FINAL

Paper 16

Strategic Cost Management

Study Notes

SYLLABUS 2022

The Institute of Cost Accountants of India

CMA Bhawan, 12, Sudder Street, Kolkata - 700 016

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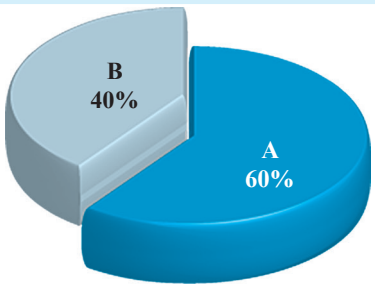
PAPER 16 : STRATEGIC COST MANAGEMENT

Syllabus Structure:

The syllabus comprises the following topics and study weightage:

Module No.	Module Description	Weight
	Section A: Strategic Cost Management for Decision Making	**60%**
1	Introduction to Strategic Cost Management	**5%**
2	Quality Cost Management	**5%**
3	Decision Making Techniques	**25%**
4	Activity Based Management and Just in Time (JIT)	**10%**
5	Evaluating Performance	**15%**
	Section B:Quantitative Techniques in Decision Making	**40%**
6	Linear Programming	**15%**
7	Transportation	
8	Assignment	
9	Game theory	**15%**
10	Simulation	
11	Network analysis – PERT, CPM	
12	Learning Curve	
13	Business Application of Maxima and Minima	**10%**
14	Business Forecasting Models – Time Series and Regression Analysis	
15	Introduction to Tools for Data Analytics	



Learning Environment – Paper 16

Subject Title	**STRATEGIC COST MANAGEMENT**
Subject Code	**SCM**
Paper No.	**16**
Course Description	The course provides comprehensive insights into the modern-day principles and practices of strategic cost management. It starts with an introduction to strategic cost management and moves on to cover manifold topics that encompass quality cost management, decision making techniques, activity-based management & JIT and evaluating performance. It provides all-inclusive knowledge about the noteworthyentrepreneurial practices through illustrative examples and case studies.The course lays special emphasis on conceptual clarity with a view to facilitate effective application of the handy tools & techniques of cost management acrossthe contemporary enterprises spanning over multiple sectors of economy including agriculture.
CMA Course Learning Objectives (CMLOs)	1. Interpret and appreciate emerging national and global concerns affecting organizations and be in a state of readiness for business management. a. Identify emerging national and global forces responsible for enhanced/varied business challenges. b. Assess how far these forces pose threats to the status-quo and creating new opportunities. c. Find out ways and means to convert challenges into opportunities 2. Acquire skill sets for critical thinking, analyses and evaluations, comprehension, syntheses, and applications for optimization of sustainable goals. a. Be equipped with the appropriate tools for analyses of business risks and hurdles. b. Learn to apply tools and systems for evaluation of decision alternatives with a 360-degree approach. c. Develop solutions through critical thinking to optimize sustainable goals. 3. Develop an understanding of strategic, financial, cost and risk-enabled performance management in a dynamic business environment. a. Study the impacts of dynamic business environment on existing business strategies. b. Learn to adopt, adapt and innovate financial, cost and operating strategies to cope up with the dynamic business environment. c. Come up with strategies and tactics that create sustainable competitive advantages. 4. Learn to design the optimal approach for management of legal, institutional, regulatory and ESG frameworks, stakeholders' dynamics; monitoring, control, and reporting with application-oriented knowledge. a. Develop an understanding of the legal, institutional and regulatory and ESG frameworks within which a firm operates. b. Learn to articulate optimal responses to the changes in the above frameworks. c. Appreciate stakeholders' dynamics and expectations, and develop appropriate reporting mechanisms to address their concerns. 5. Prepare to adopt an integrated cross functional approach for decision management and execution with cost leadership, optimized value creations and deliveries. a. Acquire knowledge of cross functional tools for decision management.

	b. Take an industry specific approach towards cost optimization, and control to achieve sustainable cost leadership. c. Attain exclusive knowledge of data science and engineering to analyze and create value.
Subject Learning Objectives [SLOB(s)]	1. To guide students tobe able to identify major contemporary issues that have emerged and doctrines and conventions of strategic cost management which may be applied across enterprises spanning over multiple sectors of economy. (CMLO 1a, b) 2. To enable understandingof the nature of strategic competitiveness and develop abilities to analyse thecompetitive operational environment facing an enterprise; assess attractiveness of the industry and isolate potentialsources of competitive advantages and disadvantages. (CMLO 2a, b) 3. To obtain in-depth knowledge to develop business level cost management strategies by defining the type of advantages sought and thescope of operationsandactivities required to deliver the chosen strategy. (CMLO 2c) 4. To develop application-oriented knowledge to assess the likely sustainability of the entrepreneurial strategiesand competitive positions. (CMLO 4b) 5. To equip oneself with application-oriented knowledge of various decision-making techniques for strategic choices across enterprises.(CMLO 5b,c) 6. To equip oneself with application-oriented knowledge of various quantitative techniques to facilitate management decisions for optimisation through resource allocation, managing competition, work scheduling and managing cost overrun, demand estimation, production and cost analysis etc. (CMLO 2b, 5a, 5b, 5c)
Subject Learning Outcome [SLOC(s)] and Application Skill [APS]	**SLOC(s)** 1. Students will acquire application-orientedknowledgeto analyse and evaluate the strategic cost data in a comprehensive manner to facilitate achievement of sustainable competitive advantages. 2. Students will acquire appropriate capabilitiesto highlightthe business outcome indictors to the decision makers. **APS** 1. Students will develop skills to evaluate the performance of an entity in a comprehensive mannerand formulate a strategic link to the decision-making process. 2. Students will develop necessary skills to advise the entrepreneurs on ‘what if’ and ‘how to’ tasks.

Module wise Mapping of SLOB(s)			
Module No.	**Topics**	**Additional Resources (Research articles, books, case studies, blogs)**	**SLOB Mapped**
A. Strategic Cost Management for Decision Making			
1	**Introduction to Strategic Cost Management**	Issues in Supply Chain Management– Lambert & Cooper https://www.sciencedirect.com/science/article/abs/pii/S0019850199001133	To guide students to be able to identify major contemporary issues that have emerged and doctrines and conventions of strategic cost management which may be applied across enterprises spanning over multiple sectors of economy.
2	**Quality Cost Management**	Quality cost models and their application: A review– Hwang & Aspinwall https://www.tandfonline.com/doi/abs/10.1080/09544129650034837?journalCode=ctqm19	To obtain in-depth knowledge to develop business level cost management strategies by defining the type of advantages sought and the scope of operations and activities required to deliver the chosen strategy.
3	**Decision Making Techniques**	Product life cycle cost analysis: State of the art review – Asiedu & Gu https://www.tandfonline.com/doi/abs/10.1080/002075498193444	To equip oneself with application-oriented knowledge of various decision-making techniques for strategic choices across enterprises.
4	**Activity Based Management and Just in Time (JIT)**	A brief history of just-in-time – Aycock https://dl.acm.org/doi/abs/10.1145/857076.857077	To obtain in-depth knowledge to develop business level cost management strategies by defining the type of advantages sought and the scope of operations and activities required to deliver the chosen strategy.
5	**Evaluating Performance**	Standard Costing, Variance Analysis and Decision- Making–Berger https://okknf.smcebi.edu.pl/bmx670mvie62/19-felton-hills-ii/standard-costing-variance-analysis-and-decision--9783640955985.pdf	1. To enable understanding of the nature of strategic competitiveness and develop abilities to analyse the competitive operational environment facing an enterprise; assess attractiveness of the industry and isolate potential sources of competitive advantages and disadvantages.

Module wise Mapping of SLOB(s)			
Module No.	**Topics**	**Additional Resources (Research articles, books, case studies, blogs)**	**SLOB Mapped**
			2. To develop application-oriented knowledge to assess the likely sustainability of the entrepreneurial strategies and competitive positions.
B. Quantitative Techniques in Decision Making			
6	**Linear Programming**	Operations Research– J K Sharma, McMillan Publisher Operations Research – Kanti Swarup, P K Gupta, Manmohan Operations Research for Managerial Decision Making V.K. Kapoor, Sultanchand & Co. Problems & Solution in operations Research. V. K. Kapoor, Sultanchand & Co.	To equip oneself with application-oriented knowledge of various quantitative techniques to facilitate management decisions for optimisation through resource allocation, managing competition, work scheduling and managing cost overrun, demand estimation, production and cost analysis etc.
7	**Transportation**		
8	**Assignment**		
9	**Game Theory**		
10	**Simulation**		
11	**Network analysis – PERT, CPM**		
12	**Learning Curve**	The Learning Curve: Historical Review and Comprehensive Survey–Yelle https://onlinelibrary.wiley.com/doi/abs/10.1111/j.1540-5915.1979.tb00026.x	
13	**Business Application of Maxima and Minima**	Mathematics for Economists – B Mehta S Chand & Co. Modern Microeconomics–Koutsoyiannis Palgrave Macmillan Managerial Economics – Theory & Application M. L. Trivedi Tata Mcgraw Hill Publishing Co. Ltd	
14	**Business Forecasting Models – Time Series and Regression Analysis**	Business Forecasting – Hanke & Wichern, Pearson Publications	
15	**Introduction of Data Analytical Tools**	Financial management and forecasting using business intelligence and big data analytic tools –S Mishra https://www.worldscientific.com/doi/abs/10.1142/S2424786318500111	

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SECTION A

Strategic Cost Management For Decision Making

Introduction to Strategic Cost Management

1

This Module Includes

1.1 Concepts of Strategic Cost Management in different stages of Value Chain

1.2 Cost Control and Cost Reduction–Contemporary Techniques

1.3 Value Analysis and Value Engineering -Business Process Re-engineering

1.4 Supply Chain Management

Introduction to Strategic Cost Management

SLOB Mapped against the Module

1. **Understanding the concepts of Strategic Cost Management in different stages of Value Chain.**
2. **In-depth knowledge on contemporary techniques of Cost Reduction and Cost Control.**
3. **Insights into Value Chain Analysis and Supply Chain Management**

Module Learning Objectives:

After studying this module, the students will be able to –

- Understanding the concepts of Strategic Cost Management in different stages of Value Chain.
- In-depth knowledge on contemporary techniques of Cost Reduction and Cost Control.
- Insights into Value Chain Analysis and Supply Chain Management

Concepts of Strategic Cost Management in different stages of Value Chain

1.1

A strategy is an integrated set of choices for actions which positions a firm in an industry so as to generate superior financial returns over the long run. Here 'integrated set of choices' create the environment internal to the firm, whereas 'industry' provides the external environment and the 'long run' replicates the competitive dynamics.

Strategic Cost Management (SCM)

A firm's strategy aims to match its own capabilities with the available opportunities. In other words, strategy defines as to how an organisation creates value for its customers while distinguishing itself from its competitors. In general, businesses follow one of two broad strategies, i.e.., either Cost Leadership or Product Differentiation. Low-Cost-Carriers (Airlines) are known to provide quality products or services at low prices by toeing the cost leadership strategy. Electronic giants such as Apple are known to garner premium prices by following product differentiation strategy.

Strategic Cost Management (SCM) refers to the cost management that specifically focuses on strategic issues such as:

(a) the company's cost, productivity, or efficiency advantage relative to competitors or

(b) the premium prices a company can charge over its costs for distinctive product or service features.

Strategic Cost Management, thus, plays a vital role in formulating beneficial strategies relevant for the firm by providing information about the sources of competitive advantage.

Strategic Cost Management (SCM) may be stated as the process of identifying, accumulating, measuring, analysing, interpreting, and reporting cost information useful to both internal and external groups concerned with the way in which an organisation utilises its resources to achieve its strategic objectives. As such, Strategic cost management needs to be perceived as the application of cost management techniques with a view to enhance the strategic posture of a firm and reduce the costs. It is a process of combining the decision-making structure with the cost information, in order to reinforce the business strategy as a whole. It measures and manages costs to align the same with the company's business strategy.

Strategic Cost Management may be divided into four stages, viz.

(i) Formulation of Strategies

(ii) Communication of Strategies across the entire organisation.

(iii) Implementation of the tactics to execute the strategies.

(iv) Controlling the activities to track the achievement.

In Strategic Cost Management (SCM), primary importance is given to constant improvement in the product or service to deliver better quality to its target customers. SCM, therefore, encompasses every facet of the value chain of an organisation.

The need for SCM may be summarised as:

(i) It is an updated form of cost analysis, in which the strategic elements are clearer and more formal.

(ii) It helps in identifying the cost relationship between value chain activities and its process of management to gain competitive advantage.

(iii) It is used to analyse cost information with a view to develop relevant tactics to garner a sustainable competitive advantage.

(iv) It provides a better understanding of the overall cost structure in the quest for gaining a sustainable competitive advantage.

(v) It uses cost information specifically to govern the strategic management process – formulation, communication, implementation and control.

SCM has three important pillars, viz., strategic positioning, cost driver analysis and value chain analysis.

1. **Strategic Positioning Analysis:** It determines the company's comparative position in the industry in terms of performance.
2. **Cost Driver Analysis:** Cost is driven by different interrelated factors. In strategic cost management, the cost driver is divided into two categories, i.e.., structural cost drivers and executional cost drivers. It examines, measures and explains the financial impact of the cost driver concerned with the activity.
3. **Value Chain Analysis (VCA):** VCA is the process in which a firm recognizes and analyses, all the activities and functions that contribute to the final product. VCA depicts the manner in which customer-value accrues along the activity chain that results in the final product or service.

In a nutshell, strategic cost management is not just about controlling the costs but also using the information for strategic decision making. The fundamental objective of strategic cost management is to gain a sustainable competitive advantage by way of cost leadership and product differentiation.

Value Chain

Developed by Michael Porter in 1985 and used throughout the world, the value chain is a powerful tool for disaggregating a company into its strategically relevant activities in order to focus on the sources of competitive advantage, that is, the specific activities that result in lower costs or higher prices.

A company's value chain is typically part of a larger value system that includes companies either upstream (suppliers) or downstream (distribution channels), or both. This perspective about how value is created forces managers to consider and see each activity not just as a cost, but as a step that has to add some increment of value to the finished product or service.

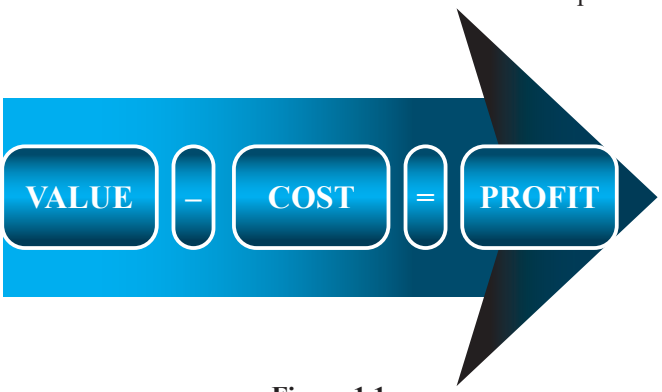

Figure 1.1

Manufacturing companies create value by acquiring raw materials and using them to produce something useful. Retailers bring together a range

of products and present them in a way that is convenient to customers, sometimes supported by services such as trial rooms or personal shopper advice and insurance companies offer policies to customers that are underwritten by larger re-insurance policies. Here, they are packaging these larger policies in a customer-friendly way, and distributing them to a mass audience.

In other words, the value that is created and captured by a company as reduced by the costs incurred is the profit margin. Expressed as a formula the equation would read as:

Value Created and Captured – Cost of Creating that Value = Profit Margin

The more value an organisation creates, the more profitable it is likely to be. As more and more value is provided to the customers, competitive advantage creeps in. Understanding how a company creates value, and looking for ways to add more value, are critical elements in developing a competitive strategy.

Thus, the value chain is a set of activities that an organisation carries out to create value for its customers. Porter proposed a general-purpose value chain that companies can use to examine all of their activities, and see how they are connected. The way in which value chain activities are performed determines costs and affects profits.

Elements in Porter's Value Chain

Rather than looking at departments or accounting cost types, Porter's Value Chain focuses on systems, and how inputs are changed into the outputs purchased by consumers. Using this viewpoint, Porter described a chain of activities common to all businesses, and he divided them into primary and support activities, as shown below.

Primary Activities: Primary activities relate directly to the physical creation, sale, maintenance and support of a product or service. They consist of the following:

- **Inbound Logistics:** These are all the processes related to receiving, storing, and distributing the inputs internally. The supplier relationships are a key factor in creating value here.
- **Operations:** These are the transformation activities that change inputs into outputs that are sold to customers. Here, operational systems create value.
- **Outbound Logistics:** These activities deliver the product or service to the customer. These are the things like collection, storage, and distributing the outputs. They may be internal or external to the organisation.
- **Marketing and Sales:** These are the processes that are used to persuade clients to purchase from the firm instead of its competitors. The benefits being offered, and how well they are communicated to the customers, are sources of value here.
- **Service:** These are the activities related to maintaining the value of the product or service to customers, once it has been purchased.

Support Activities: Support activities support the primary functions stated above. Each support, or secondary, activity can play a role in each primary activity. For example, procurement supports operations with certain activities, but it also supports marketing and sales with other activities.

- **Procurement (Purchasing):** This is what the organisation does to get the resources it needs to operate. This includes finding vendors and negotiating best prices.
- **Human Resource Management:** This is how well a company recruits, hires, trains, motivates, rewards, and retains its workers. People are a significant source of value, so businesses can create a clear advantage with good HR practices.
- **Technological Development:** These activities relate to managing and processing information, as well as protecting a company's knowledge base. Minimizing information technology costs, staying current with

technological advances, and maintaining technical excellence are sources of value creation.

- **Infrastructure:** These are a company's support systems, and the functions that allow it to maintain daily operations. Accounting, legal, administrative, and general management are examples of necessary infrastructure that businesses can use to their advantage.

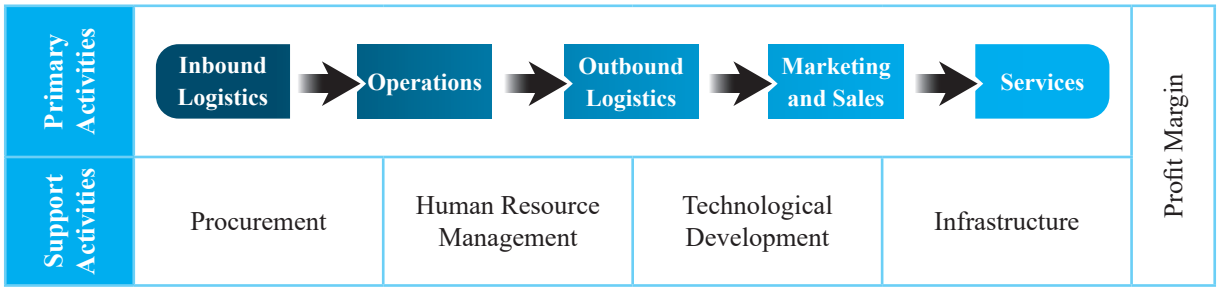

Figure 1.2

Companies use these primary and support activities as "building blocks" to create a valuable product or service.

Value chain analysis (VCA)

Value chain analysis (VCA) is a process where a firm identifies its primary and support activities that add value to its final product and then analyse these activities to reduce costs or increase differentiation. Value chain analysis relies on the basic economic principle of advantage - companies are best served by operating in sectors where they have a relative productive advantage compared to their competitors. Simultaneously, companies should ask themselves where they can deliver the best value to their customers.

Conducting a value chain analysis prompts a firm to consider how each step adds or subtracts value from its final product or service. This, in turn, can help it realize some form of competitive advantage, such as:

- Cost reduction, by making each activity in the value chain more efficient and, therefore, less expensive
- Product differentiation, by investing more time and resources into activities like research and development, design, or marketing that can help the product stand out

Typically, increasing the performance of one of the four secondary activities can benefit at least one of the primary activities.

Five Steps to developing a value chain analysis (Illustrative)

Step 1: Identify all value chain activities

Identify each activity that plays a part in creating your company's finished product. For example, it is not enough to write down that you have a product design team. You need to dig deeper and ask:

How many designers are on that team?

How much time does each activity on that team require?

What raw materials are they using?

Once you've identified each primary activity in detail, you'll need to do the same for each support activity. This step will take a considerable amount of time and, if possible, shouldn't be a one-person task. Instead, encourage cross-collaboration internally so each department can outline its logistics, operational costs and services.

Step 2: Calculate the cost of each activity

Remember to calculate cost drivers such as rent, utilities and staff. By having an accurate picture of every single cost (and what activities increase or decrease costs), it's easier to see how much revenue you're actually generating. Once each activity has been mapped out, you can delineate which parts of your value chain are costing your business the most money. According to the Financial Times, a value chain analysis on a £2.50 cup of coffee revealed that only 1penny/pence goes to the actual coffee grower. The rest of the £2.49 is made up of additional supplies like: Milk, Stirrers, Transport, Rent, Staff and Taxes. Using this value chain analysis example, we learn that the most critical component (coffee) is one of the least expensive parts of the cost breakdown. Rent and staff are the most expensive. Having this information, the company can choose their next steps wisely.

If they want to reduce rent costs, they can attempt to negotiate their contract. Failing that, they can relocate to a less expensive location. While that may draw less foot traffic, the low-cost option could potentially boost their profit margin. If they want to reduce staff costs, they could evaluate how many people are scheduled per shift and perhaps cut staff hours during less busy times. Alternatively, if they cannot streamline their process or lower costs in any way, they could try to boost their perceived value. They could do this by creating and promoting unique items, or sourcing new ingredients (at a similar cost) that increase sales or engagement.

It's easy to see why detailed, accurate calculations can make or break the effectiveness of your value chain.

Step 3: Look at what your customers perceive as value

Know that customers tie value directly to a product's price tag, in other words, perception greatly impacts product margins. Research shows that although branded and non-branded painkillers have the exact same health outcome, the former is better perceived by consumers. Because customers believe it is more valuable to their health, they're willing to pay more for the brand name. To determine what your end customers perceive as valuable, you need to dig into their psychology. Collecting quantitative and qualitative data can help you identify statistical patterns in your customer's buying behaviour. Identifying these qualities will also help your sales representatives down the line with prospecting and qualifying ideal customers. Understanding why and how your customers make purchasing decisions boils down to understanding their intent and what they perceive as valuable.

As Rory Sutherland's TED Talk highlights, the same product can mean very different things to different people. He explains that when it comes to selling a product, there's no such thing as an objective value. Rather, the value that people place on products comes from factors such as societal influence and group-think. People often make decisions based on actions that their friends, family and close social groups take. For example, if people in your social circles start to buy noise-cancelling headphones to wear at work, you may begin to think of them as valuable, even if you didn't want to buy them before. Knowing what your customers, and their social circles, desire opens up the opportunity to market your product in a way that motivates them to buy it.

Step 4: Look at your competitors' value chains

The best way to determine value is through market analysis. Although it's unlikely you will have access to your competitors' infrastructure and operational breakdowns, you can use benchmarks as a starting point. This process is called competitive benchmarking. You can choose to use competitive benchmarking in one of three main ways:

(i) **Process benchmarking:** Comparing your process structure and operations against how your competitors carry out tasks.

(ii) **Strategic benchmarking:** Comparing your high-level business strategy to your competitors' to determine what emulates success.

(iii) **Performance benchmarking:** Comparing outcomes, such as revenue, organic traffic, social media performance, reviews and ratings and so on.

First, you need to determine your competitive benchmarking goals; then, you can conduct research, make a comparison and determine value. As SmartInsights' Dave Chaffey explains, you need a baseline to review the marketing effectiveness of competitors. For example, the sales and marketing value chain of online companies can be expansive. By breaking down the rough costs of your competitor's online sales and marketing efforts, you can calculate whether your spending is too high. McKinsey recommends using a competitor-insight loop to build insight into your competitors' strategic planning and decision-making processes.

The key to making this process successful is to tap into the latest data from a competitor's frontline workforce, such as a blog or shared database, and identify value gaps.

Step 5: Decide on a competitive advantage

At this stage, you will have a clear understanding of your internal costs, what changes you can make and how they stack up to your competitors. If you choose cost advantage, you need to find a way to optimize and cut the cost of primary and support activities in your value chain. You might choose to outsource talent, replace certain human activities with automation or look for cheaper delivery services or distribution channels. As more and more people start working remotely, you may even get rid of office space. Any cost cuts you make in the chain can lower the cost of your final product. The more you can push your product prices down, the larger your cost advantage will be compared to competitors.

If you choose competitive differentiation, you must capitalize on increasing the value perception of those products that your customers and end users are most willing to pay for. You can cater to your customers' most basic desires and needs by recognizing their pain points and repositioning your products as the ultimate solution.

For example, your sales team can highlight your product differentiation during the sales pitch or closing stage in the pipeline by:

- Mentioning the unique benefits your product has that your competitors' products don't
- Presenting a case study from a customer that reinforces your position and highlighting relevant data or ROI (Return on Investment)
- Listing other businesses in the prospect's industry that have used your product or service and had a positive experience

Example of Apple

When Steve Jobs began building Macs in the 80s in his garage, he wasn't doing it for customers — it was for himself. "We were the group of people who were going to judge whether it was great or not," he said in an interview years later. "We weren't going to go out and do market research." Just over a decade later, Jobs famously quipped: "People don't know what they want until you show it to them." These admissions give us a unique understanding of the mindset behind a very successful brand. While Jobs was insistent on making products that he loved, the company spent massive amounts of money on its internal creative processes — a support activity in their value chain. These investments were made possible because of tight control over the cost of Apple's primary activities such as operations, logistics and support. This is what Apple's value chain analysis tells us about how the company became so successful.

Apple's Primary Activities

1. **Inbound logistics:** Apple's supply chain is enormous. Its top 200 suppliers provide the company with

98% of procurement expenditures for materials, manufacturing and product assembly. To manage the sheer volume of suppliers and inbound logistics, they must run a tight supply chain management ship. As such, the suppliers are held to strict quality standards and to streamline this process, the company launched the Apple Procurement Program, which states:

"Our business environment is competitive and fast-paced. Our suppliers must understand this dynamic and be agile and flexible in responding to changing business conditions. Above all, Apple values innovation. We appreciate suppliers who truly understand and share in our challenges, and who help us find the best possible solutions."

Every year, the list of suppliers is revisited. Suppliers that meet Apple's standards and provide a more competitive product are added to the list to ensure optimization of their value chain.

2. **Operations:** Apple takes advantage of lower labour and raw material costs in Japan and China, overall manufacturing costs are also cut. Outsourcing helps them keep overall manufacturing costs low.
3. **Outbound logistics:** Apple's business model allows for products to be purchased online and from the company's stores. Because the company has hundreds of retail stores, it can capitalize on keeping any retail margins made through Apple sales. Brand name recognition also means that non-Apple outlets stock the products in large numbers. A Communications Of The ACM article estimates that Apple gives retailers a 25% wholesale discount. Using this estimate, Apple was left with a gross profit of $80 for the 30GB 5th Gen iPods sold through non-Apple outlets. For any sale made through Apple's online or customer-facing stores, they also pocketed a $45 retail margin.
4. **Marketing and sales:** Apple's marketing and sales efforts are identifiable for its design, quality and innovation. In 2015, the company boosted its marketing budget to $1.8 Billion, explaining that an "ongoing investment in marketing and advertising is critical to the development and sale of innovative products and technologies". Apple's approach to marketing and sales reflects its chosen competitive advantage: 'highlighting value'. As SeedX Inc Founder Jacqueline Basulto points out, Apple reflects its perceived value not only in the cost of its products but also in its advertising.
5. **Service:** Most products sold by Apple are initially covered by a 1-year warranty and 90 days of support from staff. Customers can book appointments for technical repairs or general product assistance. They also staff their stores with trained Apple technicians who offer guided, interacted demos to customers. Allowing store visitors to engage with products, in turn, helps encourage them to buy.

Apple's Support Activities

1. **Research and development:** Apple invests heavily in research and development. In 2019 alone, more than $16 billion was pumped into its R&D program to continue research into products that can maintain Apple's competitive advantage. The investment paid off: in 2020, the company released 28 new or refreshed products onto the market.
2. **Human Resource Management:** Apple was crowned the most admired company for HR in 2019, reflecting its reputation on hiring and paying well. The company is known for recruiting top candidates and even poaching talent from other companies to get the best people working for them.

Summing up, conducting a value chain analysis is one of the most powerful processes a business can undertake. The detail involved in the analysis can uncover where your company spends its money, how well your operations are working and how you can outmanoeuvre your competitors. In fact, without a detailed value chain analysis, it's impossible to see where you can lower costs and how to decide what competitive advantage will work best for your product. At the same time, a value chain analysis is invaluable in identifying wasteful activities in your product production. By sizing up your competitors and tightening up your development process, you can take steps to add value to your product and ultimately your bottom line.

Example of Pizza Hut

As another example, let's look at the value chain of Pizza Hut:

Primary activities

- **Inbound logistics:** This includes all of the sourcing activities to procure and standardize all of the produce, ingredients and materials to bake pizza's fast, consistently, and delicious – in house. They capitalize on economies of scale, and use massive global purchase orders to source the best prices on raw products for their restaurants.
- **Operations:** By targeting areas where there is an affinity for Italian food, Pizza Hut operates in a huge number of countries globally with a licensing model where stores are managed by a local franchise owner.
- **Outbound logistics:** There are two models that Pizza Hut capitalizes on, in store dining and their home delivery service.
- **Marketing and Sales:** There is a large investment in marketing to drive additional sales, and compete with the other fast-food chains.
- **Service:** The entire goal of Pizza Hut is to offer value to their customers in affordable and convenient pizza that everyone can enjoy.

Support activities

- **Infrastructure:** Again, this includes every other activity that is required to keep the stores in business, such as finance, legal, etc.
- **Human Resources:** To keep the costs down staff are typically junior, and unskilled.
- **Technological development:** The process they have created to have unskilled chefs cooking the pizza is their biggest asset. Breaking down the complicated method into simple steps that can be repeated again and again for consistently great pizza.
- **Procurement:** The purchasing and activities required to produce the pizza, the raw food, and all of the buildings, and equipment needed to cook and deliver the pizzas.

Based on these activities, Pizza Hut is leading the market in producing pizza that is both affordable, and can be delivered to your door in under 30 minutes (in most cities). This convenience is what sets them apart from many other competing options for meals, like going out to dinner or preparing a meal at home yourself, and they use a strong campaign and marketing focus to entice customers to use them over similar competitors in the fast-food delivery industry.

Doing a value chain analysis is a fantastic way of following a process to review all of the ways you can generate value for your customers. When you review all of these in detail, you'll find that you come across many different ways you can satisfy your customers even more. Very soon you be excelling in all the things that really matter to your customers. That's when you'll have real success!

Value Innovation

Value innovation is a process in which a company introduces new technologies or upgrades that are designed to achieve both product differentiation and low costs. The changes implemented through value innovation create new or improved elements for the product or service, but also result in cost savings by eliminating or reducing unnecessary aspects during the product lifecycle. Value innovation places equal emphasis on 'Value' as also 'Innovation'. Value innovation, thus, can improve on existing services and lowers the costs of that service for both the company and their customers.

Value innovation was first outlined in a 1997 article in Harvard Business Review by W. Chan Kim and Renée Mauborgne, who would later write the book Blue Ocean Strategy in 2005. Value innovation is a key principle of "blue ocean strategy," a business approach that focuses on creating new market spaces instead of fighting competitors existing market share. Instead of competing for market share, value innovation is designed to create new markets. The goal of value innovation is to create new demand and change the market enough to render the competition irrelevant in that market.

Red Ocean vs Blue Ocean Strategy

Red oceans are all the industries in existence today – the known market space, where industry boundaries are defined and companies try to outperform their rivals to grab a greater share of the existing market. Cutthroat competition turns the ocean bloody red. Hence, the term 'red' oceans.

Blue oceans denote all the industries not in existence today – the unknown market space, unexplored and untainted by competition. Like the 'blue' ocean, it is vast, deep and powerful –in terms of opportunity and profitable growth. The creation of blue ocean enables driving costs down while simultaneously pushing value up.

Fundamental differences between Red Ocean Strategy and Blue Ocean Strategy

In order to sustain themselves in the marketplace, red ocean strategists focus on building advantages over the competition, usually by assessing what competitors do and striving to do it better. Here, grabbing a bigger share of a finite market is seen as a zero-sum game in which one company's gain is achieved at another company's loss. They focus on dividing up the red ocean, where growth is increasingly limited. Such strategic thinking leads firms to divide industries into attractive and unattractive ones and to decide accordingly whether or not to enter.

Blue ocean strategists recognize that market boundaries exist only in managers' minds, and they do not let existing market structures limit their thinking. To them, extra demand is out there, largely untapped. The crux of the problem is how to create it. This, in turn, requires a shift of attention from supply to demand, from a focus on competing to a focus on creating innovative value to unlock new demand. This is achieved via the simultaneous pursuit of differentiation and low cost.

Under blue ocean strategy, there is scarcely an attractive or unattractive industry per se because the level of industry attractiveness can be altered through companies' conscientious efforts. As market structure is changed by breaking the value-cost trade-off, so are the rules of the game. Competition in the old game is therefore rendered irrelevant. By expanding the demand side of the economy new wealth is created. Such a strategy, therefore, allows firms to largely play a non–zero-sum game, with high pay-off possibilities.

The table below summarizes the distinct characteristics of competing in red oceans (Red Ocean Strategy) versus creating a blue ocean (Blue Ocean Strategy).

Red Ocean Strategy	Blue Ocean Strategy
Compete in existing market space	Create uncontested market space
Beat the competition	Make the competition irrelevant
Exploit existing demand	Create and capture new demand
Make the value-cost trade-off	Break the value-cost trade-off
Align the whole system of a firm's activities with its strategic choice of differentiation or low cost	Align the whole system of a firm's activities in pursuit of differentiation and low cost

Blue ocean strategies reflect an entrepreneur's dream to have an unexplored market allowing innovators to create and introduce new products that capture a large share of the market. A blue ocean shift means moving the business, the team and the organisation from cutthroat markets to wide-open new markets in a way that the team owns and drives the process. To successfully shift from red oceans of bloody competition to blue oceans of new market space depends on three key components: having the right perspective, a clear roadmap with market-creating tools, and building people's confidence at every level to drive and own the process.

Examples of Blue Ocean Strategies

A blue ocean is specific to time and place. Ford, Apple and Netflix may be quoted as examples of creating blue oceans by pursuing high product differentiation at a relatively low cost.

Ford Motor Co.: In 1908, Ford Motor Co. introduced the Model T as the car for the masses. It only came in one color and one model, but it was reliable, durable, and affordable. At the time, the automobile industry was still in its infancy with approximately 500 automakers producing custom-made cars that were more expensive and less reliable. Ford created a new manufacturing process for mass-production of standardized cars at a fraction of the price of its competitors. The Model T's market share jumped up from 9% in 1908 to 61% in 1921, officially replacing the horse-drawn carriage as the principal mode of transportation.

Apple Inc.: Apple Inc. found a blue ocean with its iTunes music download service. While billions of music files were being downloaded each month illegally, Apple created the first legal format for downloading music in 2003. It was easy to use, providing users with the ability to buy individual songs at a reasonable price. Apple won over millions of music listeners who had been pirating music by offering higher-quality sound along with search and navigation functions. Apple made iTunes a win-win-win for the music producers, music listeners, and Apple by creating a new stream of revenue from a new market while providing more convenient access to music.

Netflix: Netflix is a company that reinvented the entertainment industry in the 2000s. Rather than entering the competitive marketplace of video rental stores, Netflix created new models of entertainment; first by introducing mail-order video rentals, and later by pioneering the first streaming video platform paid for by user subscriptions. Following their success, many other companies have followed in Netflix's footsteps. As a result, any new company trying to launch a video subscription model will find itself facing a red ocean rather than a blue one.

Cost Control and Cost Reduction – Contemporary Techniques

1.2

Cost Control

'Cost Control' is defined as the regulation by executive action of the costs of operating an undertaking, particularly where such action is guided by cost accounting. Thus, cost control is the guidance and regulation through an executive action and this executive action is exercised in respect of all the expenses incurred in operating an undertaking. Cost control comprises all procedures and measures by which the cost of carrying out an activity is kept under check and aims at ensuring that costs do not go beyond the targeted level. Standard costing and budgetary control are the conventional techniques adopted for cost control.

Cost control is exercised through setting standards of targets and comparing actual performance therewith, with a view to identify the deviations from standard norms and taking corrective actions in order to ensure that future performance conforms to standard norms. In other words, it is a scientific management technique to contain the costs of doing business. Cost control is concerned with the ways and means of keeping the costs at a lower level, without affecting efficiency and effectiveness.

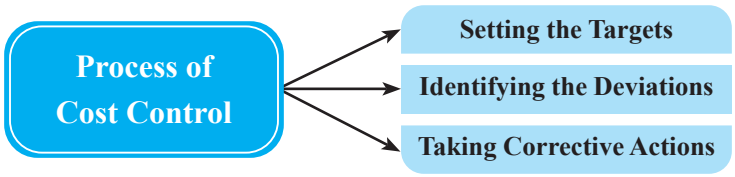

Figure 1.3

Cost control involves the following steps and covers the various facets of the management:

(a) Planning: First step in cost control is to establish plans/targets. The plan/target may be in the form of budgets, standards, estimates and even past actual may be expressed in physical as well as monetary terms. These plans/targets serve as yardsticks by which the planned objective can be assessed.

(b) Communication: The plan and the policy laid down by the management are made known to all those responsible for carrying them out. Communication is established in two directions; directives are issued by higher level of management to the lower level for compliance and the lower-level executives report performances to the higher level.

(c) Motivation: The plan is given effect to and performances starts. The performance is evaluated, costs are ascertained and information about results achieved are collected and reported. The fact that costs are being complied for measuring performances acts as a motivating force and makes individuals endeavour to better their performances.

(d) Appraisal and Reporting: The actual performance is compared with the predetermined plan and variances,

i.e.., deviations from the plan are analyzed as to their causes. The variances are reported to the proper level of management.

(e) Decision Making: The variances are reviewed and decisions taken. Corrective actions and remedial measures or revision of the target, as required, are taken.

Key points for exercising effective Cost Control

(i) Quantity and price standards should be set to, or be estimated for, each physical unit. The factors influencing variances should not be ignored (inadequate facilities, poor organisation and poor materials).

(ii) To make the standards realistic, all concerned should be associated in determining standard costs.

(iii) The data collected should be kept to a minimum, and proper collection and processing of cost control data are important.

(iv) The different variances, price, usage, mix and efficiency should be considered, whether they are relating to materials, labour or overheads.

(v) No amount of detailed analysis of the cost of variances can undo what has already been done; however, control measures should ensure that such mistakes are not repeated. The only way to prevent excess costs in practice is for the manager to take action before the event.

(vi) The essentials of effective cost control not only include realistic targets (based on work study data) but also flexible attitudes regarding the standards set.

It shall always be remembered that cost control implies deriving maximum benefits for the costs incurred. In other words, the objective of cost control is the performance of the same job at a lower cost or a better performance for the same cost.

Advantages of cost control

The advantages of cost control are mainly as follows:

(a) Achieving the expected return on capital employed by maximising or optimising profit.

(b) Increasing the productivity of the available resources.

(c) Delivering the product or service to the customers at a reasonable price.

(d) Continued employment and job opportunity for the workers

(e) Economic use of limited resources of production

(f) Increased credit worthiness

(g) Prosperity and economic stability of the industry

Cost Reduction

Cost reduction is defined as the real and permanent reduction in the unit costs of goods manufactured or services rendered without impairing their suitability for the use intended.

As will be seen from the definition, the reduction in costs should be real and permanent. Reductions due to windfalls, fortuities receipts, changes in government policy like reduction in taxes or duties, or due to temporary measures taken for tiding over the financial difficulties do not fall under the purview of cost reduction. At the same time, a programmer of cost reduction should in no way affect the quality of the products nor should it lower the standards of performance of the business.

Profit is the result of two variable factors, viz., sales and cost. The wider the gap between these two factors, the

larger is the profit. Thus, profit can be maximised either by increasing sales or by reducing cost. In a competition-less market or in case of monopoly products, it may perhaps be possible to increase prices to earn more profits and the need for reducing costs may not be felt. Such conditions cannot, however, exist paramount and when competition comes into play, it may not be possible to increase the sale price without having its adverse effect on the sale volume, which, in turn, reduces profit. Besides, an increase in prices of finished products has the ultimate effect of pushing up the raw material prices, wages of employees and other expenses all of which tend to increase costs.

In the long run, substitute products may come up in the market, resulting in loss of business. Avenues have, therefore, to be explored and methods devised to cut down expenditure and thereby reduce the cost of products. In short, cost reduction would meanmaximization of profits by reducing cost through economies and savings in costs of manufacture, administration, selling and distribution.

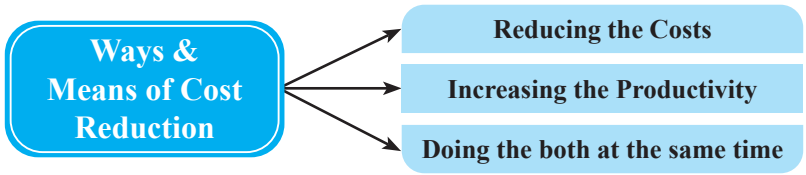

Figure 1.4

Broadly speaking reduction in cost per unit of production may be affected in two ways viz.,

(a) By reducing expenditure, the volume of output remaining constant, and

(b) By increasing productivity, i.e.., by increasing volume of output and the level of expenditure remaining unchanged.

These aspects of cost reduction are closely linked and they act together; there may be a reduction in the expenditure and at the same time, an increase in productivity.

Five steps to Strategic Cost reduction

A research study by PWC puts forward the following five steps for strategic cost reduction to ensure that the business can sustain competitive relevance and maximise its potential.

1. **Start with strategy:** Have a clear view of cost reduction strategy and ensure it is consistently understood across the organisation.
2. **Align costs to strategy:** Look across the whole organisation and differentiate the strategically-critical 'good-costs' from the non-essential 'bad-costs'.
3. **Aim high:** Be bold, be brave and be creative – use technology, innovation and new ways of working to radically optimise the cost base.
4. **Set direction and show leadership:** Deliver cost optimisation as a strategic, business transformation Programme.
5. **Create a culture of cost optimisation:** Ensure that a culture of ownership is embedded and continuous improvement is incentivised.

There are huge top and bottom-line rewards for getting this right. Your business will be more differentiated and equipped to deliver on its objectives. You'll also be less reliant on pricing to compete in the market as resources are targeted at high earning growth business. Without this clear sense of what costs to keep and what ones to eliminate, you run the risk of being left behind.

Tools & Techniques

There are several tools and techniques that are adopted in achieving cost reduction. Some of the vital ones which are normally used are listed below.

(i) Value Analysis
(ii) Business Process Re-engineering.
(iii) Simplification & Standardisation
(iv) Benchmarking
(v) Financial Restructuring
(vi) Work Study
(vii) Job Evaluation
(viii) Quality Control
(ix) Inventory Control
(x) Credit Control

Any of these lists would remain inconclusive without mentioning lean management and target costing.

Cost Reduction Practices

Cost reduction efforts shall be continuous and incessant. Furnished here under are few such practices as Case Studies.

Case Study 1: How a Reputed Consulting Firm (RCF) assisted a Client in Cost Reduction

The client is world leader in the food and beverage industry. As his legacy, the departing executive committed the company to adding hundreds of basis points to the bottom line. The CFO of the client approached RCF in 2011 to help the company establish a strategic cost reduction program. Understanding the culture of the company, the CFO wanted to start small and expand as milestones were achieved.

Although there are a number of approaches to cost reduction, many companies opt for zero-based budgeting. Zero-based budgeting removes a budget's baseline, which means that every cost identified in the budget must be approved. The client, under discussion, preferred to take a priority-based budgeting approach where marginal services or costs need to be justified.

RCF began to prioritize cost savings by looking at half of the company's cost base. RCF team recommended that the company first seek savings in non-headcount-related areas, such as travel and entertainment, as well as consultant fees. The goal was to remove 10% of the costs in these areas in the first year and then 5% to 10% annually thereafter for the following two years.

Once the company was well on its way to removing costs from these areas, RCF team helped the company renegotiate procurement costs to gain greater efficiencies. After that, RCF team set to work determining cost savings in targeted emerging market locations to expand "efficient growth."

Priority-based budgeting formed one part of the cost reduction equation for all of RCF team's efforts. Culture formed another. For every cost savings RCF team members identified, they had to then put it through the client's cultural lens to confirm that the decision was a good fit for both the company and its employees.

The company had spent years cultivating a youthful and energetic culture for the organisation. As such, it needed to balance shareholder and analyst demands for cost reductions with a culture that formed the company's identity and its brand — with employees and in the market.

Working closely with the client in targeted areas of the organisation, RCF helped the company carve out more than US$250 million in costs from its bottom line over three years by reducing or eliminating activity in non-headcount areas. RCF expects the company would save another US$50 million by renegotiating contracts and generating efficiencies in the company's procurement processes.

In addition to the savings identified, the client's cost reduction program is also expected to help the departing executive to reach his legacy goal. Because culture is such an important factor for the client, the company took a conservative approach to its priority-based decision-making. However, the CFO was willing — and prepared — to take more aggressive action, should the need arise.

Case Study 2: A Four-pronged Approach to input steel prices and commodity purchases

A research paper by 'Atkearney' suggests that there are four ways that the companies can improve their steel and other commodity purchases.

1. **Capture the value of Scrap:** Steel scrap, a by-product of the manufacturing process, is typically not well managed. Depending on the process, upto 30% of input steel is unused and considered waste. This is true for numerous manufacturing industries from automotive, white goods and electronics to heavy industries. While manufacturers focus on minimizing waste, they often fail to capture the value of material scrap in the part price. Companies that account for scrap material value in the component price can reduce their material costs by 5 to 8 percent.
2. **Increase Sourcing Power:** Steel is often purchased from an intermediary, such as a steel service center, resulting in an extended supply chain that includes numerous service centers and different pricing levels. It is possible to increase negotiating leverage and reduce costs by gaining more visibility and control over material supply chain – specifically by optimizing the material purchases directly from the large steel mills.
3. **Optimize Material Usage:** The third component of the strategy is to focus on reducing costs through technical improvements including reducing complexity, shrinking, part design costs, and segmenting supplies. To reduce complexity, the focus turns to portfolio rationalization to reduce specifications such as gauges and grades and then implementing processes to prevent re-proliferation. Reducing part design costs begin with collaborative reviews with internal and supplier engineering teams to evaluate all parameters that affect material costs and utilisation. In the context of segmentation, sourcing parts that use the same grade or gauges to the same supplier allows for nesting parts more effectively. Optimization of material usage can result in cost reduction from 5 to 8 percent.
4. **Include Scrap in Material Supply Chain:** Material scrap generated – both internally and externally – shall form part of material supply chain. The goal is to create a closed loop network whereby the company uses the scarp dealer for processing and transportation and sells scrap directly to a scrap consuming suppler.

Case Study 3: Ichalkaranji Power-Loomers minimise their Fixed Cost Burden

Ichalkaranji is a moderate industrial town located in the western parts of Maharashtra. The place is well known for skilled weavers and a prosperous power-loom industry. Hence, the town has acquired the fame as the Manchester of Maharashtra. The power-loom is considered as a diligent economic model between well-organized mill sector and outdated handlooms. An important characteristic of the power loom industry in Ichalkaranji is that most of the looms are owned by the local micro entrepreneurs with an average holding of about four looms.

One power-loom unit, on an average, produces about 80 metres of grey cloth per day from either cotton or polyester yarn. The cloth is used as the primary material by the textile and garment industries. As the textile industry is prone to seasonal fluctuations, i.e.., surging in sales during festive and marriage seasons and declining sales in slack seasons; the power-looms also used to suffer from lack of buyers during the slack season. In order

to retain the skilled labour during the slack season, the loom owners used to pay wages to the workers even when there is no work. As such, the industry is burdened with considerable retaining costs (i.e.., idle labour costs) which tend to remain fixed for the entire slack-period. These of the idle costs used to cripple the earnings of the loom owners severely.

Grey cloth is one of the primary packing materials for the agriculture-seeds because of the fact that most of the seeds are packed in cloth bags. One of the renowned seed companies, which was having international presence, was looking for ways and means of reducing its packing costs. The company came to know about the slack season cost-burden of the power loom industry of Ichalkaranji. The company has also observed that peak demand for the seed packing coincides with the slack-season of the power looms.

The seed company came up with a pricing proposal for buying the cloth from the power loom owners during the slack season on variable cost-plus basis whereby the fixed cost burden of the looms would be reduced substantially. The loom owners came forward willingly and supplied the cloth to the seed company at fairly cheaper prices. The end result was a win-win cost reduction both for the loom owners as also the seed company. The loom owners were able to reduce their slack season idle costs by about eighty per cent and the seed company was able to reduce its packing material costs by about twenty percent.

Case Study 4: MEC multiplies its profit through Outsourcing

MEC (name changed) is a medium scale electronic manufacturer located in Central India. Its annual turnover used to be about five crores of rupees. The components used in the company's products could be conveniently divided into A, B and C; A items accounting for ten percent in quantity and seventy percent in value, B items twenty percent in quantity and twenty percent in value and C items seventy percent in quantity and ten percent in value. Over a period of time, the company established a niche for quality in its field and started experiencing an upswing.

For the year under consideration the company was flooded with profitable orders worth twenty crores of rupees, i.e.., four times of its existing turnover. After a diligent review, the management felt that its existing capacity can, at best, be stretched by fifty percent whereby orders to the extent of ₹7.5 crore can be executed.

The management had several sessions of brainstorms. The executives realised that the company is capable of producing the entire quantity of A & B items needed for the orders; but the challenge was about C items. Assembly labour was identified as the major limiting factor for the production of C items. The deliberations were extended to the vendors and a viable solution brought out. The vendors were willing to undertake the work of assembling the C items, if they were given to them in SKD (Semi Knocked Down) form. The proposition was readily accepted.

At the end MEC was able to execute the orders worth ₹20 crores successfully by outsourcing the assembly operations relating to C items. The productivity as also the profitability of MEC and its vendors were multiplied by means of prudent deployment and optimum utilisation of their labour resources.

Case Study Learnings

The tools and techniques of cost reduction could be many; but the key is successful adaptation and implementation. Cost behaviour, too, plays a significant role in cost reduction endeavours. The approach, methods, and duration targets could be different for variable costs as compared to fixed costs. Variable costs may be prone to reduction even on short term basis whereas as fixed cost reduction may warrant long term strategies. In the ultimate, it is the total cost that shall be reduced on a permanent basis. Cost Reduction is the first step towards Cost Leadership.

Difference between Cost Control and Cost Reduction

Controlling the costs, with reference to the pre-determined standards or benchmarks, is the main focus of cost control whereas the primary focus of cost reduction is permanent reduction in costs. In that cost reduction is a

process which actually starts from where cost control ends. The key distinctions, nomenclature wise, between cost control and cost reduction can be tabulated as follows:

Sl.	Nomenclature	Cost Control	Cost Reduction
1	Objective	Containing the cost in accordance with the pre-set targets	Exploring ways and means of improving the targets
2	Approach	Attaining lowest possible costs under the existing circumstances	A continuous process of analysis to find out new ways & means to achieve reduction in costs.
3	Nature	Preventive function	Corrective function
4	Emphasis	The emphasis is on the past i.e.., on predetermined standards	The emphasis is on the present and the future i.e.., on feasible permanent reductions
5	Assumptions	Assumes the existence of certain standards or norms	Assumes the existence of concealed potential savings in the standards or norms

Value Analysis and Value Engineering - Business Process Re-engineering

1.3

Concept

Value Analysis (VA) is one of the important techniques of cost reduction and control. It is a scientific approach that ensures all the functions of a product or service are carried out at the minimum cost without compromising quality, reliability, performance and appearance. Society of American Value Engineers (SAVE) states "Value analysis is the systematic application of recognised techniques which identify the function of a product or service to establish a monetary value for the function and to provide the necessary function reliability at the lowest overall cost."

Value analysis is a methodical approach to sharpening the efficiency and effectiveness of any process. Value, in the context of value analysis, refers to economic value, which may reflect:

(i) Use value
(ii) Cost value
(iii) Exchange value, or
(iv) Esteem value.

'Use Value' reflects the intrinsic value. It is the measure of properties, qualities and features which make the product or service useful for the consumer. Use value, therefore, is the price paid by the buyer or the cost incurred by the manufacturer in order to ensure that the product or service performs its intended function efficiently.

'Cost Value' is the sum of all costs incurred in producing the product or rendering a service. Cost value, thus, is the sum of raw material cost, labour cost, and overheads expended to produce the product or service.

'Exchange Value' is the measure of all the properties, qualities and features of the product or service which make the product or service possible of being traded for another product or service or for money. In a conventional sense, 'exchange value' refers to the price that a purchaser is willing to offer for the product or service, the price being dependent upon the satisfaction level that is derived from the product or service.

'Esteem Value' is the measure of properties, features, attractiveness graphic packaging and the like which increases sales appeal or which attracts customers and create in them a strong desire to own the product. 'Esteem value', therefore, is the price paid by the buyer or the cost incurred by the manufacturer beyond the use value. It is the perception value.

Use value may be construed as the fundamental form of economic value. An item without use value can have neither exchange value nor esteem value. Summing up it may be stated that value is: quality, performance, style, design and cost in relation to a product or service.

Value Equation

Value analysis aims to simplify products and process, thereby increasing efficiency. Value analysis enables

people to contribute towards value addition by continuous focus on product design and services. Value analysis provides a structure through initiatives in the direction of cost saving, cost reduction and continuous improvement.

Value Equation: Value = {(Performance + Capability) ÷ Cost}
= Function ÷ Cost

Value addition is not a matter of just minimizing the cost. It is a '3D technique'. Value can be increased either by increasing function or reducing the cost or by doing both simultaneously. The concept is that of adding value by enhancing the functional worth

Any attempt to improve the value of a product must consider two elements. The first element is the utility of the product, i.e.., the use value. The second element relates to the value of ownership, i.e.., esteem value.

The concept can, better, be explained by the price discrimination being practiced in relation to a luxury car and a basic small car. From the use point of view both the cars fulfil the same function, viz. both of them offer safe economical travel (use value); but the luxury car has a greater esteem value and hence priced at a phenomenal value.

Another example could be the exorbitantly priced gold-plated ball pen in comparison to a disposable pen. Even though the use value for both the pens is nearly the same, the factor of esteem value enables a privileged pricing for gold-plated ball pen.

Focus of Value Analysis

The key focus of the VA approach is, therefore, the management of 'functionality' to yield value for the customer. Let us emphasize this point a little. Not that long ago, consumers of electric kettles were offered a variety of different types of metal-based boiling device. The value of a kettle is derived through heating water and therefore its functionality can be determined (temperature, capacity, reliability, safety etc.). Now faced with the same functionality (to boil water), designers would probably look towards a kettle made of plastic.

Plastic has the same functionality as metal in terms of containing and boiling water. The action to boil water is conducted by the same part - known as the element. However, the switch from metal to plastic does not impair this value and functionality with the customer – they still want to boil water - but it does result in a cost saving for the manufacturing company. If a company that traditionally made metal kettles did not review its design process, then it would be severely disadvantaged when attempting to compete against the lower cost plastic alternative. This is a simple example used only to provide an illustration of the VA concept but it does demonstrate the point of maintaining value whilst reducing costs.

If a company seeks to reduce the costs of producing a product, then it must seek out costs that are unnecessary or items of the product that provide no functional value to the customer. If you adopt this approach, then the VA process is concerned with removing a specific type of cost that can be removed without negatively affecting the function, quality, reliability, maintainability or benefit required by the customer. As such, the target for all VA activities is to find these costs as opposed to simply re-engineering a product design with no real purpose to the re-engineering exercise. The VA approach is, thus, formal and systematic because it is directed towards highlighting and dealing with these 'recoverable costs' of production. The objective is to create value for money as opposed to creating new products that do not provide customer satisfaction but are relatively inexpensive. The rules governing the application of the VA approach are simple:

- **No cost can be removed if it compromises the quality of the product or its reliability,** as this would lower customer value, create complaints and inevitably lead to the withdrawal of the product or lost sales.
- **Marketability / Saleability is another issue that cannot be compromised,** as this is an aspect of the product that makes it attractive to the market and gives it appeal value.

- **Any activity that reduces the maintainability of the product increases the cost of ownership** to the customer and can lower the value attached to the product.

Phases of Value Analysis

Value Analysis may consist of the following seven phases.

(i) **Origination:** The phase of origination starts with the identification of a project to undertake value analysis. After selecting the project, a project team consisting of experts from various fields and departments is constituted.

(ii) **Information:** The second phase is that of collecting relevant information. In this phase, the relevant facts relating to specifications, drawings, methods, materials, etc. are collected. Costs are, also, ascertained for each of the elements that are being studied.

(iii) **Functional Analysis:** Then follows the important phase of functional analysis. After familiarisation with the relevant facts & figures, a functional analysis is carried out to determine the functions and uses of the product and its components. The cost and importance of each function are identified. A value index is computed on the basis of cost benefit ratio for each of the functions. A list of the functions is prepared wherein the functions are arranged in decreasing order of their value.

(iv) **Innovation:** This is the creative phase concerned with the generation of new alternatives to replace or remove the existing ones. The objective is to produce ideas and to formulate alternative means and methods for accomplishing the essential functions and improving the value of the element under consideration. Creative problem solving techniques are utilized to discover alternatives that will provide essential or required functions at the lowest possible cost.

(v) **Evaluation:** During the stage of evaluation, each and every alternative is analysed and the most promising alternatives are selected. These alternatives are further examined for economic and technical feasibility. The alternatives finally selected must be capable of performing the desired functions satisfactorily. They must meet the standards of accuracy, reliability, safety, maintenance and repairs, environmental effects, and so on.

(vi) **Choice:** In this phase, the decision makers choose the best of alternatives. The programs and action plans are then developed to implement the chosen alternative.

(vii) **Implementation:** The chosen alternative is put to the actual use with the help of the programs and action plans. The progress of implementation is continuously monitored and followed up to ensure that the desired results are achieved.

Types of Value Analysis Exercises

VA for Existing Products: One of the best approaches to VA is simply to select an existing product that is sold in relatively large volumes. This product, or product family, will tend to have a great deal of the basic information, and documented history, which can be used quickly as opposed to a newly introduced product where such a history is not available. An existing product unites all the different managers in a business, each with an opinion and list of complaints concerning the ability to convert the design into a 'saleable' product. Therefore, any team that is created for the purpose of VA will understand their own problems but not necessarily the cause of these problems across the entire business. These opinions regarding poor performance (and documented evidence of failures) are vital to the discussions and understanding of how the product attracts costs as it is converted from a drawing to a finished product. These discussions therefore allow learning to take place and allow all managers to understand the limitations to the scope of product redesign and re-engineering activities. These issues include:

- The inability to change existing product designs due to the need to redesign tooling and the expense of such an initiative.

- The project team may have a finite duration before the project is concluded and therefore time will dictate what can be achieved.
- The high levels of purchased costs may imply a need to engage with suppliers in the VA process. This initiative will be constrained by a number of issues such as the timing of the project, the availability of resources from the supplier, the location of the suppliers, and other constraints.

VA for New Products (Value Engineering): For new products, the team will need to modify the VA approach and will operate in an environment that is less certain and has poor levels of available information upon which to make decisions. In this case, the analysis and systematic process of review for new products is known as Value Engineering (VE). The VE approach is similar to that of Value Analysis but requires a much greater level of investment by the organisation in terms of the skilled, experienced and proficient human resources seconded to the group.

VA for Product Families- Horizontal Deployment: The final form of VA is results when there is scope for the 'horizontal deployment' of the results of a VA exercise with a single product or family of products. Under conditions where the value analysis project team finds similarities with many products manufactured by the company, then it is possible to extend the benefits to all these other products concurrently. In this manner, all affected products can be changed quickly to bring major commercial benefits and to introduce the improvement on a 'factory-wide basis'. This is particularly the case when supplying companies offer improvements that affect all the products to which their materials or parts are used. The horizontal deployment activity has many advantages both in terms of financial savings and also the relatively short amount of time required to introduce the required changes to the product design.

Competitive VA: VA techniques are not simply the prerogative of the business that designed the product. Instead, VA is often used as a competitive weapon and applied to the analysis of competitor products in order to calculate the costs of other company's products. This is often termed 'strip down' but is effectively the reverse value analysis. Here the VA team are applied to understand the design and conversion costs of a competitor product. The results of the analysis is to understand how competitor products are made, what weaknesses exist, and at what costs of production together with an understanding of what innovations have been incorporated by the competitor company.

It is recommended that the best initial approach, for companies with no real experience of VA, is to select a single product that is currently in production and has a long life ahead. This approach offers the ability to gain experience, to learn as a team, and to test the tools and techniques with a product that has known characteristics and failings. In the short term it is most important to develop the skills of VA, including understanding the right questions to ask, and finally to develop a skeleton but formal process for all VA groups to follow and refine.

The core advantage of using value analysis is its potential for reducing costs, which is a benefit that permeates all advantages of the system. Because of the fact that value analysis breaks down a product or service into components, it enables the analysis of each of the components on its own, evaluating its importance and efficiency. A value analysis correctly implemented and applied enables the entity to identify components that are not worth the cost they require and that can be eliminated or replaced with an alternative. In this manner, the process for the product or service being analyzed is refined to be done at less expense.

Value Engineering (VE)

'VA' and 'VE' are closely related terms so much so that they are, frequently, used interchangeably. Though the philosophy of understanding the two is the same, the difference lies in the time and stage at which the technique is applied.

"Value Analysis" is the application of a set of techniques to an existing product with a view to improve its value. Thus, it is a remedial process. "Value Engineering" is the application of exactly the same set of techniques to a

new product at the design stage to ensure that bad features are not added. Thus, it is a 'preventive' measure. In that sense, 'VE' is fundamental and VA is collateral because 'prevention is better than cure."

Value Engineering simply answers the question "what else will accomplish the purpose of the product, service, or process we are studying?". VE technique is applicable to all type of sectors. Initially, VE technique was introduced in manufacturing industries. This technique is then expanded to all type of business or economic sector, which includes construction, service, government, agriculture, education and healthcare.

Case Study (Illustrative)

Aadarsh Instruments, located in Ambala, is a medical instrument manufacturing company considered to apply Value Engineering in to the Focus Adjustment Knob in one of their model SL 250 for Slit Lamp in microscope. This microscope has found application in the field of eye inspection. The value engineering analysis may help company in running its export business of medical microscope. This firm is producing different types of microscopes which they export to various countries around the globe. All of the products manufactured here are conforming to the international standards. It is an ISO certified company.

The following are the steps to be used for carrying out the Value Engineering exercise by Aadarsh Instruments in their model SL 250 for Slit Lamp in Microscope for the Focus Adjustment Knob:

(i) Selection of the Product Plan.
(ii) Gathering Product Information
(iii) Functional Analysis
(iv) Creativity Phase and preparing the work-sheet
(v) Evaluation Sheet
(vi) Cost Analysis
(vii) Result and Conclusion
(viii) Implementation.

The total savings after the implementation of value engineering are as given below:

- Cost before analysis — ₹ 29.99
- Total Cost of Nylon Knob — ₹18.40
- Saving per product — ₹11.59
- Percentage saving per product — 38.64%
- Annual Demand of the product — 8,000
- Total Annual Saving — ₹92,720
- Value Improvement — ₹62.98% $\left(\frac{92,720}{18.40\times 8,000}\times 100\right)$

With a critical evaluation of this study, Aadarsh Instruments has been able to increase the value of the product by substituting another material in place of the one currently in use. The% value improvement is to the tune of 62.98% and the total annual saving has been ₹92,720. The various advantages have been observed in terms of:

- Cost Reduction
- Increase in overall production
- Reduction in man-power
- Reduction in scrap.

Thus, the cost has been brought down by a substantial margin and thereby the value of the product has been increased.

Business Process Reengineering

Concept

Hammer and Champy (1993) define Business Process Reengineering (BPR) as: " the fundamental rethinking and radical redesign of the business processes to achieve dramatic improvements in critical, contemporary measures of performance, such as cost, quality, service and speed". BPR refers to a complete redesign of a process with an emphasis on finding creative new means to accomplish an objective.

BPR involves the radical redesign of core business processes to achieve dramatic improvements in productivity, cycle times and quality. In Business Process Reengineering, companies start with a blank sheet of paper and rethink existing processes to deliver more value to the customer. They typically adopt a new value system that places increased emphasis on customer needs.

Companies reduce organisational layers and eliminate unproductive activities in two key areas. First, they redesign functional organisations into cross-functional teams. Second, they use technology to improve data dissemination and decision making.

Rather than searching continually for minute improvement, re-engineering involves a radical shift in thinking about how an objective should be met. Re-engineering prescribes radical, quick and significant change. Admittedly, it can entail high risks, but it can also bring big rewards. These benefits are most dramatic when new models are discovered for conducting business.

Characteristics

(i) Several jobs are combined into one
(ii) Very often workers make decisions
(iii) The steps in the process are performed in a logical order
(iv) Work is performed, where it makes most sense
(v) Quality is built in
(vi) Manager provides a single point of contact
(vii) Centralized and decentralized operations are combined.

Seven Principles

(i) Processes should be designed to achieve a desired outcome rather than focusing on existing tasks
(ii) Personnel who use the output from a process should perform the process
(iii) Information processing should be included in the work, which produces the information
(iv) Geographically dispersed resources should be treated, as if they are centralized
(v) Parallel activities should be linked rather than integrated
(vi) Doers should be allowed to be self-managing
(vii) Information should be captured once at source.

Key Benefits

(i) Reduction in Costs and Cycle Times: Business Process Reengineering reduces costs and cycle times

by eliminating unproductive activities and the employees who perform them. Reorganisation by teams decreases the need for management layers, accelerates information flows and eliminates the errors and rework caused by multiple handoffs.

(ii) **Improvement in Quality.** Business Process Reengineering improves quality by reducing the fragmentation of work and establishing clear ownership of processes. Workers gain responsibility for their output and can measure their performance based on prompt feedback.

Example of Business Process Reengineering:

Example 1: Credit Card Approval

An applicant submits an application. The application is reviewed first to make sure that the form has been completed properly. If not, it is returned for completion. The complete form goes through a verification of information. This is done by ordering a report from a credit company and calling references. Once the information is verified, an evaluation is done. Then, a decision (yes or no) is made. If the decision is negative, an appropriate rejection letter is composed. If the decision is positive, an account is opened, and a card is issued and mailed to the customer. The process, which may take a few weeks due to workload and waiting time for the verifications, is usually done by several individuals. Business processes are characterized by three elements:

- **The inputs**, (data such customer inquiries or materials),
- **The processing** of the data or materials (which usually go through several stages and may necessary stops that turns out to be time and money consuming), and
- **The outcome** (the delivery of the expected result).

The problematic part of the process is processing. Business process reengineering mainly intervenes in the processing part, which is reengineered in order to become less time and money consuming.

Example 2: Ford Motors

One of the best-known examples of organisations that used BPR in an effort to become more efficient is Ford Motors, a car manufacturer. Ford Motor Company is the world's second largest manufacturer of cars and trucks with products sold in more than 200 markets.

With inherent large-scale growth issues, more demanding customers, and mounting cost pressures, Ford needed to transform from a linear, top-down bureaucratic business model to an Internet ready, nimble organisation that engages and integrates customers, suppliers, and employees. Working with Cisco, Ford integrated and leveraged their supplier base by designing Covisint, an end-to-end infrastructure that enables an online, centralized marketplace connecting the automotive industry supply chain. Ford also enhanced the customer buying experience through redesigned and more user friendly Web sites.

As a result, Ford is enjoying an increase in customer satisfaction, sees huge revenue opportunities for developing and retaining loyal product advocates, and has taken both complexity and cost out of the supply chain.

Supply Chain Management

1.4

Supply Chain

Supply Chain refers to the entire gambit of linkages in manufacturing a product or rendering a service. For example, in relation to a manufacturing entity, it encompasses all the activities that commence from the extraction of raw materials till the delivery of the finished product to the ultimate consumer. Listed below are the generic links of a supply chain:

(i) Extraction of Raw Materials

(ii) Vendor

(iii) Manufacturer

(iv) Distributer

(v) Retailer

(vi) Consumer

In its simplest form a supply chain is the activities required by the organisation to deliver goods or services to the consumer. A supply chain is a focus on the core activities within the organisation required to convert raw materials or component parts through to finished products or services.

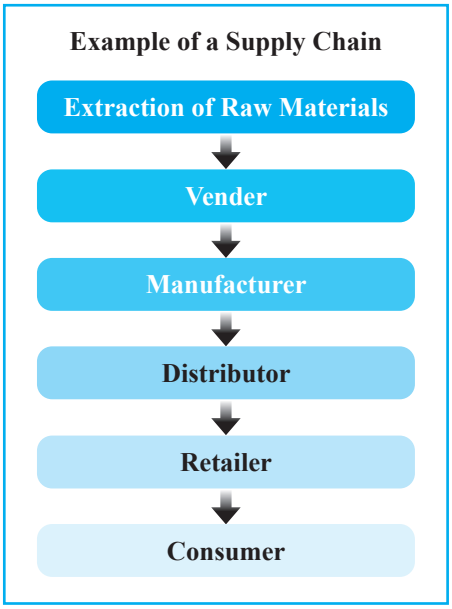

Figure 1.5

In its simplest form the stages in a supply chain are as depicted within the Porters Value Chain and this can be considered a good guide to a supply chain structure, viz.

- Inbound Logistics
- Operations
- Marketing and Sales
- Outbound Logistics
- Services

Thus, supply chains are made up of all the links that participate in the design, assembly, and delivery of a particular product.

- Vendors supply raw materials
- Producers convert those raw materials into products

- Warehouses store that product until it's needed
- Distribution centers pick up and deliver that product
- Retailers, online and in-store, bring that product to you

Supply chains are the reason that the producer can provide customers what they want, when and where they want it, at the price they need. For example, in the electronics industry, the supply chain is the central nervous system that governs how products are created. In an HDTV supply chain, a variety of companies play a role in building the components, assembling the final product, and moving it through the supply chain (see chart-fig 1.5). The goal of the supply chain is to have the television in stock when you're ready to purchase it.

Supply Chain Management (SCM)

Supply chain management encompasses every activity involved in maintaining the supply chain. The goal of supply chain management is to look holistically at the entire supply chain from supplier through to the consumer, and review three core areas of people, process and systems in order to maximise value from all activities. Behind every product one uses – electronics, coffee, clothing, lawn mowers – there lies SCM which makes it possible to get the products better, faster, and cheaper.

Each year, these products get bigger and better, yet the prices drop. How is it possible? It's the end result of SCM professionals working together – LCD glass panel fabricators in South Korea, semiconductor manufacturers in Taiwan, television assembly plants in Mexico. These global partners collaborate across time zones and oceans to decrease costs and increase performance in ways no single company ever could.

In essence, supply chain management integrates supply and demand management within and across companies. Companies like Dell, Nokia, Proctor & Gamble, Toyota, and Walmart consider SCM to be a key factor in their overall success.

Not only is supply chain management important to the world's leading organisations, this fast-paced, global field offers tremendous employment opportunities. Nearly every size and type of organisation needs motivated, well-prepared individuals to become their supply chain leaders.

Supply Chain Strategy

Without a strategy the supply chain activities cannot be aligned to an overall objective. Think of an organisation with no functional or operational strategy much like a ship setting sail without letting the crew know the destination, the crew could be making decisions that could unwittingly impede the ship arriving safely at its end destination.

Supply chain strategy follows the corporate strategy. Once the corporate strategy is defined, this will cascade into the functional areas of the business where each function will set their strategy that is aligned to the corporate strategy. The supply chain strategy may be set for example as "We aspire to reduce waste in our supply chain activities to support the company's strategy to be a cost leader in our market".

Once this strategy is determined for the function it will influence daily operational decisions.

- Procurement may focus on driving cost out of the procurement activities by sourcing suppliers with favourable terms, negotiating quality improvements that reduce waste activities or stronger contractual terms
- Operations may look to remove the 7 wastes from their existing processes.
- Logistics may look to invest in equipment to support removal of waste activities or review their operational processes.

There are three core areas to consider when developing the supply chain strategy and business case:

- People – Do you have the right number of staff with the right skill set?
- Process – Are there waste activities within your current operating processes?
- Systems – Are your systems enablers to the strategy or are legacy systems holding you back?

Strategies need to be clear, voiced to ALL staff members and have buy in. When in 1961 JFK visited NASA he asked a janitor what his job was, his reply was: "I'm sending a man to the moon". This is a clear example of a well communicated strategy and mission flowing throughout the whole organisation, with complete buy in, regardless of an individual's position within the organisation they understand expectations and the part they play in that strategy.

Importance of Supply Chain Management

It is well known that supply chain management is an integral part of most businesses and is essential to company success and customer satisfaction.

Boosts Customer Service

- **Right Location:** Customers expect products to be available at the right location. (i.e.., customer satisfaction diminishes if an auto repair shop does not have the necessary parts in stock and can't fix the car for an extra day or two).
- **Right Delivery Time:** Customers expect products to be delivered on time (i.e.., customer satisfaction diminishes if pizza delivery is two hours late or Christmas presents are delivered on December 26).
- **Right After Sale Support:** Customers expect products to be serviced quickly. (i.e.., customer satisfaction diminishes when a home furnace stops operating in the winter and repairs can't be made for days)

Reduces Operating Costs

- **Decreases Purchasing Cost:** Retailers depend on supply chains to quickly deliver expensive products to avoid holding costly inventories in stores any longer than necessary. For example, electronics stores require fast delivery of 60" flat-panel plasma HDTV's to avoid high inventory costs.
- **Decreases Production Cost:** Manufacturers depend on supply chains to reliably deliver materials to assembly plants to avoid material shortages that would shut-down production. For example, an unexpected parts shipment delay that causes an auto assembly plant shutdown can cost ₹20,000 per minute and lakhs of rupees per day in lost wages.
- **Decreases Total Supply Chain Cost:** Manufacturers and retailers depend on supply chain managers to design networks that meet customer service goals at the least total cost. Efficient supply chains enable a firm to be more competitive in the market place. For example, Dell's revolutionary computer supply chain approach involved making each computer based on a specific customer order, then shipping the computer directly to the customer. As a result, Dell was able to avoid having large computer inventories sitting in warehouses and retail stores which saved millions of dollars. Also, Dell avoided carrying computer inventories that could become technologically obsolete as computer technology changed rapidly.

Improves Financial Position

- **Increases Profit Leverage:** Firms value supply chain managers because they help control and reduce supply chain costs. This can result in dramatic increases in firm profits. For instance, U.S. consumers eat 2.7 billion packages of cereal annually, so decreasing U.S. cereal supply chain costs just one cent per cereal box would

result in $13 million dollars saved industry-wide as 13 billion boxes of cereal flowed through the improved supply chain over a five-year period.

- **Decreases Fixed Assets:** Firms value supply chain managers because they decrease the use of large fixed assets such as plants, warehouses and transportation vehicles in the supply chain. If supply chain experts can redesign the network to properly serve customers from six warehouses rather than ten, the firm will avoid building four very expensive buildings.
- **Increases Cash Flow:** Firms value supply chain managers because they speed up product flows to customers. For example, if a firm can make and deliver a product to a customer in 10 days rather than 70 days, it can invoice the customer 60 days sooner.

Societal Benefits

- Lesser known, is how supply chain management also plays a critical role in society. SCM knowledge and capabilities can be used to support medical missions, conduct disaster relief operations, and handle other types of emergencies. Whether dealing with day-to-day product flows or dealing with an unexpected natural disaster, supply chain experts roll up their sleeves and get busy. They diagnose problems, creatively work around disruptions, and figure out how to move essential products to people in need as efficiently as possible.

Case Study 1: Walmart's Inventory Innovations

Fewer links in the Supply Chain: Even in its early years, Walmart's supply chain management contributed to its success. Walmart's supply chain innovation began with the company removing a few of the chain's links, right from the very beginning. Founder Sam Walton, who owned several Ben Franklin franchise stores before opening the first Walmart in Rogers, Arkansas in 1962, selectively purchased bulk merchandise and transported it directly to his stores. Later, in the 1980s, Walmart began working directly with manufacturers to cut costs and more efficiently manage the supply chain. In the process, Walmart has pioneered the concept of Vendor Managed Inventory (VMI) with an added competitive advantage.

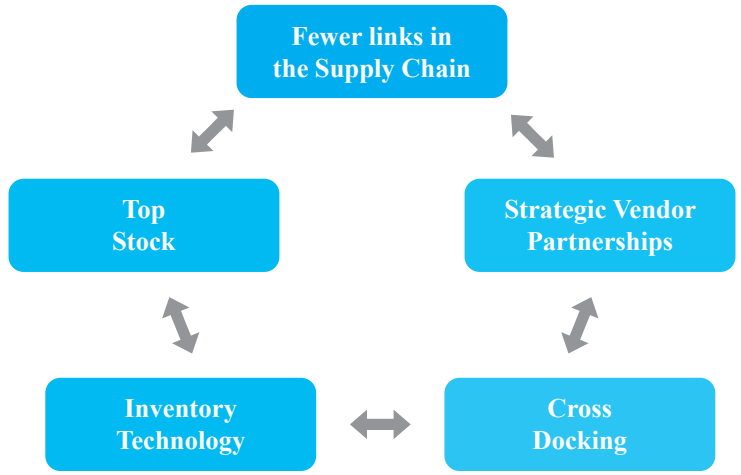

Figure 1.6

Strategic Vendor Partnerships: Walmart has long practiced strategic sourcing to find products at the best price from suppliers who are in a position to ensure they can meet demand. The company then establishes strategic partnerships with most of their vendors, offering them the potential for long-term and high-volume purchases in exchange for the lowest possible prices.

Furthermore, Walmart streamlined supply chain management by constructing communication and relationship networks with suppliers to improve material flow with lower inventories. The network of global suppliers, warehouses, and retail stores has been described as behaving almost like a single firm.

Cross-docking: Cross-docking is a logistics practice that is the centrepiece of Walmart's strategy to replenish inventory efficiently. It means the direct transfer of products from inbound or outbound truck trailers without the need for extra storage, by unloading items from an incoming semi-trailer truck or railroad car and loading these materials directly into outbound trucks, trailers, or rail cars (and vice versa), with no storage in between.

Suppliers have been delivering products to Walmart's distribution centers where the product is cross-docked and then delivered to Walmart stores. Cross-docking keeps inventory and transportation costs down, reduces transportation time, and eliminates inefficiencies.

Walmart's truck fleet of drivers continuously deliver goods to distribution centers (located an average 130 miles from the store), where they are stored, repackaged and distributed without sitting in storage. Goods will cross from one loading dock to another, usually in 24 hours or less, and company trucks that would otherwise return empty "backhaul" unsold merchandise.

This strategy has reduced Walmart's costs significantly, allowing the company to pass those savings on to their customers with highly competitive pricing.

Advanced Inventory Technology: In its relentless pursuit of low consumer prices, Walmart embraced and invested in technology to become an innovator in the way stores track inventory and restock their shelves, Thus, allowing them to cut costs. In 2015, the company spent a reported $10.5 billion on information technology and has also invested significantly in improving their e-Commerce capability.

Technology plays a key role in Walmart's supply chain, serving as the foundation of their supply chain strategy. Walmart has the largest information technology infrastructure of any private company in the world, and it is this state-of-the-art technology and network design that allows Walmart to accurately forecast demand, track and predict inventory levels, create highly efficient transportation routes, manage customer relationships, and service response logistics.

For example, Walmart implemented the first company-wide use of Universal Product Code (barcodes) in 1983, through which store level information was immediately collected and analyzed. Later, Walmart leveraged this now-everyday technology into a further innovation: 'Savings Catcher', which allows consumers to scan product barcodes on their smartphones to compare best prices.

The company then devised 'Retail Link', a mammoth database. Through a global satellite system, Retail Link is connected to analysts who forecast supplier demands to the supplier network, which displays real-time sales data from cash registers and to Walmart's distribution centers.

Suppliers and manufacturers within the supply chain synchronize their demand projections under a collaborative planning, forecasting and replenishment scheme, and every link in the chain is connected through technology that includes a central database, store-level point-of-sale systems, and a satellite network.

What made Walmart so innovative? Was that it had been sharing all this information with their partners? Back in the day, a lot of companies weren't doing that, but rather using third-party services where they had to pay for the information.

Walmart's approach allows for frequent, informal cooperation among stores, distribution centers and suppliers, and less centralized control. Furthermore, the company's supply chain, by tracking customer purchases and demand, allows consumers to effectively pull merchandise to stores through demand, rather than having the company push goods onto shelves.

In recent years, Walmart has used radio frequency identification tags (RFID), which use numerical codes that can

be scanned from a distance to track pallets of merchandise moving along the supply chain. As inventory must be handled by both Walmart and its suppliers, Walmart has encouraged its suppliers to use RFID technology as well.

Even more recently, the company has begun using smart tags, read by a handheld scanner, that allow employees to quickly learn which items need to be replaced so that shelves are consistently stocked and inventory is closely watched.

According to researchers at the University of Arkansas, there has been a 16% reduction in out-of-stocks since Walmart introduced RFID technology into its supply chain. The researchers also pointed out that the products using an electronic product code were replenished three times as fast as items that only used barcode technology.

In addition, Walmart also networked its suppliers through computers. It entered into collaboration with P&G for maintaining the inventory in its stores and built an automated re-ordering system, which linked all computers between the P&G factory through a satellite communication system. P&G then delivered the item either to a Walmart distribution center or directly to the concerned stores.

Top Stock: And it's not just high-tech innovation that Walmart innovates on: in the recent past, Walmart announced the trial of a new system to manage its stock, called Top Stock, in which the top shelves are utilized for more storage, freeing up back rooms. This move is designed to get products on the shelves sooner, creating more space for fulfilling online delivery orders and allowing more visibility of stock levels for both staff and customers. The move also means that customers don't have to wait to find a staff member to track down an item they don't see on a shelf.

Competitive Advantages: Walmart's supply chain management strategy has provided the company with several sustainable competitive advantages, including lower product costs, reduced inventory carrying costs, improved in-store variety and selection, and highly competitive pricing for the consumer. This strategy has helped Walmart become a dominant force in a competitive global market. As technology evolves, Walmart continues to focus on innovative processes and systems to improve its supply chain and achieve greater efficiency.

Case Study 2: Deere & Company

Deere & Company (brand name John Deere) is famed for the manufacture and supply of machinery used in agriculture, construction, and forestry, as well as diesel engines and lawn care equipment. Despite the ongoing challenges associated with the pandemic, John Deere delivered a year of solid performance in 2020. The company's Net sales and revenues for the year were $35.54 billion, and net income was $2.75 billion. Deere also delivered solid returns to investors.

Supply Chain Cost Reduction Challenges: Deere and Company has a diverse product range, which includes a mix of heavy machinery for the consumer market, and industrial equipment, which is made to order. Retail activity is extremely seasonal, with the majority of sales occurring between March and July.

The company was replenishing dealers' inventory weekly, using direct shipment and cross-docking operations from source warehouses located near Deere & Company's manufacturing facilities. This operation was proving too costly and too slow. So the company launched an initiative to achieve a 10% supply chain cost reduction within four years.

The Path to Cost Reduction: The company undertook a supply chain network-redesign program, resulting in the commissioning of intermediate "merge centers" and optimization of cross-dock terminal locations. Deere & Company also began consolidating shipments and using break-bulk terminals during the seasonal peak. The company also increased its use of third-party logistics providers and effectively created a network that could be optimized tactically at any given point in time.

Supply Chain Cost Management Results: Deere & Company's supply chain cost-management achievements

included an inventory decrease of $1 billion, a significant reduction in customer delivery lead times (from ten days to five or less) and annual transportation cost savings of around 5%.

Case Study 3: Intel

One of the world's largest manufacturers of computer chips, Intel needs little introduction. However, the company needed to reduce supply chain expenditure significantly after bringing its low-cost "Atom" chip to market. Supply chain costs of around $5.50 per chip were affordable for units selling for $100; but the price of the new chip was a fraction of that, at about $20.

The Supply Chain Cost Reduction Challenge: Somehow, Intel had to reduce the supply chain costs for the Atom chip, but had only one area of leverage—inventory. The chip had to work, so Intel could make no service trade-offs. With each Atom product being a single component, there was also no way to reduce duty payments. Intel had already whittled packaging down to a minimum, and with a high value-to-weight ratio, the chips' distribution costs could not be pared down any further.

The only option was to try to reduce levels of inventory, which, up to that point, had been kept very high to support a nine-week order cycle. The only way Intel could find to make supply chain cost reductions was to bring this cycle time down and therefore to reduce inventory.

The Path to Cost Reduction: Intel decided to try what was considered an unlikely supply chain strategy for the semiconductor industry: make to order. The company began with a pilot operation using a manufacturer in Malaysia. Through a process of iteration, they gradually sought out and eliminated supply chain inefficiencies to reduce order cycle time incrementally. Further improvement initiatives included:

- Cutting the chip assembly test window from a five-day schedule, to a bi-weekly, 2-day-long process
- Introducing a formal Standard Operating Planning Process (S&OP).
- Moving to a vendor-managed inventory model wherever it was possible to do so

Supply Chain Cost Management Results: Through its incremental approach to cycle time improvement, Intel eventually drove the order cycle time for the Atom chip down from nine weeks to just two. As a result, the company achieved a supply chain cost reduction of more than $4 per unit for the $20 Atom chip—a far more palatable rate than the original figure of $5.50.

Case Study Learnings

Evidently, Supply Chain Management is an important avenue of cost reduction. What can be seen from these brief accounts is that for an enterprise to make significant and sustainable cost improvements, substantial change must take place. At the same time, none of the changes took place overnight. Each of the companies tackled issues in phases, effectively learning more as they went along. If one wants to see sustainable cost reductions, one will need to view the big picture from a new perspective and be prepared to step out of the comfort zone and seek long term distinct solutions.

Terms to Master

Strategic Cost Management: Strategic cost management refers to the cost management that specifically focuses on strategic issues.

Value Chain: Value chain is a set of activities that an organisation carries out to create value for its customers.

Cost Control: Cost Control is the regulation by executive action of the costs of operating an undertaking, particularly where such action is guided by cost accounting.

Cost Reduction: Cost reduction refers to the real and permanent reduction in the unit costs of goods manufactured or services rendered without impairing their suitability for the use intended.

Value Analysis: Value Analysis (VA) or Value Engineering (VE) is a function-oriented, structured, multi-disciplinary team approach to solving problems or identifying improvements.

Business Process Reengineering (BPR): BPR refers to a complete redesign of a process with an emphasis on finding creative new means to accomplish an objective.

Supply Chain: Supply Chain refers to the entire gambit of linkages in manufacturing a product or rendering a service.

Exercise

A. Theoretical Questions:

⊙ Multiple Choice Questions

1. Which of the following is not a primary activity of Value Chain?
   A. Inbound Logistics
   B. Operations
   C. Service
   D. Infrastructure

2. Which of the following is not a secondary activity of Value Chain?
   A. Procurement
   B. Human Resource Development
   C. Service
   D. Technology Development

3. Which of the following is not a term normally used in value analysis?
   A. Resale value
   B. Use value
   C. Esteem value
   D. Cost value

   Reason: The resale value is normally referred to as the 'exchange value.

4. A company has forecast sales and cost of goods sold $\left(\because \text{Inventory Turnover} = \frac{\text{CoGS}}{\text{Average Inventory}}\right)$ for the coming year as ₹25 lakhs and ₹18 lakhs respectively. The inventory turnover has been taken as 9 times per year. In case the inventory turnover increases to 12 times and the short-term interest rate on working capital is taken as 10%, what will be the saving in cost?
   A. ₹10,000
   B. ₹20,000
   C. ₹15,000
   D. ₹5,000

Reason:

Workings

Level of Inventory when the turnover is 9 times	=	(18,00,000 ÷ 9)	=	₹2,00,000
Level of Inventory when the turnover is 12 times	=	(18,00,000 ÷12)	=	₹1,50,000
Reduction in the level of Inventory	=	(₹2,00,000 - ₹1,50,000)	=	₹50,000
Saving in working capital interest cost	=	(₹50,000 × 10%)	=	₹5,000

Answer:

1	**D**	**2**	**C**	**3**	**A**	**4**	**D**

⊙ State True or False.

1. Strategic cost management refers to the cost management that specifically focuses on strategic issues.
2. 'VA' and 'VE' are closely related terms so much so that they are, frequently, used interchangeably.
3. Cost reduction refers to the real and permanent reduction in the unit costs of goods manufactured or services rendered without considering their suitability for the use intended.
4. Supply Chain Management is not an avenue of cost reduction.

Answer:

1	**T**	**2**	**T**	**3**	**F**	**4**	**F**

⊙ Essay Type Questions

1. Define Strategic Cost Management (SCM) and discuss its relevance in the contemporary scenario.
2. What are the generic links of Porter's Value Chain?
3. Demonstrate the significance of Value Chain Analysis with an illustrative example.
4. List out the key points for exercising cost control.
5. Discuss the tools and techniques of cost reduction.
6. Differentiate Cost Control with Cost Reduction.
7. Narrate five steps to Strategic Cost Reduction?
8. Draft a report to your Managing Director emphasizing the importance of value analysis with reference to an existing problem in your organisation.
9. Explain the phases of Value Analysis.
10. Distinguish between Value Analysis and Value Engineering.
11. What is the need for Business Process Reengineering (BPR)?
12. Define Supply Chain. Discuss the generic links of supply chain.
13. What is Cross-Docking?
14. Explain Supply Chain Management with an illustrative case let.

B. Practical Problems:

⊙ Comprehensive Numerical Questions

1. Ever Forward Ltd is manufacturing and selling two products: Splash and Flash, at selling prices of ₹3/- and ₹4/- respectively. The following sales strategy has been outlined for the year 2023.

(i) Sales planned for year will be ₹7.20 lakhs in the case of Splash and ₹3.50 lakhs in the case of Flash.

(ii) Break-even is planned at 60% of the total sales of each product.

(iii) Profit for the year to be achieved is planned at ₹69,120 in the case of Splash and ₹17,500 in the case of Flash. This would be possible by launching a cost reduction programme and reducing the present annual fixed expenses of ₹1,35,000 allocated as ₹1,08,000 to Splash and ₹27,000 to Flash.

The selling price of Splash and Flash will be reduced by 20% and 12.5% respectively to meet the competition.

You are required to present the proposal in financial terms giving clearly the following information.

(a) Number of units to be sold of Splash and Flash to break-even as well as the total number of units of Splash and Flash to be sold during the year.

(b) Reduction in fixed expenses product-wise that is envisaged by the cost Reduction Program.

2. The profit for The Forward Look Ltd. works out to 12.5% of the capital employed and the relevant figures are as under:

	(₹)
Sales	5,00,000
Direct Materials	2,50,000
Direct Labour	1,00,000
Variable Overheads	40,000
Capital employed	4,00,000

The new Sales Manager who has recently joined the Company estimates for the next year a profit of about 23% on the capital employed provided the volume of Sales is increased by 10% and simultaneously there is an increase in Selling Price of 4% and an overall cost reduction in all the elements of cost by 2%.

Verify the contention of the Sales Manager by computing in detail the cost and profit for the next year and state whether his proposal can be adopted by the management.

3. The anticipated sales of Electronic Corporation Ltd. is ₹ 4,00,000 and unit selling price is ₹ 20 each. The per unit cost of direct material is ₹ 9, labour is ₹ 3 and other variable expenses are ₹ 3 per unit. The company is earning a net profit of 5% and to improve the profitability, the following proposals were discussed at the Executive Committee Meeting:

(i) The present administrative setup is on the regional basis and it was felt that centralization will reduce the fixed cost by ₹ 12,000.

(ii) The Production Manager has agreed that he will try to work on a cost reduction programme which will reduce the cost by ₹ 1 per unit but there will be little impact on the quality which will be negligible to the customer.

(iii) The Sales Manager opposed the two proposals and suggests that it may be possible to increase the number of units sold by 20%, provided the selling price is reduced by 5%

(iv) Alternatively, as per Sales Manager, if the selling price is increased by 10%, the sales number of units will be reduced by 5%.

As the Cost and Management Accountant of the company, evaluate the aforesaid four proposals and also put forward your suggestions to improve the situation.

Answer:

1. Computation of Number of units to be Sold, Breakeven & envisaged Reduction in FC

Item	Splash	Flash	Total
No. of units to be sold	3,00,000	1,00,000	4,00,000
Break even units	1,80,000	60,000	
Cost Reduction envisaged in FC (₹)	4,320	750	5,070

2. Percentage of Profit on Capital Employed = 23.195 i.e.. > 23%

   Recommendation: The Sales Manager's proposal can be adopted.

3. **Evaluation of Alternatives**

Alternative	(i)	(ii)	(iii)	(iv)
Proposal	Central administration (Reduction in F.C. by ₹ 12,000)	Variable cost Reduction by ₹ 1 per unit	20% increase in Sales units with 5% reduction in selling price	10% increase in Selling price and 5% reduction in sales units
Ranking	3	2	Reject	1
Suggestion				Accept

Recommendation: As Cost and Management Accountant of the company, it will be recommended a combination of proposals (i) and (iii) which will, together, generate an additional profit of ₹45,000 (12,000 + 33,000).

Abbreviations

BPR	**Business Process Reengineering**
RFID	**Radio Frequency Identification Tag**
SAVE	**Society of American Value Engineers**
SCM	**Strategic Cost Management**
SCM	**Supply Chain Management**
VA	**Value Analysis**
VCA	**Value Chain Analysis**
VE	**Value Engineering**