UNIT – I	9 hours
INTRODUCTION: Fundamentals -need for supply chain management —evolution- Role in Economy - Importance - Decision Phases - Supplier- Manufacturer-Customer chain.	

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Fundamentals -need for supply chain management —evolution- Role in Economy - Importance - customer value, customer service & retention – value of out of stock- setting customer service priorities- Logistics and shareholder value, logistics cost analysis- Principles of logistics costing,

Introduction:

Supply Chain Management (SCM) is a pivotal discipline that governs the seamless flow of goods, information, and resources across a network of interconnected entities, from raw material suppliers to end consumers. It encompasses the strategic planning, execution, and monitoring of various activities aimed at efficiently delivering products and services while optimizing costs and enhancing overall value.

In today's complex and globalized business landscape, effective supply chain management has become a critical competitive advantage. It involves the integration of diverse functions such as procurement, production, distribution, logistics, inventory management, and demand forecasting. SCM seeks to create a well-coordinated and synchronized ecosystem, where each step in the process is finely tuned to minimize waste, reduce lead times, and respond swiftly to changing market demands.

Key objectives of supply chain management include achieving higher operational efficiency, enhancing customer satisfaction through timely deliveries, mitigating risks by building resilient supply networks, and maximizing profitability by minimizing excess inventory and streamlining processes. The digital revolution has significantly transformed SCM by enabling real-time visibility, data-driven decision-making, and the application of advanced technologies like blockchain, artificial intelligence, and the Internet of Things (IoT) to optimize various aspects of the supply chain.

As supply chains extend across borders and continents, supply chain professionals are tasked with addressing global challenges such as geopolitical uncertainties, environmental sustainability, and ethical considerations. Success in supply chain management demands a holistic approach, where collaboration, adaptability, and innovation play crucial roles in ensuring the efficient movement of goods and services from source to destination.

popular case study to introduce Supply chain management

One of the most iconic and frequently studied case studies in the realm of supply chain management is that of **Apple Inc.** and its revolutionary approach to managing its supply chain. Apple's success story is not only a testament to innovative product design and marketing but also to a meticulously crafted supply chain strategy that has played a significant role in the company's meteoric rise to become one of the world's most valuable and recognized brands.

Apple's supply chain management strategy is characterized by several key elements:

Vertical Integration: Apple's supply chain is renowned for its vertical integration, with the company owning and controlling many aspects of its production process. This includes designing its own processors, manufacturing its devices through contracted manufacturers like Foxconn, and even operating its own retail stores**.**

Supplier Relationships: Apple maintains close relationships with its suppliers, often working collaboratively on innovations and sharing risks. This approach has led to a tightly

integrated network that enables swift adjustments to changes in demand and technological advancements.

Demand Forecasting: Apple excels in demand forecasting, gathering data from a wide array of sources such as online orders, retail store sales, and even social media trends. This information helps the company anticipate demand fluctuations accurately and adjust production accordingly.

Lean Inventory Management: Despite having a diverse product portfolio, Apple is known for keeping relatively low levels of inventory. This approach reduces the risk of overstocking and minimizes the need for excessive storage space.

Global Distribution: Apple's products are manufactured in different parts of the world, allowing the company to take advantage of cost efficiencies and access specialized expertise. Its distribution centers are strategically located to ensure timely delivery to different markets.

Product Launch Coordination: Apple's supply chain prowess is perhaps most evident during product launches. The company manages to coordinate global releases seamlessly, ensuring that its products are available in numerous countries simultaneously, creating hype and demand.

The Apple supply chain case study serves as an inspiration for companies seeking to optimize their supply chain operations. It highlights the importance of strategic integration, innovation, supplier collaboration, demand sensing, and risk management in creating a resilient and efficient supply chain capable of supporting rapid growth and market dominance.

Case study II - Automobile sector

he automobile industry provides another compelling case study in supply chain management, and one of the standout examples is Toyota's approach to supply chain optimization, famously known as the Toyota Production System (TPS) or Lean Manufacturing.

Toyota's Lean Manufacturing: A Supply Chain Success Story

Toyota's approach to supply chain management is centered around the concept of "lean," which aims to eliminate waste, optimize efficiency, and enhance value for customers. Here are key principles of Toyota's supply chain strategy:

Just-In-Time (JIT) Manufacturing: Toyota pioneered the concept of JIT, where materials and components are delivered to the assembly line precisely when they are needed. This minimizes inventory holding costs and reduces the risk of overproduction.

Continuous Improvement (Kaizen): Toyota emphasizes a culture of continuous improvement. Employees at all levels are encouraged to identify and solve problems, leading to incremental enhancements in processes, quality, and efficiency over time.

Pull Production System: Instead of pushing products through the production process based on forecasts, Toyota uses a pull production system. Products are produced based on actual customer demand signals, minimizing the risk of producing excess inventory.

Standardized Work: Toyota places great importance on standardizing work processes and tasks. This ensures consistent quality, reduces errors, and allows for easier identification of issues in the production process.

Supplier Collaboration: Toyota maintains strong relationships with its suppliers, often involving them in the early stages of product development. This collaboration helps in aligning production capabilities with design requirements and reducing lead times.

Multi-Skilled Workforce: Employees are trained to be versatile and multi-skilled, capable of performing various tasks within the production process. This flexibility enables smoother operations and efficient resource allocation.

Toyota's approach to supply chain management has not only led to remarkable cost savings and operational efficiencies but has also been a driving force behind the company's reputation for producing high-quality, reliable vehicles. The Toyota Production System has been widely studied and adopted by companies across industries as a model for achieving lean and efficient supply chain operations.

This case study underscores the significance of minimizing waste, fostering a culture of continuous improvement, and building strong supplier relationships in achieving supply chain excellence, especially in industries where efficiency, precision, and customer satisfaction are paramount.

Case study III – IT sector

An interesting case study in the IT sector is Amazon's innovative supply chain management strategy, which has been a significant contributor to the company's rapid growth and dominance in the e-commerce industry.

Amazon's Fulfillment and Distribution Network: A Supply Chain Innovation

Amazon's supply chain management is built around speed, efficiency, and customer satisfaction. Here are some key elements of Amazon's supply chain strategy:

Fulfillment Centers: Amazon operates a vast network of fulfillment centers strategically located near major population centers. These centers house a wide range of products and utilize advanced robotics and automation to pick, pack, and ship orders quickly.

Two-Day Shipping: Amazon Prime's promise of two-day shipping has become a hallmark of the company's supply chain strategy. The company invested heavily in building infrastructure and partnerships to enable this level of speedy delivery for its Prime members.

Predictive Analytics: Amazon leverages sophisticated data analytics and machine learning algorithms to predict customer preferences and demand patterns. This helps the company stock products in its fulfillment centers based on anticipated demand, reducing delivery times.

Multi-Channel Distribution: Amazon's distribution strategy is not limited to its own website. The company allows third-party sellers to use its platform for sales, enabling a diverse array of products to be available to customers.

Dynamic Pricing: Amazon uses dynamic pricing algorithms to adjust prices based on factors such as demand, competitor prices, and inventory levels. This allows the company to optimize revenue while remaining competitive.

Last-Mile Delivery: Amazon is experimenting with innovative delivery methods, including drone delivery and Amazon Lockers, to improve the last-mile delivery experience for customers.

Supply Chain Visibility: Amazon provides end-to-end supply chain visibility to its customers, allowing them to track the status of their orders in real-time. This transparency builds trust and customer loyalty.

Amazon's supply chain strategy is characterized by its relentless focus on speed, convenience, and customer-centricity. The company's investments in technology, logistics infrastructure, and data analytics have not only transformed the e-commerce landscape but have also set new standards for supply chain management across industries.

This case study underscores the importance of leveraging technology, data analytics, and customer insights to create an efficient and customer-focused supply chain in the IT sector. It also demonstrates the power of innovation in shaping competitive advantage and redefining customer expectations.

Case study IV – Education sector
An example of supply chain management in the education sector can be seen in the operations of a university or educational institution that offers online courses or programs.

Online Education Platform: A Supply Chain Perspective

In the context of online education, the supply chain involves the process of designing, developing, and delivering courses to students through digital platforms. Here's how supply chain management principles apply in this scenario:

Course Development: Similar to product development in traditional supply chains, course development involves designing the curriculum, creating educational content, and developing assessments. The curriculum is designed to meet learning objectives and the needs of the target audience.

Content Creation: Just as suppliers provide raw materials, content creators, educators, and instructional designers act as suppliers of educational content. Their contributions are critical in shaping the quality and effectiveness of the educational experience.

Quality Assurance: Like quality control in manufacturing, quality assurance in education ensures that courses meet academic standards and deliver a valuable learning experience. Peer reviews, assessment validation, and continuous improvement are part of this process.

Platform and Technology: The educational platform and technology infrastructure act as the distribution channels in the supply chain. This includes the Learning Management System (LMS), video conferencing tools, assessment platforms, and more.

Logistics: Just as products need to be shipped to distribution centers, digital course materials need to be uploaded and managed on the online platform. This involves uploading videos, presentations, assignments, and other learning resources.

Student Engagement: Student engagement and interaction are akin to customer engagement in traditional supply chains. Online discussions, live sessions, and student support services create an interactive and engaging learning experience.

Assessment and Feedback: Similar to post-purchase feedback in traditional supply chains, assessments and student feedback help evaluate the effectiveness of courses and identify areas for improvement.

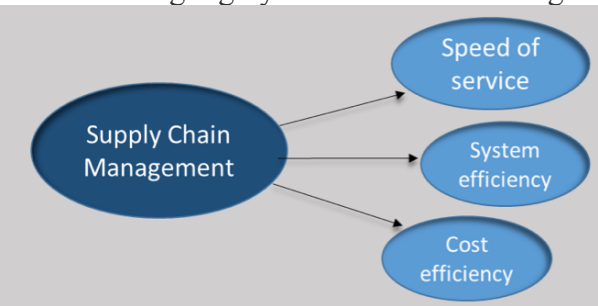
Data Analytics: Data analytics plays a role in understanding student behavior, engagement patterns, and learning outcomes. This information informs decisions on course design, content enhancement, and student support.

In the education sector, supply chain management principles are adapted to create efficient, effective, and engaging learning experiences for students. Institutions must carefully manage the sourcing, development, distribution, and evaluation of educational content while maintaining a strong focus on student satisfaction and learning outcomes. This example highlights how supply chain management concepts can be applied to a non-traditional setting, demonstrating the versatility of these principles across industries.

In 1982, Keith Oliver, a consultant at Booz Allen Hamilton introduced the term "supply chain management" to the public domain in an interview for the Financial Times. In 1983 WirtschaftsWoche in Germany published for the first time the results of an implemented and so called "Supply Chain Management project", led by Wolfgang Partsch.

In the mid-1990s, more than a decade later, the term "supply chain management" gained currency when a flurry of articles and books came out on the subject. Supply chains were originally defined as encompassing all activities associated with the flow and transformation of goods from raw materials through to the end user, as well as the associated information flows. Supply-chain management was then further defined as the integration of supply chain activities through improved supply-chain relationships to achieve a competitive advantage.

Corporations of the world rely on supply chains when fulfilling their business and IT goals each year. Supply chain processes affect both the speed and efficient service delivery of a company. Speed and efficiency factors cost money, so it is very important to strike a balance between being highly efficient and adhering to cost reduction strategies.



Supply chain management (SCM) is critical to a company's procurement to production lifecycle; however, it is not highly publicized. With the advent of emerging technologies such as cloud computing, big data and more, the need for a SCM system is becoming more prominent. An efficient SCM system is crucial for almost all industries to run their businesses uninterruptedly, including the federal government.

Supply chain Vs Supply chain management

A supply chain, as opposed to supply-chain management, is a set of organizations directly linked by one or more upstream and downstream flows of products, services, finances, or information from a source to a customer. Supply-chain management is the management of such a chain.

A supply chain is the connected network of individuals, organizations, resources, activities, and technologies involved in the manufacture and sale of a product or service. A supply chain starts with the delivery of raw materials from a supplier to a manufacturer and ends with the delivery of the finished product or service to the end consumer.

SCM oversees each touchpoint of a company's product or service, from initial creation to the final sale. With so many places along the supply chain that can add value through efficiencies

or lose value through increased expenses, proper SCM can increase revenues, decrease costs, and impact a company's bottom line.

A supply chain basically has three key parts:

i. Supply:

It focuses on the raw materials supplied to manufacturing-, including how, when, and from what location.

ii. Manufacturing:

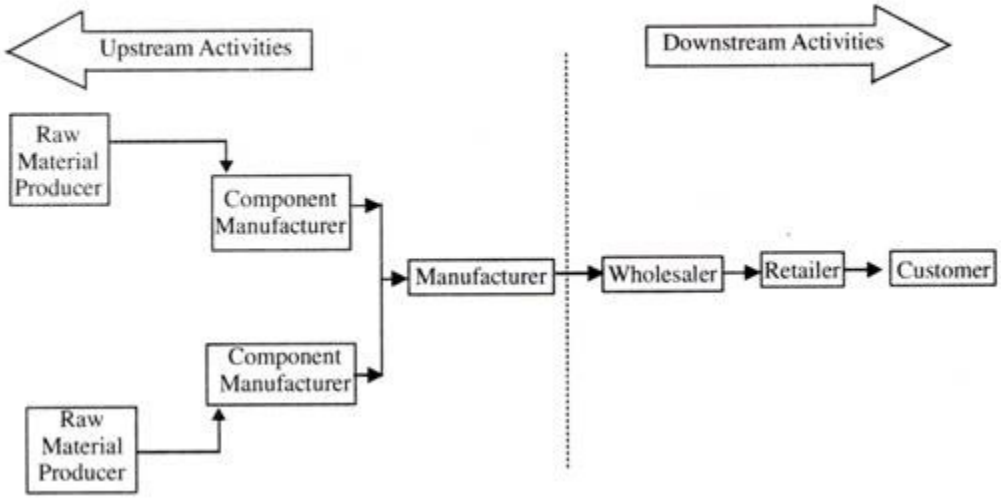
It focuses on converting these raw materials into finished products.

iii. Distribution:

It focuses on ensuring that these products reach the consumers through an organized network of distributors, warehouses, and retailers.

Figure 16.1

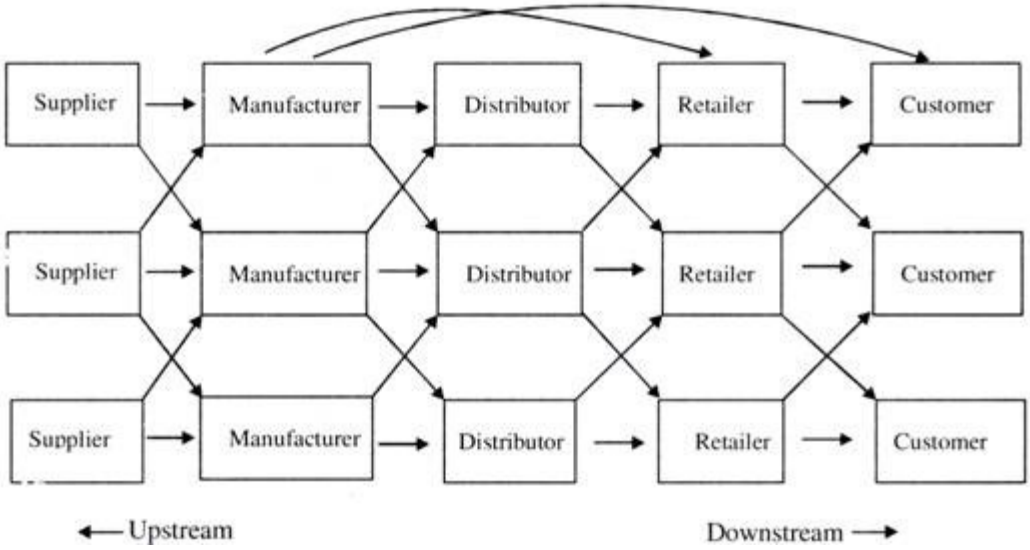
A Typical Supply Chain



Though often applied to manufacturing and consumer products, a supply chain can also be used to show how various processes supply to one another (figure 16.2). The supply chain definition in this sense can apply to Internet technology, finance, and many other industries.

A supply chain strategy defines how the supply chain should operate in order to compete in the market. The strategy evaluates the benefits and costs relating to the operation. While a business strategy focuses on the overall direction a company wishes to pursue, supply chain strategy focuses on the actual operations of the organization and the supply chain that will be used to meet a specific goal.

Figure 16.2
A Network of Supply Chains



Concepts of Supply Chains

Historically built on Procurement, Operations and Logistics foundations; Supply Chain Management exceeds these traditional concepts. Supply Chain Management is involved with **integrating three key flows**, between the different stages, across the boundaries of the companies:

λ Flow of Product/materials,
λ Flow of information and,
λ Flow of Funds

SCM is involved with integrating three key flows, between the different stages, across the **Product/Materials:** This is the most obvious and visible part of the supply chain. Physically,λboundaries of the companies: the flow manifests itself in the form of goods and services. This is also called the 'value flow'. Goods and service flows follow a similar sequence.

Example: Goods flows constitute raw materials (including material being transported), work in process, finished goods, and spares, and reverse flows due to returns, rework or recycling of the goods. The vendor side of these flows is called 'upstream' and the flows towards the customer are referred to as 'downstream'.

Flow of information: Information flows allow the various supply chain partners to coordinate their long-term plans, and to control the day-to-day flow of goods and material to the supply chain. It consists of flows both from vendor to the customer and from the customer to the vendor. The **downstream flow of information** has important components like capacity estimates for plans, stocks available, dispatch advices, stock transfer notes, quality assurance reports, warranties, etc. The **upstream components of information** flow are inputs for forecasts, marketing plans, dispatch plans, production plans and procurement

Funds: This is the commercial part of the supply chain, and runs counter to the direction of quantities and timing, orders from customers and dealers, quality feedback, and warranties. the value flow. It reflects the money paid with respect to the transfer of title and/or service delivery in the supply chain. Other features of cash flow are credit periods/advances for payments from customers/dealers, and to vendors. The cash flow determines how the value flow is financed by the various actors in the supply chain.

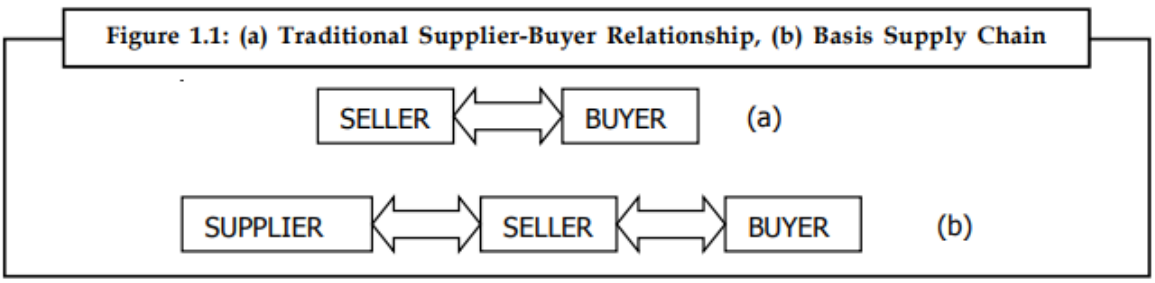
Members of the supply chain act as partners who are "linked" together through both physical and information flows. It is this that makes an effective supply chain. The flows that involve the transformation, movement, storage of goods and materials and money are called 'physical flows'. These flows are easily visible.

The physical flows are reinforced by information flows. Information flows are used by the various supply chain partners to coordinate their long-term plans, as well as efficiently control the day-to-day flow of goods and material to the supply chain. In essence, the supply chain enables the flow of products, services, and information goes both up and down the chain. Successful integration or coordination of these three flows produces improved efficiency and effectiveness for business organizations.

'Supply Chain Management' can be defined as the active management of supply chain activities to maximize customer value and achieve a sustainable competitive advantage. It represents a conscious effort by the supply chain firms to develop and run supply chains in the most effective and efficient ways possible.

There can be various types of supply chains. There is a basic supply chain, and an extended supply chain. The definition of a **basic supply chain** is: a set of three or more companies directly linked by one or more of the upstream or downstream flows of products, services, finances and information from a source to a customer. An **extended supply chain** includes suppliers of the immediate supplier and customers of the immediate customer, all linked by one or more of the upstream and downstream flows of products, services, finances, and information.

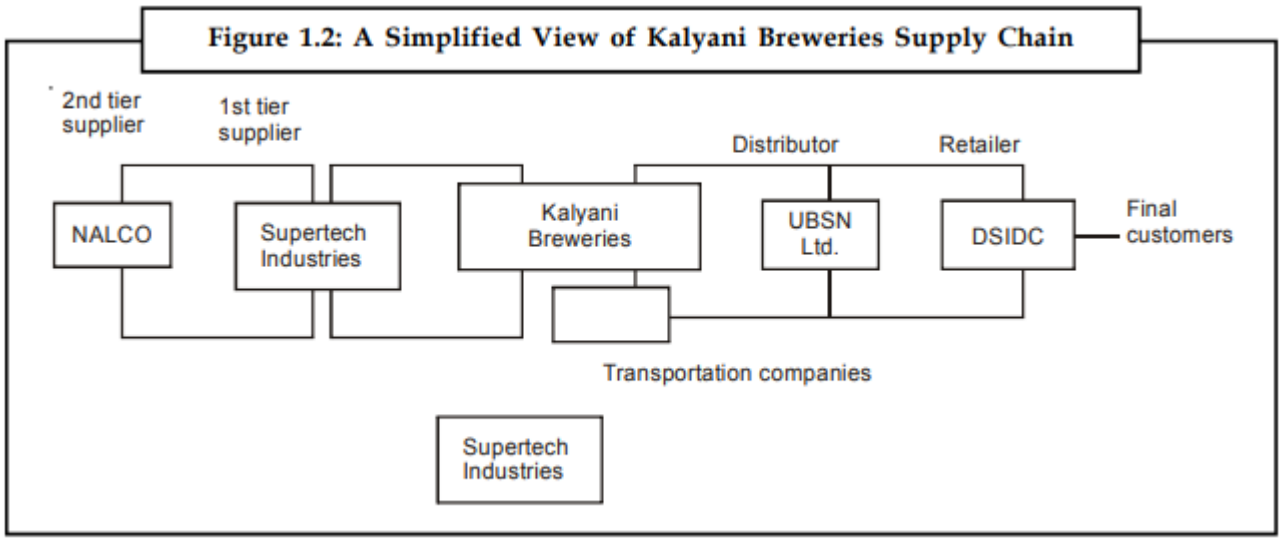
Figure 1.1: (a) Traditional Supplier-Buyer Relationship, (b) Basis Supply Chain



Source: Upendra Kachru (2010), "Exploring the Supply Chain," Excel Books

Figure 1.1 shows a traditional seller-buyer relationship (a) and a basic supply chain (b). An extended supply chain is the supply chain shown in Figure 1.2. An extended supply chain consists of a number of relationships. These are called tiers.

The simplified version of the supply chain of Kalyani Breweries, exemplifies this.



Source: Upendra Kachru, (2010), "Exploring the Supply Chain," Excel Books

For the product to reach a typical customer who goes to the shop to buy beer, these linkages and the steps necessary to bring the product to him are not probably apparent.

Example: Take Cans

National Aluminum (NALCO) extracts the aluminium ore and converts it into aluminium metal. The aluminium metal is shipped to Supertech Industries at Bangalore, who convert the aluminium into cans. Supertech Industries supplies cans to Kalyani Breweries. As Supertech Industries supplies directly to Kalyani Breweries, it is a first-tier supplier in the supply chain. Using the same logic, NALCO is a second-tier supplier. It is the supplier of a supplier. The beer is produced from other raw materials, such as barley, hops, yeast, and water. Aluminium cans from Supertech Industries used to contain the product and combined with cartons, to produce the packaged beverage. Kalyani Breweries then sells the packaged beverage to UBSN Ltd., the distributor, who in turn sells the finished good to retailers like DSIDC. Transport carriers, who move the inputs and outputs from one place to the next along the supply chain, provide the logistic support. In the example given, we see that goods and information flow travels both ways. In other words, members in a supply chain are both customers and suppliers, with respect to these flows.

Example: Supertech Industries places an order (information) with Nalco, who in turn ships aluminium (product) to Supertech Industries.

Supertech Industries is, therefore, a customer to Nalco and a supplier to Kalyani Breweries. We can visualize an extended relationship where Kalyani Breweries returns empty pallets or containers to its first-tier suppliers. This would result in a flow of physical goods back up the supply chain. If this happens, Kalyani Breweries becomes a supplier to Supertech Industries. This is in addition to its being the customer. An organization can be part of numerous supply chains. This follows from the definition given earlier.

For any supply chain, there is only one source of revenue: the customer. At DSIDC, a customer purchasing beer is the only one providing positive cash flow for the supply chain. All other cash flows are simply fund exchanges that occur within the supply chain given that different stages have different owners. When DSIDC pays its supplier, it is taking a portion of the funds the customer provides and passing that money onto the supplier. It is all these flows – information, products, or funds - that generate the costs within the supply chain. The

appropriate design of the supply chain will depend on both the customer's needs and the role of the stages involved. This relationship reflects a single strand in the supply chain.

In a typical supply chain, there are many more participants than the ones – Kalyani Breweries has hundreds of suppliers who provide barley, hops, yeast, cartons, etc. It also has a large extended network of retailers throughout the country whose number is even higher. Regardless of the number and different types of suppliers a firm uses to satisfy its requirements, the overall structure and its essential interfaces and control processes have to be identified, irrespective of how vast and complex the system is. Any operation or facility in one supply chain arrangement may also be a part of different supply chains.

Example: As was mentioned earlier, Dabur is a part of the supply chain for consumer care products, consumer health products, food products, and home products. A supplier typically participates in numerous different supply chains, which may involve a wide variety of industries and customers. In the case of the mail order business, such as Amazon.com, the company maintains an inventory of product from which it fills customer orders. In the case of retail stores, the supply chain may also contain a wholesaler or distributor, the store and, the manufacturer. The final consumer is always considered a member of the supply chain. There can be many types of supply chains.

Example: A third-party logistics (3PL) provider may be a member of two supply chains where it is performing the logistics activities between companies that conventionally compete with each other. An example of an even more complex relationship could be the case of **Reliance Communications.** Reliance Communications might find Nokia to be a customer in one supply chain, a partner in another, a supplier in a third, and a competitor in still a fourth supply chain. This multiple supply chain phenomenon also explains the complex nature of the network created by many supply chains.

In large enterprises, like Dabur, involved in marketing a broad product line to numerous customers – engaging in basic manufacturing and assembly, and procuring materials and components on a global basis, the supply chain is very complex. However, **for any supply chain, there is only one source of revenue, the customer.** Logically, the sources of cost are all flows of information, product, or funds. Thus, the appropriate management of these flows is a key to supply chain success. The conceptual framework of a supply chain is shown in Figure 1.3

In evaluating the success of the supply chain, the links between the manufacturer and the retailer have to function at a desired level. Even when the performance at earlier stages of the supply chain is outstanding, this is not important – if the product is not available to support retail sales. This is because the end customer is the only source of revenue for the supply chain and the linkage is the ultimate test to the success of the supply chain.

The **basic objective of Supply Chain Management is to maximize the supply chain profitability.** A more successful supply chain will, therefore, have higher profitability. The profitability of a supply chain is the difference between what the customer pays for the final product and the costs the supply chain expends in filling the customer's request.

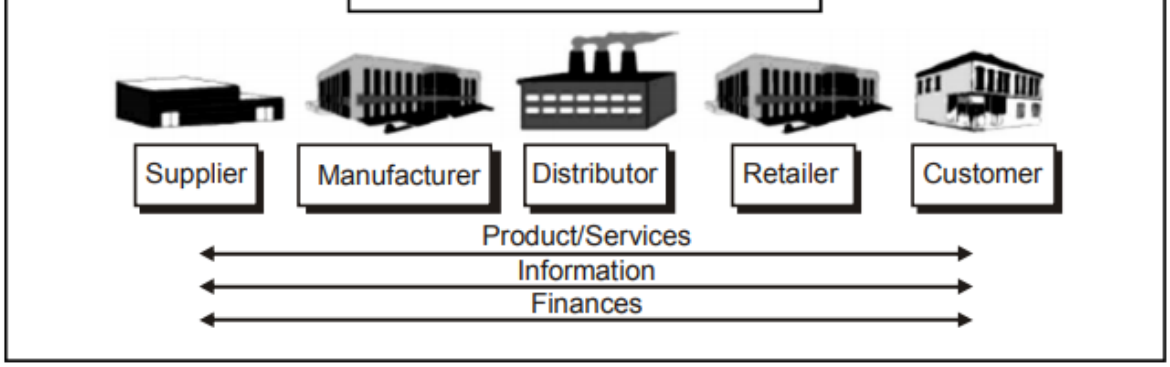
FMCG major Hindustan Lever has **reduced its inventory** from about 45 days to less than 5 days; Mahindra & Mahindra has been able to reduce its inventory by 20-50 days, while in

LG's case, the reduction has been around 30 days. These companies attribute a significant part of their success to the way they manage the operations of their supply chain.

Generalised Supply Chain Model

The general concept of an integrated supply chain is typically illustrated by a line diagram that links participating firms into a coordinated competitive unit. A conventional supply chain is shown in Figure 1.4. It is a chain of firms that are involved in providing a product or service, each firm performing its own functions that begins activities with a customer order and ends when a satisfied customer has paid for his or her purchase. Generally, more than one player is involved at each stage. A manufacturer may receive materials from several suppliers and then supply several distributors. Thus, most supply chains are actually networks.

Figure 1.4: The Supply Chain



Source: Upendra Kachru, (2010), "Exploring the Supply Chain," Excel Books

Though many stages are shown in the Figure 1.4, each stage need not be present in a supply chain. The number of stages included should meet the primary purpose for the existence of the supply chain, i.e. is to satisfy customer needs.

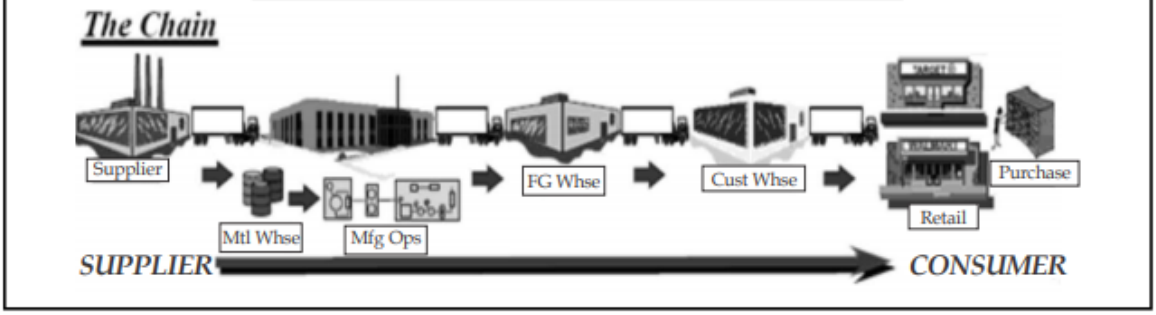
It is in the process that the organization generates profits for itself. A typical supply chain may involve a variety of stages.

These supply chain stages include:

λ Component/Raw material suppliers
λ Manufacturers
λ Wholesalers/Distributors
λ Retailers
λCustomers

In materials management, most participants performed as buyers and sellers independently of other firms supplying to the buyer. Supply chain management differs in the sense that its efforts involve individual firms taking steps to improve the flow of information with its suppliers and reduce the variation in business processes and practices between the firms that form the supply chain. In essence, the supply chain concept tries to make each participant in the chain more efficient by coordinating their efforts towards a common goal. A lot of interaction and trust between companies is required to make the supply chain work. In that respect, it is significantly different from materials management.

Figure 1.5: Different Stages of a Supply Chain



Source: Upendra Kachru (2010). "Exploring the Supply Chain". Excel Books.

Consider the supply chain shown in Figure 1.5. The component supplier after making the component sends the material to the material warehouse. From the material warehouse, the material goes to the manufacturer. After completion of manufacturing operations, the material goes to the finished goods warehouse, where it is transferred to the customer warehouse on receipt of an order. From the customer warehouse, the product moves to the retail outlet, from where it is purchased by the customer. This is basically what the philosophy of the supply chain management recognizes. Without the retail store, the supplier does not make any profit and without the supplier, the retail store has no business. In either case, the customer gets no value. But what does this mean in terms of the supply chain? Firstly, every product that reaches an end user represents the cumulative effort of multiple organizations. And secondly, organizations have to pay attention to what is happening outside their "four walls" and manage the entire chain of activities that ultimately delivers products to the final customer in order to maximize profits. This means that the supply chain philosophy extends the concept of partnerships into a set of beliefs that each firm in the supply chain directly and indirectly affects the performance of all the other supply chain members. It also affects the ultimate, overall channel performance. This philosophy recognizes that the purpose of supply chain management is to improve customer value and satisfaction. It directs supply chain members to focus on developing innovative solutions to create unique, individualized sources of customer value.

Definition of Supply chain Management

Supply chain management (SCM) is the active management of supply chain activities to maximize customer value and achieve a sustainable competitive advantage. It represents a conscious effort by the supply chain firms to develop and run supply chains in the most effective & efficient ways possible. Supply chain activities cover everything from product development, sourcing, production, and logistics, as well as the information systems needed to coordinate these activities.

The concept of Supply Chain Management (SCM) is based on two core ideas:

1. The first is that practically every product that reaches an end user represents the cumulative effort of multiple organizations. These organizations are referred to collectively as the supply chain.
2. The second idea is that while supply chains have existed for a long time, most organizations have only paid attention to what was happening within their "four walls." Few businesses understood, much less managed, the entire chain of activities that ultimately delivered products to the final customer. The result was disjointed and often ineffective supply chains.

Other commonly accepted definitions of supply-chain management include:

- The management of upstream and downstream value-added flows of materials, final goods, and related information among suppliers, company, resellers, and final consumers.
- The systematic, strategic coordination of traditional business functions and tactics across all business functions within a particular company and across businesses within the supply chain, for the purposes of improving the long-term performance of the individual companies and the supply chain as a whole[18]
- A customer-focused definition is given by Hines (2004:p76): "Supply chain strategies require a total systems view of the links in the chain that work together efficiently to create customer satisfaction at the end point of delivery to the consumer. As a consequence, costs must be lowered throughout the chain by driving out unnecessary expenses, movements, and handling. The main focus is turned to efficiency and added value, or the end user's perception of value. Efficiency must be increased, and bottlenecks removed. The measurement of performance focuses on total system efficiency and the equitable monetary reward distribution to those within the supply chain. The supply-chain system must be responsive to customer requirements.
- The integration of key business processes across the supply chain for the purpose of creating value for customers and stakeholders

How Supply Chain Management Works

Typically, SCM attempts to centrally control or link the production, shipment, and distribution of a product. By managing the supply chain, companies are able to cut excess costs and deliver products to the consumer faster. This is done by keeping tighter control of internal inventories, internal production, distribution, sales, and the inventories of company vendors.

SCM is based on the idea that nearly every product that comes to market results from the efforts of various organizations that make up a supply chain. Although supply chains have existed for ages, most companies have only recently paid attention to them as a value-add to their operations.

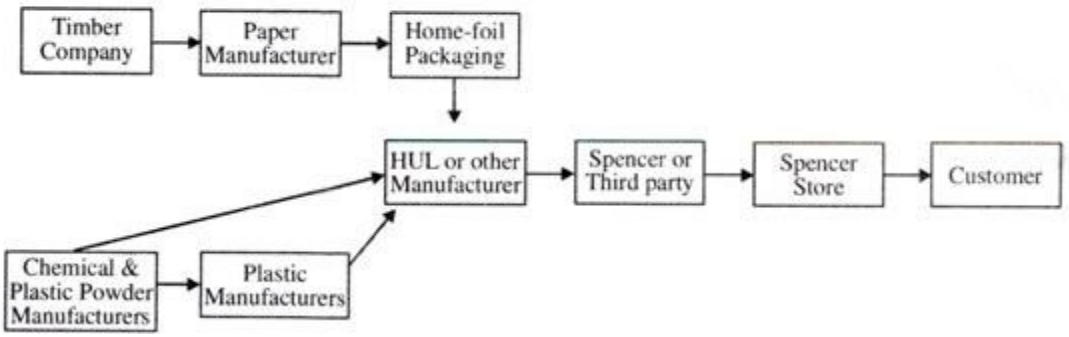
In SCM, the supply chain manager coordinates the logistics of all aspects of the supply chain which consists of five parts:

- The plan or strategy
- The source (of raw materials or services)
- Manufacturing (focused on productivity and efficiency)
- Delivery and logistics
- The return system (for defective or unwanted products)

The supply chain manager tries to minimize shortages and keep costs down. The job is not only about logistics and purchasing inventory. According to Salary.com, supply chain managers, "make recommendations to improve productivity, quality, and efficiency of operations."
Improvements in productivity and efficiency go straight to the bottom line of a company and have a real and lasting impact. Good supply chain management keeps companies out of the headlines and away from expensive recalls and lawsuits.

Example of SCM
There are many examples of prosperous companies that have correctly developed the supply change management concept and that enforce efficient practices. These are some examples.
Consider a customer walks into Spencer Store to purchase beauty soap. The supply chain begins with the customer and his need for beauty soap. The next stage of this supply chain is the Spencer retail store where the customer visits. Spencer stocks its shelves using inventory that may have been supplied from a finished goods warehouse managed by Wal-Mart or received from third party (vendor). The vendor in turn is stocked by the manufacturer [say Hindustan Uni Liver (HUL)].
The HUL manufacturing plant receives raw material from a variety of suppliers who may themselves have been supplied by lower tier suppliers. For example, packaging material may come from Home- foil (an aluminum foil company) while Home-foil receives raw material to manufacture the packaging material from other suppliers. This forms a typical supply chain.

Figure 16.3
Stages of a beauty soap supply chain



In another example, a customer purchases a wrist watch and traveling bag online from Reliance retail. The supply chain includes, among others, the customer Reliance Website that accepts the customer's order, the Reliance store, and all of Reliance's suppliers and their suppliers.
The Reliance Website provides the customer with information regarding pricing, product features, and product availability. After selecting the product, the customer clicks on 'order form' and pays for the product. The customer may later return to the Website to check the status of the order.

The Coca-Cola Company.
Main makers, marketers and distributors of drink concentrates and non-alcoholic syrups. The main office is located in Atlanta, GA but their products are distributed to virtually every country in the world. Their preparation, distribution and transportation logistics are in line with a segmentation strategy for their customers when it comes to the size and presentation of their products. **Aside from having an extremely successful supply chain, Coca-Cola participates in sponsorships, partnerships, and alliances; thus creating a great management and marketing of their products.**
Colgate.
The main toothpaste brand made by Colgate-Palmolive, dedicated to producing, distributing and selling oral hygiene and home cleaning products since the last part of the 19th century. Colgate keeps present all aspects of product diversity, effectiveness, optimization and

customer support and it uses an effective distribution channel that encompasses all aspects of care and maintenance. **Their products are sold in many venues such as pharmacies, supermarkets, convenience stores and small wholesalers, thus creating an excellent impact within their distribution channels and management.**

7-Eleven.

Image courtesy of Mike Mozart at Flickr.com

7-Eleven is an international chain of convenience stores, based out of Dallas, Texas. The currently have around 58.308 in 16 different countries, most of them franchises. They are mainly focused on selling basic food items, medicine and toiletries and magazines, but this all depends on their host country. Their main stores are located throughout the United States and Asia. **They supply a huge variety of customer needs 24 hours a day in most locations. Their reach, capacity and management have made 7-Eleven one of the biggest and most productive companies in the world.**

Zara.

Zara is one of the main clothing and accessory retailers internationally based in Spain. **They are mainly focused on new, trendy and cutting edge fashion for men and women alike. Currently it operates in 88 different markets worldwide, their main distributors are in Madrid and Zaragoza**. Zara is known for its energy saving efforts and techniques, as well as their minimization and efficient waste management. This commitment with the environment is paramount within their operations across all plants and departments and has helped create a collective conservation consciousness among members of the staff. In their fabrics, they used environmentally friendly fabrics like organic cotton amongst others. Their textile production comes from Spain, the Far East, India and Morocco. Biodiesel fuel is used to transport their products, according to their environmental policies. The have a great concern for animal treatment and under no circumstances, use animal products that come from animals that were not treated ethically or sacrificed for the sole purpose of commercializing their leather, skin, horns, feathers, etc. While other retailers use third-party production, Zara produces about 60% of the fabrics they use and use cutting-edge technology to cut and measure the handling of fabric so this is done in a precise and efficient manner, thus reducing waste overall.

Amazon.

Image courtesy of Robert Scoble at Flickr.com

Amazon is a US electronic commerce and cloud computing company. Their headquarters are based in Seattle, Washington and they are the largest internet-based retailer in the United States. Amazon was one of the first companies that started selling book online. Currently their range of products doesn't stop there; they also sell music, videogames, shoes, clothing, luggage and many other accessories. Amazon offers about everything you can think of and their variety in offers and products along with their customer driven shopping and recommendations is a hit with customers. One of the reasons why Amazon can have such a wide spectrum of products is the fact that they are not limited by physical spaces, since they don't have actual stores. **Their supply chain goes from the lowest levels of inventory, through the logistics of the order itself all they way up to an outstanding distribution chain of their products in an international scale.** Amazon can currently ship close to 10 million different products. This diversity gives it an edge against competitors and makes it a perfect example of what efficient supply chain management can accomplish.

Understanding the importance of SCM to its business, Walgreens Boots Alliance Inc. placed focused effort on transforming its supply chain in 2016. The company operates one of the

largest pharmacy chains in the United States and needs to efficiently manage and revise its supply chain so it stays ahead of the changing trends and continues to add value to its bottom line.
As of July 5, 2016, Walgreens has invested in the technology portion of its supply chain. It implemented a forward-looking SCM that synthesizes relevant data and uses analytics to forecast customer purchase behavior, and then it works its way back up the supply chain to meet that expected demand.
For example, the company can anticipate flu patterns, which allow it to accurately forecast needed inventory for over-the-counter flu remedies, creating an efficient supply chain with little waste. Using this SCM, the company can reduce excess inventory and all of the inventories' associated costs, such as the cost of warehousing and transportation.

CASE STUDY: Supply Chain Management of Dabbawala

Source: Upendra Kachru, (2010), "Exploring the Supply Chain," Excel Books

As the story of the semi-literate tiffin-wallahs shows, a world-class supply chain basically requires the coordination of information and activities from the housewife (she supplies the tiffin and is considered as the supplier in the supply chain context) to the householder (he receives the tiffin and is the client), trust between the tiffin-wallahs (firms) and management of relationships (NMTBSCT). How does this supply chain system work? The tiffin is filled with lunch at the client's kitchen by the housewife and kept outside the door of the residence at 8.25 a.m. At 8.30 a.m., the tiffin-wallah arrives, picks up the tiffin and moves on, knocking at the door only if the tiffin is not seen. Under normal circumstances, there is no interaction with any member of the client's household. By 8:38 a.m. the tiffin is placed on the bicycle or pushcart together with tiffins collected from other customers.

Bicycles and pushcarts drawn by individual tiffin-wallahs arrive from various collection centres to the suburban railway station by 9:20 a.m. At the stations, the sorting operation begins with tiffins sorted according to destinations and placed in cartages that are specific to each destination. The cartages come in two standard sizes, accommodating 24 and 48 tiffins each. This is completed by 9:41 a.m., when the suburban train arrives. The cartages, normally numbering 5-6, are loaded into the special compartment located next to the driver's cabin. The train arrives at one of the major hubs by 10:21 a.m. The cartages are unloaded and bundled with those arriving from other collection centres. They are resorted according to destinations. By 11:05 a.m., the cartages are located into the suburban train for onward journey to the final destination terminals. When the suburban train reaches the terminal station, cartages are unloaded and tiffins are resorted, now according to specific delivery routes. By 12:10 p.m., the tiffins are placed in destination-specific cartages and hitched, typically onto bicycles or pushcarts for delivery to individual clients and delivered at the doorstep of the client's workplace, at the latest by 12:30 p.m. The delivery process is reversed in the afternoon. The empty tiffin is picked up between 1:15 p.m. and 2:00 p.m. for its return to the client's home early that evening (e.g. by 5:30 p.m.). As will be apparent, the whole operation is a marvel of product movement (through coordination, trust, multi-tasking and role changes) and perfect exchange of information (through the coding system, rail timings, and knowledge of Mumbai's geography) – this is a perfect supply chain.
The supply chain is about information use and it is about product movement. There are three key areas of focus: (a) Proper information use, (b) Proper product movement, and (c) Proper relationship management. Factors that assist in enhancing information use, relationships, or product movement, help in improving and creating excellence in the supply chain

Case Study 2

Example: Dell and Wal-Mart have been the pioneers in this concept of Supply Chain Management. They reflect some of the most successful examples of effective supply chain management. What is interesting is that they have created world-class supply chains by tackling the 'Forrester Effect' from different ends. Dell has been a pioneer in the build-to-order ('pull') cycle i.e. reducing forecasting based demand uncertainty, and Wal-Mart has been a pioneer in the use of information flow to reduce demand uncertainty. Dell Computers builds-to-order, i.e. a customer order initiates manufacturing at Dell. Dell does not have retailers, wholesalers, or distributors in its supply chain. While other computer companies must stock a month of inventory, Dell carries only a few days worth of stock. It plans orders and signals suppliers every two hours, which enables it to manufacture and deliver exactly what its customers want. In fact, many of the components are delivered to Dell within a few hours of assembly and shipped to the customer. The success of Wal-Mart is drawn from new technologies combined with new ways of doing business. It has used the power of information flow to create a global supply chain designed down to the last atom of efficiency. Automated replenishment and the smooth functioning of the Wal-Mart supply chain depend on reliable connectivity between the stores, the centralized database, and the distribution centres. The Wal-Mart network connects more than 2,400 stores, 100 distribution centres worldwide, and 950,000 Wal-Mart associates.

The Basics of Supply Chain Management Processes

There are key supply chain processes that you must take into consideration to effectively understand and manage them. These processes are all at play regardless of the type of supply chain you're using.

Customer relationship management (CRM) comes first, because as the principles of SCM state, you must adapt everything in the supply chain to the customer. If no one is buying, there's no need to produce anything. At the front of your supply chain, where a store's staff interacts with its consumers, they must have plans in place for ongoing relationships. They need CRM tools to gather customer information for marketing and market research, all to determine the products and services to offer in the future.

Customer service management is another process that ties in, as it is where you gather negative and positive feedback to determine future needs.

Demand management is closely linked with the previous two, as it takes customer interactions and orders into account to determine the workload all the way up the supply chain. At its core, customers buying more means make more, and customers buying less means make less. Customer forecasting is an important task that analysts must perform well to determine the current demand and what it will be in the future, to prevent waste in the supply chain.

Product development is an important part of the supply chain that is informed by consumer demand. You must work with CRM and customer service data to determine what they want, which influences new products, product line extensions, and also what to stop making. You must integrate suppliers in this process because it affects cost, quality, and delivery time.

Supplier relationship management goes without saying - if you want to produce your products on time and on budget, you need a solid rapport with everyone you're outsourcing to

in the chain. This impacts **manufacturing flow management**, which ensures everything gets where it needs to go without delay, and at the correct spec.

Order fulfilment involves coordinating with distribution centers and either retail locations or 3PL to get the product direct to consumers. You've now made it all the way back to the beginning of the cycle, and need to pay attention to new CRM and customer service data.

Returns management, also known as the "reverse supply chain," is a vital part of the flow of products that doesn't fit perfectly into the clean supply chain cycle. It involves picking up online orders from 3PL locations or from consumers' addresses and accepting returns at retail locations. Once these items are put back into inventory, they must be ready to get to a different customer while the product run is still live.

Vital Supply Chain Management Concepts to Know

Having a passing familiarity with the following terms will help you see just what kind of skillset and abilities will be required when working in supply chain management:

Border Adjustment Tax: Also known as a destination-based cash flow tax (DBCFT), it is a tax levied on imported goods which is important to know in global supply chains.

Customer Relationship Management: Also known as CRM, this concept refers to providing ongoing service to customers and collecting data about their likes and purchases. There are also CRM tools that help automate and record interactions with customers.

Cumulative Mean: A figure for knowing how much or how little to produce in advance, involving mean orders with all previous data treated as equally useful.

Demand Management: Understanding customer behavior and patterns to control how much is ordered and produced at each link in the supply chain, with the goal of eliminating wasted production.

Financial Flows: Credit terms, payment schedules, accounts payable and receivable, and other factors that you must monitor to determine if a supply chain is profitable or not.

Information Flows: Transmission of orders, delivery status, and other data that influence the supply chain's responsiveness to demand.

Integrated SCM: This is a method of SCM wherein all of the links are tightly integrated, operating almost as one company rather than a loose association of buyers and sellers.

Inventory Management: Monitoring and controlling orders, storage, and use of owned components to create the products your company sells.

Lean Six Sigma: A data-backed philosophy of continuous improvement that focuses on preventing defects and mistakes rather than discovering them later, which reduces waste and production time via standardization.

Logistics: The physical movement of products from one link in the supply chain to the next, and the practice of improving their efficiency.

Make vs. Buy: A simple evaluation of whether it is more cost-effective and time-efficient to produce a required product with your company's existing resources, or to outsource the need.

New Product Development: The creation of new products both in response to and in anticipation of customer demand, using data gleaned from CRM and the whole supply chain.

Operational Accounting: Accounting for a company that focuses on planning, directing, and controlling of daily activities by their costs and eliminating waste.

Physical Flows: The actual movement of parts and products throughout the supply chain, which the Logistics team must manage and analyze to keep going without pause.

Project Management: The process and tools involved in ensuring that a codified piece of work (project or product) gets done on time while keeping all contributors aware of their next step.

Reverse Supply Chain: Aftermarket customer service, which may involve accepting returns, refurbishing and discounting, or otherwise finding use for the reacquired inventory.

Risk Management: Identifying, evaluating, and then choosing which risks to address first, with the goal of reducing overall risk in a supply chain.

S&OP: Sales and Operations Planning is a management process that aligns its constituent parts to ensure that the organization is only focused on operations that improve sales. Learn more about S&OP here.

Strategic Sourcing: Formalizing a company's information gathering in order to use its purchasing power to take advantage of the best values in the marketplace of suppliers.

Theory of Constraints: A methodology that identifies the largest limiting factor in production, then finding a way to remove it to improve the efficiency of the entire production.

Why do we need supply chain management?

We have an increased reliance on suppliers. Procurement happens in each and every aspect of an organization, from business needs to IT needs. Everything needed in a corporation is tied to suppliers and there will be a long list of suppliers in no time. The need to manage supplier relations, information, contracts and more grows rapidly while the need to follow regulations persists.

Organizations need a SCM system to establish streamlined supply chain management processes in order to realize the very best value from their spending through supplier analysis of cost, risk and performance. They need a SCM system to realize a 360-degree visibility into their supplier ecosystem.

Why is supply chain management important?

Supply chain management is important because it can help achieve several business objectives. For instance, controlling manufacturing processes can improve product quality, reducing the risk of recalls and lawsuits while helping to build a strong consumer brand. At the same time, **controls over shipping procedures** can improve customer service by avoiding costly shortages or periods of inventory oversupply. Overall, supply chain management provides several opportunities for companies **to improve their profit margins**, and is especially important for companies with large and international operations.

Organizations increasingly find that they must rely on effective supply chains, or networks**, to compete in the global market** and networked economy. In Peter Drucker's (1998) new management paradigms, this concept of business relationships extends beyond traditional

enterprise boundaries and seeks to organize entire business processes throughout a value chain of multiple companies.

In recent decades, globalization, outsourcing, and information technology have enabled many organizations, such as Dell and Hewlett Packard, to successfully operate collaborative supply networks in which each specialized business partner focuses on only a few key strategic activities. This **inter-organisational supply network** can be acknowledged as a new form of organisation. However, with the complicated interactions among the players, the network structure fits neither "market" nor "hierarchy" categories.

In the 21st century, **changes in the business environment have contributed to the development of supply-chain networks.** First, as an outcome of globalization and the proliferation of multinational companies, joint ventures, strategic alliances, and business partnerships, significant success factors were identified, complementing the earlier "just-in-time", lean manufacturing, and agile manufacturing practices. Second, technological changes, particularly the dramatic fall in communication costs (a significant component of transaction costs), have led to changes in coordination among the members of the supply chain network.

Many researchers have recognized supply network structures as a new organisational form, using terms such as "Keiretsu", "Extended Enterprise", "Virtual Corporation", "Global Production Network", and "Next Generation Manufacturing System".In general, such a structure can be defined as "a group of semi-independent organisations, each with their capabilities, which collaborate in ever-changing constellations to serve one or more markets in order to achieve some business goal specific to that collaboration".

The **importance of supply chain management proved crucial in the 2019-2020 fight against the coronavirus** (COVID-19) pandemic that swept across the world. During the pandemic period, governments in countries which had in place effective domestic supply chain management had enough medical supplies to support their needs and enough to donate their surplus to front-line health workers in other jurisdictions. Some organizations were able to quickly develop foreign supply chains in order to import much needed medical supplies.

Supply-chain management is also **important for organizational learning**. Firms with geographically more extensive supply chains connecting diverse trading cliques tend to become more innovative and productive.

The security-management system for supply chains is described in ISO/IEC 28000 and ISO/IEC 28001 and related standards published jointly by the ISO and the IEC. Supply-Chain Management draws heavily from the areas of operations management, logistics, procurement, and information technology, and strives for an integrated approach.

Tasks and Objectives of Supply Chain Management

SCM ensures cross-company, process-oriented planning and control of the entire value chain. Consumers force logistics to rethink, which is why high customer expectations and short product life cycles are taken into account. Furthermore, relationships with suppliers are considered in order to optimally design and control goods deliveries, cash flows and information flows (Supplier Relationship Management).

Functions Within Supply Chain Management:

- **Customer Relationship Management:** Consistent focus on end customer demand to meet the increasing customer requirements and ensures a high degree of flexibility.
- **Flexibility and demand-oriented production:** Continuous cost reduction and resource optimization across all stages of the value chain.
- **Synchronization of supply and demand:** Increasing the adaptability and development capability of the supply chain.

Several sub-objectives can be derived from these long-term objectives:

- Inventory reduction along the value chain,
- Reduction of warehousing costs,
- Safeguarding the just-in-time supply,
- Acceleration of cash-to-cash cycles,
- Improvement of delivery reliability,
- Reduction of throughput times.

What are the five elements of supply chain management?

Supply chain management is often described as having five key elements: **planning, sourcing of raw materials, manufacturing, delivery, and returns.** The planning phase refers to developing an overall strategy for the supply chain, while the other four elements specialize in the key requirements for executing on that plan. Companies must develop expertise in all five elements in order to have an efficient supply chain and avoid expensive bottlenecks.

What are primary SCM activities?

1. Integrated behaviour and integration of processes
2. Mutually sharing information
3. Mutually sharing channel risks and rewards
4. Co-operation
5. Goal-sharing and partnership

To be fully effective in today's competitive environment, firms must exhibit integrated behaviour with the supply chain partners, such as suppliers, carriers, and manufacturers, to dynamically respond to the needs of the end customer. Customer Relationship Management (CRM) and Demand Planning have given today's businesses better tools for managing and integrating customers' demands across a company's entire value chain. These tools, coupled with proven business strategies and processes, produce a uniform picture of demand that can then integrate the behaviour and drive all subsequent planning and operations helping in the integration of processes. The end result is an agile organization, capable of rapidly recognizing and responding to changes in the market.

Integrated behaviour and integration of processes leads to **information sharing**. Information sharing is the willingness to make strategic and tactical data available to other members of the supply chain. Open sharing of information such as inventory levels, forecasts, sales promotion strategies, and marketing strategies reduces the uncertainty between supply partners and results in enhanced performance. Effective SCM also requires supply chain partners mutually sharing **channel risks and rewards** that yield a competitive advantage
A supply chain succeeds if all the members of the supply chain have the **same goal and the same focus on serving customers**. Establishing the same goal and the same focus among supply chain members means that they are working towards a form of policy integration.

Most organizations go through **four stages of policy integration**:
Stage 1: It represents the base line case. At this point, the supply chain is a function of fragmented operations within the individual company. It is based on traditional concepts and

characterized by staged inventories, independent and incompatible control systems and procedures, and functional segregation.
Stage 2: It is the start of internal integration. It begins with a focus on cost reduction rather than performance improvement. It is characterized by an emphasis on internal trade-offs and reactive customer service.
Stage 3: The firm attains internal corporate integration. It is characterized by full visibility of purchasing through distribution, medium-term planning, tactical focus, emphasis on efficiency, extended use of electronics supports for linkages, and a continued reactive approach to customers.
Stage 4: It has a strategic focus. The organization achieves supply chain integration by extending the scope of integration outside the company to embrace suppliers and customers. All firms go through these four stages.

Ultimately, policy integration is made possible by the supply chain members trying to create compatible cultures and management techniques. Collaboration takes place when two or more independent companies work jointly to plan and execute supply chain operations with greater success than when they are acting in isolation. This is not easy and requires a sustained effort through cross-functional teams, in-plant supplier personnel, and third party service providers.

Evolution of SCM

Historical developments

Six major movements can be observed in the evolution of supply-chain management studies: creation, integration, and globalization, specialization phases one and two, and SCM 2.0.

Creation era

The term "supply chain management" was **first coined by Keith Oliver in 1982**. However, the concept of a supply chain in management was of great importance long before, in the early 20th century, especially with the creation of the assembly line. The characteristics of this era of supply-chain management include the need for large-scale changes, re-engineering, downsizing driven by cost reduction programs, and widespread attention to Japanese management practices. However, the term became widely adopted after the publication of the seminal book *Introduction to Supply Chain Management* in 1999 by Robert B. Handfield and Ernest L. Nichols, Jr., which published over 25,000 copies and was translated into Japanese, Korean, Chinese, and Russian.

Integration era

This era of supply-chain-management studies was highlighted with the **development of electronic data interchange (EDI) systems** in the 1960s, and developed through the 1990s by the introduction of **enterprise resource planning (ERP) systems**. This era has continued to develop into the 21st century with the expansion of **Internet-based collaborative systems**. This era of supply-chain evolution is characterized by both **increasing value added and reducing costs through integration.**

A supply chain can be classified as a stage 1, 2 or 3 network. In a **stage 1–type supply chain**, systems such as production, storage, distribution, and material control are not linked and are independent of each other. In a **stage 2 supply chain**, these are integrated under one plan and enterprise resource planning (ERP) is enabled. A **stage 3 supply chain** is one that achieves vertical integration with upstream suppliers and downstream customers. An example of this kind of supply chain is Tesco.

Globalization era

It is the third movement of supply-chain-management development, the globalization era, can be **characterized by the attention given to global systems of supplier relationships** and the expansion of supply chains beyond national boundaries and into other continents.

Although the use of global sources in organisations' supply chains can be traced back several decades (e.g., **in the oil industry**), it was not until the late 1980s that a considerable number of organizations started to integrate global sources into their core business. This era is characterized by the globalization of supply-chain management in organizations with the goal of increasing their competitive advantage, adding value, and reducing costs through global sourcing.

Specialization era (phase I): outsourced manufacturing and distribution
In the 1990s, companies began to focus on "**core competencies**" and **specialization**. They **abandoned vertical integration, sold off non-core operations**, and **outsourced** those functions to other companies. This changed management requirements, as the supply chain extended beyond the company walls and management was distributed across specialized supply-chain partnerships.

This transition **also refocused the fundamental perspectives** of each organization. **Original equipment manufacturers (OEMs)** became brand owners that required visibility deep into their supply base. They had to control the entire supply chain from above, instead of from within. **Contract manufacturers had to manage bills of material** with different part-numbering schemes from multiple OEMs and support customer requests for work-in-process visibility and vendor-managed inventory (VMI).

The specialization model **creates manufacturing and distribution networks composed of several individual supply chains** specific to producers, suppliers, and customers that **work together** to design, manufacture, distribute, market, sell, and service a product. This set of partners may change according to a given market, region, or channel, resulting in a proliferation of trading partner environments, each with its own unique characteristics and demands.

Specialization era (phase II): supply-chain management as a service
Specialization within the supply chain began in the 1980s with the inception of transportation brokerages, warehouse management (storage and inventory), and non-asset-based carriers, and has matured beyond transportation and logistics into aspects of supply planning, collaboration, execution, and performance management.
Market forces sometimes demand rapid changes from suppliers, logistics providers, locations, or customers in their role as components of supply-chain networks. This variability has significant effects on supply-chain infrastructure, from the foundation layers of establishing and managing electronic communication between trading partners, to more complex requirements such as the configuration of processes and work flows that are essential to the management of the network itself.

Supply-chain specialization enables companies to improve their **overall competencies** in the same way that outsourced manufacturing and distribution has done; it allows them to **focus on their core competencies** and assemble networks of specific, best-in-class partners to contribute to the overall value chain itself, thereby increasing overall performance and efficiency. The ability to quickly obtain and deploy this domain-specific supply-chain expertise without developing and maintaining an entirely unique and complex competency in house is a leading reason why supply-chain specialization is gaining popularity.

Outsourced technology hosting for supply-chain solutions debuted in the late 1990s and has taken root primarily in transportation and collaboration categories. This has progressed from the application service provider (ASP) model from roughly 1998 through 2003, to the on-demand model from approximately 2003 through 2006, to the software as a service (SaaS) model currently in focus today.
Supply-chain management 2.0 (SCM 2.0)

Building on globalization and specialization, the term "SCM 2.0" has been coined to describe **both changes within supply chains themselves as well as the evolution of processes, methods, and tools to manage them in this new "era".** The growing popularity of collaborative platforms is highlighted by the rise of **TradeCard's supply-chain-collaboration platform,** which connects multiple buyers and suppliers with financial institutions, enabling them to conduct automated supply-chain finance transactions.

Web 2.0 is a trend in the use of the World Wide Web that is meant to increase creativity, information sharing, and collaboration among users. At its core, the common attribute of Web 2.0 is to help **navigate the vast information available** on the Web in order to find what is being bought. It is the notion of a usable pathway. SCM 2.0 replicates this notion in supply chain operations. It is the pathway to SCM results, a combination of processes, methodologies, tools, and delivery options to guide companies to their results quickly as the complexity and speed of the supply-chain increase due to global competition; rapid price fluctuations; changing oil prices; short product life cycles; expanded specialization; near-, far-, and off-shoring; and talent scarcity.

Benefits of SCM:

Boosts Customer Service

One of the most important aspects of a business is its customer service. The correct product assortment and quantity needs to be delivered to the customer on time and efficiently in order to ensure they are satisfied. Customers also expect products to be serviced quickly if repairs or replacement products are requested/needed. SCM can help ensure that customers are satisfied at all times, which can improve your business's bottom line.

Reduces Operating Costs

Supply chain management decreases **overall supply chain costs** since retailers and manufacturers often rely on supply chain managers to create networks that meet customer service goals at the most affordable rate. Retailers also require supply chains to quickly deliver expensive products in a timely manner in order to limit inventory holds longer than necessary. SCM further reduces production costs because manufactures require supply chains to deliver materials to assembly plants to ensure proper material supply at all times.

Improves Financial Position

SCM **increases profit leverage** since supply chain managers help control and reduce the cost of the supply chain, which provides drastic increases in firm profits. Supply chain managers also decrease the use of plants, warehouses, and transportation vehicles within the chain so that fixed assets can be reduced. Lastly, SCM can increase your business's cash flow given that customers can receive their products faster thanks to supply chain managers.

Motivation and Advantages of Supply Chain Management

An effective SCM system helps accomplish the following:

- **Managing contractual obligations** to assure a continuous supply and avoid a service company's delivery disruptions.
- **Strengthening supplier relations** for systematic synergy with suppliers and different lines of business.
- **Enterprise spending management** to assure procurement happens through the right suppliers and reduces costs.
- **Managing risk and compliance** to abide by organizational as well as industry specific regulations and compliances.
- Establishing a single **comprehensive supplier view** and deriving insightful procurement analytics.

Today, companies cannot guarantee competitiveness for their products and services on their own. The entire supply chain contributes to success. **No longer are individual companies in**

competition, but entire supply chains. With the promise of a long-term win-win situation for each individual participant, companies can be persuaded to become part of a supply chain. Tip: The Guide for the successful integration of companies in supply chains provides valuable support!

BENEFITS TO THE CUSTOMER

Ultimate benefits that will accrue to customers by dealing with a well-managed vendor with an effective Supply Chain Organisation in place are:

(i) Improved customer service through fewer shortages
(ii) Better delivery performance
(iii) Quicker response to changes in demand
(iv) Optimal purchase cost due to possibility of long-term purchase contracts.
(v)

BENEFITS TO THE COMPANY

(i) Reduction in tied-up capital and administrative costs
(ii) Reduction in time and money lost through production line stoppage
(iii) More flexibility in planning
(iv) Sustained growth
(v) Increased shareholder value

Unsolved Supply Chain Management Problems Can Lead to Disadvantages

The **rapid development in information technology** has made all of this progress possible. Nevertheless, there are **numerous problems along the supply chain** that make successful implementation of supply chain management difficult in practice.

- **Mutually exclusive goals:** The companies involved in the supply chain can pursue different, sometimes mutually exclusive goals.
- **Distribution of costs, risks and profits:** A further hurdle is the fair distribution of cost and financing burdens or risks and the distribution of value-added shares.
- **Lack of transparency of the processes:** The different competence levels of the partners and the **fear of the exploitation of knowledge** causes a lack of transparency of the processes between the actors.
- **Lack of uniform key figures:** Agreement with the partner companies on internal, uniform key figures and technical transfer standards.
- **Increasing dependency:** Companies need to work more closely together and exchange information more intensively.
- **Legal issues:** What do contracts look like between partners exchanging sensitive internal company data and how are violations of the agreement punished?
- **Building relationships based on partnership:** How do you organize trust without being dependent on a handful of employees who maintain these relationships? Management concepts for building and maintaining such relationships are required.

Prerequisites for a More Successful SCM
For companies, SCM entails a change of processes and culture. Its objective is to optimize processes, increase performance characteristics, reduce costs and increase customer satisfaction. In order to be successful in supply chain management, you must meet these seven requirements:

1. Interdisciplinary Cooperation
Process networking requires comprehensive cooperation. This awareness is necessary to build up the necessary know-how.

Our recommendations:
- Make yourself aware that SCM does not end at the company premises.
- Know and understand the process chain and its relationships.
- Focus on joint solutions instead of self-optimization.
- Make your contribution to optimization.
- Minimize the risk in the entire chain and not only your own risks.
- Adapt the SCM process to changing circumstances.

2. Open Exchange of Information
Aim for an open exchange of information with all companies involved in the supply chain. Confirm unrealistic plans: **The intelligent and the qualified are successful**, not the stronger one.

Our recommendations:
- Talk openly about the strengths and weaknesses of your technical processes.
- Admit internal risks to your business partners.
- Report changes openly and at short notice.
- Position your business partner so that his or her strengths can help you.
- Use the opportunities to motivate your business partner with your honesty.

3. Fast Responsiveness
The ability to react more quickly to changes represents qualified process networking.
Our recommendations:
- Create opportunities to illustrate the required changes, e.g. a change in customer needs.
- Adjust customer and material purchase orders to current material replacement times so that the planning horizon corresponds to the supply documents.
- Identify the need for action by projecting the actual status within the process chain using key figures.
- Motivate your employees to embrace this rapid responsiveness.
- Prevent any delay to avoid lasting damage to the process chain.
- Pay attention to quality despite this speed.

4. Short Process Times
The relation between the production times and the process times in the upstream processes serves as an indicator for the reaction speed. While the production times amount to a few hours or days, the operative process times in upstream processes may take several days. Put these times into question.
Our recommendations:
- Measure the process times away from production.
- Determine how long it takes for a customer to be provided with a reliable order confirmation.
- Capture all process times and develop a concept to shorten them.

- A lengthy process time is often caused by the quality of the work tools, the lack of transparency and the lack of process speed. The key to success is an ERP system.

5. Powerful ERP System

The prerequisite for the required speed and dynamism within the supply chain is a qualified ERP system. The manual execution of standard processes is a thing of the past. We recommend to examine the suitability of the ERP system carefully. Establish a sustainable performance profile with IT systems to reduce complexity in logistics.

Suitable ERP systems support your employees in the following areas:

- Automated production planning processes,
- Intelligent review processes in order management,
- Notification of employees in charge if action is required,
- Automated dunning processes,
- Automated import of parts lists,
- Support tools for quotation calculations.

6. Holistic Logistics

The integration of information, material and process logistics is not a simple task. Adjust these processes to fit into the chain and do not underestimate the impact of disturbed chain links.

Our recommendations:

- Are you familiar with batch sizes, framework agreements and customer purchase commitments?
- Avoid delays in communicating changes.
- Reduce risks by using comprehensive logistics systems.
- Facilitate fast action by establishing time-saving IT connections between the participants in the supply chain.
- Increase the chance for your own adaptation by acting quickly without causing damage.
- Safeguard the success of supply chain management by integrating all areas concerned: Production planning, customers, suppliers, purchasing, sales and production.

7. Clear and Binding Rules

A qualified supply chain can only be created if clear process rules and responsibilities are established. A discreet omission of these guidelines poses a typical vulnerability. Define clear rules and follow them.

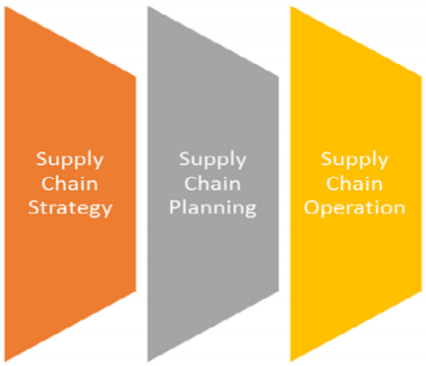
We recommend the adoption of the following rules:

- Processes including process times,
- Responsibilities,
- Requirements within the supply chain,
- Harmonized key figures for internal and external evaluation,
- Escalation mechanisms that ensure successful conflict management.

SCM – Decision Phases

Decision phases can be defined as the different stages involved in supply chain management for taking an action or decision related to some product or services. Successful supply chain management requires decisions on the flow of information, product, and funds that fall into three decision phases. Here we will be discussing the three main decision phases involved in the entire process of supply chain.

The three phases are described below:



Supply Chain Strategy

In this phase, **decision is taken by the management mostly**. The decision to be made considers the sections like **long term prediction** and involves **price of goods** that are very expensive if it goes wrong. It is very important to study the market conditions at this stage. These decisions consider the prevailing and future conditions of the market. **They comprise the structural layout of supply chain.** After the layout is prepared, the tasks and duties of each is laid out. All the strategic decisions are taken by the higher authority or the senior management. These decisions include deciding manufacturing the material, factory location, which should be easy for transporters to load material and to dispatch at their mentioned location, location of warehouses for storage of completed product or goods and many more.

Supply Chain Planning

Supply chain planning should be done according to the demand and supply view. In order to understand customers' demands, a **market research** should be done. The second thing to consider is awareness and updated information about the competitors and strategies used by them to satisfy their customer demands and requirements. As we know, different markets have different demands and should be dealt with a different approach. This phase includes it all, starting **from predicting the market demand to which market will be provided the finished goods to which plant is planned in this stage.** All the participants or employees involved with the company should make efforts to make the entire process as flexible as they can. A supply chain design phase is considered successful if it performs well in short-term planning.

Supply Chain Operations

The third and last decision phase consists of the **various functional decisions that are to be made instantly within minutes, hours or days.** The objective behind this decisional phase is minimizing uncertainty and performance optimization. Starting from handling the customer order to supplying the customer with that product, everything is included in this phase. For example, imagine a customer demanding an item manufactured by your company. Initially, the marketing department is responsible for taking the order and forwarding it to production department and inventory department. The production department then responds to the

customer demand by sending the demanded item to the warehouse through a proper medium and the distributor sends it to the customer within a time frame. All the departments engaged in this process need to work with an aim of improving the performance and minimizing uncertainty.

Cycle view of SCM:

The processes in a supply chain are divided into a series of cycles, each performed at the interface between two successive stages of a supply chain.

All supply chain processes can be broken down into the following four process cycles:

- Customer order **cycle**.
- Replenishment **cycle**.
- Manufacturing **cycle**.
- Procurement **cycle**.

Each cycle occurs at the interface between two successive stages of the supply chain. Not every supply chain will have all four cycles separated. For example, a grocery supply chain in which a retailer stock finished goods inventories and places replenishment orders, which a distributor is likely to have all four cycles separated.

A cycle view of a supply chain is very useful when considering operational decisions because it clearly specifies the rules and responsibilities of each member of the supply chain. The detailed process description of a supply chain in the cycle view forces a supply chain designer to consider the infrastructure required to support these processes.

The cycle view of a supply chain is useful, for example, when setting up information systems to support supply chain operations, as process ownership and objectives are clearly defined.

Customer order cycle

The customer order cycle occurs at the customer/retailer interface and includes all processes directly involved in receiving and filling the customer's order.

Typically, the customer initiates this cycle at a retailer site and the cycle primarily involves filling customer demand. The retailer's interaction with the customer starts when the customer arrives or contact is initiated and ends when the customer receives the order.

The processes involved in the customer order cycle include:

- Customer arrival
- Customer order entry
- Customer order fulfillment
- Customer order receiving

Customer arrival

The term "customer arrival" refers to the customer's arrival at the location where he or she has access to his or her choice sand makes a decision regarding a purchase. The starting point for any supply chain is the arrival of a customer.

- The customer walks into a supermarket to make a purchase
- The customer calls a mail order telemarketing center
- The customer uses the web or an electronic link to a mail order form

From the supply chain perspective, the key flow in this process is the customer's arrival. The goal is to facilitate the contact between the customer and the appropriate product so that the customer's arrival turns into a customer order.

At a supermarket, facilitating a customer order may involve managing customer flows and product displays. At a telemarketing center, it may mean ensuring that the customer does not have to wait on hold for too long.

It may also mean having systems in place so that sales representatives can answer customer queries in a way that turns calls into orders. At a website, a key system may be

searched capabilities with tools. That allow customers to quickly locate and view products that interest them.

The objective of the customer arrival process is to maximize the conversion of customer arrivals to customer orders.

Customer order entry

The term "customer order entry" refers to customers informing the retailer what products they want to purchase and the retailer allocating products to customers. At a supermarket, order entry may take the form of customers loading all items that they intend to purchase onto their carts.

At a mail-order firm's telemarketing center or website, order entry involves customers informing the retailer of the items and quantities they selected.

The objective of the customer order entry process is to ensure that the order entry is quick, accurate, and communicated to all other supply chain processes that are affected by it.

Customer order fulfillment

During this process, the customer's order is filled and sent to the customer. At a supermarket, the customer performs this process. At a mail order firm this process includes picking the order from inventory, packaging it, and shipping it to the customer.

All inventories will need to be updated, which may result in the initiation of the replenishment cycle. In general, customer order fulfillment takes place from retailer inventory. In a build-to-order scenario, however, order fulfillment takes place directly from the manufacturer's production line.

The objective of the customer order fulfillment process is to get the correct orders to customers by the promised due dates at the lowest possible cost.

Customer order receiving

During this process, the customer receives the order and takes ownership. Records of this receipt are updated and payment completed. At a supermarket, receiving occurs at the checkout counter. For a mail order firm, receiving occurs when the product is delivered to the customer.

Replenishment cycle

The replenishment cycle occurs at the retailer/distributor interface and includes all processes involved in replenishing retailer inventory. It is initiated when a retailer places an order to replenish inventories to meet future demand.

A replenishment cycle may be triggered at a supermarket that is running out of stock of detergent or at a mail order firm that is low in stock of a particular shirt.

The replenishment cycle is similar to the customer order cycle except that the retailer is now the customer. The objective of the replenishment cycle is to replenish inventories at the retailer at minimum cost while providing high product availability.

The processes involved in the replenishment cycle include:

- Retail order trigger
- Retail order entry
- Retail order fulfillment
- Retail order receiving

Retail order trigger

As the retailer fills customer demand, inventory is depleted and must be replenished to meet future demand. A key activity the retailer performs during the replenishment cycle is to devise a replenishment or ordering policy that triggers an order from the previous stage.

The objective when setting replenishment order triggers is to maximize profitability by ensuring economies of scale and balancing product availability and the cost of holding

inventory. The outcome of the retail order trigger process is the generation of a replenishment order that is ready to be passed on to the distributor or manufacturer.

Retail order entry

This process is similar to customer order entry at the retailer. The only difference is that the retailer is now the customer placing the order that is conveyed to the distributor. This may be done electronically or by some other medium. Inventory or production is then allocated to the retail order.

The objective of the retail order entry process is that an order is entered accurately and conveyed quickly to all supply chain processes affected by the order.

Retail order fulfillment

This process is very similar to customer order fulfillment except that it takes place at the distributor. A key difference is the size of each order as customer orders tend to be much smaller than replenishment orders.

The objectives of the retail order fulfillment are to get the replenishment order to the retailer on time while minimizing costs.

Retail order receiving

Once the replenishment order arrives at a retailer, the retailer must receive it physically and update all inventory records. This process involves product flow from the distributor to the retailer as well as information updates at the retailer and the flow of funds from the retailer to the distributor.

The objective of the retail order receiving process is to update inventories and displays quickly and accurately at the lowest possible cost.

Manufacturing cycle

The manufacturing cycle typically occurs at the distributor/manufacturer (or retailer/manufacturer) interface. This includes all processes involved in replenishing distributor (or retailer) inventory.

The manufacturing cycle view of supply chain is triggered by customer orders (as is the case with Dell), replenishment orders from a retailer or distributor (Wal-Mart ordering from P&G), or by the forecast of customer demand and current product availability in the manufacturer's finished-goods warehouse.

One extreme in a manufacturing cycle is an integrated steel mill that collects orders that are similar enough to enable the manufacturer to produce in large quantities. In this case, the manufacturing cycle is reacting to customer demand (referred to as a pull process). Another extreme is a consumer products firm that must produce in anticipation of demand.

In this case, the manufacturing cycle is anticipating customer demand (referred to as a push process).

The processes involved in the manufacturing cycle include:

1. ***Order arrival from the finished-goods warehouse, distributor, retailer, or customer***
2. ***Production scheduling***
3. ***Manufacturing and shipping***
4. ***Receiving at the distributor, retailer, or customer***

1 Order arrival

During this process, a finished-goods warehouse or distributor sets a replenishment order trigger base on the forecast of future demand and current product inventories. The resulting order is then conveyed to the manufacturer.

In some cases, the customer or retailer may be ordering directly from the manufacturer.

In other cases, a manufacturer may be producing to stock a finished products warehouse.

Another situation could be, the order is triggered bases on product availability and a forecast of future demand. This process is similar to the retail order trigger process in the replenishment cycle.

2 Production scheduling

This process is similar to the order entry process in the replenishment cycle where inventory is allocated to order. During the production scheduling process, orders (or forecasted orders) are allocated to a production plan.

Given the desired production quantities for each product, the manufacturer must decide on the precise production sequence. If there are multiple lines, the manufacturer must also decide which products to allocate to each line.

The objective of the production scheduling process is to maximize the proportion of orders filled on time while keeping costs down.

3 Manufacturing and Scheduling

This process is equivalent to the order fulfillment process described in the replenishment cycle. During the manufacturing phase of the process, the manufacturer produces to the production schedule. During the shipping phase of this process, the product is shipped to the customer, retailer, distributor, or finished product warehouse.

The objective of the manufacturing and shipping process is to create and ship the product by the promised due date while meeting quality requirements and keeping costs down.

4 Receiving

In this process, the product is received at the distributor, finished-goods warehouse, retailer, or customer and inventory records are updated. Other processes related to storage and fund transfers also take place.

Procurement cycle

The procurement cycle occurs at the manufacturer/supplier interface. This includes all processes necessary to ensure that materials are available for manufacturing to occur according to schedule.

During the procurement cycle, the manufacturer orders components from suppliers that replenish the component inventories. The relationship is quite similar to that between a distributor and manufacturer with one significant difference.

Whereas retailer/distributor orders are triggered by uncertain customer demand, component orders can be determined precisely once the manufacturer has decided what the production schedule will be. Component orders depend on the production schedule.

Thus it is important that suppliers be linked to the manufacturer's production schedule. Of course, if a supplier's lead times are long, the supplier has to produce to forecast because the manufacturer's production schedule may not be fixed that far in advance.

In practice, there may be several tiers of suppliers, each producing a component for the next tier. A similar cycle would then flow back from one stage to the next.

Key point

A cycle view of the supply chain clearly defines the processes involved and the owners of each process. This view is very useful when considering operation decisions.

Review

1. What are the basic concepts of Supply Chain Management?
2. Discuss about the traditional supplier-buyer relationship.
3. Explain the simplified view of Kalyani Breweries supply chain.
4. What is the basic objective of Supply Chain Management?
5. "A typical supply chain may involve a variety of stages". Elaborate.
6. What are the different stages of a supply chain?
7. "SCM philosophy drives supply chain members to have a customer orientation". Explain.
8. What are the primary SCM activities?

Logistics and customer value – customer value, customer service & retention – value of out of stock- setting customer service priorities- Logistics and shareholder value, logistics cost analysis- Principles of logistics costing,

A supply chain is comprised of all the businesses and individual contributors involved in creating a product, from raw materials to finished merchandise.

Logistics is a specialized field of its own comprised of shipping, warehousing, courier services, road/rail transportation, and air freight. Retail companies become involved in supply chain management to control product quality, inventory levels, timing, and expenses. In a global economy, supply chain management often includes dealings with companies and individual contributors in other countries, which requires involvement in politics, trade and tariff laws, quality control, and international relationships.

Examples of supply chain activities include farming, refining, design, manufacturing, packaging, and transportation. Because global supply chains are both logistically and technologically complicated, there are now global supply chain management specialists and firms who oversee the process for many different retail companies.

As consuming trends increasingly move towards digital purchases shipped from a central warehouse facility directly to the consumer, the largest retail companies are going to be increasingly involved with supply chain management and logistics.
The Role of Logistics in Supply Chain Management

Estimates of the size of the global logistics industry in 2019 range from $4.96 trillion to $9.30 trillion.[1] [2] That means that moving and storing goods around the planet accounts for anywhere from 5.6% to 10.6% of global GDP.

The Beginning of Supply Chain and Logistics
"Supply chain" was first used as a military term in the early 1900s to describe the process of getting food, weapons, ammunition, etc. to the front line of battles. It involved creating "supply points" between the military base and the battlefields.
"Logistics" was also a military-related word, first used in 1838 in the book "The Art of War, which was written by a French General in Napoleon's army.[4] [5]
Supply Chain and Logistics Fun Facts and Statistics

- Barcodes were first used to track and label railroad cars. The first product using a barcode was a pack of Wrigley's gum scanned in a supermarket in 1974.[6]
- Approximately 62.7% of all U.S. freight was transported by trucks in 2018.[7]
- Electronics, motorized vehicles, and mixed freight (items bound for restaurants, grocery stores, and retail stores) are the most valuable categories of products that are shipped in the U.S.[8]

Current Statistics and Fun Facts About Logistics - by the Numbers
14.8 million - The total number of people employed in transportation and warehousing in the U.S. in 2019.
$102.4 billion - The global amount spent on air freight in 2019.
73% - The percentage of cargo that is transported via air freight between Europe and Asia.
1% - The percentage of total world trade that is transported by air freight, when measured by tonnage.
35% - The percentage of total world trade that is transported by air freight when measured by the value of the freight.

11.9 billion - Total tonnage of freight carried via sea freighters in 2019, compared to 60.9 million tonnes of freight transported by air.
9.2 million - The total number of people employed in transportation-related industries in the U.S. in 2019.
$10.8 trillion - Total value of freight transported by truck in the U.S. in 2018.
11.1 billion - The total tonnage of goods transported via truck in the U.S. in 2018.

Supply Chain Best Practices and Their Benefits

According to Supply Chain Quarterly, these are the 10 Best Practices that companies in the retail industry (and any industry) need to ensure that their supply chain management is as effective as possible and contributing as much as possible to the company's bottom line.

1. Identify supply chain stakeholders and establish a committee to engage stakeholders in supply chain issues and establish a workgroup comprised of departments.
2. Make sure the supply chain itself has appropriate staffing.
3. Technology is your friend.
4. Establish synergistic relationships with key suppliers.
5. Engage in collaborative strategic sourcing.
6. Don't just consider price when making supply chain decisions. Consider the "total cost of ownership."
7. Supply chain leaders should have some contribution and control with contracts.
8. Inventory optimization is essential.
9. Establish appropriate controls throughout the supply chain system to minimize risk.
10. Keep the supply chain sustainable with social responsibility and green initiatives

What is Logistics Management?

Logistics management is the process of strategically managing the procurement, movement and storage of materials, parts and finished inventory (and the related information flows) through the organization and its marketing channels in such as way that current and future profitability are maximized through the cost-effective fulfillment of orders.

The Difference Between Logistics and Supply Chain Management

Previously used as a synonym, supply chain management, in contrast to logistics, goes beyond the confines of a company. Both supply chain management and logistics deal with the **organization of object flows along the process stages of the supply chain**. Both are aimed at increasing customer benefits (effectiveness) and system-wide improvement of the cost-benefit ratio (efficiency).

Modern supply chain management goes a step further, especially in the areas of transport and warehousing within the company. SCM explicitly includes the organization and coordination of autonomous business units within a value chain its the analysis. This accentuates the inter-organisational aspect of logistics management. SCM takes a **cross-company perspective on all business processes** and connects all areas of business administration, such as purchasing, production, distribution, marketing, controlling, etc. Focused on the strategic aspects of functional areas, SCM leaves tactical questions to the individual participants.

The basic difference between Logistics and Supply Chain Management is that Logistics management is the process of integration and maintenance (flow and storage) of goods in an organization whereas Supply Chain Management is thecoordination and management (movement) of supply chains of an organization.

Another difference between Logistics and Supply Chain Management is that theobjective of Logistics Management is customer satisfaction while Supply ChainManagement emphasizes more on competitive advantage.

Earlier to deliver any goods or services to its final customers only LogisticsManagement was applied whereas Supply Chain Management is an evolved andmodern concept of the same.

Another difference between Logistics Management and Supply Chain Managementis that Logistics Management involves only one organization whereas multipleorganizations (coordination and collaboration of parties like suppliers, intermediaries, distributors and customers) are involved with Supply Chain Management.

Another most important di erence between Logistics Management and SupplyChain Management is that Logistics Management is a small part of Supply Chain Management whereas Supply Chain Management is a new and modern concept.

The difference between SCM and Logistics is that Supply Chain Management(SCM) involves the planning, implementation and e ective storage of goods andservices between the point of origin and point of consumption to meet customerrequirements. Whereas Logistics Management's main objective is to deliver theright product at the right time with all other attributes in place.
Another difference between SCM and Logistics is that Supply Chain Management(SCM) is a series of interconnected activities related to the movement of rawmaterials to finished goods until it reaches the end-user. Whereas Logistics Management involves activities like warehousing, proper packaging, orderfulfilment, stock control and stock management.

Another difference between SCM and Logistics is that Supply Chain Management isa broader term which refers to the connection with the suppliers to the ultimateconsumer. Whereas Logistics Management is associated with only maintenanceand storage of goods.
Logistics is a very old term whereas Supply Chain has evolved as a new concept.Supply Chain Management is an addition over Logistics Management where bothcomplement each other for e ective distribution of goods and services.

Differentiate SCM and logistics.

Logistics	Supply Chain Management
is the process of integration and maintenance (flow and storage) of goods in an organization	is the coordination and management (movement) of supply chains of an organization.
the objective of Logistics Management is customer satisfaction	emphasizes more on competitive advantage.
Earlier to deliver any goods or services to its final customers only Logistics Management	Supply Chain Management is an evolved and modern concept of the same.

was applied	
Logistics Management involves only one organization	multiple organizations (coordination and collaboration of parties like suppliers, intermediaries, distributors and customers) are involved with Supply Chain Management.
Logistics Management is a small part of Supply Chain Management	Supply Chain Management is that whereas Supply Chain Management is a new and modern concept.
Logistics Management's main objective is to deliver the right product at the right time with all other attributes in place.	(SCM) involves the planning, implementation and effective storage of goods and services between the point of origin and point of consumption to meet customer requirements.
Logistics Management involves activities like warehousing, proper packaging, orderfulfilment, stock control and stock management.	(SCM) is a series of interconnected activities related to the movement of rawmaterials to finished goods until it reaches the end-user.
Logistics Management is associated with only maintenanceand storage of goods.	is a broader term which refers to the connection with the suppliers to the ultimate consumer.
Logistics is a very old term	Supply Chain has evolved as a new concept.

The marketing and logistics interface

Even though the textbooks describe marketing as the management of the 'Four Ps' – product, price, promotion and place – it is probably true to say that, in practice, most of the emphasis has always been placed on the first three. 'Place', which might better be described in the words of the old cliché, 'the right product in the right place at the right time', was rarely considered part of mainstream marketing.

There are signs that this view is rapidly changing, however, as the power of customer service as a potential means of differentiation is increasingly recognised. In more and more markets the power of the brand has declined and customers are more willing to accept substitutes; even technology differences between products have been reduced so that it is harder to maintain a competitive edge through the product itself. In situations like this it is customer service that can provide the distinctive difference between one company's offer and that of its competitors.

Two factors have perhaps contributed more than anything else to the growing importance of **customer service as a competitive weapon.** One is the **continual increase in customer expectations;** in almost every market the customer is now more demanding, more 'sophisticated' than he or she was, say, 30 years ago. Likewise, in industrial purchasing situations we find that buyers expect higher levels of service from vendors, particularly as more companies convert to just-in time logistics systems. **The second factor is the slow but inexorable transition towards 'commodity' type markets.** By this is meant that increasingly the **power of the 'brand' is diminishing** as the technologies of competing products converge, thus making product differences difficult to perceive – at least to the average buyer. Take, for example, the current state of the personal computer market. There are many competing models which in reality are substitutable as far as most would-be purchasers are concerned.

Faced with a situation such as this the customer may be influenced by price or by 'image' perceptions but overriding these aspects may well be '**availability'** – in other words, is the product in stock, can I have it now? **Since availability is clearly an aspect of customer service,** we are in effect saying that the power of customer service is paramount in a situation such as this. This trend towards the **service-sensitive customer** is as apparent in industrial markets as it is in consumer markets.

Hence companies supplying the car industry, for example, must be capable of providing just-in-time deliveries direct to the assembly line; similarly a food manufacturer supplying a large supermarket chain must have an equivalent logistics capability, enabling it to keep the retail shelf filled whilst minimising the amount of inventory in the system. The evidence from across a range of markets suggests that the critical determinant of whether orders are won or lost, and hence the basis for becoming a preferred supplier, is customer service. Time has become a far more critical element in the competitive process. Customers in every market want ever shorter lead times; product availability will overcome brand or supplier loyalty – meaning that if the customer's preferred brand is not available and a substitute is, then the likelihood is a lost sale.

Delivering customer value

Ultimately the success or failure of any business will be determined by the level of customer value that it delivers in its chosen markets. Customer value can be defined quite simply as the difference between the perceived benefits that flow from a purchase or a relationship and the total costs incurred. Another way of expressing the idea is:

$$\text{Customer value} = \frac{\text{Perceptions of benefits}}{\text{Total cost of ownership}}$$

'Total cost of ownership' rather than 'price' is used here because in most transactions there will be costs other than the purchase price involved. For example, inventory carrying costs, maintenance costs, running costs, disposal costs and so on. In business-to-business markets particularly, as buyers become increasingly sophisticated, the total costs of ownership can be a critical element in the purchase decision. 'Life-cycle costs', as they are referred to in the military and defence industries, have long been a critical issue in procurement decisions in those markets.

Figure 2.1 shows the 'iceberg' effect of total costs of ownership where the immediate purchase price is the only aspect of cost that is visible, whereas below the surface of the water are all the costs that will arise as a result of the purchase decisions.

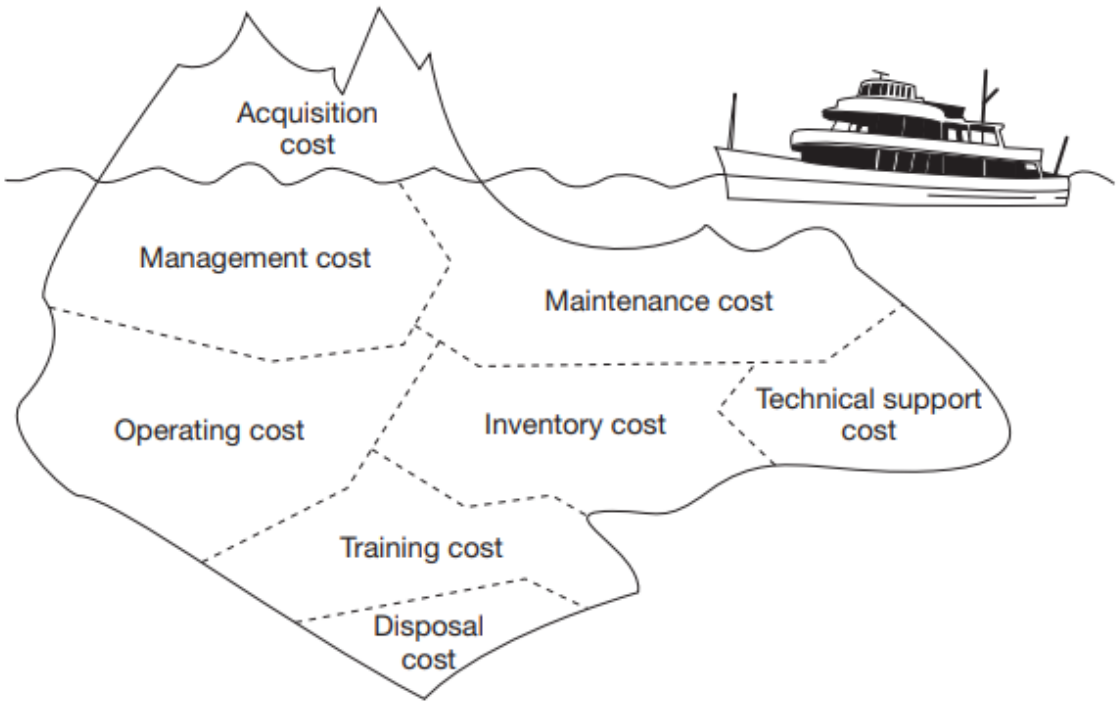


Fig. Total cost of ownership

In the same way that the total cost of ownership is greater than the initial purchase price so too the benefits that are perceived to flow from the purchase or the relationship will often be greater than the tangible product features or functionality. For example, there may be little difference between two competitive products in terms of technical performance, but one may be superior to the other in terms of the customer support that is provided.

One way to define **'competitive advantage'** is simply that the successful companies will generally be those that deliver more customer value than their competitors. In other words, their ratio of benefits to costs is superior to other players in that market or segment at market or segment.

Logistics management is almost unique in its ability to impact both the numerator and the denominator of the customer value ratio. This point becomes clearer if we expand the ratio as follows:

$$\text{Customer value} = \frac{\text{Quality} \times \text{Service}}{\text{Cost} \times \text{Time}}$$

Each of the four constituent elements can briefly be defined as follows:

Quality: The functionality, performance and technical specification of the offer.

Service: The availability, support and commitment provided to the customer.

Cost: The customer's transaction costs including price and life cycle costs.

Time: The time taken to respond to customer requirements, e.g. delivery lead times

Each of these four elements requires a continuous programme of improvement, innovation and investment to ensure continued competitive advantage.

What is customer service?

It has been suggested that the **role of customer service is to provide 'time and place utility' in the transfer of goods and services between buyer and seller.** Put another way, there is no value in the product or service until it is in the hands of the customer or consumer. It follows that making the product or service 'available' is what, in essence, the distribution function of the business is all about. 'Availability' is in itself a complex concept, impacted upon by a galaxy of factors which together constitute customer service. These factors might include **delivery frequency and reliability, stock levels and order cycle time,** for example. Indeed it could be said that ultimately customer service is determined by the interaction of all those factors that affect the process of making products and services available to the buyer.

In practice, we see that many companies have varying views of customer service. LaLonde and Zinszer in a major study of customer service practices suggested that customer service could be examined under three headings:

1 Pre-transaction elements

2 Transaction elements

3 Post-transaction elements

The pre-transaction elements of customer service relate to corporate policies or programmes, e.g. written statements of service policy, adequacy of organisational structure and system flexibility. The transaction elements are those customer service variables directly involved in performing the physical distribution function, e.g. product and delivery reliability. The post-transaction elements of customer service are generally supportive of the product while in use, for instance, product warranty, parts and repair service, procedures for customer complaints and product replacement.

Table 2.1 indicates some of the many elements of customer service under these three heading

Table 2.1 The components of customer service

Pre-transaction elements
For example: Written customer service policy (Is it communicated internally and externally? Is it understood? Is it specific and quantified where possible?) Accessibility (Are we easy to contact/do business with? Is there a single point of contact?) Organisation structure (Is there a customer service management structure in place? What level of control do they have over their service process?) System flexibility (Can we adapt our service delivery systems to meet particular customer needs?)
Transaction elements
For example: Order cycle time (What is the elapsed time from order to delivery? What is the

reliability/variation?) Inventory availability (What percentage of demand for each item can be met from stock?) Order fill rate (What proportion of orders are completely filled within the stated lead time?) Order status information (How long does it take us to respond to a query with the required information? Do we inform the customer of problems or do they contact us?)
Post-transaction elements
For example: Availability of spares (What are the in-stock levels of service parts?) Call-out time (How long does it take for the engineer to arrive and what is the 'first call fix rate'?) Product tracing/warranty (Can we identify the location of individual products once purchased? Can we maintain/extend the warranty to customers' expected levels?) Customer complaints, claims, etc. (How promptly do we deal with complaints and returns? Do we measure customer satisfaction with our response?)

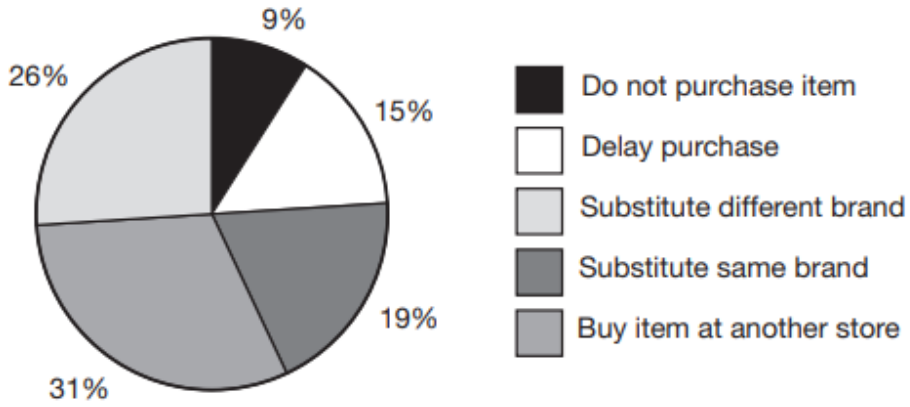
In any particular product/market situation, some of these elements will be more important than others and there may be factors other than those listed above which have significance in a specific market. Indeed the argument that will be developed later is that it is essential to understand customer service in terms of the differing requirements of different market segments and that no universally appropriate list of elements exists; each market that the company services will attach different importance to different service elements.

It is because of the multivariate nature of customer service and because of the widely differing requirements of specific markets that it is essential for any business to have a clearly identified policy towards customer service. It is surprising perhaps that so few companies have defined policies on customer service, let alone an organisation flexible enough to manage and control that service, when it is considered that service can be the most important element in the company's marketing mix. A considerable body of evidence exists that supports the view that if the product or service is not available at the time the customer requires it and a close substitute is available then the sale will be lost to the competition. Even in markets where brand loyalty is strong a stock-out might be sufficient to trigger brand switching.

The impact of out-of-stock

One study identified that a significant cost penalty is incurred by both manufacturers and retailers when a stock-out occurs on the shelf. The research found that on a typical day a shopper in the average supermarket will face stock-outs on 8 per cent of items in the categories studied. The reaction of customers when faced with a stock-out was highlighted by the same study. As Figure 2.2 illustrates, over a quarter of shoppers bought a different brand and 31 per cent said they would shop elsewhere for that product. This represents bad news for

both the manufacturer and the retailer. Even worse, other research4 has suggested that over two-thirds of shopping decisions are made at the point of purchase, i.e. the purchase is triggered by seeing the product on the shelf. If the product is not on the shelf then the purchase will not be triggered. Persistent stock-outs can also drive customers away from the brand and/or the store permanently. The potential loss of business for both manufacturers and retailers caused by out-of-stock situations is clearly significant.



Source: Corsten, D. and Gruen, T., 'Stock-outs cause walkouts', *Harvard Business Review*, May 2004

Fig. Shopper behaviour when faced with a stock-out

In industrial markets, too, the same pressures on purchasing source loyalty seem to be at work. It is perhaps not surprising that as more and more companies adopt 'just-in-time' strategies, with minimal inventories, they require even higher levels of response from suppliers. The demand is for ever shorter delivery lead times and reliable delivery. The pressure on suppliers is further increased as these same customers seek to rationalise their supplier base and to do business with fewer suppliers. Becoming a preferred supplier in any industry today inevitably means that a high priority must be placed on delivering superior customer service.

Many companies have suffered in this new competitive environment because in the past they have focused on the traditional aspects of marketing – product development, promotional activities and price competition. However, whilst these are still necessary dimensions of a successful marketing strategy they are not sufficient. Equally damaging has been the focus on cost reduction that has driven many companies' operational and logistics strategy – particularly as a result of recession. Cost reduction is a worthy goal as long as it is not achieved at the expense of value creation. Low-cost strategies may lead to efficient logistics but not to effective logistics. More often than not today the order winning criteria are those elements of the offer that have a clearly identifiable positive impact upon the customers' own value-creating processes.

One powerful way of highlighting the impact that customer service and logistics management can have on marketing effectiveness is outlined in Figure 2.3. The suggestion here is that customer service impacts not only on the ultimate end user but also on intermediate customers such as distributors. Traditionally marketing has focused on the end customer – or consumer – seeking to promote brand values and to generate a 'demand pull' in the marketplace for the company's products. More recently we have come to recognise that this by itself is not sufficient. Because of the swing in power in many marketing channels away

from manufacturers and towards the distributor (e.g. the large concentrated retailers) it is now vital to develop the strongest possible relations with such intermediaries – in other words to create a customer franchise as well as a consumer franchise.

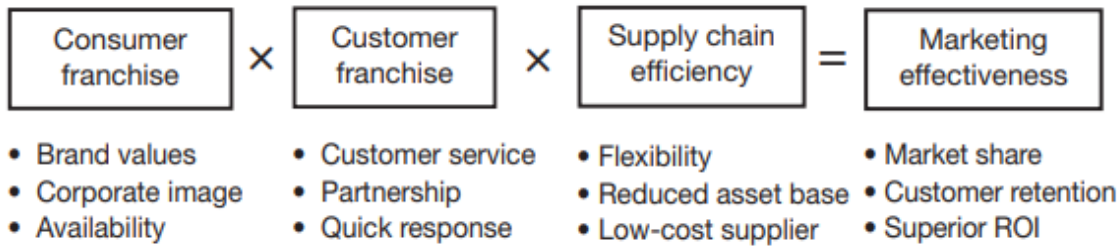


Figure 2.3 The impact of logistics and customer service on marketing

The impact of both a strong consumer franchise and a customer franchise can be enhanced or diminished by the efficiency of the supplier's logistics system. It is only when all three components are working optimally that marketing effectiveness is maximised. To stress the interdependence of these three components of competitive performance it is suggested that the relationship is multiplicative. In other words the combined impact depends upon the product of all three.

Customer service and customer retention

It will be apparent from what has been said that organisations that compete only on the product's features will find themselves at a severe disadvantage to those companies that augment the basic product with added-value services. It was one of the leading thinkers in marketing, Theodore Levitt, who first said that 'people don't buy products, they buy benefits'.5 The idea behind this statement is that it is the totality of the 'offer' that delivers customer value. A simple example would be that a finished product in a warehouse is the same as a finished product in the hands of the customer in terms of its tangible features. Clearly, however, the product in the hands of the customer has far more value than the product in the warehouse. Distribution service in this case has been the source of added value.

Figure 2.4 develops this idea with the concept of the 'service surround'.

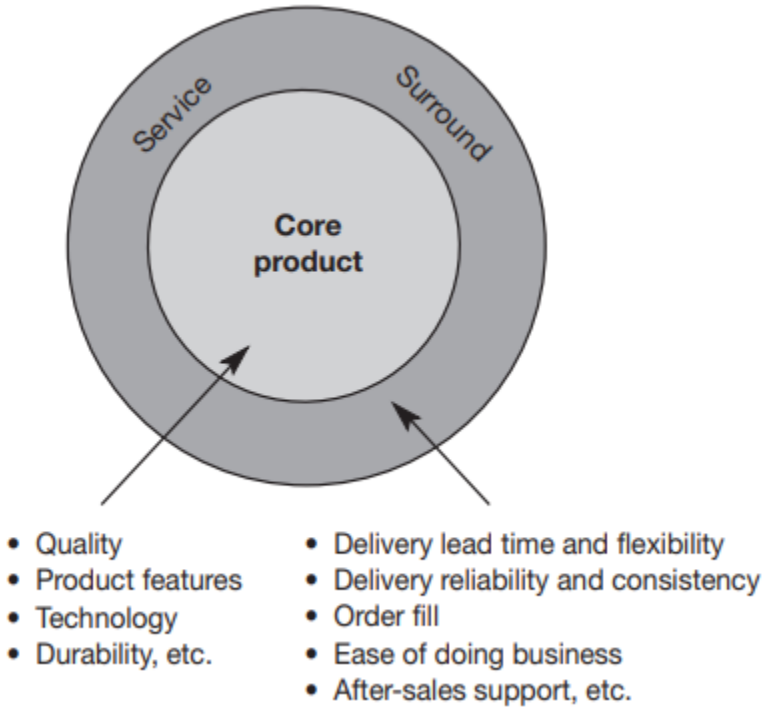


Figure 2.4 Using service to augment the core product

At the centre is the core product, which is the basic product as it leaves the factory. The outer 'halo' represents all the added value that customer service and logistics provide. Clearly it is not only customer service and logistics activity that add value; in many cases advertising, branding and the packaging can all enhance the perceived value of the product to the customer. However, it is increasingly evident, as we have seen, that it takes more than branding to differentiate the product.

This idea underpins the current emphasis on seeking to create strategies that focus on 'servitisation', i.e. converting a product into a service. The example of Rolls-Royce aero engines, highlighted below, provides powerful support for this idea.

One of the classic definitions of marketing is that it is concerned with 'getting and keeping customers'. In practice, if we look at where most organisations' marketing efforts focus, it is on the 'getting' of customers, rather than on the 'keeping' of them. Thus an examination of the typical marketing plan will show a bias towards increasing market share rather than towards customer retention. Whilst new customers are always welcome in any business it has to be realised that an existing customer can provide a higher profit contribution and has the potential to grow in terms of the value and frequency of purchases.

The importance of customer retention is underlined by the concept of the 'lifetime value' of a customer. The lifetime value of a customer is calculated as follows:

Lifetime value = Average transaction value × Yearly frequency of purchase × Customer 'life expectancy'

Clearly if customers can be persuaded to remain loyal to a supplier, their lifetime value can be significantly increased. A further benefit comes from the fact that the longer the customer

stays with an organisation the more profitable they become. A study by consulting company Bain and Co found higher customer retention rates correlated strongly with profitability. The reasons for this are that a retained customer typically costs less to sell to and to service. Also as the relationship develops there is an increased likelihood that they will give a greater part of their business to a supplier whom they are prepared to treat as a partner. This is the idea of 'share of wallet', whereby the goal is to increase the total spend that is captured by the company. Furthermore, satisfied customers tell others and thus the chance increases that further business from new customers will be generated through this source.

A simple measure of customer retention is to ask the question: 'How many of the customers that we had 12 months ago do we still have today?' This measure is the real test of customer retention. It can be extended to include the value of purchases made by the retained customer base to assess how successful the company has been in increasing the level of purchasing from these accounts (see Figure 2.5).

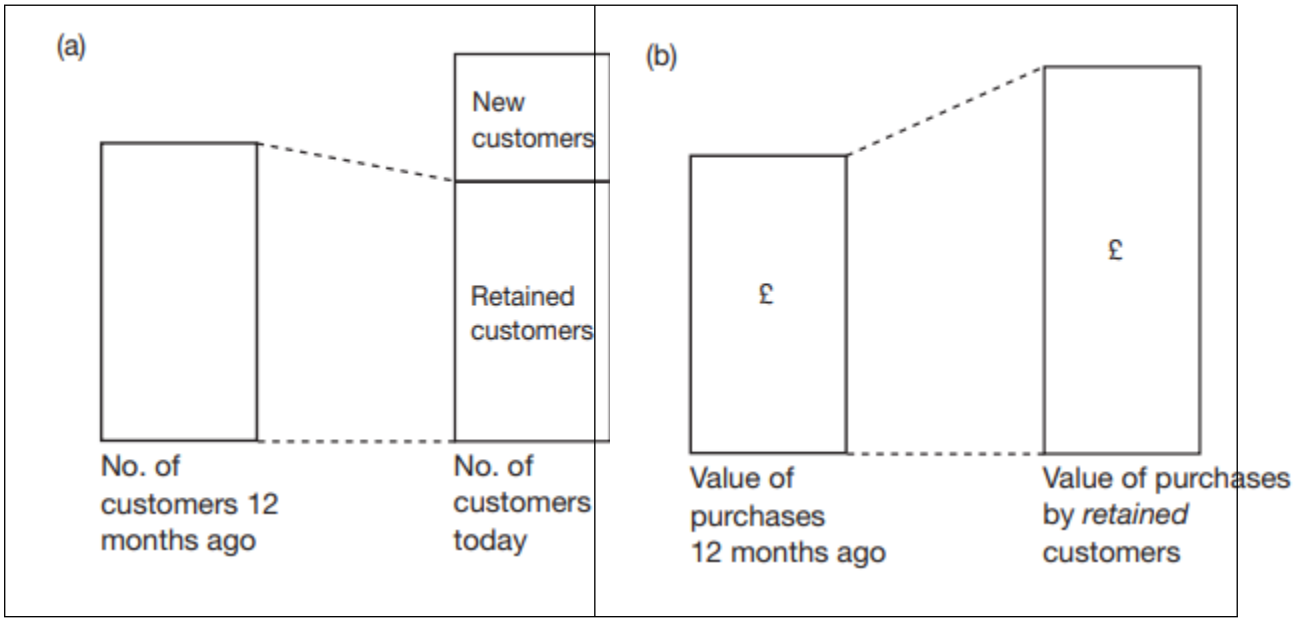


Figure 2.5 Customer retention indicators

A prime objective of any customer service strategy should be to enhance customer retention. Whilst customer service obviously also plays a role in winning new customers it is perhaps the most potent weapon in the marketing armoury for the keeping of customers.

There is rapidly emerging a new focus in marketing and logistics on the creation of 'relationships' with customers. The idea is that we should seek to create such a level of satisfaction with customers that they do not feel it necessary even to consider alternative offers or suppliers. Many markets are characterised by a high level of 'churn' or 'promiscuity' amongst the customer base. In these markets customers will buy one brand on one occasion and then are just as likely to buy another on the next occasion.

The principle behind 'relationship marketing' is that the organisation should consciously strive to develop marketing strategies to maintain and strengthen customer loyalty. So, for example, an airline might develop a frequent-flyer programme, or a credit card company might award points based upon the value of purchases made with the card that

can then be redeemed for cash or awards. At the other extreme, a company like IBM will consciously seek to develop long-term relationships with its customers through training programmes, client seminars, frequent customer communication and so on.

Setting customer service priorities

Whilst it should be the objective of any logistics system to provide all customers with the level of service that has been agreed or negotiated, it must be recognised that there will inevitably need to be service priorities. In this connection **the Pareto Law, or 80/20 rule, can provide us with the basis for developing a more cost-effective service strategy**. Fundamentally, the service issue is that since not all our customers are equally profitable nor are our products equally profitable, should not the highest service be given to key customers and key products? Since we can assume that money spent on service is a scarce resource then we should look upon the service decision as a resource allocation issue. Figure 2.11 shows how a typical company might find its profits varying by customer and by product

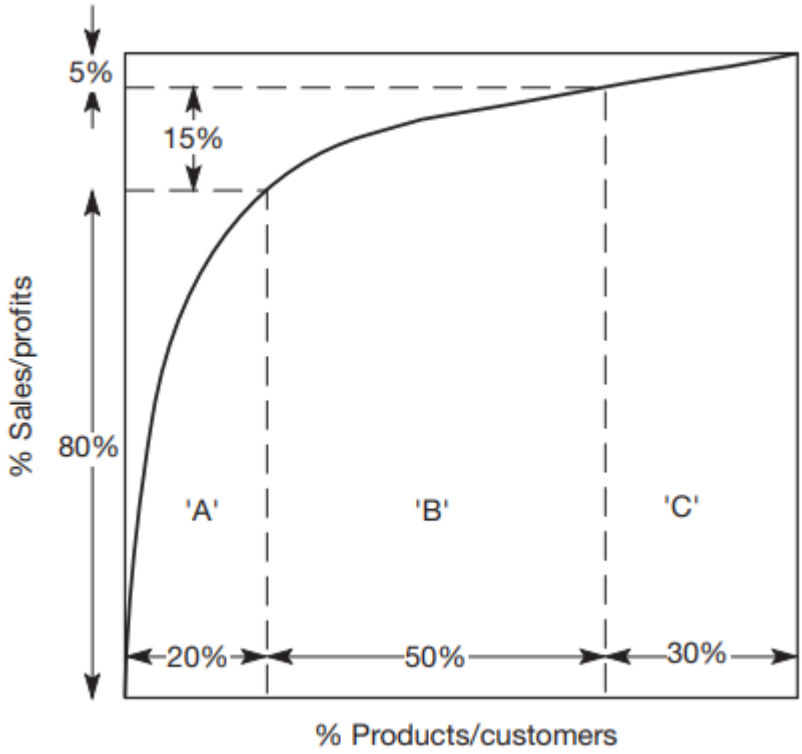


Figure 2.11 The 'Pareto' or 80/20 rule

The curve is traditionally divided into three categories: the top 20 per cent of products and customers by profitability are the 'A' category; the next 50 per cent or so are labelled 'B'; and the final 30 per cent are category 'C'. The precise split between the categories is arbitrary as the shape of the distribution will vary from business to business and from market to market.

The appropriate measure should be profit rather than sales revenue or volume. The reason for this is that revenue and volume measures might disguise considerable variation in costs. In the case of customers this cost is the 'cost to serve', and we will later suggest an approach to measuring customer profitability. In the case of product profitability we must also be careful that we are identifying the appropriate service-related costs as they differ by product. One of

the problems here is that conventional accounting methods do not help in the identification of these costs.

What we should be concerned to do at this stage in the analysis is to identify the contribution to profit that each product (at the individual stock keeping unit (SKU) level) makes. By contribution we mean the difference between total revenue accruing and the directly attributable costs that attach as the product moves through the logistics system.

Looking first at differences in product profitability, what use might be made of the A,B,C categorisation? Firstly it can be used as the basis for classic inventory control whereby the highest level of service (as represented by safety stock) is provided for the 'A' products, a slightly lower level for the 'B' products and lower still for the 'Cs'. Thus we might seek to follow the stock holding policy shown below:

Product category	*Stock availability*
A	99%
B	97%
C	90%

Alternatively, and probably to be preferred, we might differentiate the stock holding by holding the 'A' items as close as possible to the customer and the 'B' and 'C' items further up the supply chain. The savings in stock holding costs achieved by consolidating the 'B' and 'C' items as a result of holding them at fewer locations would normally cover the additional cost of despatching them to the customer by a faster means of transportation (e.g. overnight delivery).

Perhaps the best way to manage product service levels is to take into account both the profit contribution and the individual product demand.

We can bring both these measures together in the form of a simple matrix in Figure 2.12. The matrix can be explained as follows.

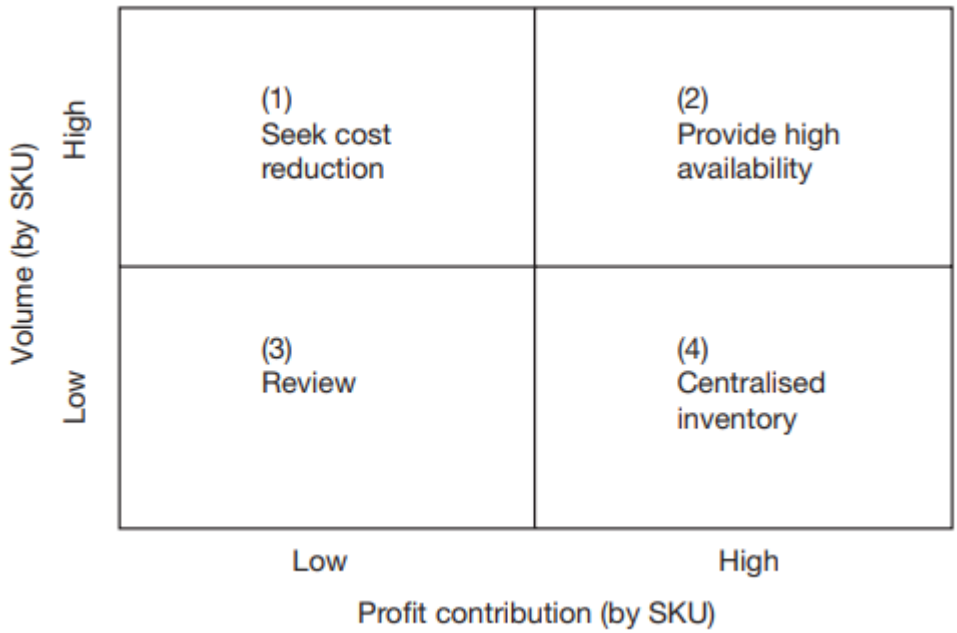


Figure 2.12 Managing product service levels

Quadrant 1: Seek cost reductions

Because these products have high volume it would suggest that they are in frequent demand. However, they are also low in profit contribution and the priority should be to re-examine product and logistics costs to see if there is any scope for enhancing profit.

Quadrant 2: Provide high availability

These products are frequently demanded and they are more profitable. We should offer the highest level of service on these items by holding them as close to the customer as possible and with high availability. Because there will be relatively few of these items we can afford to follow such a strategy

Quadrant 3: Review

Products in this category should be regularly appraised with a view to deletion from the range. They do not contribute to profits (or at least only marginally) and they are slow movers from a sales point of view. Unless they play a strategic role in the product portfolio of the firm then there is probably a strong case for dropping them.

Quadrant 4: Centralised inventory

Because these products are highly profitable but only sell at a relatively slow rate they are candidates for centralised management. In other words, they should be kept in some central location, as far back up the supply chain as possible in order to reduce the total inventory investment, and then shipped by express transport direct to customers.

This concept of service prioritisation by product can be extended to include customer priorities. Because the same 80/20 rule applies to customers as it does to products, it makes sense to focus resources on key accounts as well as key products

Figure 2.13 shows that if the 80/20 rule applies both to products and customers then all businesses are actually very dependent upon a very few customers buying a few high profit lines. Indeed the arithmetic is easy:

20% of customers buying 20% of the products
= 4% of all customer/product transactions

Which provides:

80% of 80% of total profit = 64%

In other words, just 4 per cent of transactions (measured order line by order line) gives us 64 per cent of all our profit!

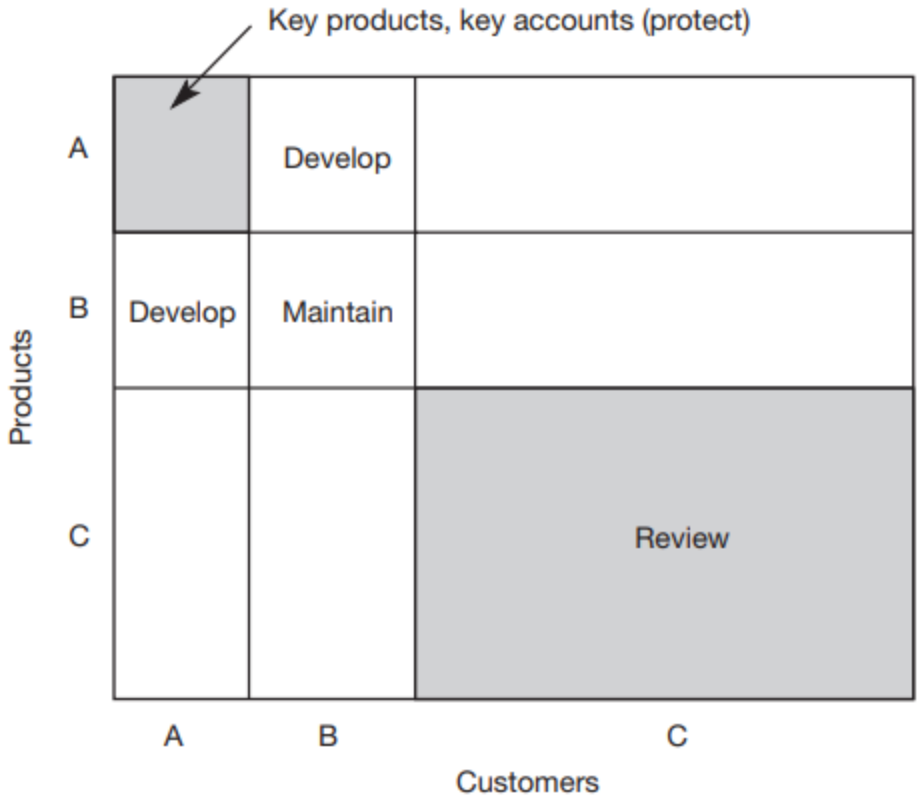


Figure 2.13 Customer service and the 80/20 rule

How can we make use of this important fact? The first thing is obviously to offer the highest levels of service and availability to key customers ordering key products. At the other end of the spectrum we should constantly review the less profitable customers and the less profitable products. In between there is scope for a degree of pragmatism, perhaps based upon the 'critical value' of an item to the customer. This is particularly relevant when developing a service strategy for spare parts. The idea is that if certain items are essential for, say, the operation of a machine where the downtime costs are high then those parts would be accorded a high critical value. If appropriate a 'weight' could be assigned on the basis of criticality and the 80/20 ranking based on profit could be adjusted accordingly. Table 2.2 provides an example.

Table 2.2 Critical value analysis

Critical values: 1 = Sale lost 2 = Slight delay acceptable 3 = Longer delay acceptable

Products	*Profitability rank order*	*Critical value to customers* 1	2	3	*Rank × Critical value*	*Order of priority for service*
C	1			x	3	1
P	2		x		4	2 =
R	3		x		6	5
B	4	x			4	2 =
X	5	x			5	4
Y	6			x	18	8
Z	7		x		14	7
H	8	x			8	6
J	9			x	27	10
K	10		x		20	9

Measure Logistics Cost

Logistics cost usually involves the cost that is occurring other than the production cost. This includes the cost of service, transportation, inventory and warehouse. Companies see these cost which adds price to the product after production thus decreasing the performance.

The first step in assessing the performance of logistics is by calculating the difference between total cost and the sum of production cost material cost labor cost utility costs etc. This will be usually the profit associated with the manufacturing of a product. Logistics cost is the decrease in this value due to the cost involved during the transportation stages from company to customer through supply chain and logistics management.

In some cases the service cost increase due to the inability to deliver the product in bulk thus not meeting the orders. Ordering delays, delivery time delays and back order management also usually affect the logistics cost. Products which are damaged or malfunctions upon delivery also increases the logistics cost which includes the returning item cost.

For the consumer, **price** is only one part of total **cost** of a **product**. The consumer has the additional **costs** of transportation, usage and eventually, disposal of the **product**. Together, these **costs** are referred to as the total **customer cost** (TCC).

Logistics and shareholder value

One of the key measures of corporate performance today is shareholder value. In other words, what is the company worth to its owners? Increasingly senior management within the business is being driven by the goal of enhancing shareholder value. There are a number of complex issues involved in actually calculating shareholder value but at its simplest it is determined by the net present value of future cash flows.
These cash flows may themselves be defined as:
Net operating income
less
Taxes
less
Working capital investment
less
Fixed capital investment
=
After-tax free cash flow

More recently there has been a further development in that the **concept of economic value added (EVA)** has become widely used and linked to the creation of shareholder value. The term EVA originated with the consulting firm Stern Stewart although its origins go back to the economist Alfred Marshall who, over 100 years ago, developed the concept of 'economic income'.

Essentially EVA is the difference between operating income after taxes less the true cost of capital employed to generate those profits. Thus:
Economic value added (EVA)
= Profit after tax − True cost of capital employed

It will be apparent that it is possible for a company to generate a negative EVA. In other words, the cost of capital employed is greater than the profit after tax. The impact of a negative EVA, particularly if sustained over a period of time, is to erode shareholder value. Equally improvements in EVA will lead to an enhancement of shareholder value. If the net present value of expected future EVAs were to be calculated this would generate a measure of wealth known as **market value added (MVA),** which is a true measure of what the business is worth to its shareholders.

A simple definition of MVA is:
Stock price × Issued shares
less
Book value of total capital invested
=
Market value added

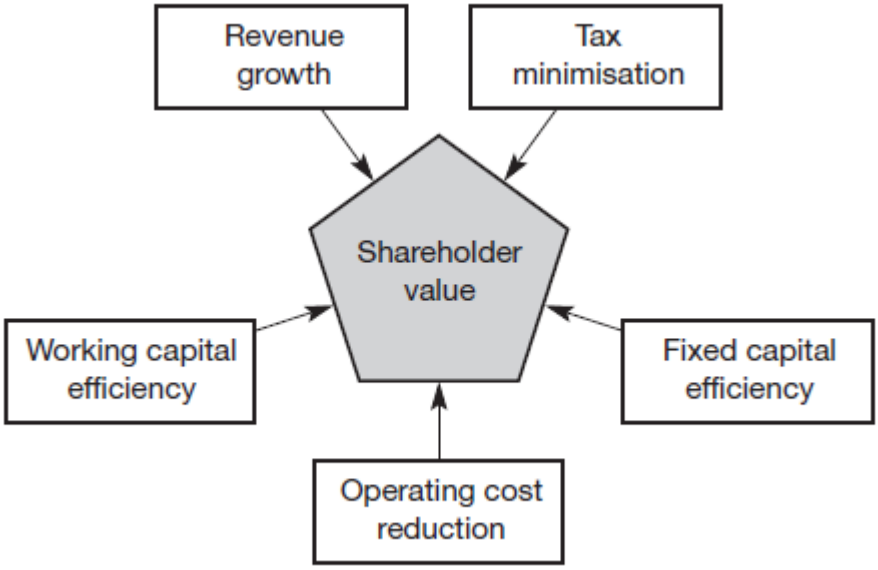
and, as we have already noted,
MVA = Net present value of expected future EVA

Clearly, it will be recognised that there are a number of significant connections between logistics performance and shareholder value. Not only the impact that logistics service can have upon net operating income (profit) but also the impact on capital efficiency (asset turn). **Many companies have come to realise the effect that lengthy pipelines and highly capital-intensive logistics facilities can have on EVA and hence shareholder value.** As a result they have focused on finding ways in which pipelines can be shortened and, consequently, working capital requirements reduced. At the same time they have looked again at their fixed capital deployment of distribution facilities and vehicle fleets and in many cases have moved these assets off the balance sheet through the use of third-party logistics service providers.

The drivers of shareholder value

The **five basic drivers** of enhanced shareholder value are shown in Figure 3.4. They are revenue growth, operating cost reduction, fixed capital efficiency, working capital efficiency and tax minimisation. All five of these drivers are directly and indirectly affected by logistics management and supply chain strategy.

Figure 3.4 The drivers of shareholder value



Revenue growth

The critical linkage here is the impact that logistics service can have on sales volume and customer retention. Whilst it is not generally possible to calculate the exact correlation between service and sales there have been many studies that have indicated a positive causality.

It can also be argued that superior logistics service (in terms of reliability and responsiveness) can strengthen the likelihood that customers will remain loyal to a supplier. In Chapter 2 it was suggested that higher levels of customer retention lead to greater sales. Typically this occurs because satisfied customers are more likely to place a greater proportion of their purchases with that supplier.

Operating cost reduction

The potential for operating cost reduction through logistics and supply chain management is considerable. Because a large proportion of costs in a typical business are driven by logistics decisions and the quality of supply chain relationships, it is not surprising that in the search for enhanced margins many companies are taking a new look at the way they manage the supply chain.

It is not just the transportation, storage, handling and order processing costs within the business that need to be considered. Rather a total pipeline view of costs on a true 'end-to-end' basis should be taken. Often the upstream logistics costs can represent a significant proportion of total supply chain costs embedded
in the final product.

There is also a growing recognition that time compression in the supply chain not only enhances customer service but can also reduce costs through the reduction of non-value-adding activities. This is an issue that we shall return to in Chapter 6.

Fixed capital efficiency

Logistics by its very nature tends to be fixed asset 'intensive'. Trucks, distribution centres and automated handling systems involve considerable investment and, consequently, will often depress return on investment. In conventional multi-echelon distribution systems, it is not unusual to find factory warehouses, regional distributioncentres and local depots, all of which represent significant fixed investment.

One of the main drivers behind the growth of the third-party logistics service sector has been the desire to reduce fixed asset investment. At the same time the trend to lease rather than buy has accelerated. Decisions to rationalise distribution networks and production facilities are increasingly being driven by the realization that the true cost of financing that capital investment is sometimes greater than the
return it generates.

Working capital efficiency

Supply chain strategy and logistics management are fundamentally linked to the working capital requirement within the business. Long pipelines by definition generate more inventory; order fill and invoice accuracy directly impact accounts receivable and procurement policies also affect cash flow. Working capital requirements can be dramatically reduced through time compression in the pipeline and subsequently reduced order-to-cash cycle times.

Surprisingly few companies know the true length of the pipeline for the products they sell. The 'cash-to-cash' cycle time (i.e. the elapsed time from procurement of materials/components through to sale of the finished product) can be six months or longer in many manufacturing industries. By focusing on eliminating non-value-adding time in the supply chain, dramatic reduction in working capital can be achieved. So many companies have lived with low inventory turns for so long that they assume that it is a feature of their industry and that nothing can be done. They are also possibly not motivated to give working capital reduction a higher priority because an unrealistically low cost of capital is often used in decision making.

Tax minimisation

In today's increasingly global economy, organisations have choices as to where they can locate their assets and activities. Because tax regimes are different country by country, location decisions can have an important impact on after-tax free cash flow. It is not just corporate taxes on profits that are affected, but also property tax and excise duty on fuel. Customs regulations, tariffs and quotas become further considerations, as do rules and regulation on transfer pricing. For large global companies with production facilities in many different countries and with dispersed distribution centres and multiple markets, supply chain decisions can significantly affect the total tax bill and hence shareholder value.

Logistics cost analysis

logistics cost is the total expenditure done on a single product from the beginning of procurement to selling it to end customer.

cost includes like:

- transportation cost
- storage cost (warehouse cost)
- transit cost (in transit damage)
- Damage cost (in storage damage)

After a century or more of reliance upon traditional cost accounting procedures to provide an often unreliable insight into profitability, managers are now starting to question the relevance of these methods.[7] The accounting frameworks still in use by the majority of companies today rely upon arbitrary methods for the allocation of shared and indirect costs and hence frequently distort the true profitability of both products and customers. Indeed, as we shall see, these traditional accounting methods are often quite unsuited for analysing the profitability of customers and markets since they were originally devised to measure product costs. Because logistics management is a flow-oriented concept with the objective of integrating resources across a pipeline which extends from suppliers to final customers, it is desirable to have a means whereby costs and performance of that pipeline flow can be assessed.

Probably one of the main reasons why the adoption of an integrated approach to logistics and distribution management has proved so difficult for many companies is the lack of appropriate cost information. The need to manage the total distribution activity as a complete system, having regard for the effects of decisions taken in one cost area upon other cost areas, has implications for the cost accounting systems of the organisation. Typically, conventional accounting systems group costs into broad, aggregated categories which do not then allow the more detailed analysis necessary to identify the true costs of servicing customers buying particular product mixes. Without this facility to analyse aggregated cost data, it becomes impossible to reveal the potential for cost trade-offs that may exist within the logistics system.

Generally the effects of trade-offs are assessed in two ways: from the point of view of their impact on total costs and their impact on sales revenue. For example, it may be possible to trade off costs in such a way that total costs increase, yet because of the better service now being offered, sales revenue also increases. If the difference between revenue and costs is greater than before, the trade-off may be regarded as leading to an improvement in cost effectiveness. However, without an adequate logistics-oriented cost accounting system it is extremely difficult to identify the extent to which a particular trade-off is cost-beneficial.

Types of Logistics Costs

Shipping and storage expenses represent the two major types of logistics costs. Once you find a source for your product or raw materials, you need to pay a freight company to deliver it. The materials typically arrive at your location in a semi truck, and it's your responsibility to have a safe space to unload this truck and store the delivery. The volume of deliveries you expect each day determines the size of your warehouse and the number of docks available, all of which affect how much you pay in rent and utilities.

Staffing represents another critical type of logistics cost. The warehouse facility needs to be staffed to unload and organize materials, and you also need a team of logistics managers to schedule deliveries. However, a warehouse is only temporary storage; the **materials still need to get to either a manufacturing plant or the end user in a process called distribution**. You can either contract out this movement of materials to another freight company or hire an internal distribution team.

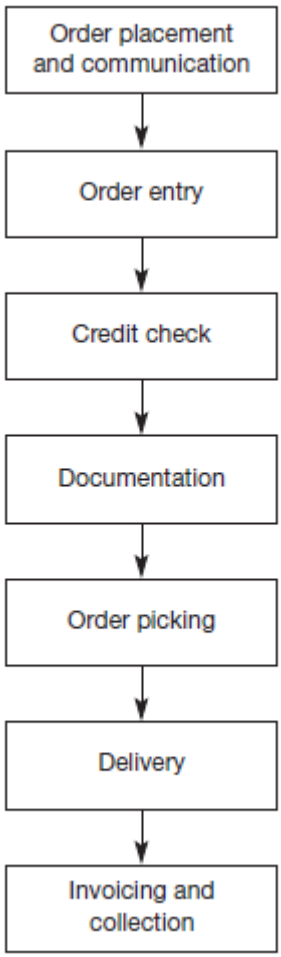
The concept of total cost analysis

Many problems at the operational level in logistics management arise because all the impacts of specific decisions, both direct and indirect, are not taken into account throughout the corporate system. Too often decisions taken in one area can lead to unforeseen results in other areas. **Changes in policy on minimum order value, for example, may influence customer ordering patterns and lead to additional costs.** Similarly, changes in production schedules that aim to improve production efficiency may lead to fluctuations in finished stock availability and thus affect customer service.

The problems associated with identifying the total system impact of distribution policies are immense. By its very nature logistics cuts across traditional company organisation functions with cost impacts on most of those functions. Conventional accounting systems do not usually assist in the identification of these company-wide impacts, frequently absorbing logistics-related costs in other cost elements. The cost of processing orders, for example, is an amalgam of specific costs incurred in different functional areas of the business which generally prove extremely difficult to bring together. Figure 3.6 outlines the various cost

elements involved in the complete order processing cycle, each of these elements having a fixed and variable cost component which will lead to a different total cost for any one particular order.

Figure 3.6 Stages in the order-to-collection cycle

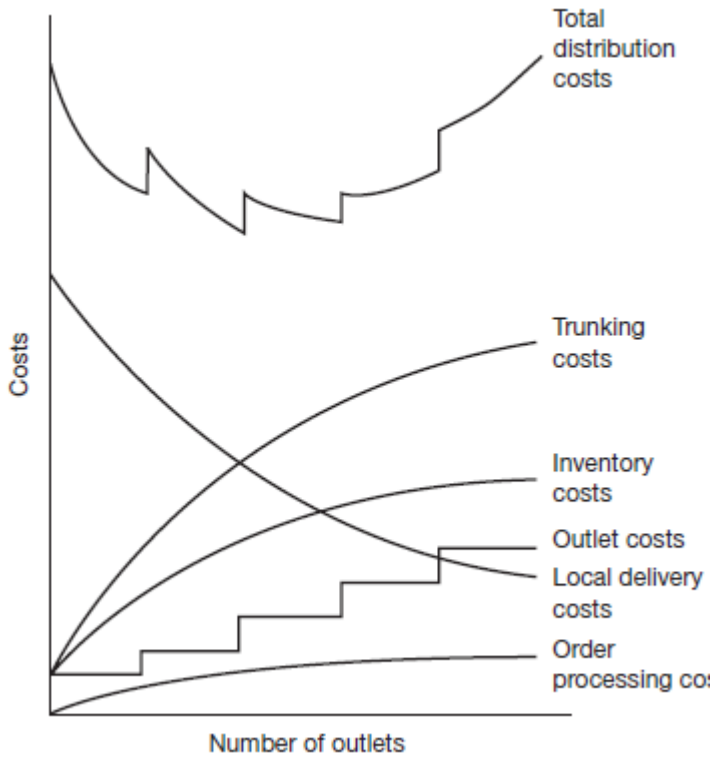


Accounting practice for budgeting and standard-setting has tended to result in a compartmentalisation of company accounts; thus budgets tend to be set on a functional basis. The trouble is that policy costs do not usually confine themselves within the same watertight boundaries. It is the nature of logistics that, like a stone thrown into a pond, the effects of specific policies spread beyond their immediate area of impact.

A further feature of logistics decisions that contributes to the complexity of generating appropriate cost information is that they are usually taken against a background of an existing system. The purpose of total cost analysis in this context is to identify the change in costs brought about by these decisions. Cost must therefore be viewed in incremental terms – the change in total costs caused by the change to the system. Thus the addition of an extra warehouse to the distribution network will bring about cost changes in transport, inventory investment and communications.

It is the incremental cost difference between the two options that is the relevant accounting information for decision making in this case. Figure 3.7 shows how total logistics costs can be influenced by the addition, or removal, of a depot from the system.

Figure 3.7 The total costs of a distribution network



Logistics Cost Management

Expect to continually look for ways to reduce logistics costs while still operating your business efficiently. One of the simplest ways to keep logistics costs under control is to manage orders and deliveries effectively. It costs a lot more to receive a rush delivery because the materials need to be loaded onto a plane. Avoid outrageous delivery costs by keeping a close eye on supply and demand (a process called forecasting) to ensure your order arrives before it's desperately needed and to avoid overwhelming the warehouse with too many deliveries at once.

Weigh the pros and cons of local versus international materials. The purchase price of international products is often lower than local counterparts, but it's far more expensive and time-consuming to ship international versus domestic products. The closer your suppliers, the more you save on logistics costs.

Examples of Logistics Cost Reduction

Sometimes a little creativity reduces logistics costs. For example, Walden University reports that toilet paper manufacturers were able to fit more toilet paper rolls onto freight carriers by reducing or eliminating the cardboard tube. Because they could ship the same amount of products in fewer trips (or more product for the same cost), the toilet paper companies experienced a logistics cost reduction.

In addition, shipping companies like ReTrans Freight offer logistics cost management solutions, such as order consolidation. Instead of making small and frequent orders, consider spacing out your orders to place as many materials or products as possible onto a single truck.

Growing companies may find it beneficial to set up a distribution center in a centralized location, which allows a single truck filled with materials or products to arrive at one warehouse. From there, small deliveries can be made on an internal, as-needed basis to manufacturing plants in the region.

Airports represent an excellent example of this model. Large planes frequently carry passengers to and from the most popular cities, and small planes take a reduced number of

passengers to less-popular regional destinations on a less frequent schedule. It would be less efficient to always use small planes because the airport terminals would quickly become overcrowded. Your logistics management and supply chain distribution work in much the same way

The cost of holding inventory

As we noted, there are many costs incurred in the total logistics process of converting customer orders into cash. However, one of the largest cost elements is also the one that is perhaps least well accounted for and that is inventory. It is probably the case that many managers are unaware of what the true cost of holding inventory actually is. If all the costs that arise as a result of holding inventory are fully accounted for, then the real holding cost of inventory is probably in the region of 25 per cent per annum of the book value of the inventory.

This figure is as high as it is because there are a number of costs to be included. The largest cost element will normally be the cost of capital. The cost of capital comprises the cost to the company of debt and the cost of equity. It is usual to use the *weighted cost of capital* to reflect this. Hence, even though the cost of borrowed money might be low, the expectation of shareholders as to the return they are looking for from the equity investment could be high. The other costs that need to be included in the inventory holding cost are the costs of storage and handling, obsolescence, deterioration and pilferage, as well as insurance and all the administrative costs associated with the management of the inventory (see box).

The true cost of inventory
Cost of capital
Storage and handling
Obsolescence
Damage and deterioration
Pilferage/shrinkage
Insurance
Management costs

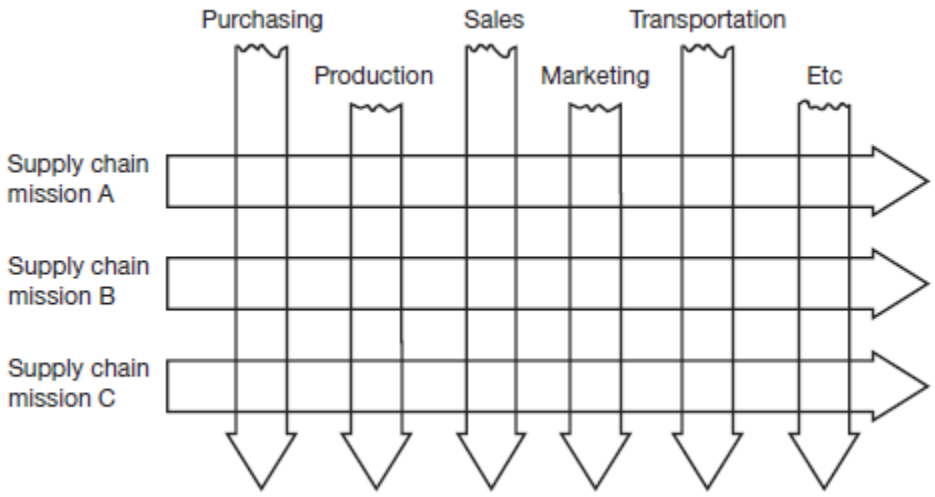
Principles of logistics costing

It will be apparent from the previous comments that the problem of developing an appropriate logistics-oriented costing system is primarily one of focus. That is, the ability to focus upon the output of the distribution system, in essence the provision of customer service, and to identify the unique costs associated with that output. Traditional accounting methods lack this focus, mainly because they were designed with something else in mind.

One of the basic principles of logistics costing, it has been argued, **is that the system should mirror the materials flow, i.e**. it should be capable of identifying the costs that result from providing customer service in the marketplace. A second principle is that it **should be capable of enabling separate cost and revenue analyses to be made by customer type and by market segment or distribution channel.** This latter requirement emerges because of the dangers inherent in dealing solely with averages, e.g. the average cost per delivery, since they can often conceal substantial variations either side of the mean.

To operationalise these principles requires an 'output' orientation to costing. In other words, we must first define the desired outputs of the logistics system and then seek to identify the costs associated with providing those outputs. A useful concept here is the idea of 'mission'. In the context of logistics and supply chain management, a mission is a set of customer service goals to be achieved by the system within a specific product/market context. Missions can be defined in terms of the type of market served, by which products and within what constraints of service and cost. A mission by its very nature cuts across traditional company lines. Figure 3.8 illustrates the concept and demonstrates the difference between an 'output' orientation based upon missions and the 'input' orientation based upon functions.

Figure 3.8 Missions that cut across functional boundaries



The successful achievement of defined mission goals involves inputs from a large number of functional areas and activity centres within the firm. Thus an effective costing system must seek to determine the total systems cost of meeting desired mission objectives (the 'output' of the system) and the costs of the various inputs involved in meeting these outputs.

Figure 3.9 illustrates how three supply chain missions may make a differential impact upon activity centre/functional area costs and, in so doing, provide a logical basis for costing within the company. As a cost or budgeting method, mission costing is the reverse of traditional techniques: under this scheme a functional budget is determined now by the

demands of the missions it serves. Thus in Figure 3.9 the cost per mission is identified horizontally and from this the functional budgets may be determined by summing vertically.

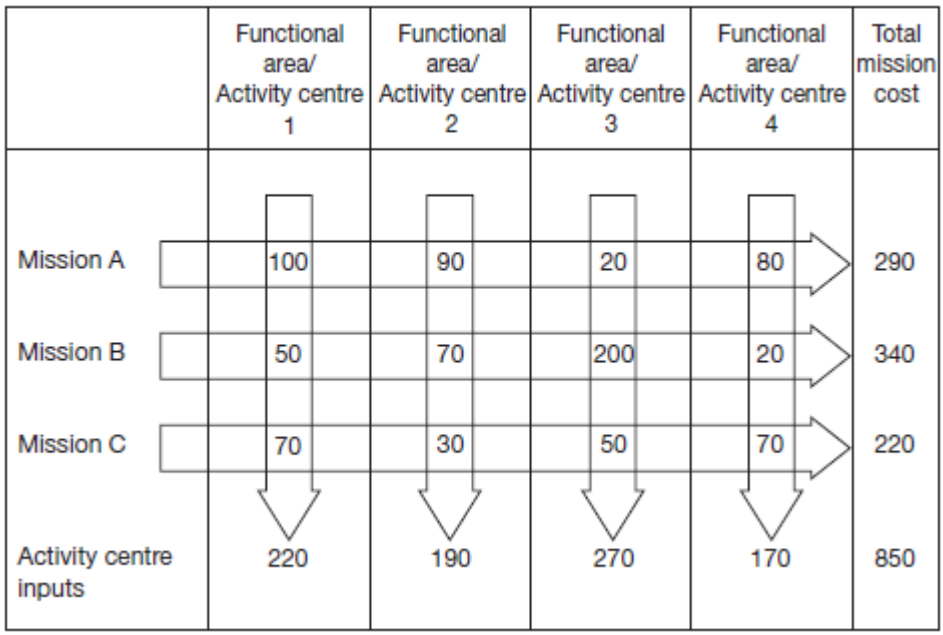


Figure 3.9 The programme budget (£'000)

Given that the logic of mission costing is sound, how might it be made to work in practice? This approach requires firstly that the activity centres associated with a particular distribution mission be identified, e.g. transport, warehousing, inventory, etc., and secondly that the incremental costs for each activity centre incurred as a result of undertaking that mission must be isolated. Incremental costs are used because it is important not to take into account 'sunk' costs or costs that would still be incurred even if the mission were abandoned. We can make use of the idea of 'attributable costs' to operationalise the concept: *Attributable cost is a cost per unit that could be avoided if a product or function were discontinued entirely without changing the supporting organization structure.*

In determining the costs of an activity centre, e.g. transport, attributable to a specific mission, the question should be asked: 'What costs would we avoid if this customer/ segment/channel were no longer serviced?' These avoidable costs are the true incremental costs of servicing the customer/segment/channel. Often they will be substantially lower than the average cost because so many distribution costs are fixed and/or shared.
This approach becomes particularly powerful when combined with a customer revenue analysis, because even customers with low sales offtake may still be profitable in incremental costs terms if not on an average cost basis. In other words the company would be worse off if those customers were abandoned.

Such insights as this can be gained by extending the mission costing concept to produce profitability analyses for customers, market segments or distribution channels. The term '**customer profitability accounting'** describes any attempt to relate the revenue produced by a customer, market segment or distribution channel to the costs of servicing that customer/segment/channel.