



STUDY NOTE - 5

FORECASTING, MODEL BUILDING AND MODELS

This Study Note includes:

- **Forecasting Models**
- **Accounting and Financial Models**
- **Decision Analysis Models**
- **Econometric Models**
- **Simulation Models**
- **Life cycle Models**
- **Strategic Options Models**
- **Portfolio Planning Models**

Introduction

Many tools are being used in all analytical exercises, whether they are in science, engineering, management, economics or social sciences. Models are a group of tools, which help comprehension of problems and also help assist in taking decisions. A typical modeling process starts with the identification of a problem and analysis of the requirements of the situation. This analysis will include the scope of the problem, internal or external forces acting as part of the problem and the dynamics of the situation. While such an analysis is attempted, the need to identify variables and their relationship is very essential. Whenever a model is built assumptions are made. These assumptions usually are untested beliefs or predictions and as such they will have to be tested for their relevance to the model. As otherwise the results of the model may not be realistic.

The analysis stated above can be either static or dynamic. **Static analysis** is about “single snap shot situation”. This would mean that all occurrences take place in a single interval whose duration can be either short or long. For example, “make or buy decisions” belong to static analysis. **Dynamic analysis** is applied to situations, which are subject to change over a period. A simple example would be a financial projection either of profitability or funds over five-year period. The input data such as investments, costs, prices and quantities are likely to change from year to year. Another important factor is that the dynamic models are temporal dependent. For instance, arrival of people at a station to board the train changes right through the day hour-to-hour on the basis of the departure time of the various trains.

Dynamic models also are used for analyzing trends and patterns over a period of time. Statistical averages have been used in many a forecasting dynamic model. Dynamic analysis is used very frequently to analyze the changes occurring with in a business enterprise over a period of time. This analysis is also used for developing solutions to specific business problems as also in the formulation of business strategies, tactics and plans. Decision support systems are also utilizing models especially as many situations need to assume certainty, uncertainty or risk.



The advantage of models is that many user inputs and data are transformed into useful information. Models also represent a real situation as an abstract framework. A general model can be framed in mathematical equations or in natural language expressions or as a computer algorithm. The models can be used to manipulate the input and give corresponding changed out puts. They can update records, provide responses to user actions and perform repeated analytical work.

An **explanatory model** narrates the relationship between occurrences and results and also provides an analysis of the situation. For example, a correlation between production, raw materials, product mix and capacity utilization and a comparison with another time period is an explanatory model.

A **contemplative model** is about forecasting outcomes that may result from introduction of a specific set of parameters or changes to a model. This analysis is dynamic and requires interaction with the user.

An **algebraic model** involve introduction of simultaneous equations to provide specific solutions. A manager decides on an outcome and also a point of initiation, and then runs the model. This type of model assists managers to assess to what extent variables can be manipulated between two definite points (beginning and the end). While explanatory models are descriptive in nature, contemplative and algebraic models are predictive models.

For **decision support systems models** used are cost benefit analysis, forecasting demands, sales pattern, etc, finance and investment quantification, inventory control and stock out, transportation problems, project management, queuing, scheduling, etc.

FORECASTING MODELS

Business forecasting is an integral part of strategic management. In that forecast models are needed to develop strategic plans for long-range perspectives. Forecasting models are of four types:

1. Qualitative models
 - a. Delphi model – Collects and analyzes panel of experts opinions
 - b. Historic data – Develop analogies to the past through judgment
 - c. Nominal group technique – Participative group process with forced voting
2. Naive (time series) quantitative models
 - a. Simple average – Averages past data to project the future based on that average
 - b. Exponential smoothing – Weights differently earlier forecasts and the recent to project into the future
3. Causal quantitative model
 - a. Regression analysis – Defines functional relationships among variables as to whether it is linear or non-linear
 - b. Economic modeling – Offers an overall forecast for a variable like Gross National Product (GNP)
4. Combination of monetary and physical projections
 - a. Marketing projections – Monetary by region, product and product group



- b. Economic projections – Monetary by region, industry and broad product category
- c. Historical demand projections – In units, monetary by product and product group
- d. Demand forecast – In units by product and product group for operations management and monetary for sales and financial planning. (This is a combination of a, b and c)

Criteria for selecting a forecasting method

Often the managers are called upon to prepare forecasts regarding trend, seasonality, and turning points for short, medium and long term. Sourcing data also becomes a difficult problem and the managers have to take decision on how they should select the method of forecast with the available data. The following table is a guide for such selection:

Serial Number	Forecasting method	Quantum of data	Pattern of data	Time horizon	Preparation time	Type of skills required
1	Simple exponential smoothing	Maximum 10 observations to accord weight	Stationary	Short	Short	No sophistication
2	Holt's exponential smoothing	10 – 15 observations to set both weights	Trend without seasonality	Short / Medium	Short	Some sophistication
3	Winter's exponential smoothing	Minimum 4-5 observations per season	Trend and seasonality	Short and Medium	Short	Moderate sophistication
4	Regression trend models	Maximum 20 observations. Minimum 5 observations per season	Trend and seasonality	Short / Medium	Short	Moderate sophistication
5	Causal regression models	Minimum 10 observations per independent variable	Complex	Short / Medium / Long term	Long development time but can be implemented in short time	Considerable sophistication
6	Time series decomposition	Adequate to cover at least two peaks and troughs	Cyclical / seasonal containing turning points	Short / Medium	Short / Moderate	No sophistication
7	Box Jenkins	Minimum 50 observations	Stationary	Short / Medium / Long term	Long	Highly sophisticated

Adapted from J. Holton Wilson and Deborah Allison – Korber, “Combining subjective and objective forecasts improves results”, The Journal of business forecasting, fall 1992, and page 4.



ACCOUNTING AND FINANCIAL MODELS

Target pricing model for identifying selling prices for new product is one of the important models. For this two sub models are used – a break-even point for new product and a target return on investment model. After “What-if analysis” the selling price can be computed. These models help in developing the relationship between prices, marketing expenses, and profits for brand and product planning.

The **break-even model** provides price-volume-profit relationships. The important facet of this model is making reasonable assumptions in regard to fixed and variable costs.

Budget financial models: Budgeting data support systems with their intense calculations and multi-variables require models, which can track the necessary solutions for divisions, products or projects. As a process, it's a company wide effort. Companies are trying to combine the traditional bottom-up approach for budget preparation with a top-down approach to align the strategic objectives. Using web technologies changes are made through the budget model estimates. Some new models support participative budget processes. Comshare, Adaytum software and Hyperion solutions have developed products that assist the strategic planning, budgeting, management reporting, analysis and consolidation.

Proforma financial statements: Strategic planning must be supported by financial analysis and projections. A Proforma income statement projects financial results for a specific time horizon. Gross sales are projected and costs are estimated based on specific assumptions, historical data and projections. A profit and loss statement is also computed. These statements are useful for formulating and evaluating strategic plans and can be used for monitoring implementation.

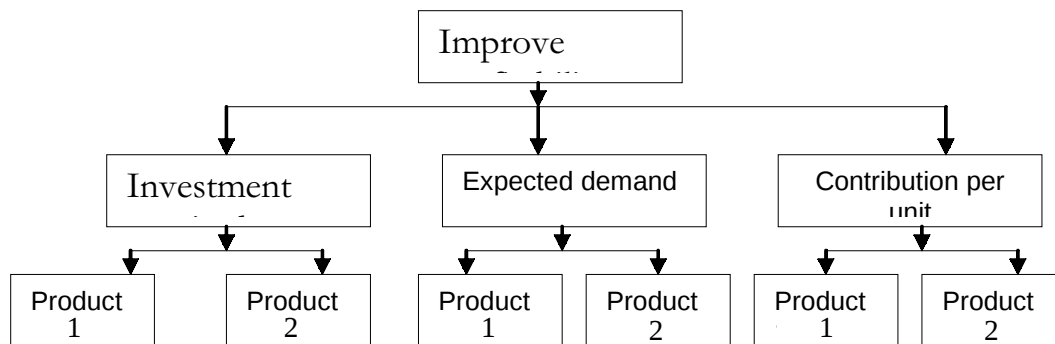
Ratio analysis: Ratio analysis is a much sought after methodology for interpreting and evaluating a company's performance. A decision support system can model a time series of sales growth as also a table of key ratios. There are many specific accounting and financial models along with ratio analysis for monitoring firms' credit worthiness, potential earnings, financial strengths and weaknesses.

DECISION ANALYSIS MODELS

Situations some times involve analysis techniques to help decision makers comprehend their problem and identify different variables for priorities and preferences. This is normally achieved through structuring problems into a hierarchy of objectives and by identifying decision alternatives on specific criteria. In general, computerized decision analysis tools are used to break and structure problems.

Analytical hierarchy process (AHP)

This is one such technique and is characterized by a multi-criteria decision technique combining qualitative and quantitative variables. The first step is to make a hierarchical representation of the problem. The overall objective is designated first followed by decision alternatives at the bottom. Between top and bottom levels selection criteria are indicated.



Hierarchical representation

Having developed the above representation the necessary data will have to be generated for comparing the alternatives. A decision maker has to make comparisons in pairs of the elements relative to next higher level in hierarchy. Usually in the analytical hierarchy process, a relational scale of real numbers from one to nine is used to indicate preferences.

Having determined the relative priority of each attribute a consistency ratio is calculated. This has the option of re doing the comparison matrix. Finally, the priorities are weighed of the lowest level alternatives relative to topmost objective are computed and shown. Thus AHP helps developing a holistic and logical analysis of problems, which exhibit considerable uncertainty. The widely used AHP package is Expert Charts.

Decision trees or multi-attribute utility models (MAUA)

Usually, decision trees model is used to decide on alternatives to be proceeded with or to be dropped. A generalized decision analysis programme models develops such a system with different probabilities and for a particular criteria. The criteria can be maximizing monetary value or maximizing sales, etc.

Mutli-attribute utility analysis model use more decision factors with proper weights. The decision maker also provides adequate information about each alternative on each attribute. This method MAUA has been often used in selection problems in which there is certainty regarding the attribute levels of the alternatives. If there are uncertainties in these values, probability can be introduced. This probability distribution can be used in combination to MAUA to establish a consistent framework for selection decisions.

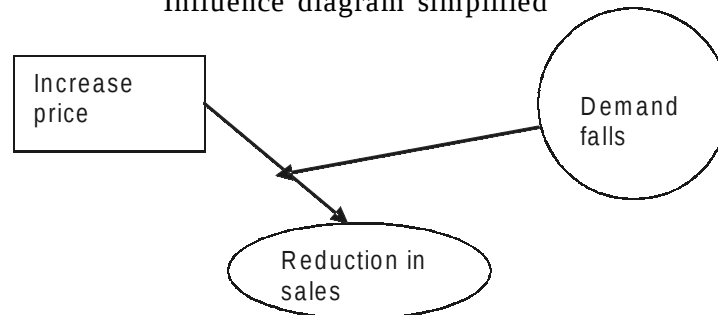
Influence diagrams

Another important decision analysis tool is known as an influence diagram. It offers a graphical presentation of decision situation expressing the exact nature of relationships between the variables. Bodily (1985) developed certain conventions for influence diagrams. They are:

1. A rectangle is a decision variable
2. A circle is an uncontrollable or intermediate variable
3. An oval is a result or outcome variable

These three types of variables are connected with arrows that indicate the direction of influence. Arrows can be one way or two ways.

Influence diagram simplified



ECONOMETRIC MODELS

Economics as a subject has evolved over a period of time and latterly injection of statistics into economics created a new branch as econometrics marrying theoretical economics with statistical computations. This has helped developing dynamic, stochastic, general equilibrium models, which have more theoretical assumptions and least statistical interventions. Incomplete Dynamic Stochastic General Equilibrium Models has still substantial theoretical coherence with increased statistical intervention. Models with Explicit Long Run Equilibrium contain more or less equal inputs from theoretical economics and statistical information. Vector Autoregressive (VAR) model is essentially a statistical model containing lot of statistical inputs with economic assumptions. VAR is used to introduce the impact of various variables on the Gross National Product or Foreign trade or industrial production and so on. Such variable or shocks are interest rate, real exchange rate, inflation, terms of trade, domestic demand and foreign demand. Kapetianos, Tin Bergen, Mckibbin and Vines Colette Black are some of the professionals who developed econometric models to help formulating fiscal as well as monetary policies.

A non-linear statistical model of business cycle has been developed as an econometric model. Harding, Pagan and Breunig developed this model to measure the business cycles. The cycles are divided into phases – periods like boom and recession. These non-linear models depicted peaks and troughs with turning points.

Econometric models like Input-output model and End-use model have been used extensively in preparing countries economic plans. The Input-output model is a special type of economic model in which a number of inputs are chosen and for each relationship the quantities of a number of different outputs through linear relationship. The inputs being independent variables, the output would be the forecasted dependent variables. In the End-use model, the product for which demand is to be forecast is related to the various end uses to which it is put and the quantitative relationship between units of the product and corresponding units of the end-use product is established. This relationship is known as the bridging factor. The projected demand of the end-use product over the forecasting period is now obtained and worked backwards to obtain the demand forecast of the product.



It will be seen that there is considerable similarity between input-output analysis and end-use model. A major obvious difference is that whereas in input-output analysis, the inputs are the independent variables, in the end-use model, the position is reversed. Also, in the input-output model, multiple inputs and outputs are considered simultaneously, any output having one or more inputs, just may be related to one or more outputs. As against that, in the end-use model, a single product is considered and is related to all the end products, which have significant requirement of the product. The forecast derivation in the end-use model is thus more direct and data requirement is often less. Both the models, it may be mentioned, are extremely important and significant, having extensive use in forecasting.

SIMULATION MODELS

Simulation model is normally used when companies have to take interrelated decisions. For example, manufacture of a new product would require decisions on plant and machinery, scheduling and dispatching on the shop floor and the manufacturing philosophy itself. Such interrelated decisions issues are taken care of through discrete event simulations and costing models. A simulation model can generate test conditions approximating actual or operational conditions. For example, wind tunnel where conditions akin to space conditions are created to train pilots to fly aircrafts. Many problems can be evaluated through simulations including materials management, manpower planning, transportation problem, and replacement policy and scheduling.

Simulation models are different from other models in that most models are based on abstract reality, while simulation models try to imitate reality. Again, simulation models enable “what-if” analysis over a multiple time periods or events. Simulation models also help to narrate and predict the characteristics of a given system under different conditions. Finally, simulation is normally used when the problem is too complex for using optimization models.

Simulation model building involves following steps:

1. Define the problem
2. Construct the simulation model gathering necessary data and develop a flow chart to describe the process
3. Program the model
4. Test and validate
5. Design experiments
6. Conduct experiments
7. Evaluate the results

Types of Simulation models

There are several types of simulation as given below:

1. **Probabilistic simulation** where one or more independent variables is conceptualized as a probability distribution of values
2. **Discrete simulation** where it becomes important to know when an event exactly occurs
3. **Visual simulation** is a graphical representation of computerized results. Software for this method is one of the recent developments in computer - human interaction and problem solving



Advantages and disadvantages of simulation models

Decision support systems have been increasingly using simulation models for the following reasons:

1. Simulation theory is relatively easy to comprehend
2. Simulation can offer solutions to “what-if” type questions
3. Decision support system analysts work closely with managers who seek solution
4. The simulation model is built for one particular problem
5. Simulation models allow inclusion of real life complexities and no simplifications are necessary

Disadvantages:

1. An optimal or the best solution is not always guaranteed
2. Building simulation model is a slow and costly process
3. Solutions and inferences from a specific simulation model cannot be transferred for other problems

Sensitivity analysis

Whenever the plan is formulated or a model constructed or a budget document is prepared, many assumptions underlie such activity. These activities are time bound and also involve time consuming exercises. They are prepared normally ahead of a particular dead line for implementation. So, it is possible that some of the key assumptions may undergo a change to near efflux of time. So it is always prudent to quantify the impact of such assumptions or variables due to their deviations from the original quantifications. A sensitivity analysis guides an analyst through the varying impacts of the particular component or variable on the model or the plan or the budget. Sensitivity analysis is often attempted by varying one sensitive factor at a time, other factor remaining the same and quantifies the impact on the model or budget or plan. For instance, price and capacity utilization are two common factors that are taken for sensitivity analysis. If the price of the product were to go up, sales falls due to lowering demand. But how exactly the increments of price per unit affect the demand or the sale will be borne out in the sensitivity analysis. It becomes very important for the models as the variables can be many and interdependencies will have to be fully understood for a meaningful exercise. Towards this sensitivity analysis helps.

LIFE CYCLES MODELS

Life cycle models apply to products, processes, machines, projects and businesses. Products have life from the inception of the concept to embryonic, growth, maturity and decline. Processes in the same manner has a life cycle due to technological obsolescence – technological feasibility, development, commercialization, growth, maturity and decline. Machines have their life span from the time of acquisition through sustenance and final scrapping. Projects again are onetime activities and as such have a cycle of conceptualization, startup, implementation and completion. Businesses have also exhibited a life cycle with embryonic, growth, shake outs, maturity and decline.

So it is absolutely imperative that whenever a strategy is formulated and implemented it should take full cognizance of the life cycles involved, as strategies will vary with the stage of the life cycle.



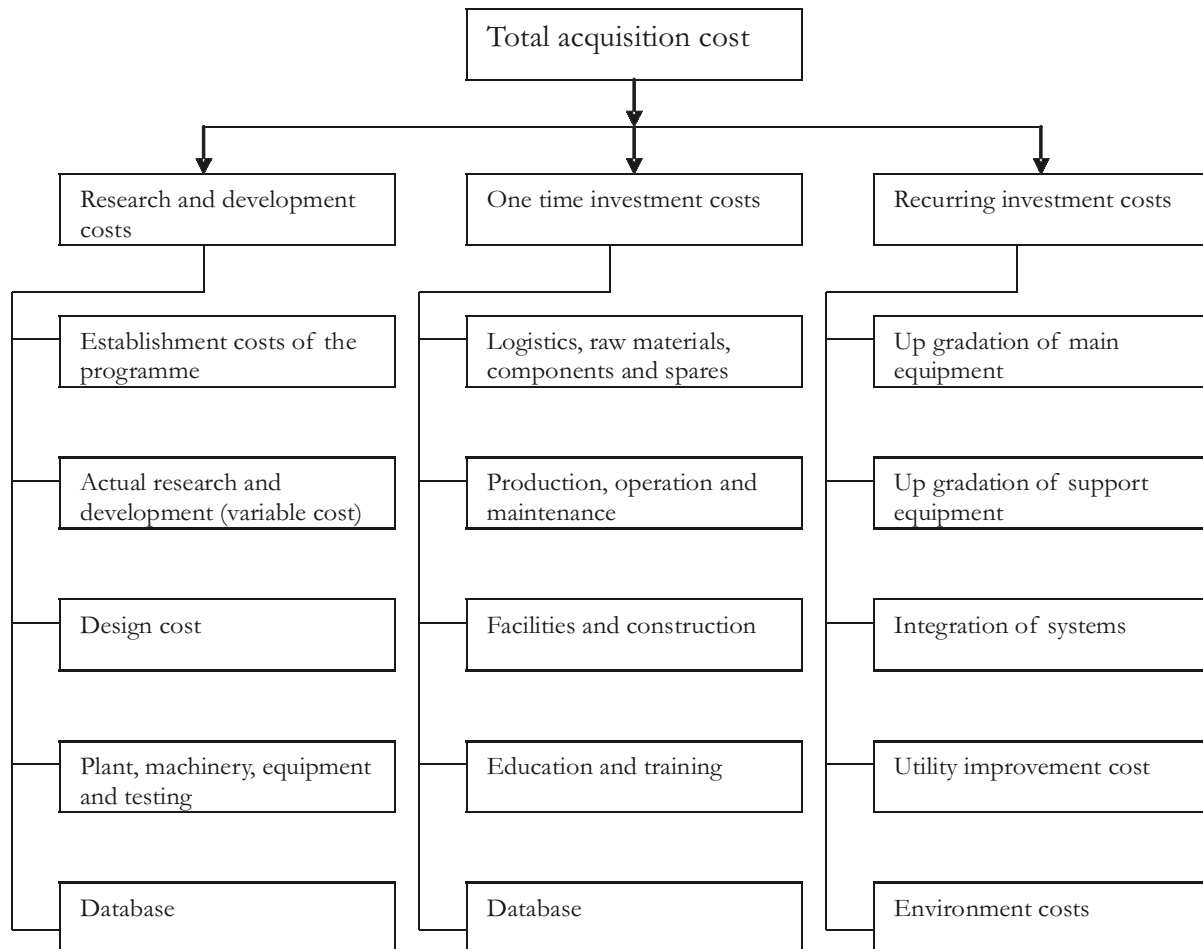
Apart from that in the beginning of every life cycle, be it for product, process, machine, project or business, there is a huge commitment cost involved followed by sustenance cost. Strategies naturally have to be built up from two different stand points:

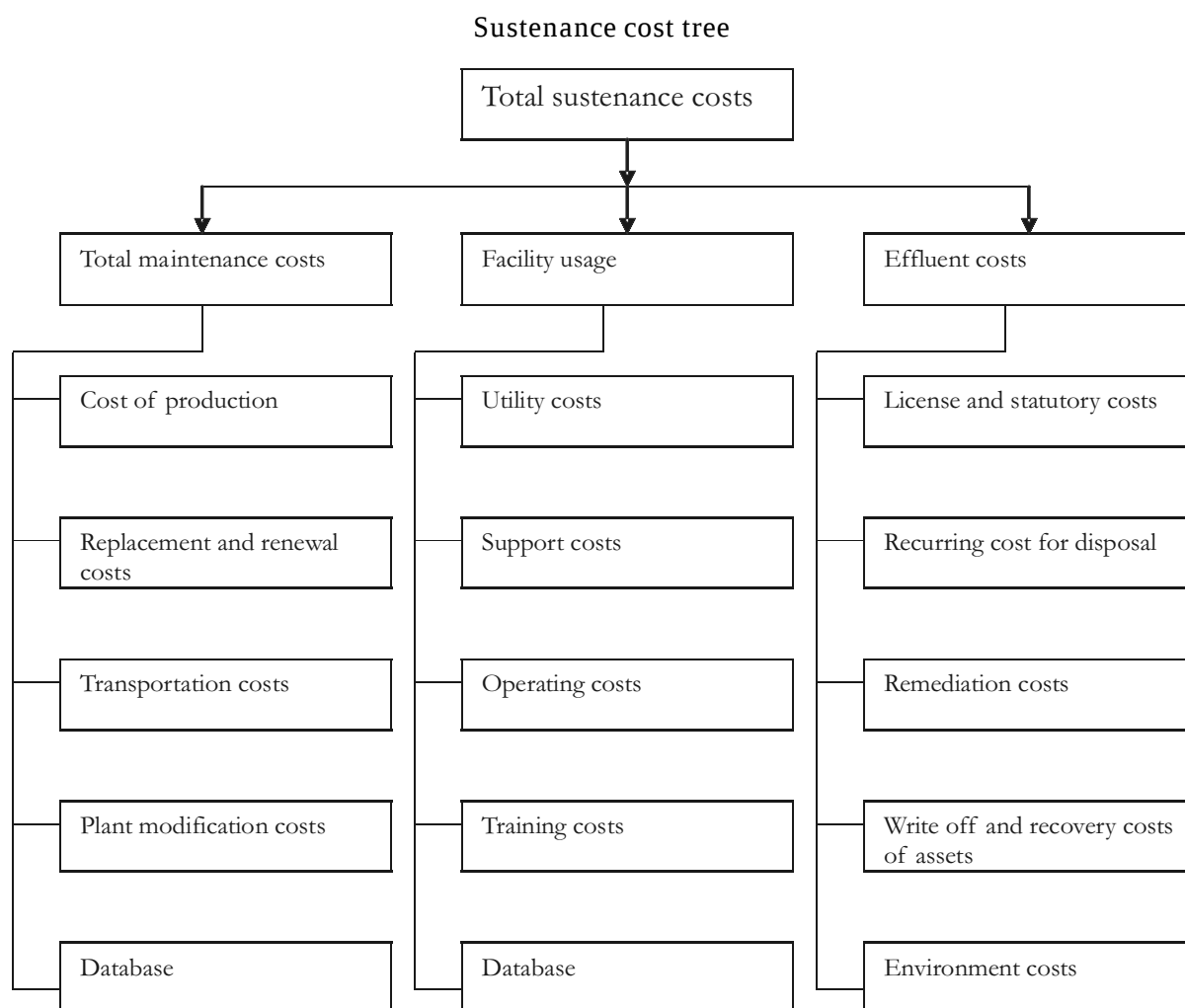
How the commitment costs are transformed into actual expenditure over a time frame? and
How they are matched with resources available?

Computation of return on the total investment has to be recovered throughout the life cycle and the programming of such return and the rates of such return at different stages of lifecycle depends on the strategy employed.

Life cycle costs analysis becomes necessary for providing the customers a long term guarantee taking into account the business and financial risk, keeping the system value during time, optimizing sustenance procedures, etc. These are dependent on reliability, maintainability, safety and performance of the entity during the life cycle. So, development of a life cycle cost model starts with a simple relationship based on costs for acquisition and a cost for sustenance totaling to life cycle cost.

Acquisition cost tree





Normally, acquisition costs are one time cost, whereas sustenance cost is a continuing cost through out the lifecycle. Though the acquisition cost is in the nature of capital cost and is incurred within a definite time horizon. Sustenance cost is more in revenue nature and is incurred over a longer period throughout a life cycle. However, sustenance cost is always many times greater than acquisition cost.

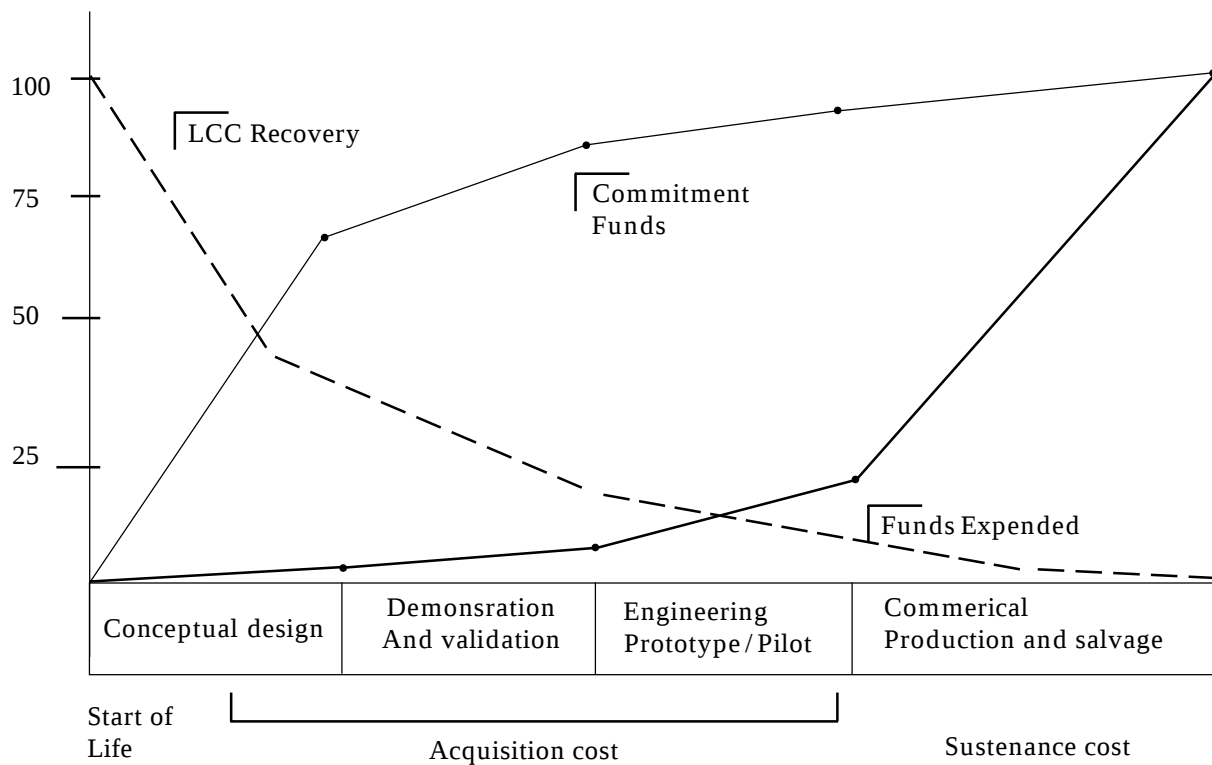
A life cycle cost calculation will have definite steps as below:

1. Define the problem, which requires computation of lifecycle costs
2. Alternatives and acquisition / sustaining costs
3. Prepare a break up for both acquisition and sustenance costs
4. Identify an analytical cost model
5. Prepare cost estimates and cost models
6. Prepare cost profiles for each year or period of the lifecycle
7. Develop break even charts for the time intervals



8. Develop Pareto charts for identifying the vital cost drivers
9. Develop sensitivity analysis for the cost drivers
10. Risk analysis - both physical and financial
11. Select preferred course of action using life cycle cost
12. Feedback of 11 to 2, 3, 4 and 5

Components of Life cycle cost and recovery through the cycle



SOME MODELS TO ASSIST IN EXPLORING STRATEGIC OPTIONS

The value chain

To get a bird's eye view of an organization's operation is the purpose of the value chain model of corporate activities, developed by Michael Porter. Competitive advantage, says Porter, arises out of the way in which firms organize and perform activities. One should keep in mind that in Porter's analysis, business activities are not the same as business functions.

1. Functions are the familiar departments of a business and reflect the format organization structure and distribution of labor.



2. Activities are what actually goes on, and the work that is done. A single activity can be performed by a number of functions in sequence.

Activities are the means by which a firm creates a value in its products. Activities incur costs, and in combination with other activities, provide a product or service which earns revenue. Firms create value for their buyers by performing these activities. The ultimate value a firm creates is measured by the amount customers are willing to pay for its products or services above the cost of carrying out value activities. A firm is profitable if the realized value to customers exceeds the collective cost of performing the activities. There are two points to note here:

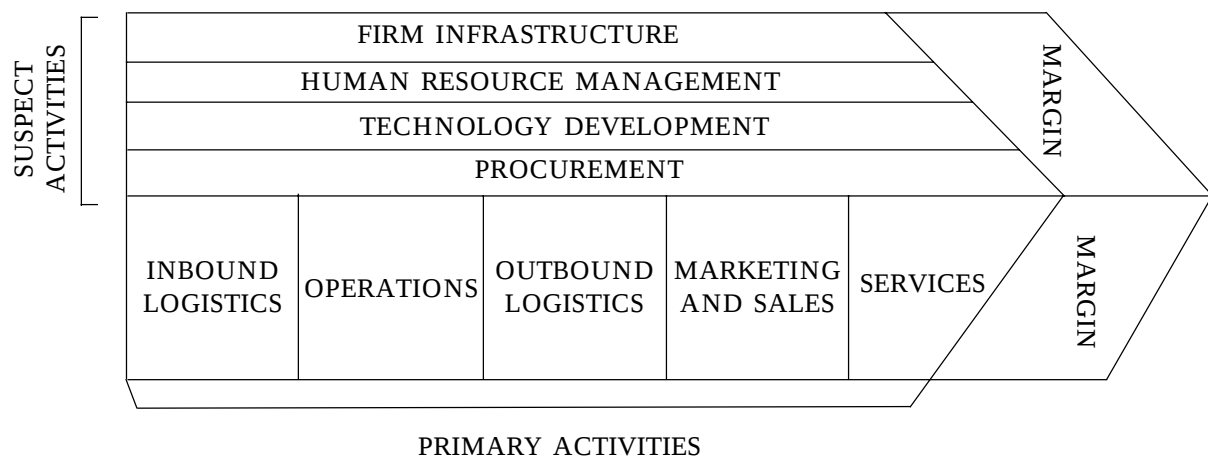
1. Customer's purchase value, which they measure by comparing a firm's products and services with similar offerings by competitors.
2. The business creates value by carrying its activities either more efficiently than other businesses, or combined in such a way as to provide a unique product or service.

Porter analyzed the various activities of an organization into a value chain. This is a model of value activities and the relationships between them.

Primary Activities – are those directly related with production, sales, marketing, delivery and services. The diagram shows five primary activities.

- a. **Inbound logistics** are those activities involved with receiving, handling and storing inputs to the production system.
- b. **Operations** are those activities which convert resource inputs into a final product.
- c. **Outbound logistics** are those activities relating to storing the product and its distribution to customers.
- d. **Marketing and sales** are those activities that relate to informing customer about the product, persuading them to buy it, and enabling them to do so.
- e. **After sales services:** For many companies, there are activities such as installing, repairing products, providing spares, etc.

The Value chain





Support Activities – are those which provide purchased inputs, human resources technology and infrastructural functions to support primary activities. Support activities include:

- a. **Procurement** refers to those activities which acquire the resource inputs to the primary activities.
- b. **Technology Development:** These activities are related to both product design and to improving process and / or resource utilization.
- c. **Human Resource Management** is the activities of recruiting training and rewarding people.
- d. **Firm infrastructure:** The systems of planning, finance etc., are activities which Porter believes are crucially important to an organization's strategic capability in all primary activities.

Furthermore, in addition to the categories described above, Porter identifies three other ways of categorizing activities:

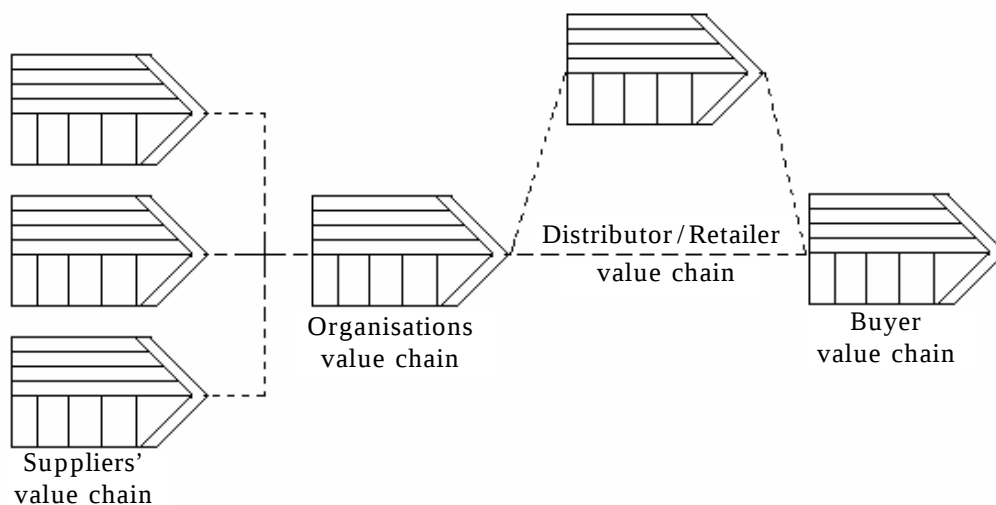
- a. Direct activities are concerned with the adding value to inputs.
- b. Indirect activities enable direct activities to be performed, e.g., maintenance.
- c. Quality assurance: This type of activity monitors the quality of other activities and includes – inspection; review and audit.

Linkages connect the interdependent elements of the value chain together. They occur when one element of the value chain affects the cost or effectiveness of another.

The Value chain contains an element of **margin**. This is the excess of the amount that the customer is prepared to pay over the costs of the resource inputs and value activities. Firms can gain competitive advantage by conceiving of new ways to conduct activities, employing new procedures, implementing new technologies, or using different inputs and by exploiting linkage effectively.

A company's value chain is not bounded by a company's border. It is connected to what Porter describes as a value system.

The Value System



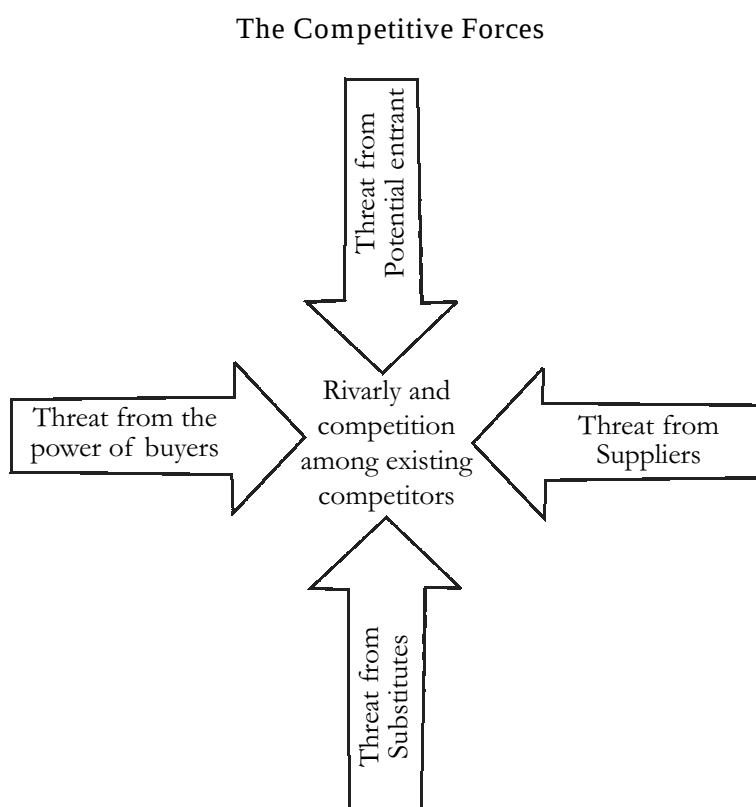
As well as managing its own value chain, a firm can secure competitive advantage by managing the linkage with its suppliers and customers. A company can create competitively advantage by making best use of these links and this means considering the value chain of these suppliers and customers.

The value chain is also a useful model for analyzing a firm's competitiveness and also further on in the planning process for designing strategies. A firm's value chain not always easy to identify nor are the linkages between the different elements. However, it is an important analytical tool because it helps people:

- a. to see the business as a whole
- b. to identify potential sources of competitive advantage

Industry structure analysis

When one looks at the competitive map of an industry, it is possible to identify distinctly five economic and competitive forces acting simultaneously upon it as illustrated in figure.



To compete effectively, a firm has to find how best to defend itself against these forces, even to the extent of devising ways of influencing them in its favor. In order to do this, the firm must first know where it is located on its competitive map of its industry, so that thereafter it can relate itself to each of the five competitive forces, viz.



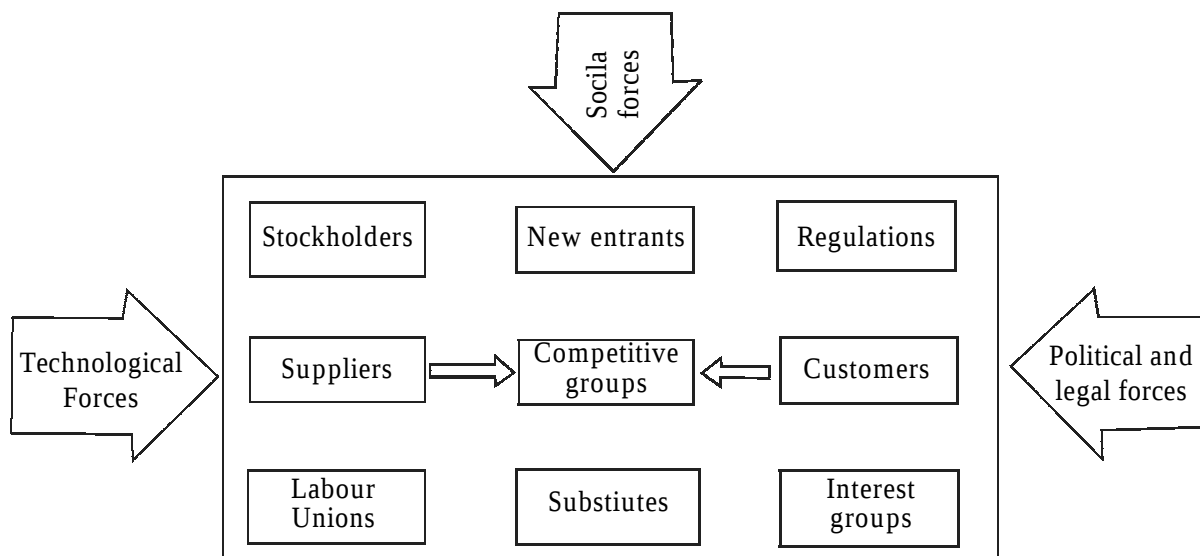
- Threats from potential entrants.
- Threats from substitutes;
- Threats from power of buyers;
- Rivalry and competition among competitors;
- Threats from suppliers;

It is in the context of the five dimensions of competitive environment that strategic decisions have to be made. The objective of such decisions is to obtain a proper strategic fit between the environment and the organization. Such a strategic fit obviously requires a proper understanding of

- the objectives;
- the ever changing environment; and
- the organization;

Perhaps it would be useful to consider this in greater detail. The competitive industry environment in which the company has to function could be detailed in Figure.

The Competitive Industry Environment



The current product portfolio – outputs

The outputs of the value chain are goods or services or some combination of the two. Now, let us examine a firm's existing products.

The Product Life Cycle

From the firm's point of view, a way of stabilizing its risk / return profile is to provide a number of different products, which have different financial and marketing characteristics. This mirrors and investor's concern to reach a desired trade-off between risk and return.

The profitability and sales of a product can be expected to change over time. The product life cycle is an attempt to recognize distinct stages in a product's sales history. Marketing managers distinguish between the following:

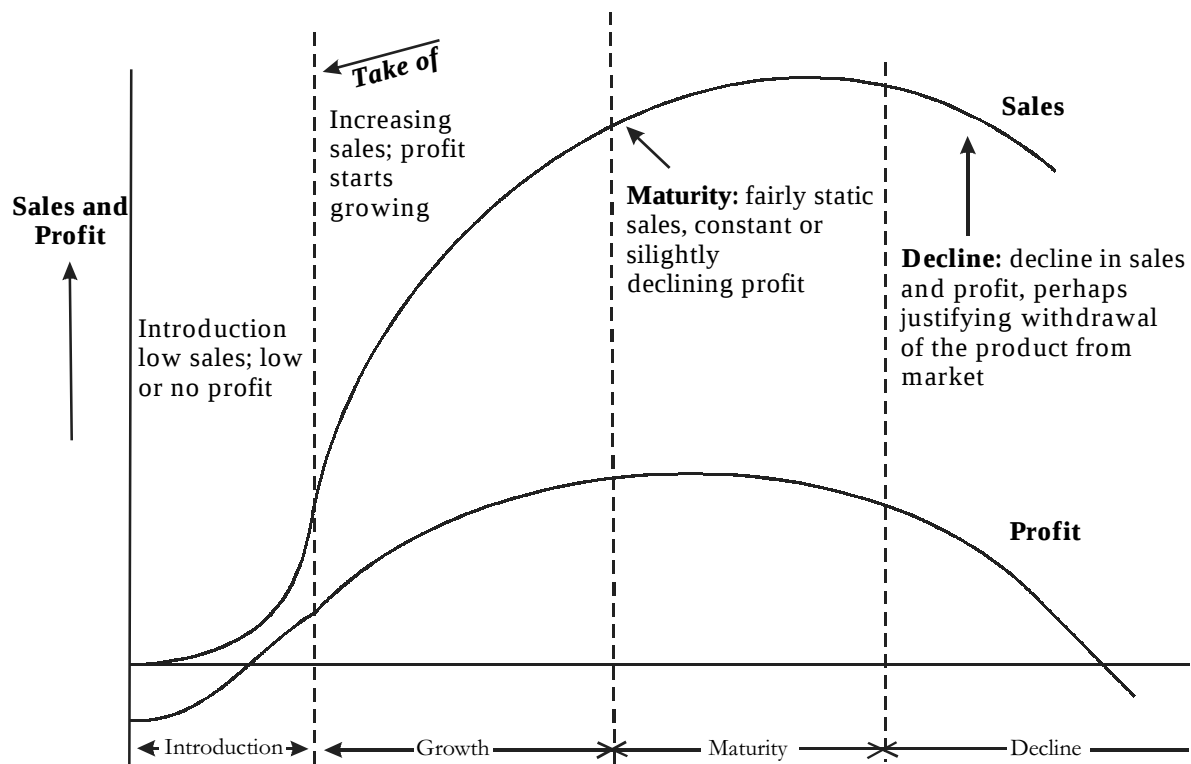
- Product class: this is a broad category of product.
- Product form: within a product class there are different forms that the product can take.
- The particular type of the product form. This is sometimes referred to as brands, but one must be careful about how one uses this word.

The product life cycle applies in different degrees to each of the three classes. A product class may have along maturity stage and a particular make or brand might have an erratic life cycle or not. Products forms, however, tend to conform to the classic life cycle pattern, commonly described by a curve as in Figure below:

Introduction

A new product takes time to find acceptance by would be purchases and there is a slow growth rate in sales. Only low output and expensive sales promotion; there may be early teething troubles with production technology and prices may be high to cover costs as much as possible. The product for the time being is a loss market.

Product Life Cycle



**Growth**

If the new product gains market acceptance, sales will eventually rise more sharply and the product will start to make profits. As sales and production rise, unit cost falls. Since demand is strong, prices tend to remain fairly stable for a time. However, the prospect of cheap mass production and a strong market will attract competitors so that the number of producers is increasing. With the increase in competition, manufactures must spend money on product improvement, sales promotion and distribution to obtain a dominant or strong position in the market.

Maturity

The rate of sales growth slows down and the product reaches a period of maturity which is probably the longest period of a successful product's life. Most products on the market will be at the mature stage of their life.

Decline

Most products reach a stage of decline which may be slow or fast. Eventually, sales will begin to decline so that there is over-capacity or production in the industry. Severe, competitions occur, profits fall and some producers leave the market. The remaining producers seek means of prolonging the product life by modifying it and searching for new market segments. Many producers are reluctant to leave the market, although some inevitably do because of falling profits. If a product remains on the market too long, it will be unprofitable. However, there are some cases where positive cash flows will be received.

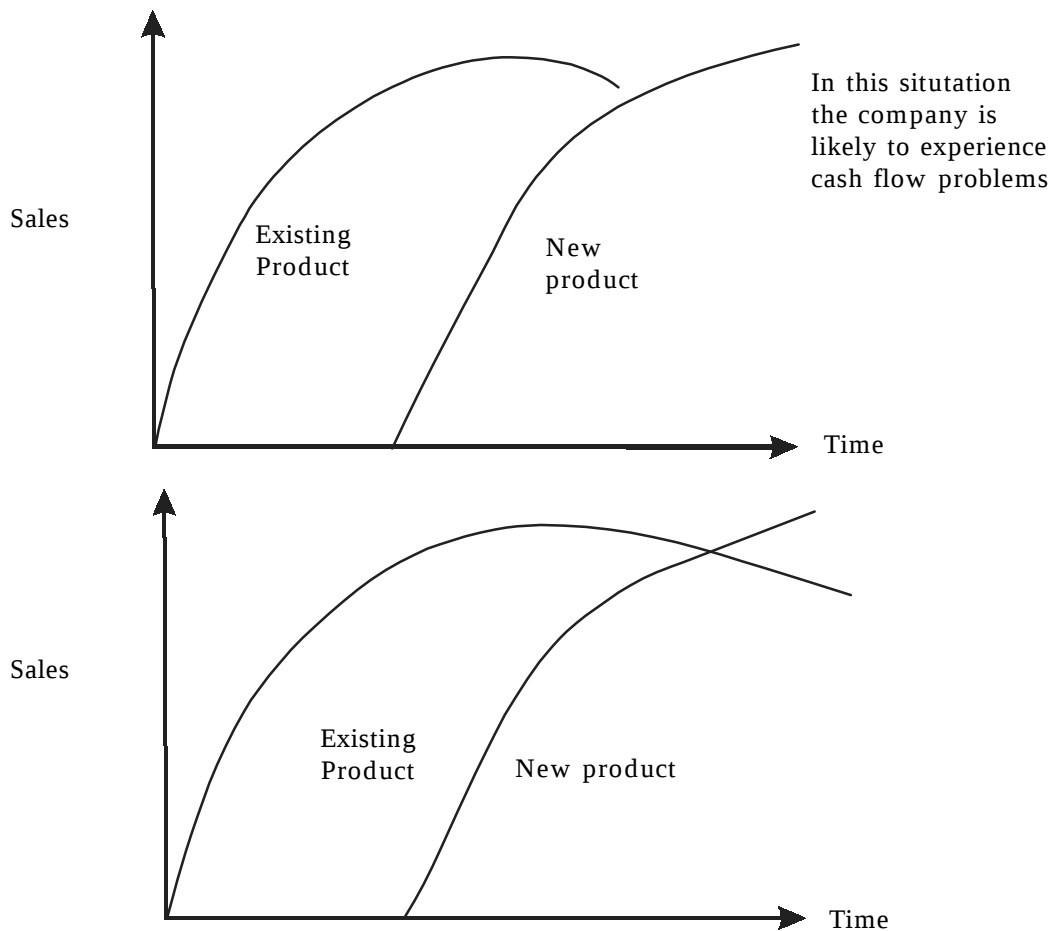
A company selling a range of products must try to look into a longer term, beyond the immediate budget period, and estimate how much each of its products is likely to contribute towards sales revenue and profitability.

Another aspect of product life cycle analysis is new product development and strategic planner must consider the following.

- a. How urgent is the need to innovate, and how much will have to be spent on R & D to develop the new products in time?
- b. Capital expenditure and cash flow. New product cost money to introduce. Not are there R & D costs, but there is also capital expenditure on plant and equipment and probably heavy expenditure on advertising and sales promotion. A new product will use up substantial amounts of cash in its early life and it will not be until its growth phase in under way even the maturity phase reached, that a product will pay back the initial outlays of capital and marketing expenditure.

It is essential that firms plan their portfolio of products to ensure that new products are generating positive cash flow before existing earners enter the decline stage consider figure:

Timing for launch of a new product



By considering the product life cycle of the existing product, while planning the timing for launch of a new product, cash flow problems can be avoided.

It is perhaps easy enough to accept that products have a life cycle, but it is not so easy to sort out how far through its life a product is and what its expected future life might be.

- a. There ought to be regular review of existing products as a part of marketing management responsibilities.
- b. Information should be obtained about the likely future of each product and sources of such information might be as follows:
 - a. an analysis of past sales and profit trends
 - b. the history of the products



- c. market research
- d. if possible, an analysis of competitors

The future of each product should be estimated in terms of both sales revenue and profits.

1. Estimates of future life and profitability should be discussed with experts to give their advices. Accordingly, decisions must be taken about what to do with each product.

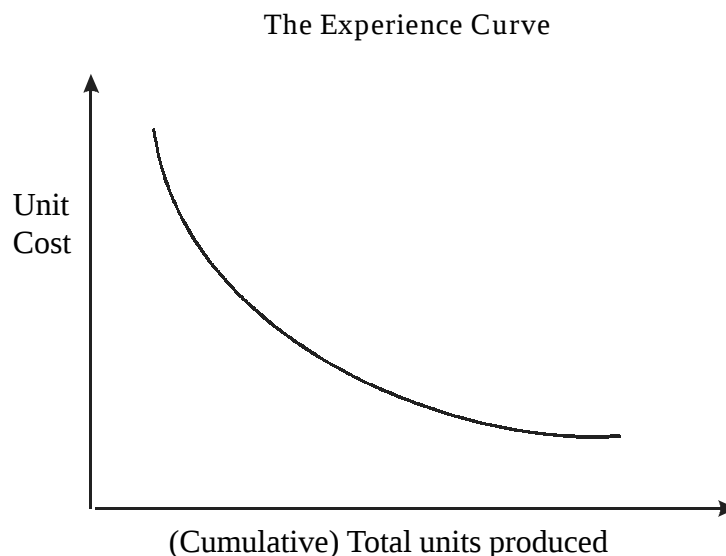
There are some legitimate criticisms of the product life cycle concept as a practical tool in strategic management.

2. How can market managers or other managers, recognize just where a product stand in its life cycle?
3. The traditional curve of the product life cycle does not always occur in practice.
4. Strategic decisions can change a product's life cycle.
5. Competition varies in different industries and the strategic implications of the product life cycle will vary according to the nature of the competition.

But, the product life cycle is a tool that can be applied to many aspects of a strategy formation process. Furthermore, the product life cycle concept can be applied creatively at the number of levels.

The experience curve

The relationship between unit cost and total units produced over time resembles:



It should be noted in this connection that:

1. The total units produced means cumulative units over time;
2. The growth of unit cost tends to plateau with cumulative production.

The cost reduction is quite significant in magnitude. It is estimated that each time the cumulative production doubles, the cost decline is between 20 and 30 per cent net of inflation. Some of the reasons for this cost decline are as follows:

1. **The learning function** – Any one doing a job learns to do it better over time and given increased experience, labor cost should in fact decline about 10 to 15% each time cumulative experience doubles.
2. **Specialization** – As sale of production increases it becomes possible to split jobs into more and more specialized units. Doing half as much and twice as often equals the same amount of effort but twice the experience with the task.
3. **Scale** – The capital costs required to finance additional capacity diminish as that capacity grows.
4. Innovations of the production process
5. **Improved product mix** – As products are redesigned with cost saving in mind.

Though the experience curve has been observed in all sorts of industries, businesses and markets, as the name implies, however, the experience curve effect is personal dependent. The experience curve also implies that the same technology, process and equipment continue for a significant period of time. In these days of fast technological, process and equipment changes, however, a follower can fully or largely negate the benefits of the experience curve of the leader by effecting such changes.

PORTFOLIO PLANNING

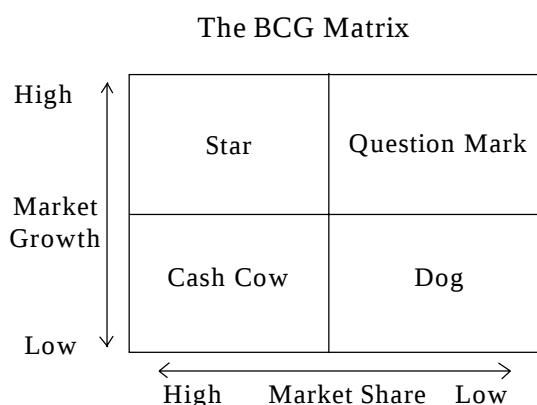
Portfolio planning is a term used in describing methods of analyzing a product – market portfolio with the following aims.

- a. To identify the current strengths and weaknesses of an organization's products in its markets, and the state of growth or decline in each of these markets.
- b. To identify what strategy is needed to maintain a strong position or improve a weak one.

Several matrices have been developed over the years to analyze market share, market growth and market position. Some of them will be discussed hereinafter:

The BCG Matrix

The Boston Consulting Group (BCG) have developed a matrix, based on empirical research, which analyses products and businesses by market share and market growth. This growth/ share matrix for the classification of products into cash cows, rising stars and questions marks is known as the Boston classification.

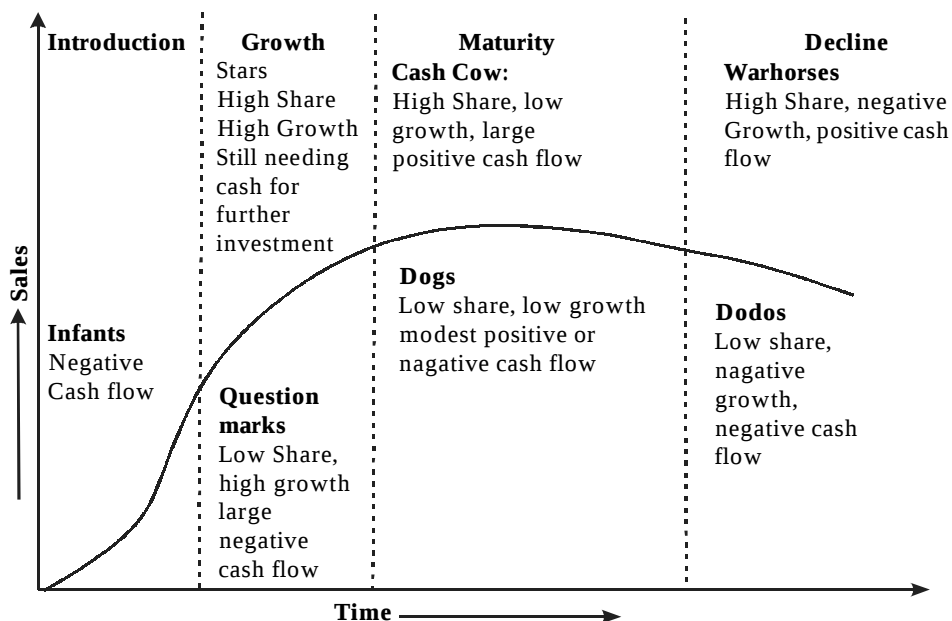




- a. **Stars** are products with a high share of a high growth, market. In the short term, these require capital expenditure, possibly in excess of the cash they generate, in order to maintain their market position, but promise high returns in the future.
- b. In due course, however, stars will become **cash cows**, with a high share of a low-growth market. Cash cows need very little capital expenditure and generate high levels of cash income. The important strategic feature of cash cows are that they are generating high cash returns, which can be used to finance the stars.
- c. A **question mark** (sometimes called **problem child**) is a product in a high growth market, but has a low market share. A decision needs to be taken about whether the product justifies considerable expenditure in the hope of increasing its market share, or whether it should be allowed to die quietly as it has been squeezed out of the expanding market by rival products. Because, considerable expenditure would be needed to turn a question mark into a star by building up market share, question marks will usually be poor cash generators and show a negative cash flow.
- d. **Dogs** are products with a low share of a low growth market. They may be ex-cash cows that have now fallen on hard times. Dogs should be allowed to die or should be killed off. Although they will show only a modest net cash flow or even a modest cash inflow, they are cash traps which tie up funds and provide a poor return on investment, and not enough to achieve the organization's target rate of return.
- e. There are also **infants** (i.e. products in an early stage of development) and **warhorse** (i.e. products that have been cash cows in the past, and still are making acceptable sales and profits even now) and **dodos** (low share, negative growth, and negative cash flow).

The product life cycle concept can be added to a market share / market growth classification of products as in Figure below:

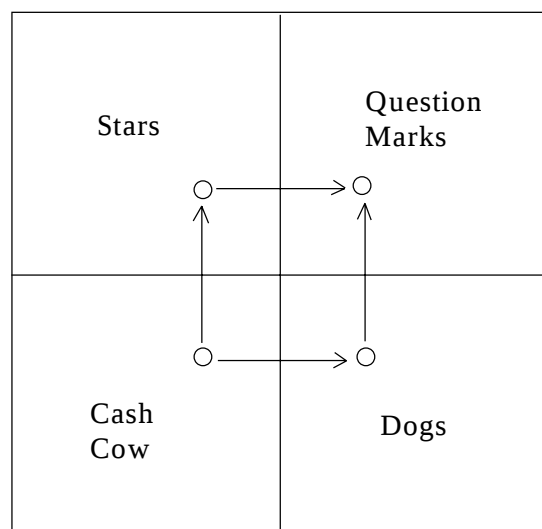
Product Life Cycle with market share / market growth classification



These matrices straightaway focus attention on the strategies most logical for investments in the four quadrants. Thus for stars, the logical strategy both from a long-term perspective as also for immediate business reasons, should be preferably to increase market share or at least to hold on to existing market share. For cash cows, in view of market growth, any attempt to increase market share, particularly, if it requires very substantial investment and cash outgo, is hardly a logical strategy. Over the years, these investments do not have very substantial growth prospects. The logical strategy, is therefore, to hold on to the market share and harvest as much cash as possible in the form of retained profit. For dogs, four strategies are feasible: invest to increase the market share and get into the question mark category; harvest; divest; invest to get into the cash cow category. For a question mark, two possible strategies exist: elevate itself into the star category; disinvest.

It will thus be seen that the logical progression of an investment should be anticlockwise, as shown in Figure below. Any progression in the opposite direction would be indicative of bad strategic management.

Logical Progression of Investment



In order to dominate a market, a company must normally gain that dominance when the market is in the growth stage of the product life cycle. In a state of maturity, a market is likely to be stable with customer loyalties fairly fixed. It is therefore, more difficult to gain share. But if all companies in the growth stage attempt to gain market share, competition will be very fierce; therefore only those companies prepared to invest in order to gain share will achieve dominance. This may well suggest that a company following the principles suggested by the BCG will need to price low and spend high amounts on advertising and selling in order to dominate such a strategy is one of high risk unless such low margin activity is financed by higher profit earning products. This leads to the idea of a product wise balanced BCG model for the growth share matrix as a tool for product portfolio analysis.



The matrix combines market growth rate and market share and thus directly related to the experience curve. Thus for a star, the high volume is likely to yield the benefits of the experience curve and a reduction in the cost. This benefit would not be available in case of question mark. In the case of cash cow again, the high volume would lead to the benefits of the experience curve yielding higher potential profit. Dogs are the worst of all combinations. They are often a cash drain and use up a disproportionate share of management time and resources. The implications for the analysis and evaluation of strategy are thus easy to see.

Directional Policy Matrix the Nine-Cell G.E. Matrix

Directional Policy Matrix

		Business Strength		
		Weak	Average	Strong
Industry Attractiveness	Unattractive	Divest	Phased Withdrawal	Invest selectively to maximise cash generation
	Average			Invest for market share or withdrawal
	Attractive			Invest to retain market share as industry grows
				Priority products and services

General Electric of USA, assisted by McKinsey, developed a nine-cell strategic planning grid which attempted to correct some of the limitations of the BCG matrix approach. This grid is illustrated in the above figure as the Directional Policy Matrix. Each dimension is a composite measure of several component factors. Industry attractiveness is a function of a number of factors. The procedure involves assigning each of the factors a weight depending on its perceived importance, followed by assessing how each business compared on each factor using a 1 to 10 rating scale, and then computing a weighted composite rating. The choice of the factors and the weights assigned to the factors vary from business unit to business unit.

The same approach is used to measure Business Strength where aspects relevant to competitive position are considered. Each of the dimensions is classified into three categories: high (strong); medium; low (weak); thus, creating nine cells. The Tables (Nos.1 and 2) below given a hypothetical illustration of rating of industry attractiveness and business strength. Each factor is assigned a weight. Rating of 1 to 4 considered as low; 4 to 7 as medium and 7 to 10 as high.



In the hypothetical case illustrated in Table nos.1 and 2, the total score of industry attractiveness is 6.75 and for business strength is 7.55 out of the maximum possible score of 10 for each. In other words, the industry attractiveness is medium and the business strength is high.

Table 1
Industry Attractiveness

Factors	Weight	Rating (1 to 10)	Value
Availability of inputs	0.20	7	1.40
Overall market size	0.15	8	1.20
Annual growth rate of market	0.15	6	0.90
Profitability	0.15	7	1.05
Competitive intensity	0.15	6	0.90
Technological requirements	0.10	7	0.70
Capacity utilization	0.10	6	0.60
Total	1.00		6.75

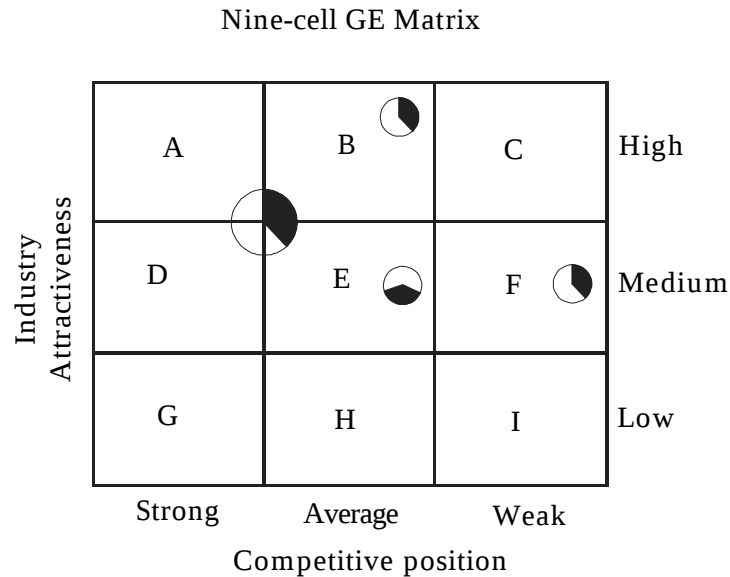
Table 2
Business Strength

Factors	Weight	Rating (1 to 10)	Value
Market Share	0.15	5	0.75
Market share growth rate	0.20	7	1.40
Brand image	0.05	8	0.40
After sales service	0.05	7	0.35
Pricing	0.10	7	0.70
Distribution capacity	0.10	9	0.90
Capacity utilization	0.10	9	0.90
Product quality	0.10	8	0.80
Technology	0.15	9	1.35
Total	1.00		7.55

The choice of the factors determining the industry attractiveness and business strength and the determination of weights are very critical in the analysis. Therefore, they often involve a lot of research. Companies will be successful to the extent that they go into attractive markets and



possess the required business strength to succeed in those markets. If one or the other is missing, the business will not produce outstanding results. Neither a strong company operating in an unattractive market nor a weak company operating in an attractive market will do very well. All the businesses of the company (hypothetical case stated above) are shown in a Nine-cell GE Matrix (Figure)



The sizes of the circles represent the size of the relevant markets. The company's market share in each of the business is represented by the shaded area. The position of the business in the matrix would suggest the appropriate strategy for the business. There are three possible strategies. Along the lower left to the upper right diagonal (cells G, E, C) representing SBUs which are medium in overall attractiveness. Selective investment may be appropriate. These are holding type strategy and would not, therefore, rank as a priority in resource terms.

The three cells below the diagonal (H, I, F) represents SBUs which are low in overall attractiveness. The appropriate strategy for them would be harvesting or divesting.

It will be seen that the overall attractiveness of products / services diminishes as one moves diagonally from the top left hand corner to the bottom right hand corner. Priority products in the top left hand corner are those which score highly on both axes. As a result they should receive priority for development and the resources necessary for this should be allocated to them. Products / services bordering on the priority box should receive the appropriate level of investment to ensure that, at least, the very market share is retained as the industry grows.

Products / services with a weak competitive position in an attractive industry are placed at top right hand corner of the matrix. They should be evaluated in respect of the potential to establish and sustain real competitive advantage. If the prospect seems good, the carefully targeted investment should be considered seriously. A method of targeting would be to select among the factors contributing to the total weighed score of the competitive position. Those, who's weighed scores are most significant, would receive priority.

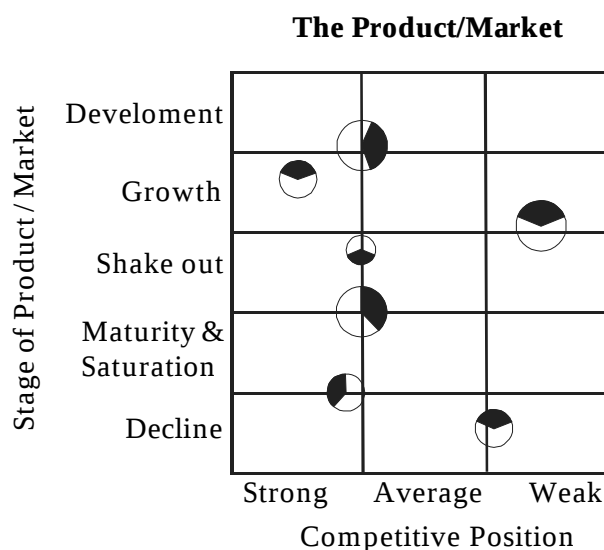
Products across the middle diagonal should receive cordial treatment. A good proportion of products are likely to fall in this category, indicating attempt to maximize cash generation with limited commitment of additional resource.

Currently profitable products with little future potential should be withdrawn gradually but retained as long as they are profitable and the resources committed to them cannot be allocated more effectively elsewhere

This model is an improvement over the BCG matrix in the sense that while BCG matrix bases industry attractiveness on a single variable (industry growth rate), in this model industry attractiveness is measure by a number of factors. Similarly while the BCG matrix bases business growth entirely on relative market share, in this model, the business strength is rated by considering a number of factors. Also, the Nine Cell model is a refinement of the four-cell BCG matrix (only high and low), which is too simplistic and in which the link between market share profitability is not necessarily strong. Low share business can be profitable and vice versa.

The Product / Market Evolution Matrix (HOFER MATRIX)

In order to identify the developing winner, Hofer and Schendel suggest a fifteen cell matrix in which businesses are plotted in terms of their competitive position and their stage of product / market evolution. Such a matrix is depicted in Figure below:



As with GE matrix, circles represent the sizes of the industries involved, and the pie-wedges represent the market share of the business involved. Future positions can be plotted and used to identify the major strategic issues.

SPACE (Strategic Position and Action Evaluation)

A.J. Rowe and others have developed a model based on four important variables:

- the relative stability / turbulence of the environment;
- industry attractiveness;



- the extent of any competitive advantage;
- the company's financial strengths

Scores are awarded to each factor and then diagrammed.

Arthur D. Little (ADL) presents a twenty-cell matrix identified by the competitiveness position of a business and its industry maturity. Competitiveness position is approximated by market share, share movement, technology, breadth of the product line, and special market advantages, and industry maturity is measured by considering industry growth, rate of technological change, stability of shares, and customer switching. Again, weights must be defined to calculate the matrix position of a particular business. The matrix location of each unit can then be used to formulate a natural strategy to accomplish the business goals of the firm. This model is shown in Figure below:

The life cycle Portfolio Matrix (A.D. Little)

Embryonic		Growth	Mature	Age-ing
Dominant	Fast Growth Start up	Fast Growth Attain cost leadership, renew Defend position	Defend position Attain cost leadership, Renew, Fast growth	Defend position leadership, Renew Growth with industry
Strong competitive position	Start up differentiate fast growth.	Fast Growth Renew, Focus, differentiate	Attain cost leadership, Renew Focus Differentiate growth with	Find niche hold niche hand on, Growth with industry, Harvest.
Favourable	Start up differentiate Focus, fast growth	Differentiate Focus, Catch up, Growth with Industry	Harvest, Hang on Fince Niche, Hold Niche, Renew turn around Differentiate Focus, Grow with Industry	Retrench, Turn around
Tenable	Start up grow with Industry, Focus	Harvest, Catch up, Hold Niche, Hang on, Fince Niche, Turn around Focus, Grow with Industry	Harvest, Turn around Fince Niche, Retrench	Divest Retrench
Weak	Find niche, Catch up, Grow with Industry	Turn around Retrench	Withdraw Divest	Withdraw

Stages of Industry Maturity



Note: The lines across the figure indicate the growth history of different products of the company during life cycle.

In it, market situation is described in four stages – from embryonic to ageing. The competitive situation is shown in five categories ranging from weak to dominant. The purpose of the matrix is to establish the appropriateness of a particular strategy in relation to these two dimensions.

The position within the life cycle and the company is determined in relation to eight external factors or disciplines of the evolutionary stage of the industry. These are : market growth rate; growth potential; breadth of product line; number of competitors; spread of market share among the competitors; customer loyalty; entry barriers; and technology. It is the balance of these factors which determine the life cycle.

The competitive position of the organization within its industry can be established by looking at the characteristics of each category. Thus a dominant position usually results from quasi-monopoly. Strong organizations are those that can follow strategies of their own choice without too much concern for the competitors etc.

Within the general framework, however, strategies suggested by the various models may be quite different. There are three reasons for it:

- The portfolio position of a unit in the relevant matrix can differ due to different characteristics used in the classification schemes of the models.
- The GE and ADL models, have more potential classification than the BCG model, may generate more potential strategies for a business unit than the later.
- The models differ with regard to their treatment of risk. The McKinsey and ADL models both seek to incorporate some concept of risk in the matrix position of the unit. The BCG model downplays risk.
- Moreover, there are a number of theoretical problems associated with portfolio models. Some of the important ones are:
 - The assumption of independent business units ignores significant theoretical problems with the diversification ability of the firm into business units.
 - The assumption for the cost of capital appears to represent capital rationing and fails to consider risk.
 - The assumption of dominance tends to give excessive consideration to the relative competitive position of a business and minimizes the influence of other characteristics that affect profitability.
 - The assumption of industry attractiveness ignores special investment opportunities and downplays the importance of competitor's strategies.

Strategic choice

We can identify three categories of strategic choices as:

- The competitive strategies are the strategies, an organization will pursue for competitive advantages. These determine how to compete.



- Product-market strategies determine where to compete and the direction of growth.
- Institutional strategies determine the method of growth.

How to compete?

The environment within which many firms operate is characterized by the need to achieve competitive advantage. Competitive advantage is anything which gives one organization an edge over its rival.

A competitive strategy is intended to achieve some form of competitive advantage for the firm. Competitive strategy means taking offensive or defensive actions to create a defensible position in an industry, to cope successfully with competitive forces and thereby yield a superior return on investment for the firm. Firms have discovered many different approaches to this end, and the best strategy for a given firm is ultimately a unique construction reflecting its particular circumstances.

Porter suggests that there are three generic strategies for competitive advantage see figure.

Cost leadership: become the lowest cost producer for the market as a whole.

Differentiation: is the exploitation of a product or service which is unique in the market as a whole.

Focus: depends on segmentation and involves pursuing, within the segment only, a strategy of cost leadership or differentiation.

Porter's Model of Generic Strategy

		Competitive Advantage	
		Low Cost	Differentiation
Competitive Scope	Broad Target	Cost leadership	Differentiation
	Narrow Target	(a) Cost Focus	(b) Differentiation focus

Cost leadership

A cost leadership strategy seeks to achieve the position of lowest cost producer in the industry. The competitive advantage that results from producing the lowest cost is that the manufacturer can compete on price with every other producer in the industry and can earn the highest unit profits. Bajaj Auto Limited and Telco appear to be following this strategy in India.



Differentiation

A differentiation strategy attempts to make the product unique in terms of attributes which are derivable to the customer, including customer service. The assumption is that competitive advantage can be gained through the particular characteristics of a firm's products will build up and customers are not so price sensitive. The firm can then sell its products at prices that are higher than the low cost producers. Bata shoe, Otis Elevators, Cini fans are some examples where the strategy seems to be dominant guiding force.

Focus

Focus strategy is based on segmenting the market and targeting particular segments instead of trying to serve the entire market with a single product. It has been described as a 'pistol' approach as distinct from a 'short gun' approach. The competitive advantage which results is that the firm is thus able to serve its narrow strategic target more effectively and efficiently than competitors who are more broadly. As a result the firm achieves either differentiation from better meeting the needs of the particular target, or lower cost in serving this target, or both. Genteel, a liquid detergent for expensive clothes and Ponds talcum powder are some examples for this strategy.

Competitive scope refers to whether the organization chooses to target the entire market, or whether it chooses to concentrate on a more narrowly defined segment. **Competent advantage** refers to the route taken to serve the market or segment.

A firm pursuing a cost leadership strategy aims to be the lowest cost producer in the market as a whole or, in the case of a cost focus strategy, in a segment; cost leader cannot undercut on price, and can enjoy higher profitability.

1. Not every firm can be a cost leader and many choose to use differentiation, which is the exploitation of unique aspect or features of the product in the market as a whole or in a segment of it.
2. Porter argues that firms must choose between these strategies and a firm that may stick in the idle is doomed.
3. The choice of generic strategy is likely to be a long-term one. A firm can not realistically pursue cost leadership one year and differentiation the next.
4. Also, most firms' employ some form of market segmentation, and the model cannot identify which segments the firm should pursue if it follows a focus strategy.
5. The model can highlight confusions in the firm's existing strategy, if it is applied to the current competitive situation of the firm.

It would not be out of context that in the book, *Marketing Warfare*, Al Ries and Tack Trout have developed a war like analogy for marketing in competitive environment. The true nature of marketing today is not serving the customer: it is over witting, outflanking, outfitting your competitors. In short, marketing is war where the enemy is the competition and the customer is the ground to be won', says Ries and Trout. They suggest four ways to fight this war by following the principles of:



The Defensive Warfare

This is essentially recommended for market leaders. It aims at protecting against regularly provisions, industrial licensing restrictions, etc. According to authors, a leader has to spend more time in safeguarding its interests against government and public environment rather than the immediate next competitor. Thus for companies like Telco, Hindustan Lever, Bajaj Auto, the major worry may be the interference of the government. At the same time, a leader can not afford to overlook the moves of the competitors. A leader should also be able to attack itself. The three principles of defensive warfare are:

- Only the market leader should consider playing defence
- The best defensive strategy is the courage to attack yourself
- Strong competitive moves should always be blocked

The Offensive Warfare

Offensive warfare is almost like a mirror image of the defensive warfare. The number two of the industry are suggested to follow the offensive strategy by identifying a weakness in leader's strength and attacking at that point. Thus, very high prices of steel tubes of Tata Steel gave an opportunity to other pipe manufacturers like Zenith Tubes, Gujrat Steel Tubes and the likes to capture sizeable market at lower prices. The principles of offensive warfare are:

- the main consideration is the strength of the leaders position
- find a weakness in the leader's strength and attack at the point
- launch the attack on as narrow a front as possible

The Flanking Warfare

According to Rice and Trout, flanking is the most innovative form of marketing warfare. Over the years, most of the biggest marketing successes have been flanking moves. It is recommended to firms with limited resources. These firms cannot afford to fight the large firms holding number one or two positions on the same battle ground. The entry of Promise tooth paste with clove oil clout is an example of flanking warfare. Flanking can be achieved in any manner such as flanking with low price, flanking with high price, flanking with small size, flanking with large size, flanking with distribution, flanking with product from. One would see a parallel between a marketer cutting a niche and flanking. Basically, they mean the same thing, i.e., creating a distinctive position for itself and avoiding any head on collision with the leaders. The principles of flanking warfare are:

- a good flanking move must be made in an uncontested area
- tactical surprise ought to be an important element of the plan
- the pursuit is just as critical as the attack itself

The Guerrilla Warfare

The last form is the guerrilla warfare. Most of the players in a marketing war would be fighting in the market place like the guerrillas. According to Ries and Trout, smaller companies can highly be successful as long as they do not try to emulate the giants in their field. Like flanking form, there can be many guerrillas; geographic guerrillas, demographic guerrillas, industry

guerrillas, product guerrillas, high end guerrillas. In each state, one will find locally made suit cases and other luggage items along with the well known national brands. Local brands of rubber and plastic chappals are other examples of a low price end guerrillas. The principles of guerrilla warfare are:

- find a segment of the market small enough to defend
- no matter how successful you become, never act like the leader
- be prepared to buyout at a moment's notice

Product-market Strategies (Ansoff's matrix)

A successful market must develop its products and markets, if it is to avoid eventual extinction. This calls for strategic decisions about product-market development and manufacturing. Ansoff drew up a growth vector matrix, describing a combination of a firm's activities in current and new markets, with existing and new products. He was mainly interested in growth, but firms in declining industries may wish to scale down their operations in existing markets or product areas. This is outlined in Figure as below:

		Ansoff's Matrix	
		Product	
		Present	New
Market	Present	Market penetration (a)	Product Development (c)
	New	Market penetration (b)	Deversification (d)

The matrix identifies four different kinds of product market strategy that the organization can pursue, depending on whether the firm concentrates on existing products and / or markets or embraces upon new ventures.

Market penetration involves trying to milk more from existing products and existing markets. If the market as a whole is growing, this might appear a fairly low risk strategy to adopt. Where the market is stagnant, market penetration might involve increasing market share at the expense of other producers.

Market development uses existing products in new markets. Exporting is perhaps an example of this strategy. This might be attractive if the firm has to achieve high sales volumes to utilize capacity efficiently.



Product development involves offering new products to existing markets. Firms with an expensive distribution network may choose this to make most efficient use of it by marketing more products through.

Diversification involves moving into new market with new products. However, this need not always be as risky as it sounds, especially if the products and / or markets have some similarities to existing ones. Conglomerate diversification can sometimes be justified on the existence of synergies.

The Ansoff model is a framework for discussing alternative directions. It cannot take decisions, only managers can.

- As suggested, market penetration may not be possible if the markets are mature; only examination of the specifics will identify which is the best approach.
- Obviously, it is too general on its own to suggest which markets should be targeted.

Johnson and Scholes suggested the following principle and guidelines for product market planning.

- **The potential for improvement and growth:** It is a thing to eliminate unprofitable products but will there be sufficient growth potential among the products that remain in the product range?
- **Cash generation:** New products require some initial capital expenditure. Retained profits are by far the most significant sources of new funds for companies. A company investing in the medium to long term which does not have enough current income from existing products will go into liquidation, in spite of its future prospects.
- **The timing decision for killing off existing products:** There are some situations where existing products should be kept going for a while longer to provide or maintain a necessary platform for launching new models.
- The long term rationale for product or market development.
- **Diversification by acquisition:** It might pay to buy product ranges or brands in a takeover deal. If the product-market strategy includes a policy of diversification, then the products or services which the expanding company should seek to acquire should provide definite benefits.

The aim of product-market strategies is to close the profit gap that is found by gap analysis. A mixture of strategies may be needed.

Methods of growth

Once a firm has made its choice as to which competitive strategies to pursue, and what product to place in which markets, it needs to choose an appropriate mechanism. Broadly speaking, it can:

1. develop the business
2. acquire or merge with an already existing business
3. cooperate in some way with another firm



The main issues involved in choosing a method of growth are:

Resources: A firm may not be able to go it alone, or it may have plenty of resources to invest.

Synergy: Two different businesses might have complementary skills.

Speeds: Does a firm need to move fast?

Control: A firm might wish to retain control of a product or process, rather than share control with another firm.

Organization and culture: Combining businesses not only involves integrated facilities and plant, but also people and organization culture.

Risk: A firm may either increase or reduce the level of risk to which it is subject. (However, this risk is not necessarily the same as the business risk involved with diversification).

Limitations of models

All models are abstractions and simplification of real life situations, and it is best to consider them as aids to creative thought rather than scientific laws or axioms, which must be followed without question.

Porter's generic strategy model

Porter's statement that no firm can pursue a stuck in the middle strategy is not entirely borne out by the facts. Instead, a variety of approaches can be adopted to rice and the differentiating product features. Some seem to prosper quite successfully. Firms do strive for cost leadership and differentiation at the same time.

1. Cost refers to internal measures, rather than the market demand. It can be used to gain market share; but it is market share, which is important, not cost leadership as such.
2. If cost leadership applies cross the whole industry, only one firm will pursue this strategy successfully.
3. Having low costs does not mean, one has to charge lower prices or compete on price. A cost leader can choose to invest higher margins in R & D or marketing. Being a cost leader arguably gives producers more freedom to choose other competitive strategies. Competitive advantage can only be achieved in terms of a products (or service) which is seen by a user to have an advantage. Its cost base is relevant only in so far as it may provide a means of enhancing that output in some way.
 - o Low costs give you more opportunity to differentiate to product.
 - o Low costs is also enable one to serve many segments, in other words to pursue a focus strategy (for many segments).

Differentiation

Porter assumes that a differentiated product will always be sold at a higher price; however, a differentiated product may be sold at the same price as competing products in order to increase market share. Differentiation can be achieved by keeping costs down; the savings can be reinvested in unique products features. Two other points can be mentioned:

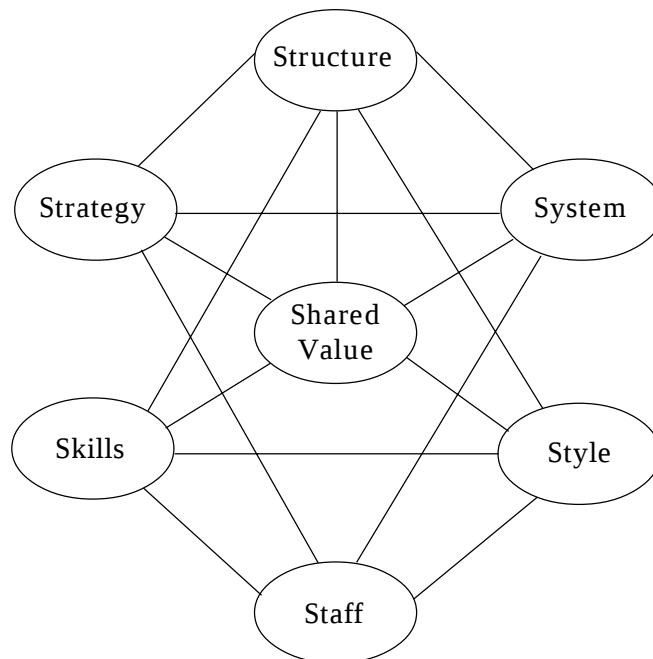


- **The object of differentiation:** The firm must discern who are its competitors? Where they serve other market segments and if they compete on the same basis?
- **The source of differentiation:** This can include all aspects of the marketing mix, not only the product. Restaurants aim to create an atmosphere or ambience, as well as serving food of good quality.

Ansoff's product – market matrix

- **No criterion for choice:** As indicated in (a), the matrix is only a frame work for identifying for product market opportunities. There is nothing to stop a firm carrying out all four strategies simultaneously providing it has the resources. A firm can pursue a penetrating strategy in its existing markets as well as diversifying into new ones.
- **Limited scope:** Another problem is that there are various strategic developments not covered in the matrix. New technology and manufacturing technologies can also alter the dynamics of the market: Henry ford made cars much cheaper than other producers massively expanding the market for them.
- It does not address the degree of change in each product market area; it suggests they are static.
- **Profit:** The Ansoff's matrix does not identify the role of profit.
- Withdrawing from a market or product is not offered as an option.

McKinseys's 7s Framework





The model considers the criteria in success of a business organization and forms an interconnected framework of seven elements:

- Structure
- Strategy
- Skills
- System
- Staff
- Style; and
- Shared Values

Of these, the first two, strategy and structure, form the hardware of the organization, the remaining components constituting the software. The hard components are easily recognized as important, the soft ones, often barely recognized, are equally important and critical for the success of a firm.

Of these, shared values, system, style all relate to behavioral patterns involving staff (people) and their skill. These behavioral patterns act as the binding fabric that successfully holds the company's cohesive activities and strategies together. Four major aspects of the behavioral fabric are of crucial importance. They are: Power; leadership; culture and risk.

The successful implementation of a strategy requires the right align of a various activities and processes within the organization, viz., structure, resource allocation, staffing (both managerial technical), skills, styles and competencies rewards and incentives, policies and procedures, shared values and beliefs. The McKinsey's consultants call strategy and structure, the hardware of the organization and suggest that the other five-S, are the software and are often ignored by corporate strategists. While strategy and structure are important to the organization, they by themselves cannot assure success which comes about by corporate commitment. It is the other five-S which play an important role in creating a climate of commitment. The better the alignment between and among all the seven levers of the organization, the better are likely to be the results.

Shared values the central core of the framework, give rise to a certain spirit among organizational members regarding 'who we are and where we can headed.' The spirit permeating in the organization in turn is reflected in the values, attitudes and philosophy of its members. The corporate value defines the ideas and beliefs which guide the organizational operations. They lay down the foundation of the organization management philosophy and give rise to a particular culture.

The virtue of 7-S framework is that it highlights some important organizational inter connections and their roles in effecting change. Whether and to what extent the organization will be able to bring about the needed shifts in strategy would depend upon the extent of and pace of accomplishment of action plans in the sphere of seven-Ss. The seven-S framework illustrates in a simple way, that the real task of implementing strategy is one of bringing all seven-Ss in to harmony, when the Ss are in good alignment, the organization is poised and energized to



execute strategy to the best of its ability. The McKinsey model provides the convenient checklist for judging whether organization is ripe for implementing strategy. It also helps in diagnosing the results emanating from the implementation of a strategy fall short of expectations and therefore what new fits would be required. The framework helps strategists in evaluating their organizations along each of the seven dimensions.

The McKinsey company was not first to propose the multivariable model of organizational change. Harold Leavitt had many years ago proposed the model for analyzing change in organizations. According to that model, organizational change, whether it originated in the organizational structure, the tasks, the technology develop in performing the tasks of organization; human component was likely to have effects on the other three. The 7-S model, however, emphasizes a few other variables, which Leavitt had not considered. Though, the research base for the framework may be subject to considerable academic discussion and criticism, the framework is useful to practicing managers as it is easy to remember because of the alliteration and also because it provides useful checklist for a comprehensive look at managing organization change.

Thus, 7-S framework is a powerful expository tool. However, it may be stated that changing the culture of the organization which is pivotal to the McKinsey model is a difficult task. Even after prolonged efforts spanning a period of 5-7 years, the organization may achieve only partial success. Nonetheless, the organization must endeavor to recreate the culture if it is regarded as an important determinant of its success, as is envisaged in the 7-s model.

PIMS (Profit Impact of Market Share)

PIMS was developed by General Electric in the sixties as a technique for internal analysis to identify those strategic factors that most influence cash flow investment needs and success. Its scope was extended by the Harvard Business School and eventually in 1975 the Strategic Planning Institute was established to develop PIMS for variety of clients.

PIMS is a very sophisticated computer model and its database is information submitted by clients. They provide about a hundred pieces of information about the business environment and the competitive position of each product, production processes, research and development, sales and marketing activities, and financial performance. From an analysis of the data; those elements that are most significant to the performance of each businesses are identified and the information is related back to the client. **PIMS** can be used for:

- Evaluating business performance in relation to competitors, and
- Establishing targets for return on investment and cash flow

It is claimed that variables in the PIMS models are available to explain some 80% of the variables in the performance of the business involved. According to Buzzel and Gale, PIMS approach is similar to portfolio analysis in that industry, characteristics and strategic position are being seen as important determinants of strategy and strategic success. However, PIMS was designed to explore the impact of a wide variety of strategic and environmental issues on business performance, and to provide principles that will help managers to understand how market conditions and particular strategic choices might affect business performance.



Major findings

Amongst the most significant findings that have emerged from the PIMS models are the following:

- High investment intensity is associated with low profitability, substantial investments create additional production capacity that companies seek to use. Quite often this results in low prices and low margins for products.
- High productivity and high return on capital are associated
- Additional investments in products and industries are not guaranteed to bring increased profits
- High relative market share has a strong influence on profitability, but is not the only factor
- High industry growth rates absorb cash and can have a harmful effect on cash flow.
- High relative product quality is related to high return on investment
- Product innovation and differentiation lead to profitability particularly in mature markets
- Vertical integration is more likely to prove successful in stable industries than in unstable ones
- The conclusions of the experience curve and sound

Limitations

PIMS has certain drawbacks, which include the following:

1. PIMS assumes that short-term profitability is the prime objective of the organization.
2. The analysis is based on historical data and the model does not take into account future changes in the company's external environment.
3. The model cannot take account of interdependencies and potential synergy within organization.

Planning techniques can be extremely useful, particularly as they force managers and organizers to ask themselves many relevant and searching questions and compile and analyze important information. The techniques do not and cannot, however, provide answers; they merely generate the questions. The danger is that some managers may perceive the output of a technique such as PIMS or a matrix analysis as the answer to strategic issues.

New concepts and models

The third wave during the last three decades has transformed the business world totally and the global market place is being keenly contested. The number of models and concepts available still are not able to cope up with the rapid transformation within the business internally and at the market place externally. W.Chan Kim and Rene Mauborgne, Gary Hamel and C.K. Prahalad are a few international management experts who have put forward certain new concepts and models which are breaking away from traditional thought.

**Blue ocean strategy**

Blue ocean strategy as presented by W.Chan Kim and Rene Mauborgne breaks new grounds. As against the present strategy based on competition in the existing market place (Red ocean strategy) creating a market place where there is no competition is known as Blue ocean strategy. This strategy tries to make competition irrelevant, create and capture new demand and make a value-cost trade off. The tools and models for the purpose are:

1. **Strategy canvas:** This captures the current state of business relating to products, service, delivery and customer perception.
2. **Four actions framework:** This is developed to reconstruct value elements in crafting a new value curve to find answers for the factors which need to be eliminated, reduce such factors well below the industry standards, raise certain factors well above the industry standards and create new factors that are not offered currently.
3. **Eliminate – reduce – raise – create grid:** Develop the framework under 2 in to a grid to understand specifically the factors involved. Identify them and develop methods to implement the strategy.

Competing for future

Hamel and Prahalad have developed a new strategy paradigm to include regenerating strategies, industry transformation and competing for opportunity share to meet the competitive challenge in the future. To enunciate what future is they recommend unlearning the past and develop strategy for foresight and opportunity share. When mobilization is made for the future they go beyond present concept of strategy as fit and resource allocation to strategy as stretch and resource accumulation and leverage. The most important factor they point out is get in to the future earlier than the competitor so that a company is in a position to shape the future industry structure, core competence leadership, maximizing the rate of new market learning while minimizing time to global preemption. When they are discussing about customer types as served and un- served, and customer needs as articulated and unarticulated. Competing for future should go for unexploited opportunities for the existing customers who still have unarticulated needs, un-served customers with articulated needs and un-served customers with unarticulated needs.

Confrontation strategies

With the globalization of markets entering uncharted territories would require definite strategies to avoid unexpected failures. Sun Tzu's strategy for confrontation in different terrains in case of war offers clues for business strategies also when we have cross border investments where the environmental factors of political, social and geography of the terrains have major impact. The following steps are relevant in introducing a new product in a new territory:

1. A company should introduce a proven finished product and not a product under development
2. Identify the proper time and place and go fast with the entire team assigned for the purpose
3. Look for immediate success

4. Introduce the product at chosen places and not all over the place
5. Enter the territory before the competitor enters
6. Identify allies in the new territory

In conclusion the tools and models which have been discussed in this chapter aid either in decision making process or for analyzing the impact of environment on business. The table below will be helpful in selecting the particular tool or model based on the strategic assignment undertaken by the company:

Name of tool / model	Decision support	Environmental analysis
Balanced score card	√	√
Bench marking		√
Core competencies	√	√
Critical success factors	√	√
Experience curves	√	√
Life cycle analysis	√	√
Mc Kinsey	√	√
Multiple scenarios	√	√
PESTEL	√	√
Porter's 5F	√	√
Portfolio classification analysis	√	√
Reengineering	√	√
Simulation	√	√
SPACE	√	√
Value chain analysis	√	√
SWOT	√	√
Econometric models		√
Sensitivity	√	
GE matrix	√	√
HOFEL matrix	√	√
Ansoff		√
PIMS		√
Blue ocean		√
Competing for future by Hamel and Prahalad		√
Sun Tzu	√	