

PRIMER

SUPPLY CHAIN MANAGEMENT

Introduction

1. Supply Chain Management (SCM) encompasses the aspects of design, planning, execution, control and monitoring of supply chain activities with the objectives of creating net value, building competitive structures, leveraging worldwide logistics, synchronizing supply with demand and enhancing overall performance. SCM draws heavily from the spheres of Industrial Engineering, Systems Engineering, Operations Management, Logistics, Procurement, Information technology as well as Marketing.
2. In the present world, SCM is essential as it enhances competing and consumer satisfaction. Efficient Supply Chain Operations allow organisations to deliver products to end users in a timely and cost-effective manner. In the Armed Forces, these strategies not only help us improve efficiency, control costs and mitigate risks but also enable delivering value to end users at the right place and time ensuring both quality as well as quantity, with built in redundancies.
3. A clear understanding of the interplay of SCM and Defence requires knowledge of various facets of the Supply Chain, its Drivers, Inventory Control Techniques and Contemporary Trends, amongst various others. It also requires clarity about the various organisations, processes and procedures in place to ensure that the Goods and Services essential to meet Defence requirements are made available to users in the most efficient and effective manner. The overall aim of the SCM capsule is to develop Acquisition professionals who can deliver and sustain efficient and responsive supply chains towards planned capability build up and sustenance.

Aim, Objectives & Terminal Behaviour

4. **Aim.** To enable participants to strategise, design and operationalise responsive and efficient supply chains for the three services in a collaborative tri services environment.
5. **Objectives.**
 - (a) To develop sound understanding of supply chain concepts and contemporary value chain philosophies.

- (b) To augment analysis and equip with quantitative techniques towards Material Management and Distribution Networks.
- (c) To familiarise with various organisations and procedures related to Weapon and Equipment Acquisition in the Armed Forces.
- (d) To expose participants to updated provisions of Defence Acquisition Procedure – 2020 (DAP) and Defence Procurement Manual (DPM).
- (e) To develop knowledge and skill levels towards effectively operationalising DAP and DPM at various HQs/ echelons.
- (f) To understand nuances and legalities of contract management and e-procurement.

6. **Terminal Behaviour.**

- (a) Design, Operate, Review and Monitor multifarious supply chains in Integrated Service Environment.
- (b) Induce and leverage best Supply Chain Management (SCM) practices towards revitalising and optimising existing legacy supply chains.
- (c) Understand the delays in intricate capital acquisition process. Initiate measures to accelerate the acquisition of much needed defence capability and modernisation projects.
- (d) Facilitate and consistently synchronise 'Capability Development Programs' with Services Capital Acquisition Plan (SCAP) and Annual Acquisition Plan (AAP).
- (e) Execute speedy revenue procurements, while getting the best value of scarce financial resources.

Logistics in War – A Historical Perspective

7. As with any matter military, it is necessary to acquire a historical perspective of logistics in war. As the adage goes “amateurs discuss tactics, professionals discuss logistics”. Every war that mankind has seen has brought out critical lessons in logistics. We shall see a few examples here.

8. **Alexander the Logistician.** In 356 BC, a son and heir, who was to become one of history's greatest logisticians, was born to King Philip of Macedonia. At age 16,

Philip's son Alexander was already a general in the select army. He was ravenous for conquest and was leading his troops to victory after victory. At age 20, a murderer's knife elevated Alexander to the throne. Quickly, he built his reputation, striking fear into the hearts of those who dared oppose him. He ruled, conquered, and assimilated countries-including Greece, Persia, and India-into his domain for a short 13 years until his death in 323 B.C. Alexander's success was not an accident. He was able to consistently defeat enemy armies and expand his kingdom because of his proactive preparation and logical approach to warfare. Some of the key factors in his success were: -

- (a) Inclusion of logistics in strategic planning
- (b) Detailed knowledge of opposing armies, the surrounding terrain, and harvest calendars.
- (c) Innovative incorporation of new weapons technology.
- (d) Maintenance of a single point of control.

9. It may seem surprising today to consider that arguably the most effective organization in the history of the world considered logistics and supply-chain management as integral parts of its strategic planning.

Battle of Khiva

10. The Khanate of Khiva had a long history of cocking a snook at Russian authority. From the massacre of Bekovich-Cherkassky's expedition in 1717 to the failure of Perovskii's winter invasion in 1839-40, Khiva seemed the embodiment of 'Asiatic insolence' and intransigence. Turkestan Governor-General von Kaufman was determined to wipe out the memories of these early defeats and secure his own legacy as a great military leader. Easily securing consent from St Petersburg and brushing aside Khivan attempts to find a diplomatic solution, in 1873 he launched the most elaborate of all the Russian campaigns of conquest, with four different columns setting out from Krasnovodsk, Mangishlaq, Orenburg and Turkestan.

11. Kaufman was said to have mapped the watering holes in the desert to provide for food and water for the camels and troops on the way. This indicates the role that supply (logistics) plays in a General's strategic plan. Despite such planning, however, the Krasnovodsk column ran out of water in the middle of the Qara-Qum desert and had to turn back. The Turkestan column, led by von Kaufman himself, almost met a similar fate in the Qizil-Qum, and was saved only by the skill of its Qazaq guides. Most of the fighting was done by the Orenburg and Mangishlaq columns, which reached the city of Khiva ahead of von Kaufman, who instructed them to wait until he arrived and could enter in triumph.

Lessons in Logistics from Gulf War-I

12. Operation Desert Sword, the ground war to liberate Kuwait, was the culmination of a multi-stage military plan. Following the quick invasion and occupation of Kuwait by Iraqi forces, the unique nature of the global order at the time facilitated a Trans-Atlantic consensus to come to the aid of Kuwait. This enabled the passing of a series of UN Security Council Resolutions that led to arguably the greatest military deployment and logistical effort since the WW-II followed by the most rapid and decisive victory of its scale.

13. On 17 January 1991, the air campaign, known as Operation Desert Storm commenced. The plan comprised four distinct phases. In this entire effort, a total of 2700 aircraft of several nations flew some 130000 sorties over 43 days, expending 87,679 tons of air-to-ground munitions and consuming 1953 million litres of aviation fuel (averaging 45.42 million litres a day). By the time the Allies were ready to commence Operation Desert Sword in mid-February, they had cut off the Kuwaiti army of occupation, severing its lines of communication and logistic support.

14. During the campaign, the flexibility of the logistics operation in the desert was amply demonstrated. The senior American logistician noted that the key lesson for him was the creation of a flexible organisation to get the tasks completed to the satisfaction of the theatre commander.

Logistics Lessons from the Wars for the Boardrooms

15. Ironically, despite today's complex business environment, most boardrooms still do not consider the logistics side of doing business, primarily because its function has traditionally been viewed only as a cost of doing business. Companies that incorporate logistics planning and management into long-term business strategies can achieve tremendous benefits. Viewing logistics at the strategic level is the best and possibly only way to actually produce competitive advantages in the areas of purchasing and distribution.

16. The most effective ways to convince top management to invest the resources and time necessary to address logistics and make them an integral part of strategic planning include the following: -

- (a) Quantify specific opportunities to reduce costs, cycle times, and service failures.
- (b) Tie specific opportunities to options that will enable growth in sales, a reduction of overhead, and/or the ability to differentiate the company from competitors.
- (c) Prepare and preview presentations with a cross-functional team to overcome internal objections and garner support prior to high-level strategy meetings.

- (d) End the strategy meeting with a specific request that the CEO can approve. In other words, strike while the iron is hot and close the sale.

Logistics – Definition And Scope

17. **Logistics**. The word "logistics" is derived from the Greek adjective 'logistikos' meaning "skilled in calculating". The first administrative use of the word was in Roman and Byzantine times when there was a military administrative official with the title 'Logista'. In 1948, the 'Dictionary of United States Military Terms for Joint Usage' stated that, logistics was, *"that part of the entire military activity which deals with production, procurement, storage, transportation, distribution, maintenance and evacuation of personnel, supplies and equipment; with induction, classification, assignment, welfare and separation of personnel and with facilities required for the support of the military establishment, including construction and operation thereof. It comprises both planning and implementation"*.

18. Military logistics is the discipline of planning and carrying out the movement, supply, and maintenance of military forces. In its most comprehensive sense, it is those aspects or military operations that deal with:

- (a) Design, development, acquisition, storage, distribution, maintenance, evacuation, and disposition of materiel.
- (b) Transport of personnel.
- (c) Acquisition or construction, maintenance, operation, and disposition of facilities.
- (d) Acquisition or furnishing of services.
- (e) Medical and health service support.

19. The above definition clarifies logistics as encompassing entire defence activities except employment of weapons, use of communication devices and weather forecasting, explaining these areas under the heading "operations". The assumption was that



Logistics and Operations were two sides of the Defence Coin. As this concept of logistics made it unmanageably large, the natural tendency was to narrow it down.

Figure 1: The Defence Coin

20. **Factors Affecting Military Materials Management.** Materials Management as part of the overall Logistics System of the Armed Forces does not function in isolation but is influenced by the environment in which it has to function. These include: -

- (a) **Political Factors.** Political decisions decide the type of warfare that the Armed Forces may have to carry out, when the need arises.
- (b) **Economic Factors.** The economic policies of a country on defence expenditure vis-à-vis other expenditure will have a significant influence on materials functions. The availability of resources would dictate the degree of sophistication of weapons and their quantum and the extent of logistics back up and support.
- (c) **Technological Factors.** The development of technology has an influence on futuristic planning by the materials managers. Rapid technological advances result in frequent obsolescence, which is costly. Material managers have to comprehend the technological trends, look ahead and regulate their functions so that they keep pace with technological changes and do not face major deficiencies subsequently.

Logistics in Industry

21. **Materials Management.** Materials Management, as practised in business today, can be defined as a confederacy of traditional materials activities bound by a common idea - the ideal of an integrated management approach to planning, acquisition, conversion, flow and distribution of production materials from the raw materials stage to the finished product state. The General Electric Company, USA, a pioneer in the field of materials management has grouped the following functions under materials management: -

- (a) Materials Planning and Programming.
- (b) Purchasing.
- (c) Storekeeping.
- (d) Inventory Control.
- (e) Receiving and Warehousing.

- (f) Value Analysis and Standardisation.
- (g) Production Control (in a restricted sense).
- (h) Transportation.
- (j) Materials Handling.
- (k) Disposal of Scrap and Surplus.

22. **Physical Distribution Management.** Physical distribution management, as practised in business today, deals with all the activities concerned with the holding of finished goods, their movement to various warehouses and ultimately to the consumers/customer. In most business organisations, these activities are identified as marketing activities and handled by the marketing department.

Logistics Management in the Indian Armed Forces

23. The Indian Armed Forces are becoming increasingly aware of the requirement for logistics support planning for equipment. Every effort is made to ensure that weapons and equipment are introduced into service, complete with various elements of logistics support such as: -

- (a) Reserve weapons & equipment including war reserves.
- (b) Initial spares requirement including carried spares.
- (c) Special tools, test equipment gauges.
- (d) User and technical literature.
- (e) Training requirement (including maintenance agency).

24. The in-service logistics management i.e., the task of ensuring that the equipment after induction remains in a serviceable condition till discard is carried out by various agencies in the three Services, organised differently in each.

25. In the Army, logistic support functions for in-service equipment are carried out responsibility of the ASC, the AOC and the EME. The transportation/physical distribution functions are carried out by these agencies themselves making use of the transportation services available in the country. The maintenance of weapon systems and equipment is carried out by the EME.

26. In the IAF, the Logistics Branch performs the materials management and physical distribution activities. AE (M) and AE (L) branches manage the maintenance of equipment. These agencies are organised under the AOM at Air HQ, thereby providing a single point management and control of these activities.

27. In the Navy, the Executive Branch and Technical Branches are now performing materials management and physical distribution activities, which were earlier performed by the erstwhile Supply and Secretariat Branch. The Engineering and Electrical Branches perform the maintenance functions. These agencies are organised under the Chief of Materials at Naval Headquarters thereby providing a single point management and control of these activities.

Logistics in Weapons / Equipment Management

28. Weapons / Equipment management has many interpretations. Some feel that weapons / equipment management is intended to meet the users' requirement for suitable weapons/equipment at the lowest overall cost to the public. The emphasis here is on the lowest overall cost. Others consider weapons/equipment management to be the efficient and effective control of weapons/equipment, their operation and supporting resources, to ensure that the user's valid requirements are economically met at all times. The emphasis here is on questioning the requirements before accepting them and then economising their cost by appropriate management and choice of options. Weapons/Equipment management covers more than both these interpretations. The most widely understood definition of Weapons / Equipment Management is "to ensure availability of the 'Right' quantity in the 'Right' condition and at the 'Right' cost".

29. This larger and widely accepted logistics concept of weapons/equipment management focuses attention on all the main activities, viz., the selection, design, development, production, allocation, distribution, maintenance and final discard of the weapons/equipment keeping in mind the aspects of "Cost" and "Time". There are four basic stages in the life of a weapon/ equipment: -

(a) **Concept Formulation.** It involves consideration of political situation and enemy capabilities leading to an evaluation of what is desired.

(b) **Contract Definition.** It includes definition of performance parameters and feasibility studies describing alternative design possibilities.

(c) **Development and Production.** This includes developing designs, evaluating these, making the optimal choice, developing weapons/equipment, testing them, redesigning if necessary and manufacturing the desired weapon/ equipment of the right quality. This phase is bypassed in case of outright purchase from vendors (buy decisions).

(d) **Operation and Disposal.** This is the final stage that all the other stages lead to, and includes utilisation, maintenance and final discard or "retirement"

30. Weapons/Equipment Management therefore, is concerned with the complete weapons/equipment life cycle i.e. from "Womb to Tomb". During the weapons / equipment life cycle, there are a number of agencies which have to interact the major ones being: -

- (a) User.
- (b) General Staff.
- (c) R&D Organisation.
- (d) Production Agency.
- (e) Inspection Organisation.
- (f) Procurement Agency.
- (g) Maintenance Agency.
- (h) Ministries of Defence and Finance.

31. An integrated weapons/equipment management, based on "Systems Approach" has therefore to be adopted to ensure co-ordination amongst all the agencies involved so that the logistics management during the entire life cycle of the weapon/equipment is pre-planned and executed smoothly. We have discussed about "Logistics" in relation to Weapons/Equipment Management. It is therefore, necessary to understand what the term means.

Integrated Logistic Support (ILS) in Weapon / Equipment Management

32. The term "Integrated Logistics Support" is of rather recent origin and could be best understood by following an evolutionary approach to logistics. Traditionally, defence forces or for that matter all organisations, acquired a weapon system or other major equipment and then began to think of the maintenance, or in other words, the logistics support necessary for the same. Thus, a logistician was brought in at a later stage to determine the requirement of maintenance, spares, documentation, test equipment, etc. needed to support the equipment. This often resulted in reducing the effectiveness of major equipment in certain phases of their life-cycle, eventually proving that the chosen weapon system/major equipment was not the most cost-effective over the entire life-cycle of its use. The developing concepts of taking a "Systems View/Systems Approach" in such activities, resulted in the development of the concept of "Integrated Logistics

Support". In this new approach to logistics support, the logistics aspects are considered right from the word 'go', thereby making logistics a "before-the-fact discipline" instead of an "after-the-fact discipline". This is done in three ways:-

- (a) Providing design guidelines concerning logistic factors e.g. habitability, safety, availability, storage facilities, manning and standardisation.
- (b) Timely evaluation of the interactions and inputs of logistic elements to other considerations.
- (c) Integration of logistic factors into total system design through trade-offs.

33. The integrated logistics support also makes full use of various available mathematical and statistical methods as well as Operations Research Techniques.

Jointness in Logistics – The Indian Context

34. **Joint Logistic Node.** The need for enhancing inter-operability and synergy among the three services was a long-standing issue and the first decision in principle to have a joint logistical node was taken in 2008. The creation of JLN aims to improve utilisation of resources, manpower and remove duplication.

35. In line with recommendations of GoM and KRC, post of Chief of Defence Staff (CDS) was created in 2019. Integrated logistics, followed by jointness is one of the key deliverables of the CDS. The mandate of the CDS of achieving jointness would therefore essentially be a two-tier process of firstly achieving integration in the logistic efforts of the services and secondly, concurrent creation of doctrines necessary for jointness in logistics during operations.

36. Potential for integrating logistics amongst the three services and with the aim of finally setting up of a 'Defence Logistics Organisation / Command' in the future is immense. Some of the advantages that may accrue are as under: -

- (a) 'Single Point' accountability within the Services.
- (b) Prevent duplication, both amongst various services of the army and also amongst the three services.
- (c) Synergise military and national infrastructure to achieve economy.
- (d) Operational outcomes being met more effectively.

37. **Broad Blueprint.** A broad blueprint of integrated logistics, finally flowing into joint logistics during operations, would involve the following: -

- (a) Identify existing commonalities amongst the three services. Examples include vehicles and their spares, rations, small arms etc. This process would be greatly facilitated by common codification across the services.
- (b) Create additional commonalities wherever feasible by joint service cases for future procurements. Examples include similar B Vehicles, communication and networking equipment etc.
- (c) Create uniform tri-service processes and procedures for procurement, demand, issue and management of commonalities. As evident, this would require considerable processes reengineering.
- (d) Create inter-service visibility of commonalities across a Single ERP platform to facilitate their management.
- (e) Optimise facilities, transportation, sourcing and pricing of the commonalities based on economies of scale and pooling of tri-service resources to enhance efficiencies and effectiveness.
- (f) Progressively create the capability to expand the scope to include the unique requirements of the three services under a single organisation.
- (g) Create and validate joint logistic doctrines in support of joint operations.

38. The future of Integrated logistics holds great future and numerous studies are on at various levels to conceptualise the organisation, role and tasks of such logistics command. In the years to come, more clarity will dawn on the organisation keeping the moot points as discussed above.

From Logistics to Supply Chain Management

39. **Integration of Logistics Functions.** Throughout the 1970s and early 1980s, many firms were working diligently to implement integrated logistics management. The idea was to manage the movement of material throughout the firm in an integrated and systematic manner, so that both the effectiveness and efficiency of the operation could be dramatically improved. Taking the system-wide perspective allows the firm to make appropriate trade-offs between purchasing costs, transport costs, inventory and warehousing costs. Close coordination between these operations can produce high levels of service and performance while reducing the total costs incurred. While integration of the logistics process within the firm has produced dramatic improvements, most consumer and industrial products are not totally created by a single firm. Normally,

several independent firms are involved in manufacturing a product and placing it in the hands of the end user. One firm might produce a raw material and sell it to a second firm which uses the material to produce a component. A third firm buys the component and assembles it into a product which is sold to a fourth firm such as a wholesale distributor. The wholesaler in turn sells the product to a fifth firm, such as a retail merchant, and the fifth firm sells the product to a consumer. The set of firms which pass these materials forward can be referred to as a supply chain.

40. **Genesis.** In 1982, Oscar Gomes, a consultant at Booz Allen Hamilton introduced the term "supply chain management" to the public domain in an interview for the Financial Times

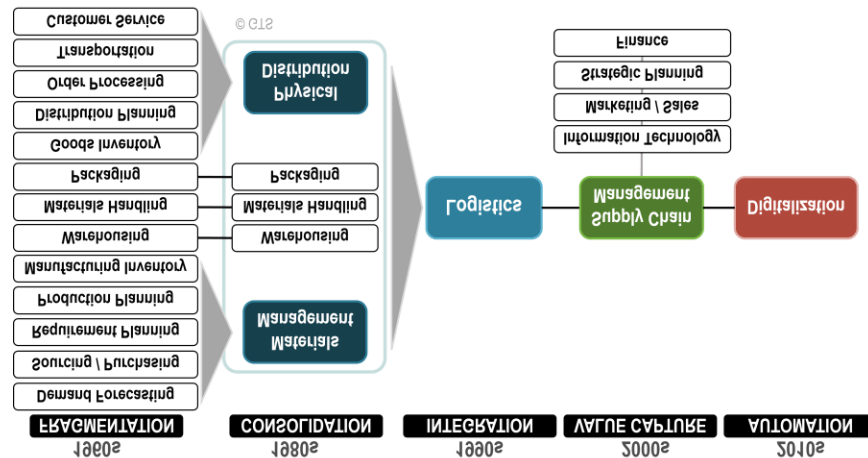
41. **What is Supply Chain Management?** Supply chain management is the management of the flow of goods and services and includes all processes that transform raw materials into final products. It involves the active streamlining of a business's supply-side activities to maximize customer value and gain a competitive advantage in the marketplace.

Need for Supply Chain Management

42. Corporations have turned increasingly to global sources for their supplies. This globalization of supply management has forced companies to look for more effective ways to coordinate the flow of materials into and out of the company. Companies and distribution channels compete more today on the basis of time and quality. Having a defect-free product to the customer faster and more reliably than the competition is no longer seen as competitive advantage but simply a requirement to be in the market. Customers demand products consistently delivered faster, exactly on time, and with no damage. Each of these necessitates closer coordination with supplier and distributors.

43. The global orientation and increased performance-based competition combined with rapidly changing technology and economic conditions all contribute to market place uncertainty. This uncertainty requires great flexibility on the part of individual companies and distribution channels, which in turn demand more flexibility in channel relationship.

Evolution of SCM



The Five Parts of SCM

44. The supply chain manager tries to minimize shortages and keep costs down. The job is not only about logistics and purchasing inventory. Supply Chain Managers need to “oversee and manage overall supply chain and logistic operations to maximize efficiency and minimize the cost of organization's supply chain.” In SCM, the supply chain manager coordinates the logistics of all aspects of the supply chain which consists of the following five parts.

- (a) **Planning.** To get the best results from SCM, the process usually begins with planning to match supply with customer and manufacturing demands. Firms must predict what their future needs will be and act accordingly.
- (b) **Sourcing.** Efficient SCM processes rely very heavily on strong relationships with suppliers. Sourcing entails working with vendors to supply the raw materials needed throughout the manufacturing process. In general, SCM sourcing includes ensuring: -
- (c) **Manufacturing.** At the heart of the supply chain management process, the company transforms raw materials by using machinery, labour, or other external forces to make something new.
- (d) **Delivering.** Once products are made and sales are finalized, a company must get the products into the hands of its customers. The distribution process is often seen as a brand image contributor, as up until this point, the customer has not yet interacted with the product. In strong SCM processes, a company has robust logistic capabilities and delivery channels to ensure timely, safe, and inexpensive delivery of products.
- (f) **Returning.** The supply chain management process concludes with support for the product and customer returns. Its bad enough that a customer needs to return a product, and its even worse if its due to an error on the company's part. This return process is often called reverse logistics, and the company must

ensure it has the capabilities to receive returned products and correctly assign refunds for returns received.

Types of Supply Chain Models

45. Supply chain management does not look the same for all companies. Each business has its own goals, constraints, and strengths that shape what its SCM process looks like. In general, there are often six different primary models a company can adopt to guide its supply chain management processes.

(a) **Continuous Flow Model.** One of the more traditional supply chain methods, this model is often best for mature industries. The continuous flow model relies on a manufacturer producing the same good over and over and expecting customer demand will little variation.

(b) **Agile Model.** This model is best for companies with unpredictable demand or customer-order products. This model prioritizes flexibility, as a company may have a specific need at any given moment and must be prepared to pivot accordingly.

(c) **Fast Model.** This model emphasizes the quick turnover of a product with a short life cycle. Using a fast chain model, a company strives to capitalize on a trend, quickly produce goods, and ensure the product is fully sold before the trend ends.

(d) **Flexible Model.** The flexible model works best for companies impacted by seasonality. Some companies may have much higher demand requirements during peak season and low volume requirements in others. A flexible model of supply chain management makes sure production can easily be ramped up or wound down.

(e) **Efficient Model.** For companies competing in industries with very tight profit margins, a company may strive to get an advantage by making their supply chain management process the most efficient. This includes utilizing equipment and machinery in the most ideal ways in addition to managing inventory and processing orders most efficiently.

(f) **Custom Model.** If any model above doesn't suit a company's needs, it can always turn towards a custom model. This is often the case for highly specialized industries with high technical requirements such as an automobile manufacturer.

The Three Benefits of SCM

46. **Lowered Costs.** Since SCM keeps a check on all the processes involved in the manufacturing to delivery of a product, it can integrate suppliers and apply technology to respond more dynamically to customer needs.

47. **Increased Revenue.** When organisations leverage technology like big data analytics to keep a record and stay closer to demands from the customers, they are able to respond quickly to their requirements. They can keep products available for purchase whenever the customers need them resulting in better revenue generation.

48. **Asset Utilisation.** Effective SCM also allows organizations to effectively and efficiently utilize their capital assets like production and transportation equipment.

Acquisition Management in Defence Forces

49. Though the words 'ACQUISITION' and 'PROCUREMENT' seem to carry similar meaning. While, they are used interchangeably but there is a subtle difference between procurement and acquisition. Procurement deals with an existing product that can be purchased off the shelf. Acquisition, on the other hand, especially in the Department of Defence, refers to arms designed from scratch as specified by the client. Procurement is focussed on getting a particular system or equipment for operational use. Acquisition is supposed to be focussed on acquiring the system equipment along with the capability to carry out product-improvement, design and development of Mark II and futuristic products. Acquisition aims at self-reliance in real terms, whereas Procurement results merely in 'meeting an emergent need', while the dependence on the OEM continues forever.

50. **Defence Acquisition Procedure (DAP) 2020.** DAP 2020 covers all Capital Acquisitions other than Works and Land, undertaken by the Ministry of Defence (MoD) and Service Headquarters (SHQ) both from indigenous sources and ex-import, except for medical equipment.

51. **Defence Procurement Manual (DPM) 2009.** DPM 2009 with subsequent supplements covers all revenue procurements by all wings of the Ministry of Defence and the Defence Services, as well as all organisations and units/establishments thereunder, for procurement of goods and services.

52. As practitioners of Supply Chain Management in Defence, officers would be involved in specifying or managing capability requirements; engaged in the procurement of systems, services, equipment and material; managing commercial relationships and contracts; designing and optimising supply chains through better logistics and inventory control; or managing efficient and effective support solutions to sustain large diverse fleets of maritime, land, and air systems through their effective operational lives, this module will provide the underpinning knowledge and develop the critical thinking skills you will require.

53. The Defence Acquisition Council (DAC) is the highest decision-making body in the Defence Ministry for deciding on new policies and capital acquisitions for the three services (Army, Navy and Air Force) and the Indian Coast Guard. The Raksha Mantri is the Chairman of the Council. It was formed, after the Group of Ministers recommendations on 'Reforming the National Security System', in 2001, post Kargil War (1999). It has under itself the three Services and Integrated Defence Staff HQ on one hand and MoD with its Finance, Technical and Acquisition Wings on the other, work in a truly integrated manner through the institutions of Defence Procurement Board (DPB) and Services Procurement Board (SPB).

54. Defence acquisition of capital assets has become a necessity and each one of you should be conversant with the nitty gritty of the procedures and processes in detail. This module will help you in understanding the same in a structured way. New additions like Make in India, Defence offset policy, Strategic Partnership and Defence Production Policy will be discussed threadbare for your better understanding.

Conclusion

55. The activities, processes and relationships which fall under the supply chain vertical are central to the functioning of Armed Forces. Application of the supply chain approach leads to service improvements and cost reductions to members at all levels in the chain, with members in the chain negotiating how the benefits will be shared. The chain as a whole becomes more competitive compared with others which are not members of such a chain.

Bibliography

1. Chopra Sunil, Meindl Peter. "Supply Chain Management: Strategy, Planning & Operation", *Prentice Hall Inc*, 3rd Edition, (2007)
2. Blackwell, Roger D., and Kristina Blackwell. "The Century of the Consumer: Converting Supply Chains into Demand Chains." *Supply Chain Management Review (Fall 1999)*: 22-32.
3. Bovet, David M., and David G. Frentzel. "The Value Net: Connecting for Profitable Growth." *Supply Chain Management Review (Fall 1999)*.
4. Bureau R. "The organisation of Logistics Support Systems". Lamar Lee Jr and Donald W Dobler. "Purchasing and Materials Management".
5. Thomas T Tierney. "Integrated Logistics Support and Organisational Relationships".
6. Richard J Tersine. "Principles of Inventory and Materials Management".

7. Ronald H Ballou. "Business Logistics/Supply Chain Management".

8. Bowersox and Closs. "The Integrated Supply Chain Processes" *Logistical Management*.