investments)*100

= Cash Flow - (After Depreciation and Tax)/ Original Investments

=(No. of Projects / No. of Years)*100

Where
Average investment would be equal to the Original investment plus salvage value divided by Two
Average Investment = Original Investment /2

or

=(Original Investment - Scrap Value of the Project)/2

(1) It considers all the years involved in the life of a project rather than only pay-back years.
(2) It applies accounting profit as a criterion of measurement and not cash flow.

(1) It applies profit as a measure of yardstick not cash flow.
(2) The time value of money is ignored in this method.
(3) Yearly profit determination may be a difficult task.

Discounted Cash Flow Method (or) Time Adjusted Method: Discount cash flow is a method of capital investment appraisal which takes into account both the overall profitability of projects and also the timing of return. Discounted cash flow method helps to measure the cash inflow and outflow of a project as if they occurred at a single point in time so that they can be compared in an appropriate way. This method recognizes that the use of money has a cost, i.e., interest foregone. In this method risk can be incorporated into Discounted Cash Flow computations by adjusting the discount rate or cut off rate.

Net Present Value Method (NPV) : This is one of the Discounted Cash Flow technique which explicitly recognizes the time value of money. In this method all cash inflows and outflows are converted into present value (i.e., value at the present time) applying an appropriate rate of interest (usually cost of capital).
In other words, Net Present Value Method discount inflows and outflows to their present value at the appropriate cost of capital and set the present value of cash inflow against the present value of outflow to calculate Net Present Value. Thus, the Net Present Value is obtained by subtracting the present value of cash outflows from the present value of cash inflows.
Equation for Calculating Net Present Value:
(1) In the case of conventional cash flows. i.e., all cash outflows are entirely initial and all cash inflows are in future years, NPV may be represented as follows:

$$= \left[\frac{R_1}{(1+K)^1} + \frac{R_2}{(1+K)^2} + \frac{R_3}{(1+K)^3} + \frac{R_n}{(1+K)^n} \right] - 1$$

Illustration:

Calculate the Net Present Value of the following project requiring an initial cash outlays of Rs. 20,000 and has a no scrap value after 6 years. The net profits after depreciation and taxes for each

year of Rs. 6,000 for six years. Assume the present value of an annuity of Re.1 for 6 years at 8% p.a. interest is Rs.4.623.

Solution:

Calculation of Net Present Value

Initial Cash Outlays	=	Rs. 20,000
Present Value of Cash Inflows	=	Rs. 6,000 x Rs. 4,263
	=	Rs. 27,738
Net Present Value (NPV)	=	Present Value of Cash Inflows – Value of Cash Outflows
	=	Rs. 27,738 – Rs. 20,000
	=	Rs. 7,738
Net Present Value (NPV)	=	Rs. 7,738

(2) In the case of non-conventional cash inflows, i.e., where there are a series of cash inflows as well as cash outflows the equation for calculating NPV is as :

$$NPV = \left[\frac{R_1}{(1+K)^1} + \frac{R_2}{(1+K)^2} + \frac{R_3}{(1+K)^3} + \frac{R_n}{(1+K)^n} \right] - \left[I_0 + \frac{I_1}{(1+K)^1} + \frac{I_2}{(1+K)^2} + \frac{I_3}{(1+K)^3} + \frac{I_n}{(1+K)^n} \right]$$

Where:

NPV= Net Present Value

R= Future Cash Inflows at different times

K= Cost of Capital or Cut-off rate or Discounting Rate

I= Cash outflows at different times

Illustration:

A project cost Rs. 25,000 and it generates cash inflows through a period of five years Rs. 9,000, Rs. 8,000, Rs. 7,000, Rs. 6,000 and Rs. 5,000. the required rate of return is assumed to be 10%. Find out the Net Present Value of the project.

solution:

The following table gives us the Net Present Value of the Project :

Calculation of Net Present Value

Year 1	Cash inflows 2 Rs.	Discounted Factor 3 Rs.	Present Value of Cash Inflows (2 x 3) = 4 Rs.
1	9,000	0.9091	8,181
2	8,000	0.8264	6,608
3	7,000	0.7513	5,257
4	6,000	0.6830	4,098
5	5,000	0.6209	3,100
	Net Present Value of Cash Inflows		27,244

Net Present Value	=	Present Value of Cash Inflows – Value of Cash Outflow
	=	Rs. 27,244 – 25,000 = Rs. 2,244

Now the NPV of the project is positive and it can be accepted for investment.

Rules of Acceptance: If the rate of return from a project is greater than the return from an equivalent risk investment in securities traded in the financial market, the Net Present Value will be positive. Alternatively, if the rate of return is lower, the Net Present Value will be negative.

In other words, if a project has a positive Net Present Value it is considered to be viable because the present value of the inflows exceeds the present value of the outflows. If the projects are to be ranked or the decision is to select one or another. the project with the greatest Net Present Value should be chosen

Symbolically the accept or reject criterion can be expressed as follows:

Where

NPV > Zero Accept the proposal

NPV < Zero Reject the Proposal

Advantages of Net Present Value Method:

(1) It recognizes the time value of money and is thus scientific in its approach.

(2) All the cash flows spread over the entire life of the project are used for calculations.

(3) It is consistent with the objectives of maximizing the welfare of the owners as it depicts the positive or otherwise present value of the proposals.

Disadvantages :

(1) This method is comparatively difficult to understand or use.

(2) When the projects in consideration involve different amounts of investment, the Net Present Value Method may not give satisfactory results.

(2) Internal Rate of Return Method (IRR)

This discounted cash flow method or time adjusted method for capital budgeting is the internal rate of return method. This technique is also known as yield on investment, marginal efficiency on capital or so on. While arriving at the required rate of return for finding out present values the cash flow, inflow as well as outflow are not considered. It depends on the initial outlay and the cash proceeds of the project.

It is the rate of return which equates the aggregate present value to net cash inflows. It is the rate at

$$\sum \frac{P_n}{(1+i)^n} - P = 0$$

which NPV=0 .

Where,

$\sum \dfrac{P_n}{(1+i)^n}$ = discounted cash inflows of different years.

P = initial cash outlay

The Interpolation formula can be used to measure the Internal Rate of Return as follows :

Lower Interest Rate + $\dfrac{\text{NPV of Lower Rate}}{\text{NPV Lower Rate } (-) \text{ NPV Higher Rate}}$ x (Higher Rate – Lower Rate)

Illustration:

The cost of a project is Rs. 32,400. It is expected to generate cash inflows of Rs. 16,000, Rs. 14,000 and Rs. 12,000 through it three year life period. Calculate the Internal Rate of Return of the Project.

Solution:
Calculation of Internal Rate of Return (IRR)
To begin with let us try a rate of 20% and calculate the present value of cash inflows on this rate. The following table will give the calculations:

Year 1	Cash inflows 2 Rs.	Discounted Factor at 20% 3	Present Value of Cash Inflows (2 x 3) = 4 Rs.
1	16,000	0.833	13,328
2	14,000	0.694	9,716
3	12,000	0.579	6,948
		Total Present Value of Cash Inflows =	Rs. 29,992

Net Present Value	=	Present Value of Cash Inflows – Value of Cash Outlays
	=	Rs. 29,992 – Rs. 32,400 = (–) Rs. 2408
Net Present Value (NPV)	=	– Rs. 2408

The Net Present Value in this case is negative indicating that 20% is the higher rate and so a lower rate should be tried. Let us try 18%, 16% and 14% respectively. On these rates we will get the following results :

Year 1	Cash Inflows 2 Rs.	Discounted Factor 18% 3	Present Value (2 x 3) 4 Rs.	Discount Factor 16% 5	Present Value (2 x 5) 6 Rs.	Discount Factor 14% 7	Present Value (2 x 7) 8 Rs.
1	16,000	0.847	13,552	0.862	13,792	0.877	14,032
2	14,000	0.718	10,052	0.743	10,402	0.769	10,766
3	12,000	0.609	7,308	0.641	7,692	0.675	8,100
Present Value of Cash Inflows			30,912		31,886		31,898
Less: Value of Cash Outflows			32,400		32,400		32,400
Net Present Value (NPV) = (–)			1,488		(–) 514		(–) 498

From the above table of Calculation is can be observed that the real rate lies in between 14% and 16%. Therefore let us select 15% as the internal rate to ascrtain its applicability.

Year 1	Cash inflows 2 Rs.	Discounted Factor 15% 3	Present Value of Cash Inflows (2 x 3) 4 Rs.
1	16,000	0.870	13,920
2	14,000	0.756	10,584
3	12,000	0.658	7,896

Present Value of Cash Inflows	=	32,400
Less : Value of Cash Outflow	=	32,400
Net Present Value		0

Thus, the Net Present Value at 15% rate is zero. It indicates that the present value of cash inflows is equal to the present value of cash outflows. Thus internal rate of return 15% for the project under review.

A popular discounted cash flow method, the internal rate of return criterion has several virtues :

(I) It takes into account the time value of money.
(2) It considers the cash flows over the entire life of the project.
(3) It makes more meaningful and acceptable to users because it satisfies them in terms of the rate of return on capital.

Limitations :

(1) The internal rate of return may not be uniquely defined.
(2) The IRR is difficult to understand and involves complicated computational problems.
(3) The internal rate of return figure cannot distinguish between lending and borrowings and hence high internal rate of return need not necessarily be a desirable feature.

(3) Profitability Index Method :

Profitability Index is also known as Benefit Cost Ratio. It gives the present value of future benefits, computed at the required rate of return on the initial investment. Profitability Index may either be Gross Profitability Index or Net Profitability Index. Net Profitability Index is the Gross Profitability Index minus one. The Profitability Index can be calculated by the following equation:

$$\text{Profitability Index} = \frac{\text{Present Value of Cash Inflows}}{\text{Initial Cash Outlays}}$$

Rule of Acceptance: As per the Benefit Cost Ratio or Profitability Index a project with Profitability Index greater than one should be accepted as it will have Positive Net Present Value. Likewise if Profitability Index is less than one the project is not beneficial and should not be accepted.

Advantages of Profitability Index:

(1) It duly recognizes the time value of money.
(2) For calculations when compared with internal rate of return method it requires less time.
(3) It helps in ranking the project for investment decisions.
(4) As this method is capable of calculating incremental benefit cost ratio, it can be used to choose between mutually exclusive projects.

Illustration:

A project is in the consideration of a firm. The initial outlay of the project is Rs. 10,000 and it is expected to generate cash inflows of Rs. 4,000, Rs. 3,000, Rs. 5,000 and Rs. 2,000 in four years to follow.
Assuming 10% rate of discount, calculate the Net Present Value and Benefit Cost Ratio of the project.

Solution:

Profitability Index

Year 1	Cash inflows 2 Rs.	Discounted Factor 10% 3	Present Value of Cash Inflows (2 x 3) 4 Rs.
1	4,000	0.909	3,636
2	3,000	0.826	2,478
3	5,000	0.751	3,755
4	2,000	0.683	1,366
Net Present Value of Cash Inflows =			11,235

Net Present Value (NPV) = Present Value of Cash Inflows – Value of Cash Outflows
= Rs.11,235 – 10,000 = Rs.1,235

Net Present Value = Rs.1235

Gross Profitability Index = $\dfrac{\text{Present Value of Cash Inflows}}{\text{Initial Cash Outlays}}$

= $\dfrac{\text{Rs. 11,235}}{\text{Rs. 10,000}}$ = 1.1235

Net Profitability Index = Gross Profitability Index – 1.0
= 1.1235 – 1.0
= 0.1235

The Profitability Index indicates less than one, the project is not beneficial and should not be accepted.

Break-even is the point of zero loss or profit. At break-even point, the revenues of the business are equal its total costs and its contribution margin equals its total fixed costs. Break-even point can be calculated by equation method, contribution method or graphical method. The equation method is based on the cost-volume-profit (CVP) formula:

$$px = vx + FC + Profit$$

Where,
p is the price per unit,
x is the number of units,
v is variable cost per unit and
FC is total fixed cost.

Calculation

BEP in Sales Units

At break-even point the profit is zero therefore the CVP formula is simplified to:

$$px = vx + FC$$

Solving the above equation for x which equals break-even point in sales units, we get:

Break-even Sales Units = x = $\dfrac{FC}{p-v}$

Example

Calculate break-even point in sales units and sales dollars from following information:
Price per Unit-Rs15
Variable Cost per Unit- Rs7
Total Fixed Cost-Rs9,000
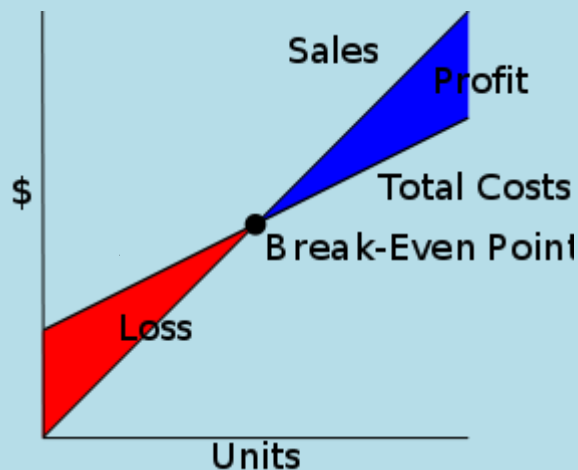
Solution

We have,
p = Rs15
v = Rs7, and
FC = Rs9,000
Substituting the known values into the formula for breakeven point in sales units, we get:
Breakeven Point in Sales Units (x)

= 9,000 ÷ (15 − 7)

= 9,000 ÷ 8

= 1,125 units

Contribution Margin:

Contribution margin (CM) is the amount by which sales revenue exceeds variable costs. It is the net amount that sales 'contribute' towards periodic fixed costs and profits. It is expressed either as total contribution margin, contribution margin per unit or contribution margin ratio.

Variable costs are costs which vary directly with sales. For example, if sales double, variable costs double too, and vice versa. Variable cost may be direct as well as indirect. Direct variable costs include direct material cost and direct labor cost. Indirect variable costs include certain variable overheads.

Total contribution margin is calculated by subtracting total variable costs from total sales. Contribution margin per unit equals sales price per unit minus variable costs per unit or it can be calculated by dividing total contribution margin by total units sold. Contribution margin ratio equals contribution margin expressed as a percentage of sales.

Example

XYZ is a sports footwear startup which currently sells just one shoe brand, A. The sales price is Rs80, variable costs per unit is Rs50 and fixed costs are Rs2,400,000 per annum. During financial year 2015, the company sold 200,000 units. Calculate the company's contribution margin for the period and calculate its breakeven point in both units and dollars.

Solution

Contribution margin per unit
= sales price – variable cost per unit
= Rs80 – Rs50 = Rs30

Total contribution margin
= total sales – total variable costs
= units sold * sales price – units sold * variable cost per unit)
= units sold * (sales price – variable cost per unit)
= Rs80 * 200,000 - Rs50 * 200,000
= 200,000 (Rs80 - Rs50)

= Rs6,000,000

Total contribution margin can also be calculated as follows:

Total contribution margin
= contribution margin per unit * unit sales
= Rs30 * 200,000 = Rs6,000,000

Breakeven point in units
= fixed costs/contribution margin per unit
= Rs2,400,000/Rs30 = 80,000 units

WORKING CAPITAL MANAGEMENT

The process of managing activities and processes related to working capital. This level of management serves as a check and balances system to ensure that the amount of cash flowing into the business is enough to sustain the company's operations. This is an ongoing process that must be evaluated using the current level of assets and liabilities. Working capital management may involve implementing short-term decisions that may or may not carry over from one earnings period to the next.

Net working capital is calculated by subtracting the current liabilities from the current assets on a company's balance sheet. Current assets are cash and other assets that can be converted to cash in a year or less. Current liabilities are the financial obligations that a company is required to pay in the next year, and cash and cash equivalents are needed in order to fund the day to day operations of a business.

WORKING CAPITAL= CURRENT ASSETTS--CURRENT LIABILLITIES

Enterprise resource planning (ERP)

Enterprise resource planning (ERP) is a category of business-management software—typically a suite of integrated applications—that an organization can use to collect, store, manage and interpret data from many business activities, including: product planning, purchase. manufacturing or service delivery. It is business process management software that allows an organization to use a system of integrated applications to manage the business and automate many back office functions related to technology, services and human resources.

Characteristics

ERP systems typically include the following characteristics:
•   An integrated system that operates in (or near) real time without relying on periodic updates
•   A common database that supports all applications
•   A consistent look and feel across modules
•   Installation of the system with elaborate application/data integration by the Information Technology (IT) department, provided the implementation is not done in small steps.

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