

इशरान्देश

Last Mile Referencer for

STRATEGIC COST MANAGEMENT AND PERFORMANCE EVALUATION



**The Institute of Chartered
Accountants of India**

(Setup by an Act of Parliament)

Board of Studies (Academic)

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Saransh – Last Mile Referencer for Strategic Cost Management and Performance Evaluation

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PREFACE

Board of Studies (Academic), the student wing of the Institute, does not leave any stone unturned in providing best-in-class services to its students. It imparts quality academic education through its value-added study materials, wherein concepts are explained in lucid language. Illustrations and Test Your Knowledge Questions contained therein facilitate enhanced understanding and application of concepts learnt. Booklet on MCQs & Case Scenarios contain a rich bank of MCQs and Case Scenarios to hone the analytical skills of students, by applying the concepts learnt in problem solving. Revision Test Papers contain updates and Q & A to help students update themselves with the latest developments before each examination and revise the concepts and provisions by solving questions contained therein. Suggested Answers containing the ideal manner of answering questions set at examination also helps students revise for the forthcoming examination. Mock Test Papers help students assess their level of preparedness before each examination. BoS (Academic) also conducts live virtual classes through eminent faculty for its students across the length and breadth of the country.

To reach out to its students, the BoS (Academic) has also been publishing subject-specific capsules in its monthly Students' Journal "The Chartered Accountant Student" since the year 2017 for facilitating effective revision of concepts dealt with in different topics of each subject at the Foundation, Intermediate and Final levels of the chartered accountancy course. Each issue of the journal includes a capsule relating to specific topic(s) in one subject at each of the three levels. In these capsules, the concepts and provisions are presented in attractive colours in the form of tables, diagrams and flow charts for facilitating easy retention and quick revision of topics.

In today's business world, Chartered Accountants are very much part of the decision-making team of any Organisation. They are rigorously involved in decision making process with the help of Strategic Cost Management and Performance Evaluation tools. The capsule on 'Strategic Cost Management and Performance Evaluation' covers diagrams, flow charts tables and formulas. In addition, it encompasses case studies and skill assessment-based questions so that students can critically analyse business problems and strengthen their analytical skills through interpreting and evaluating." This capsule, though, facilitates the students in undergoing quick revision, under no circumstances, such revisions can substitute the detailed study of the materials provided by BoS such as Study Material and Practice Manual.

Happy Reading!

Message of Key ICAI Office Bearers



CA. (Dr.) Debashis Mitra

President, ICAI

The Board of Studies (Academic) of ICAI has always been at the forefront of providing quality education to aspiring CA students and handholding them in preparing for their exams. Saransh – Last Mile Referencer is a step in that direction. This pack of 3 booklets on Accounting, Auditing & Cost Management and Strategic Decision Making covers significant concepts of each chapter in precise form. This will not only help students for their reference for examinations but also Members can use it for their practice reference.



CA. Aniket S. Talati

Vice-President, ICAI

It has always been the endeavour of ICAI to provide updated information to its student to keep them abreast about the latest happenings in the accounting and related fields. The Board of Studies (Academic), the academic wing of ICAI, has come up with a series of booklets 'Saransh – Last Mile Referencer' with key points of different subjects. This will help facilitate effective revision of concepts in each subject.



CA. Dayaniwas Sharma

Chairman, Board of Studies (Academic)

Saransh – Last Mile Referencer is a compilation of capsules on different subjects of Foundation, Intermediate and Final levels of the chartered accountancy course. This series of booklets consolidates all significant topics of Accounting including Accounting Standards & Ind AS, Auditing with Auditing Standards and Cost Management and Strategic Decision Making at one place by capturing the key points. The concepts and provisions presented in attractive colours in the form of tables, diagrams and flow charts will facilitate quick revision of topics and easy retention.



CA. Vishal Doshi

Vice-Chairman, Board of Studies (Academic)

Among the many best-in-class services that the Board of Studies (Academic) provides to its students, Saransh – Last Mile Referencer is another initiative in that direction. These booklets on different subjects have been provided in a concise and precise form. It will facilitate understanding of the concepts better to students and grasp the essence of the subject. These capsules will enhance of level of preparedness before the examinations.



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SKILL ASSESSMENT

The questions/ cases are based on *Skill Assessment*. An illustrative list of the verbs that appear in the requirements for each question/ case is given below. It is important that students answer according to the definition of the verb:

Important

Evaluation & Synthesis

Analysis & Application

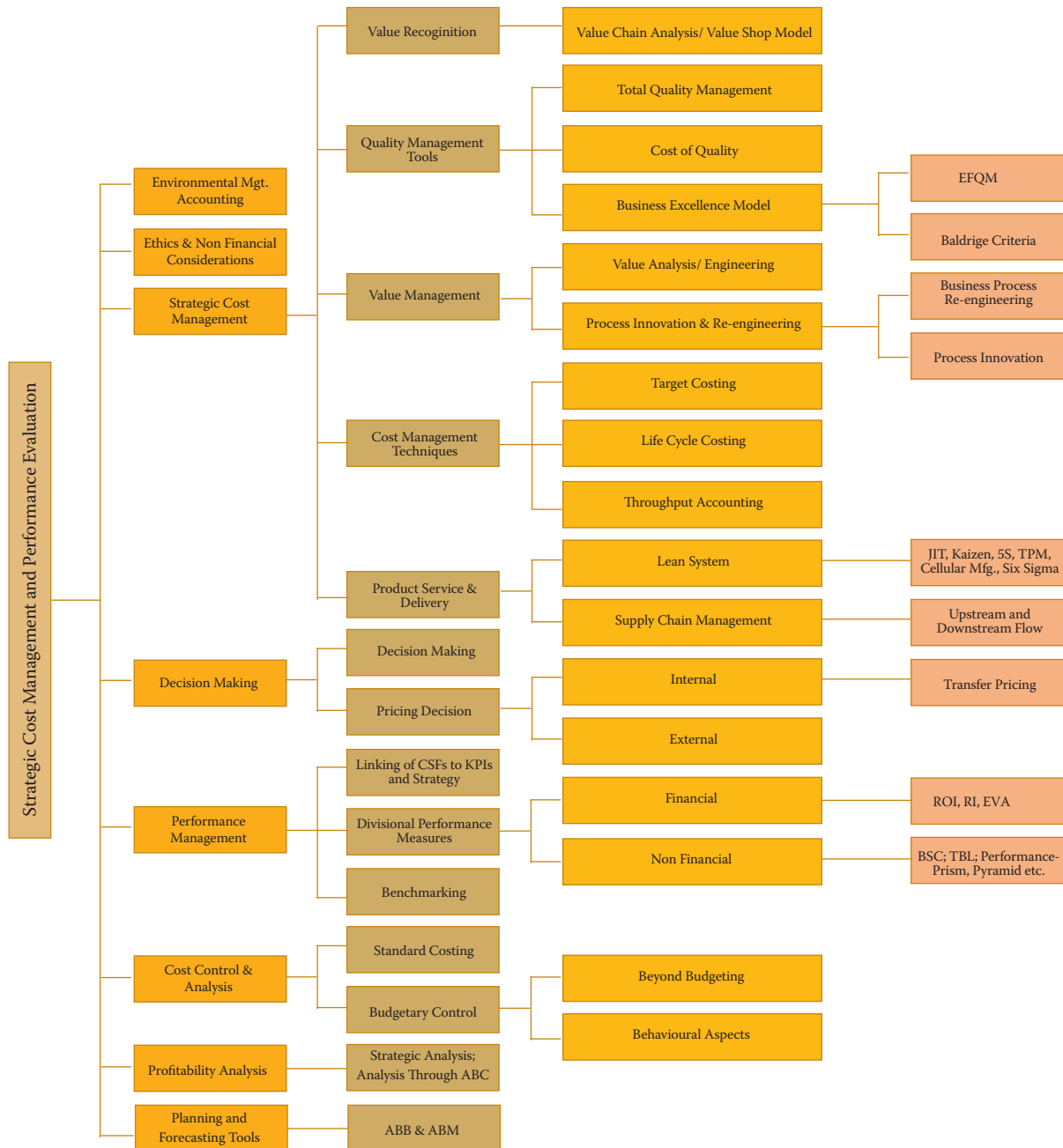
Comprehension & Knowledge

Level	Learning Objective	Illustrative Verbs	Definition/ Explanations ¹
III	EVALUATION How are you expected to use your learning to evaluate, make decisions or recommendations?	Recommend	<ul style="list-style-type: none"> To recommend you must: Identify and explain any reasonable options → evaluate each → conclude → recommend.
		Evaluate	<ul style="list-style-type: none"> 'Evaluate' means balanced assessment including both the <i>positive</i> and <i>negative</i> aspects of an issue. It might mean computations, but it might not. It is important to emphasise something is in <i>qualitative terms</i>, as well as <i>monetary</i>.
		Advise	<ul style="list-style-type: none"> 'Advise' requires to build up a good, comprehensive, <i>argument</i> that leads to one or more choices for the owners or managers to consider.
II	ANALYSIS How are you expected to analyse the detail of what you have learned?	Produce	<ul style="list-style-type: none"> Begin with very little or nothing to make something or bring something into existence.
		Prioritise	<ul style="list-style-type: none"> To decide which of a group of things are the most important so that you can deal with them first. Here, you'll also have to <i>elucidate/ clarify</i>, for each item, why you put it, where you did in the list of 'priorities'.
		Interpret	<ul style="list-style-type: none"> Generally, 'Interpret' is translation of one form of words to another, where the latter is more clear in its exact sense than the former. This is often the <i>second stage</i> of 'analyse'.
		Discuss	<ul style="list-style-type: none"> There needs to be an 'argument'. You need two or more differing or conflicting viewpoints. Also, any discussion should, if possible, end in an outcome. For example; advantages vs. disadvantages → outcome; Or reasons why vs. why not → outcome; Or maybe this vs. maybe that → outcome.
		Construct	<ul style="list-style-type: none"> As 'prepare', but maybe with an <i>elucidation</i> as to why you put things.
		Compare and contrast	<ul style="list-style-type: none"> An elucidation of the <i>similarities</i> and <i>differences</i> between two or more things.
		Categorise	<ul style="list-style-type: none"> To put things into groups with the same features with an <i>explanation</i> after each item saying why you put it in that particular group and not one of the others.
	Analyse	<ul style="list-style-type: none"> Taking apart information or data to discover <i>relationships, causes, patterns</i> and <i>connections</i>. This is about a series of <i>detailed explanations</i>. 	
	APPLICATION How you are expected to apply your knowledge?	Tabulate	<ul style="list-style-type: none"> An arrangement of facts and numbers in rows or blocks.
		Solve	<ul style="list-style-type: none"> Generally, 'Calculation' is how to do something. 'Solve' leave you to select the <i>most suitable</i> technique or process.
		Reconcile	<ul style="list-style-type: none"> To find a way in which two situations (often the results of calculations) that are opposed to each other can agree and exist together.
		Prepare	<ul style="list-style-type: none"> 'Prepare' is used where there is a fair amount of numerical data given in the question. You have to consider the relevant data, process it by calculations or rearranging it, then provide it in a specific form.
		Demonstrate	<ul style="list-style-type: none"> 'Demonstrate' is consistent with situations where there is <i>only one correct answer</i>. You need to show something to be correct, apart from any doubt, by giving proof.
		Calculate	<ul style="list-style-type: none"> Ascertain or reckon mathematically.
Apply		<ul style="list-style-type: none"> Applying the facts, rules, concepts, and ideas. This is not just talk about it in theory, do it for real i.e. new situations. 	
I	COMPREHENSION What you are expected to understand?	Illustrate	<ul style="list-style-type: none"> Give an example.
		Identify	<ul style="list-style-type: none"> Recognise, establish or select after consideration.
		Explain	<ul style="list-style-type: none"> To make something clear or easy to understand by describing or giving information about it. Write a sentence that makes point → Then write another to clarify why the sentence is so → If point still isn't clear, write another sentence that makes it clearer.
		Distinguish	<ul style="list-style-type: none"> To recognize the difference between two things. List the features of each of the things that make them unlike from each other.
	KNOWLEDGE What you are expected to know?	Describe	<ul style="list-style-type: none"> What it is? This is <i>next step</i> from list, state, define. You might need to give a <i>short paragraph</i> covering the issues.
		Define	<ul style="list-style-type: none"> Just give a textbook or dictionary <i>definition</i>, you may use your <i>own words</i> instead. This is simply a <i>test of memory</i>.
		State	<ul style="list-style-type: none"> What is...? Convey what need to say <i>in brief</i>. No need to explain, unless it isn't clear.
		List	<ul style="list-style-type: none"> How many...? Just give a list. Each of the points on 'list' should be stated in terms of a <i>full sentence</i>, for clarity, but there's no requirement to go any further than that.

It may be presumed that the skills specified in Level I are inherent in Level II i.e., only when the student possesses Level I skills, he/ she would be able to achieve Level II skills. Likewise, the skills specified in Levels I and II are inherent in Level III i.e., only when a student possesses Level I and II skills, he/ she would be able to achieve Level III skills.

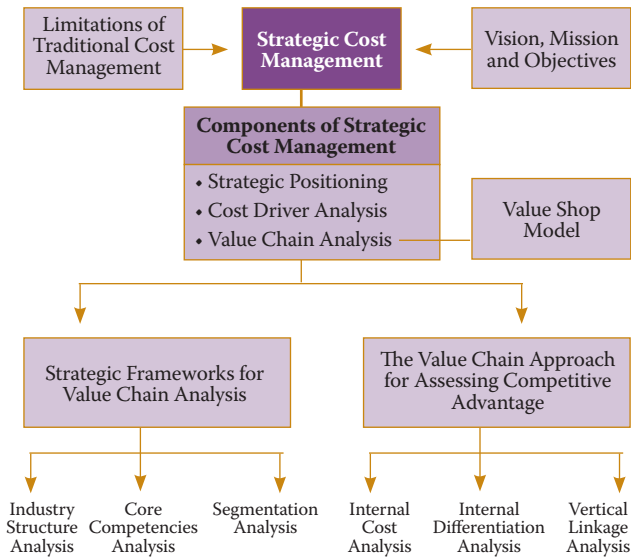
“Strategy is about setting yourself apart from the competition. It’s not a matter of being better at what you do - it’s a matter of being different at what you do.”

– Michael Porter

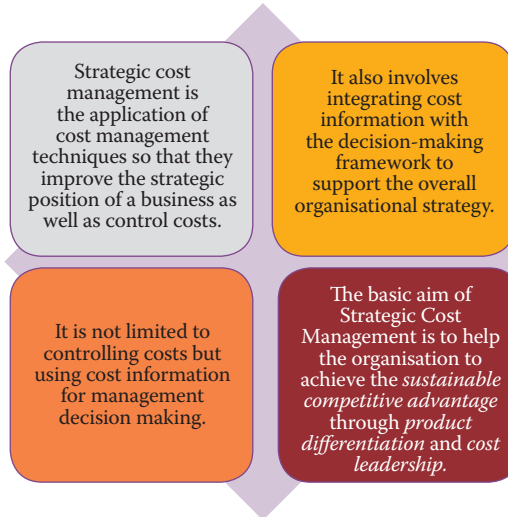


INTRODUCTION TO STRATEGIC COST MANAGEMENT

Chapter Overview



Strategic Cost Management

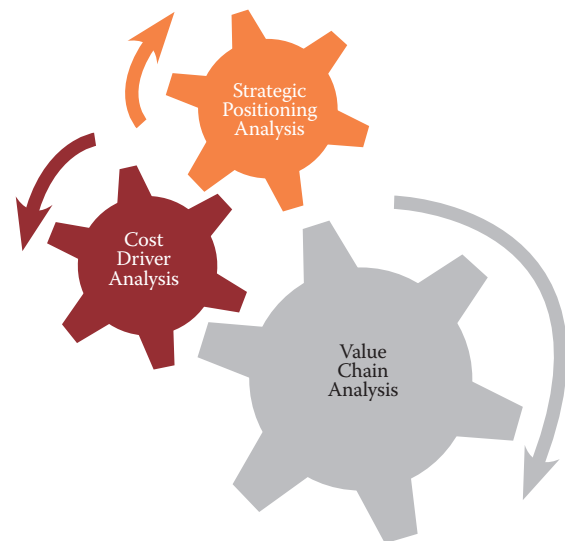
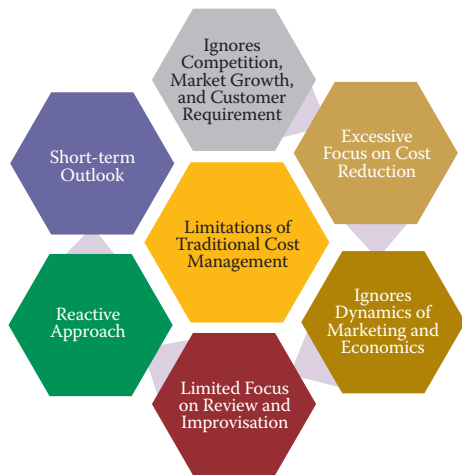


Components of Strategic Cost Management

Strategic Cost Management primary revolves around three business themes - Value Chain analysis, Cost driver analysis and Strategic positioning analysis.

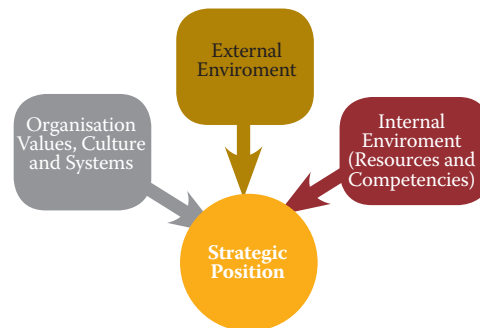
Traditional Cost Management

Traditional cost management system involves *allocation of costs* and *overheads* to the production and focusses largely on cost control and cost reduction.



Strategic Positioning Analysis

Strategic Positioning Analysis is a company's *relative position within its industry* matters for performance. Strategic positioning reflects choices a company makes about the kind of value it will create and how that value will be created differently than rivals. The following factors affect the strategic position of a company –



External environment can be analysed using models like **PESTEL** (Political, Economic, Social, Technological, Environmental and Legal factors) and **Porter's 5 forces**.

Cost Driver Analysis

Cost is caused or driven by various factors which are interrelated. Cost is not a simple function of volume or output as considered by traditional cost accounting systems. Cost driver concept is explained in two broad ways in strategic cost management parlance - Structural cost drivers and Executional cost drivers.

Structural cost drivers are the organisational factors which affect the costs of a firm's product. These factors drive costs of an organisation in varied ways. The scale and scope of operation of a company will impact the costs.

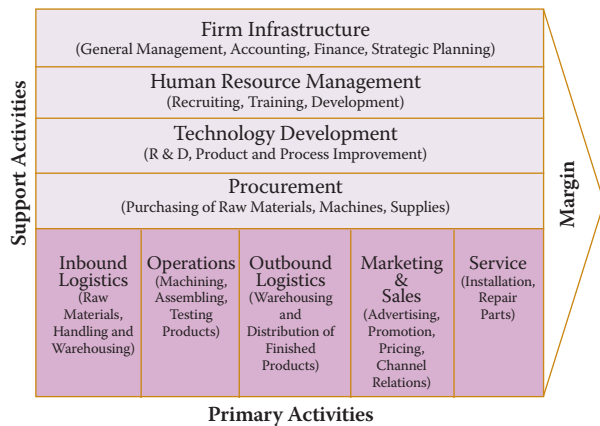
Executional cost drivers are based on firm's operational decision on how the various resources are employed to achieve the goals and objectives. These cost drivers are determined by management style and policy. The participation of workforce towards continuous improvement, importance of total quality management, efficiency of plant layout etc. are examples of executional cost drivers.

A company must focus on those cost drivers which is of strategic importance.

Value Chain Analysis

"Value-chain analysis is a process by which a firm identifies & analyses various activities that add value to the final product"

- ◆ The idea is to identify those activities which do not add value to the final product/service and eliminate such non-value adding activities.
- ◆ The analysis of value chain helps a firm obtain cost leadership or improve product differentiation.
- ◆ Resources must be deployed in those activities that are capable of producing products valued by customers.



Primary activities are those which are directly involved in transforming of inputs (Raw Material) into outputs (Finished Products) or in provision of service. Secondary activities (also known as support activities) support the primary activities.

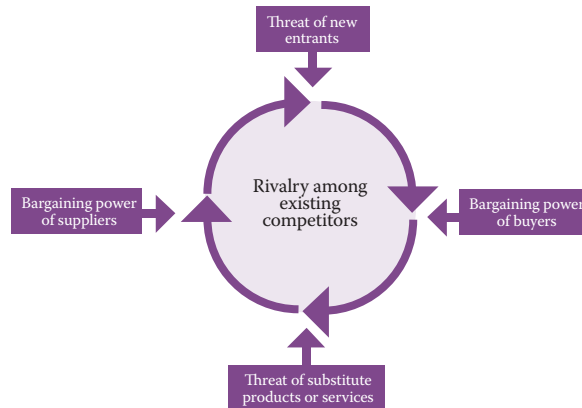
Strategic Frameworks For Value Chain Analysis

The Value Chain analysis requires strategic framework for organizing varied information. The following three are generally accepted strategic framework for Value Chain analysis.

Industry Structure Analysis

An industry might not yield high profits just because the industry is large or growing. The five forces suggested by Porter's play an important role in determining profit potential of the firms in an industry.

Factors which influence profitability are:

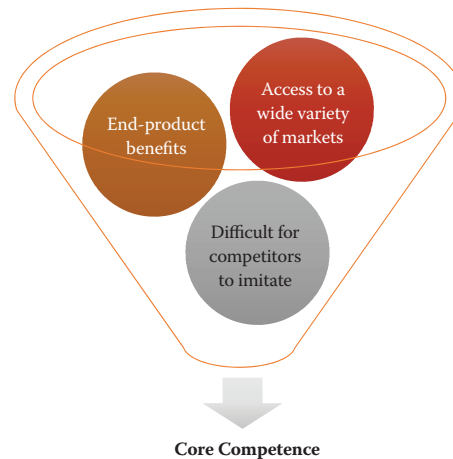


The five forces analysis helps a firm to better understand the industry value chain and its competitive environment.

Core Competencies Analysis

Core Competency is a distinctive or unique skill or technological knowhow that creates distinctive customer value. A core competency is the primary source of an organisation's competitive advantage. The competitive advantage could result from cost leadership or product differentiation.

There are three tests useful for identifying a core competence.



In order to attain superior performance and attain competitive advantage, a firm must have distinctive competencies. Distinctive competencies can take any of the following two forms:

- ◆ An offering or differentiation advantage. If customers perceive a product or service as superior, they become more willing to pay a premium price relative to the price they will have to pay for competing offerings.
- ◆ Relative low-cost advantage, under which customers gain when a company's total costs undercut those of its average competitor.

Segmentation Analysis

A single industry might be a collection of different market segments. This analysis will reveal the competitive advantages or disadvantages of different segments. A firm may use this information to decide to exit the segment, to enter a segment, reconfigure one or more segments, or embark on cost reduction/ differentiation programs.

The Value Chain Approach For Assessing Competitive Advantage

The value chain model can be used by business to assess the competitive advantage. Companies must not only focus on the end product/ service but also on the *process/ activities* involved in creation of these products/ services. The value chain approach can be used to better understand the competitive advantage in the following areas:

Internal Cost Analysis

Organisations can use the value chain analysis to understand the cost of processes and activities and identify the source of profitability.

Internal Differentiation Analysis

Companies can also use value chain analysis to create and offer superior differentiation to the customers. The focus is on improving the value perceived by customers on the companies' products and service offering. The firms must identify and analyse the value creating process and carry out a differentiation analysis.

Vertical Linkage Analysis

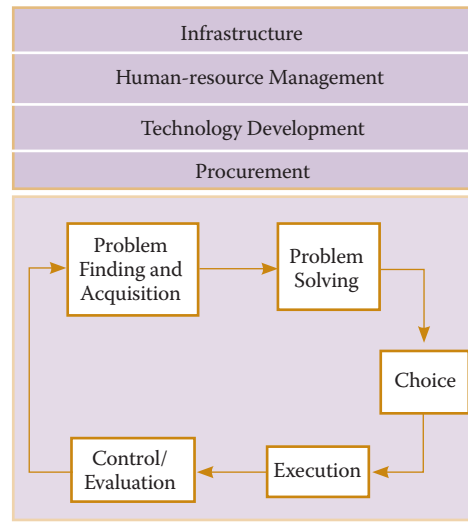
A company generates competitive advantage not only through linkages of internal processes within a firm but also through linkages between a firm's value chain and that of suppliers or users. A vertical linkage analysis includes all upstream and downstream activities throughout the industry.

In the SCM frame work, effective cost management involves a broad focus which Porter calls the value chain. It is a strategic tool used to analyse internal firm activities. Its goal is to recognize, which activities are the most valuable (i.e. are the source of cost or differentiation advantage) to the firm and which ones could be improved to provide competitive advantage. *Cost leadership* can be achieved through techniques like target costing. *Product differentiation* is directly proportional to market movements and changing business requirements.

Value Shop Model or Service Value Chain

This concept aims to serve companies from *service sector*. In value shop principle, no value addition takes place. It only deals with the problem, figure-out the main area requires its service and finally comes with the solution. This approach is designed to *solve customer problems rather than creating value by producing output from an input of raw materials*. **The model has the same support activities as Porter's Value Chain but the primary activities are described differently.** In the value shop they are:

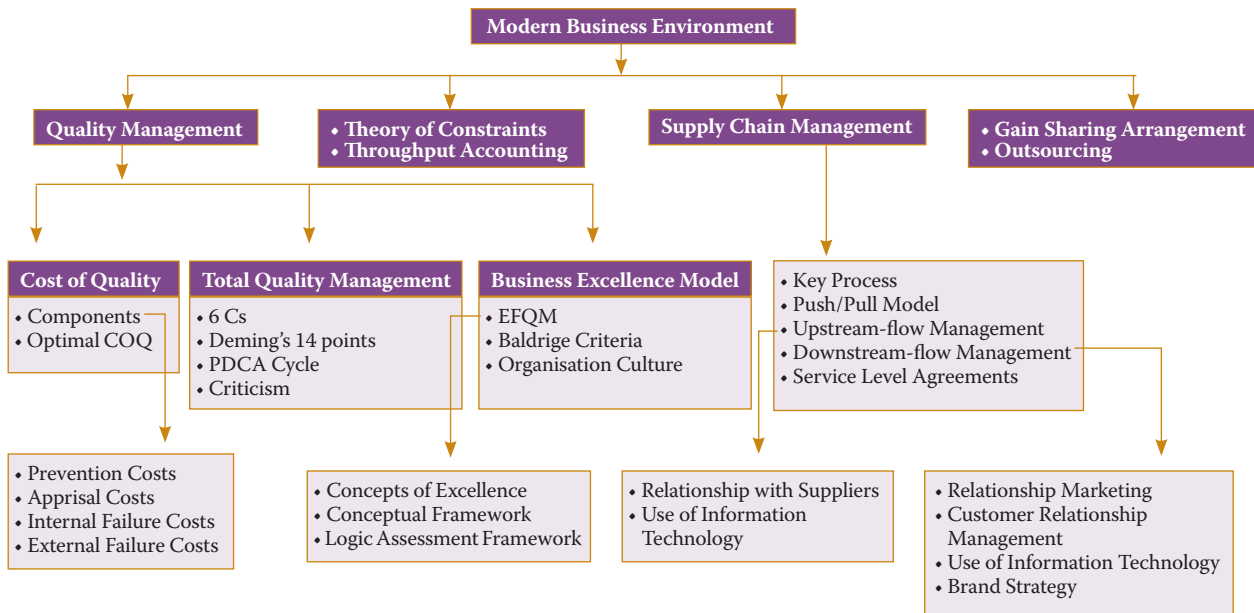
- ◆ Problem finding and acquisition.
- ◆ Problem solving.
- ◆ Choosing among solutions.
- ◆ Execution and control/evaluation.



The management in a value shop focuses on areas like problem and opportunity assessment, resource mobilization, project management, solutions delivery, outcome measurement, and learning.

MODERN BUSINESS ENVIRONMENT

Chapter Overview

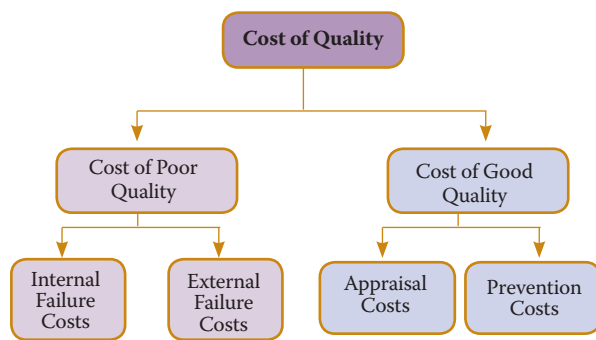


Modern Business Environment

Today's business environment is that of a *buyer's market*. This trend is the result of international transitions and macroeconomic, technological, political, and social changes. The challenge for businesses today is to satisfy their customers through the exceptional performance of their processes.

Cost Of Quality (COQ)

Mr. Philip B. Crosby in his book 'Quality is Free' referred to the COQ costs in two broad categories namely 'Price of Conformance' and 'Price of Non-conformance'. These two can be bifurcated further in to prevention & appraisal costs and internal & external failure costs. Hence, COQ is often referred as PAF (Prevention, appraisal & failure) model. *In other words*, 'Price of Conformance' is known as 'Cost of Good quality' and 'Price of Non-conformance' is often termed as 'Cost of Poor Quality'.



Prevention Costs

- ◆ The costs incurred for *preventing* the poor quality of products and services may be termed as Prevention Cost.
- ◆ They are planned and *incurred before actual operation* and are associated with the design, implementation, and maintenance of the quality management system.

Appraisal Costs

- ◆ The need of control in product and services to ensure high quality level in all stages, conformance to *quality standards* and *performance requirements* is Appraisal Costs.
- ◆ Appraisal Cost incurred to determine the degree of conformance to quality requirements (measuring, evaluating or auditing).

Internal Failure Costs

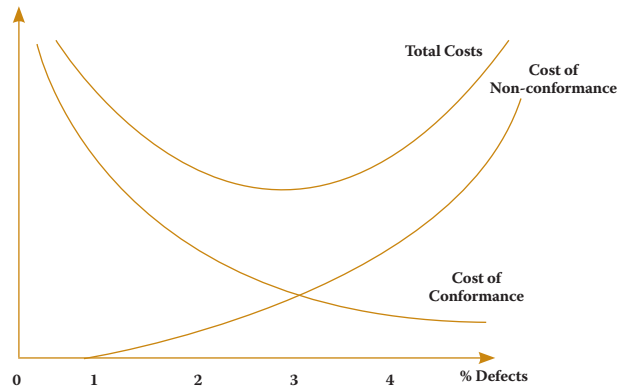
- ◆ These are costs that are caused by products or services not conforming to requirements or customer/user needs and are found *before delivery of products and services* to external customers.
- ◆ Deficiencies are caused both by errors in products and inefficiencies in processes.

External Failure Costs

- ◆ These costs occur when products or services that fail to reach design quality standards are not *detected until transfer to the customer*.

Optimal COQ

It is generally accepted that an increased expenditure in prevention and appraisal is likely to result in a substantial reduction in failure costs. Because of the trade off, there may be an *optimum operating level* in which the **combined costs are at a minimum**.



Total Quality Management (TQM)

Total Quality Management (TQM) is a management strategy aimed at embedding awareness of quality in all organizational processes. TQM requires that the company maintain this quality standard in all aspects of its business. This requires ensuring that *things are done right the first time and that defects and waste are eliminated from operations*. TQM is a comprehensive management system which:

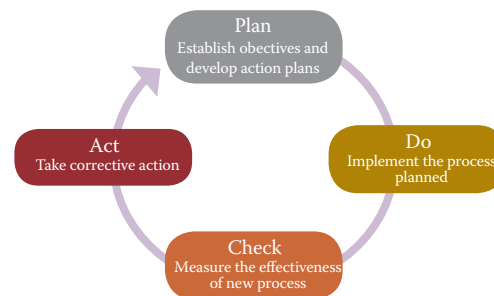
- ◆ Focuses on meeting owner's/ customer's needs, by providing quality services at a reasonable cost.
- ◆ Focuses on continuous improvement.
- ◆ Recognizes role of everyone in the organization.
- ◆ Views organization as an internal system with a common aim.
- ◆ Focuses on the way tasks are accomplished.
- ◆ Emphasizes teamwork.

Six C's of TQM



The Plan-Do-Check-Act (PDCA) Cycle

Deming developed the Plan - Do - Check - Act cycle. PDCA Cycle describes the activities a company needs to perform in order to incorporate *continuous improvement* in its operation.



Deming outlined his philosophy on quality in his famous “14 Points.” These points are principles that help guide companies in achieving quality improvement.

Criticisms of Total Quality Management

- ◆ the focus on documentation of process and ill-measurable outcomes;
- ◆ the emphasis on quality assurance rather than improvement;
- ◆ an internal focus which is at odds with the alleged customer orientation; and
- ◆ may not be appropriate for service based industries

The Business Excellence Model

Business Excellence (BE) is a philosophy for developing and strengthening the management systems and processes of an organization to *improve performance* and *create value for stakeholders*. The essence of this approach is to *develop quality management principles* that increase the overall efficiency of the operation, minimize waste in the production of goods and services, and help to increase employee loyalty as a means of maintaining high standards throughout the business by *achieving excellence in everything* that an organization does (including leadership, strategy, customer focus, information management, people and processes).

Several business excellence models exist world-wide. While variations exist, these models are all *remarkably similar*. The most common include;

- ◆ EFQM Excellence Model
- ◆ Baldrige Criteria for Performance Excellence
- ◆ Singapore BE Framework
- ◆ Japan Quality Award Model
- ◆ Australian Business Excellence Framework

Business Excellence Model and Organizational Culture

- ◆ Business Excellence approach focuses on strengthening the internal function and communication, looks towards the cultivation of strong ties with consumers and can be incorporated into the culture.
- ◆ Excellence cannot be attained if the staffs are forced to conform to certain norms. They have to be critically managed and motivated.



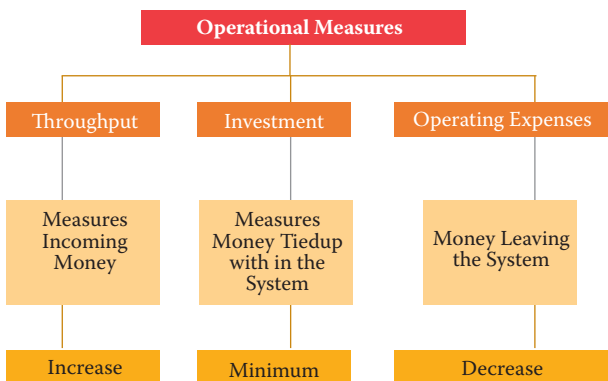
Theory of Constraints

Operational Measures of Theory of Constraints

The theory of constraints focuses on revenue and cost management when faced with bottlenecks. It advocates the use of three key measures. These are:

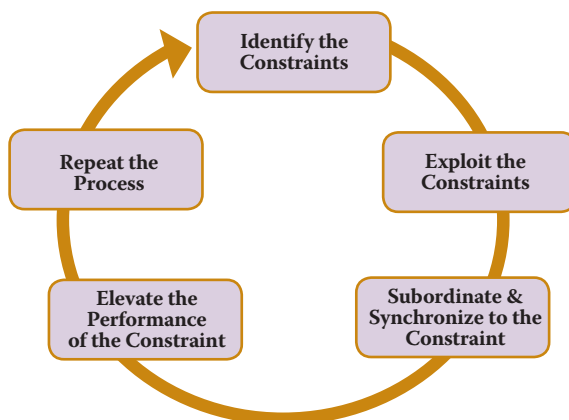
Core Measures	Definition
Throughput (T)	<ul style="list-style-type: none"> ◆ Throughput as a TOC measure is the rate of generating money in an organization through Sales. ◆ $\text{Throughput} = (\text{Sales Revenue} - \text{Unit Level Variable Expenses}) / \text{Time}$ ◆ Direct Labour Cost is viewed as a fixed unit level expenses and is not usually included.
Investment (I)	<ul style="list-style-type: none"> ◆ This is money associated with turning materials into Throughput and do not have to be immediately expensed. ◆ Includes assets such as facilities, equipment, fixtures and computers.
Operating Expense (OE)	<ul style="list-style-type: none"> ◆ Money spent in turning Investment into Throughput and therefore, represent all other money that an organisation spends. ◆ Includes direct labour and all operating and maintenance expenses.

Based on these three measures, the objectives of management can be expressed as increasing throughput, minimizing investment and decreasing operating expenses.



Goldratt's Five-Step Method for Improving Performance

The key steps in managing **bottleneck resources** are as follows:



Throughput Accounting

Several ratios were defined by Galloway and Waldron based on the definition of throughput.

Throughput Accounting Ratio:

$$\frac{\text{Throughput per Bottleneck Minute}}{\text{Factory Cost per Bottleneck Minute}}$$

If the TA ratio is greater than 1 the product in question is “profitable” because, if all capacities were devoted to that product, the throughput generated would exceed the total factory cost. If there was a bottleneck, products could be ranked by a variant of the TA ratio (although the ranking is the same as that derived by the use of throughput per bottleneck minute).

Other Performance Ratios suggested include:

$$\frac{\text{Throughput}}{\text{Labour Cost}} \quad \text{and} \quad \frac{\text{Throughput}}{\text{Material Cost}}$$

Supply Chain Management

The Global Supply Chain Forum (GSCF) defines Supply chain management as the “integration of key business processes from end user through original suppliers that provides products, services, and information that add value for customers and other stakeholders.”

Types of Supply Chain- Push and Pull

Push Model



Pull Model

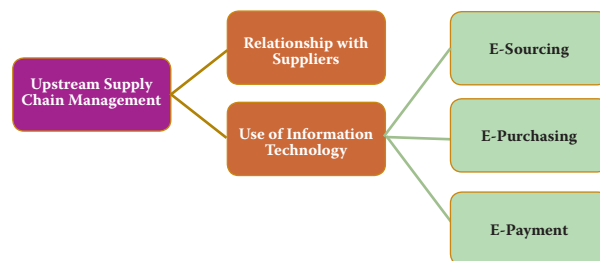


Upstream and Downstream Flow

A supply chain begins right from the supplier and finally ends on end customer or consumer. In the total chain, there are flows of material, information and capital or finance. When the flow relates to supplier, it is termed as upstream flow. If the flow is with consumers or customers, it is named as downstream flow.

Management of Upstream Supplier Chain

Management of transactions with suppliers are termed as upstream supply chain management.



Relationship with Suppliers

Supplier capabilities of innovation, quality, reliability and costs/price reductions and agility to reduce risk factors all have witnessed significant changes when aligned with key suppliers. Greater value can

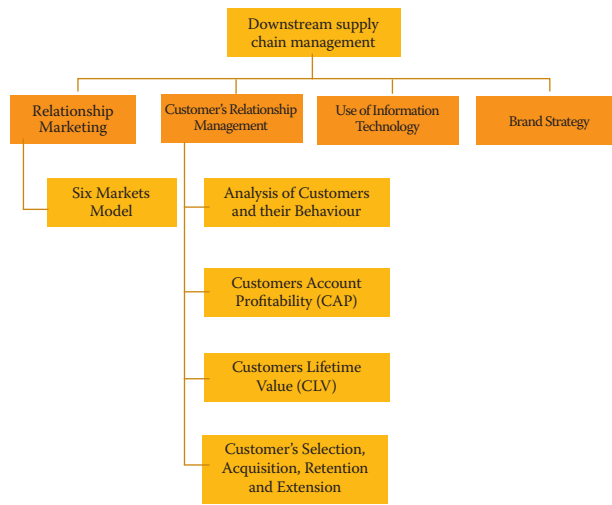
be achieved for both businesses, something that would be difficult to achieve if operating independently.

Use of Information Technology

The main activities of upstream supply chain are procurement and logistics. In modern business environment upstream supply chain management use E-Procurement process. E-Procurement is the electronic methods beginning from identification of the organization's requirements and end on payment. E-Procurement includes E-Sourcing, E-Purchasing and E-Payment.

Downstream Supply Chain Management

Management of transactions with consumers or customers are termed as downstream supply chain management.



Relationship Marketing

Marketing plays a vital role to successfully handle the downstream supply chain management. The relationship marketing helps the organization to keep existing customer and to attract new customers through helpful staff, quality service / product, appropriate prices and proper customer care etc.

Six Markets Model identifies the six key “market domains” where organizations may consider directing their marketing activities.



The six markets model suggests that a firm must regulate its actions towards developing appropriate relationships with each of the market areas as the management of relationships in each of the six markets is critical for the attainment of customer retention objective.

The growing interest in relationship marketing suggests a shift in the nature of marketplace transactions from discrete to relational

exchanges, from exchanges between parties with no past history and no future to interactions between parties with a *history and plans for future interaction*.

Customers Relationship Management

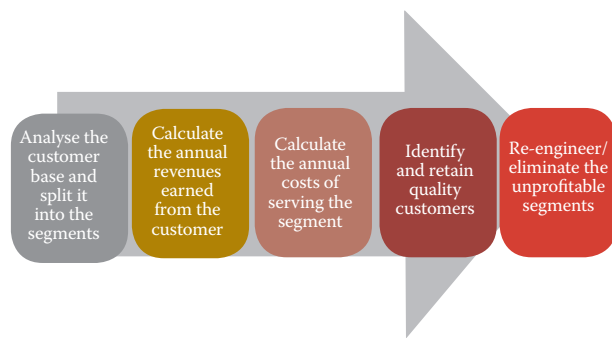
To manage and analyse customer's interaction and data throughout the life cycle with the main motive of improving business relations the strategies and technologies used is Customer Relationship Management (CRM). Relation includes relations with customers, assisting in customer retention and driving sales growth. CRM is knowing the needs of the customers and providing them with best possible solution.

Analysis of Customers and their Behaviour

Analysis of customers is necessary based on geographical location or purchasing characteristics. For industrial customer expectation of benefits - quality, discount, serviceability, size of the should be taken into consideration. During such analysing process, management should keep in mind the physiological need, safety need, social need, status/ego need and self-fulfillment need of existing and future customers.

Customers Account Profitability (CAP)

Undertaking a customer account profitability improvement initiative is a **five-step process**:



Customers Lifetime Value (CLV)

Customer Life time value is the present value of net profit that we derive from a customer over the entire lifetime of relationship with that particular customer. It is the *net present value of the projected future cash flows from a lifetime of customer relationship*. It is an essential tool used in marketing to focus on more profitable customers and **stop servicing non-profitable customers**.

Customer's Selection, Acquisition, Retention and Extension



The use of Information Technology in Downstream Supply Chain Management

In managing downstream supply chain, organizations link *their sales system* to the *purchasing system of its customer* through Electronic Data Change. Using E-Business, they sell products. Intelligence gathering is used to monitor the online customer transactions. E-mail is the way through which organization keeps in touch with customers. Use of IT results in quick action, reduction in associated cost and saving in time.

Brand Strategy

Specially branding of product makes a huge difference in its *appeal to customers*. Branding can be usage of logo or specific colour or any other means which makes the product or service distinctively visible among others.

Gain Sharing Arrangements

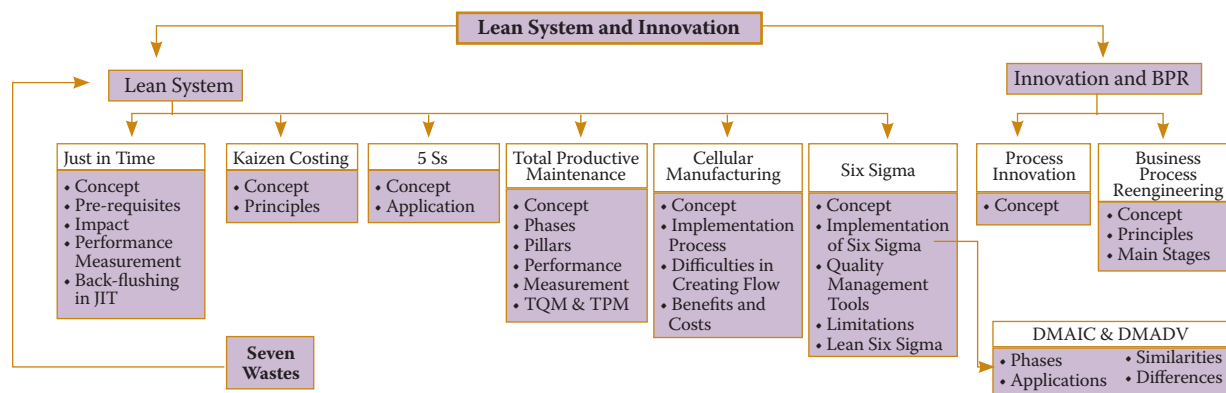
Gain sharing is an approach to the review and adjustment of an existing contract, or series of contracts, where the adjustment provides benefits to both parties.

Outsourcing

Outsourcing is a business practice used by companies to reduce costs or improve efficiency by shifting tasks, operations, jobs or processes to another party for a span of time.

LEAN SYSTEM AND INNOVATION

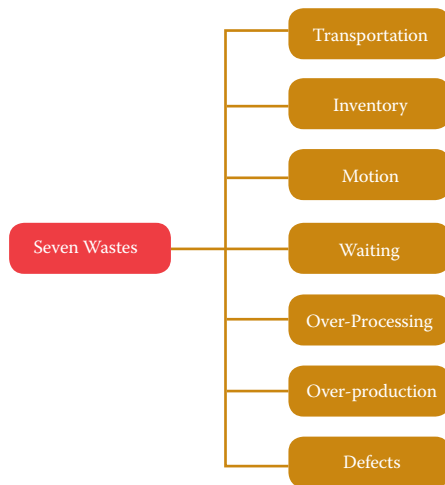
Chapter Overview



Lean System

“Lean System is an organized method for waste minimization without sacrificing productivity within a manufacturing system. Lean implementation emphasizes the importance of optimizing work flow through strategic operational procedures while minimizing waste and being adaptable.”

There are generally 7 type of wastes:



Most of lean system techniques are based on following *principles*:

- ◆ Perfect first-time quality
- ◆ Waste minimization
- ◆ Continuous improvement
- ◆ Flexibility

The *characteristics* of lean manufacturing:

- ◆ Zero waiting time
- ◆ Zero inventory
- ◆ Pull processing
- ◆ Continuous flow of production
- ◆ Continuous finding ways of reducing process time.

Just-In-Time (JIT)

CIMA defines:

“System whose objective is to produce or to procure products or components as they are required by a customer or for use, rather than for stock. Just-in-time system **Pull system**, which responds to demand, in contrast to a push system, in which stocks act as buffers between the different elements of the system such as purchasing, production and sales.”

A complete JIT system begins with production, includes deliveries to a company’s production facilities, continues through the manufacturing plant, and even includes the types of transactions processed by the accounting system.

Features

Spare Parts/ Materials from suppliers on the exact date and at the exact time when they are needed	Straight delivery to the production floor for immediate use in manufactured products	Visit of engineering staff at supplier sites to examine supplier’s processes
Installation of EDI system that tells suppliers exactly how much of which parts are to be sent	Dropping off products at the specific machines	Shorten the setup times
Eliminating the need for long production runs/ Streamlined flow of parts from machine to machine	Training to employees how to operate a multitude of different machines, perform limited maintenance	Several alterations in the supporting accounting systems

Essential Pre-requisites of a JIT system

- ◆ Low variety of goods
- ◆ Vendor reliability
- ◆ Good communication
- ◆ Demand stability
- ◆ TQM
- ◆ Defect-free materials
- ◆ Preventive maintenance

Impact of JIT System on

- ◆ **Waste Costs:** When fully installed, a JIT system vastly reduce all these types of waste. When this happens, there is a sharp drop in several aspects of a product’s costs.
- ◆ **Overhead Costs:** The costs of material handling, facilities, and quality inspection decline when a JIT system is installed.
- ◆ **Product Prices:** When a company achieves a higher level of product quality, along with ability to deliver products on the dates required, customers may be willing to pay a premium.

Performance Measurements in a JIT System

Many of the performance measurement measures used under a *traditional accounting system* are not useful in a JIT environment, while new measures can be implemented that take advantage of the unique characteristics of this system.

- ◆ Machine utilization measurements can be discarded under JIT environment.
- ◆ Another inappropriate measurement is any type of piece rate tracking for each employee.
- ◆ Any type of direct labour efficiency tracking is highly inappropriate in a JIT system.
- ◆ Installing a JIT system does not mean that there should be a complete elimination of operational measures.

Back-flushing in a JIT System

Back-flushing requires no data entry of any kind until a finished product is completed.

Kaizen Costing

This philosophy implies that small, incremental changes routinely applied and sustained over a long period result in significant improvements.

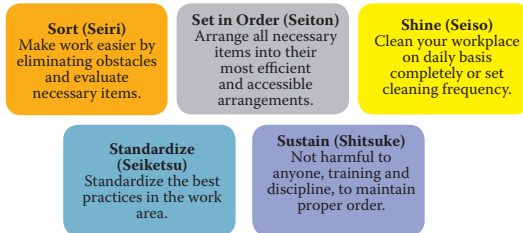
Kaizen Costing Principles

- ◆ The system seeks gradual improvements in the existing situation, at an acceptable cost.
- ◆ It encourages collective decision making and application of knowledge.
- ◆ There are no limits to the level of improvements that can be implemented.
- ◆ Kaizen involves setting standards and then continually improving these standards to achieve long-term sustainable improvements.
- ◆ The focus is on eliminating waste, improving systems, and improving productivity.
- ◆ Involves all employees and all areas of the business.

5S

5S is the name of a workplace organization method that uses a list of five Japanese words: **seiri, seiton, seiso, seiketsu, and shitsuke**. It explains *how a work space should be organized for efficiency and*

effectiveness by identifying and storing the items used, maintaining the area and items, and sustaining the new order.

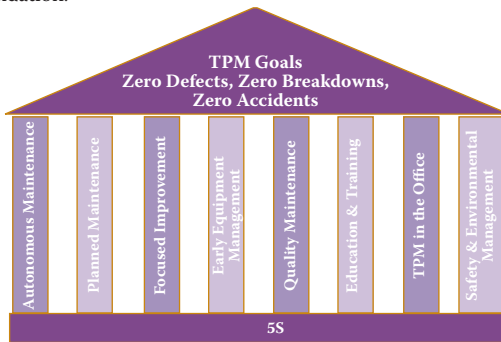


5S methodology is being applied to a wide variety of industries including Manufacturing, Health care, Education & Government.

Total Productive Maintenance (TPM)

Total Productive Maintenance (TPM) is a system of maintaining and improving the integrity of production and quality systems. This is done through the machines, equipment, processes, and employees that add to the value in Business Organisation. TPM helps in *keeping all equipment in top working condition* so as to avoid breakdowns and delays in manufacturing processes.

TPM Strategy focuses on **eight pillars** of success with 5S strategy as foundation.



Performance Measurement in TPM

The most important approach to the measurement of TPM performance is known as Overall Equipment Effectiveness (OEE) measure.

$$\text{Performance} \times \text{Availability} \times \text{Quality} = \text{OEE} \%$$

OEE may be applied to any individual assets or to a process. It is unlikely that any manufacturing process can run at 100% OEE. According to Dal *et al* (2000), Nakajima (1998) suggested that ideal values for the OEE component measures are:

Availability	> 90%
Performance	> 95%
Quality	> 99%

Accordingly, OEE at World Class Performance would be approximately 85%. Kotze (1993) contradicted, that an OEE figure greater than 50% is more realistic and therefore more useful as an acceptable target.

Cellular Manufacturing/ One Piece Flow Production System

A Sub Section of JIT and Lean System is Cellular Manufacturing. It encompasses a group technology. The goals of cellular manufacturing are:

- ◆ To move as quickly as possible,
- ◆ Make a wide variety of similar products,
- ◆ Making as little waste as possible.

Six Sigma

It is quality improvement technique whose objective is to *eliminate defects* in any aspect that affects customer satisfaction. The premise of Six Sigma is that by measuring defects in a process, a company can develop ways to eliminate them and practically achieve “zero defects”. Six sigma can be used with balanced scorecard by providing more rigorous measurement system based on statistics.

Numerical Concept of Six Sigma

‘Sigma’ is a statistical term that measures how far a process deviates from perfection. The higher the sigma number, the closer the process is to perfection.

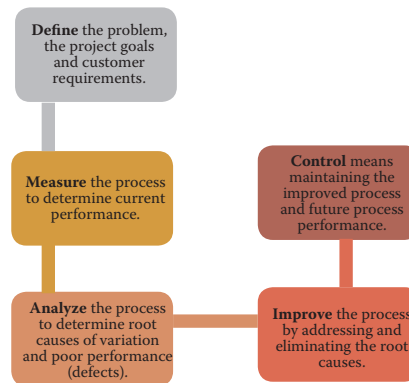
The values of Defect Percentage

Six Sigma is 3.4 defects per million opportunities or getting things right 99.99966% of the time. It is possible to develop ways of reducing defects by measuring the level of defects in a process and discovering the causes.

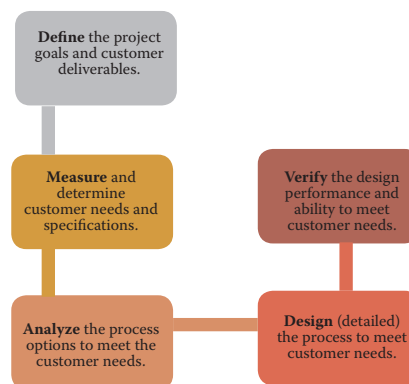
Implementation of Six Sigma

There are two methodologies for the implementation of Six Sigma-

DMAIC: This method is very robust. It is used to improve *existing business process*. To produce dramatic improvement in business process, many entities have used it successfully. It has *five phases*:



DMADV: The application of these methods is aimed at creating a high-quality product keeping in mind customer requirements at every stage of the product. It is an improvement system which is used to develop *new processes or products* at Six Sigma quality levels. Phases are described in diagram:



Both DMADV and DMAIC are fundamental six sigma methodologies for improving quality of product/process. Broadly, DMAIC deals with improving some existing process to make it align with customer's needs while DMADV deals with new design or redesign.

Lean Six Sigma

Lean Six Sigma is the combination of *Lean* and *Six Sigma* which help to achieve greater results that had not been achieved if Lean or Six Sigma would have been used individually. It increases the speed and effectiveness of any process within any organization. By using lean Six Sigma, organisations will be able to Maximize Profits, Build Better Teams, Minimize Costs, and Satisfy Customers.

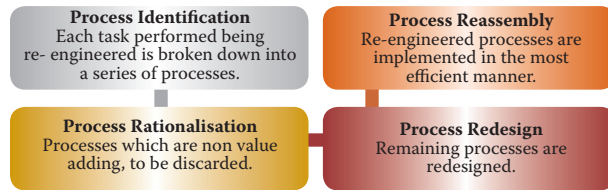
Process Innovation

Process Innovation means the implementation of a new or significantly improved production or delivery method (including significant changes in techniques, equipment and/ or software).

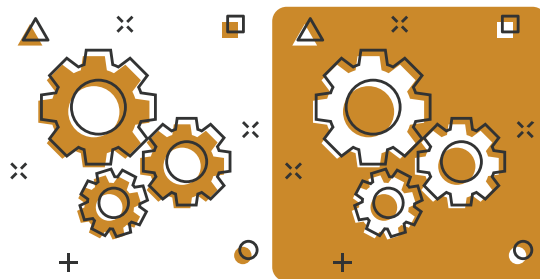
Business Process Reengineering

Hammer defines Business Process Reengineering (BPR) (or simply reengineering) as *“the fundamental rethinking and radical redesign of business processes to achieve dramatic improvements in critical contemporary measures of performance, such as cost, quality, service, and speed.”*

Main Stage of BPR

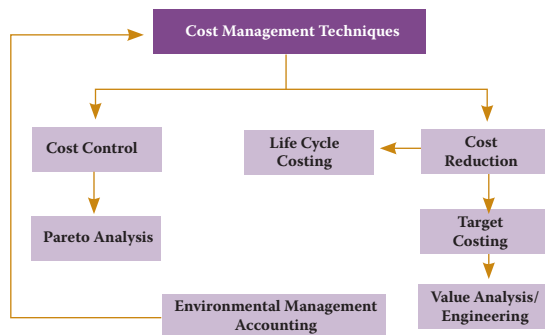


Porter's Value Chain is commonly used in Business Process Re-engineering as a technique to identify and analyse processes that are of strategic significance to the organisation.



COST MANAGEMENT TECHNIQUES

Chapter Overview



Value Analysis is a planned, scientific approach to cost reduction which reviews the material composition of a product and production design so that modifications and improvements can be made which do not reduce the value of the product to the customer or to the user.

Value Engineering is the application of value analysis to new products. Value engineering relates closely to target costing as it is cost avoidance or cost reduction before production.

The initial value engineering may not uncover all possible cost savings. Thus, *Kaizen Costing* is designed to repeat many of the value engineering steps for as long as a product is produced, constantly refining the process and thereby stripping out extra costs.

Further, Target Costing System is based on involving representatives of all the *Value Chain* such as suppliers, agents, distributors and existing after-sales service in the target costing system.

Target Costing

It can be defined as *“a structured approach to determining the cost at which a proposed product with specified functionality and quality must be produced, to generate a desired level of profitability at its anticipated selling price.”*

In Target costing, we first determine what price we think the consumer will pay for our product. We then determine how much of a profit margin we expect and subtract that from the final price. The remaining amount left is what is available as a budget to be used to create the product.

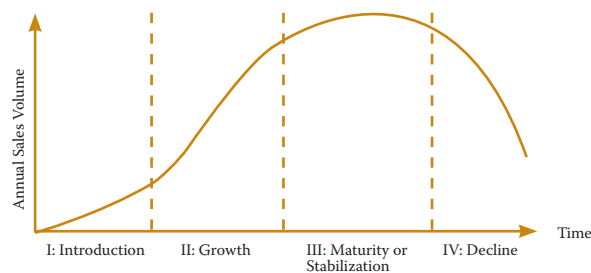
Components of Target Costing System

Typically, the total target is broken down into its various components, each component is studied and opportunities for cost reductions are identified. These activities are often referred to as Value Analysis (VA) and Value Engineering (VE).

Life Cycle Costing

Life Cycle Costing involves identifying the costs and revenue over a product's life i.e. from inception to decline. Life cycle costing aims to maximize the profit generated from a product over its total life cycle.

The life cycle of a product consists of four phases/ stages viz., Introduction; Growth; Maturity; Saturation and Decline.



Life Cycle Characteristics

	Introduction	Growth	Maturity	Decline
Objectives	Create product awareness & trial	Maximise market share	Maximise profits while defending market share	Reduce expenditures & milk the brand
Sales	Low sales	Rapidly rising	Peak sales	Declining sales
Costs per Customer	High cost per customer	Average cost per customer	Low cost per customer	Low cost per customer
Profits	Negative	Rising profits	High profits	Declining profits
Customers	Innovators	Early adopters	Middle majority	Laggards
Competitors	Few	Growing number	Steady number beginning to decline	Declining number

Strategies

	Introduction	Growth	Maturity	Decline
Product	Offer basic product	Offer product extensions, service & warranty	Diversify brands and models	Phase out weak items
Price	Cost plus profit	Price to penetrate market	Price to match or beat competitors	Price cutting
Advertising	Build product awareness amongst early adopters & dealers	Build awareness & interest in mass market	Stress on brand differences and benefits	Reduce level to keep hard core loyalty
Distribution	Build selective distribution	Build Intensive distribution	Build more intensive distribution	Go selective: Phase out unprofitable outlets
Sales Promotion	Use heavy sales promotion to entice trial	Reduce to take advantage of heavy consumer demand	Increase to encourage brand switching	Reduce to minimal level

Pareto Analysis

Pareto Analysis is a rule that recommends focus on the most important aspects of the decision making in order to simplify the process of decision making. It is based on the 80:20 rule that was a phenomenon first observed by Vilfredo Pareto, a nineteenth century Italian economist. He noticed that 80% of the wealth of Milan was owned by 20% of its citizens. This phenomenon, or some kind of approximation of it say, (70: 30 etc.) can be observed in many different business situations. The management can use it in a number of different circumstances to direct management attention to the *key control mechanism or planning aspects*. It helps to clearly establish top priorities and to identify both profitable and unprofitable targets.

Identification of Environmental Costs

To prepare environmental management accounts an intense review of general ledger containing costs of materials, utilities and waste disposal etc. is required. Since the *environmental costs are generally 'hidden' in 'general overheads' of the company*, it becomes difficult for management to identify opportunities to cut environmental costs but nonetheless it is crucial for them to do so to preserve natural resources getting scarcer.

In 2003, the UNDSO identified four management accounting techniques for the Identification and Allocation of Environmental Costs:

Input-Output Analysis

This technique records material inflows and balances this with outflows on the basis that, what comes in, must go out.

Flow Cost Accounting

This technique uses not only material flows but also the organizational structure. Classic material flows are recorded as well as material losses incurred at various stages of production. Flow cost accounting makes material flows transparent by using various data, which are quantities (physical data), costs (monetary data) and values (quantities x costs). The material flows are divided into three categories, material, system, and delivery and disposal.

Life Cycle Costing

Lifecycle costing considers the costs and revenues of a product over its whole life rather than one accounting period. Therefore, the full environmental cost of producing a product will be taken into account. In order to reduce lifecycle costs, an organization may adopt a TQM approach.

Activity Based Costing (ABC)

ABC allocates internal costs to cost centres and cost drivers on the basis of the activities that give rise to the costs. In an environmental accounting context, it distinguishes between *environment-related*

Environmental Management Accounting [EMA]

- EMA identifies and estimates the costs of *environment-related activities* and seeks to control these costs.
- The focus of EMA is not on financial costs but it also considers the environmental cost or benefit of any decisions made.
- EMA is an attempt to integrate best management accounting thinking with best environmental management practice.

Environmental Costs

Environmental Prevention Costs – Those costs associated with *preventing* adverse environmental impacts.

Environmental Appraisal Costs – The cost of activities executed to determine whether products, process and activities are in *compliance* with environmental standards, policies and laws.

Environmental Internal Failure Costs – Costs incurred from activities that have been produced but *not discharged* into the environment.

Environmental External Failure Costs – Costs incurred on activities performed *after discharging* waste into the environment. These costs have adverse impact on the organisation's *reputation* and *natural resources*.

costs, which can be attributed to joint cost centres, and **environment-driven costs**, which tend to be hidden on general overheads.

The *environment-driven costs* are removed from general overheads and traced to products or services. The cost drivers are determined based on environment impact that activities have and costs are charged accordingly. This should give a good attribution of environmental costs to individual products and should result in better control of costs.

Controlling Environmental Costs

After Identification and Allocation of Environmental Costs, task of controlling starts. An organization may try to control these costs as mentioned below-

Waste

'Mass balance' approach can be used to determine how much material is wasted in production, whereby the weight of *materials bought is compared to the product yield*.

Water

Businesses pay for water twice – first, to buy it and second, to dispose of it. If savings are to be made in terms of reduced water bills, it is important for organizations to identify where water is used and how consumption can be decreased.

Energy

Often, energy costs can be reduced significantly at very little cost. Environmental management accounts may help to identify inefficiencies and wasteful practices and, therefore, opportunities for cost savings.

Transport and Travel

Again, EMA techniques may be used to identify savings in terms of travel and transport of goods and materials. At a simple level, a business can invest in more fuel-efficient vehicles.

Consumables and Raw Materials

These are directly attributable costs and discussions with management can reduce such costs. For example, toner cartridges for printers could be refilled rather than replaced.

Reasons for Controlling Environmental Cost

There are three main reasons why the management of environmental costs is becoming increasingly important in organizations.

First, a 'carbon footprint' (as defined by the Carbon Trust) measures the total greenhouse gas emissions caused directly and indirectly by a person, organization, event or product.

Second, environmental costs are becoming huge for some companies, particularly those operating in highly industrialized sectors such as oil production. Such significant costs need to be managed.

Third, regulation is increasing worldwide at a rapid pace, with penalties for non-compliance also increasing accordingly.

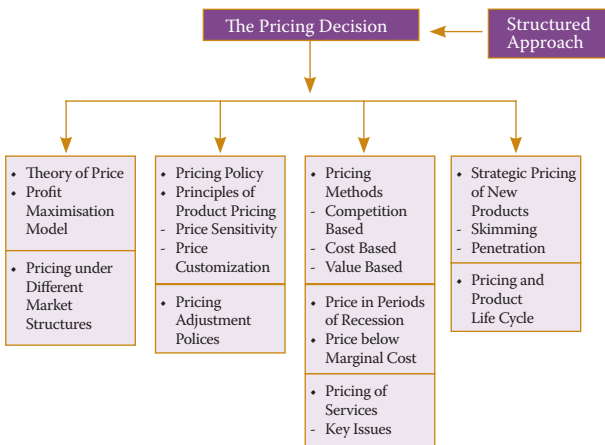
Role of EMA in Product/ Process Related Decision Making

The correct costing of products is a pre-condition for making sound business decisions. The accurate product pricing is needed for strategic decisions regarding the volume and choices of products to be produced. *EMA converts many environmental overhead costs into direct costs and allocate them to the products that are responsible for their incurrence*. The results of improved costing by EMA may include:

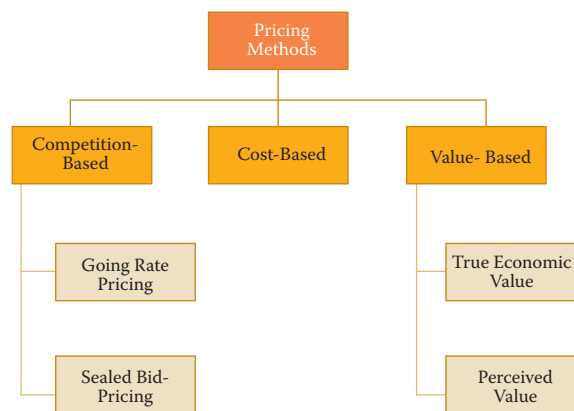
- ◆ Different pricing of products as a result of re-calculated costs;
- ◆ Re-evaluation of the profit margins of products;
- ◆ Phasing-out certain products when the change is dramatic;
- ◆ Re-designing processes or products in order to reduce environmental costs and
- ◆ Improving housekeeping and monitoring of environmental performance.

PRICING DECISION

Chapter Overview



Pricing Methods



Cost-Based Pricing Method

In many businesses, the common method of price determining is to estimate the *cost of product & fix a margin of profit*. The term 'cost' here means **Full Cost** at current output and wages level since these are regarded as most relevant in price determination.

Pricing based on total costs is subjected to two limitations. They are:

- ◆ The allocation of inter-departmental overheads is based on an *arbitrary basis*; and
- ◆ The allocation overheads will require estimation of normal output which often cannot be done precisely.

In order to avoid these complications, **Variable Costs** which are considered as relevant costs are used for pricing, by *adding a mark-up* (to include fixed costs allocation also).

Sometimes, *instead of arbitrarily adding a percentage on cost for profit, the firm determines an average mark-up on cost necessary to produce a desired Rate of Return on Investment*. The rate of return to be earned by the firm or industry must depend on the *risk involved*.

Competition-Based Pricing Method

When a company sets its price mainly on the consideration of *what its competitors are charging*, its pricing policy under such a situation is called competitive pricing or competition-oriented pricing. It is not necessary under competitive pricing to charge the same price as charged by the concern's competitors. But under such a pricing, the concern may keep its prices lower or higher than its competitors by a certain percentage.

Going Rate Pricing	}	It is a competitive pricing method under which a firm tries to <i>keep its price at the average level charged by the industry</i> . The use of such a practice of pricing is especially <i>useful where it is difficult to measure costs</i> .
Sealed Bid-Pricing	}	The objective of the firm in the bidding situation is <i>to get the contract</i> , and this means that it hopes to set its price lower than that set by any of the other bidding firms. But however, the firm does not ordinarily set its price below a certain level. Even when it is anxious to get a contract in order to keep the plant busy, it cannot quote price below marginal cost. On the other hand, if it raises its price above marginal cost, it increases its potential profit but reduces its chance of getting the contract.

Value- Based Pricing Method

There is an increasing trend to price the product on the basis of *customer's perception of its value*. This method helps the firm in reducing the threat of price wars. Marketing research is important for this method. It is based on:

Objective Value or True Economic Value (TEV)

This is a measure of benefits that a product is *intended to deliver to the consumers relative to the other products* without giving any regard whether the consumer can recognize these benefits or not.

True economic value for a consumer is calculated taking two differentials into consideration:

$$TEV = \text{Cost of the Next Best Alternative} + \text{Value of Performance Differential}$$

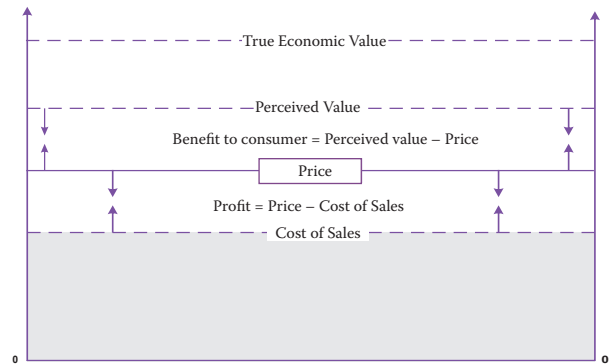
Cost of the next best alternative is the cost of a comparable product offered by some other company. Value of performance differential is the value of additional features provided by the seller of a product.

A firm's product may be superior to the next best alternative in some dimensions but inferior in others.

Perceived Value

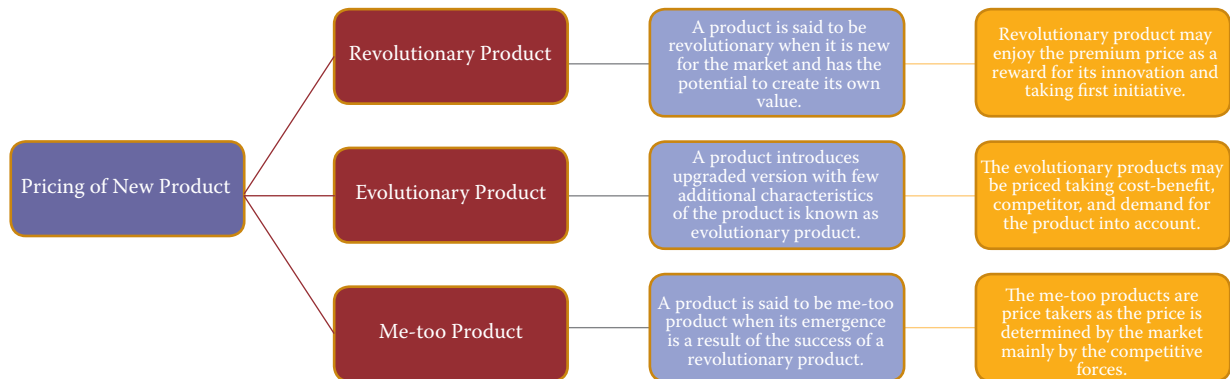
This is the *value that consumer understands the product deliver to it*. It is the price of a product that a consumer is willing to spend to have that product.

At the time of fixing price, it is to be kept in the mind that any price which set below the perceived value but above the cost of goods sold give incentives to both buyers and the seller. This can be understood with the help the diagram given below.

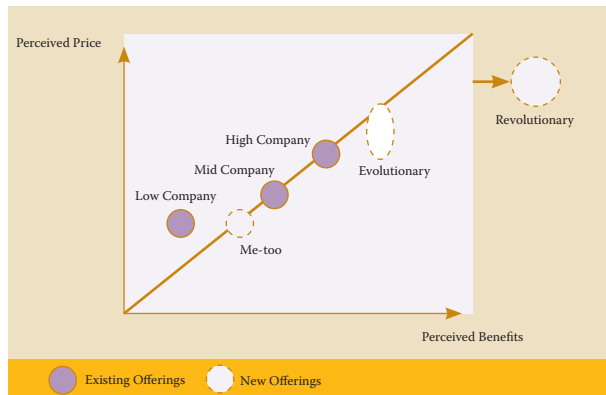


Strategic Pricing of New Products

The pricing of new product poses a bigger problem because of the uncertainty involved in the estimation of their demand. In order to overcome this difficulty, experimental sales are conducted in different markets using different prices to see which price is suitable. A new product is analysed into three categories for the purpose of pricing:



Three New Product Pricing Situations



While preparing to enter the market with a new product, management must decide whether to adopt a skimming or penetration pricing strategy.

Skimming Pricing

It is a policy of high prices during the early period of a product's existence. This can be synchronised with high promotional expenditure and in the later years the prices can be gradually reduced. The reasons for following such a policy are:

- The demand is likely to be *inelastic* in the earlier stages till the product is established in the market.
- The change of high price in the initial periods serves to *skim the cream of the market* that is relatively insensitive to price.
- The demand for the product is *not known* the price covers the initial cost of production.
- High initial capital outlays, needed for manufacture, results in high cost of production.

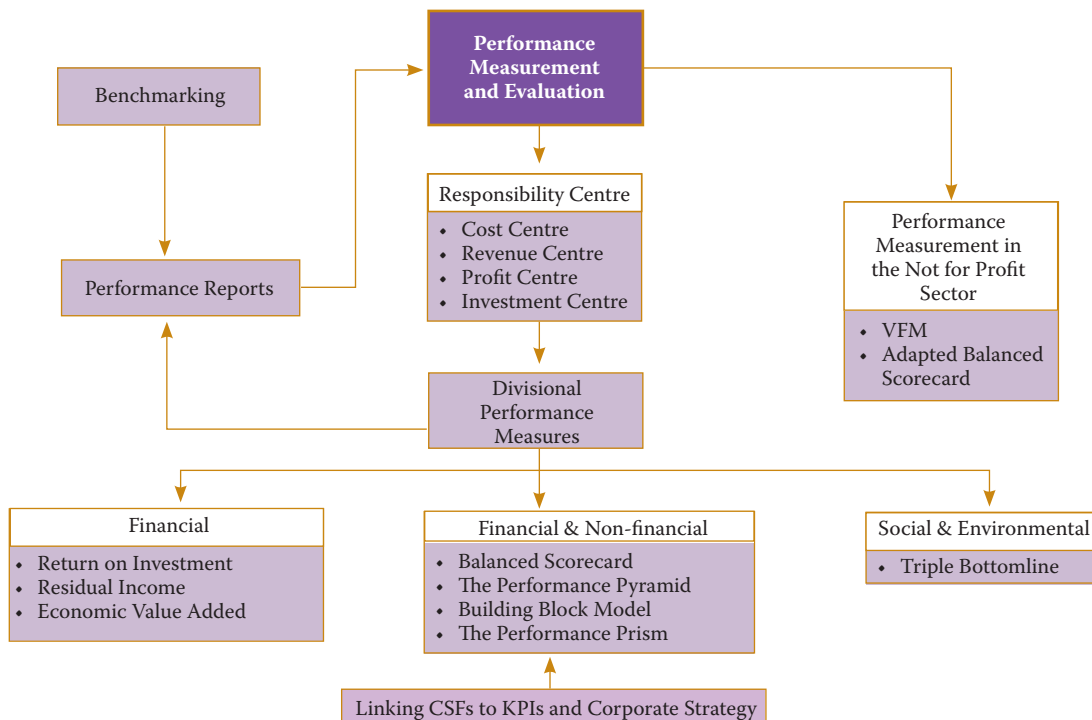
Penetration Pricing

This policy is in favour of using a low price as the principal instrument for penetrating mass markets early. It is opposite to skimming price. The low price policy is introduced for the sake of long-term survival and profitability and hence it has to receive careful consideration before implementation. The three circumstances in which penetrating pricing policy can be adopted are:

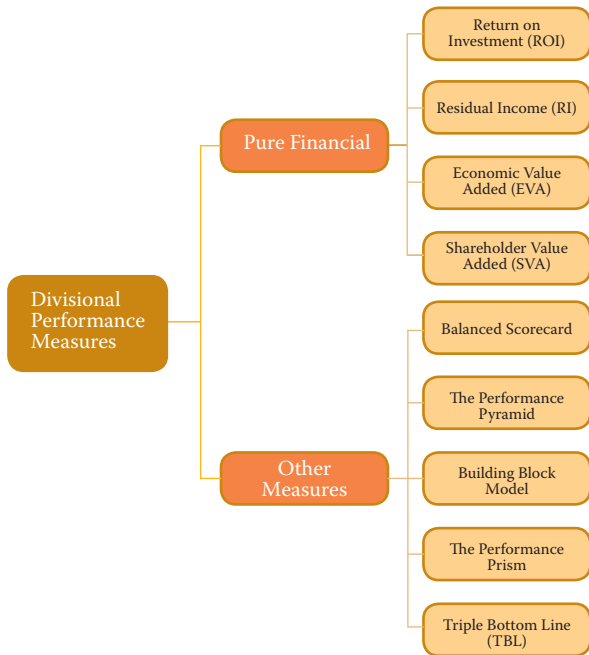
- When demand of the product is elastic to price.
- When there are substantial savings on large scale production.
- When there is threat of competition.

PERFORMANCE MEASUREMENT AND EVALUATION

Chapter Overview



Divisional Performance Measures



Return on Investment (ROI)

- ◆ ROI expresses divisional profit as a percentage of the assets employed in the division.
- ◆ ROI is a common measure and thus is ideal for comparison across corporate divisions for companies of similar size and in similar sectors. ROI can therefore lead to a lack of goal congruence.

Residual Income (RI)

- ◆ To overcome some of the dysfunctional consequences of ROI, the residual income approach can be used.
- ◆ For evaluating the economic performance of the division, residual income can be defined as divisional contribution less a cost of capital charge on the total investment in assets employed by the division.
- ◆ Residual income suffers from the disadvantages of being an absolute measure, which means that it is difficult to compare the performance of a division with that of other divisions or companies of a different size.

Economic Value Added (EVA)

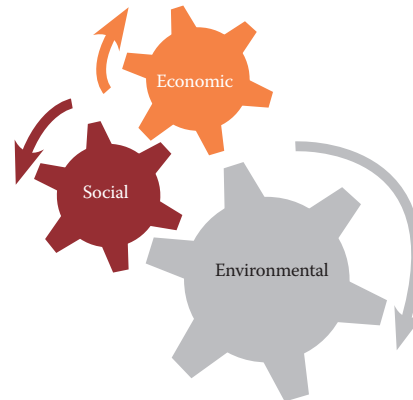
- ◆ Economic Value Added is a measure of economic profit. Economic Value Added is calculated as the difference between the Net Operating Profit After Tax (NOPAT) and the Opportunity Cost of Invested Capital. This opportunity cost is determined by multiplying the Weighted Average Cost of Debt and Equity Capital (WACC) and the amount of Capital Employed.

$$EVA = NOPAT - WACC \times \text{Capital}$$



Triple Bottom Line (TBL)

TBL incorporates the three dimensions-



- ◆ *Environmental*- measures the impact on resources, such as air, water, ground and waste emissions (Baumgartner & Ebner, 2010, p.79).
- ◆ *Social*- relates to corporate governance, motivation, incentives, health and safety, human capital development, human rights and ethical behaviour.
- ◆ *Economic*- refers to measures maintaining or improving the company's success.

Linking CSFs to KPIs and Corporate Strategy

In order to truly achieve effective measurement of business performance, the KPIs must be selected and designed in a way that ensures that the CSF is delivered if the KPI meets the threshold, and the CSFs in turn must be designed and constructed in a way that ensures that the company's strategic vision is delivered if the CSFs are met.

Balanced Scorecard

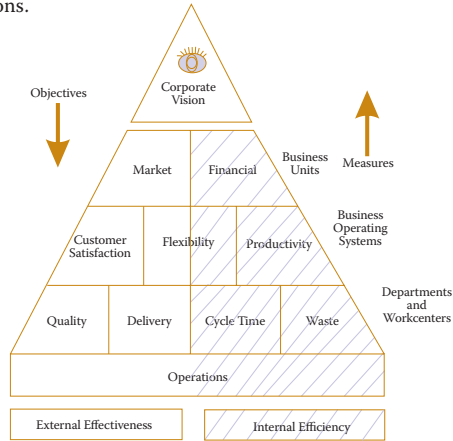
The balanced scorecard is a method which displays organisation's performance into four dimensions namely financial, customer, internal and innovation. The four dimensions acknowledge the interest of shareholders, customers and employees taking into account of both long-term and short-term goals. Kaplan and Norton classified performance measures into four business 'perspectives'

<p>Financial Perspective Financial performance measures indicate whether the company's strategy implementation and execution are contributing to its revenue and earnings.</p>	<p>Customer Perspective In this stage, companies identify customers and market segments in which they compete and also the means by which they provide value to these customers and markets.</p>
<p>Internal Business Perspective In this stage companies identify processes and activities which are necessary to achieve the objectives as identified at financial perspectives and customer perspective stage. These objectives may be achieved by reassessing the value chain and making necessary changes to the existing operating activities.</p>	<p>Learning and Growth Perspective In the learning and growth perspective, Companies determine the activities and infrastructure that the company must build to create long term growth, which are necessary to achieve the objectives set in the previous three perspectives.</p>

Performance Pyramid

The Performance Pyramid is also known as Strategic Measurement and Reporting Technique by Cross and Lynch 1991. They viewed businesses as performance pyramids. The attractiveness of this

framework is that it links the business strategy with day-to-day operations.

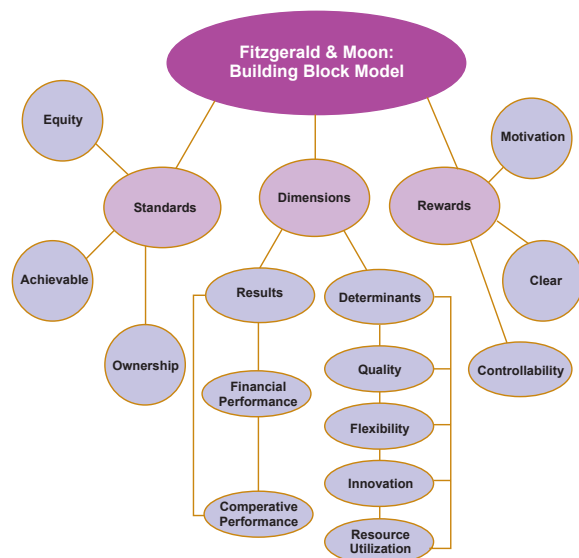


In the above pictorial presentation:

- ◆ 'Objectives' are shown from top to bottom.
- ◆ 'Measures' are from bottom to the top.
- ◆ At the top is the organization's *corporate vision* through which long term success and competitive advantages are described.
- ◆ The 'business level' focuses on achievements of organization's CSF in terms of *market* and *financial* measures.
- ◆ The marketing and financial success of a proposal is the initial focus for the achievement of corporate vision.
- ◆ The above business are linked to achieving *customers' satisfaction*, increase in *flexibility* and high *productivity*.
- ◆ The above driving forces can be monitored using the operating forces of the organization.
- ◆ The left-hand side of the pyramid contains *external* forces which are 'non-financial'.
- ◆ On the other hand, the right-hand side of the pyramid contains *internal efficiency* which are predominantly 'financial' in nature.

The Building Block Model

Fitzgerald and Moon proposed a Building Block Model which suggests the solution of performance measurement problems in *service industries*. But it can be applied to other manufacturing and retail businesses to evaluate business performance.

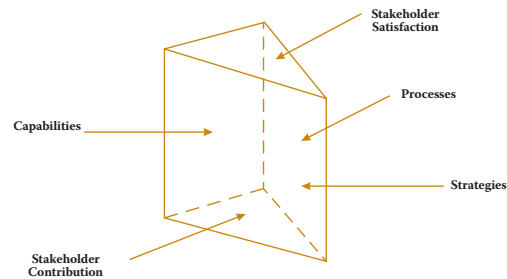


Performance Prism

The Performance Prism is an approach to performance management which aims to effectively meet the needs and requirements of **all stakeholders**. This is in contrast with the performance pyramid which tends to concentrate on *customers* and *shareholders* and is also in contrast with value based management, which prioritizes the needs of shareholders. There are five 'facets' to the Performance Prism which lead to key questions for strategy formulation and measurement design:

<p>Stakeholders Satisfaction The organization needs to focus on who are the stakeholders? What are the needs and wants of the stakeholders.</p>	<p>Strategies What are the strategies required by the organization to fulfill the wants and needs of the stakeholders?</p>	<p>Processes What are the necessary processes required for satisfying the above strategies?</p>
<p>Capabilities What capabilities does the organization need for operating and enhancing the process?</p>	<p>Stakeholders' Contributions It further takes into account what contribution does the management need from its stakeholders?</p>	

Comprehensiveness of Performance Prism



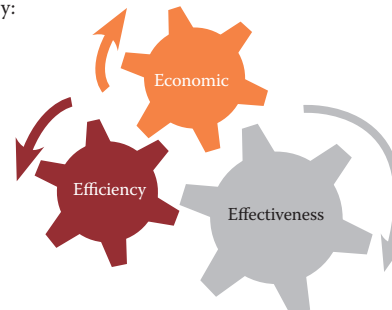
Performance Measurement in the Not for Profit Sector

The following are key challenges for measuring performance in not-for-profit organisations –

Benefits cannot be quantified	Benefits may accrue over a longer term
Key Challenges	
Measurement of utilisation of funds & expenditure	Multiple objectives

Value for Money (VFM) Framework

A framework which can be used for measurement of performance in not-for-profit sector is the Value for Money framework. Not-for-profit organisations are expected to provide value for money which is demonstrated by:

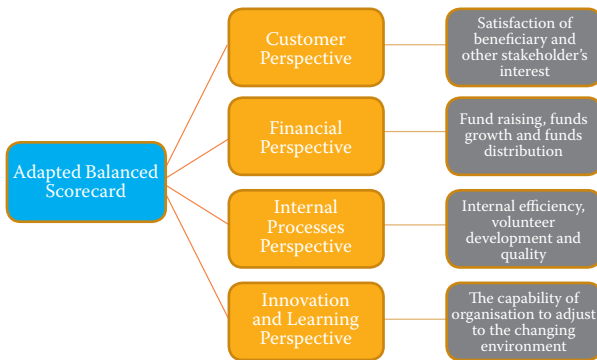


- ◆ **Effectiveness:** Whether the organisation has *achieved its desired mission and objectives*?
- ◆ **Efficiency:** Whether the *resources and funds* available to the organisation has been *utilised efficiently* i.e, maximum output has been obtained with minimum input?
- ◆ **Economy:** Whether the *desired output has been obtained using the lowest cost*? It must be noted that use of lowest cost approach should not compromise quality.

- ◆ The best use of financial as well as non-financial resources to achieve desired objectives and mission.
- ◆ The long-term impact (benefits) of the activities of the not-for-profit organisations.
- ◆ The quality of services provided by the organisations.

Adapted Balanced Scorecard

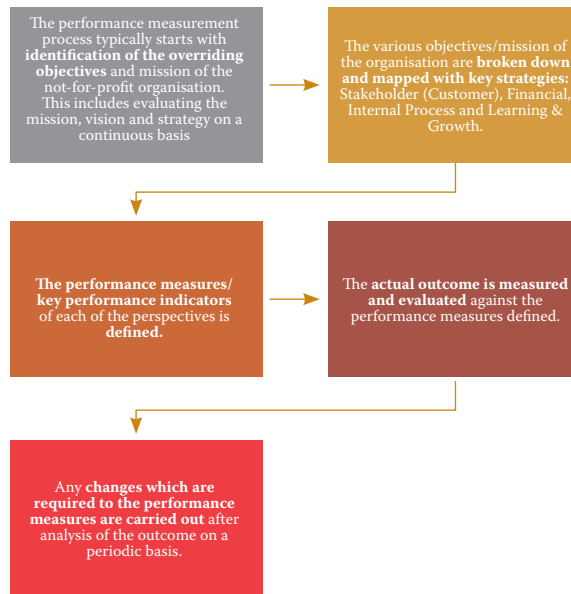
Kaplan developed the 'Adapted Balanced Scorecard' for measuring performance at NGOs. The main assumption of this adapted scorecard is that mission statement and not profits is the main point to be met.



Other Performance Measures

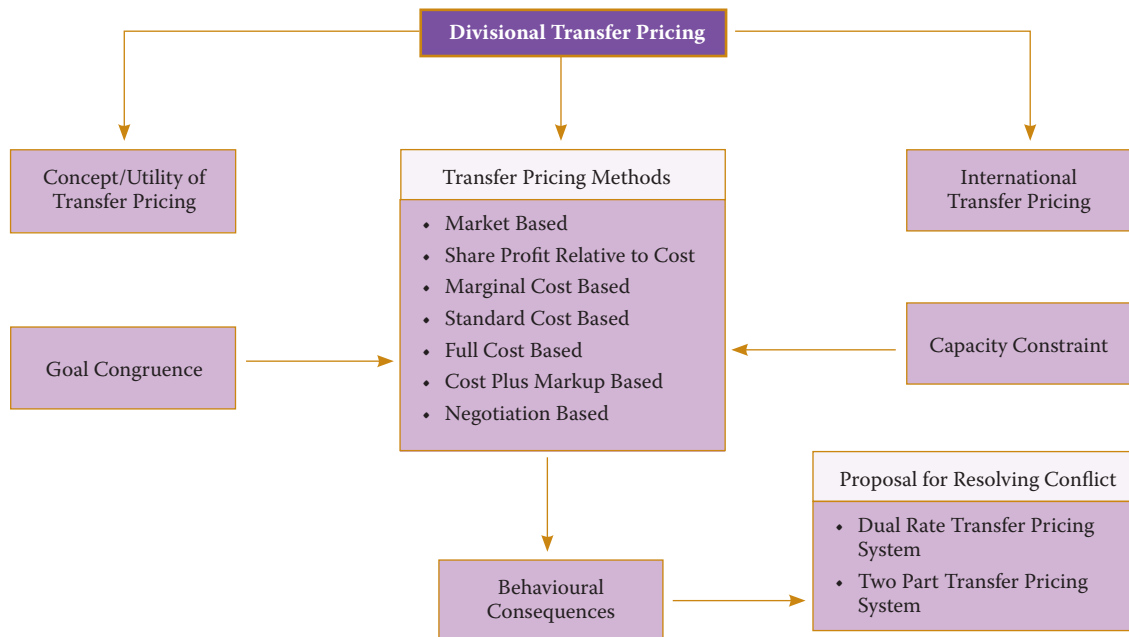
- ◆ The ability to raise funds to meet the objectives efficiently.
- ◆ Submitting periodic reports to the stakeholders in a transparent manner.

Performance Measurement Process

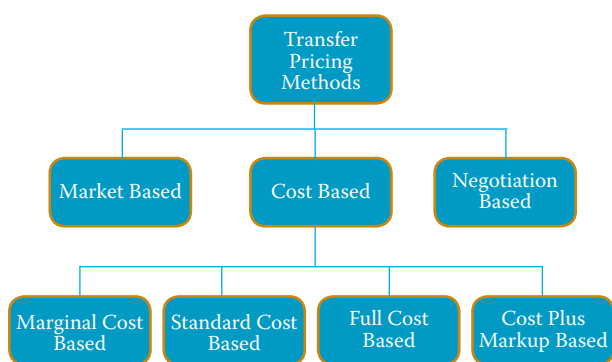


DIVISIONAL TRANSFER PRICING

Chapter Overview



Transfer Pricing Methods



Market Based Transfer Price

Transfer price is based on *market price* of goods or services similar to the ones transferred internally within divisions. The transfer can be recorded at the external market price, **adjusted for any costs that can be saved by internal transfer** e.g. selling and distribution expenses, packaging cost.

Advantages	Disadvantages
<ul style="list-style-type: none"> ◆ Since demand and supply determine market price, it is likely to be unbiased. ◆ Market prices are less ambiguous compared to cost-based pricing. ◆ Since the pricing is competitive, divisional performance can be linked more objectively to its contribution to the company's overall profits. 	<ul style="list-style-type: none"> ◆ Market price may not be completely unbiased, if a competitive environment does not exist. ◆ May not be suitable when market prices can fluctuate widely or quickly. ◆ Goods that are transferred may be at an intermediate stage in the production process. At times market price may not be available for such intermediate goods.

Shared Profit Relative to Cost Based Transfer Price

Shared profit relative to cost method is an alternative to market price method. Cost incurred by each division indicates the value it has added to the product cost, that is finally used to arrive at the selling price of the final product. The primary advantage of this method is that *it allocates profit based on the proportion of value addition to the product in terms of cost.*

Cost Based Transfer Price

Cost based pricing models are based on the *internal cost* records of the company. They may be used when the management wants to benchmark performance with the cost targets set within the company or may be an alternative *when market prices for the goods cannot be determined due to lack of comparable market.* Cost based transfer price may consider variable cost, standard cost, full cost and full cost plus mark-up. Therefore, the basis for cost price may be subjective and has to be adapted based on its suitability to the entity.

Advantages	Disadvantages
<ul style="list-style-type: none"> ◆ Performance can be benchmarked to internal cost targets (budgets). ◆ Information is more easily available as compared to market price. 	<ul style="list-style-type: none"> ◆ The cost basis on which transfer pricing is used can be subjective since there can be multiple ways of interpreting costs. ◆ Since cost is passed on to another division, there may be instances when managers of the supplying division may find little incentive to lower the cost of production by adopting cost efficient methods.

Marginal Cost Based Transfer Price

Transfer price is recorded *marginal cost* required to produce one additional unit:

Advantages	Disadvantages
<ul style="list-style-type: none"> ◆ Useful when the supplying division has excess capacity. 	<ul style="list-style-type: none"> ◆ No fixed cost or mark-up is allowed to be charged to the purchasing division. Each unit of internal sale will hence result in a loss at approximately fixed cost per unit.

Behavioral Consequences

In such a setup, profit evaluation is centralized at the entity level. Therefore, the supplying division may have little incentive to find measures for making cost efficient. Non-recovery of fixed costs would *demotivate the supplying division.* It may oppose certain decisions like capacity expansion or further infusion of investment, that lead to higher fixed costs.

Standard Cost Based Transfer Price

Transfer price is recorded at a *predetermined cost*, which is based on budgets and certain assumptions regarding factors of productions like capacity utilization, labor hours etc.

Advantages	Disadvantages
<ul style="list-style-type: none"> ◆ Performance evaluation can be done against budgeted cost targets. 	<ul style="list-style-type: none"> ◆ Profit performance measurement is centralized and cannot be measured for individual divisions.

Behavioral Consequences

Budgeted costs are generally based on historic records. Therefore, *little incentive* exists to make costs more efficient to improve profitability.

Full Cost Based Transfer Price

Transfer price is based on full product cost. It includes *cost of production plus a share of other costs of the value chain* like selling and distribution, general administrative expense, research and development etc.

Advantages	Disadvantages
<ul style="list-style-type: none"> ◆ Full cost of goods transferred is recovered, hence the supplying division will not show a loss. 	<ul style="list-style-type: none"> ◆ Since mark-up cannot be charged on internal transfers, the supplying division does not record any profit on these sales. This is a disincentive for the supplying division.

Cost plus a Mark-up Based Transfer Price

Transfer price is based on *full product cost plus a mark-up.* Mark-up could be a percentage of cost or of capital employed.

Advantages	Disadvantages
<ul style="list-style-type: none"> ◆ Since the supplying division makes a profit, this method addresses the disincentive problem discussed above in the full cost method. 	<ul style="list-style-type: none"> ◆ Since the transfer price under this method could closely approximate its market price, the purchasing division may bear a share of the selling expenses although none was incurred for such internal sales.

Behavioral Consequences

Special orders from purchasing division may typically be placed to meet short term demands. If transfer price is quoted at below full cost, it may be rejected because they could result in a loss for the supplying division. This could lead to *sub-optimization of resources*. Fixed costs remain constant in the short run, while the contribution margin from such special orders may have benefited the company as a whole. In such cases, management intervention has to happen for goal congruence.

Negotiation Based Transfer Price

This is a go-between between market and cost methods. Managers of the purchasing and supplying divisions independently negotiate and arrive at a mutually agreeable transfer price.

Advantages	Disadvantages
<ul style="list-style-type: none"> Managers are given autonomy to decide whether to purchase (or sell) from its sister unit or source then from (or to) external market. 	<ul style="list-style-type: none"> This method requires sufficient external information to be available regarding the external market price, terms of trade etc. Internal cost information must also be shared in order to negotiate a reasonable price.

Behavioral Consequences

While autonomy is given to the managers, top management intervention may be required if decisions lead to *sub-optimal utilization of resources*.

Negotiated prices depend on the ability of the manager to bargain on behalf of the division. This could affect the division's performance. The process may be time consuming that could even lead to conflict among the units.

Transfer Pricing and Goal Congruence

Since internal transfer pricing develops a competitive setting for managers of each division, it is possible that they may operate in the best interest of their individual performance. This can lead to *sub-optimal utilization of resources*. In such cases, transfer pricing policy may be established to promote goal congruence.

Range of transfer price that promotes goal congruence:

(i)	(ii)
<ul style="list-style-type: none"> Minimum Transfer Price (determined by the supplying division) = Additional Outlay Cost per unit + Opportunity Cost per unit. Additional Outlay Cost = Marginal Cost+ Any Additional Incidental Costs incurred by the supplying division e.g. storage, transportation etc. Opportunity Cost is the benefit that is foregone from selling internally rather than externally. 	<ul style="list-style-type: none"> Maximum Transfer Price (determined by the purchasing division) = Lower of Net Marginal Revenue and the External Buy-in Price Net Marginal Revenue = Marginal Revenue (i.e. Selling Price p.u.) – Marginal Cost to Purchasing Division



Transfer Pricing Decision, Different Circumstances

Different Capacity Levels

When the supplying division has *excess capacity*, the range for transfer pricing would be

(i)	(ii)
<ul style="list-style-type: none"> Minimum Transfer Price = Marginal Cost p.u. This ensures that the supplying department is able to recoup at least its additional outlay incurred on account of the transfer. Fixed cost is a sunk cost hence ignored. Since capacity can be utilized further, it would be optimum for the supplying division to charge only the marginal cost for internal transfer. The purchasing division gets the advantage, getting the goods at a lower cost than market. 	<ul style="list-style-type: none"> Maximum Transfer Price = Lower of Net Marginal Revenue and the External Buy-in Price

When the supplying division operates at *full capacity*, the range for transfer pricing would be

(i)	(ii)
<ul style="list-style-type: none"> Minimum Transfer Price = Marginal Cost p.u. + Opportunity Cost p.u. Since the supplying division is operating at full capacity, it has no incentive to sell the goods to the purchasing division at a price lower than the market price. If the internal order is accepted, capacity is diverted towards this sale. Hence the supplying division would additionally charge the lost contribution from external sales that had to be curtailed. 	<ul style="list-style-type: none"> Maximum Transfer Price = Lower of Net Marginal Revenue and the External Buy-in Price

Different Demand Levels

Therefore, while catering to different levels of demand, any *change in cost should also be accounted for* to calculate transfer pricing. The general rule for minimum and maximum range of transfer price applies here too.

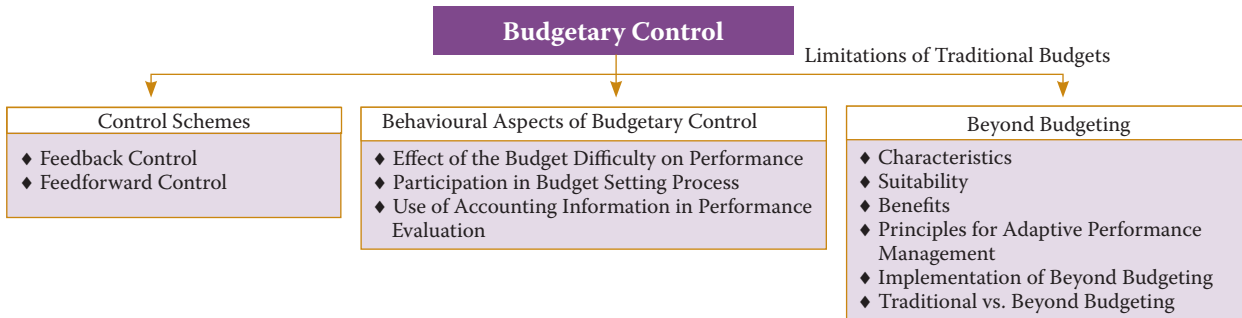
Proposals For Resolving Transfer Pricing Conflict

Conflict of interest between interests of individual divisions and the company can also be addressed by following the following systems for transfer pricing:

Dual Rate Transfer Pricing System	Two Part Transfer Pricing System
<ul style="list-style-type: none"> The <i>supplying division</i> records transfer price by including a normal profit margin thereby showing reasonable revenue. The <i>purchasing division</i> records transfer price at marginal cost thereby recording purchases at minimum cost. This allows for better evaluation of each division's performance. It also improves co-operation between divisions, promoting goal congruence and reduction of sub-optimization of resources. Drawbacks of Dual Pricing include: It can complicate the records, thereby may result in errors in the company's overall records. (ii) Profits shown by the divisions are artificial and need to be used only for internal evaluations. 	<ul style="list-style-type: none"> This pricing system is again aimed at resolving problems related to distortions caused by the full cost based transfer price. Transfer price = marginal cost of production + a lump-sum charge (two part to pricing). While marginal cost ensures recovery of additional cost of production related to the goods transferred, lump-sum charge enables the recovery of some portion of the fixed cost of the supplying division. Therefore, while the <i>supplying division</i> can show better profitability, the <i>purchasing division</i> can purchase the goods a lower rate compared to the market price.

BUDGETARY CONTROL

Chapter Overview



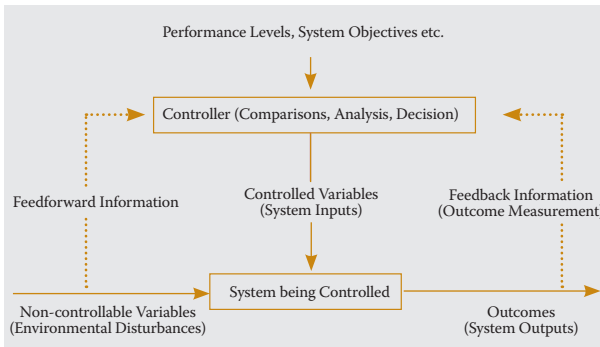
Budgetary Control

Budget is an estimation of revenues and expenses over a specified future period of time which needs to be compiled and *re-evaluated on a periodic basis* based on the needs of the organisation.

Budgetary Control is the process by which budgets are prepared for the future period and are compared with the actual performance for finding out variances, if any. In other words, Budgetary Control is a process with the help of which, managers set financial and performance goals, compare the actual results with the budgets, and adjust performance, as it is needed.

Feedback and Feed-Forward Control

Feedback and Feed-forward are two types of control schemes for systems that react automatically to changing environmental dynamics.



Feedback Control

Feedback as the name suggests is a reaction after an action has taken place. So, *there has to be an error* if we want to take corrective actions.

According to the CIMA's Official Terminology, *It is defined as: 'Measurement of differences between planned outputs and actual outputs achieved, and the modification of subsequent action and/or plans to achieve future required results. Feedback control is an integral part of budgetary control and standard costing systems.'*

A feedback system would simply compare the actual historical results with the budgeted results.

Limitations

Feedback control system does have some operational limitations. First, it *depends heavily on success of the error detection system*. Second, there may be a *time lag between the error detection, error confirmation, and error revision* during which actual results may change again.

Feed-forward Control

In certain cases, we may be able to measure the amount of error before it has actually taken place. We may thus be able to place a control mechanism *before the error takes place*. Feed-forward Control is one such Controlling system.

According to the CIMA's Official Terminology, *It is defined as the 'forecasting of differences between actual and planned outcomes and the implementation of actions before the event, to avoid such differences.'*

A feed-forward control system operates by comparing budgeted results against a forecast. Control action is triggered by differences between budgeted and forecasted results.

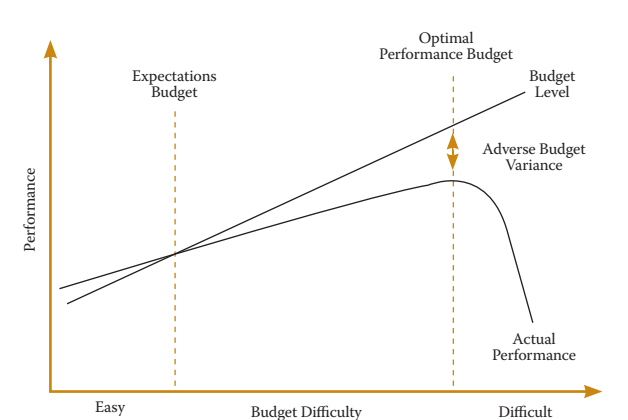
Any manager who ignores feed-forward control will contribute to the downfall of a company.

Limitations

The feed-forward process is an evaluation process and is concerned with the estimates of uncertain future. This problem of uncertainty is likely to limit application of the concept.

Study of future is not well developed; neither are the tools that have potential for overcoming the problem of uncertainty.

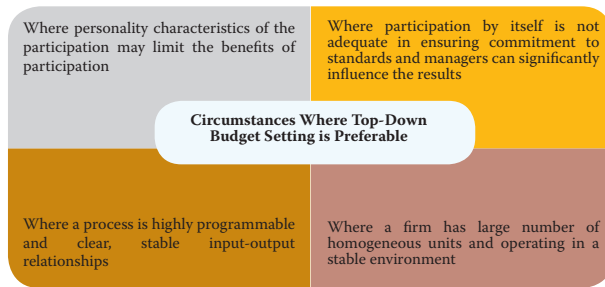
The Effect of Budget Difficulty on Performance



"Budget level that motivates the best level of performance may not be achievable. In contrast, the budget that is expected to be achieved motivates a lower level of performance as managers no longer aspire to

meet the budget target.” The balanced scorecard approach of Kaplan and Norton, and the building block approach of Fitzgerald and Norton can be a great help in ensuring that objectives (or targets), or budgets are set for a very wide range of factors, both financial and non-financial.

Circumstances Where Top-Down Budget Setting is Preferable



Use of Accounting Information in Performance Evaluation

Some dysfunctional consequences that arise with accounting measures of performance may not be due to the insufficiency of the performance measures, but rather may be outcome from the way in which the accounting measures are used. The accounting information provided by an *accounting system must be interpreted and used with care.*

Hofstede (1968) found that stress on the actual results in performance evaluation led to more extensive use of budgetary information, and this made the budget more relevant. However, this stress was associated with a feeling that the performance appraisal was unjust. To overcome this problem, the *correct balance must be established when the budgeted performance is evaluated.*

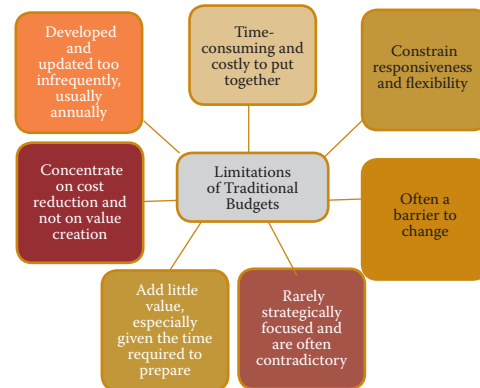
Hopwood (1976) observed three distinct styles of using budget and actual cost information in performance evaluation in manufacturing division of a large US company:

- ◆ *Budget Constrained Style:* The evaluation is based upon the Cost Centre head's ability continually to meet the budget on short term basis.
- ◆ *Profit Conscious Style:* Performance of the Cost Centre's head is linked to ability in increase the general effectiveness of his unit's operations in relation to the long- term goals of the organisation.
- ◆ *Non-Accounting Style:* Accounting data plays a relatively unimportant part in the supervisor's evaluation of the Cost Centre head's performance.

A Summary of the Effects of Three Styles of Management

	Style of Evaluation		
	Budget-Constrained	Profit-Conscious	Non-Accounting
Involvement with Costs	High	High	Low
Job-related Tension	High	Medium	Medium
Manipulation of Accounting Information	Extensive	Little	Little
Relations with Superiors	Poor	Good	Good
Relations with Colleagues	Poor	Good	Good

Beyond Budgeting (BB)



To overcome these limitations a tool came into force known as Beyond Budgeting. **Beyond Budgeting** is a leadership philosophy that relates to an alternative approach to budgeting which should be used instead of traditional annual budgeting.

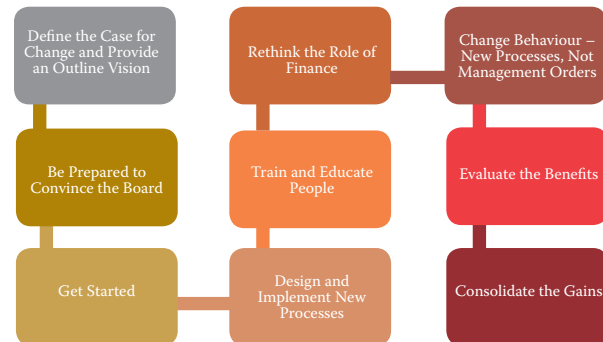
According to CIMA's Official Terminology- 'An idea that companies need to move beyond budgeting because of the inherent flaws in budgeting especially when used to set contracts. It is argued that a range of techniques, such as rolling forecasts and market related targets, can take the place of traditional budgeting'

BB identifies its two main advantages.

- ◆ It is a more *adaptive process* than traditional budgeting.
- ◆ It is a *decentralised process*, unlike traditional budgeting where leaders plan and control organisations centrally.

Implementation of Beyond Budgeting

There are nine steps that Hope and Fraser consider to be essential to implementing the Beyond Budgeting approach.



Conclusion on Budgeting



CASE STUDY

Essentials for Case Study

- ◆ Case Study is not about the quantity, but the quality.
- ◆ Prepare a plan for each issue.
- ◆ Decide what models to use and prioritize the issues.
- ◆ Identify the impact and alternative actions that could be taken, as well as the relevant concepts and calculations required.
- ◆ Answer should have a logical flow.
- ◆ Offer a detailed analysis of the issues and conclude with sound, well justified recommendations.
- ◆ Not to spend too much time on calculations.
- ◆ Do not place too much attention and time on the presentation.
- ◆ Quality of discussion on each issue which is most important, not the ranking order.
- ◆ Discuss each of the issues in depth, explaining their impact.
- ◆ Do not leave any of the issues undecided.
- ◆ Recommendations should include 'what to do', 'why to do it' and 'how to do it'.
- ◆ Identify ethical issues and then briefly justify.
- ◆ Recommendation should appear at the end of the report.
- ◆ Practice makes perfect.

Note:

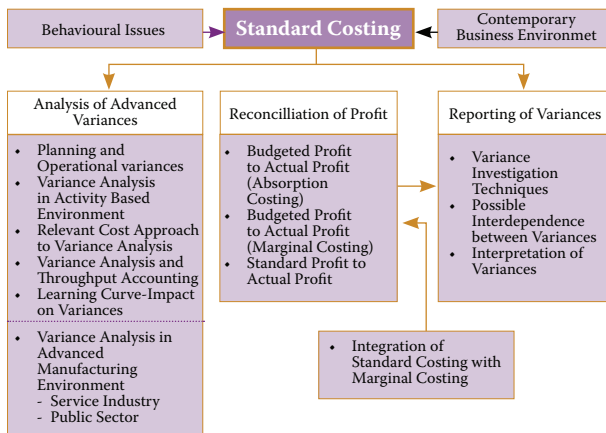
Not all topics of SCMPE have been covered in this capsule. However, our selection doesn't attach more importance to some topics and less to others.

“Competition on dimensions other than price—on product features, support services, delivery time, or brand image, for instance—is less likely to erode profitability because it improves customer value and can support higher prices.”

– Michael Porter

STANDARD COSTING

CHAPTER OVERVIEW



ANALYSIS OF ADVANCED VARIANCES

Variance analysis is examinable both at Intermediate Level (Cost and Management Accounting) and at Final Level (Strategic Cost Management and Performance Evaluation). One main difference in syllabus between the two papers is that the Final Level syllabus includes analysis of advanced variances, as follows:



Planning & Operational Variances

When the current environmental conditions are different from the anticipated environmental conditions (prevailing at the time of setting standard or plans) the use of routine analysis of variance for measuring managerial performance is not desirable / suitable. The variance analysis can be useful for measuring managerial performance if the variances computed are determined on the basis of revised targets / standards based on current actual environmental conditions.

In order to deal with the above situation i.e. to measure managerial performance with reference to **material, labour and sales variances**, it is necessary to compute the Planning and Operational Variances.

Planning Variance

A Planning Variance simply compares a revised standard to the original standard.

Classification of variances caused by *ex-ante* budget allowances being changed to an *ex post* basis. Also, known as a revision variance.

Operational Variance

An Operational Variance simply compares the actual results against the revised amount.

Operating Variances would be calculated after the planning variances have been established and are thus a realistic way of assessing performance.

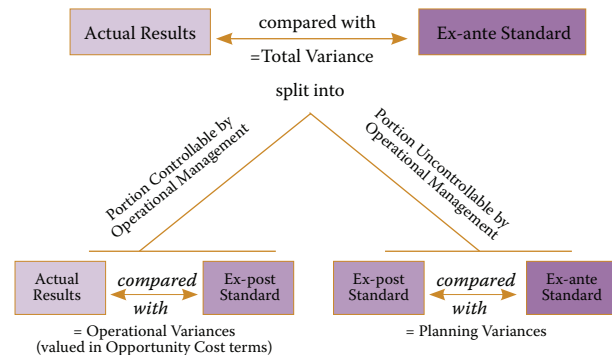
Classification of variances in which non-standard performance is defined as being that which differs from an *ex post* standard. Operational variances can relate to any element of the standard product specification.

Standard ex ante

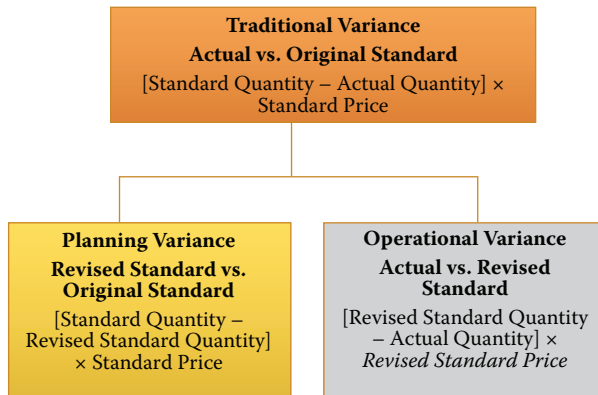
Before the event. An ex ante budget or standard is set before a period of activity commences.

Standard, ex post

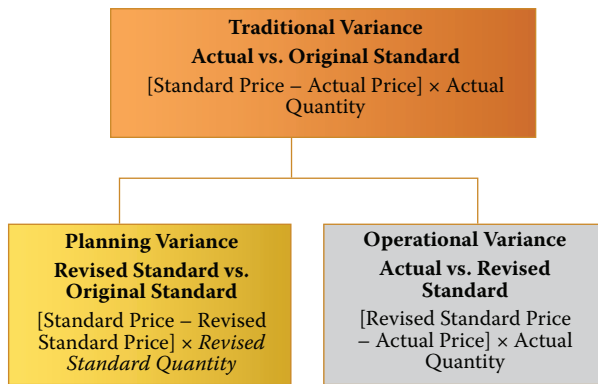
After the event. An ex post budget, or standard, is set after the end of a period of activity, when it can represent the optimum achievable level of performance in the conditions which were experienced. Thus, the budget can be flexed, and standards can reflect factors such as unanticipated changes in technology and in price levels. This approach may be used in conjunction with sophisticated cost and revenue modelling to determine how far both the plan and the achieved results differed from the performance that would have been expected in the circumstances which were experienced.



Direct Material Usage Variance



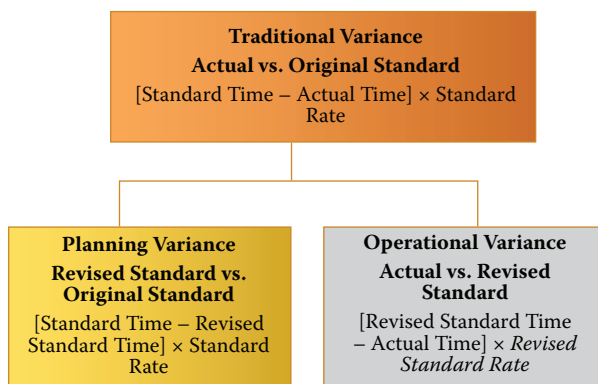
Direct Material Price Variance



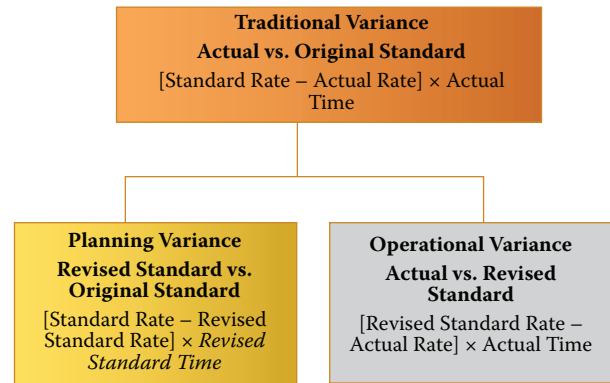
Note: Direct Material Usage Operational Variance using *Standard Price*, and the Direct Material Price Planning Variance based on *Actual Quantity* can also be calculated. This approach reconciles the Direct Material Price Variance and Direct Material Usage Variance calculated in part.

Like Material Variances, here also Labour Efficiency and Wage Rate Variances should also be adjusted to reflect changes in environmental conditions that prevailed during the period.

Direct Labour Efficiency Variance



Direct Labour Rate Variance



Note: Direct Labour Efficiency Operational Variance using *Standard Rate*, and the Direct Labour Rate Planning Variance based on *Actual Hours* can also be calculated. This approach reconciles the Direct Labour Rate Variance and Direct Labour Efficiency Variance calculated in part.

The conventional Sales Volume Variance reports the difference between actual and budgeted sales valued at the standard price per unit. The variance just indicates whether sales volume is greater or less than expected. It does not indicate **how will sales management has performed**. *In order to assess the performance of sales management, market conditions prevailing during the period should be taken into consideration.*

Accordingly, the sales volume variance can be sub-divided into a planning variance (market size variance) and operational variance (market share variance).

A Planning Variance simply compares a revised standard to the original standard. An Operational Variance simply compares the actual results against the revised amount. Controllable Variances are those variances which arises due to inefficiency of a cost centre /department. Uncontrollable Variances are those variances which arises due to factors beyond the control of the management or concerned department of the organization.

Planning variances are generally *not controllable*. Where a revision of standards is required due to environmental/ technological changes that were not anticipated at the time the budget was prepared, the planning variances are truly *uncontrollable*. However, standards that failed to anticipate known market trends when they were set will reflect faulty standard-setting; it could be argued that these variances were controllable at the planning stage.

Variance Analysis in Activity-Based Costing

Variance analysis can be applied to activity costs (such as setup costs, product testing, quality testing etc.) to gain understanding into why actual activity costs vary from activity costs in the static budget or in the flexible budget.

Interpreting cost variances for different activities requires understanding whether the costs are output unit-level, batch level, product sustaining, or facility sustaining costs².

We use the similar track to variance analysis for activity-based costing as for traditional costing. The price variance is the difference between standard price and actual price for the actual quantity of input used for each cost driver. The efficiency variance measures the difference between the actual amount of cost driver units used, and the standard allowed to make the output. We multiply the difference in quantities by the standard price per cost driver to get the rupee value of the variance³.

ABC approach is based on the assumption that the overheads are basically variable (but variable with the delivery numbers and not the units output). The **efficiency variance** reports the cost impact of undertaking more or less activities than standard, and the **expenditure variance** reports cost impact of paying more or less than standard for the actual activities undertaken⁴.

Learning Curve- Impact on Variances

Learning curve is a geometrical progression, which reveals that there is steadily decreasing cost for the accomplishment of a given repetitive operation, as the identical operation is increasingly repeated. The amount of decrease will be less and less with each successive unit produced. As more units are produced, people involved in production become more efficient than before. Each additional unit takes less time to produce. The amount of improvement or experience gained is reflected in a decrease in man-hours or cost. Where learning takes place with a regular pattern it is important to take account of reduction in labour hours and cost per unit.

Automated manufacturing is unlikely to have much variation or to display a regular learning curve. In less-automated processes, however, where learning curves do occur, *it is important to take the resulting decline in labour hours and costs into account in setting standards, determining prices, planning production, or setting up work schedules.*

With the help of the learning curve theory the standard time of any batch or unit can be computed then compare the actual data with the standard and compute the variances.

Relevant Cost Approach to Variance Analysis

Traditional approach to variance analysis is to compute variances based on total actual cost for production inputs and total standard cost applied to the production output. This is ambiguous, when inputs are limited. Failure to use limited inputs properly leads not only to increased acquisition cost but also to a lost contribution. Therefore, it is necessary to consider the *lost contribution* in variance analysis. When this approach is used, price or expenditure variances are not affected.

Variance Analysis and Throughput Accounting

Variance analysis has no emphasis on the constrained resources. Instead, it is based on the *efficiency and cost of operation* of each part of the manufacturing system, rather than the ability of the entire system to generate a profit. Thus, a firm may find that it attains excellent efficiency and price variances by having long manufacturing rounds and buying in large quantities. A system based on constraint management will likely show very odd results under a variance reporting system.

For example, when a terminal upstream from the constrained resource runs out of work, a manager functioning under throughput accounting system will shut it down in order to avoid the formation of an unnecessary level of work-in-process inventory. However, this will result into a negative labor efficiency variance, since the terminal's staff is not actively producing anything.

Throughput accounting does use variance analysis, but not the ones used by a traditional system. Instead, its main emphasis is on tracking variations in the size of the inventory buffer placed before the constrained resource, to confirm that the constraint is never halted due to an inventory shortage.

Variance Analysis in Advanced Manufacturing Environment/ High-Technology Firms

The variance analysis generally applies to all types of organizations; however, high-technology firms like Audio Technology, Automotive, Computer Engineering, Electrical and Electronic Engineering, Information Technology, Medical

devices, Nanotechnology, Semiconductors, Telecommunication apply the model somewhat differently. Now much of electronic industry is highly automated. A large part of manufacturing process is computerized.

In the high-technology environment that is emerging, many costs that once were largely variable have become fixed, most becoming committed fixed cost. Some high technology manufacturing organizations have found that the two largest variable costs involve materials and power to operate machines. In these companies, the emphasis of variance analysis is placed on direct materials and variable manufacturing overhead.

Much of the manufacturing labour consists of highly skilled experts/ operators/ programmers are largely committed cost. Firms don't want to take risk losing such highly trained personnel even during an economic downturn. The result is **less direct labour and more overhead**. For these firms labour variances may no longer be meaningful because direct labour is a committed cost, not a cost expected to vary with output.

Standard Costing in Service Sector

Standard Costing can be equally applicable for various types of industries for example accountants, solicitors, dentists, hairdressers, transport companies and hotels. Service industries comprise a wide range of different businesses that differ in size and types of service provided. Standard costing and variance analysis is more tough to apply to service sector organizations as *major portion of their cost is comprised of overhead expenses rather than production expenses*. While traditional variance analysis of overheads does not deliver very useful information for overheads control purposes, **application of activity based costing can provide an effective basis for variance analysis** of overheads in service sector organizations although this may need significant time and effort in the implementation of a MIS.

McDonaldization⁵

McDonaldization is a process of rationalisation, which takes a task and breaks it down into smaller tasks. This is repeated until all tasks have been broken down to the smallest possible level. The resulting tasks are then rationalised to find the single most efficient method for completing each task. All other methods are then deemed inefficient and discarded.

The impact of McDonaldization is that standards can be more accurately set and assessed. It can be easily ascertained that how much time and cost should go into each activity. The principles can be applied to many other services, such as hairdressing, dentistry, or opticians' services.

Standard Costing in Public Sector⁶

In order to cost control in public sector (e.g. street cleaning refuse disposal and so on), regular variance analysis is required. Actual unit costs should be calculated on a monthly basis and compared with estimated unit cost. To achieve this comparison, information needs to be maintained about the unit of service adopted. For example, statistics would be maintained on the number of visits made and the number of hours worked. In this example, time recording may be beneficial in providing the detailed information necessary for variance analysis. Actual monthly costs should be taken from the organisation's financial management system and each month financial reports should be produced which offer an accurate image of budgeted vs actual expenditure. These reports are must for budgetary control. Actual expenditure reported on financial systems may require *some modification* to take account of:

- ◆ Trade Payables (services used but bills unpaid)
- ◆ Accruals (services used but bills yet to be received)
- ◆ Timing Differences (some costs are not incurred evenly over the year)

STANDARD MARGINAL COSTING

Standards and Variances can be calculated on the basis of marginal costing. A standard marginal costing system incorporates only costs which are variable to the product. Accordingly, the absorption of fixed costs, and the variances derived therefrom, do not feature in a standard marginal costing system. **When Marginal Costing is in use there is no Overhead Volume Variance, because Marginal Costing does not absorb Fixed Overhead.** Fixed Overhead Expenditure Variance is the only variance for Fixed Overhead in a Marginal Costing system. It is calculated as in an Absorption Costing system.

RECONCILIATION OF PROFIT

Generally, under variance analysis we compute various variances from the actual and the standard/budgeted data. Sometimes all or a few variances and actual data are made available and from that we are required to prepare standard product cost sheet, original budget and to reconcile the budgeted profit with the actual profit. Some important concepts are given below:

**Reconciliation Statement-I
Budgeted Profit to Actual Profit (Absorption Costing)**

Budgeted Profit	<input type="checkbox"/>
(Budgeted Quantity × Standard Margin)	
Effect of Variances	
Material Cost Variance	
Material Price Variance	<input type="checkbox"/>
Material Usage Variance	
Material Mix Variance	<input type="checkbox"/>
Material Yield Variance	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Labour Cost Variance	
Labour Rate Variance	<input type="checkbox"/>
Labour Idle Time Variance	<input type="checkbox"/>
Labour Efficiency Variance	
Labour Mix Variance	<input type="checkbox"/>
Labour Sub-Efficiency Variance	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Variable Overhead Cost Variances	
Variable Overhead Expenditure Variance	<input type="checkbox"/>
Variable Overhead Efficiency Variance	<input type="checkbox"/> <input type="checkbox"/>
Fixed Overhead Cost Variances	
Fixed Overhead Expenditure Variance	<input type="checkbox"/>
Fixed Overhead Volume Variance	
Fixed Overhead Capacity Variance	<input type="checkbox"/>
Fixed Overhead Efficiency Variance	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Sales Margin Variances (in terms of Profit)	
Sales Margin Price Variance	<input type="checkbox"/>
Sales Margin Volume Variance	
Sales Margin Mix Variance	<input type="checkbox"/>
Sales Margin Quantity Variance	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Actual Profit	<input type="checkbox"/>

**Reconciliation Statement-II
Budgeted Profit to Actual Profit (Marginal Costing)**

Budgeted Profit	<input type="checkbox"/>
(Budgeted Quantity × Standard Margin)	
Effect of Variances	
Material Cost Variance	
Material Price Variance	<input type="checkbox"/>
Material Usage Variance	
Material Mix Variance	<input type="checkbox"/>
Material Yield Variance	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Labour Cost Variance	
Labour Rate Variance	<input type="checkbox"/>
Labour Idle Time Variance	<input type="checkbox"/>
Labour Efficiency Variance	
Labour Mix Variance	<input type="checkbox"/>
Labour Sub-Efficiency Variance	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Variable Overhead Cost Variances	
Variable Overhead Expenditure Variance	<input type="checkbox"/>
Variable Overhead Efficiency Variance	<input type="checkbox"/> <input type="checkbox"/>
Fixed Overhead Cost Variances	
Fixed Overhead Expenditure Variance	<input type="checkbox"/>
Fixed Overhead Volume Variance	
Fixed Overhead Capacity Variance	NA
Fixed Overhead Efficiency Variance	NA NA <input type="checkbox"/>
Sales Contribution Variances	
Sales Contribution Price Variance	<input type="checkbox"/>
Sales Contribution Volume Variance	
Sales Contribution Mix Variance	<input type="checkbox"/>
Sales Contribution Quantity Variance	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Actual Profit	<input type="checkbox"/>



Reconciliation Statement-III
Standard Profit to Actual Profit (Absorption Costing)

Standard Profit				<input type="checkbox"/>
(Actual Quantity × Standard Margin)				
Effect of Variances				
Material Cost Variance				
Material Price Variance		<input type="checkbox"/>		
Material Usage Variance				
Material Mix Variance	<input type="checkbox"/>			
Material Yield Variance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Labour Cost Variance				
Labour Rate Variance		<input type="checkbox"/>		
Labour Idle Time Variance		<input type="checkbox"/>		
Labour Efficiency Variance				
Labour Mix Variance	<input type="checkbox"/>			
Labour Sub-Efficiency Variance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Variable Overhead Cost Variances				
Variable Overhead Expenditure Variance		<input type="checkbox"/>		
Variable Overhead Efficiency Variance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Fixed Overhead Cost Variances				
Fixed Overhead Expenditure Variance		<input type="checkbox"/>		
Fixed Overhead Volume Variance				
Fixed Overhead Capacity Variance	<input type="checkbox"/>			
Fixed Overhead Efficiency Variance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Sales Margin Variance (in terms of Profit)				
Sales Margin Price Variance		<input type="checkbox"/>		
Sales Margin Volume Variance				
Sales Margin Mix Variance	NA			
Sales Margin Quantity Variance	NA	NA	<input type="checkbox"/>	<input type="checkbox"/>
Actual Profit				<input type="checkbox"/>



INVESTIGATION OF VARIANCES

Variances focus attention on deviations, but all deviations cannot be taken as 'out of Control' situations. However, variance investigation on the other hand may not be fruitful in any given situation considering that it requires resources and thus a **cost benefit analysis** should be considered before undertaking investigation.

Investigating variances is a key step in using variance analysis as part of performance management. "Interpretation may suggest possible cause of variances but investigation must arrive at definite conclusions about the cause of the variance so that action to correct the variance can be effective." There are behavioural as well as technical consequences to the decision to investigate variances. If no variances are investigated, it may cease to be motivated by the system which produce variances. Investigating favourable and adverse variances may create positive behavioural reinforcements, with implications for motivation, aspiration levels and inter-departmental relationships.

Factors to be Considered When Investigating Variance

Certain set of factors should be considered before undertaking the variance investigation of the actual performance against the estimates set.

Size: A standard is seen as an average of the estimates and therefore small variations seen from the standard should be ignored and not investigated further. In addition, organizations can establish limits and the variances seen beyond those limits should be undertaken for further investigation.

Type of Variance: Adverse variance is given more importance by the organization over favourable variances seen with regards to the estimates.

Cost: The costs associated with the undertaking of the investigation should be lower than the benefits associated with the investigation of variances for the organization to undertake the said investigation.

Pattern in Variance: The variances need to be monitored over a period of time and if the variance of a particular cost is seen to be worsening over time then in that case the investigation in relation to the variance needs to be undertaken.

Budgetary Process: In case the budgetary process is uncontrollable and unrealistic then in that case the investigation should be re-evaluating the budgetary process rather than undertaking investigation of the variances.

Method Used for Investigating Variance⁷

Simple Rule of Thumb Model

It is based on arbitrary criteria such as investigating if the absolute size of a variance is greater than a certain amount or if the ratio of the variance to the total cost exceeds some predetermined percentage. They are based on *managerial judgement* and do not consider statistical significance.

Statistical Decision Model

For the statistical models, two mutually exclusive states are possible. First assumes that the system is 'In Control' and a variance is simply due to *random fluctuations around the expected outcome*. The second possible state is that the system is in some way 'Out of Control' and corrective action can be taken to remedy the situation.

POSSIBLE INTERDEPENDENCE BETWEEN VARIANCES

It is a term used to express the way in which the cause of one variance may be wholly or partially explained by the cause of another variance. For control purposes, it might therefore be essential to look at several variances together and not in isolation. Some **examples** of interdependence between variances are listed below:

Use of cheaper material which is poorer quality, the material price variance will be favourable, but this can cause more wastage of materials leading to adverse usage variance.

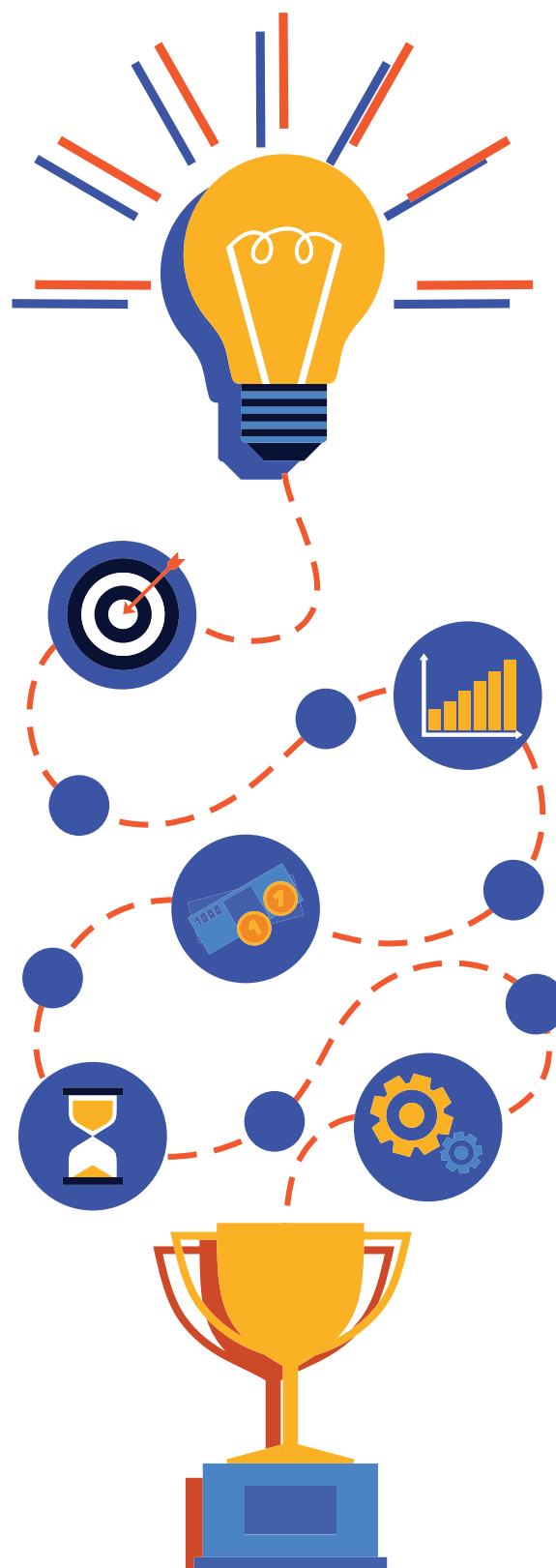
Using more skilled labour to do the work will result in an adverse labour rate variance, but productivity might be higher as a result due to experienced labour.

Changing the composition of a team might result in a cheaper labour mix (favourable mix variance) but lower productivity (adverse yield variance).

Workers trying to improve productivity (favourable efficiency variance) in order to get bonus (adverse rate variance) might use materials wastefully in order to save time (adverse materials usage).

Cutting sales prices (adverse sales price variance) might result in higher sales demand from customers (favourable sales volume variance).

Similarly, favourable sales price variance may result in adverse sales volume variance.



INTERPRETATION OF VARIANCES

There can be a number of *potential causes leading to variances* in the operational costs



Material Price Variance

- ◆ Might be caused due to the *use of a different supplier*.
- ◆ *Order size* can result in variance.
- ◆ Any form of unexpected increase in *buying costs* such as higher delivery charges.
- ◆ Efficiency or inefficiency associated with the *buying procedure* adopted.
- ◆ Lack of appropriate *inventory control* can result in emergency purchase of material resulting in adverse variance.

Labour Rate Variance

- ◆ Unexpected increase in the *pay rate* of labour.
- ◆ Level of *experience* of the labour can impact the direct cost of labour.
- ◆ Payment of bonuses added to the direct labour costs.

Material Usage Variance

- ◆ Purchase of inferior *quality material*.
- ◆ Implementation of better *quality control*.
- ◆ Increased *efficiency* in production can help in bringing down wastage rate.
- ◆ Changes made in the *material mix*.
- ◆ Careless way of *handling material* by production department.
- ◆ *Change in method* of production/ design.
- ◆ *Pilferage* of material from the production department.
- ◆ *Poor inspection*.

Labour Efficiency Variance

- ◆ Improvement in work or productivity *efficiency*.
- ◆ *Workforce mix* can have an impact upon labour efficiency levels.
- ◆ *Industrial action* in relation to workforce.
- ◆ *Poor supervision* of the workforce.

Labour Rate Variance

- ◆ Change in the *composition* of the workforce can impact direct labour costs.

Labour Efficiency Variance

- ◆ *Learning curve effect* upon the labour efficiency levels.
- ◆ *Resource shortages* causing an unexpected delay and lowering of labour efficiency levels.
- ◆ Using inferior *quality of material*.
- ◆ *Introduction of new machinery* resulting in improvement of labour productivity levels.

Fixed Overhead Variance

- ◆ Fixed Overhead Expenditure Variance (adverse) are caused by *spending in excess* of the budget.
- ◆ Fixed Overhead Volume Variance is caused by *changes in production volume*.

Variable Overhead Variance

- ◆ Variable Overhead Expenditure Variance are often caused by changes in machine running costs.
- ◆ Variable Overhead Efficiency Variances- Causes are similar to those for a direct labour efficiency variance.

Sales Price Variance

- ◆ Higher *discounts* given to customers in order to encourage bulk purchases.
- ◆ The effect of low price offers during a *marketing campaign*.
- ◆ *Poor performance by sales personnel*.
- ◆ *Market conditions or economic conditions* forcing changes in prices across the industry.

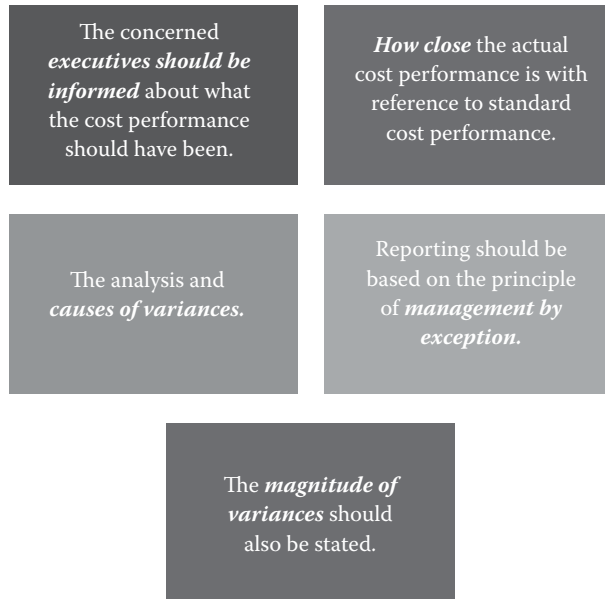
Sales Volume Variance

- ◆ Successful or unsuccessful *direct selling efforts*.
- ◆ Successful or unsuccessful *marketing efforts* (for example, the effects of an advertising campaign).
- ◆ Unexpected changes in *customer preferences or buying patterns*.
- ◆ Failure to satisfy demand due to *production difficulties*.
- ◆ Higher demand due to a *cut in selling prices*, or lower demand due to an *increase in sales prices*.

REPORTING OF VARIANCES

Computation of variances and their reporting is not the final step towards the control of various elements of cost. It in fact demands an analysis of variances from the side of the executives, to ascertain the correct reasons for their occurrence. After knowing the exact reasons, it becomes their responsibility to take necessary steps so as to **stop the re-occurrence of adverse variances in future**. To enhance the utility of such a reporting system it is necessary that such a system of reporting should not only be prompt but should also facilitate the concerned

managerial level to take necessary steps. Variance reports should be prepared after keeping in view its ultimate use and its periodicity. Such reports should highlight the essential cost deviations and possibilities for their improvements. In fact the variance reports should give due regard to the following points:-



BEHAVIOURAL ISSUES⁸

Variance analysis may encourage *short-termism* due to their inherent tendency towards short-term, quantified objectives and results.

A negative perception of an organization's variance analysis process can also encourage other *sub-optimal behaviour* among employees such as attempts to include budget slacks.

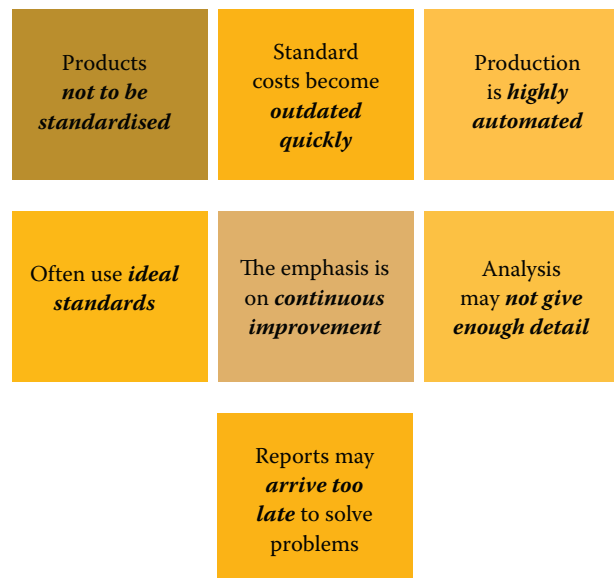
The behavioural issues connected with variance analysis could be managed by participating employees during budget setting so that they do not assess the procedure as biased. It is also vital for

an organization's performance measurement system to be based on an extensive range of *quantitative* and *qualitative* measures so as to encourage management to adopt a long-term view that is aligned with an organization's strategic direction.

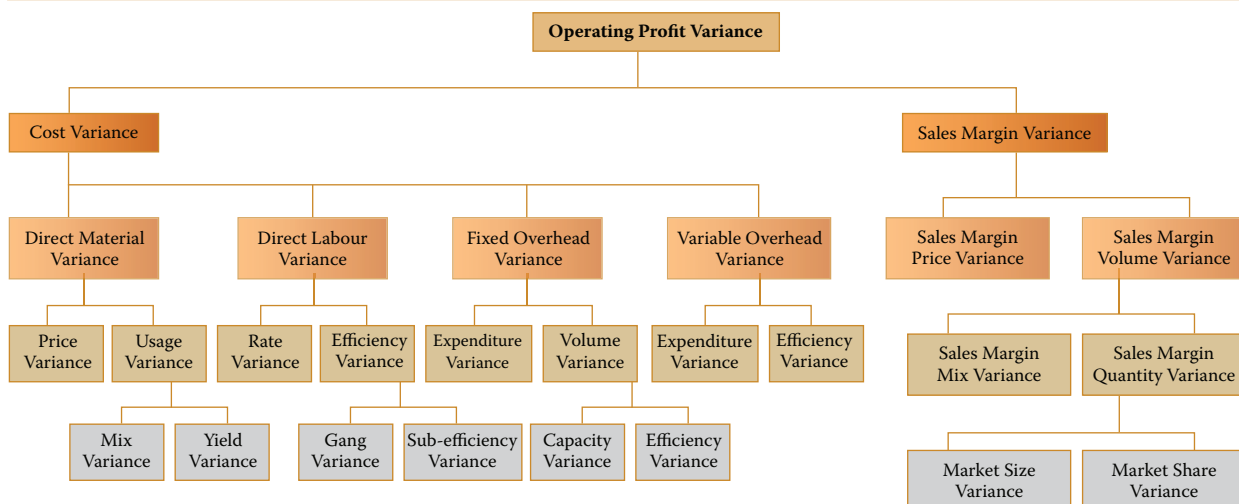
Ethics⁹

Variance analysis for evaluating performance can have strong ethical consequences. For example, standard costing methods have been proposed for medicine as a means for improving performance. Interpretation of a favourable variance may be difficult because it either reflects insufficient treatment or compliance to guidelines. Most hospitals in various countries are reimbursed as specified by the diagnostic related groups (DRG). Each DRG has specified standard "length of stay". If a patient leaves the hospital early, the hospital is financial impacted favourably but a patient staying longer than the specified time costs the hospital money.

STANDARD COSTING IN CONTEMPORARY BUSINESS ENVIRONMENT¹⁰



FORMULAE



Sales Variances (Absorption Costing)



* in terms of profit

Note:

BQ = Budgeted Sales Quantity
 AQ = Actual Sales Quantity
 RAQ = Revised Actual Sales Quantity
 = Actual Quantity Sold Rewritten in Budgeted Proportion
 SM = Standard Margin
 = Standard Price per Unit – Standard Cost per Unit
 AM = Actual Margin
 = Actual Sales Price per Unit – Standard Cost per Unit

Market Size Variance
 Budgeted Market Share % × (Actual Industry Sales Quantity in units – Budgeted Industry Sales Quantity in units) × (Average Budgeted Margin per unit) **Or**
 (Budgeted Market Share % × Actual Industry Sales Quantity in units – Budgeted Market Share % × Budgeted Industry Sales Quantity in units) × (Average Budgeted Margin per unit) **Or**
 (Required Sales Quantity in units – Total Budgeted Quantity in units) × (Average Budgeted Margin per unit)

Market Share Variance
 (Actual Market Share % – Budgeted Market Share %) × (Actual Industry Sales Quantity in units) × (Average Budgeted Margin per unit) **Or**
 (Actual Market Share % × Actual Industry Sales Quantity in units – Budgeted Market Share % × Actual Industry Sales Quantity in units) × (Average Budgeted Margin per unit) **Or**
 (Total Actual Quantity in units – Required Sales Quantity in units) × (Average Budgeted Margin per unit)

Market Size Variance + Market Share Variance
 (Required Sales Quantity in units – Total Budgeted Quantity in units) × (Average Budgeted Margin per unit) **Add**
 (Total Actual Quantity in units – Required Sales Quantity in units) × (Average Budgeted Margin per unit) **Equals to**
 (Total Actual Quantity in units – Total Budgeted Quantity in units) × (Average Budgeted Margin per unit)

Sales Margin Quantity Variance

Sales Variances (Marginal Costing)



Note:

BQ = Budgeted Sales Quantity
 AQ = Actual Sales Quantity
 RAQ = Revised Actual Sales Quantity
 = Actual Quantity Sold Rewritten in Budgeted Proportion
 SC = Standard Contribution
 = Standard Price per Unit – Standard Cost (variable) per Unit
 AC = Actual Contribution
 = Actual Sales Price per Unit – Standard Cost (variable) per Unit

Market Size Variance
 Budgeted Market Share % × (Actual Industry Sales Quantity in units – Budgeted Industry Sales Quantity in units) × (Average Budgeted Contribution per unit) **Or**
 (Budgeted Market Share % × Actual Industry Sales Quantity in units – Budgeted Market Share % × Budgeted Industry Sales Quantity in units) × (Average Budgeted Contribution per unit) **Or**
 (Required Sales Quantity in units – Total Budgeted Quantity in units) × (Average Budgeted Contribution per unit)

Market Share Variance
 (Actual Market Share % – Budgeted Market Share %) × (Actual Industry Sales Quantity in units) × (Average Budgeted Contribution per unit) **Or**
 (Actual Market Share % × Actual Industry Sales Quantity in units – Budgeted Market Share % × Actual Industry Sales Quantity in units) × (Average Budgeted Contribution per unit) **Or**
 (Total Actual Quantity in units – Required Sales Quantity in units) × (Average Budgeted Contribution per unit)

Market Size Variance + Market Share Variance
 (Required Sales Quantity in units – Total Budgeted Quantity in units) × (Average Budgeted Contribution per unit) **Add**
 (Total Actual Quantity in units – Required Sales Quantity in units) × (Average Budgeted Contribution per unit) **Equals to**
 (Total Actual Quantity in units – Total Budgeted Quantity in units) × (Average Budgeted Contribution per unit)

Sales Contribution Quantity Variance

- ◆ **Sales Price Variance** is equal to **Sales Margin/ Contribution Price Variance**. This is because, for the actual quantity sold, standard cost remaining constant, change in selling price will have equal impact on turnover and profit/ contribution.
- ◆ **Sales Margin Volume Variance** is equal to **Sales Volume Variance × Budgeted Net Profit Ratio**
- ◆ **Sales Contribution Volume Variance** is equal to **Sales Volume Variance × Budgeted PV Ratio**

A Relation	
Sales Margin Volume Variance in terms of Profit & Contribution	
Sales Margin Volume Variance	Standard Margin Per Unit × (Actual Quantity – Budgeted Quantity) Or
Sales Margin Volume Variance	[Standard Contribution Per Unit – Standard Fixed Overheads Per Unit] × (Actual Quantity – Budgeted Quantity) Or
Sales Margin Volume Variance	{Standard Contribution Per Unit × (Actual Quantity – Budgeted Quantity)} – [Standard Fixed Overheads Per Unit × (Actual Quantity – Budgeted Quantity)] Or
Sales Margin Volume Variance	Sales Contribution Volume Variance – Fixed Overhead Volume Variance Or
Sales Contribution Volume Variance	Sales Margin Volume Variance + Fixed Overhead Volume Variance

Note: Production units equals to Sales units for both actual & budget.

Sales Variances (Turnover or Value)



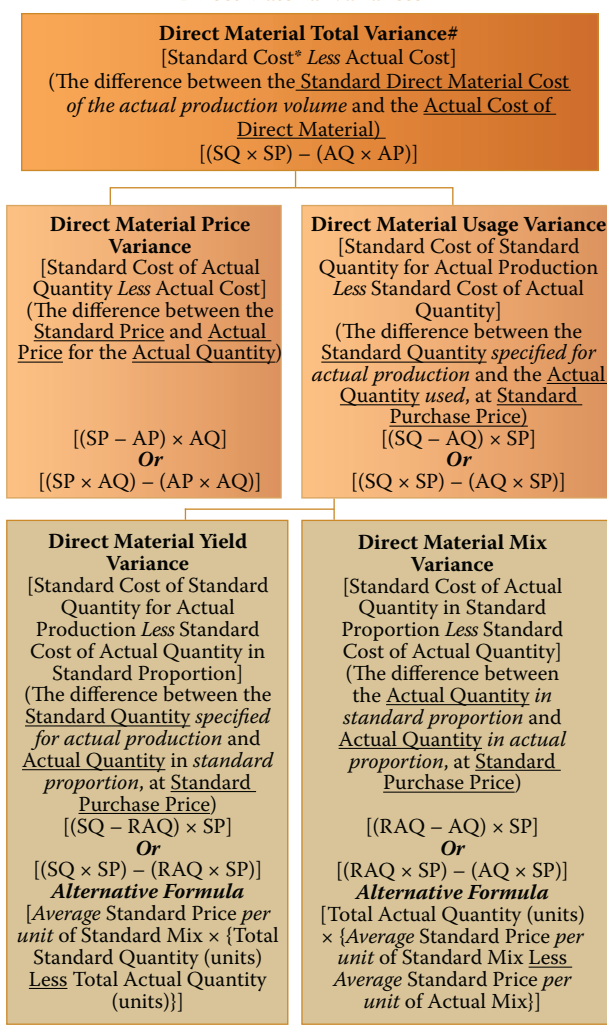
Market Size Variance
 Budgeted Market Share % × (Actual Industry Sales Quantity in units – Budgeted Industry Sales Quantity in units) × (Average Budgeted Price per unit) **Or**
 (Budgeted Market Share % × Actual Industry Sales Quantity in units – Budgeted Market Share % × Budgeted Industry Sales Quantity in units) × (Average Budgeted Price per unit) **Or**
 (Required Sales Quantity in units – Total Budgeted Quantity in units) × (Average Budgeted Price per unit)

Market Share Variance
 (Actual Market Share % – Budgeted Market Share %) × (Actual Industry Sales Quantity in units) × (Average Budgeted Price per unit) **Or**
 (Actual Market Share % × Actual Industry Sales Quantity in units – Budgeted Market Share % × Actual Industry Sales Quantity in units) × (Average Budgeted Price per unit) **Or**
 (Total Actual Quantity in units – Required Sales Quantity in units) × (Average Budgeted Price per unit)

Market Size Variance + Market Share Variance
 (Required Sales Quantity in units – Total Budgeted Quantity in units) × (Average Budgeted Price per unit) **Add**
 (Total Actual Quantity in units – Required Sales Quantity in units) × (Average Budgeted Price per unit) **Equals to**
 (Total Actual Quantity in units – Total Budgeted Quantity in units) × (Average Budgeted Price per unit)

Sales Quantity Variance

Direct Material Variances



Note:
 SQ = Standard Quantity = Expected Consumption for Actual Output
 AQ = Actual Quantity of Material Consumed
 RAQ = Revised Actual Quantity = Actual Quantity Rewritten in Standard Proportion
 SP = Standard Price per Unit
 AP = Actual Price per Unit
 (*) = Standard Cost refers to 'Standard Cost of Standard Quantity for Actual Output'
 (#) = Direct Material Total Variance (also known as material cost variance)

Material Purchase Price Variance
 [Standard Cost of Actual Quantity – Actual Cost]
 (The difference between the Standard Price and Actual Price for the actual quantity of material purchased)
 $[(SP - AP) \times PQ]$
Or
 $[(SP \times PQ) - (AP \times PQ)]$

Note:
 PQ = Purchase Quantity
 SP = Standard Price
 AP = Actual Price

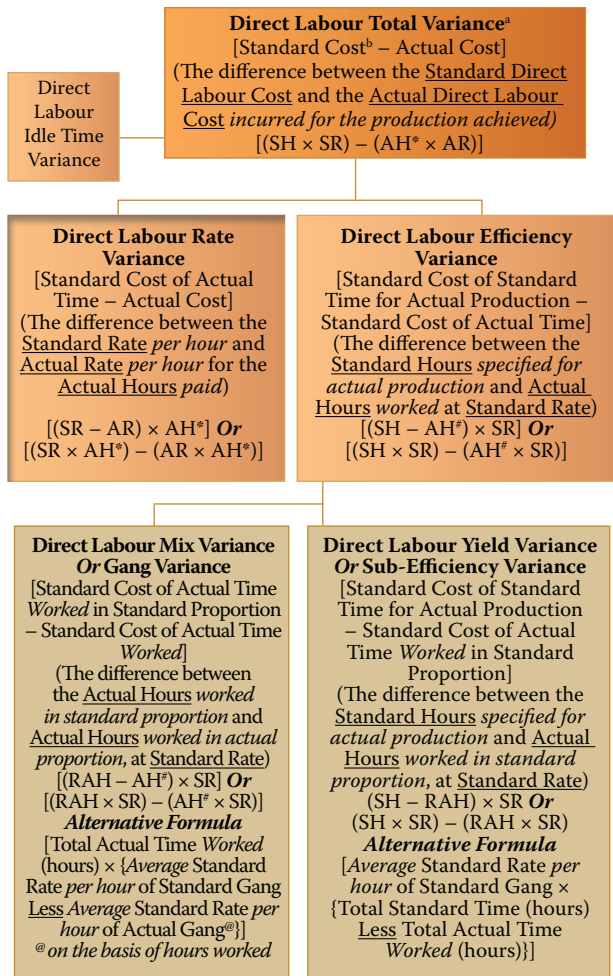
Direct Labour Idle Time Variance
 [Standard Rate per Hour × Actual Idle Hours]
 (The difference between the Actual Hours paid and Actual Hours worked at Standard Rate)
 $[(AH^* - AH^w) \times SR]$
Or
 $[(AH^* \times SR) - (AH^w \times SR)]$

Note:
 SH = Standard Hours = Expected time (Time allowed) for Actual Output
 AH* = Actual Hours paid for
 AH^w = Actual Hours worked
 RAH = Revised Actual Hours = Actual Hours (worked) rewritten in Standard Proportion
 SR = Standard Rate per Labour Hour
 AR = Actual Rate per Labour Hour Paid
 (°) = Standard Cost refers to 'Standard Cost of Standard Time for Actual Output'
 (°) = Direct Labour Total Variance (also known as labour cost variance)
In the absence of idle time
 Actual Hours Worked = Actual Hours Paid

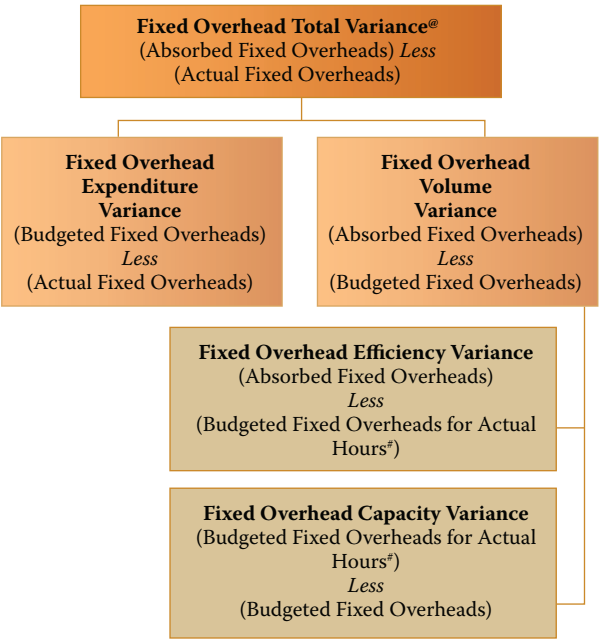
Idle Time is a period for which a workstation is available for production but is not used due to e.g. shortage of tooling, material, or operators. During Idle Time, Direct Labour Wages are being paid but no output is being produced. The cost of this can be identified separately in an Idle Time Variance, so that it is not 'hidden' in an adverse Labour Efficiency Variance.

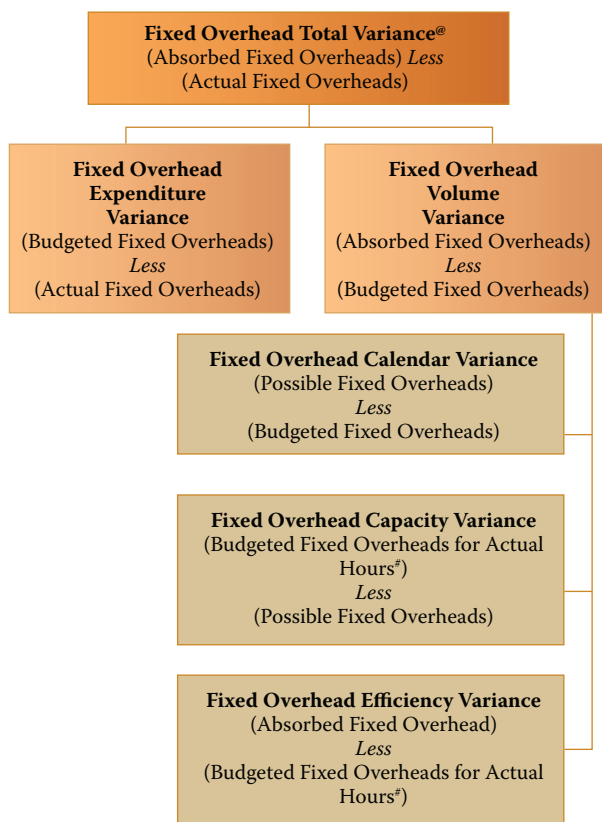
Some organizations face Idle Time on regular basis. In this situation, the Standard Labour Rate may include an allowance for the cost of the expected idle time. Only the impact of any unexpected or abnormal Idle Time would be included in the Idle Time Variance.

Direct Labour Variances



Fixed Production Overhead Variances





Actual Hours (Worked)

Note:

- Standard Fixed Overheads for Production (Absorbed)**
 - = Standard Fixed Overhead Rate per Unit × Actual Production in Units
 - = Standard Fixed Overhead Rate per Hour × Standard Hours for Actual Production
- Budgeted Fixed Overheads**
 - = It represents the amount of fixed overhead which should be spent according to the budget or standard during the period
 - = Standard Fixed Overhead Rate per Unit × Budgeted Production in Units
 - = Standard Fixed Overhead Rate per Hour × Budgeted Hours
- Actual Fixed Overheads Incurred**
- Budgeted Fixed Overheads for Actual Hours**
 - = Standard Fixed Overhead Rate per Hour × Actual Hours
- Possible Fixed Overheads**
 - = Expected Fixed Overhead for Actual Days Worked
 - = $\frac{\text{Budgeted Fixed Overhead}}{\text{Budgeted Days}} \times \text{Actual Days}$

^(®) = Fixed Overhead Total Variance also known as 'Fixed Overhead Cost Variance'

Fixed Overhead Efficiency Variance

(Absorbed Fixed Overheads) – (Budgeted Fixed Overheads for Actual Hours)

Or

(Standard Fixed Overhead Rate per Hour × Standard Hours for Actual Output) – (Standard Fixed Overhead Rate per Hour × Actual Hours)

Or

Standard Fixed Overhead Rate per Hour × (Standard Hours for Actual Output – Actual Hours)

Fixed Overhead Capacity Variance

(Budgeted Fixed Overheads for Actual Hours) – (Budgeted Fixed Overheads) *Or*

(Standard Fixed Overhead Rate per Hour × Actual Hours) – (Standard Fixed Overhead Rate per Hour × Budgeted Hours) *Or*

Standard Fixed Overhead Rate per Hour × (Actual Hours – Budgeted Hours)

Fixed Overhead Volume Variance-I

(Absorbed Fixed Overheads) – (Budgeted Fixed Overheads) *Or*

(Standard Fixed Overhead Rate per Unit × Actual Output) – (Standard Fixed Overhead Rate per Unit × Budgeted Output) *Or*

Standard Fixed Overhead Rate per Unit × (Actual Output – Budgeted Output)

Fixed Overhead Volume Variance-II

(Absorbed Fixed Overheads) – (Budgeted Fixed Overheads)

Or

(Standard Fixed Overhead Rate per Hour × Standard Hours for Actual Output) – (Standard Fixed Overhead Rate per Hour × Budgeted Hours)

Or

Standard Fixed Overhead Rate per Hour × (Standard Hours for Actual Output – Budgeted Hours)

Or

Standard Fixed Overhead Rate *per Hour* × (Standard Hours per Unit × Actual Output – Standard Hours per Unit × Budgeted Output)

Or

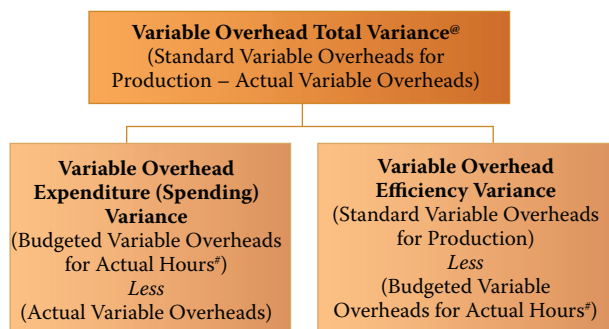
(Standard Fixed Overhead Rate per Hour × Standard Hours per Unit) × (Actual Output – Budgeted Output)

Or

Standard Fixed Overhead Rate per Unit × (Actual Output – Budgeted Output)

Overhead Variances can also be affected by idle time. It is usually assumed that Overheads are incurred when labour is working, not when it is idle. Accordingly, hours worked has been considered for the calculation of Variable and Fixed Overheads Variances.

Variable Production Overhead Variances



Actual Hours (Worked)

Note:

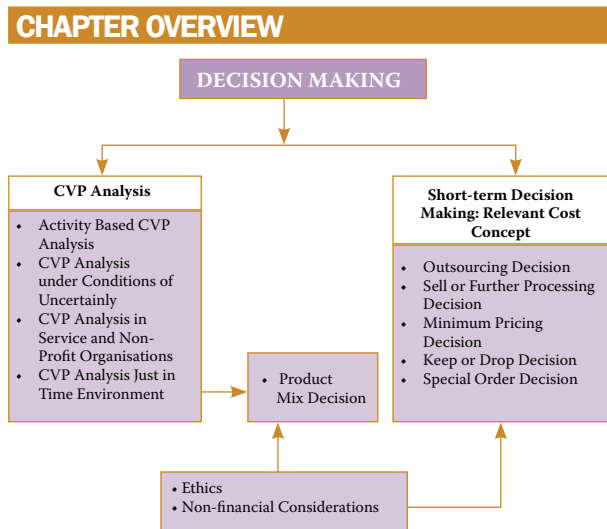
- Standard Variable Overheads for Production/Charged to Production**
 - = Standard/Budgeted Variable Overhead Rate per Unit × Actual Production (Units)
 - = Standard Variable Overhead Rate per Hour × Standard Hours for Actual Production
- Actual Overheads Incurred**
- Budgeted Variable Overheads for Actual Hours**
 - = Standard Variable Overhead Rate per Hour × Actual Hours

^(®) = Variable Overhead Total Variance also known as 'Variable Overhead Cost Variance'

Variable Overhead Efficiency Variance
(Standard Variable Overheads for Production) – (Budgeted Overheads for Actual Hours)
<i>Or</i>
(Standard Variable Overhead Rate <i>per Hour</i> × Standard Hours for Actual Output) – (Standard Variable Overhead Rate <i>per Hour</i> × Actual Hours)
<i>Or</i>
Standard Variable Overhead Rate <i>per Hour</i> × (Standard Hours for Actual Output – Actual hours)

Variable Overhead Expenditure Variance
(Budgeted Variable Overheads for Actual Hours) – (Actual Variable Overheads)
<i>Or</i>
(Standard Rate <i>per Hour</i> × Actual Hours) – (Actual Rate <i>per Hour</i> × Actual Hours)
<i>Or</i>
Actual Hours × (Standard Rate <i>per Hour</i> – Actual Rate <i>per Hour</i>)

DECISION MAKING



CVP ANALYSIS¹¹

CVP analysis involves analysing the interrelationships among revenues, costs, levels of activity, and profits. CVP analysis is useful for numerous decisions related to production, pricing, marketing, cost structure, and many more. Although CVP analysis is most useful for planning, it can also be used to assist with **controlling decisions** and **evaluating decisions**.

Consider a decision about choosing *additional features of an existing product* i.e. product modification. Different choices can affect selling prices, variable cost per unit, fixed costs, units sold, and operating income. CVP analysis helps managers make product decisions by estimating the *expected profitability* of these choices.



Activity Based CVP Analysis

Conventional CVP analysis assumes *volume based* measures. An alternative approach is activity based costing. In an activity-based costing system, costs are segregated into unit and *non-unit-based* categories. Activity-based costing acknowledges that some costs vary with units produced and some costs do not. However, while activity-based costing admits that non-unit-based costs are fixed with respect to production volume changes, it also argues that many non-

unit-based costs vary with respect to other cost drivers. In contrast, the volume based approach combines the cost of these activities and treat them as fixed costs since they do not vary with output volume. Activity based costing provides a more accurate determination of costs because it separately identifies and traces non-unit based costs to products rather than combining them in a pool of fixed costs as volume based approach does.

The Break-even can then be expressed as follows:

$$\text{Break-even units} = \frac{[\text{Fixed costs} + (\text{Setup cost} \times \text{Number of Setups}) + (\text{Engineering Cost} \times \text{Number of Engineering Hours})]}{(\text{Price} - \text{Unit Variable Cost})}$$

A comparison of the ABC break-even point with the conventional break-even point reveals two important differences.

First, the fixed costs differ. Some costs previously identified as being fixed may actually vary with non-unit cost drivers, in this case setups and engineering hours.

Second, the numerator of the ABC break-even equation has two non-unit-variable cost terms: one for batch-related activities and one for product- sustaining activities.

“The use of activity-based costing does not mean that CVP analysis is less valuable. In fact, it becomes more valuable, since it delivers more precise understandings concerning cost behaviour. These understandings produce better decisions. CVP analysis within an activity-based framework, however, must be improved.”



CVP Analysis in Service and Non-Profit Organisations

CVP analysis can also be applied to decisions by service and non-profit organisations. To apply CVP analysis in service and non-profit organisations, we need to *focus on measuring their output*, which is different from tangible units sold by manufacturing and merchandising companies.

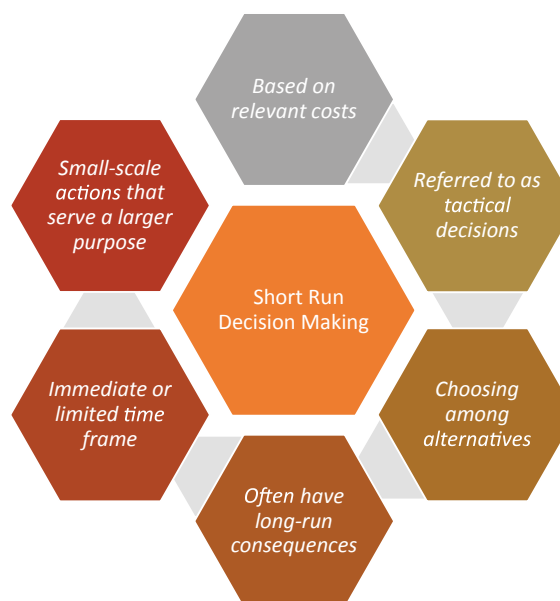
CVP Analysis in Just in Time Environment

In a firm has implemented *Just in Time*, the variable cost per unit sold is reduced, and fixed costs are increased. Direct labor is considered as fixed instead of variable. On the other hand, direct material vary with production volume (unit- based variable cost) due to emphasis on *total quality* and *long-term purchasing*. Waste, scrap, and quantity discounts are removed. Other unit-based variable costs, such as power and sales commissions, also exist. Further, the batch - level variable is absent as in *Just in Time*, the batch is equal to one unit.

Therefore, the cost equation for *Just in Time* can be expresses as follows:

$$\text{Total Cost} = \text{Fixed Cost} + (\text{Unit variable Cost} \times \text{Number of Units}) + (\text{Engineering Cost} \times \text{Number of Engineering hours})$$

“Managers often use CVP analysis to guide other decisions, many of them are of strategic nature due to tremendous potential of increase in the profitability and organisational effectiveness”

**SHORT RUN DECISION MAKING**

Short-run decision making involves the act of choosing one course of action among various feasible alternatives available. Short-term decisions sometimes are referred to as tactical, or relevant, decisions because they involve choosing between alternatives with an immediate or limited time frame.

Strategic decisions, on the other hand, usually are long term in nature because they involve choosing between different strategies that attempt to provide a *competitive advantage* over a long time frame.

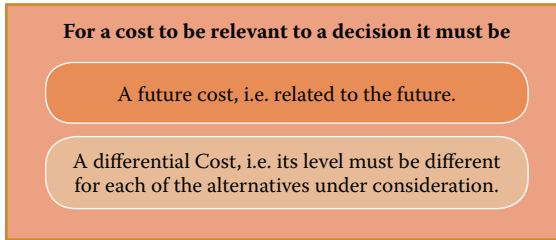
Short run decisions involve evaluation of the costs and benefits of short term actions, such as *whether to make a product or outsource, whether to accept a special order, whether to keep or drop an unprofitable segment, and whether to sell a product as is or process it further*. If resources are limited, managers may also have to decide on the *most appropriate product mix*. While such decisions tend to be *short run* in nature, it should be emphasized that they often have *long-run consequences*.

Consider a second example, suppose that a company is thinking about producing a component instead of buying it from suppliers. The immediate objective may be to lower the cost of making the main product. Yet this decision may be a small part of the overall strategy of establishing a cost leadership position for the firm. Therefore, short-run decisions often are *small-scale actions that serve a larger purpose*¹².

The tactical decision making approach just described emphasized the importance of identifying and using **relevant costs**. But how do we identify and define the costs that affect the decision?

“Consumers tend to be more price sensitive if they are purchasing products that are undifferentiated, expensive relative to their incomes, or of a sort where quality is not particularly important to them.”

- Michael E. Porter



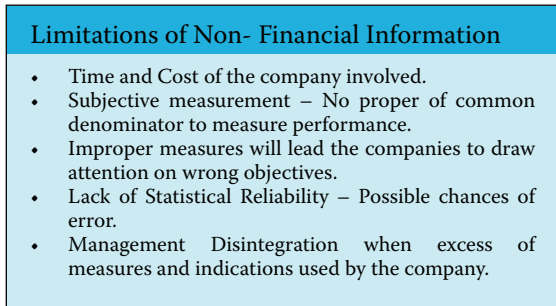
Accordingly, only future costs can be relevant to decisions. However, to be relevant, a cost must not only be a future cost but must also differ from one alternative to another. If a future cost is the same for more than one alternative, it has no effect on the decision. Such a cost is irrelevant cost. The ability to identify relevant and irrelevant costs is a vital decision making skill.

Non-Financial Considerations

With increase in competition, dynamic market changes and changing needs of customers, non-financial information have gained relevance in the decision-making process. Information to which monetary value can be attached is in the nature of financial information. Information of an organization like number of employees, employee morale, customer satisfaction that cannot be expressed in monetary terms is termed non-financial in nature. Non-financial information is long term focused and ensures profitability and sustainability in long term for an organization thereby evaluating the internal performance of the company. Non-Financial information which a company should focus that would turn out to be advantageous while making decisions for a company are:

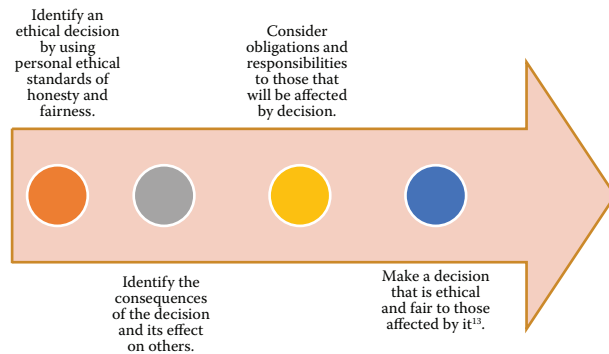
Quality	Employee Satisfaction	Customer Satisfaction
Corporate Social Responsibility	Environmental Factors	Intellectual Property
Intangible Assets	Competitor's Movements	Brand Name

Decisions made in a business rest on the balance between the perceived effects of financial and non-financial information. Following are Limitations of Non-Financial Information-



Ethics

Ethics are moral principles that guide the conduct of individuals. By their behaviour and attitude, managers set the company culture.

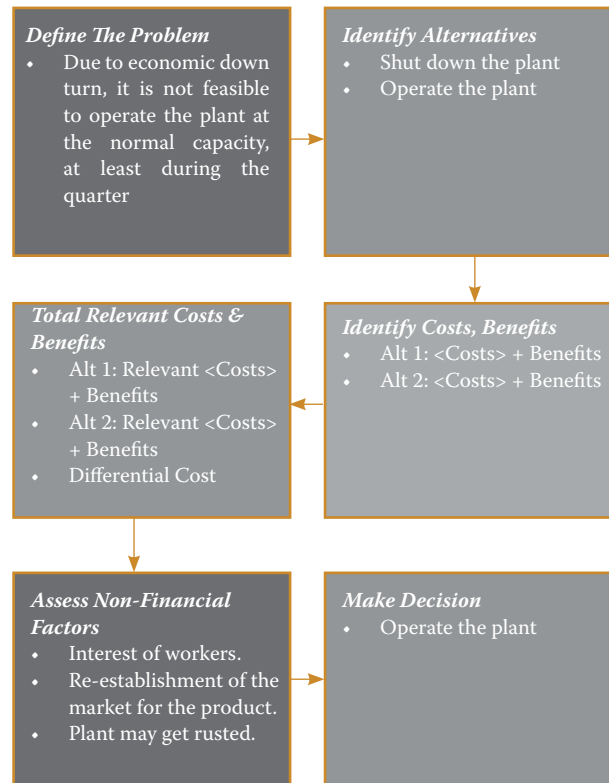


Some ethical problems can be avoided simply by using common sense and not focusing solely on the short term at the expense of long term.

Firms with a strong code of ethics can create strong customer and employee loyalty. Furthermore, a firm that values people more than profit and is viewed as operating with integrity and honour is more likely to be a commercially successful business¹⁴.

Decision Making Model

An Application



SOME APPLICATIONS OF CVP ANALYSIS AND COST CONCEPTS

Short run decisions are many and varied but some of the more important ones, we shall look in this chapter include:

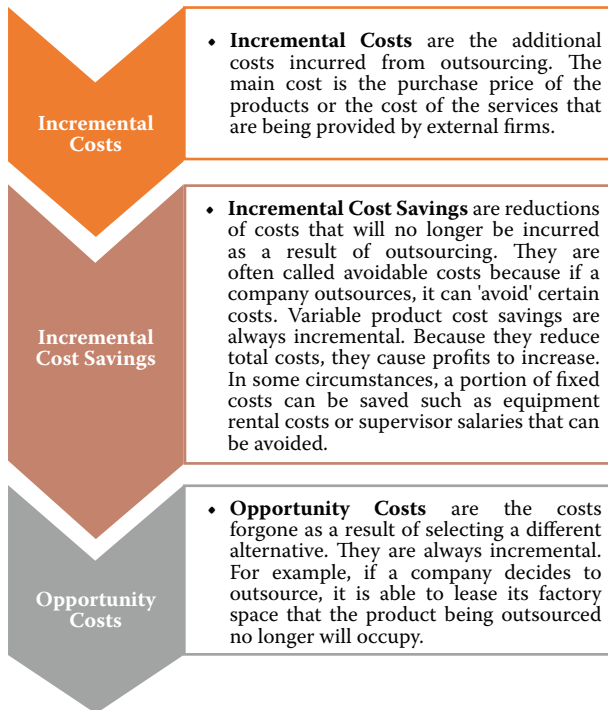


Outsourcing Decision¹⁵

Outsourcing decision is often called a 'make or buy' decision. It involves a decision of whether to continue 'making' a product versus 'buying' it from an external firm. Outsourcing enables a firm to

- ◆ reduce costs or
- ◆ benefit from supplier efficiencies

Outsourcing decision requires *incremental analysis*. The incremental amounts are based on the difference in the *cost of buying a product or service* compared to the *cost of producing the item or providing the service in house*.



Outsourcing Decisions- Accept or Reject?

<ul style="list-style-type: none"> ◆ If incremental cost savings + opportunity costs < incremental costs 	<ul style="list-style-type: none"> ◆ If incremental cost savings + opportunity costs > incremental costs 	<ul style="list-style-type: none"> ◆ If incremental cost savings + opportunity costs are = incremental costs
<ul style="list-style-type: none"> ◆ reject the outsourcing, unless qualitative factors fiercely impact the decision. 	<ul style="list-style-type: none"> ◆ accept the outsourcing unless qualitative factors fiercely impact the decision. 	<ul style="list-style-type: none"> ◆ focus primarily on qualitative factors to evaluate the decision.

Qualitative Factors

While considering the decision to Outsourcing the management should consider qualitative aspects like quality of goods, reliability of suppliers, impact on the customers and suppliers etc.

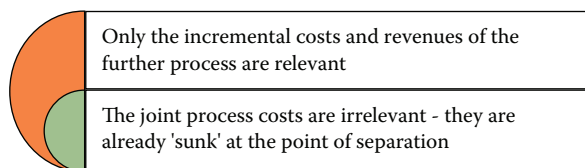
A firm generally decides to outsource:

- If it costs less rather than to manufacture it internally;
- If the return on the necessary investment to be made to manufacture is not attractive enough;
- If the company does not have the requisite skilled manpower to make;
- If the concern feels that manufacturing internally will mean additional labour problem;
- If adequate managerial manpower is not available to take charge of the extra work of manufacturing;
- If the component shows much seasonal demand resulting in a considerable risk of maintaining inventories;
- If transport and other infrastructure facilities are adequately available;
- If the process of making is confidential or patented;
- If there is risk of technological obsolescence for the component such that it does not encourage capital investment in the component.

Sell or Further Process

Sell or process further refers to a decision-making situation where an executive has to decide either to sell a component/ product/ raw material as it is or alternatively process it further by incurring additional expenses. For instance, sometime, a redundant material lying in stores for a long time may be sold as scrap at a small value or may be thrown away as waste. This material may, however, be converted into a product of higher saleable value by carrying out some further operations or processes. On further processing the component/product/raw material may not only be improved or reconditioned but will mostly fetch a higher sale value as well. Here if the *differential sales value is more than the further processing cost*, then it is beneficial to process the product further otherwise sell it without further processing. Such type of decision making problems usually arise in the case of joint products.

There are two rules to follow when ascertaining whether the further processing is worthwhile:



Qualitative Factors

Qualitative factors related to processing further decisions include resource availability such as the readiness of employees to work extra hours to further process the products and availability of materials required for the processing. In addition, the influence on customers that prefer the original product should also be considered, as sales to these customers may be lost to competitors.

Minimum Pricing Decisions

The minimum pricing approach is a useful method in situations where there is a lot of intense competition, surplus production capacity, clearance of old inventories, getting special orders and/or improving market share of the product.

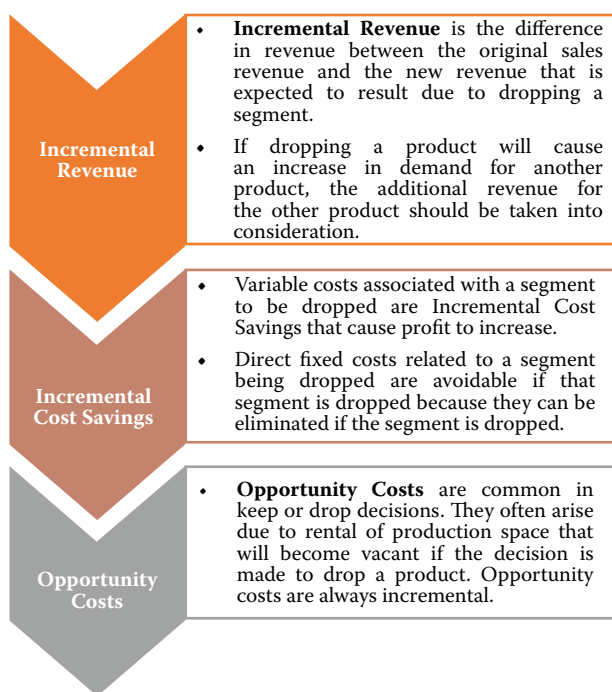
The minimum price should be set at the incremental costs of manufacturing, plus opportunity costs (if any).

For this type of pricing, the selling price is the lowest price that a company may sell its product at usually the price will be the *total relevant costs of manufacturing*.

Keep or Drop Decisions¹⁵

Another type of operating decision that management must make is whether to keep or drop unprofitable segments, such as product lines, services, divisions, departments, stores, or outlets.

The decision is based on whether or not the segment's revenue exceeds the costs directly traceable to the segment, including any direct fixed costs.



Decision - Keep or Drop?

<ul style="list-style-type: none"> If incremental cost savings > incremental revenue lost 	<ul style="list-style-type: none"> If incremental revenue lost = incremental cost savings 	<ul style="list-style-type: none"> If incremental cost savings < incremental revenue lost
<ul style="list-style-type: none"> the segment should be dropped, unless qualitative characteristics fiercely impact the decision. 	<ul style="list-style-type: none"> qualitative effects must be used to make the decision. 	<ul style="list-style-type: none"> the segment should not be dropped, unless qualitative characteristics fiercely impact the decision.

Qualitative Factors

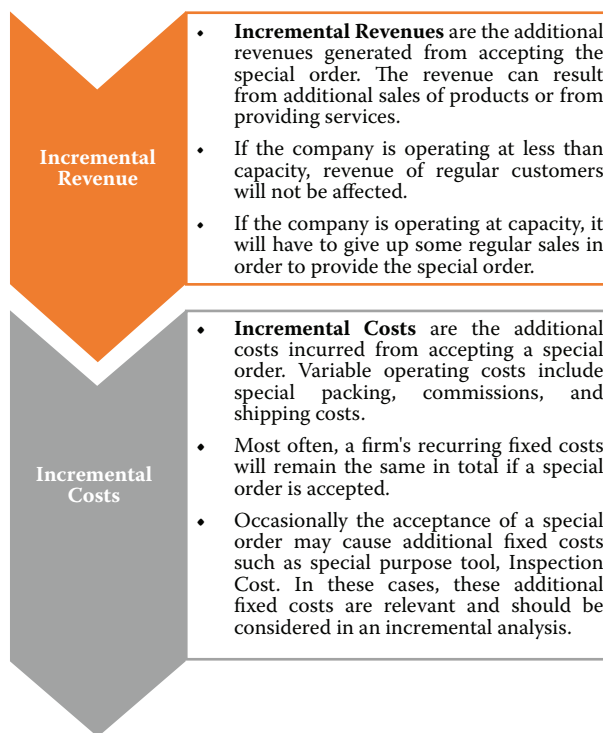
Qualitative factors related to keep or drop decisions often include considerations of employees that will be terminated if the product is dropped, the effect a lay off might have on employees that are not terminated, effects of suppliers from which the materials needed for the product will no longer be purchased, and the effect of customers who previously purchased the product being dropped.

Special Order Decisions¹⁵

Special order decisions focus on whether a special priced order should be accepted or rejected. These orders often can be attractive, especially when the firm is *operating below its maximum productive capacity*.

Price discrimination laws require that firms sell identical products at the *same price to competing customers* in the same market. This law does not apply to

- ◆ Noncompeting customers from the same market.
 - ◆ Potential customers in markets not ordinarily served.
- Special order decisions are based on incremental analysis. Incremental analysis enables managers to emphasis on the *relevant areas of a decision*.



Decision - Accept or Reject?

<ul style="list-style-type: none"> If incremental revenue < incremental cost 	<ul style="list-style-type: none"> If incremental revenue = incremental cost 	<ul style="list-style-type: none"> If incremental revenue > incremental cost
<ul style="list-style-type: none"> reject the special order, unless qualitative characteristics fiercely impact the decision. 	<ul style="list-style-type: none"> qualitative effects must be used to make the decision. 	<ul style="list-style-type: none"> accept the order, unless qualitative characteristics fiercely impact the decision.

Dangers of Concentrating Excessively on a Short-Run Time Horizon¹⁶

- It is vital that the information presented for decision-making relates to the appropriate time horizon.
- If inappropriate time horizons are selected there is a risk that misleading information will be presented.
- Long-term considerations should always be taken into account when special pricing decisions are being evaluated.
- The effect of accepting a series of successive special orders over several periods constitutes a long-term decision.
- If demand from normal business is considered to be permanently insufficient to utilize existing capacity, then a long-term capacity decision is required.
- This decision should be based on a comparison of the relevant revenues and costs arising from using the excess capacity for special orders with the capacity costs that can be eliminated if the capacity is reduced.

Product Mix Decision

Many times, the management has to take a decision whether to produce one product or another instead. Generally, decision is made on the basis of contribution of each product. Other things being the same the product which yields the *highest contribution* is best one to produce. But, if there is shortage or limited supply of certain other resources which may act as a key factor like for example, the machine hours, then the *contribution is linked with such a key factor for taking a decision*.

For example, in an undertaking the availability of machine capacity is limited and the machine hours required for one unit of the two products are different. In such cases the contribution is to be linked with the machine hour and the product which yields the *highest contribution per machine hour* is to be preferred for taking decision.

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- Management Accounting for Business By Colin Drury

- For previous capsule, final students may refer November 2017 Journal.
- Intermediate students may also refer pages 17 to 20 of this capsule for quick reference of 'Cost Variance' formulae.

“Corporate social responsibility is a hard-edged business decision. Not because it is a nice thing to do or because people are forcing us to do it... because it is good for our business.”

– Niall FitzGerald, Former CEO, Unilever

IN A NUTSHELL

KNOWLEDGE UPDATE

FRAMEWORKS FOR REPORTING TO EXTERNAL STAKEHOLDERS

Background

Triple Bottom Line Reporting

- Dimension (sets) of TBL

Global Reporting Initiative (GRI)*

- Need for “Global Reporting Initiative”
- Global Reporting Standards

Integrated Reporting (IR)*

- Integrated Reporting Framework and the Integrated Report
- Fundamental Concepts related to the Integrated Report
- Preparation and Presentation of the Integrated Report
- Conclusion

CAPSULE

CASE STUDY

Triple Bottom Line

- Vidyut Dam Project

CASE SCENARIO

Six Sigma

- Smooth Connect Telecom

Performance Measurement

- Shakti Automobiles

SKILL ASSESSMENT BASED PROBLEMS

Questions and Answers

- Life Cycle Costing
- Theory of Constraints
- Target Costing

*This portion of the article aims to provide an understanding of the framework – Integrated Reporting (as presented by the International Integrated Reporting Council (IIRC)) and Sustainability Reporting as presented by the Global Reporting Initiative (GRI). Since these frameworks are *good indicator of the performance* of an organisation, it is good to have at least basic understanding of the concepts involved. These topics are for the “**Knowledge Update**” of the Students and not for examination purpose.

Frameworks for Reporting to External Stakeholders about Sustainability and Value Creation: Global Trends

Framework for external reporting on sustainability and value creation

- Triple Bottom Line (sustainability)
- GRI (sustainability)
- Integrated Reporting Framework (sustainability through value creation)

Performance Reports

Background

Corporate Reporting is the platform used by organisations to provide information to its users about its business. Corporate Reporting is a useful tool to connect with *stakeholders*, external to the organisation because:

- Presentation of their business performance, in particular their financial performance, enables them to get access to equity, debt or other types of financing.
- By showcasing their performance, capabilities and strategy, these reports can assist organisations to negotiate with customers and suppliers.
- Showcasing their strong performance would assist them to recruit talented employees and retain them. Talented employees in turn are an asset that every company should nurture for future growth.

Therefore, corporate reporting is an important exercise that *goes beyond reporting past performance*. Instead, it is a very important tool to *present* the organisation's business and its *future* prospects. A widely read corporate report would be the annual report released each year by organisations. It has a plethora of vital information that is useful to assess an organisation's performance. Information contained here is largely focussed on financial performance, current year and of past years. At the same time, it also focusses on *management narratives* and *non-financial issues*.

Good quality corporate reporting helps an organisation demonstrate to its *stakeholders* its operational capabilities, take advantage of opportunities and its ability to manage risks due to changes in the business environment. To enable this understanding, the report should contain information that is concise, relevant and transparent. Importantly, the user must be able to connect information spread over many pages/ reports to get a complete understanding of the *business model*.

Many frameworks govern corporate reporting. Examples are Indian Accounting Standards (Ind AS), International Financial Reporting Standards (IFRS), disclosures under Companies Act 2013, SEBI Guidelines and Disclosures etc. All of them aim at full, accurate and timely disclosures of financial and relevant non-financial information.

In the recent past users of the corporate reports, felt that information, while available in sufficient detail, was scattered within different reports or sections of the annual report. It has been difficult to piece together relevant information to get complete information about the business.

In the recent past, human race has taken quantum leaps due to globalisation and changes in technology impacting daily life. There is also a highlighted concern about climate change and its impact. This has led to the following realisations:

- **Environmental impact:** Businesses utilise natural resources as inputs, convert them into outputs to make profits out this activity. So, businesses deplete natural resources to earn profits. Natural resources are limited in supply since nature cannot replenish the depleted resource at the same rate. **For example**, the resource that gets depleted faster than its replenishment rate is fossil fuel. Likewise, there are many other resources that get utilised without the sources being allowed renew itself. It might lead to scenarios where these resources may not be available to future generations. It could also affect the ability of the businesses to sustain in the

long run. When these resources run out, organisations may have to close down unless they take corrective action now. So, there is an important realisation that "**Sustainability**" of the *environment* is critical for "sustainability" of *organisation*. An organisation should try to reduce its "ecological footprint" **for example** minimise "carbon footprint" generated by its activities. It should avoid wastage of natural resources in business operations. Develop CSR activities that can nurture the natural resource, like use renewable energy, recycling waste, rehabilitation of mines from which mining activities are done, rehabilitation of wildlife, fisheries etc.

- **Societal impact:** Business operations impact the lives of the employees that work with them as well as the society in large. Organisations have to be socially responsible. Exploitation of workforce through long work hours, low wages, child labour etc. are examples of unethical business practices that should cease. If businesses can impact the community it influences through corporate social responsibility programs, it will improve the quality of life for such communities. CSR programs help in building healthier communities, this nurtures talent.
- **Economic impact:** For profit organisations have their main objective to deliver financial returns to their investors. While profit is important, it is crucial for organisations to ensure that profit objective does not negatively impact the environment or society. The *investing community* has become more sensitive to these issues and wants transparency about how the organisation creates "**value**".

To address this change in investor mindset, a number of initiatives to develop useful, transparent corporate reporting was undertaken that has culminated in development of few Frameworks that organisations can use to report about their activities in relation to sustainability and value creation. Organisations can choose to present their information using any of the following frameworks:

1. **Triple Bottom Line (TBL report).** As explained earlier, traditional accounting systems had a restricted view limited to the financial performance of the organisation. This concept expands this view to include the impact of business on environment and society as well. The 3Ps draws the organisation's attention to not just "Profit" motive but also to nurturing "Planet" and "People" towards a sustainable future.
2. **Global Reporting Initiative report (GRI report)** as per the GRI Guidelines issued by an independent institute called GRI whose mission is to develop and disseminate globally acceptable *sustainable reporting guidelines*.
3. **Integrated Report <IR>** as per the Integrated Reporting Framework laid out by the International Integrated Reporting Council (IIRC). It provides the providers of 'capital' with a holistic view of the *organisation's value creation process*.

Triple Bottom Line Reporting

British business author John Brett Elkington in year 1994 coined the term TBL. But the origin of concept actually lies in Brundtland report by World Commission on Environment and Development, (now known as Brundtland Commission) published in year 1987, in which **Sustainable Development** is explained as is "*development that meets the needs of the present without compromising the ability of future generations to meet their own needs*". It is also important here to note that United Nations Conference on Environment and Development taken place in year 1992, gave stress on sustainable development.

As mentioned earlier **every business needs to be sustainable rather only profitable.**

But what comes to mind is:

- When can a business be called sustainable?
- The obvious answer is when management makes sustainable business decisions.

Hence, the real question is:

- When does a business decision become sustainable? How does one measure the performance of business decisions in terms of sustainability?

Answer lies in TBL i.e. **Triple Bottom Line**.



Triple bottom line

To measure the performance of business decisions in economic terms we consider only one bottom line i.e. profit, but to consider sustainability of business decisions, there are three bottom lines i.e. **People, Planet and Profit** (also known as dimensions of TBL).

TBL truly extends the scope of traditional accountancy, and transforms it into modern day **sustainability reporting** (which is beyond financial reporting because it considers *social* and *environmental performance* too). Some organisations even have separate business sustainability reporting system and they apply the standard of sustainability reporting pronounced by **Global Reporting Initiative**, which is the independent, international organisation that helps businesses and other organisations take responsibility for their impacts, by providing them with the global common framework (standards) to report those impacts.

Dimension (sets) of TBL

- **Planet** – *the environmental bottom line* measures the impact on resources, such as air, water, ground and emissions to determine the *environment impact* and *ecological footprints*.
- **People** – *the social equity bottom line* relates to corporate governance, motivation, incentives, health and safety, human capital development, human rights and ethical behaviour.
- **Profit** – *the economic bottom line* refers to measures maintaining or improving the company's success in term of adding value to shareholders.

A **sustainable decision** is one which is acceptable from the aspect of each bottom line.

TBL believes in a *stakeholder approach* rather than a shareholder approach. TBL implies that businesses must consider the full cost, hence becoming a substitute to **full cost accounting** with even wider perspectives.

TBL can be used to encourage each division and manager within the organisation to act in a responsible manner from holistic perspective.

Global Reporting Initiative (GRI)

Global Reporting Initiative (GRI) is an independent organisation that is working at promoting the use of globally applicable reporting standards. They are promoting the GRI Standards that promote transparency and accountability on sustainable development **by reporting** on *economic, environmental* and *social issues*. They have a range of partners who believe in their vision that include governments and various donor foundations.

Need for “Global Reporting Initiative”

The Framework has been developed to encourage organisations across the world to report on how their business activities are impacting “Economic, Environmental and Social” sustainability. The **need for standardised reporting globally** is that users can compare reports of different organisations to identify the ones that are more sustainable to these three aspects – *economy, environment* and *social*. Sustainability is important to leave behind a conducive environment and healthy society for our future generations.



Global Reporting Standards

A Sustainability Report prepared as per GRI Framework is used by organisations to report their impact on the economy, environment and society. Impact includes both *positive* and *negative* matters. Users can then be better informed about the risks and opportunities that the organisation faces.

The degree to which the GRI Standards have been applied gives an organisation the choice to prepare the report as per:

i) **Core Option** : indicates that the report has *minimum information* needed to understand the organisation, material topics and related impacts and how they are managed.

or

(ii) **Comprehensive Option**: In addition to information that comes under the “core option”, it has *additional disclosures* regarding an organisation's strategy, ethics and integrity. The report should have extensive discussion about the material topics and related impacts.

The report has to clearly state that it is “in accordance” with Core Option or Comprehensive Option.

Thus, Core Option has less details than Comprehensive Option.

Organisations can also prepare “**GRI referenced**” report when it wants to report on specific economic, environmental or social impact as per selected standards but is not looking to provide a full report as per the GRI Standards. Include specific reference to which standard or section has been used.

An overview of the GRI Standards are:

Universal Standards

3 Universal Standards are applicable to all organisations.

(1) **GRI 101 – Foundation**, starting point for using GRI Standards. It contains the Reporting Principles that define the *report content* and *quality*.

Reporting Principles for ‘Report Content’ include: Stakeholder Inclusiveness, Sustainability Context, Materiality and Completeness.

Reporting Principles for ‘Report Quality’ include: Accuracy, Balance (positive and negative impacts), Clarity, Comparability, Reliability and Timeliness.

GRI 101 is used to identify *material matters* related to the economy, environment and society. The organisation will then use the topic specific standards to report on them.

(2) **GRI 102 – General Disclosures**, to report contextual information about an organisation. Information related to”

- organisation's profile,
- strategy,
- ethics and integrity,
- governance,
- reporting process, and
- stakeholder engagement process are reported here.

(3) **GRI 103 – Management Approach**, to report management's approach to material matters. It discusses *why a matter is material*, where is the impact and how is the organisation managing the impact. Management Approach will include the policies, goals, responsibilities, resources, grievance methods, specific actions related to the material topic.

Topic Specific Standards

Circumstances unique to each organisation's business operations will determine what to report under the Topic Specific Standards.

Below is a summary of the discussions that happen under each category covered under the Topic Specific Standards.

Under each of the sub-topics under the economic, environmental and social categories, the report should include discussion about management's approach disclosures, topic specific disclosures or both. This list is only for the student's reference to help them understand the content of the report better.

The below standards will apply to all reports published on or after **July 1, 2018** except GRI 207, GRI 303 and GRI 403 w.e.f. Jan 2021 and GRI 306 w.e.f. Jan 2022.

(A) GRI 200 – Economic		402: Labor / Management Relations	<ul style="list-style-type: none"> Minimum notice periods regarding operational changes
201: Economic Performance	<ul style="list-style-type: none"> Direct economic value generated and distributed Financial implications and other risks and opportunities due to climate change Defined benefit plan obligations and other retirement plans Financial assistance received from the government. 	403: Occupational Health and Safety	<ul style="list-style-type: none"> Occupational health and safety management system Hazard identification, risk assessment, and incident investigation Occupational health services Worker participation, consultation, and communication on occupational health and safety Worker training on occupational health and safety Promotion of worker health Prevention and mitigation of occupational health and safety impacts directly linked by business relationships Workers covered by an occupational health and safety management system Work-related injuries Work-related ill health
202: Market Presence	<ul style="list-style-type: none"> Ratios of standard entry level wage by gender compared to local minimum wage Proportion of senior management hired from the local community 	404: Training and Education	<ul style="list-style-type: none"> Average hours of training per year per employee Programs for upgrading employee skills and transition assistance programs Percentage of employees receiving regular performance and career development reviews
203: Indirect Economic Impacts	<ul style="list-style-type: none"> Infrastructure investments and services supported Significant indirect economic impacts 	405: Diversity and Equal Opportunity	<ul style="list-style-type: none"> Diversity of governance bodies and employees Ratio of basic salary and remuneration of women to men
204: Procurement Practices	<ul style="list-style-type: none"> Proportion of spending on local suppliers 	406: Non-Discrimination	<ul style="list-style-type: none"> Incidents of discrimination and corrective actions taken
205: Anti-corruption	<ul style="list-style-type: none"> Operations assessed for risks related to corruption Communication and training about anti-corruption policies and procedures Confirmed incidents of corruption and actions taken 	407: Freedom of Association and Collective Bargaining	<ul style="list-style-type: none"> Operations and suppliers in which the right to freedom of association and collective bargaining may be at risk
206: Anti-competitive behaviour	<ul style="list-style-type: none"> Legal actions for anti-competitive behaviour, anti-trust, and monopoly practices 	408: Child Labour	<ul style="list-style-type: none"> Operations and suppliers at significant risk for incidents of child labour
207: Tax	<ul style="list-style-type: none"> Approach to tax Tax governance, control, and risk management Stakeholder engagement and management of concerns related to tax Country-by-country reporting 	409: Forced and Compulsory Labour	<ul style="list-style-type: none"> Operations and suppliers at significant risk for incidents of forced or compulsory labour
(B) GRI 300 – Environmental		410: Security Practices	<ul style="list-style-type: none"> Security personnel trained in human rights policies or procedures
301: Material	<ul style="list-style-type: none"> Materials used by weight or volume Recycled input materials used Reclaimed products and their packaging materials 	411: Rights of Indigenous People	<ul style="list-style-type: none"> Incidents of violations involving rights of indigenous peoples
302: Energy	<ul style="list-style-type: none"> Energy consumption within the organisation Energy consumption outside of the organisation Energy intensity Reduction of energy consumption Reductions in energy requirements of products and services 	412: Human Rights Assessment	<ul style="list-style-type: none"> Operations that have been subject to human rights reviews or impact assessments Employee training on human rights policies or procedures Significant investment agreements and contracts that include human rights clauses or that underwent human rights screening
303: Water and Effluents	<ul style="list-style-type: none"> Interactions with water as a shared resource Management of water discharge related impacts Water withdrawal Water discharge Water consumption 	413: Local Communities	<ul style="list-style-type: none"> Operations with local community engagement, impact assessments, and development programs Operations with significant actual and potential negative impacts on local communities
304: Bio-diversity	<ul style="list-style-type: none"> Operational sites owned, leased, managed in, or adjacent to, protected areas and areas of high biodiversity value outside protected areas Significant impacts of activities, products, and services on biodiversity Habitats protected or restored IUCN Red List species and national conservation list species with habitats in areas affected by operations 	414: Supplier Social Assessment	<ul style="list-style-type: none"> New suppliers that were screened using social criteria Negative social impacts in the supply chain and actions taken
305: Emissions	<ul style="list-style-type: none"> Direct (Scope 1) GHG emissions Energy indirect (Scope 2) GHG emissions Other indirect (Scope 3) GHG emissions GHG emissions intensity Reduction of GHG emissions Emissions of ozone-depleting substances (ODS) Nitrogen oxides (NOX), sulfur oxides (SOX), and other significant air emissions 	415: Public Policy	<ul style="list-style-type: none"> Political contributions
306: Waste	<ul style="list-style-type: none"> Waste generation and significant waste related impacts Management of significant waste related impacts Waste generated Waste diverted from disposal Waste directed to disposal 	416: Customer Health and Safety	<ul style="list-style-type: none"> Assessment of the health and safety impacts of product Incidents of non-compliance concerning the health and safety impacts of products and services
307: Environment Compliance	<ul style="list-style-type: none"> Non-compliance with environmental laws and regulations 	417: Marketing and Labelling	<ul style="list-style-type: none"> Requirements for product and service information and labelling Incidents of non-compliance concerning product and service information and labelling Incidents of non-compliance concerning marketing communications
308: Supplier Environmental Assessment	<ul style="list-style-type: none"> New suppliers that were screened using environmental criteria Negative environmental impacts in the supply chain and actions taken 	418: Customer Privacy	<ul style="list-style-type: none"> Substantiated complaints concerning breaches of customer privacy and losses of customer data
(C) GRI 400 – Social		419: Socio Economic Compliance	<ul style="list-style-type: none"> Non-compliance with laws and regulations in the social and economic area
401: Employment	<ul style="list-style-type: none"> New employee hires and employee turnover Benefits provided to full-time employees that are not provided to temporary or part-time employees Parental leave 		

Source: <https://www.globalreporting.org/standards/gri-standards-download-center/?g=9c1bfe70-c407-4c4b-9139-04d64d5ba335>

Integrated Reporting

This article is based on the International <IR> Framework (Dec'2013). The International Integrated Reporting Council (IIRC) has published on 19 Jan'2021 revisions to the International <IR> Framework, originally released in 2013, to enable more decision-useful reporting. This latest version applies to reporting periods commencing 1 January 2022.

Integrated Reporting Framework and the Integrated Report

The International Integrated Reporting Council (IIRC) is a global coalition of regulators, investors, companies, standard setters, the accounting profession, academia, NGOs. IIRC's long-term vision is to promote "integrated thinking" that will result in efficient allocation of capital, that enable financial stability and sustainability. Integrated thinking takes into account the *inter-relationships* between its various functional and operating units and "**the capital**" that the organisation uses. As explained later, the term "capital" is not restricted to financial capital alone but is defined to include a wider variety of resources / enablers that support the *value creation* process of a business. This "integrated thinking" is facilitated by presenting the "Integrated Report" (<IR>).

Need for "Integrated Thinking"

Impact of "intangibles" to the business model: Traditionally assets of an organisation have been tangible assets, that have been reported within the financial statements. Intangibles have also been recognised, pegged a monetary value and reflected in the financial statements. The tangible assets have traditionally formed major part of the assets side of the balance sheet. This worked well as long as value created by business was more internally driven. "Internally driven" implies that business being less impacted by the changes in the external environment in which it operates. Examples of which could include: its ability to get raw materials directly from the source rather than depending on suppliers, business reach being more regional rather than having national or globalised reach, labour force creating products being majorly semi-skilled therefore easily replaceable etc. However, due to globalisation many businesses have become national /international players rather than being limited to being regional in scope. Due to outsourcing of business processes, the supply chain of organisations has changed. An organisation is now dependent on other organisations for its materials, labour, IT systems etc. Use of technology within the business many times becomes a game changer driving value for the business. (e. g.) Online sales versus brick and mortar outlets). The service sector has seen tremendous boom in development (e.g. IT industry, banking). Consequently, human capital has become more skilled, so talented employees have become a critical value driver of business.

To summarise, *during the last two decades, every organisation has become inter-dependent on other organisations and the external environment to conduct its business. Businesses have become dependent on relationships with suppliers /customers /government agencies, natural resources, human capital, infrastructure and technology. These relationships and interactions are intangibles, that cannot be strictly quantified and reflected in the balance sheet. These can be looked upon as "capitals" beyond the regular financial capital of the balance sheet. This aspect cannot be immediately perceived by the users of corporate reports unless they are informed about it. However, this interdependency is very critical for an organization to function.* For example, if it runs out of a particular natural resource with which it makes products, then this could impact business. (World is facing shortage of 'Silica' which is used in innumerable industries like electronics, construction. The other natural resources in short supply are energy giving fossil fuels and water.) Likewise, only talented employees can deliver on attaining strategic objectives, therefore talent has to be groomed. In the modern world innovation is the key to success, something that can be driven only by motivated, talented employees.

Therefore, the need to have a narrative in the form of an Integrated Report <IR> that spells out how an organisation can manage, preserve and grow /deplete these "capitals". Information about managing these capitals has become paramount to assess business performance, stability and sustainability.

Definition of Integrated Report <IR>

An Integrated Report <IR> can be defined as: "*An integrated report is a concise communication about how an organisation's strategy, governance, performance and prospects, in the context of its external environment, lead to the creation of value over the short, medium and long term.*"

Source: <https://integratedreporting.org/resource/international-ir-framework/>

Objectives of Integrated Report

Information presented in an integrated or connected manner can enable the user to understand the following:

- The *various types of capitals* (defined later), in addition to financial capital that the organisation uses to create value. Understand their *interdependencies*, including *trade-offs* between them.
- Capacity of the organisation to respond to various *stakeholder's legitimate needs and interests*. Stakeholders here include not just the providers of financial capital, but includes customers, suppliers, local communities, government authorities, employees and any other interested party.
- Ability of the organisation to *respond to changes in the external environment* towards both risks and opportunities.
- Promotes understanding of the organisation's *business model*, its *activities, performance* (financial and non-financial metrics) outcome over a period of time – past, present and future. Traditional corporate reporting has primarily presented historic (past) information. <IR> is a *more future oriented report* that focusses on how an organisation's strategy can be aligned to the external environment.
- Enables accountability and stewardship for the different types of capital (financial, manufactured, human, intellectual, natural, social and relationship). An organisation can create value only when it is able to develop the interest of its key stakeholders, broadly contained within the various "capitals".
- *Disclosure about* how the organisation is working towards *maintaining its capital* in the report can serve as a tool for better corporate governance.
- Supports integrated thinking that can enable better decision making to *create value* over short, medium and long term time horizons.

In India SEBI has mandated the reporting of "Business Responsibility Report" (BRR) for the top 500 listed companies. For the year 2017-18 they may voluntarily adopt "Integrated Reporting" and include it in the annual report. Alternatively, they may present this separately on their website and give reference to it in the annual report.

Integrated Framework as prescribed by IIRC

The <IR> should be prepared in accordance with the Integrated Framework laid out by IIRC. The Framework provides Guiding Principles and Content Elements that can be referred to while preparing the <IR>. The Framework **does not prescribe** any specific KPI metrics or measurement methods or about the disclosure of individual matters. It is left to the judgement of the preparers of the report to decide on the content based on the case-specific scenario of each organisation. Points to consider while preparing an Integrated Report:

- Preparers must use judgement about *materiality* of a matter under consideration to determine its inclusion in the report.
- Preparers must use judgement about *manner of disclosure* of matters including the basis for measurement, disclosure methods as found appropriate.
- If information presented in the <IR> is similar to information presented elsewhere, then the content in the <IR> should be prepared on the basis or should be *reconciled with the information presented elsewhere*.
- It may be prepared in compliance with *governing regulations*.
- <IR> aims at explaining how an organisation creates value over time. The report can contain *quantitative* and *qualitative information* to explain this. It is more than just a summary of other communication that an organisation publishes. It makes explicit connectivity of how value is created by an organisation.
- It may either be a standalone report or be included as a distinguishable part of another report (example an annual report). It has to be *clearly identified* as an <IR>.
- Those charged with governance should *acknowledge* the (i) integrity of the information in the report (ii) that the report was prepared by seeking their opinion and (iii) an opinion as to whether the report is in accordance with the Framework.

Users of <IR> would primarily be those who provide financial capital to the organisation. However, there may be interested parties like suppliers, customers, employees, business partners, local communities, regulators, legislators and policy makers who may also want to understand <IR>.

Fundamental Concepts related to the Integrated Report

Value creation for the organisation and for others

The integrated report provides *qualitative* and *quantitative disclosures* about how the organisation creates, diminishes or preserves value.

Value created for the organisation itself enables financial returns to the providers of financial capital.

Value created for others is also of interest to the providers of financial capital. Notably it must be understood that:

- Value is influenced by *external environment*.
- Value is created through *relationships with stakeholders*, internal and external. **Internal factors** like management and operations, employees, licenses, patents, financial stability of the organisation. **External factors** that impact value creation are suppliers, customers, prevailing economic conditions, government policies etc. Together they can enhance /deter /preserve the value created by the organisation.
- Value creation is *subjective* and changes based on the perspective of each stakeholder. **Example** could be: A good employer may not be very profitable. Therefore, while the employee may be satisfied with the value an organisation provides them, but if the target financial metrics are not met, the investors may not be satisfied with the value an organisation provides them.

Value creation is *not an independent activity* within the organisation's sole control. **Value is created using capital.** In integrated reporting, capital is *not limited* to just financial capital. There are six different categories: *financial, manufactured, human, natural, intellectual, social and relationship* capitals (details are covered later). A combined effect of these capital is what results in *value creation* for the company.

The ability of an organisation to create value is linked to the value it creates for others. This happens through a wide range of activities, interactions and relationships. **Example:**

Sales to customers will change financial capital. This is reflected in the financial statements. At the same times, after sales support interactions handled by after-sales personnel (human capital) can impact customer satisfaction (social capital). Customer satisfaction will determine their willingness to give more business to the organisation in future (developing a relationship). Any material issues with customer satisfaction like harmful content detected while consuming product that has resulted in causalities, faulty technology leading to product recalls will have to be disclosed and discussed in the Integrated Report. Positive instances like superior technology (intellectual capital) enhancing customer satisfaction can also be discussed.

Another instance would be willingness of key suppliers to trade with the organisation and the terms and conditions of these agreements. Suppose there is a case of vendor lock-in, where the organisation has to be dependent on one particular supplier and is unable to switch to other suppliers without substantial switching costs. This may be disclosed and discussed to make the users aware of potential risks to business. Likewise highlighting positive instances where long term procurement agreements will improve business operations and product quality can also be disclosed in the report.

Therefore, the play of activities, interactions and relationship are building blocks for the value chain. *An organisation's strategy,*

leadership and culture are internal factors that need to be aligned with the external environment in which the business operates. The business model should promote development of all stakeholders in order to sustain in the long run. Therefore, by *disclosing issues that are relevant to stakeholders*, an organisation can align itself better to promote *mutual development*. It will also give the user insight about the building blocks in the value creation process. <IR> thus serves as a tool to make the organisation align towards its own *financial stability and sustainability and better corporate governance*. Capital allocation can then be streamlined to support activities that would enable sustainability and stability of the organisation.

The Framework also includes scenarios where there may have been **no change in the value or that the value of the company is preserved**. Scenarios when value preservation may need to be discussed would be:

- Businesses being merged and acquired.** Generally the "value creation" of an acquired /merged business *does not happen immediately*. In reality, integration of two businesses is challenging due to *operational and organisational cultural differences*. So in reality, although the deal may be closed, the "value creation" from the acquired business is deferred. Here, the management may wish to point out the steps it wishes to take to steer the business integration so that it creates value in the long run. This could include measures to stabilise the acquired business. Discussion could centre around how the experience of the top management (strategic initiative) will enable the management at the operational level (tactical initiatives) to have seamless integration. These are steps taken by an organisation to **"preserve value"**.

This discussion may be needed in order to reassure the providers of finance that the management has a clear road map on how to manage the "business /value acquired" so that it generated sustainable value in the long run. Others such as employees of the company may also be interested in the management's outlook.

- Debt Restructuring:** Challenges faced by an organisation may lead to situations where there is a cash flow crunch in operations. This may hinder it from meeting its debt obligations. If fresh capital investments cannot be infused, the organisation may go for debt restructuring. It negotiates with the bank to draw up a better scheme of arrangement that can enable it to meet its obligations. Such instances put concerns about the organisation's liquidity on various stakeholders like investors, bankers, suppliers, employee union, government who would be anxious if the organisation would be able to meet its obligations.

A discussion by the management on the road map that the organisation plans to follow to improve its solvency would highlight the risks that the organisation faces. Accordingly, the stakeholders can make informed judgements about the organisation's value.

The report should also take into consideration the effects of business operations that have been **"externalised"**. For example, smoke emission from the factory does not impact the organisation directly. However, the impact is felt in the form of air pollution in the city. Similarly, waste dumped in landfill does not impact the organisation but does impact the city living conditions. These are impacts that are externalised. Where judged **material** they need to be discussed in the report. Providers of financial capital may need to be aware of material information of these externalities to assess their effects.

Example, externality could negatively impact business: Chennai city faced severe drinking water supply the summer of 2019. The crisis impacted normal life for many months. Many IT firms had to request their employees to work from home since they could not provide water facilities at office. If unprepared, this crisis could have disrupted business for some of these firms.

Do You Know?

The Business Roundtable (BRT) is an association of CEO's of America's top companies. These CEO members lead companies with more than 15 million employees and more than \$7 trillion in annual revenues. The BRT released an updated statement on the '**Purpose of a Corporation**' in Aug' 2019. The statement stated a fundamental commitment to **all stakeholders**- customers, employees, suppliers, communities and shareholders; representing a move away from the long-standing view that shareholder profit is the only purpose of corporations. The statement received support from 181 CEOs, including the leaders of Abbott, Accenture, Amazon, Apple, American Airlines, American Express, Bank of America, Boston Consulting Group, Citigroup, The Coca-Cola Company, Cognizant, Dell, Procter & Gamble and Walmart.

The Capitals – Financial, Manufactured, Human, Intellectual, Natural, Social and Relationship

Capitals are the stocks of value change through activities and outputs of an organisation. **For example**, financial capital increases when profit is made, human resource capital improves when employees are better trained. Overall Value of stock of capital keeps changing. One type of capital can be transformed into another, so there is constant flow between the capital. **For example**, (i) New equipment purchased increases manufactured capital while decreasing financial capital or (ii) talented employees (human resource capital) have developed a patent for a component (intellectual capital) that increases the product's sales, thus profits (financial capital) or (iii) a school is built for local community children to study in (societal and relationship with the outflow of financial capital).

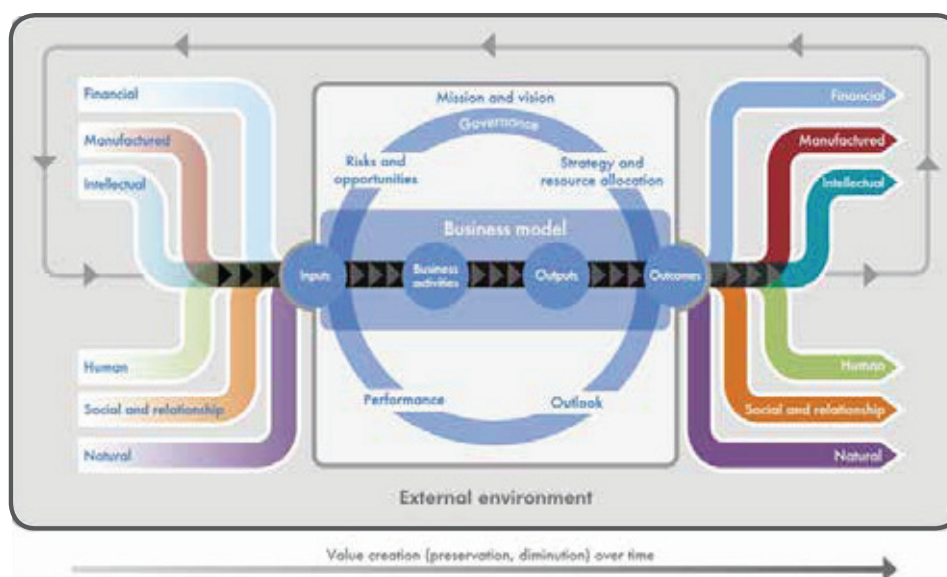
Categories and descriptions of capitals

- (1) **Financial Capital:** Refers to the conventional "monetary" capital. It is generated through financing (either in the form of equity or debt), investments and surplus generated from business operations. *Businesses use this pool of funds to create value by transforming it into other forms of capital like manufactured, intellectual, people, environmental, social and relationship capitals.*
- (2) **Manufactured Capital:** The "physical infrastructure" needed to manufacture a product or provide service. These are manufactured physical objects (as against natural physical objects like lakes and mountains). **Examples**, machinery, building, infrastructure such as roads, bridges or even inventory held for sale / captive consumption.
- (3) **Intellectual Capital:** These are resources that are critical to value creation. **Examples**, of intellectual property are patents, copyrights, software, licenses, brand value.
- (4) **Human Capital:** The combined know-how, skill, effort and experience of the workforce of an organisation forms its human capital. A motivated workforce can enable the organisation to achieve its objectives. To derive this mutual benefit, their work should be aligned with the organisation's governance framework, risk management approach, ethical values. They also need to understand the organisation's strategy and develop and implement it. To retain the work force loyalty, an organisation has to groom talent and the leadership team.
- (5) **Social and Relationship Capital:** An organisation has multiple stakeholders, direct and indirect, internal and external to the organisation. They include customers, vendors, suppliers, associates, alliances, dealers, sales network, government, regulatory authorities, communities and society.

Social and Relationship capital refers to:

- a. The *shared norms, common value and behaviour stakeholders* may have with the organisation. **For example**, both the organisation and supplier may value not to employ child labour, value safe working environment for employees etc. An organisation may take due diligence while doing business with a supplier to ensure that these norms are met.
 - b. Key stakeholder *relationships* and the *trust and willingness* an organisation has built with external stakeholders. Trust must be earned but can be easily lost. Therefore, an organisation must strive to build trust be it with customers, suppliers or regulatory authorities. **For example**, timely settlement of suppliers' dues will build strong relationships. This will contribute positively because they will be more willing to engage with the organisation while doing business.
 - c. Relationship is built on the *brand and reputation* that the organisation has developed. **For example**, the trust that the customer places on the organisation while consuming products manufactured by it, with the belief that it is not detrimental to the users' health. This trust and willingness of the customer forms the very basis of brand loyalty, value that the organisation has to maintain.
 - d. An organisation's *social license* to operate: Social license is the acceptance of an organisation's business practices by its employees, stakeholders and larger public. An organisation has to work to build trust within itself and with the external environment it operates in. Closely linked to the **Triple Bottom Line** concept, it should take care of its employees, the environment and corporate social responsibility. Any issue that arises that can erode this social license should be quickly resolved.
- The management may discuss any material matters relating to its social and relationship capital like the *corporate social responsibility* initiatives that it has undertaken. Any issue that can threaten social license to operate may also be addressed here.
- (6) **Natural Capital:** Renewable and non-renewable natural resources that an organisation uses for its business operations. These would be land, water, air, fossil fuel etc. Certain industries for example those in the agriculture and mining industries are highly dependent on natural resources for their business. Proper utilisation and maintenance of these resources can determine the future sustainability of the organisation.

Not all capitals are equally relevant or applicable in all organisations. However, the Framework provides this guideline so that no aspect of the "value chain" is overlooked.



Source : <https://integratedreporting.org/wp-content/uploads/2015/03/13-12-08-THE-INTERNATIONAL-IR-FRAMEWORK-2-1.pdf>

Value Creation Process

The business model of an organisation uses capitals as inputs and through various business activities converts them as outputs (products or service). The organisation's activities and its outputs lead to outcomes in terms of their effects on the capital. *Nurturing capital* in terms of its availability, quality and affordability in order to sustain business in the long run. **For example**, if a company's food product (activity leading to output) causes health issues like diabetes or obesity to the consumers (affects the society and relationship capital), in the long run the public will avoid its products. This can impact *business sustainability*. Therefore, the company has to change its strategy to additionally provide healthy offerings so that consumers have a choice about the food they want to consume. This change can nurture both customer satisfaction and public health to promote business stability and sustainability. Therefore, business models need to be *flexible* to adapt to changes internal and external.

Preparation and Presentation of the Integrated Report

An <IR> is prepared with the help of Guiding Principles and Content Elements, preparers of the report can refer to Guiding Principles to understand the concepts that underpin the preparation and presentation of the report. They can refer to Content Elements to understand to understand what the report should include. These are not water-tight guidelines. Preparers must *exercise judgement* to decide on these matters while preparing the report.

Guiding Principles of the Integrated Report

- 1. Strategic focus and future orientation:** The report has to provide *insight into the organisation's strategy* and *enumerate how it can create value* in the short, medium and long term time horizons. It might want to **highlight** significant risks, opportunities and dependencies flowing from the organisation's market position and business model. The management has to clearly articulate about the continued availability, quality and affordability of *significant capitals* relevant to the organisation's business since only when capital is nurtured, it will help sustain business in future. They may provide their opinion about learnings from past experiences that have influenced future directions, relationship between past and future performance and factors that can change them.
- 2. Connectivity of information :** The usefulness of the <IR> is enhanced when it is *logically structured, presented in an understandable yet concise way*. Information has to be clearly delineated but linked together to present a holistic picture of business model and value creation process. The Content Elements (subject matter of the report) should have a *clear narrative* that helps conjure a total picture of dynamic and systemic interactions of the organization's activities. Connectivity of information could talk about the flexibility and ability of the organisation's strategy to help the business model adapt to changes within and to the external environment. *Qualitative, Quantitative and KPI metrics* information can be used in the narrative to connect information.
- 3. Stakeholder relationships :** An effective <IR> report would be transparent in providing *accountability to key stakeholders by their disclosing legitimate needs and interests*. Accountability places the organisation in the role of stewardship to take care of the value creating capitals. Engagement with stakeholders like suppliers, consumers and employees would happen in the regular course of business. In some cases, engagement with local communities or regulatory authorities, NGOs may happen in special circumstances. An organisation has to understand their information needs and concerns. Needs and concerns that are *material* may be discussed in the <IR> along with the actions and decisions the organisations have taken to address them. Thus <IR> could serve as a *tool to build trust and resilience between the organisation and its stakeholders*.
- 4. Materiality :** *A matter related to value creation is material when its known or potential impact on the organisation's value creation ability is significant and important*. While exercising judgement about the magnitude of the effect it should be noted that it can

be both quantitative or qualitative, financial or non-financial, internal or external to the organisation and relate to different time frames (short, medium or long). Disclosure of material matters requires *judgement*, an ability to think from different perspectives. This can be developed with regular engagement with the providers of capital and other stakeholders.

- 5. Conciseness :** The information should be presented in a *logical structure, avoiding repetition and clearly cross-linked* within the report to establish connectivity of information. The narrative should be written in *lucid language* that is easy to understand.
- 6. Reliability and completeness :** Information presented should include both *positive and negative matters* to make the report complete. Information should be without material error to enhance its reliability.
- 7. Consistency and comparability:** Information presented should be *consistently* prepared over time. Any change in compilation or measurement of information should be disclosed. **Tools** such as *industry benchmarks*, presenting information in the form of ratios or comparing standard quantitative indicators enables users to compare the report with that of other organisations.

Content Elements of the Integrated Report

The content of an organisation's Integrated Report would vary depending on the *individual circumstances of each organisation*. Therefore, Content Elements are stated in the form of questions rather than of checklists of specific disclosures. **Judgements need to be made** to decide on what to report on using the Integrated Reporting Framework as a reference. Questions can be posed for each of the categories of Content Elements below:

- 1. Organisational overview and external environment**
 - What is the Vision and Mission of the organisation?
 - What is the ownership structure, its culture, ethics, values?
 - What are the principal activities and markets?
 - What is the competitive landscape, the organisation's position in the value chain?
 - Significant legal, social, environmental, political, commercial aspects from the external environment in which the organisation operates may also be discussed.
 - Key quantitative information may be presented here.
- 2. Governance**
 - How does an organisation's governance structure influence value?
 - What are the skills and experience of those charged with governance? Actions they take to influence and monitor the strategic direction of the company.
 - Processes in place to make strategic decisions and its implementation.
 - How are remuneration and compensation linked to value creation?
 - These are some of the discussions that can be laid out in this section.
- 3. Business model**
 - A business model with the help of business activities transforms inputs into outcomes or outputs that fulfill the organisation's strategic objectives.
 - The report has to enumerate what constitutes inputs, business activities, outputs and outcomes.
 - There can be a pictorial representation of the model along with an explanatory narrative.
 - Connection with other Content Elements like strategy, risk and opportunities, performance (financials and KPIs).
- 4. Risks and opportunities**
 - Specific risks and opportunities that affect the organisation's ability to create value.
 - How is the organisation dealing with them?
 - Address the continued availability, quality and affordability of capital.
 - Disclosure about the likelihood of occurrence of the perceived risk and opportunity.
 - Discuss specific steps to mitigate risk or to create value from opportunities.

- Where a particular risk can threaten the fundamental ability of the organisation to create value, it needs to be reported even if the likelihood of occurrence is small.
- 5. Strategy and resource allocation**
- Identification of short, medium and long term strategic objectives.
 - Resource allocation the organisation has planned to achieve the objectives.
 - Link the strategic objectives with resource allocation plans, ability to adapt to change in the external environment.
 - Discussion about what gives the organisation its competitive advantage: innovation, development and use of intellectual capital, environmental and social considerations that give it the competitive edge.
- 6. Performance**
- The report may contain qualitative and quantitative information about the performance of the organisation.
 - Include quantitative indicators comparing actual performance with targets explaining their significance and importance.
 - Include a narrative of the organisation's effects (both positive and negative), connecting financial performance with regard to other capital.

7. Outlook

- Report can discuss the changes the organisation can expect in the external environment.
- How is the organisation equipped to respond to critical risks and uncertainties that can arise?

8. Basis of preparation and presentation

- The report should disclose how the report was prepared.
- The basis for determining materiality, reporting boundary, summary of significant framework and methods.

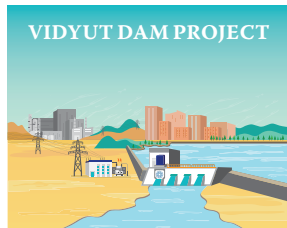
Conclusion

Investors well informed about the organisation's business operations can take *mature decisions* that will improve the financial environment and the economy as a whole. Organisations that are profitable, by taking along their stakeholders in their success stories, will always be rewarded. Also, organisations that talk about the risks the business faces improve transparency of corporate report. ***With multiple scandals rocking the investment world, there is a need to improve the integrity of corporate reporting. The Integrated Report aims to fulfill that needs.***

Case Study

The basic objective of the case study is to allow the students to apply ideas and insights from theory to the *real life issues and problems*.

Case Study - Triple Bottom Line



VIDYUT DAM PROJECT

A preliminary investigation for the **Vidyut Dam Project** was completed in 1962 in a South-Asian country (here-in-after referred as country) and its design was completed in 1973 with a 600 MW capacity power plant. Construction began in 1979, but was delayed due to economic, environmental and social impacts.

In year 1987, technical and financial assistance was provided by the neighbouring country to said country after signing of MoU, but this was interrupted just a year later with political instability. Hence, said country was forced to take control of the project and at the first, it was placed under the direction of the irrigation department of concerned home state of said country. However, in July 1989 the Vidyut Hydro Development Corporation Limited (VHDCL) was formed to manage 1,900 MW Vidyut Hydro Power Complex; wherein 75% stake held by union government and remaining 25% stake by concerned home state government. The 1,900 MW **Vidyut Hydro Power Complex comprises of Vidyut Dam and 1,000 MW Vidyut Hydro Power Plant (250MW×4)**, Beejuree HEP (400 MW), and Vidyut PSP (500 MW).

The **Vidyut Dam** is a 260.61 m (855 ft) multi-purpose high rock and earth-fill embankment dam on the Karaka River near Chapala town. Its length is 574.85 m (1,886 ft), crest width 20.11 m (66 ft), and base width 1,128.06 m (3,701 ft). The dam creates a reservoir of 4.0 cubic kilometres (~32,00,000 acre ft).

The **1,000 MW Vidyut Hydro Power Plant (Vidyut HPP)** was **commissioned** in 2007-08 as a multipurpose project, with variable speed features which can optimise the round trip efficiency under varying water levels in its reservoirs. Power is distributed to 10 northern states (including concerned home state) of said country. The complex will afford irrigation to an area of 2,71,139 hectares (=6,70,000 acres), irrigation stabilisation to an area of 6,07,028 hectares (=15,00,000 acres), and a supply of 270 million imperial gallons (1.23×10⁶ m³) of drinking water per day. 162 million gallons of drinking water for around 4 million people of the neighbouring state, apart from 108 million gallons of drinking water for around 3 million people of the concerned home state. Due to regulated releases from the Vidyut storage reservoir, the existing downstream hydro

projects are also benefitted by way of augmentation in generation at no additional cost to them. Concerned home state also gets 15% of generated power as free. The total expenditure for this project was USD 1 billion. Since 2007-08, which was the first year of operation, VHDCL has been a profit making company.

The Vidyut Dam has been the object of protests by environmental organisations and local people of the region. The protest was against the displacement of town inhabitants and environmental consequences of the weak ecosystem. ***“We don't want the dam. The dam is the mountain's end”*** was the prominent slogan.

The relocation of nearly 1.5 lakh people or may be even more, from the area has led to protracted legal battles over resettlement rights and, ultimately, resulted in the project's delayed completion despite the fact that land acquisition was started in 1980. There is no master plan for rehabilitation nor even a clear estimate of the number of people affected. According to the 2003 status report of the public work department of Chapala town, the Dam replaced 15,550 families. This estimate excludes a large number of people who lost their lands but have not been officially recognised as project-affected. Among those officially recognised, allotted with land of poor quality or with multiple ownership claims.

Near to year 2006, while filling of the reservoir has led to the reduced flow of Karaka River's water from the normal 1,000 cu ft/s (28 m³/s) to a mere 220 cu ft/s (6.3 m³/s). This reduction has been central to local protest against the dam, since the Karaka River is considered sacred river whose waters are crucial to religious beliefs.

Old Chapala town shifted and named as New Chapala Town (NCT) which is semi-ultra-modern hill station at height of 1,555-1,855 m above MSL, with better road network and district head quarter (shifted to NCT, earlier about 65 kms away from Chapala). NCT equipped with better health (got 80 bed modern hospital against 25 bed hospital in old Chapala, and also got 5 primary health centres with additional 75 bed facility in total) and education facilities (hostel facility of 900 students, degree college with university campus which can accommodate 440 residential students and faculties, and against 1 inter college in old Chapala, 5 inter-college established (one in NCT and 4 in nearby villages). This all done at project cost.

In addition to the human rights concerns, the project has spurred concerns about the environmental consequences of locating such a large dam in the fragile ecosystem of the foothills of great mountain range. There are further concerns regarding the dam's geological stability. The Vidyut dam is in a major geologic fault zone. This region was the site of a 6.7 magnitude earthquake in September 1992, with an epicentre 55 km (34 mi) from the dam. Dam proponents claim that the complex is designed to withstand an earthquake of 8.4 magnitude, but some seismologists say that earthquakes with a magnitude of 8.5 or more could occur in this region. Were such

a catastrophe to occur, the potentially resulting dam-break would submerge numerous towns downstream, whose populations total near half a million.

In spite of concerns and protestation, operation of the Vidyut Dam continues and is completed. But VHDCL was aware of these and tried to respond in a constructive way. The spirit of CSR initiative is depicted by its CSR initiative title 'VHDC Sahridaya' (Corporate with a Human heart), wherein the focus areas are:

- *Shiksha* - Education Development
- *Svasth* - Nutritional Health and Sanitation and Drinking Water Projects
- *Nipun* - Livelihood Generation and Skill Development Initiatives
- *Unnaati* - Rural and Infrastructure Development
- *Yogy* - Empowerment Initiatives
- *Srrishti* - Environment Protection Initiatives

Out of these 'VHDC Srrishti' has some special mentions, 'Environment Focussed Initiatives' is working with three objectives Soil and Water Conservation, Green Energy Generation and Technology Promotions and Environment Protection and Promotion.

To conserve soil and water VHDCL is working on water harvesting and water harvesting tanks (capacity 3,000 litres each) were installed in the project affected villages for rainwater harvesting. Through this activity, beneficiaries were able to store almost 9 lakh litres of rainwater during monsoon. In addition, VHDCL under this program installed more than 730 LED based Solar Street Lights and more than 180 LED based Solar High Mast Lights in near-by towns and villages in year 2019-20. Moreover, to promote plantation of different fruit, fodder, and medicinal plants, VHDCL planted 2,70,202 plants/ sampling till now.

VHDCL has won many awards in the last decade in different categories including CSR domain, but most recent and relevant (for case study) among them are →

- HR Platinum Award for Training Excellence in 2019-20
- National CSR Leadership Award 2020
- CSR Innovation and Leadership Award 2020

It has not only gained recognition in term of awards, VHDCL has obtained following Certifications:

- ISO 9001:2015 Certification (Quality Management System).
- ISO 14001:2015 Certification (Environment Management System).
- OHSAS 18001:2007 Certification (Occupational Health and Safety Management System).

Required

As part of the policy initiative, if VHDCL is willing to implement the Triple Bottom Line (TBL) reporting initiative; then **ADVISE** the management regarding dimensions of TBL, and what are perspectives composed by different dimensions of TBL. Also, enumerate the challenges, expected benefits, and initiatives under each dimension in context of Vidyut Dam and Vidyut Hydroelectric Power Plant (1,000 MW).

Solution

British business author **John Brett Elkington** in year **1994** coined the term **TBL**. Every business needs to be **sustainable, rather than only profitable**. A business is said to be sustainable, when management makes sustainable business decisions. To consider sustainability of business decision there are three bottom lines i.e. **People, Planet and Profit** (also known as dimensions of TBL), instead of single bottom line (i.e. Profit).

Here-in VHDCL, shows *strong commitment for CSR* through the certification (regarding quality, environment and safety) they obtained and also through the awards they won (in the domain of CSR and Training).

Dimensions (sets) of TBL

- (i) **People**, the **social equity** bottom line relates to corporate governance, motivation, incentives, health and safety, human capital development, human rights and ethical behaviour.

The project has major concerns about the **displacement of town inhabitants**, followed by reduction in flow of Karaka River from the normal 1,000 cu ft/s (28 m³/s) to a mere 220 cu ft/s

(6.3 m³/s). Former concern is more significant than the later concern, because later was of short duration; it is obvious when the reservoir is filled to its maximum capacity, the flow of the river will again become normal. Regarding the displacement, it is mentioned in the case itself that according to the 2003 status report of the public work department, the Dam replaced 15,550 families. Further, this estimate excludes a large number of people who lost their lands but have not been officially recognised as project-affected. Even those officially recognised, allotted with land of poor quality or with multiple ownership claims. This concern substantiates in absence of a full-proof master plan.

It is not the case that local resident were/ are in complete distress, they were/are compensated with **alternative and better facilities and remedies** as well that too at **project cost**, which includes the:

- Development of hill station to attraction for tourism – The New Chapala Town (NCT) is developed with semi-ultra-modern facility at height of 1,555-1,855 m above MSL as pre-planned hill station which will attract the tourist. By creation of lake due to the impoundment of the reservoir of Vidyut Dam, scope of water sports is there. Hotels, Guides and Tour and Travels will cause *employment opportunities* for locals.
- Better road network leads to *ease of living* and *improved communication channels* which also help in establishing suitable industries according to environmental aspects.
- Shifting of district head quarter to NCT results in reduction of distance of travel by town residents to reach to district head quarter for any task by about 65 kms, hence *life of locals will be further eased*.
- *Improved health facilities* - NCT equipped with better health facilities. It got 80 bed modern hospital against a 25 bed hospital situated in old Chapala town. Apart from this also got 5 primary health centres with additional 75 beds in total.
- *Improved Education facilities* in terms of hostel facility of 900 students and increase in number of inter-colleges.

Not only the local resident (directly affected), **other too got benefit from project**, such as 250 cusecs (~162 million gallons per day) of water supply to neighbouring state, which will meet drinking water need of around 4 million people, apart from 167 cusecs (~108 million gallons per day) of water supply to concerned home state, which will meet the drinking water need of around 3 million people. Power is also distributed to 10 northern states (including concerned home state) of said country.

VHDCL showed social commitment through Shiksha, Svasth, Nipun, Unnaati, and Yogy as part of their CSR initiative.

- (ii) **Planet**, the **environmental** bottom line measures the impact on resources, such as air, water, ground and emissions to determine the **environmental impact and ecological footprints**.

The project has spurred concerns about the **environmental consequences** of locating such a large dam in the fragile ecosystem of the foothills of great mountain range, which will result in **weak ecosystem** and concerns over a **catastrophe to occur** (due to earthquake - the potential dam-break). Regarding the later concern, it is also mentioned in the case that the Vidyut dam is in a major geologic fault zone. This region was the site of a 6.7 magnitude earthquake in September 1992, with an epicentre 55 km from the dam. In response to which the Dam proponents claim that the complex is designed to withstand an earthquake of 8.4 magnitude, but some seismologists say that earthquakes with a magnitude of 8.5 or more could occur in this region. Were such a catastrophe to occur, the potentially resulting dam-break would submerge numerous towns downstream, whose populations total near half a million.

The major environmental **benefit** is generation of 1,000 MW (3,532 MU of Annual Energy) of **environment friendly** peaking power.

In order to leave improved environment footprint and to trade-off the environmental loss caused during construction, VHDCL through **initiative** 'VHDC Srrishti' working on:

- *Rainwater Harvesting* – It has installed the necessary infrastructure in the affected areas to harvest almost 9 lakh litres of rainwater during monsoon.
- *Green Energy Generation and Technology Promotions* through installing LED based Solar Street Lights and LED based Solar High Mast Lights.
- *Environment Protection and Promotion* through plantation of 2,70,202 samplings so far, of different fruit, fodder, and medicinal plants.

(iii) **Profit**, the **economic** bottom line refers to measures maintaining or improving the company's success in terms of adding value to shareholders.

It is an inherent feature (rather project specific concern) of hydro power projects that the duration of construction is quite lengthy and huge capital outlay is involved. In case of Vidyut Dam too, Construction began in 1979, but was delayed due to economic impact apart from social and environmental pressure. In 1987, technical and financial assistance was provided by the neighbouring country, but this was interrupted years later with political instability. Project then placed under the direction of the irrigation department of concerned home state of said country. However, in July 1989 the Vidyut Hydro Development Corporation Limited (VHDCL) was formed to manage such 1,900 MW Vidyut Hydro Power Complex; wherein 75% stake held by union government and remaining 25% stake by

concerned home state government. The total expenditure for this project was USD 1 billion. Since 2007-08, which was the first year of operation, VHDCL is a profit making company.

The initiative includes the feature of variable speed, the 1,000 MW Vidyut HPP has variable speed features which can optimise the round trip efficiency under varying water levels in its reservoirs to keep the *cost of operation low*.

The quantifiable economic benefits include:

- The generation of 1,000 MW (3,532 MU of Annual Energy) of environment friendly peaking power. This will no doubt lead to industrial and agricultural growth in the northern region.
- 15% of generated power will be given free to the concerned home state, apart from power as per their share, where the distress is caused due setting up of the project. Hence, the state has economic benefit from the project too.
- Irrigation of 2.71 lakhs hectares of area, beside irrigation stabilisation of 6.07 lakhs hectares. Hence, supporting other economic activities as well indirectly.

To conclude, the project largely seems **sustainable** as running in *profit* since it was operational, leaving minimal and positive *environmental* footprint, and also payback society (especially directly affected local population) with alternate better facilities and compensation (may be with few minor exceptions or irregularity on case to case basis).

Case Scenario

Case Scenarios, as opposed to Case Studies, are *short cases*. Written in a more compact style with an appealing narrative, the Case Scenario's focus is on covering more depth in a *specific area*.

Case Scenario – Six Sigma



Smooth Connect Telecom (SCT) is the private sector telecom company. SCT is second largest player in telecom sector of country, with subscriber base of more than 10 million. SCT achieved this magnificent growth by acquiring competitor in recent years. SCT deals in fixed line telephone services, corporate services and mobile (cellular) services. SCT is meeting all the requirements from regulator in efficient and timely manner.

SCT is known for continuous innovation in its services, with changing pace of technology and business need like wise use of Optical Fiber Wire and VoLTE (Voice over Long-Term Evolution) etc. This helps the SCT in acquisition of many corporate clients.

The largest player in telecom industry is Voice Telecom, which is resulting company out of corporate restructuring of state-owned telecom corporation. Voice Telecom still own largest market share due infrastructural advantage over other players in the market. SCT is also facing tough competition from Voice Telecom on pricing and customer volume.

Majority of telecom operators, including SCT and Voice Telecom, usually criticised by customers for poor customer services, misallocation of call duration and call drop; but majority of complaints are on account of;

- Calculating wrong tariff, and
- Dull and delayed response from customer care executives.

Hence, by focussing on customer services, if SCT improves its billing process and handles the customer complaints wisely; then SCT can gain competitive advantage over other players including Voice Telecom. In order to improve the quality of customer services, SCT decide to practice Six Sigma initiative.

Required

Enumerate the modus operandi that 'how SCT can APPLY DMAIC method to implement Six Sigma.'

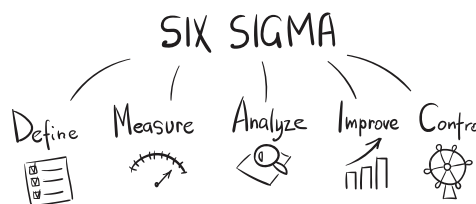
Solution

Six Sigma was first used by Mr Bill Smith of Motorola Corporation in 1986 for *improvement of manufacturing process and elimination*

of defects. Six-Sigma seeks to improve the quality of process by identifying and removing the cause of defects (defect can be anything, which lead to customer dissatisfaction). Six Sigma uses quality management and statistical methods with special infrastructure of people. Six-Sigma can be implemented through two methodologies;

- DMAIC** (Define, Measure, Analyse, Improve and Control) - Improve existing business process (remove defect).
- DMADV** (Define, Measure, Analyse, Design and Verify) - Create new business process (defect free).

DMAIC methodology of Six Sigma implementation at SCT



Define – Define the improvement area

Define includes definition of customer requirement or problem faced by customer.

First and foremost, requirement of is to ensure customer must be billed correctly, because wrong billing may lead to either of;

- Delayed revenue – due to litigation for wrong billing
- Loss of revenue – due to porting to alternate telecom operator by customer

Customer care *executives need to be trained*, so that they can guide the customer in most appropriate way and ensure lowest possible wait time to solve customer complaint.

Measure – Existing process for comparison

Existing performance needs to be measured

Since performance need to be measured specially in two domains 'billing processes' and 'customer complaint handling', hence SCT needs to have a system through which it can collect reliable information (likewise number of complaints as percentage of total customers, similarly wrongly billed customers against total customers; is there any process of reissue the correct bill? – if yes – than in how many cases it is issued? and average time to solve complaints) in order to measure existing performance.

Performance is required to be measured against each of *critical success factors* (which will create value for customer).

Analyse – Cause effect relationship between factors of process

Existing process needs to be mapped in order to determine the root cause of problem

SCT should further analyse the information collected in second point (measure) above for determining the performance, in order to reach to root cause of customer complaints and wrong billing; So that necessary *preventive* and *corrective* steps then can be taken.

Improve – Plan improvement on basis of analysis

Existing process need to be improved in order to mitigate the root cause threats

Once the SCT done with the analysis, it has to identify the possible solution to root causes, in order to improve the performance.

Any improvement, which is so ever is suggested; needs to be both **feasible** from SCT prospective and **valuable** from customers' perspective.

Improvement can be done by reissue of bill where it was wrongly issued earlier, if already process of revision of bill is in existence than wait time for reissue need to be curtailed.

Control – Continuous control to identify and correct the process variance

Improved processes need to be controlled continually in order to assure enhanced performance shall be maintained

Post improvement in process (issue of bill and handling of customer complaints), the manager who is responsible for such process at SCT need to assure continuous control over the process, so that customer services should create same value for customer and keep them satisfied.

For monitoring, **KPI against CSEs** can be established and reported on daily basis, likewise number of complaints (especially which remain unresolved at day end) and wrong billing cases. These KPI will also act as early signal to Line Manager or Senior Management.

In order to implement Six Sigma as per DMAIC method, SCT need to form a team of line managers from different processes which are need to be improved (or critical from prospective of customer services). Team and implementation project should lead by some senior management person (may be CEO him-self).

Case Scenario – Performance Measurement

Shakti Automobiles Limited (SAL) is a leading battery based e-rickshaw manufacturing firm, under brand 'Shah Swaari' in three models – Super, Star, and Speed. SAL started this business around 5 years back when it was only manufacturer of such e-rickshaw. SAL manufactures all assembly components themselves, irrespective of fact that these components can be acquired from market at a cheaper rate. Major component of total costs in manufacturing of such e-rickshaw is variable in nature. Company was performing well, earning reasonable and enjoyed large market share up-till two year ago majorly due to first mover advantage. But due to increasing competition as new entrant coming into market and rough macro economic conditions, market share starts shrinking; resultantly profit starts declining. If no major steps taken, then company may run into red in year to come.

Mr Pillai, CEO attended some workshop last week, where he learned about the lean management and techniques of cost management. He asked Mr Reddy, Chief Management Accountant to report on underlying reasons behind current performance with available set of possible solution. Mr Reddy immediately convened a meeting of top ranked officers, which is chaired by CEO, at meeting;

Mr Swami, VP Marketing mentioned that it is difficult to maintain same level of sales in upcoming years because price of Shah Swaari is much higher than price offered by all the competitors in market. Quality and features of other are also similar.

Mr Dutta, Customer Relation Officer also supported Mr Swami and said that the popularity of their product is declining, he quoted that he receives lot of complaints from buyers in e-mails and tele-calls due to manufacturing defects; which arise in product within a month period of purchase and frequency of such calls and emails have increased in recent years. He also mentioned that in some cases, customer reported that assembled part did not belong to model they purchased, and some customers say, assembly is not as per specification provided.

Mr Sodhi, Head Workshop and Repairs agrees that the repair issues in case of recently sold vehicle have been increased.

Mr Murthy, VP Production and Operations who recently joined the SAL replied, firstly large percentage of worker are unskilled; secondly due to large amount and categories of raw materials, dumped by store at production floor; that's too well prior to need. These two reasons cause worker fails to differentiate among parts which appear similar. He also mentioned entire business process, especially production process is quite old and contains certain activities which are purely unnecessary, he also highlight importance of industry 4.0 and give stress on business re-engineering through artificial intelligence, machine learning, etc.

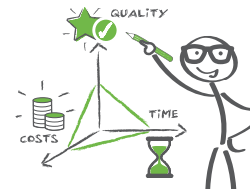
Mr Naidu, VP Purchases immediately responded about economics of discount involved behind purchase of large quantity and also mentioned buying too less may lead to stock-out situation.

Required

You were also presented at meeting as deputy to Mr Reddy. Post meeting you came back to your desk and start working. Mr Reddy called to you to his cabin, on reach to his cabin; he asked you to prepare draft of report (**ADVISE**) seek by CEO; and meet him with copy of draft after half an hour from now.

Solution**Report**

Addressed to;
Office of CEO,
Shakti Automobiles Limited (SAL).
Dated – 19th Jan 2021

Report on underlying reasons behind current performance and Lean Management, Cost Management tools

- (i) First reason behind weak financial performance is highlighted by Mr. Swami i.e. **Price** of SAL's Product Shah Swaari is much higher than price offered by all the competitors in market. Quality and features of other products are also similar.

Target Costing as cost management technique can be applied. Since market condition are stiff and *bargaining power of customers* is high due to multiple competitors, and these competitors are selling the product at price lesser than price offered by SAL. Hence, price offered by such vendors should be considered as 'Target Price' and after reducing 'Target Profit' from same 'Target Cost' can be identified. Production, operations facilities along with product need to be reengineered to achieve such 'Target Cost'.

- (ii) Second reason is that SAL manufactures all assembly components themselves, irrespective of fact that these components can be acquired from market at a cheaper rate.

Relevant cost of both, '**Make or Buy**' needs to be compared. As mentioned that major component of total costs in manufacturing of such e-rickshaw is variable in nature, hence, such major component of costs can be controlled if SAL buy the all the components instead of Making them.

Only those products need to be made in house whose variable cost of manufacturing is less than market price and vice versa.

- (iii) Third and major reason is popularity of their product is declining, this is evident from declining in market share and lot of complaints from buyers in e-mails and tele-calls for manufacturing defects.

Since these defects arise in product within month period of purchase. Hence, product needs to be looked at. Further, some of cases customer reported that assembled part is not belonging to model they purchased and some customers say assembly is not as per specification provided. Hence, quality is needed to be ensured in the product delivered.

One of way to look at 'Quality' is conformance to need of customer, to ensure same Total Productivity Management/ Total Quality Management supported by Six Sigma need to be applied as part of Lean System Management.

Total Quality Management is management of entire process, including planning process, to meet customer's requirements. **PRAISE** analysis can be used in order to achieve improve quality. Using **DMAIC** (Define, Measure, Analyse, Improve and Control) methodology of **Six Sigma**, existing business process can be improved to ensure customer satisfaction, reducing cycle time and reduction in waste also.

- (iv) Fourth reason being, large percentage of worker are unskilled. Each worker should be provided with **requisite training**. Though **Kaizen**, workers should be involved into improvement of existing process so that they become able to address small problems or improve a process.
- (v) Fifth and second major reason is large amount and categories of raw materials, dumped by store at production floor; that's too well prior to need. This reason may be root cause of one of complaint by customer that assembled part is not belong to model they purchased.

JIT can be implemented as part of lean system. JIT is **pull system of production**, with **single piece flow** after considering **takt time**. In JIT, production facility is need to be integrated with vendor system for signal (Kanban) based automatic supply which depends upon demand based consumption. Under JIT system of inventory storage cost is at lowest level due to direct issue of material to production department as and when required and

resultantly less/no material lying over in store or production floor. Note - Takt time is the maximum time to meet the demands of the customer, this will help to decide the speed of/at manufacturing facility. Heijunka can be applied in order to reduce variation between takt times over the production.

Cost benefit analysis of 'reduction in storage cost along with opportunity cost saved' and 'increase in ordering cost, purchase cost along with stock-out cost' need to be made.

- (vi) Sixth reason for low performance is **old established businesses processes**, especially production processes and contains **certain activities which are purely unnecessary**.

Value Analysis is need to be applied in order to ensure maximum value to customer by eliminating activities which are not value generating, this will control cost also, that's too strategically.

Process Innovation and **Business Process Re-engineering** can also be applied. Re-engineering is rethinking and radical design of business process in order to achieve improvement. It will help the SAL to keep them at par with changing technology by synchronisation along with redesign, retool the business process.

Further details can be tabled on requisition basis.

Closure of Report

Mr Reddy,
Chief Management Accountant
(For Management Accounting Division)
Shakti Automobiles Limited

Skill Assessment Based Questions

The questions at this level are based on **skill assessment**. An illustrative list of the verbs that appear in a question requirement for each question is given in November 2019 issue. It is important that students answer the question according to the definition of the verb.

Question 1

About Problem	Target Verb/(s)
Life Cycle Costing	Advise

Royal Bakers is famous for cakes and cookies. Mr Das the owner at Royal Bakers is interested in offering affordable products to their customers, hence keen to capture the small scope of cost-effectiveness. Royal Bakers located in the centre of the city where space has a huge cost and royal baker is running out of space during peak hour causing loss of sale. Most of the customers are regular to Royal Bakers. Royal Bakers is known for fast service, Mr Das wish to be true to the tagline 'Close your eyes to wish and open them to find it cooked for you'. The hurdle rate is 12%.

Non-availability of skilled workers and high attrition rate of workers including chefs is the cause of worry for Mr Das. In order to retain workers, Royal Bakers is paying a higher salary than industry standards. The raw material is easily available as and when required. Royal Bakers is considering two different models of baking oven machine to replace its old oven. The baking capacity of both machines are the same and both will occupy a similar amount of space.

The first model is the automatic oven which will cost about ₹ 10,00,000. Another model is the semi-automatic oven which will cost at ₹ 5,60,000. The annual operating cost (including depreciation) is 40% of the acquisition cost and ₹ 4,20,000 in case of automatic and semi-automatic oven *respectively*. After 3 years of use, the automatic oven can be salvage at ₹ 70,000, whereas semi-automatic oven will fetch ₹ 20,000 only. The automatic oven is more advanced and equipped with latest technologies to speed up the baking, because only ingredient need to be inserted in right proportion and mix. Whereas in semi-automatic machine some part of the process needs to be performed manually by the workers.

Required

ADVISE which oven shall royal baker acquire.

Note- You can ignore taxes but need to consider the time value of money; decimal accuracy up-to two digits is expected.

Answer

Statement of the Comparable Life Cycle Cost

Particulars	Automatic (₹)	Semi-Automatic (₹)
Acquisition Cost	10,00,000	5,60,000
PV of Entire Life Cash Operating Cost (W.N.2)	2,16,000	5,76,000
PV of Salvage Value (W.N.3)	(49,700)	(14,200)
Total Cost of the Oven over the life cycle	11,66,300	11,21,800

Note – Hurdle rate of 12% (marginal cost of capital rate) is considered, for purpose of application of time value of money.

Working Note 1 – Depreciation (₹)

Particulars	Automatic	Semi-Automatic
Acquisition Cost	10,00,000	5,60,000
Salvage Value	70,000	20,000
Depreciable Value	9,30,000	5,40,000
Useful life in a number of years	3	3
Depreciation on SLM basis	3,10,000	1,80,000

Working Note 2 – Present Value of Entire Life Cash Operating Cost

Particulars	Automatic	Semi-Automatic
Annual Operating Cost	4,00,000	4,20,000
Depreciation (see W.N. 1)	3,10,000	1,80,000
Annual Cash Operating Cost	90,000	2,40,000
Cumulative PV factor @ 12% for 3 years	2.40	2.40
PV of Entire Life Cash Operating Cost (₹)	2,16,000	5,76,000

**Annual operating cost is 4,00,000 i.e., 40% of 10 Lakhs, in case of automatic machine.*

Working Note 3 – Present Value of salvage value

Particulars	Automatic	Semi-Automatic
Salvage Value	70,000	20,000
PV Factor @ 12% for 3rd year	0.71	0.71
PV of Salvage Value (₹)	49,700	14,200

Advise

Based upon life cycle cost, Royal Bakers are advised to acquire semi-automatic oven, because it causes a saving of ₹44,500. The cost has **qualitative implications** too, apart from quantitative or monetary implications. Similarly, a management decision is also impacted by qualitative and non-monetary quantitative factors. Hence, decision taken in part a above may differ if Royal Bakers consider-

Finishing of bake products – the look and taste

It is obvious the presence, which one important feature for bakery product in order look delicious and tempting; will be way different if cooked in the automatic and semi-automatic machine. The taste may also be different, which is more critical from prospective of customer retention because a large number of the customers are regular to the royal baker, hence maintaining the principal customer is maybe a key consideration. This factor may go in favour of any of version oven. If look goes in favour of automatic oven, then taste may be in semi-automatic due to corrections by the worker during baking and relatively authentic preparation.

Manpower

Availability of skilled workers and retention of workers is the cause of worry presently. In order to operate an automatic oven obviously fewer workers are required; hence money can be saved by cutting down recruitment cost and excess salary paid to the worker in order to retain them. On the other hand, skilled workers are already in scarcity, automatic machine obviously requires a more technically competent operator. But largely this factor moves in favour of automatic machine despite is costlier.

Space

Royal Bakers located in the centre of the city where space has a huge cost and Royal Bakers is running out of space during peak hour causing loss of sale. Although the size of both the ovens are same, the number of worker and space required for them surely be less in case of the automatic oven. Hence, this factor again moves in favour of automatic oven.

Power consumption and availability

Although the power consumption cost is presumed to already include in annual operating cost hence considered as a monetary factor but need and availability of power is a very important factor; in order to ensure uninterrupted baking. In the absence of stand-by power back-up, power cut may lead to downtime. It will complete downtime for the automatic oven and to a certain extent in the case of semi-automatic (because the manual process will keep going on). Stand-by power back-up will also have an additional cost.

Customisation

In case of cookies, it may be ok to produce the standard product; but the cake needs to base upon the order of the customer, who may seek customisation. Scope of customisation needs to evaluate. In the case of the semi-automatic oven, the scope of customisation and ethnicity will be relatively high.

Speed

Royal Bakers is known for fast service, and Mr Das wish to be true to tagline 'Close your eyes to wish and open them to find it cooked for you.' The automatic oven is more advanced and equipped with latest technologies to speed up the production. Hence, this factor moves in favour of automatic oven.

Detection of the defect

If speed thrills, then it kills too. In case of the bakery, rework and

reprocessing is hardly possible, even if possible then at a huge cost; hence, it is essential to keep vigil control over quality and detection of defect at the earliest stage. In the semi-automatic oven, there is the scope of reviewing the material after stage/s and improvisation can be done.

Overall, Royal Bakers should take the decision only after due and careful consideration of above factors.

Question 2

About Problem	Target Verb/(s)
Theory of Constraints	Calculate, Interpret, Apply

Ajanta Digital Solutions (ADS) is a renowned name for manufacturing a wide variety of digital stationery products for office and academic use. The 'Abacus division' of ADS is engaged in the production of basic calculators, capable of academic and commercial use. Presently Abacus is manufacturing only three models, named C-100, C-125, and C-500. These calculators are sold to customers through wide-spread retailers and distributors' network across the country.

During manufacturing process, each calculator needs to pass through various steps, before it gets ready. PC-1A is the essential step and performed manually, where processing chip is being installed, activated, and tested. The production capacity of Abacus is constraint by PC-1A. The basic information pertaining to top-line and the prime cost is as follows (Amount in ₹)-

Particulars	C-100	C-125	C-500
Sale price per unit	140	200	450
Material cost per unit	72	104	200
Labour cost per unit	30	52.5	75

All the process and division at ADS are operating for a single shift of 8 hours in a day. Conversion cost per hour (including labour cost) is ₹5,600. The standard output for PC-1A during a day is the processing of either 800 units of C-100 or 560 units of C-125, or 320 units of C-500. ADS is capable of sale more than, what they are presently capable to produce in all range of models. The CEO of ADS recently attended a science fair, Robo-tech 4.0; where he saw a Robot developed by Synergy Robotics Limited, capable to assembly including installation of processing chip to any sort of device.

Required

Management hired you as cost consultant, advice on the following aspects→

- On a random day if 480 units, 140 units and 120 units of C-100, C-125, and C-500 respectively are produced and sold, CALCULATE at what efficiency level current constraint (bottleneck) is operational. INTERPRET the same. COMPUTE profit earned during such day.
- FIND production of which model is more beneficial, considering the ranking (based upon throughput performance ratio).
- APPLY Goldratt's five steps to remove the bottleneck at Abacus.

Answer

- Efficiency level can be measured with help of Efficiency Ratio, which is one among the control ratios.

Efficiency ratio indicates the degree of efficiency attained in production. It is expressed in term of standard hours for actual production as a percentage of the actual hours spent in producing that work.

$$\frac{\text{Standard hours for actual production} \times 100}{\text{Actual hours worked}}$$

$$= (9.8/8) \times 100$$

$$= 122.5\%$$

Working Note – Standard hour required for actual production

Product	Actual output (Units) (a)	Standard Daily Output (Units) (b)	Standard Hourly Output (Units) (c) (b)/8	Standard Hour Required (a)/(c)
C-100	480	800	100	4.8
C-125	140	560	70	2
C-500	120	320	40	3
Standard Time Required (in hours)				9.8

Interpretation – 122.5% signifies that efficiency (usage) of exploiting bottle-neck activity is 22.5% better than the standard use. PC-IA is producing out-put which require 9.8 hours, in 8 hours.

Profit earned during the day

Particulars	Amount in (₹)
Revenue [(480×140) + (140×200) + (120×450)]	1,49,200
Less: Material Cost [(480×72) + (140×104) + (120×200)]	73,120
Less: Conversion Cost (including labour cost) [5,600 × 8hrs.]	44,800
Profit	31,280

(ii) Statement of ranking, based upon throughput performance ratio (using throughput contribution)

Particulars	C-100	C-125	C-500
Sale price per units ...(a)	₹ 140	₹ 200	₹ 450
Material cost per unit ...(b)	₹ 72	₹ 104	₹ 200
Throughput contribution per unit ...(c) = (a) – (b)	₹ 68	₹ 96	₹ 250
Maximum possible production ...(d)	800	560	320
Maximum possible throughput contribution ...(e) = (c)×(d)	₹ 54,400	₹ 53,760	₹ 80,000
Conversion cost (including labour cost) (5,600×8hrs) ...(f)	₹ 44,800	₹ 44,800	₹ 44,800
Throughput performance ratio ...(e)/(f)	1.21	1.20	1.78
Ranking	II	III	I

Considering the throughput performance ratio (or TA ratio) and ranking above most beneficial model to produce is C-500 followed by C-100 and C-125.

$$TA\ Ratio = \frac{\text{Throughput contribution}}{\text{Conversion cost}}$$

- Throughput accounting developed by Galloway and Waldron which use the term factory cost and completely rely upon the Goldratt’s theory of constraints which use the term operating expenses, but the meaning of factory cost and operating expenses used at both places are *identical*.
- Theory of constraints consider *short-run time horizons* and assume other current operating cost to be fixed costs.
- Higher the throughput performance ratio (or TA ratio) is better and beneficial.
- All the products/ models which have throughput performance ratio (or TA ratio) **more than one** may be produced/ continued to produce, depending upon constraint function.

(iii) Application of Goldratt’s five steps to remove the bottleneck at Abacus

Goldratt’s theory of constraints describes the following mentioned five steps process of identifying and taking steps to remove the bottlenecks that restrict output.

- Identifying the System Bottlenecks** – At Abacus division of ADS, PC-IA is bottleneck.
- Exploit the Bottlenecks** – Bottleneck activities’ capacity must be fully utilised. Although the efficiency of bottleneck activity is already 122.5% but further attention on the possibility to enhance the flow of products from bottleneck activity is needful.
- Non-bottleneck activities are subordinate** – Bottleneck activity should setup the pace for non-bottleneck activities. Abacus shall plan its production keeping PC-IA at the centre point, because even if the efficiency of other activities which are non-bottleneck enhanced beyond current level; the output can be maximum possible by PC-IA.
- Elevate the bottleneck** – Eliminate the bottleneck by enhancing the capacity and efficiency. Major change (business reengineering) or continuous minor change (Kaizen) may do. In the case of Abacus, the introduction of the robot may be a way to elevate the bottleneck.
Note – There will always be one bottleneck in the system, if such bottleneck is eliminated then a new constraint emerges as a bottleneck. Hence, this process continues. Ultimately improvement is a never-ending continues process.
- Repeat the process** – Apply step 1 to new bottleneck activity which emerges at Abacus and repeat the process.

Question 3

About Problem	Target Verb/(s)
Target Costing	Explain, Calculate, Evaluate

Venice Light Works (VLW) manufactures multicolour glow bulb (MCG-10) used for lighting and decoration. MCG-10 considered as reliable product in market due to zero-defect. VLW sells MCG-10 through retail-chains and individual shopkeeper apart from factory outlet. MCG-10 has demand throughout the year but there is high demand during festival seasons especially ahead of Diwali. Company follows the lot purchase system and manufacture the product ahead of peak season of festivals. Presently the VLW is working at 80% of capacity and manufacture 4,00,000 bulbs annually, at following per unit cost:

Particulars	Behaviour	Amount (₹)
Direct Material	Variable	22
Direct Labour	Variable	6
Factory Overhead		
1. Engineering Cost	Fixed	10
2. Machining Cost	Fixed	5
3. Inspection Cost	Variable	5
Administration Overheads	Fixed	12
Selling and Distribution Overheads	Fixed	12
Total Cost		72

Recently the competition in decorative lights and electronic markets has escalated, due to goods imported from Chinese manufactures at cheap rates. Such imported light bulbs are also sold through same shops at which MCG-10 is available for sale. Due cheaper in rate customer prefer imported light bulb rather MCG-10.

To be competitive in market, the marketing department of VLW conducted applied research and suggested that price should be 12.5% lower than the current prices. VLW during last three financial years and during current year records the pre-tax profit @ 10% rate of sale, management of VLW wish to earn the same rate of profit (margin) in upcoming years too.

Production and operation manager is of opinion that cost reduction, in order to be competitive in market may result in reduction in quality, whereas Manager - Quality control suggests, if number of inspection staff increased, then inspection can be performed at each stage and defect can be curtailed at the earliest stage to eliminate rework cost.

Management accountant is of the opinion that since MCG-10 is mature product, hence majority of cost associated in production of MCG-10 are committed in nature, price cutting seems difficult; it may hit the top line and bottom line adversely. In response to him, Chief engineer suggest product (MCG-10) can be redesigned; but marketing manager shown his resistance on the suggestion of redesigning of product because according to him 'existing product appearance and features are key reasons for popularity of product in market and leads to sale'.

Required

- (i) CALCULATE the price suggested by marketing department.
- (ii) COMPUTE the target cost and new margin, appraise percentage decline in margin.
- (iii) If proportionate cost reduction plan is applied, then
 - (a) CALCULATE planned cost reduction for each cost category.
 - (b) EXPLAIN proportionate cost reduction plan.
- (iv) Based upon discussion taken place among the functional manger, EVALUATE the possibility of cost reduction in order to analyse the possibility of application of target costing. Also suggest course of action to adopt.

Answer

(i) **Price suggested by marketing department (Target Price)**

Current cost per unit – ₹72 per unit
 Profit (Margin) @10% of sale price
 Sale Price = ₹72 + 10% of Sale Price
 So, let presume sale price is 'X'
 $X = ₹72 + 10\% \text{ of } X$
 $X = ₹72 + 0.1X$
 $X - 0.1X = ₹72$
 $0.9X = ₹72$
 $X = ₹72 / 0.9$
 $X = ₹80$
 New price will be 12.5% less than current price
 $₹80 - 12.5\% \text{ of } 80$
 $₹80 - ₹10 = ₹70$

(ii) **Target cost and new margin**

Target Price – Margin (i.e. 10% of sale price) = Target Cost
 Target Cost = ₹70 – 10% of 70
 $₹70 - ₹7 = ₹63$
 New Margin (under target costing) is ₹7

Percentage decline in margin

$$\frac{\text{Existing Margin} - \text{New Margin (under target costing)}}{\text{Existing Margin}} \times 100$$

$$= \frac{8-7}{8} \times 100$$

$$= 12.5\%$$

Note

There is decline in margin in absolute term, whereas in relative term the margin remains same i.e. 10% of sale price.

(iii) **Planned cost reduction for each cost category under proportionate reduction plan**

Amount in ₹

Particulars	Existing Cost	Target Cost
Direct Material	22	19.25
Direct Labour	6	5.25
Factory Overhead		
1. Engineering Cost	10	8.75
2. Machining Cost	5	4.375
3. Inspection Cost	5	4.375
Administration Overheads	12	10.5
Selling and Distribution Overheads	12	10.5
Total Cost	72	63

Under proportionate reduction plan cost for each category is proportionately reduced in proportion of existing weight. Here, a presumption is needed to be taken that all the cost are avoidable in nature, where as in case of every business; there are some of cost categories which are true sense unavoidable and committed in such a way that, these continue to occur even in shut down situation (e.g. salary to guard, minimum rental for electricity and water meter etc.); same is pointed by Management Accountant, that product is matured in nature (means not in designing or research phase) hence committed cost may be unavoidable in nature.

Note

Students must note that fixed costs are not as same as unavoidable cost. Fixed cost may be avoidable in nature.

(iv) **Possibility of cost reduction and Suggested course of action for VLW**

Target costing comprises four stages. First being determining the product target price, quality, and functionality; second determine the target cost; thirdly designing the product and production process to achieve the target costing, and fourth use pilot project to evaluated feasibility. Based upon discussion taken place among the functional managers, it is evidential that VLW is presently moving towards third stage.

As stated by management accountant that product MCG-10 is mature nature hence majority of cost are of committed nature, hence may be unavoidable in nature. Product MCG-10 is *material-oriented product* and raw material cost is around 30% of total cost. So, if *gain sharing arrangement* can be entered with vendor then surely VLW can save some portion of material cost.

As said by production and operation manager, cost reduction may lead to compromise with quality. He may be right, but he needs to look for scientific way to reduce the cost of operations like change in batch size (if required can shift to JIT) or outsource some part of operations; scientific management can also be applied in order to curtail motion time and reduction in labour cost.

Quality Manager is of opinion with extra inspection staff, quality can be assured, but appointment of additional inspector and supervisor will also lead to increase in cost; hence effective way to ensure quality while reducing cost of application of practice of *TQM* and *Kaizen*. *Kaizen* costing will be great help to management of VLW to cut the cost, with support and participation from worker.

Chief engineer suggestion is appreciable, because target costing is most beneficial in those case where the product is in designing and planning phase. As per research around 70-80% of cost is committed at stage of designing of product. It is important to note that the word 'committed' is used as 'not incurred'; therefore, cost being committed (i.e., not incurred cost) will be incurred when it became due in course of production. But redesigning is not feasible from the prospects of marketing of product as per the statement made by marketing manager.

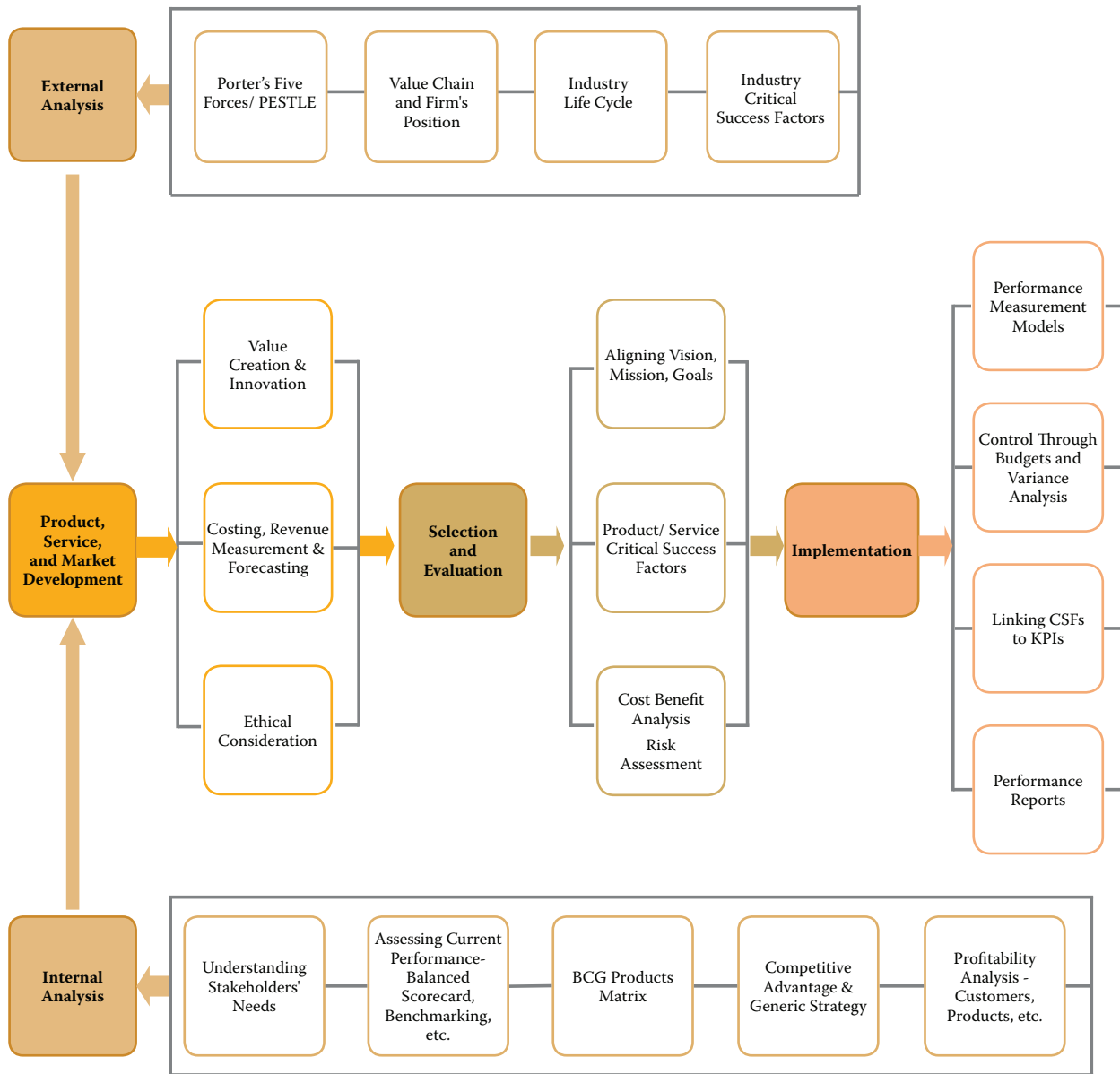
Marketing manager can conduct applied research in order to develop understanding the temperament of customer of MCG-10, whether they are price sensitive or conformance to need is their priority. If customer found price sensitive (existing recommendation of marketing team shows high possibility of this, because marketing team feels customers can be retained is price is reduced by 12.5%) then product redesign may opted. But if conformance to need is their (customers) priority, then *value chain analysis* can be used to identify the activities which creates value to customer and other than these activities (which are not creating the value) can be eliminated in order to reduce the cost. So, there are possibility to reduce the cost, even if not in all the cost category then surely in some of categories; so that target cost can be achieved.

"Every effort has been made to include all possible elucidations for a given case/ question aided by outline and well-chosen photographs for quick industry/ concept reference".

“Strategy is about making choices and trade-offs; it’s about deliberately choosing to be different”

– Michael Porter

Strategic Role of Management Accounting- An Overview



CASE STUDY

The basic objective of the case study is to allow the students to apply ideas and insights from theory to the *real life issues and problems*.

Pricing Strategy

ITB is a multi-brand diversified conglomerate corporation that deals in a wide range of industries, from hotels to FMCG; from paper to tobacco; from IT solutions to agro/agri (AGRO) business through its different divisions and departments, which are working independently. Managers of some of these divisions are accountable for their cost and revenue, while in others they are additionally accountable for the capital employed too. ITB is still diversifying its business.

FMCG Division

In the recent quarter, the FMCG Division of ITB launched *moonfeast* dream cream biscuits, which are flavoured twin cream biscuits. These biscuits are available in two different sizes of packing - price ₹5 for 35 grams and ₹10 for 80 grams. Division decided the price considering the cost it incurred and a preferred margin. The margin stipulated by manager for two years period.



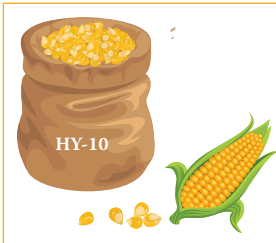
The market segment relevant to such cream biscuits is highly competitive and hostile, customers are price sensitive too, but the segment has a turnover value of nearly ₹4.5 crores during such recent quarter. Response to *moonfeast* dream cream biscuits is merely reasonable. The Division is looking forward to launching a range of flavours. A report containing investment requirements regarding the new flavours sent to corporate head office for approval. As per market research report of a trade association, during the same quarter total of around 375 MT biscuit was sold in the relevant segment.

AGRO Division

A high-yield variety of hybrid maize seed **HY-10** was developed after incurring the huge R&D cost, nearly ₹2.35 crores by AGRO Division. Maize is largely a Rabi crop and seed rate depends upon the factors like purpose, seed size, season, plant type, sowing method (For winter and spring maize seed rate of 8-10 kg/acre is desired, whereas for sweet corn, baby corn, and pop-corn seed rate of 8, 16, and 7 kg/acre is respectively desired). **HY-10** committed and provide high yield and big-deep grains; also reduces the seed rate requirements to 80%-90% of aforementioned. **CP-555** was a prominent seller prior to the launch of **HY-10** and its 4 kg packing was sold for in the range of ₹1,450-1,500 generally. Other players are also working on developing HYV maize seeds.

AGRO Division has lined up many such more development projects which are duly approved by the divisional head, and some are in pipeline. **HY-10** approved by the regulator and government authorities three seasons ago and available for commercial sale thereafter in the market. **HY-10** sold in a pack of 2, 10, and 25 kgs only. Figures pertaining to these three seasons are tabled below-

Season	Revenue (thousand ₹)	Volume of sale (quintal)
First	7,460	149.2
Second	13,185	293.0
Third	12,460	311.5



ITB Hotels

ITB hotels are known for state of art amenities and great hospitality. The occupancy rate ranges from 70% to 80% on average, but for few metropolitan locations, the occupancy touches to 90% to 100%. ITB hotels follow tariff policy, wherein tariff is based upon the cost of living of individual city (wherein hotel is located) and occupancy rate (of the individual hotel) when customer check-in. Dr. Angel Gupta who is a regular guest at ITB in Mumbai (due to her medical conferences) surprised to see the variation between the tariffs. She was charged ₹5,400 per night when her stay during the trip falls on weekdays and ₹8,000 when it falls on weekends.



Required

- COMMENT on the ITB's organisational structure and its appropriateness.
- DEFINE responsibility accounting and responsibility centre.
- EXPLAIN profit centre and investment centre.
- IDENTIFY the nature of FMCG and AGRO Divisions from the preview of responsibility accounting.
- EVALUATE the pricing strategies adopted (along with appropriateness, and set of advice where it seems inappropriate) by-
 - FMCG Division
 - AGRO Division
 - ITB Hotels

[Support your answer with facts and figures (calculation thereof) given in the case]

Solution

- Organisational Structure** outlines the roles of individuals in the organisation and decides the way in which authority and responsibility are allocated among them and how they are coordinating with each other to attain organisational objectives. ITB is following the **divisional structure** wherein various divisions operating autonomously. Since divisions are operating independently hence may be termed as **strategic business units (SBUs)**. Due to high autonomy, the **decision-making process is usually decentralized**.

This type of organisation structure is fit for growing companies that are diversifying because it's easy to bolt on another division. Since ITB is a multi-brand diversified conglomerate corporation that deals in a wide range of industries and still diversifying its business hence the **divisional form of organisational structure best fits ITB**.

Mind it, in divisional structure too, some functional departments are working horizontally throughout the organisation and known as corporate function or shared/support services, such as Accounts and HR & Payroll, etc.

- Responsibility accounting** is that type of management accounting that collects and reports planned actual accounting information in terms of responsibility centers. A **responsibility centre** is a specific unit of an organisation assigned to a manager who is held responsible for its operation and resources. The division can be designate as either of **cost, profit, revenue, or investment centre** depending upon the responsibility (accountability) assigned to its manager (s)/ divisional manager.

- Profit Centre and Investment Centre.**

Wherein the manager of division is accountable for the cost and revenue of division, it shall be categorised as **profit centre**. Thus, the performance of such division shall be measured in terms of the **difference between the revenues and costs** (the absolute amount of profit).

But wherein manager is additionally (apart from cost and revenue) accountable for the capital employed too -categories

as **investment centre**. The performance of an investment centre can be measured by appraising profit/return in relation to the investment base of centre, **ROI, RI, and EVA** are some prominent financial performance measures.

- (iv) FMCG Division is a **profit centre** because it decides its own prices as well as a cost but for investment, it has to take the *approval of the head office*, as it is mentioned in the case that a report containing investment requirement regarding the new flavours sent to corporate head office for approval. Moreover, the desired margin, which is used to determine the price also stipulated by the manager only.

AGRO Division is an **investment centre** because it takes investment decisions on its own, without the intervention of head office, as it is mentioned in the case that AGRO Division has lined up many such more development projects which are duly approved by the divisional head, and some are in pipeline.

- (v) **FMCG Division**

FMCG Division determines the prices based upon the cost it incurred and desired margin stipulated by manager. Hence, pricing strategy (hence the decision) adopted is the **cost-plus margin** approach.



Concept Insight

It is important to note the **limitations of cost-plus margin** approach:

- It ignores the price charged by the competitors,
- It also ignores the price which customer ready to pay, and
- Enterprise not looking towards cost control and management.

FMCG Division determines the two different **prices of moonfeast dream cream biscuits**; ₹5 for 35 grams and ₹10 for 80 grams; hence the price ranges from **₹125 to ₹142.86 per kg** in comparison to an average price of **₹120 per kg only** (see the working note below) charged by other players in the relevant segment.

It is mentioned in the case that the market segment relevant to such cream biscuits is highly competitive and hostile, customers are price sensitive too; hence selling them product at a **premium price** (which more than the average price) is not a good strategy to penetrate into the market and acquire market share. This is the reason that response to moonfeast dream cream biscuits is merely reasonable.

Hence it is **advisable** for divisional managers of the FMCG Division to pick the **penetration strategy**, which means **keep the prices low initially** (in comparison to average market price or near rival) to gain the market share (and product acceptance), once market share reach a reasonable level then prices can be reinstated to normal level (the average market price).

Note – FMCG Division can practice techniques like Target costing, Kaizen to bring the cost down to reduce the price and sell the product at or lower than market-led prices.

Working note– Determination of price charge by other players in the relevant segment during the said quarter.

Turnover – ₹4.5 crores

Quantity sold – 375 MT (Metric Ton) - since 1 MT is equal to 1,000 kg hence 3,75,000 kg biscuits were sold during the said quarter.

Average price per kg – ₹4.5 crores / 3,75,000 kg = ₹120 per kg.

AGRO Division

The price charged by the AGRO Division for HY-10 during three previous sessions are tabled below, which depicts AGRO Division use the strategy of **price skimming** in the case of HY-10 because the prices were initially high (₹500 per kg) and continually decline thereafter (₹450 then ₹400 per kg). The price initially charged for HY-10 was much more than the price range of ₹362.5-375 per kg that CP-555 charged which was a prominent seller prior to launch of HY-10.

Season	Revenue (in thousand ₹)	Volume of sale (in quintal)	Volume of sale (in kg)	Price per kg (in ₹)
First	7,460	149.2	14,920	500
Second	13,185	293.0	29,300	450
Third	12,460	311.5	31,150	400

Price skimming seems an **appropriate strategy** for the AGRO Division because HY-10 was developed after incurring the **huge R&D cost** (nearly ₹2.35 crores), that need to be recovered in few early years because some **other players are also working** on developing HYV maize seeds; if once they developed HYV maize seeds then ITB may not be in a position to charge the high price to recover its R&D cost from the product.

Customer (formers) might not mind paying a high price for HY-10 because it committed and actually provide high yield and big-deep grains and also reduce the seed rate requirements to 80%-90% of normal requirement.

Hotels

The tariff charged by ITB hotels is based upon the cost of living of an individual city (wherein the hotel is located) and occupancy rate (of the individual hotel) when customers check-in. It means ITB is relying upon the strategy of **differential pricing**.

One of the factors that determine the price in the case of ITB hotels is occupancy rate. It means ITB considers the importance of capacity constraints. The practice of charging a higher price for the same product or service when the demand for it approaches the physical limit of the capacity to produce that product or service is known as **peak-load pricing**.

The pricing strategy **seems appropriate largely**, but for regular guests like Dr. Gupta, it may be annoying.

Peak-load pricing, on one hand, generates high profit for ITB at the same time it brings equilibrium in demand and supply. But guests like Dr. Gupta, who is a regular guest of ITB may not be happy with differential pricing (tariff ₹5,400 per night on weekdays and ₹8,000 per night on weekends) on account of the peak load factor. The impact of peak-load pricing will be more likely to be seen in those metropolitan locations when the occupancy rate touches 90% to 100%

CASE SCENARIO

Case Scenarios, as opposed to Case Studies, are *short cases*. Written in a more compact style with an appealing narrative, the Case Scenario's focus is on covering more depth in a specific area.

Profitability Analysis

"A" is a mid-size bank with a loan asset portfolio that primarily comprises of housing loans and commercial loans. Efforts are underway to identify business opportunities that can contribute positively to the bank's bottom line. As a management analyst, you are analyzing the interest income from loan portfolios, the main income portfolio for any bank. You notice interest income from two types of loan portfolios – student education loans and consumer durable loans. These loan portfolios have not been focused upon until date since the loans form a minor portion of the entire loan portfolio, each less than 1% of the total loan portfolio. Consequently, the interest income generated is also minor in terms of the entire interest income of the bank. The primary focus has always been on housing loans and commercial loans, which form a major portion of the loan segment.

Following is some information you have about the interest on the student education loan segment and the interest on consumer durable loan segment:

Interest income earned on student education loan segment and consumer durable loan segment.

(₹ in Lakhs)

Particulars	Year 1	Year 2	Year 3	Year 4	Year 5
Interest earned on Student Education Loans	15	18	21	28	35
Interest earned on Consumer Durable Loans	30	28	22	16	12

Other information available to you:

Student Education Loans:

The bank recognizes around 150 educational institutions for the purpose of providing educational loans to students who need financing. These are premier institutes that are well recognized for their academic rigor. Due to the quality of their courses, 100% of the students get job placements immediately after graduation. Due to this the loan default on these loans has been very negligible, if any. Also, the bank has identified around 25 courses, predominantly post graduate courses, for which it has been extending education loans to students.



On the other hand, information from peer group banks shows that on an average each bank recognizes around 450 educational institutions. The number of courses recognized are both graduate and post graduate degrees, almost 100 courses. Not all institute are premier. The recognition of these degrees in the market varies. Therefore, only around 80% of the graduates to whom peer bank group offers financing, find job placements immediately after graduation.

Consumer Durable Loans:

The bank provides unsecured consumer durable loans for limited product purchase such as TVs, Refrigerators, mobile phones etc. It has a list of 15 products for which it provides loans to customers who need financing. The loan disbursement procedure is routed through sales personnel who are present in select branches of stores with whom the bank has tie up for such loans. Loan processing takes few days with due diligence done based on the loan application documents that the customer submits. Again, due to this due diligence, default rates have been negligible.

On the other hand, information from peer banks suggests that that on an average each bank recognizes about 45 products for which they provide customers financing when they want to purchase the consumer durable item. Also, loan processing is done online, with the help of the respective bank's inbuilt loan application system. Loan disbursement is immediate. The consumer durable can be purchased from any store, not just from recognized stores that have a tie up with the respective bank. This enables hassle free shopping experience to many.

Required

Put forward your inputs (**recommend**) based on the information provided above, to find business opportunities that can help Bank "A" grow its lending portfolio and interest income.

Solution

Student Education loans and Consumer Durable loans have been a very minor part of "A"'s business operations, each being less than 1% of entire loan portfolio. At the same time, these maybe segments that **can potentially grow** our lending portfolio and increase our interest income earning capacity.

Student Education Loans:

It can be seen that interest income from student education loans have increased steadily from ₹15 Lakh in Year 1 to about ₹35 Lakh in Year 5. This shows that the volume in this loan segment has been *steadily growing* in the recent years. It could be a *potential area to explore to expand our loan offering*. Currently, "A" recognizes 150 educational institutions for the purpose of providing education loan to students in need of financing *but* each bank in peer bank group on an average recognizes 450 such institutes for the same purpose. The number of courses "A" recognizes for which a loan is extended is 25 courses, mostly courses that are undertaken to earn a higher qualification like post-graduation degree. However, peers on the other hand each recognizes, a broader variety of 100 courses, both graduate and post-graduate degree for which they are willing to finance students. Therefore, it seems that "A" *can expand the range of courses* for which it provides student education loans. "A" can also recognize *more educational institutions to expand* its potential market volume. However, this comes at the *risk of default*. Currently "A"'s approach to this segment has been *conservative*, limiting loans only to institutes and courses that enable the student with a very high possibility of finding a job immediately after qualifying. These may be courses that are sought out by potential job recruiters. Hence, students to whom loans were provided by "A", have not defaulted on any of the loan repayments. Its *loan default rate in almost negligible*. "A"'s peer banks have a *much broader market reach*, but at the same time, immediately after graduation only 80% of the students to whom loan financing was provided, have been able to find jobs. The job recruiters may not immediately require the some of the courses that some of the institutions offer. This increases the risk of loan default.

It is recommended to study the student education loan market segment more carefully. "A"'s strategy can be then laid out based on our internal benchmark requirements and risk profile.

Consumer Durable Loans:

The consumer durable loan segment has seen a steady decline in interest income from ₹30 Lakh in Year 1 to ₹12 Lakh in Year 5. "A" provides financing to customers to purchase from a list of 15 consumer durable products that it has identified including TVs, refrigerators, mobile phones. These are disbursed through its sales personnel present in the select stores with whom it has tie up for this purpose. Due to due diligence procedures, the loan default rate has been very low.

On the other hand, peer bank group have a much broader range of products, on an average of 45 products for which financing can be provided. There is no restriction on where the product is being purchased from. This widens the market range. Also, their customers can apply for these loans online. Disbursement of loan in immediate. This provides for hassle free shopping experience.

It is recommended to study "A"'s loan disbursement procedures further in order to increase the loan volume for consumer durables. Currently, it is restricted to purchases for specific products from select stores. Loan is being disbursed only after due diligence procedures, which have a time lag of few days. Increasing the range of products for which financing is offered and a dedicated bank system where the customer can apply for these loans may ramp up its volumes. **At the same time, the downside risk to be addressed is the risk of fraud** due to immediate loan disbursement or extending loans to customers whose credit worthiness might be lower. This would increase the risk of default.

Conclusion- By expanding customer base "A" has the advantage of tapping these customers for future **cross selling** of its home loan and commercial loan products. "A"'s current customer base especially from the home loan portfolio can also be researched to identify potential customers who may need either student education loans or consumer durable loans. Hence, the two customer segments may be considered for future expansion purpose. "A" needs to tailor its strategy based on internal benchmarks and risk profile capacity.

SKILL ASSESSMENT BASED QUESTIONS

The basis objective of the case study is to allow the students to apply ideas and insights from theory to the *real life issues* and *problems*.

Question 1

About Problem	Target Verb/ (s)
Pricing Strategy	Calculate, Elucidate

“Zinc” a brand of Zink Pen and Plastic Limited (ZPPL), is a household name for stationery products. The R&D Division of “Zinc” developed a new pen ‘Zentonic’ with assorted ink colours with the tagline ‘give your writing a Zen energy’.

“Zinc” has used market research/ studies to determine that if price of ₹40 is charged for pen, demand will be NIL. It has also been established that demand will rise or fall by 2,000 units for every ₹1 fall/ rise in the selling price. The further information is also available in Annexure as a result of these studies.

The Board members in presence of functional heads at ZPPL are discussing the different pricing strategies that can be adopted in context to ‘Zentonic’.

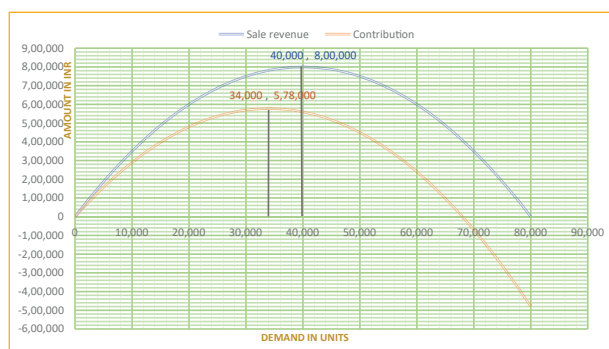
Dissension is clearly visible between the marketing head and the finance head. The marketing head is striving to keep the price as low as possible to capture the commercial space and maximise the revenue, whereas the finance head argued in favour of keeping the price high to maximise the profit because the design and R&D of ‘Zentonic’ will not be matched by the competitors currently. The distinct parameters (revenue and profit) of performance linked pay seem to be the major reason for contradiction between two functional heads. Board members consider both the thoughts and instruct you (management accountant) to drive the price(s).

ZPPL *diversifies* itself into the online learning space and starts a web-based platform ‘ZenZick’, which offers quality videos for competitive and professional exams such as JEE, NEET, UPSC, KVPY and etc. In order to attract the viewer, ‘ZenZick’ offers few lectures on fundamental concepts of curriculum after registration at the website without any cost, but for complete access, candidates need to have paid account.

Required

- (i) CALCULATE the unit selling price of ‘Zentonic’ that will maximise revenue and maximise profit.
- (ii) ELUCIDATE the pricing strategy advocated by marketing head and finance head for ‘Zentonic’ and pricing strategy adopted for ‘ZenZick’

Annexure



For Your Conceptual Understanding

Sale price per unit in ₹	Demand in units	Sale revenue in ₹	Variable cost in ₹ (@ ₹6 per unit)	Contribution in ₹
40	-	-	-	-
39	2,000	78,000	12,000	66,000
38	4,000	1,52,000	24,000	1,28,000
37	6,000	2,22,000	36,000	1,86,000
36	8,000	2,88,000	48,000	2,40,000
35	10,000	3,50,000	60,000	2,90,000
34	12,000	4,08,000	72,000	3,36,000
33	14,000	4,62,000	84,000	3,78,000
32	16,000	5,12,000	96,000	4,16,000
31	18,000	5,58,000	1,08,000	4,50,000
30	20,000	6,00,000	1,20,000	4,80,000
29	22,000	6,38,000	1,32,000	5,06,000
28	24,000	6,72,000	1,44,000	5,28,000
27	26,000	7,02,000	1,56,000	5,46,000
26	28,000	7,28,000	1,68,000	5,60,000
25	30,000	7,50,000	1,80,000	5,70,000
24	32,000	7,68,000	1,92,000	5,76,000
23	34,000	7,82,000	2,04,000	5,78,000
22	36,000	7,92,000	2,16,000	5,76,000
21	38,000	7,98,000	2,28,000	5,70,000
20	40,000	8,00,000	2,40,000	5,60,000
19	42,000	7,98,000	2,52,000	5,46,000
18	44,000	7,92,000	2,64,000	5,28,000
17	46,000	7,82,000	2,76,000	5,06,000
16	48,000	7,68,000	2,88,000	4,80,000
15	50,000	7,50,000	3,00,000	4,50,000
14	52,000	7,28,000	3,12,000	4,16,000
13	54,000	7,02,000	3,24,000	3,78,000
12	56,000	6,72,000	3,36,000	3,36,000
11	58,000	6,38,000	3,48,000	2,90,000
10	60,000	6,00,000	3,60,000	2,40,000
9	62,000	5,58,000	3,72,000	1,86,000
8	64,000	5,12,000	3,84,000	1,28,000
7	66,000	4,62,000	3,96,000	66,000
6	68,000	4,08,000	4,08,000	-
5	70,000	3,50,000	4,20,000	-70,000
4	72,000	2,88,000	4,32,000	-1,44,000
3	74,000	2,22,000	4,44,000	-2,22,000
2	76,000	1,52,000	4,56,000	-3,04,000
1	78,000	78,000	4,68,000	-3,90,000
0	80,000	-	4,80,000	-4,80,000

Answer

- (i) The unit selling price of ‘Zentonic’ that will maximise revenue and maximise profit can be easily derived through *demand function*. The graph shows sales revenue is maximised at 40,000 units and contribution (**so profit**) is maximised at 34,000 units.

Note – Fixed cost will be fixed irrespective of the level of activity (presuming fixed cost does not hold feature of step cost).

To calculate the selling price for these two levels of output, we can insert the number of units into the equation for the demand function.

Demand function $q = 80,000 - 2,000p$ or $p = 40 - 0.0005q$
Whereas p represents selling price and q represents level of output.

Revenue will be maximum when the selling price will be ₹20.

When q is 40,000 units of Zentonic pens,

$$\Rightarrow 40,000 = 80,000 - 2,000p$$

$$\Rightarrow 2,000p = 40,000$$

$$\Rightarrow \text{Then } p \text{ will be ₹20}$$

Profit will be maximum when the selling price will be ₹23

When q is 34,000 units of Zentonic pens,

$$\Rightarrow 34,000 = 80,000 - 2,000p$$

$$\Rightarrow 2,000p = 46,000$$

$$\Rightarrow \text{Then } p \text{ will be ₹23}$$

Accordingly, sales revenue at profit maximisation level would be ₹7,82,000 (₹23 × 34,000 units) and the expected profit at this level is already given i.e., 5,78,000 (refer graph). Therefore, variable cost will be ₹2,04,000 or ₹6 per unit. [not required in question]

- (ii) The marketing head is striving to keep the price low as possible to make capture the commercial space and maximise the revenue. The pricing strategy advocated by him is **penetration pricing**. It includes setting the price low with the goals of attracting customers and gaining market share. The price will be raised later once this market share is gained.

The finance head argued in favour of keeping the price high to maximise the profit because the design and R&D of Zentonic will not be matched by the competitors currently. The pricing strategy advocated by him is **price skimming**. Under price skimming, high prices are set when a new product is launched so that fewer sales are needed to break even and to reimburse the cost of investment of the original research into the product. Since it involves selling a product at a high price, sacrificing high sales to gain a high profit is therefore called "skimming" the market. Price dropped to increase demand once the customers who are willing to pay more have been 'skimmed off'.

The pricing strategy adopted for 'ZenZick' is **freemium**, freemium is a revenue model that works by offering a product or service free of charge (typically digital offerings such as software) while charging a premium for advanced features, functionality, or related products and services. The word "freemium" is a portmanteau combining the two aspects of the business model i.e., "free" and "premium".

Question 2

About Problem	Target Verb/ (s)
Service Level Agreement	Compute, Explain

Red Star Limited (RSL) is the largest manufacturer of Air-Conditioners. RSL is not good at attending the customer calls due to lack of capabilities, but it is an important activity from the aspect of the value chain. Hence, in order to improve customer experience (downstream supply chain), RSL decided to hire Krishna Infotech & BPO Services (KIBS) for attending the calls of their existing and prospective customer.



Service level agreement (SLA) was duly entered and **service level (SL) of 90/20 has been prescribed to keep a check on service quality**. Invoice will be generated monthly, and SL will also be observed on monthly basis. For the first month along with the invoice, KIBS provide the following details to RSL–

- Total calls offered 5,120
- Calls answered within threshold time 4,850
- Short or Abandon calls within threshold time 115

CFO while authorising the payment queues generated by the account executive in ERP, come across the KIBS payment; he immediately seeks a copy of SLA from legal but not able to understand the technical aspects hence he decided to call you (management accountant) to EXPLAIN few terms (including SL) and certain COMPUTATIONS.

Required

- What is the SLA threshold and what is the threshold time in this case?
- Explain the significance of 90/20 SL.
- Compute the SL level for the first month.
- Whether KIBS attained the SL level to full the terms of SLA?
- For how many calls KIBS can bill to RSL?

Answer

- A service-level agreement (SLA) threshold is the *activity response* time specified in a service level agreement. In the current case, the SLA threshold is the *number of seconds within which a call shall be responded* to by a tele-caller at KIBS. The threshold time, in this case, is 20 seconds it is represented by a service level (SL) of 90/20.
- A **service-level agreement (SLA)** defines the *level of service you expect from a vendor, laying out the metrics by which service is measured*. **Service level** basically *measures the performance*. Service level (SL) of 90/20 signifies that 90% of the calls shall be answered within 20 seconds.



Concept Insight

SLA is the document that outlines the wider service agreements between a service provider and its customer, whereas SL is the acceptable level of service performance regarding which agreement has been entered. Mind it, both the SLA and SL are **not the same**.

- Service Level (SL) measure the performance and can be computed for voice calling BPO services using the following formula–

$$SL = \frac{\text{Total calls answered within threshold time}}{\text{(Total calls offered - Short or abandon calls within threshold time)}}$$

$$SL = 4,850 / (5,120 - 115)$$

$$SL = 4,850 / 5,005$$

$$SL = 96.90\%$$

- Against the expected service level of 90%, KIBS attain the service level of 96.90% which means out of each 100 calls nearly 97 class are answered within 20 seconds (threshold time), whereas the requirement was minimum requirement is 90%; hence KIBS attain the SL level to full the terms of SLA.
- No, doubt SL used for measuring the performance which relies upon the calls answered within the threshold time, but the calls answered beyond threshold time also cause costs and resources at end of the BPO vendor (KIBS in this case) hence **billing shall be for total calls responded/answered** (rather only those which are answered in threshold time). Hence, in a given case, the KIBS can raise an invoice for 5,005 calls i.e., 5,120 (total calls offered) – 115 (short or abandon calls within threshold time).

Question 3

About Problem	Target Verb/ (s)
Cost of Quality	Analyse

NZ Ltd. implemented a quality improvement programme and had the following results:

Particulars	2020	2021
	(Figures in ₹ '000)	
Sales	6,000	6,000
Scrap	600	300
Rework	500	400
Production Inspection	200	240
Product Warranty	300	150
Quality Training	75	150
Materials Inspection	80	60

Required

ANALYSE the quality costs

Answer

Analysis



The total cost of quality in the year 2020 was ₹17,55,000. The total cost of quality in the year 2021 was ₹13,00,000. Therefore, over all the cost of quality decreased by ₹4,55,000 from 2020 to 2021. Given the same scale of operations in both years (annual turnover being 60,00,000), the profits therefore would have increased by ₹4,55,000. The break-up is summarized in the table (refer workings).

In the year 2021, more emphasis was given to **Quality Training**, the spend increased by 75,000 p.a. Quality training is a *preventive cost* that is aimed at improving the quality of output / performance of the employees. The benefit of this spend can be seen in the reduction of internal failure costs (scrap and rework costs).

The total *internal failure costs* of **Scrap and Rework** was ₹11,00,000 in the year 2020 that reduced to just ₹7,00,000 in the year 2021, this reduction of ₹4,00,000 per year is directly on account of the quality training given to employees. *Better quality output* resulted in reduced scrap and need for rework.

Material Inspection Costs decreased by ₹20,000 from 2020 and 2021. Appraisal costs check for conformance with accepted standards for production. The reduction in material inspection costs could be due to better understanding with the vendors about material requirements needed for production, better quality of materials procured etc. When the input material is of good quality and conforms with the production requirements, material inspection costs can be reduced substantially.

Better quality input material may also be a reason for the drastic reduction in rework and scrap costs highlighted above.

Product Inspection Costs increased by ₹40,000 from 2020 to 2021. This *appraisal cost* checks for conformity of the product with accepted standards of production. Quality checks on the production line is important to detect defects at the earliest. Product inspections during the manufacturing process (in-line product inspection) help in detecting defects while the product is being made. Defects can be corrected / rectified, or the unit produced can be scrapped.

Pre-shipment product inspection ensures that the product conforms with the specifications agreed with the customer. This control prevents defective units / non-conforming units from reaching customers, an external quality failure. External quality failure has costs in the form of product returns, warranty expenses etc. **Product Warranty** expenses reduced significantly by ₹1,50,000 from the year 2020 to 2021. This improvement can be attributed to *better quality production and increased product inspection*.

External quality failure has *hidden costs* in the form of shrinkage of market share, negative impact on brand image etc. Quality reassurance ensures that the goodwill of the company is maintained and there is no negative impact on the company's future business prospects.

Workings

Figures in ₹'000

Sr. No	Particulars	2020	2021	Savings / (extra spend)
1.	Prevention Costs			
(a)	Quality Training	75	150	(75)
2.	Internal Failure Costs			
(a)	Scrap	600	300	300
(b)	Rework	500	400	100
	Total	1,100	700	400
3.	Appraisal Costs			
(a)	Product Inspection	200	240	(40)
(b)	Materials Inspection	80	60	20
	Total	280	300	(20)
4.	External Failure Costs			
(a)	Product Warranty	300	150	150
	Total (1+2+3+4)	1,755	1,300	455

Question 4

About Problem	Target Verb/ (s)
Make or Buy	Comment, Assess

Mr. Venkatesh, who recently joined the Tirupati Casting and Forge Limited (TCFL) as assistant manager in the management accounting division is collecting, estimating, and arranging the information required for make vs. buy decision and pricing decision; using which chief management accountant can consider the best way to go while taking uncertainties into account and advise the management accordingly.

X-104

Balaji Enterprises (BE) ready to deliver product X-104 (in a semi-furnished state) for ₹40 under a continuous supply agreement. TCFL insists on inserting a stable price clause in the supply agreement, to which BE responds that variation will be pass on to TCFL. Finally, it was decided if the agreement entered then the price (which is currently ₹40/-) shall be subject to periodical (after each quarter) review.

Y-29

TCFL is producing the product Y-29 (at full capacity) and able to sell the entire production through a network of distributors (and through retailers, in those areas where there is no distributor appointed). TCFL contacted by an e-retail platform, with a proposal; wherein the platform shows interest in offering the product Y-29 to its customers (members/ subscribers). The E-retail platform has two types of customers, "the plus" category and others. The E-retail platform will charge ₹1,300/- from "plus" category and ₹1,350/- from others, E-retail platform has the policy to keep margin (to meet its cost and earn a profit) of 8.33% and 12.50% on the procurement cost for the sale made to "plus" category and other customers respectively. In the proposal, the E-retail platform also states the price which it can pay to TCFL; according to the requirements stated above.

Mr. Venkatesh compiled the following tables, for product X-104 and Y-29 respectively on a per unit basis –

X-104

Particulars	In-house production	Purchased from BE, there-after furnishing and re-labelling at TCFL
Selling price of product	115	112
Variable costs	73	25
Fixed costs	18	18
External purchase cost	NA	40

Y-29

Particulars	Amount in ₹
List Price	1,400
Price charge from distributors	1,225
Variable cost incurred by TCFL	870

Required

- COMMENT how TCFL should respond to the proposal of the e-retail platform regarding product Y-29 and ASSESS the sensitivity of such decision.
- COMMENT on the make vs. buy decision regarding product X-104 and ASSESS the sensitivity of such decision to the external purchase price.

Answer

- Pricing (Decision on the proposal by E-retail platform) & Sensitivity**

Decision on the proposal by E-retail platform – Since the TCFL is producing the product Y-29 at full capacity and able to sell entire production through a network of distributors at ₹1,225 (results in a contribution of ₹355), hence shall not accept the proposal of the E-retail platform at the stated price of ₹1,200 (results in a contribution of ₹330) (see the statements below for the calculations).

Price stated by E-retail platform

Particulars	Plus Customer	Others
Sale price	1,300	1,350
Less- margin kept on the procurement cost	100 (i.e.8.33%)	150 (12.5%)
Procurement cost (price stated by E-retail platform)	1,200	

Comparable Contribution

Particulars	If sold through distributors	If sold through E-retail platform
Selling price for TCFL	1,225	1,200
Less- Variable costs	870	870
Contribution	355	330

Sensitivity of the decision on the proposal by E-retail platform

If the contribution from each unit of Y-29 sold to the E-retail platform increased to 355 and beyond then TCFL will be indifferent, among the distributors and E-retail platform. Thus, the price stated by the E-retail platform needs to increase by ₹25 per unit (from ₹1,200 to ₹1,225) i.e., 25/1,200 which come out to be 0.02083 or 2.083% (25/1,200×100)

Hence, if the price stated by the E-retail platform in the proposal increase by more than 2.083% then the original decision would be reversed (because beyond that point selling through the E-retail platform will become more profitable for TCFL).

- Make vs. Buy Decision & Sensitivity Analysis**

Make vs. Buy Decision – Since the contribution is ₹47 when the product X-104 is purchased from BE and then furnishing and re-labelling done at TCFL, in comparison to ₹42 when it is produced in-house (see the calculation below); hence it is beneficial to buy the product X-104.

Comparable Contribution

Particulars	In-house production	Purchased from BE, there-after furnishing and re-labelling at TCFL
Selling price of product	115	112
Less- Variable costs	73	25
Less- External purchase cost	-	40
Contribution	42	47

Sensitivity to the external purchase price

To be indifferent, among the in-house production and buying from BE, the contribution from the product X-104 when it is purchased from BE needs to fall to ₹42 per unit. Thus, the external purchase cost needs to increase by ₹5 per unit (from ₹40 to ₹45) i.e., 5/40 which come out to be 0.125 or 12.5% (5/40×100). Hence, if the external purchase price increased by more than 12.5% the original decision would be reversed (because beyond that point buying from BE will not remain beneficial).

**Concept Insight**

Sensitivity analysis is capable to incorporate uncertainty into decision making (by taking each uncertain factor in turn), and also calculates the change (percentage change – relative measure hence comparison of importance among factors become easy) that is minimally required in factor(s) before the original decision is reversed.

Since sensitivity analysis considers uncertainly related to each factor in turn, hence where multiple factors changing simultaneously; it has no utility. Apart from this, sensitivity analysis only calculates the change that is minimally required in factor before the decision is reversed; but it does not consider or calculates the probability of such a change.

Question 5

About Problem	Target Verb/ (s)
Transfer Pricing	Comment, Recommend

AB Cycles Ltd. has 2 divisions, A and B which manufacture bicycle. Division A produces bicycle frame and Division B assembles rest of the bicycle on the frame. There is a market for sub-assembly and the final product. Each division has been treated as a profit centre. The transfer price has been set at the long-run average market price. The following data are available to each division:

	₹
Estimated selling price of final product	3,000 p.u.
Long run average market price of sub-assembly	2,000 p.u.
Incremental cost of completing sub-assembly in division B	1,500 p.u.
Incremental cost in Division A	1,200 p.u.

Required

- If Division A's maximum capacity is 1,000 p.m. and sales to the intermediate are now 800 units, should 200 units be transferred to B on long-term average price basis? COMMENT.
- What would be the transfer price, if manager of Division B should be kept motivated? Substantiate your RECOMMENDATIONS with suitable reasons.
- If outside market increases to 1,000 units, should Division A continue to transfer 200 units to Division B or sell entire production to outside market? COMMENT.

Answer

- (i) In this case there are two options available –

Option A	₹
Sell at the sub assembly stage (after completion of Division A)	2,000
Less: Incremental cost in Division A	1,200
Contribution	800

Option B	₹
Sell at the final product stage	3,000
Less: Cost at Division A and Division B (₹1,200 + ₹1,500)	2,700
Contribution	300

Therefore it is profitable to sell at the subassembly stage because of higher contribution, provided there is a market.

Hence, if there is market at intermediate stage, first priority is to sell intermediary (sub assembly). Therefore, 800 units should be sold as sale of intermediary.

The balance capacity available of $(1,000 - 800) = 200$ units should be transferred to B and B should complete the assembly and sell as final product, since the company can earn ₹300 per unit for each unit of such sale.

(ii) Recommendation

If B Div. receives the subassembly at market price of ₹2,000, plus its own incremental cost of ₹1,500 will give total cost of ₹3,500, thereby yielding a loss of $₹3,500 - ₹3,000 = ₹500$ per unit, whereas the company makes a profit of ₹300 per unit.

The loss of ₹500 per unit would demotivate the manager of Division B. This would impact the company as inhouse production of the bicycle does yield a positive result, a profit of ₹300 per unit. In order to keep the manager of Div. B motivated, the company can adopt a **dual rate transfer pricing** policy. Division A can record the transfer price at the long run average market price of ₹2,000 per unit for each bicycle transferred to Division B. This lets Division A show reasonable

revenue based on current market conditions, not constraining the "departmental profit center approach" towards operations.

Division B on the other hand can record the transfer price at the marginal cost of production for Division A. The marginal cost for Division A is ₹1,200 per unit. If Division B is allowed to record the transfer price at ₹1,200 unit per sub-assembly unit purchased from Division A, it would show a profit of ₹300 per unit of bicycle sold.

	₹
Sell at the final product stage	3,000
Less: Transfer Price for each sub assembly purchased from Division A	1,200
Less: Incremental cost for Division B to process further	1,500
Contribution	300

The problem with Dual transfer pricing system is that it can complicate the records since Division A records the transfer price at ₹2,000 per sub-assembly unit transferred to Division B. Division B records its transfer price at ₹1,200 per sub assembly unit it purchases from Division A. This can lead to errors in the company's overall records.

- (iii) Both Division A and the Company make higher contribution by selling to intermediate market. If the market demand increases to 1,000 units, the full quantity should be sold outside as intermediary and nothing should be transferred to Division B.

Question 6

About Problem	Target Verb/ (s)
Transfer Pricing	Discuss

A manufacturer of Cell Phones has many operating units within its organization structure. The 'assembly plant' that assembles parts to make the final product. The others are mainly units that manufacture 'component parts' for the cell phone. The management promotes decentralized system of working, where the manager of each unit has the power to take decisions independently. The management only oversees that the impact of major operating decisions such that they promote "goal-congruence" that will benefit or not adversely impact the company.

'Max' is the head of the 'battery manufacturing' division. The division



sells *most of its output* to its final 'assembling plant' division headed by 'Ruby'. Battery is an important component of a cell phone. The company has an **overall mission to sell only products that are of good quality**, for which long lasting life of the battery component is critical. In March this year, the engineers of both the previously mentioned divisions created an innovative design to improve battery life. These newly designed batteries will be used in **a new range of cell phones** that the company plans to produce. The 'battery' division had spent ₹50 lakhs developing a suitable prototype that was acceptable to the engineers from the 'assembly plant' division. The managers are discussing a suitable transfer price for these newly developed batteries.

As mentioned before, part of the sales from the 'battery' division is also to external customers. However, at the current levels the 'battery' division is operating only at 60% capacity producing 60,000 units annually. Its annual capacity is 1,00,000 units. The annual demand for the newly developed batteries would be an additional 40,000 units. By accepting this internal order, the entire annual capacity of the 'battery' division can be utilized.

It is now close to the year end for the company. *A very important metric* to determine the payout is the *division's financial performance*. Therefore, there is intense pressure to sell more and cut costs. Each division maintains separate accounting records.

'Max' wants to charge a transfer price of ₹300 per unit of battery. Total manufacturing cost is ₹250 per unit of battery while the variable cost is ₹230 per unit.

'Ruby', the manager of the 'assembly plant' has been trying to convince 'Max' to reduce the transfer price to ₹275 per unit. 'Ruby' argues that the additional production for the new range of cell phones would help utilize unused capacity. In line with the current arrangement, she wishes to get all her batteries from the in-house department due to their higher quality level. However, she finds the cost of ₹300 per unit very high. She shares quotes from other vendors for similar quality batteries where the average market price is ₹275 per unit. She wishes 'Max' to provide her the batteries at this rate, which she feels is a more competitive price.

As per the company's policy, if a cell phone is found defective within 1 year from date of sale, it will be completely replaced by a new phone. Cost of replacement of a cell phone is ₹3,000 per cell phone. The annual demand for the newly developed cell phone range is expected to be 40,000 units per year. Batteries procured from outside vendors could result in 0.1% of sales becoming defective. These will require replacement of the entire cell phone by the company. 'Ruby' argues that this is a minuscule portion of the annual sales. All the same, to keep this at a minimum threshold, quality inspection procedures are in place that costs the company ₹5,00,000 per year. Batteries manufactured in-house have always met the required quality standards. It would not result in any defective products.

'Max', the manager of the 'battery' division justifies the internal transfer price rate of ₹300 per unit on these counts:

- The *quality of in-house batteries is superior* compared to the external market providers. They will not result in any sale returns due to defective batteries.
- Sales policy* of the 'battery' division for both external and internal sales is –
Selling price / transfer price = Total Cost + 20% mark up.
Therefore, based on a total cost of ₹250 per unit, the transfer price is arrived as ₹300 per unit.
- The division has spent ₹50 lakhs to *develop prototype* as per the assembly line requirements. Being a profit center 'Max' insists that this cost be recouped by charging a higher rate.

Both 'Max' and 'Ruby' decide to approach senior management whom they report to in order to resolve their dispute by **examine in detail**. Assume that currently the opportunity cost of excess capacity is zero. There are no pending sales orders that help utilize the excess capacity. Also given, that the demand for cell phones has been increasing, so the industry is in the cusp of a *growth phase*.

Required

- Impact on the company's financials if (i) Batteries are procured at ₹275 each from external market and (ii) Batteries are procured in-house at ₹300 each.
- As a member of the senior management committee, with the idea of goal congruence of the divisions and the company as a whole:
 - How would you convince 'Ruby' to buy the batteries from the in-house division?
 - How would you convince 'Max' to reduce his transfer price from ₹300 for each battery?

Hint: For examine in detail use verb 'DISCUSS'.

Answer

- (i) **Impact on the company's financials:**

Amount in ₹

Department	Case a: Batteries procured from outside at ₹275 per unit	Case b: Batteries procured in house at ₹300 per unit
'Battery' Division	---	28,00,000
'Assembly Plant' Division	(1,16,20,000)	(1,20,00,000)
Overall Company	(1,16,20,000)	(92,00,000)

Case a: Batteries procured from outside at ₹275 per unit

Cost outflow to the company, incurred by the 'assembly plant' division would be ₹1.162 crores. This comprises of the following:

- Procurement cost: 40,000 units procured at ₹275 per unit = ₹1.1 crores.
- Additional quality inspection cost: ₹5 lakhs or ₹0.05 crores.
- Cost of replacement of defective units at a defect rate of 0.1% of annual sales
= 40,000 units × 0.1% × ₹3,000 per unit = ₹1.2 lakh or ₹0.012 crores

Total outflow = ₹1.1 crore + ₹0.05 crore + ₹0.012 crore = ₹1.162 crores.

When batteries are procured from outside, 'battery' division will not incur any cost outflow. However, the unit has unused / excess capacity. Since currently the opportunity cost of unused capacity is zero, this is a *non-quantifiable waste*. The company may have to consider scaling down capacity / activities in this division by shutting down some of its machines. However, since it is given that the **cell phone industry is in the cusp of a growth phase**, it is possible to bring in orders from the external market, to utilize the balance 40% unused annual capacity.

The company should however be cautious since the 'battery' division would be catering to its rival cell phone manufacturers. While the 'assembly plant' would be procuring batteries externally from the battery unit's rivals. It could lead to a situation where the company is working against itself for the sake of maintaining profitability of its individual units. This goes **against the concept of goal congruence** that could affect the company's ability to sustain business in the long run. This would be a separate study that would need inputs from other senior management executives.

Case b: Batteries procured in house at ₹300 per unit

Net cost outflow to the company will be ₹92 lakhs.

The 'battery' division would earn a revenue of ₹300 per unit while incurring a variable cost of ₹230 per unit. Total cost of production is ₹250 per unit, that includes a fixed cost of ₹20 per unit. However, this has been ignored since it is a sunk cost. Therefore, each internal sale to the assembly plant division would net revenue of ₹70 per unit. The total additional revenue earned from this internal transfer would be 40,000 units × ₹70 per unit = ₹28 lakhs. This comes with the additional benefit, that the unit is operating at full capacity, producing high quality component for another unit within the company. Thereby, **aiding goal congruence**.

The 'assembly plant' division would incur a cost outflow of ₹1.2 crores because of the internal transfer. (40,000 units × ₹300 per unit). Although this is costlier than the option of procuring from the external vendors, it comes with high quality assurance. Sale of defective cell phones can be avoided, thereby **improving the company's brand image and customer loyalty**.

Net outflow to the company = cost to the 'assembly plant' division – additional revenue for 'battery' division = ₹1.2 crores – ₹0.28 crores = ₹0.92 crores or ₹92 lakhs.

At the overall company level, this can also be simply calculated as the marginal cost of producing additional 40,000 batteries = 40,000 units × ₹230 per unit = ₹92 lakhs. Fixed cost of manufacture, a sunk cost, is ignored.

Conclusion: It is better to manufacture the batteries in-house due to the following reasons—

1. **External procurement cost** is ₹275 per unit while the marginal cost of manufacturing a battery is only ₹230 internally.
2. **Quality of in-house production is higher**, requiring no additional quality control checks.
3. **Promotes goal congruence**, where each division will work towards sustaining the company's business growth.

(ii) **Negotiating with managers of individual units:**

Negotiating with 'Ruby', the manager of 'assembly plant' division:

Ruby argues in favor of procuring similar batteries from the external market at a price of ₹275 per unit that is much lower than the internal transfer price quote of ₹300 per unit. Overall it costs ₹1.162 crore per year to procure the components as against her division bearing an internal transfer cost of ₹1.2 crore. However, by using external batteries, replacement of defective units would be 0.1% out an annual sale of 40,000 units that is 40 units need to be replaced. 'Ruby' may argue that this is a miniscule portion of the annual sales. However, the company's **image of providing quality products may take a hit**. For the company, procurement cost, along with the cost of replacement and additional quality inspection cost makes it costlier than producing the batteries in-house.

Cost of external procurement = ₹1.162 crore / 40,000 units = ₹290.50 per unit.

Cost of manufacturing in-house = marginal cost of production = ₹230 per unit.

The fact internal transfer is the better option has to be reasoned out with 'Ruby'. She in turn should be given the assurance, **the company would give importance to other non-financial metrics while evaluating her unit's performance for bonus payouts**. One of these could be the number of successful innovative designs collaborated along with other departments such as the 'battery' division. This would have a more positive impact on the employee morale. Excessive emphasis on financial metrics could lead to decisions that may benefit the unit but may be detrimental to the company.

Negotiating with 'Max', the manager of the 'battery' division:

The 'battery' division is currently operating at 60% capacity. With the additional order to produce 40,000 units, the capacity can be utilized completely. This avoids wastage of resources. Quality of components is another positive feature that the company should give credit to 'Max's' division. Therefore, he is justified in charging a premium for quality. At the same time, the following points need to be reasoned out with him:

- Development cost of new design of ₹50 lakh is a sunk cost for the company. It need not be passed onto the 'assembly plant' division. Instead during performance appraisal, 'Max' **can highlight this as an investment** that has paid off in the form a successful design for the new range of products that the company is planning to manufacture. **Such project initiative outflows need to viewed investments and not as costs against the unit**. During performance appraisal for bonus payout, the management can consider the payoffs from such project initiatives, how successful they have been and how many did not yield any result. This is Research and Development that is important for the long-term sustainability of the company.

- It is given that the opportunity cost for excess capacity is nil. Therefore, the unit's excess capacity is waste. Therefore, for determining the transfer price, 'Max' should consider only the marginal cost of producing a battery unit rather than following a cost-plus mark-up pricing policy. As explained above, fixed cost is again a sunk cost to the company.

Therefore, as a senior management committee member, 'Max' has to reasoned out in reducing the transfer price from ₹300 per unit. **Ideally**, the transfer price should **include only the marginal cost of production** of ₹230 per unit. Given the decentralized working of the organization, **leverage can be given for 'Max' to charge a premium for the quality of his products**. Overall, it would not affect the company's financials. However, there has to be a check on how reasonable this premium is since it could lead to decisions that are detrimental to the company. Also, **performance evaluation should also include non-financial metrics** like quality of products produced, innovative designs and production techniques that are factors that will sustain business in the long run.

Question 7

About Problem	Target Verb/ (s)
Relevant Cost Concepts	Analysis

An apparel manufacturing company has raw material inventory of polyester fabric bales that was initially procured to be used in manufacture of shirts. Later, keeping in mind the current fashion trend, the design department suggested manufacture of cotton shirts instead. Therefore, the bales of polyester fabric are now not required. It was procured at ₹1,00,000 few months back, the scrap value if sold in the external market would be ₹45,000 (**alternative 1**). The fabric has alternative uses:

Alternative 2:

The material can be used to make polyester jackets. This would require the following **additional work and materials**:

Material A	500 bales of material
Material B	1,000 units
Direct Labor	3,000 hours unskilled
	2,000 hours semi-skilled
	1,000 hours highly skilled
Extra selling and delivery expenses	₹50,000
Extra advertising	₹25,000

This conversion can produce 1,000 units of polyester jackets that can be sold at ₹400 each. Material A is already in stock and widely used within the company. Although present stock will be sufficient to meet normal production requirements, extra material used to facilitate alternative will need to be replaced immediately. This will avoid any loss due to stock out of Material A for the products under regular production. Material B is an imported dye item, which cannot be very easily procured due to import restrictions. At present Material B is used in the production of high-end fashion clothing that on an average gives a gross contribution of ₹750 per unit of such clothing (without the cost of Material B). Each unit high-end fashion clothing requires 5 units of Material B.

	Material A	Material B
Acquisition cost at the time of purchase	₹87 per bale	₹75 per unit
Net realizable value	₹85 per bale	₹45 per unit
Replacement cost	₹90 per bale	---

Alternative 3:

The company also manufactures curtains for which it uses polyester fabric of a different variety and texture. The bale of polyester fabric currently lying as obsolete inventory can also be used as a substitute to the regular polyester material that is used to make curtains. For this, certain modifications to the texture are required to be done along with certain other procedures that will make the material suitable for utilization in curtain production.

The substitute will contribute towards production of about ~10% of the monthly curtain production. The following would be the **additional work and material** required:

Material C	1,000 units
Direct Labor	1,500 hours unskilled
	500 hours semi-skilled
	500 hours highly skilled

In a month, 15,000 bales of regular polyester fabric used for curtain production is procured at a rate of ₹80 per bale. This month, due to the substitution, only 13,000 bales of regular polyester fabric would be required. With reduced procurement for the current month, the supplier will reduce the bulk discount given on regular purchases. Accordingly, the procurement rate of regular polyester fabric will be at a rate of ₹85 per bale for the current month.

Material C has to be made in-house since it cannot be procured as such from the external market. The **standard cost per unit of Material C** would be as follows:

Direct labor, 2 hours unskilled labor	₹10
Raw materials	₹09
Variable overhead: 1 hours at ₹1 per hour	₹01
Fixed overhead: 1 hours at ₹3 per hour	₹03
Total standard cost of production	₹23

The wage rate and overhead recover rates for the company are as follows:

Variable overhead	₹1 per direct labor hour
Fixed overhead	₹2 per direct labor hour
Unskilled labor	₹5 per direct labor hour
Semi-skilled labor	₹10 per direct labor hour
Skilled labor	₹15 per direct labor hour

The unskilled labor can be procured on contract basis to meet the exact production requirements. The contract expires once the work is done. Semi-skilled labor is part of the permanent labor force, but the company has excess supply of this type of labor at the present time. Highly skilled labor is in short supply and cannot be increased significantly in the short term. This labor force is presently engaged in the manufacture of upholstery. Each unit of upholstery requires 4 hours of highly skilled labor. The contribution from sale of each unit of upholstery is ₹36. To cater Alternative 2 or 3, they need to discontinue production of upholstery until the work is completed.

Required

Present cost information by giving detailed ANALYSIS whether the obsolete bale of polyester fabric should be sold (Alternative1), used production of jackets (Alternative2) or used as a substitute for curtain cloth production (Alternative 3).

Answer

The textile company has to take a decision whether to–

- sell the bale of obsolete polyester fabric;
- produce jackets by using this obsolete polyester fabric; or
- use obsolete polyester fabric as substitute for curtain cloth production.

To make a decision, the company has to consider the relevant cost for each option, along with any additional expenses that need to be incurred. The alternative that yields the highest cash contribution/benefit should be chosen.

Alternative 1: If obsolete bale of polyester fabric is sold as scrap in the external market it would yield cash return of ₹45,000. The original procurement cost is a sunk cost that needs to be ignored.

Alternative 2: Utilize the obsolete polyester fabric to make jackets. In addition to the polyester material, Material A and B would be added to the production process. It would also require the work of additional labor.

Calculation of net cash contribution from Alternative 2:

Particulars	Amount (₹)
Sales Proceeds (1,000 jackets × ₹400 each)	4,00,000
Material A (note 2.1)	45,000
Material B (note 2.2)	1,50,000
Direct Labor - unskilled (note 2.3)	15,000
Direct Labor - semi skilled (note 2.4)	-
Direct Labor - highly skilled (note 2.5)	24,000
Variable Overhead (note 2.6)	6,000
Extra selling and delivery	50,000
Extra advertising	25,000
Net contribution	85,000

Note 2.1: Material A is already in stock and widely used within the company. However, if this is used to make jackets as per alternative 2, it has to be replaced immediately so that other normal production activities are not impacted. Therefore, the relevant cost for Material A would be its current replacement cost at ₹90 per bale. Alternative 2 uses 500 bales of Material A. Therefore, relevant cost = 500 bales × ₹90 per bale = ₹45,000.

Note 2.2: Material B is a scarce material due to import restrictions. It can alternatively be used to make high-end fashion apparel. Gross contribution from high-end apparel clothing is ₹750 per unit sold. Each unit requires 5 units of Material B. Therefore, the gross contribution per unit of Material B would be ₹750 / 5 = ₹150.

Alternative 2 uses 1,000 units of Material B. Therefore, relevant cost = 1,000 units × ₹150 per unit of Material B = ₹1,50,000.

Note 2.3: Unskilled labor is hired on contract basis to meet exact production requirements. The contract expires once the work is done. Relevant cost = payment made to labor hired specially for this purpose = 3,000 hours × ₹5 per hour = ₹15,000.

Note 2.4: Semi-skilled labor is part of the permanent labor force, but the company has excess supply of this type of labor at the present time. This means that there is spare capacity within this workforce, their idle time can be used towards making jackets as per Alternative 2. Therefore, there is no additional cost incurred for the 2,000 hours of work needed for Alternative 2. Therefore, relevant cost = nil.

Note 2.5: Skilled labor is a scarce resource, additional labor cannot be hired easily in the short term. Therefore, relevant cost will include the payment made for the current work plus opportunity cost incurred due to diverting this scarce resource. Each unit of upholstery requires 4 hours of highly skilled labor. The contribution from sale of each unit of upholstery is ₹36. Therefore, the contribution per hour of highly skilled labor is ₹36 / 4 = ₹9 per hour of skilled labor. Alternative 2 requires 1,000 hours of skilled labor. Therefore, opportunity cost = 1,000 hours × ₹9 per hour = ₹9,000. In addition, the skilled labor is paid ₹15 per hour, the pay for making jackets as per alternative 2 = 1,000 hours × ₹15 per hour = ₹15,000. Relevant cost = opportunity cost + pay = ₹9,000 + ₹15,000 = ₹24,000.

Note 2.6: Variable overhead cost will be ₹1 per direct labor hour. Direct labor hours will equal the hours spent by unskilled, semi-skilled and highly skilled labor = 3,000 + 2,000 + 1,000 hours = 6,000 hours. Therefore, variable overhead cost = 6,000 hours × ₹1 per hour = ₹6,000.

Alternative 3: Use the obsolete bales of polyester fabric as a substitute to make curtain cloth material.

In addition to the obsolete bales of polyester fabric, this would require in-house manufacture of Material C, in addition to extra labor. The change in procurement rate of input regular polyester material should also be considered.

Calculation of net cash contribution from Alternative 3:

Particulars	Amount (₹)
Net savings in procurement cost for the current month (note 3.1)	95,000
Material C (note 3.2)	20,000
Direct Labor - unskilled (note 3.3)	7,500
Direct Labor - semi skilled (note 3.4)	-
Direct Labor - highly skilled (note 3.5)	12,000
Variable Overhead (note 3.6)	2,500
Net contribution	53,000

Note 3.1: In a month, 15,000 bales of regular polyester fabric used for curtain production are procured at a rate of ₹80 per bale. This month, due to the substitution, only 13,000 bales of regular polyester fabric would be procured at a higher procurement rate of ₹85 per bale for the current month.

The original cost of procurement = 15,000 bales × ₹80 per bale = ₹12,00,000

Cost of procurement for current month = 13,000 × ₹85 per bale = ₹1,05,000

Therefore, savings in procurement cost due to substitution = ₹95,000

Note 3.2: Cost of in-house production of Material C. Material C costs ₹23 per unit to be produced internally. Fixed overhead cost of ₹3 per unit has to be ignored since it is a sunk cost for this decision.

Therefore, for analysis, the in-house cost of production of Material C would be ₹20 per unit. Alternative 3 requires 1,000 units of Material C. Therefore, the cost of Material C = 1,000 units × ₹20 per unit = ₹20,000.

Note 3.3: Unskilled labor is hired on contract basis to meet exact production requirements. The contract expires once the work is done. Relevant cost = payment made to labor hired specially for this purpose = 1,500 hours × ₹5 per hour = ₹7,500.

Note 3.4: As explained in note 2.4 above, there is no additional cost in the utilization of semi-skilled labor force. Their idle time is used towards this extra production as per Alternative 2 or Alternative 3. Therefore, there is no additional cost incurred for the 500 hours of work needed for Alternative 3. Therefore, relevant cost = nil.

Note 3.5: As explained in note 2.5 above, skilled labor is paid at ₹15 per hour for this work. The opportunity cost of diverting this scarce resource from regular production of upholstery material is ₹9 per hour. Therefore, relevant cost for alternative 3 = 500 hours × (₹15 + ₹9) per hour = 500 × ₹24 per hour = ₹12,000.

Note 3.6: Variable overhead cost will be ₹1 per direct labor hour. Direct labor hours will equal the hours spent by unskilled, semi-skilled and highly skilled labor = 1,500 + 500 + 500 hours = 2,500 hours. Therefore, variable overhead cost = 2,500 hours × ₹1 per hour = ₹2,500.

To summarize the net cash contribution from various alternatives:

Alternative 1: sell as scrap → ₹45,000.

Alternative 2: Make of 1,000 jackets → ₹85,000

Alternative 3: Substitute in curtain cloth production → ₹53,000.

Conclusion: Alternative 2 yields the highest net cash contribution. Therefore, the obsolete inventory should be used to make polyester jackets.

“Every effort has been made to include all possible elucidations for a given case/ question aided by outline and well chosen photographs for quick industry reference / concept reference.”

“If all you’re trying to do is essentially the same thing as your rivals, then it’s unlikely that you’ll be very successful.”

– Michael Porter



CASE STUDY

The basis objective of the case study is to allow the students to apply ideas and insights from theory to the *real life issues and problems*.

Case Study- KAIZEN (with integration to 5S and PDCA)



At Sanjivini Hospital, stores recently complete the exercise of numbering the patient files to keep the record in to shorten retrieve, because the reception desk finds it cumbersome to locate the file in case of revisiting patients. The different departments (OPD, IPD, and OT) of Sanjivini Hospital uses some of the surgical items, out of common inventory pool; hence visual control is

used to prevent stock-out situation or improve inventory control.

“If someone asked me to suggest a basic procedure for solving problems scientifically, rationally, efficiently, and effectively by removing the barriers and reducing the wastes – KAIZEN may be the best possible answer”. This is the opening remark of the CMD of Sanjivini Hospitals at the recent board meeting, after which a clear split in the viewpoint of directors over the utility of Kaizen is visible; some of the directors favour the organisation-wide innovations wherein top management’s active involvement is essential; whereas some others believe performing those improvement initiatives which can be applied through an operational level workforce with the little amount of resources are essential.

The executive director responsible for planning and operation read an executive summary followed by a presentation wherein the facts and figures related to operations were highlighted. In response to a question raised by the independent director regarding the proper disposal of surgical wastes, he mentioned that during the year (just completed) colour coding was used throughout where it was possible, after considering a suggestion letter from a nurse, and this significantly prevent mix-up of medical wastes, which make disposal easy and cheap. The head of housekeeping division added, on the feedback from ward boy, all switches were labelled to save energy and cost on the environment day.

CEO, gave stress upon the clarifying ideal situation because he feels it is useful to identify problems in your working place, because the gap between ‘desired ideal status’ and ‘actual current situation’ is ‘problem/(s)’. He further added, – *“if the problems are complex and composite then the Kaizen process with help of the PDCA cycle needs to be practiced; if the problem is simple and relates to operations then Kaizen initiatives can be clubbed with 5S”*. He mentioned both the

ways have their own importance at Sanjivini Hospital in order to respond to MUDA (waste).

In favour of the Kaizen initiatives that can be clubbed with 5S, the CMD argues *“these are quick and easy and helps to eliminate or reduce waste”*. The HR (executive director) head supports the CMD by stating that *“it promotes personal growth of employees and the organization and also act a barometer of leadership”*. The finance head (who is also an executive director) supported the CMD by stating that *“these ideas (small changes) can be implemented by the worker him/herself with very little investment of time”*.

The finance head also quoted a reference of the report that was published in The New Indian Express recently, stating that private hospitals spend 50 percent of operational costs on salaries of medical staff, including doctors. The analysis says that hospitals spend 28-32 percent on drugs and consumables and maintaining a bed in a super-specialty hospital takes about ₹15,000-25,000 every day.

Then he (finance head) presented the following facts and figures in front of the board–

During the previous period (t_1), at Sanjivini Hospital the average bed capacity was 350 and the average overall actual operation cost for a week of seven working days was ₹4,59,37,500 against the standard cost of ₹18,500 per bed per day.

During the period just ended (t_0) with the Kaizen initiatives the goal of cost reduction was 8%. The average bed capacity increased by 10% and the average overall actual operation cost for a week of seven working days was ₹4,63,54,000 against the standard cost of ₹17,020 per bed per day.

Required

- (i) Assist the management of Sanjivini Hospital to CALCULATE the following, using Kaizen Costing –
 - a. Cost base for the period just ended (t_0)
 - b. Kaizen Cost reduction target during the period just ended (t_0) in amount
 - c. Cost base for the period just started (t_1)
- (ii) ASSESS the performance of Sanjivini Hospital for the period just ended (t_0) from the perspective of Kaizen Costing.
- (iii) After briefly explaining Kaizen and the 5S and IDENTIFY at-least three practices adopted by Sanjivini Hospital wherein Kaizen overlaps with 5S activities.
- (iv) ADVISE the management at Sanjivini Hospital, how it can track the Kaizen suggestions.
- (v) After stating the Kaizen process, do synthesis of the relationship between the Kaizen process and PDCA Cycle.
- (vi) LIST at-least three practices that can help Sanjivini Hospitals to foster the Kaizen culture.

Solution

(i) Kaizen Costing

- Cost base for the period just ended (t_0) = ₹4,59,37,500 / (7 days × 350 beds) = ₹18,750 per bed per day.

Note – Cost base for Kaizen Costing purpose shall always be calculated in per-unit basis to equalise the change in capacity level.

- The Kaizen Cost reduction target during the period just ended (t_0) in amount will be 8% of the cost base for the period just ended (t_0) i.e., actual cost = 8% of cost base i.e., 8% of ₹18,750 per bed per day. This comes out to be ₹1,500.

Note – Here 8% is the Kaizen Cost reduction rate and ₹1,500 is the Kaizen Cost reduction target.

- Cost base for the period just started (t_1) = ₹4,63,54,000 / (7 days × 385 beds) = ₹17,200 per bed per day.

Working Note – Average bed capacity i.e., 350 + 10% of 350 = 385 beds.



Concept Insight

It is important to understand the difference between the Standard Cost and Kaizen Costing, so refer the table of differentiation below–

Standard Costing	Kaizen Costing
It is a cost control technique.	It is a cost reduction technique.
It assumes current work condition will remain same.	It assumes continuous improving conditions.
Meet cost performance standard.	Achieve cost reduction target.
For larger period usually six or twelve months.	For relatively short span – e.g., monthly or quarterly.
For variance analysis comparison is among the actual & standard cost.	Gap between actual cost and kaizen target cost identified.
Variances need to be reported and addressed.	Reasons for missing kaizen target cost need to be addressed.

- (ii) Performance of period just ended (t_0) from the perspective of Kaizen Costing is appreciable because during the years the Kaizen Cost reduction target was ₹1,500, means through Kaizen initiatives it has to reduce the cost from ₹18,750 per bed per day to ₹17,250 per bed per day; whereas Sanjivini Hospital attains the actual average operating cost of ₹17,200 per bed per day, means a reduction of ₹1,550 (i.e., more than Kaizen Cost reduction target was ₹1,500).

In other words, one can say rather than reducing the cost by 8% Kaizen initiatives helps to reduce case by 8.27%; hence performance is acceptable and appreciable.

For better understanding on questions i and ii, refer the table below–

Period	Actual Cost	Standard Cost*	Kaizen Cost Base	Kaizen Cost Reduction Target	Kaizen Cost Target
t_1	18,750	18,500			
t_0	17,200	17,020	18,750	1,500 (i.e., 8%)	17,250
t_1			17,200		
Cost Reduction during t_0	1,550 (attained)			1,500 (desired i.e., 8%)	

* Irreverent for KAIZEN costing.

- (iii) KAI means **change** and ZEN means **improvement**, hence 'KAIZEN' represents a change for the better. 'KAIZEN' is a lean process that continuously strives for problem-solving to achieve Total Quality Management.



5S represents a scientific way of workplace management so that work can be performed effectively, efficiently, and safely. 5S acts as the foundation of eight pillars of TPM and represents;

- Seiri means Sorting
- Seiton means Set in Order
- Seiso means Shine
- Sieketsu means Standardization
- Shitsuke means Sustain



At Sanjivini Hospital, the following Kaizen initiatives can be linked with 5S–

- Colour coding of the waste bin to prevent mix-up of medical wastes.
- To save energy, switches were labelled.
- Visual control to prevent stock-out situation or improve inventory control.
- Proper numbering of the patient files to shorten retrieve time.

Note – the Kaizen initiative taken place at Sanjivini largely covered by second 'S' Seiton i.e., set in order.

- (iv) Tracking of Kaizen suggestions can easily be practiced at Sanjivini Hospital by maintaining a Kaizen suggestion board that generally comprises–

Kaizen Suggestions	To Do	Doing	Done

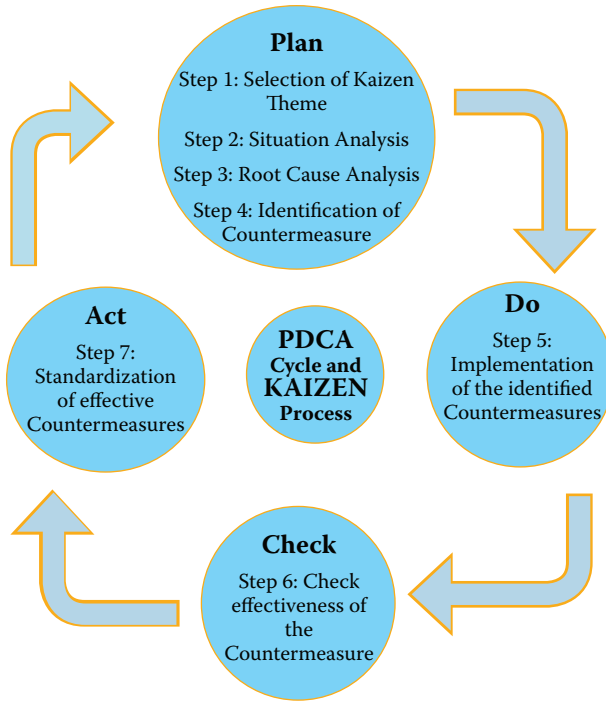
Sanjivini Hospitals can use the KAIZEN suggestion board in the following way (steps)–

- Write the idea on a paper and stick it when you come-up with ideas for improvement.
- Move the paper to "TO DO" when a supervisor or work improvement team are discussing.
- Move the paper to "Doing" when you are practicing the ideas after agreement from the supervisor or work improvement team.
- Move the paper to "Done" when you complete the ideas.

Note – If Sanjivini hospital willing then can collaborate with 5S initiatives as an extension to the Kaizen suggestion board.

- (v) **The relationship between the Kaizen process and PDCA cycle**

Kaizen is solving problems process at working place, to improve situation and condition, whereas PDCA (also known as Deming Cycle) is an iterative four-step management method used in business for the control and continuous improvement of processes and products. PDCA stands for the plan–do–check–act. The PDCA Cycle provides a framework and structure for identifying improvement opportunities. The seven steps of the Kaizen process are:



Note –

The important point that needs to keep in mind is **‘the continuous nature of improvements’**. Don’t stop after Act, do plan further on.

- (vi) The practices that Sanjivini Hospital needs to stress upon in order to foster the culture of Kaizen.
 - Promote the culture of sharing of ideas – Best practices can be evolved within the hospital through sharing and discussing the idea (change) that can solve the problem causing a gap in existing and ideal position. Such practices shall be adopted in every vertical of the hospital.
 - Do whatever best can be done with existing resources – Reach to the level of optimum utilization and remember there always scope for improvement.
 - Foster esprit-de-corps culture – A culture in which no blaming other’s opinions, instead of this they support in implementation after the agreement from the supervisor or work improvement team.
 - Integrate everyone’s image – To have overall perspective while evaluating any individual initiative (suggested change).

Case Study- 5S



Mijaj is the leading household name in the nation for electronics and automobiles. Mijaj inaugurated its two-wheeler plant at Santnagar with a planned capacity of one million motorcycles per annum, more than a

decade ago. The plant was originally built on a 65-acre area with another 155 acres allocated for a vendor cluster. The production unit spread out in 40,000 square meters and is operated by 600 line engineers.

In the plant, safety became a critical issue. This is also evident from the report of the review committee, which was submitted to the board of directors recently. Report details all those incidences (that occurred in the last couple of years) when safety norms were breached or safety measures in operation were failed and result in incident or accident.

Total such incidences are 54, out of which major are 11. Results of detailed investigation show that 14 such incidences were taken place due to sheer negligence of workers (it was also identified that 4 of such incidences occurred while the concerned worker was during overtime hours), whereas 37 incidences taken place due to poor workplace management and the remaining 3 are due to power failure.

Out of 37 incidences that took place due to poor workplace management, 19 were due to using either the wrong tool (tool required either misplaced or non-accessible due to any reason) or hazardous/toxic elements were not handled properly including failure to keep the process within the control limits (2 were serious, but no causality); 5 were due to breakdown or failure of machines (4 were serious, and the one incident resulted in a fire resulting in two casualties and injuries to many). It was also identified that all the 5 machines involved were not regularly cleaned and even regarding one of such machines a complaint (that it sparks some time) was also registered by the operator with maintenance staff (same remain unresolved). The remaining 13 were due to cluttered production floor (1 among them were serious, involving one casualty and injuries to some others).

VP Finance after reading the report sent a letter to the board, wherein immediate action is requested. He included the adverse monetary effect of such incidences in the letter.

During the next board meeting, wherein you (management accountant) are also present; an independent director who is an HR professional said ‘the consequences of such incidences include defame and low employee morale (apart from litigation and pressure from employee unions), hence resolution shall be prompt and apt.

The CEO responded ‘BSC (balanced scorecard) is already in practice at Santnagar plant of Mijaj, which includes Internal Process, and Learning & Growth, the score is also acceptable in both the perspective’. A question was posed related to accidents due to employee negligence are they (employees) learned enough? CEO while responding to question referred report from the HR head, wherein it was mentioned that during such two years 27 training programs were organised and average attendance turned out nearly 80%. Every employee who works on the production/assembly line has to undergo 3 months of training at the time of joining.

The MD expresses his concern over the number of such incidences and surprised to know that BSC is failed to deliver. MD prior to this board meeting, attended a CPE meet wherein he comes to know about 5S, red tag, and marking; but not sure whether these will help or not. MD ordered you to prepare documents showing the application of 5S to the Mijaj’s Santnagar plant, apart from preparing the precise checklist and list of benefits owing to different ‘S’. It was decided a task force of the director and top executives shall be formed to respond to the issue.

Required

- (i) EXPLAIN the 5S briefly followed by a piece of information to the task force on ‘is the root causes of incidences that took place due to poor workplace management are connected with the scope of 5Ss?’ Support your answer by correlating the facts given in the case and highlight how 5S can be helpful to Mijaj.
- (ii) You prepared the document as desired by MD and gave it to the computer operator to punch in, but she merged the checklist and list of benefits as follows–
 - a. Working out the procedures defining the course of processes.
 - b. Are lines, pipes, etc. clean, will they demand repairing?

- c. Quick informing about damages (potential sources of damages).
 - d. Do tools or remainders of materials to production lie on the floor (in the workplace)?
 - e. Has the floor any irregularity, cracks, or causes other difficulties for the operator's movement?
 - f. Are the oil's stains, dust, or remains of metal found around the position, machine, on the floor?
 - g. Better usage of the working area.
 - h. Are pipe outlets of oils not clogged by some dirt?
 - i. Shortening of the time of seeking necessary things.
 - j. Is attention given to keeping the workplace neat and clean?
 - k. Decreasing of mistakes quantity resulting from the inattention.
 - l. Is the position (location) of the main passages and places of storing clearly marked?
 - m. Are all transport palettes stored on the proper heights?
- You are also required to CLASSIFY (and re-arrange) in relevant categories of 5S.
- (iii) LIST, why do balanced scorecard fails to deliver in all the cases? Critically ASSESS the CEO's response to the question posed.
 - (iv) EXPLAIN taskforce, for what purpose red-card/tag is meant? How is it used? Are there any other colours tag too?

Solution

(i) 5S represents a scientific way of workplace management so that work can be performed effectively, efficiently, and safely. 5S first developed by Hiroyuki Hirano and was come into practice as part of the Toyota Production System. 5S is usually considered as an essential component of Lean manufacturing, and the foundation of eight pillars of TPM. 5S are as follows–

- **Seiri** means **sorting**, aiming to remove all unwanted, unnecessary, and unrelated materials at the workplace.
- **Seiton** means **set-in-order** that consists of putting everything in an assigned place so that it can be accessed or retrieved quickly as well as returned in that same place quickly.
- **Seiso** means **shine**. The shining process consists of cleaning up the workplace, keeping it neat, and giving it a 'shine'.
- **Seiketsu** means **standardization**, which involves defining the standards by which personnel must measure and maintain cleanliness.
- **Shitsuke** means **Sustain**. **Sustaining** the discipline, which helps in It maintain orderliness and to practice the first 4 S as a way of life

Note – Practice of 5S is a sequential process.

Yes, the root causes of incidences that took place due to poor workplace management at the Santnagar plant of Mijaj are highly connected with the scope of 5Ss.

The incidences that took place were largely due to items at the workplace are either not properly sorted or not in order. Lake of maintenance of the machines in term of cleaning and repair also another major reason for same.

Total of 37 incidences took place due to poor workplace management at the Santnagar plant of Mijaj, which represent more than 2/3 incidence of the last two years.

Description	Reason	Can be overcome
13 incidences (1 were serious, involving one casualty)	Cluttered production floor	Seiri (sorting) Use red and yellow tags with store and designated holding area
19 incidences (2 were serious, but no causality)	Using either wrong tool (tool required either misplaced or non-accessible due to any reason) or hazardous/toxic elements were not handled properly including failure to keep the process within the control limits	Seiton (set in order) Use of label, signs, colour code, line marking, tool form, or shadowing
5 incidences (4 were serious, involving two casualties)	Breakdown or failure of machines, because they were not regularly cleaned and repaired (even the repair request/complaints remain unresolved)	Seiso (Shine) The operator shall assume the role of cleaner. Cleaning shall involve inspection of all aspects of the machine – front, rear, left-right, top and bottom

If first 3S (sorting, set in order, and shine) become the standard which is adopted by organisation sustainably then the probability of incidences which took place due to unattended-ness of worker shall also be reduced. At the Santnagar plant of Mijaj, there were 14 such incidences in the previous two years. Hence, 5S practice can really help the Mijaj in reducing the probability of more than 90% of incidence to promote safety.

(ii) **Classification of checklist items and benefits in relevant categories of 5S**

Description of item	Checklist/ Benefit	Category
a. Working out the procedures defining the course of processes.	Benefit	Seiketsu (Standardize)
b. Are lines, pipes, etc. clean, will they demand repairing?	Checklist	Seiso (Shine)
c. Quick informing about damages (potential sources of damages).	Benefit	Seiso (Shine)
d. Do tools or remainders of materials to production lie on the floor (in the workplace)?	Checklist	Seiso (Shine)
e. Has the floor any irregularity, cracks, or causes other difficulties for the operator's movement?	Checklist	Seiri (Sort)
f. Are the oil's stains, dust, or remains of metal found around the position, machine, on the floor?	Checklist	Seiso (Shine)
g. Better usage of the working area.	Benefit	Seiri (Sort)
h. Are pipe outlets of oils not clogged by some dirt?	Checklist	Seiso (Shine)

i. Shortening of the time of seeking necessary things.	Benefit	Seiton (Set-in-order)
j. Is attention given to keeping the workplace neat and clean (SoPs)?	Checklist	Seiketsu (Standardize)
k. Decreasing of mistakes quantity resulting from the inattention.	Benefit	Shitsuke (Sustain)
l. Is the position (location) of the main passages and places of storing clearly marked?	Checklist	Seiton (Set-in-order)
m. Are all transport palettes stored on the proper heights?	Checklist	Seiton (Set-in-order)
Note- Alternate Classification may also be possible.		

(iii) **The prominent reasons for the failure of a balanced scorecard to deliver in all the cases are–**

- Managers mistakenly think mere use of non-financial measures and Balanced Scorecard is meant for reporting purposes only.
- In case senior executives delegate the responsibility of the implementation to middle-level managers.
- If companies, try to copy measures and strategies used by the best companies rather than developing their own measures suited for the environment under which they function.

Mere draw down the BSC and compute the score is no guarantee that things can't go wrong. An in-depth evaluation is required. The KPIs established may be outdated or irrelevant. Targets may be understated, and performance may be overstated.

CEO's remark includes a reference to report from the HR head, wherein it was mentioned that *during such two years 27 training program was organised and average attendance turned out nearly 80%*. Since learning is something more than training; hence conducting training program will not be enough, if participation and learning of worker are not assured. Physical attendance will not ensure the learning, for this worker need to be engaged and they shall be motivated to practice what they learn during training.

Note - Positive motivation is better than negative motivation to build a constructive culture, hence do link incentive for compliance rather than charging penalty for not following what asked for.

(iv) **Red tags** help to identify objects that need to be removed from the workplace, in the process of sorting.

How it works - While sorting, place a red tag on the undecided items. This lets everyone know this item needs to be evaluated. Notate on the tag whenever item used afterward that, this will help in deciding the frequency of use and take the decision to leave the item where it was originally placed, relocate the item, or dispose of the item.

Note - Until determining their value, such red-tagged items are placed in the Red Tag Holding Area.

Yes, apart from the red tag, another tag that can be used is the **yellow tag**. A yellow tag contains detailed information (including expected use, dates, etc.) of needful items, which are useful but not required currently, hence usually kept in store.

Case Study – Business Process Reengineering

Sim-tech Electronics Limited (SEL) deals in a wide range of electronic products for domestic and commercial use. SEL was established around 40 years back and famous for completely indigenous products. Raw materials including assembly components are procured from registered vendors only. Delayed processing of invoices by SEL is the major concern of vendors. Even a few vendors deny the further supply of material.

The processes at SEL were traditionally designed and hardly modified since its inception. Accounts payable function (process) is also not an exception and requires rationalization. It's not only the obsession of managers but also the fear of workers; that hinders the SEL from revamped even to make minor changes.

The CEO, who joined SEL recently, presided over a meeting where all the functional heads (including finance, marketing, and store, etc.) were present. Highlighting the concern of vendors, the CEO remarked **'If managers have the vision, re-engineering will provide the way'**. Many functional heads were unable to understand what the CEO intended to say, especially 'what he meant from the word re-engineering? Is this meant by improvement or innovation?'

Currently, the accounts payable department receives a duplicate hard copy of the purchase order (from the purchasing department), a duplicate of good receipt note (from gate/store), and invoice (from vendor); then match the particulars in all three and only if matched proceed for payment. Managing accounts payables (including processing vendor's invoices) as part of working capital management is KRA of CFO. He mentioned **'we are thinking to completely automate the process, to speed up the invoice processing'**. To which the CEO responded **'Don't automate, do obliterate'**. Further CEO said **'why only accounts payable, why not others or all?'**

VP-Production and Operations raised his concern over the identification criteria for processes to be rationalised. VP-HR and Payroll jumped into the discussion with the plausible conflicts and challenges out of the changes, SEL aiming at. CEO stressed the importance of **'breaking away from the old rules'**.

Required

You were also present in the meeting (as management accountant), hence required to

- CEO stressed the 'breaking away from the old rules' and mentioned 'don't automate, do obliterate'. Synthesis of both the statements in the context of BPR. Also ADVISE how account payable function (process) can be re-engineered at SEL.
- Improvement, Redesign, and Re-engineering are not the same. Briefly COMPARE the terms to help the functional heads, who unable to understand the CEO's remark.
- LIST, set of criteria that can be applied to identify the processes suitable for re-engineering.
- LIST the plausible conflicts which SEL may face along with possible the way-out.
- CEO said 'why only accounts payable why not others or all'. STATE the steps involved in Business Process Reengineering Life Cycle?

Solution



- Business Process Re-engineering (BPR)** is a **fundamental rethinking and radical redesign** of business process to achieve **dramatic improvement in critical contemporary measures** of performance, such as cost, quality, service, cycle time, etc. **Frederick Winslow Taylor** said to develop a science for each element of a man's work, whereas **Micheal Hammer** thinks differently hence drastically deviate from Taylor in the following manner:

- Hammer looks at **processes as a whole** not just as a collection of parts; because only then you can decide on the best way to do the whole process and redesign it radically.
- Hammer wrote an article titled **'Re-engineering work: Don't automate, obliterate'**, wherein he said don't use IT just to make existing processes faster; be prepared to design a completely new process. Basically, Hammer favours **breaking away from the old rules**.

Hence in both the statement CEO advocates for BPR.

Re-engineering of accounts payable at SEL

Currently, the accounts payable department receives 3 documents in physical hard copy and then matches the same to proceed for payment to the vendor.

Out of these three documents (duplicate hard copy of purchase order, a duplicate of good receipt note, and invoice) accounts payable department can skip invoice and it can proceed for payment based upon auto-matching of good receipt note with purchase order.

Further, a real-time ERP solution (maybe cloud-based or SEL's server-based) can put into place to automate the process of matching the purchase order and goods receipt note (because both the document either created or hosted on the ERP). This also results in saving time, earlier spent in punching the data (at end of account payable department), and physical movement of documents from one department from others.

Maintaining records and generating reports become easy and cheap, Such ERP will also auto-check the invoice details whenever punched into the system.

(ii) **Difference between Process Improvement, Process Redesign, and Process Re-engineering**

Process Improvement targets to tap incremental improvements, while keeping the process stable (in relative term to process redesign and process re-engineering), whereas **Process Re-engineering** involves radical redesigning of core processes.

Process Redesign is the middle path to both the extremes (Process Improvement and Process Re-engineering).

Refer to the diagram to understand the difference in scope and outcome of Process improvement, Process redesign, and Process re-engineering-

Strategic opportunities or environmental threat (process need to be re-vamped)			Process Re-engineering
The process has big problems and needs to change		Process Redesign	
Process is stable	Process Improvement		
	Smaller sub-process	Mid-sized processes	Core processes (using value chain)

(iii) **Criteria to identify the processes**

The processes for re-engineering shall be selected with the utmost care by a cross-functional team of managers considering the vision and business goals from a holistic view. SEL shall consider the following points to identify the processes -

- That can be broken into the parts.
- Those which are behaving like constraints (Bottleneck).
- Feasible to make the change.
- Cross-functional and cross-organisational.
- Core processes that have high impact - the business process which capable to add value substantially. One can use a **value chain** to identify high-level processes.
- Front-line customer serving - Business processes that are customer-facing used by front-end employees.

(iv) **Challenges in employing BPR**

Business Process Re-engineering results in radical changes in the process and may involve automation (or further automation) hence challenges pertaining to change is expected, SEL can expect the following plausible challenges which they need to respond-

- **Decreased employee morale** - Since BPR starts with a mindset that the existing process is not perfect, improvement can be made; means what employees are performing is not of optimal worth. Changes in role and responsibility are expected after BPR, with which employees may not be comfortable and may lose job satisfaction. The staff of the accounts payable department of SEL may be transferred to some other department.
- **Reduced staff (Layout)** - Automation leads to reduction of the workforce, hence job security is a cause of worry. In the accounts payable department of SEL too, many may lose the job.
- **Incomplete impact analysis** - Processes may be complex, hence BPR may result in either indirect effect or effect on an invisible element that can't be predicted with the acute degree.
- **All or nothing methodology** - BPR is all about radical change and looks at **processes as a whole** not just as a collection of parts, hence either complete change or nothing to change.

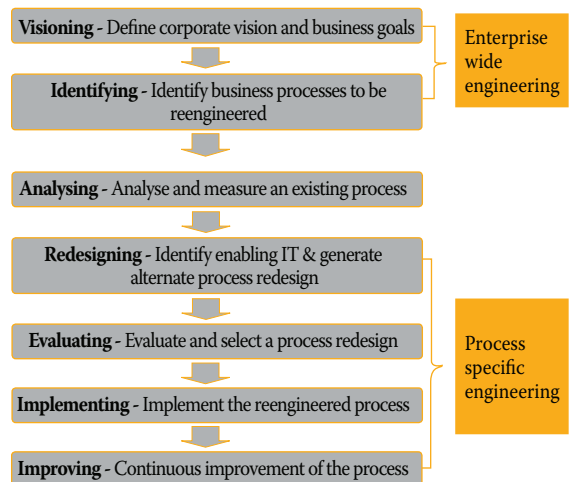
Overcoming BPR challenges

The challenges are due to change and reaction of people who will be impacted by change if change management is applied properly then SEL can easily overcome the majority of challenges posed above.

- Focus on all **change management** impacts - People, Process, and Systems.
- Communicate early and often.
- Practice continues improvement.

(v) **Business Process Re-engineering Life Cycle**

Business process re-engineering life cycle involves seven steps out of which first two are enterprise-wide and the remaining five are process specific. Refer to the diagram below-



Skill Assessment Based Questions

The basis objective of the case study is to allow the students to apply ideas and insights from theory to the *real life issues and problems*.

Question 1

About Problem	Target Verb/ (s)
Target Costing	Calculate, Assess, Advise, Comment

PX-2 manufactures cartons primarily for the use of manufacturers of electronic products. Cartons are customized for each brand that individual manufacturers produce. Cartons for each brand are unique, having specific scheme of instructions, bar code, information, and pictures. Presently, PX-2 produces at least 35 different types of cartons for each brand and has a market share of 40% in this segment. The market for electronic products is expected to grow exponentially in India. This has attracted not just more electronic products manufacturers but also suppliers of similar cartons to cater to the demand from such manufacturers. Therefore, an electronic product manufacturer can procure customized cartons for its product/(s) from multiple carton manufacturers. PX-2 has been in this business for many decades. It is a family run business.

Production Process

Kraft paper is the primary raw material required to make corrugated cartons. PX-2 buys this from external suppliers. The Kraft paper is loaded into machines called corrugators. Corrugator machines processes this into cardboard sheets. These sheets are then printed upon with unique colour along with information relevant to the electronic product for which it is being made and cut into appropriate size. Batches of finished cartons are packed together and shipped to the warehouse. In the recent years, awareness about corporate social responsibility has led manufacturers of cartons to use recycled paper as raw material to make cartons. Recyclable paper material is procured from scrap paper dealers. Raw material needed for production is stored within the factory premises.



Following is the information available about the production plan and standard costs based on budgets:

- Product Mix: The input mix to produce corrugated cardboard sheets is as below:

Material	Product Mix	Market Price per ton (₹)
Kraft paper	80%	50,000
Recyclable paper	20%	20,000

- Input Output Yield: A ton of raw material processed in the corrugators yields half ton of cardboard sheets (corrugated).
- Operating Costs: A corrugator machine can process 5 tons of cardboard sheets during an hour long production run. Operating cost of the machine for one hour is ₹30,000.
- Printing Costs: Cost of printing customized information and colour/ design costs ₹5,000 per ton of cardboard sheet.
- Other costs required to complete the manufacturing process (Inc. glue, dyes, and wax) is ₹20,000 per ton of cardboard sheet.

These standards represent “**best practices**” for the company that have been followed for the past many years. Standard costs are

revisited once every year since it is not possible to do more dynamic costing due to the 35 different types of cartons being produced. This is acceptable both to the production manager and the senior management of the company. Accordingly, the total standard cost computed from the above inputs is acceptable for evaluation of the manufacturing performance.

Storage

PX-2 receives and stores raw material within factory premises. It has a warehouse located 20 kms from its factory where finished corrugated cardboard sheets (cartons) are stored. Shipment of goods from factory to warehouse is made using trucks that the company owns. Later, based on the demand, shipments are made from the warehouse to electronic product/(s) manufacturers all over India. Stacking, dispatching, and shipping of goods is done manually.

Financial Performance

PX-2 sells each ton of carton at ₹1,40,000. In addition to the manufacturing costs detailed above, following costs are incurred:

- Shipping of goods to the warehouse 20 kms away is ₹6,000 per ton.
- Warehouse maintenance expense is ₹30,000 per ton.
- Required profit margin of finished corrugated cardboard sheets (cartons) is ₹5,000 per ton.

A back-of-the-envelope calculation indicates that the cost of operations is actually higher than this sales price. Since the market is highly competitive, PX-2 does not have the flexibility to increase its sale price.

Problem at hand

A close competitor of PX-2 is able to sell similar cartons at ₹1,10,000 per ton. There is not much product differentiation between the goods. A “competitor-study” indicates that the competitor is making reasonable return even at this price. Likewise new entrants are eating into PX-2’s market share.

On the production side, the production management team is convinced that they have the best practices in place and that the costs being incurred are reasonable. The loss making financial performance, in their opinion is due to market pricing of the product. On the other hand, the sales manager is of the opinion that given the market competition, the product cannot be sold at any higher price. Hence, the loss cannot be addressed by increasing the sale price.

Required

As a newly employed management accountant you have been requested to suggest possible solutions to improve profitability. Following questions will help you address the problem:

- CALCULATE the current cost of operations to produce 1 ton of cartons. Given the current sale price of ₹1,40,000 per ton, what is the profit or loss being incurred?
- Intense market competition and the ability of a competitor to sell a similar product at a much lower price, requires you to use target costing methodology to solve the problem. Taking the competitor’s sale price of ₹1,10,000 per ton CALCULATE the target manufacturing cost.
- In the current set-up, CALCULATE ideal manufacturing cost considering most efficient use of resources. Ideal manufacturing cost is when there is no wastage of current resources.
- What conclusions would you draw when you the target manufacturing cost and the ideal manufacturing cost? [Hint: ADVISE].
- ASSESS whether the company return improve its profitability when the following actions are taken:
 - The product input mix is changed as kraft paper 55% and recyclable paper 45%. Market price per ton of kraft paper is now ₹51,000 and of recyclable paper is ₹15,000.
 - Input output yield improves to 85% from the current level of 50%.

- (c) Storage of finished goods at the warehouse is being improved. The company is moving to a smaller warehouse within the same vicinity. Automation of stacking and dispatch operations will be done using forklifts. Storage space is being optimized by stacking the goods on racks that can store more volume within the same floor space. This can reduce warehouse operating costs by ₹5,000 per ton.
- (d) Trucks used for shipping are being replaced by more fuel efficient, larger ones. This would save the company ₹2,000 per ton.
- (vi) COMMENT on how the above target costing study has made PX-2 environmentally responsible.

Answer

- (i) Current cost of producing 1 ton of finished corrugated cardboard sheets (cartons):

Particulars	₹
Raw material cost (refer note 1 below)	88,000
Add: Operating cost (corrugator machine)	6,000
Add: Printing costs	5,000
Add: Other costs	20,000
Current manufacturing cost per ton	1,19,000
Add: Shipping of goods to the warehouse	6,000
Add: Warehouse maintenance expense	30,000
Total cost of operations per ton	1,55,000

At the current sale price of ₹1,40,000 per ton, the company is incurring a loss of ₹15,000 per ton of cartons produced.

Note 1: Material Cost

Material	Product Mix	Market price per ton (₹)	Procurement Price per ton of Input (₹)
Kraft paper	80%	50,000	40,000
Recyclable paper	20%	20,000	4,000
Total procurement price per ton of raw material			44,000

With a yield of 50%, the input raw material needed to produce a ton of corrugated cardboard sheet is 1 ton/50% = 2 tons of raw material. Hence the raw material cost for production of one ton corrugated sheets is 2 tons of raw material × ₹44,000 per ton = ₹88,000.

Note 2: Corrugator Machine

In one hour, the corrugator can produce 5 tons of cardboard sheet. Operating cost for one hour is ₹30,000. Hence operating cost per ton is ₹6,000.

- (ii) Target Manufacturing Cost when with sale price of ₹1,10,000 per ton.
Target Manufacturing Cost = Sale price – Required profit margin – Non-manufacturing expense

Particulars	₹
Competitive selling price	1,10,000
Less: Profit margin and non-manufacturing expenses	
Shipping of goods to the warehouse	6,000
Warehouse maintenance expenses	30,000
Required profit margin	5,000
Target manufacturing cost (per ton)	69,000

- (iii) Ideal manufacturing cost of production per ton of corrugated cardboard sheet. Ideal manufacturing cost would be the cost incurred when the resources are used in the most efficient manner. In the given problem, the input-output yield of 50% is the only sub-optimized resource. Hence, the ideal cost of production, without wastage of resources would be when the input-output yield is 100%.

When Yield is 100%, only one ton of raw material is needed to produce one ton of corrugated cardboard sheets. As calculated in Note 1 of question 1, the material procurement cost per ton is ₹44,000.

Therefore, the ideal manufacturing cost would be–

Particulars	₹
Raw material cost (yield 100%)	44,000
Add: Operating cost (corrugator machine)	6,000
Add: Printing costs	5,000
Add: Other costs	20,000
Ideal manufacturing cost (per ton)	75,000

- (iv) Conclusions drawn from target manufacturing cost and ideal manufacturing cost. Target manufacturing cost is ₹69,000 per ton while ideal manufacturing cost is ₹75,000 per ton of output. Hence, it can be concluded that even with the most efficient use of resources, the target manufacturing cost cannot be achieved. As mentioned in the problem, the “competitor-study” indicates that the competitor selling at ₹1,10,000 per ton is able to earn a reasonable return even at such lower price.

Therefore, it can be concluded that the **presumption that production is based on “best-practices” is wrong**. Unlike the opinion of the production team, the cost being incurred is not reasonable. *Competitors have a more cost efficient production process* that is yielding them profits even at lower sale prices. Therefore, production personnel have to undertake study of more recent advancements in the production process that the new entrants are able to implement. Such a study would include **value analysis** and **value engineering practices**. Study of the input-output yield, which is currently at 50% may result in same savings through streamlining production activities. Similarly, the production can revisit the product mix. If cheaper recyclable paper can be used to in more quantity to produce the same quality of cardboard sheets, significant savings in cost can be achieved. Efforts can also be taken by the senior management to identify areas that can have a favourable impact on cost. For example, upgrading facilities in the production line or storage areas could lead to cost savings.

- (v) **Assessment of profitability given certain parameters that can be implemented by the company.**

Given the implementation of parameters in requirement (v) of the problem, the financials for the company can be as follows:

Particulars	₹
Raw material cost (refer note 1 below)	40,941
Add: Operating cost (corrugator machine)	6,000
Add: Printing costs	5,000
Add: Other costs	20,000
Current manufacturing cost (per ton)	71,941
Add: Shipping of goods to the warehouse	4,000
Add: Warehouse maintenance expense	25,000
Total cost of operations (per ton)	1,00,941
Add: Required margin	5,000
Sales price per ton of output	1,05,941

Note 1: Material Cost (with increase in usage of recyclable material in product mix)

Material	Product Mix	Market price per ton (₹)	Procurement Price per ton of Input (₹)
Kraft paper	55%	51,000	28,050
Recyclable paper	45%	15,000	6,750
Total procurement price per ton of raw material			34,800

Change in the product mix, to include cheaper recyclable paper, without compromising on quality has reduced procurement cost from ₹44,000 to ₹34,800 per ton of raw material. Since recyclable paper component increased substantially, the company used its bargaining power with its suppliers to get a better rate. This is mildly offset by an increase in the rate for kraft paper. Yet, the savings are substantial.

In addition, it is given in the problem that due to value analysis and re-engineering, the yield has improved from 50% to 85%. Therefore, instead of 2 tons of input only 1.17647..... ton of input is required (1 ton output / 85%). Consequently, the raw material cost has reduced from ₹88,000 per ton of output to just ₹40,941 per ton of output (1.17647... tons of raw material × ₹34,800 per ton).

Note 2: Shipping cost to warehouse improved through the usage of better transportation facilities.

Note 3: Operational cost of warehouse has reduced through use of better technology and optimization of space. Cost savings are ₹5,000 per ton of output.

Conclusion: If PX-2 is able to implement these parameters, it can easily turnaround and become profitable. The output can be priced at ₹1,05,941 per ton in order to get a profit of ₹5,000 per ton. This is lower than it nearest competitors offering of ₹1,10,000 per ton. Hence not only can PX-2 become profitable, it can also regain, if not expand its market share.

(vi) **How has implementation of recommendations from the target costing study made PX-2 more environmentally responsible?**

PX-2 has become more environmentally responsible by through the following measures:

- Improving the product input – output yield from 50% to 85% has reduced wastage of raw material. The quantum of Kraft paper/recyclable paper needed for production has reduced from 2 tons to 1.17647..... tons. Since paper is a product made from trees, it contributes towards reduction of cutting down trees / deforestation.
- Changing the product mix to include more paper that is recyclable contributes towards better utilization of scrap. Otherwise, such scarp discarded in landfills becomes unusable. Landfills require huge land resources, since waste has to be buried. Hence, better utility of recyclable products protects the environment, places lesser pressure on landfill resources and at the same time reduces cost of operations for the company. By changing the product mix, PX-2 has substantially reduced raw material cost from ₹88,000 to ₹40,941 per ton, a **50% saving!**
- Use of efficient transportation facilities reduces fuel emissions. This reduces the pressure for fuel that is derived from natural resources.
- Optimization of storage space conserves energy required to operate the warehouse. Again, this reduces pressure on resources like land and electricity.

These are areas where implementation of target costing study made PX-2 more environmentally responsible.

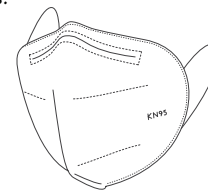
Question 2

About Problem	Target Verb/ (s)
Competitive Advantage, TOC, COQ	Advise

Gupta Surgical Products Limited (GSPL) is a renowned company for the manufacturing of a wide range of affordable surgical products. GSPL is promoted by Dr. Pooja Gupta who is a professor of medicine. GSPL is only privilege surgical equipment company which has its chain of own exclusive stores, which are selling products of GSPL, apart from a tie-up with the medical and chemist shops across the nation for the sale of their products. Although GSPL being an early mover of the industry was established around 25 years back when hardly two or three players exist in the market, but the growth phase of the industry is still continuing. Both the top and bottom line has an increasing trend, but the growth rate of the bottom line is relatively less than the rate in case of the top line, the possible reason is increasing competition. This results in the high cost of advertisement and marketing to keep market share intact. GSPL thinking to enhance the capacity of its plant and other facilities, but availability of fund is a critical issue; since the contraction in margin rate is witnessed for the last couple of years due to stiff competition, despite an increase in absolute amount; GSPL is not ready to commit incremental financial charge on an account of enhanced financial leverage, due to additional borrowing. Hence, GSPL fund their requirements internally.

In order to response proactively to the unfortunate possibility of wide-spread of Novel Corona Virus (COVID-19) in the country, the ministry of public health and welfare appeals all the surgical product manufacturers to scale-up and speed-up the production of surgical products which are useful for protection from contamination and useful for medical professionals.

GSPL is the oldest manufacturer of surgical gloves and face masks. GSPL is manufacturing only KN95 virus protection face mask (KN95) with particulate filtration efficiency more than 95%, which is approved by the regulator and ISO certified. KN-95 masks also recommended by WHO as standard equipment for safeguard. GSPL decided to charge the price of ₹90 for KN95 which is on the lower side to average price charged by other competitors ranging between ₹100-105. The cheaper face masks (blue colour, 3 layers at ₹5-10) are also available for the customer but they are not with the feature which KN95 provides.



Marketing division used to highlight the following features of KN-95 produced by GSPL, but these features more or less similar to competitor's product –

- Flat fold design for easy storage.
- Excellent filtration performance (clinically tested that filtration efficiency is more than 95%).
- Made of high quality thick 5-layer material.
- With exhalation valve.
- Washable (every mask manufacturer in the market claims this feature, but fiber significantly fell weak after wash which deteriorates efficiency. KN-95 has clinically proven result in its favour that even after a wash, if dried in sunlight for 5 minutes it will be resorted to using with the same efficiency as of new mask).
- With adjustable nose clip & self-elasticated ear loops.

With passage of time, condition worsen than expected, hence government relies upon the import of surgical equipment, but COVID-19 related conditions within such countries (from where surgical equipment including masks are imported) also turns unfavourable hence they

impose a temporary ban on the export of surgical equipment including mask. The government again urges domestic surgical equipment manufacturing companies to produce more and more such equipment. In order to motivate these manufacturers, the Ministry of finance came-up with schemes of easy credit, credit without guarantee, interest subvention and moratorium, and exemption from statutory contribution and deferment of duties, and taxes. The government is promoting the use of a home-made mask too.

Dr. Angel Gupta who is CEO of GSPL called a meeting of division heads, including 'Face Mask Division (FMD)' to look into opportunities emerging out of the present PESTLE scenario, and what GSPL can do to seize them with the purpose of enlisting core-competencies require and currently possessed. FMD is equipped with the latest technology and skilled staff who manufacture the KN-95 mask.

In such a meeting division head of FMD proudly mention that currently, they are producing one lac masks on monthly basis. He mentioned it is needless to say, we can sale even if produce more than this. He also briefs both the processes performed by FMD which are –

Cutting and spun bonding - Inner and outer fiber layers are cut-down and spun bonding using nozzles blowing melted threads of a thermoplastic polymer (polypropylene) to layer threads between 15-35 micrometres, which build up into cloth performed.

Stitching and finishing - The outer and inner fiber layers are bonded with output of spun bonding process using thermal techniques and then nose clip welded using mechanical techniques.

He also furnished the below-mentioned information pertaining to current operation aspects of these two processes –

Particulars	Cutting and spun bonding	Stitching and finishing
Monthly Capacity (in units)	1,15,000	1,00,000
Material Cost Per Unit (in ₹)	40	-
Other Operating Cost (in ₹)	10,00,000	6,00,000

FMD follows throughput accounting, hence material cost incurred during cutting and spun bonding operation is the only variable cost.

CEO wish to scale-up the level of capacity and production. She collected a bunch of ideas from division heads and the innovation team. She is from a medical background hence prior to furnishing a proposal to the board; She decided to check validity and viability with help of expert opinion/advice on the following available options–

1. Installing a machine costing ₹2 lacs, which will auto-cut the fiber sheet into requisite space, it will enhance the monthly capacity of cutting and spun bonding by 10% to the current level.
2. An automatic thermal bonding machine can be used which is expected to enhance the monthly capacity of stitching and finishing operation by 20,000 units. Such a machine is available as a monthly lease rental of ₹6 lacs.
3. An outsourcing agency offer to perform the cutting and spun bonding at a rate of ₹6 per unit if the order size is less than 10,000 units, and at a rate of ₹5 per unit of the order size is above 10,000 units. The maximum monthly order which such agency can serve is 20,000 units
4. The same outsourcing agency also offers to perform stitching and finishing process but with a maximum limit of 12,000 units during months period. For this, they will charge a uniform rate of ₹15 per unit.

In the same meeting the Quality Head mentioned that 1,000 units of KN-95 produced are found defective, which neither can be sold (even at subsidies rate) due to strict guidelines by the regulator nor can be reworked/ reprocessed. CEO is curious to know the loss if a defect is discovered at end of the cutting and spun bonding process/ at end of the stitching and finishing process.

Required

You are chief management accountant of GSPL. CEO asks you to draft a report addressing her with ADVISE on–

- (i) Assessment of opportunities available for GSPL (considering its current strategic position), while countering the related threats.
- (ii) Core competencies, which GSPL possess and can be exploits as Critical Success Factors to gain competitive advantage.
- (iii) Viability of each option available with her based upon ideas from division heads and innovation team. Consider each option an independent scenario from others and presume defect is identified at end of the cutting and spun bonding process.
- (iv) The cost of poor quality in both the possible cases.

The supporting calculations shall be shown at relevant places in report itself.

Solution

Report



Addressed to;
Office of CEO,
Gupta Surgical Products Limited (GSPL).
Dated – 04th Jan 2023

Report to assist management decisions of strategic importance regarding cost, pertaining to GSPL and FMD (in light of dynamics of the business environment emerging due to outbreak of COVID-19)

(i) Opportunities and related threats

In order to assess the strategic position, one among the major analytical tools is SWOT analysis. Strengths and weaknesses are internally generated, whereas opportunities and threats are emerging from the business environment external to the business boundary. Opportunities and threats are systemic in nature, usually uncontrollable, but can be responded. The length of opportunities and threats depends upon an event (continuing or once-in-while) and series of activities trailing to those events. The outbreak of COVID-19 is also one such event which impact the GSPL significantly because of the nature of business.

Enhanced market demand without the extra cost of advertisement – GSPL is a growing company, but completion too. Amidst the stiff competition, GSPL can see out-break of COVID-19 as an opportunity to sell more and more products. No doubt competitors will try hard to capture the significant share of enhanced market, but GSPL has the advantage of **cost leadership** which make their product affordable in the strategic segment in which they deal (KN-95, if we talk about mask specifically).

One can say enhanced demand is not permanent and it possesses severe threat, but see the option 2, 3, and 4 available, they all are such a nature where not capital cost involved. Machines are taken on lease or task is outsourced (no doubt length of lease and out-source agreement need to be decided carefully).

Another the threat which can be a highlight that the Government themselves is promoting the use of home-made mask too. KN-95 mask is approved by the regulator, ISO certified and recommended by WHO, whereas such a home-made mask obviously not.

Another threat, which can be considered that cheaper masks are also available despite that do not fall in segment (KN-95) in which GSPL deals, still apart from the counter the argument stated in the above point; GSPL can build their market by advertising the feature of 'truly washable' which make KN-95 actually reusable, and it's clinically proved. The reusable nature makes it further cheaper.

It's important here to note the cost leadership is also limited to relevant strategic segment not necessary to the entire market.

Easy availability of credit – GSPL is already considering the enhancement of capacity but finding it difficult due to the adverse effect of borrowing on financial leverage. Announcement from the ministry of finance, regarding schemes of easy credit, credit without guarantee, interest subvention and moratorium, exemption from statutory contribution, and deferment of duties and taxes for surgical equipment manufacturer are opportunities and well in time because the problem of reducing margin can also be addressed while enhancing the capacity without any adverse leverage effect. It is important to consider the length and eligibility criteria of these benefits.

- (ii) **Core competencies as Critical Success Factors** – Core Competency is a unique proposition which help firm to stand ahead in the industry by serving value to its customers. Core Competency leads to either **cost leadership or product differentiation**, which is the primary source for a firm to gain **competitive advantage**.

The following are the core competencies which may help the GSPL to gain the **cost leadership position** (to cut down cost where possible, because GSPL is charging ₹90 which is on the lower side the rest of the competitors price which ranges between ₹100 to 105) to attain competitive advantage (enhanced market share).

- **Latest technology** – Division head of FMD said in the meeting itself the FMD (concerned division here) is equipped with the latest technology in order to manufacture the KN-95 mask.
- **Knowledge** – Knowledge is a key resource. Being the initial players who start manufacturing of surgical equipment, GSPL must have a wide knowledge of the industry. Being the oldest manufacturer of KN-95, the mask also possesses certain knowledge about products which capable of putting them ahead of others.
- **Well established marketing network and wider reach** – GSPL is only privilege surgical equipment company which has its chain of own exclusive stores, which are selling products of GSPL; apart from a tie-up with the medical and chemist shops across the nation for sale of their products.
- **Professional management, who know the products well** – Be it promoter or current CEO, being medical professionals are capable to understand the technical dimensions of the product, which place them in a better position to make correct choices/decision.
- **Skilled workforce** – Division head of FMD said in the meeting itself the FMD (concerned division here) is equipped with skilled staff which manufactures the KN-95 mask.
- **Clinically tested that it 'Truly Washable'** – The feature of being truly washable (that even after a wash, if dried in sunlight for 5 minutes it will be resorted to using with the same efficiency as of new mask) is clinically proven in the case of GSPL only.

Note – Availability of credit is not a core competency because this benefit is available to all surgical equipment manufacturers. Similarly recommended by WHO is also not a core competency because, this is plus to all KN-95 mask manufacturers. (External factors are systemic in nature).

- (iii) **Viability of options available** (based upon ideas from division heads and innovation team) – the available options can be classified into two categories, options 1 and 2 are related to **process re-engineering or automation**; while options 3 and 4 are related to **outsourcing**. 1 and 3 are related to cutting and spun bonding process, whereas 2 and 4 are related to stitching and finishing process.

In order to access the viability of each such option the concept of the **bottleneck (theory of constraints)** and **throughput contribution** is relevant. Currently, the monthly production and sale are one lac units against the monthly capacity of 1,15,000 units (1,13,850 units after considering defective units) in the cutting and spun bonding process and 1,00,000 units in the stitching and finishing process. Hence the stitching and finishing process is bottleneck and operational at maximum possible capacity.

Automation Related

Auto cutting of fiber sheet – The cutting and spun bonding the process is not bottleneck activity, thus has spare capacity of 13,850 units after excluding defective products, it's not making sense to automate the process to enhance capacity further. **Hence it not advised to install the machine.**

Note – If defective units are 1,000 against the current production of 1,00,000 units, then against the production of 1,15,000 units, the defective units will be 1,150. Which means units get through the cutting and spun bonding process are 1,13,850 (1,15,000-1,150).

Automatic thermal bonding machine – Since the stitching and finishing process is the bottleneck activity, and operational at full capacity, hence any option to enhance capacity for which demand is available in the market at price more than relevant cost to be incurred; must be accepted. Since there is net monetary benefit of ₹92,500 (see table below), hence taking **automatic thermal bonding machine on lease is highly advisable.**

Statement of Cost-Benefit

Particulars	₹
Incremental Revenue* × (13,850 @ ₹90)	12,46,500
Less: Incremental Cost (material cost)(13,850 @ ₹40)	5,54,000
Less: Monthly Rental of Machine	6,00,000
Net Benefit	92,500

*Presuming additional sale will take place at the same price.

Since the capacity of the cutting and spun bonding process is limited to 1,13,850 units (after considering defects), hence enhancing the capacity of stitching and finishing process beyond such 1,13,850 units is not worth. So, the machine will result in only 13,850 additional unit, if cutting and spun bonding process, hold status quo.

Outsourcing

Cutting and spun bonding process – The cutting and spun bonding process is not a bottleneck activity, thus already has spare capacity of 13,850 units, it's not making sense to outsource some of the unit to enhance to capacity further. Given become irrelevant in case. **Hence it not advised to outsource.**

Stitching and finishing process – Since the stitching and finishing process is the bottleneck activity, and currently operating at full capacity, hence any option to enhance capacity for which demand is available in the market at a price more than the relevant cost to be incurred; must be accepted. Since there is net monetary benefit of ₹4,20,000 (see table below), hence **outsourcing of 12,000 units for the stitching and finishing process is highly advisable.** Non-monetary implication of outsourcing can be considered.

Statement of Cost-Benefit

Particulars	₹
Incremental Revenue* (12,000 @ ₹90)	10,80,000
Less: Incremental Cost (material cost) (12,000 @ ₹40)	4,80,000
Less: Cost pertaining to outsourcing (12,000 @ ₹15)	1,80,000
Net Benefits	4,20,000

*Presuming additional sale will take place at the same price.

- (iv) **Cost of poor quality** – The cost of poor quality due to **non-conformance to quality**. This includes the cost of internal and external failures. The **defect which can't be repaired and sold at a reduced price is known as scrap** and loss due to scrap covered under internal failure cost.

If the defect is discovered at the end of cutting and spun bonding process

Against the 1,000 units of KN-95, which found defective at end of cutting and spun bonding process, material required to produce another 1,000 units of KN-95 shall be introduced to the cutting and spun bonding process; because cutting and spun bonding process has a spare capacity of 15,000 units beyond the

current level of production (Cutting and spun bonding process has a capacity of 1,15,000 units against the current production of 1,00,000). Hence additional 1,000 units can be processed but this cause cost equal to material cost (the only variable cost).

Hence in this way amount of loss will be ₹40,000/- i.e., (1,000 units @ ₹40 each)

If the defect is discovered at the end of stitching and finishing process.

The 1,000 units of KN-95, which found defective at end of the stitching and finishing process, will result in loss of revenue (throughput contribution and cost of material); because the stitching and finishing process is a bottleneck activity, which currently operational at maximum capacity. Since only 1,00,000 units on

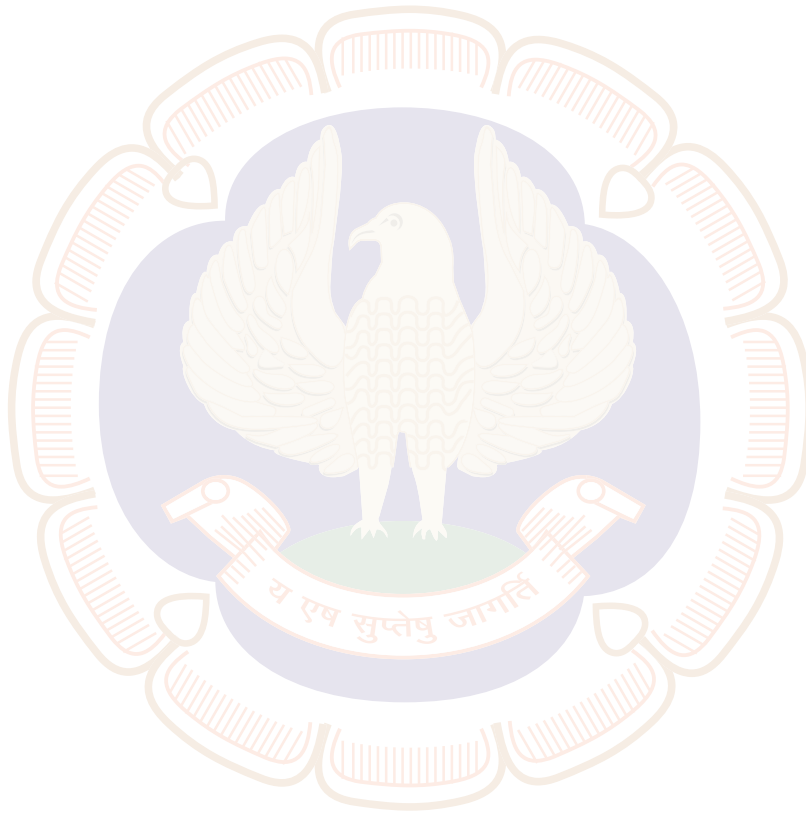
monthly basis can be processed in stitching and finishing process at maximum, hence identification of defective (causing scrap, because non-repairable and non capable of being sold at a reduced price) 1,000 units will result in only 99,000 units of KN-95 available for sale. Hence, the amount of loss will be ₹90,000/- i.e. (1,000 units @ ₹90 each (since cost of material (40) and throughput contribution (50) already included in this 90 hence become irrelevant individually).

Further details can be tabled on a requisition basis.

Closure of Report

Chief Management Accountant,
Gupta Surgical Products Limited

SARANSH





सरानश

Last Mile Referencer for

STRATEGIC COST MANAGEMENT AND PERFORMANCE EVALUATION



**The Institute of Chartered
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