LOGISTICS, SUPPLY CHAIN & TRANSPORT MANAGEMENT PROGRAM

The Cambridge International College
Publication on
‘Logistics, Supply Chain and Transport Management’
by Ronald H Ballou
will be sent to you by registered airmail post
as an integral component of the Program

Introduction

This Publication is concerned with the vital subject of business logistics and supply chain management, an area that can be essential to a firm’s competitive strategy and revenue generation. This management area has been described by many names, including physical distribution, materials management, transportation management, logistics, and supply chain management. Relevant business activities may include one or more of the following areas: transportation, inventory, order processing, purchasing, warehousing, materials handling, packaging, customer service standards, and production.

The focus of this Publication is on the planning, organizing, and controlling of these activities - key elements for successful management in any organization. Special emphasis is given to strategic planning and decision making as an important part of the management process. Managerial efforts are directed towards setting the level of the logistics activities so as to make products and services available to customers at the time and place required, and in the condition and form desired, in the most profitable and cost-effective way.

Logistical activities have always been vital to organizations, and so business logistics and supply chain management represents a synthesis of many concepts, principles, and methods from the more traditional areas of marketing, production, accounting, purchasing, and transportation, as well as from the disciplines of applied mathematics, organizational behaviour, and economics. This Publication attempts to unify these elements to assist in the effective management of the supply chain.

The Publication aims to present ideas, principles and techniques that are fundamental to good business logistics practice. It concentrates on important activities of management such as planning, organizing, and controlling, and also on a triangle of interrelated transportation, inventory, and location strategies, which are at the heart of good logistics planning and decision making.

Contemporary trends that affect the scope and practice of business logistics and supply chain management have been integrated into the body of the text. Firstly, emphasis is placed on logistics and supply chain management in a worldwide setting to reflect the growing internationalization and globalization of business in general. Secondly, the shift towards service-oriented economies by industrialized nations is emphasized by showing how logistics concepts and principles are applicable to both service-producing firms and product-producing ones. Thirdly, attention is given to the integrated management of supply chain activities.
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The Publication contains many practical and contemporary examples that show the applicability of the textual material and assist in the understanding and learning of the key points and concepts.

Each Chapter in this Cambridge International College Publication on Logistics, Chain Supply & Transport Management includes:

- An introduction section
- Examples and/or figures and diagrams to explain the concepts being covered
- A summary of concluding comments
- Review Questions designed to reinforce learning and contemplation of what is covered in the Chapter

Advice on How to Study this Program

Every individual CIC Member approaches his/her study in a different manner, and different people may have a particular study method that they find most effective for them. However, the following is a tested and proven Study Method, suggested to you as a CIC Member in order to assist in making your study and learning easier - and enjoyable - and to assist you to quickly master the contents of this CIC Publication on Logistics, Chain Supply & Transport Management:

Step 1: Set yourself a flexible study schedule, depending on the time you have available and what is best for you. For example, the target set could be to study for 1 or 2 hours a night, or for 8 or 9 hours a week, or to complete one Chapter every 2 weeks. There is no set or compulsory schedule, but simply setting a schedule or goal is often an important action in ensuring that study is undertaken successfully and within the specified timeframe.

Step 2: Read the whole of the first Chapter at your normal reading pace, without trying to memorise every topic covered or fact stated, but trying to get “the feel” of what is dealt with in the Chapter as a whole.

Step 3: Start reading the Chapter again from the beginning, this time reading more slowly, paragraph by paragraph and section by section. Make brief notes of any points, sentences, paragraphs or sections which you feel need your further study, consideration or thought. You may wish to keep any notes in a separate file or notebook. Try to absorb and memorise all the important topics covered.

Step 4: Start reading the Chapter again from its start, this time paying particular attention to - and if necessary studying more thoroughly - those parts on which you earlier wrote notes for further study. It is best that you do not pass on to other parts or topics until you are certain you fully understand and remember those parts you earlier noted as requiring your special attention. Try to fix everything taught firmly in your mind.
**Step 5:** There are self-assessment review questions at the end of the Chapter, and you are strongly advised to try to answer or think about them as best you can - but do **not** send your answers to the College. If these questions/exercises highlight any areas that you feel you need to revise or re-read in the Chapter, then go ahead and do that before moving on to Step 6.

**Step 6:** Once you have completed steps 1 to 5 above, move on to the next Chapter and repeat steps 1 to 5 for each subsequent Chapter.
LOGISTICS, SUPPLY CHAIN & TRANSPORT MANAGEMENT PROGRAM

MODULE ONE - BUSINESS LOGISTICS/SUPPLY CHAIN - A VITAL SUBJECT

(based on Chapter 1 of ‘Logistics, Supply Chain and Transport Management’ by Ronald H Ballou)

Contents
Introduction
Business Logistics Defined
The Supply Chain
The Activity Mix
Importance of Logistics/Supply Chain (SC)
Costs Are Significant
Logistics Customer Service Expectations Are Increasing
Supply and Distribution Lines Are Lengthening with Greater Complexity
Logistics/SC Is Important to Strategy
Logistics/SC Adds Significant Customer Value
Customers Increasingly Want Quick, Customized Response
Logistics/SC in Non-Manufacturing Areas
Service Industry
Military
Environment
Business Logistics/SC in the Firm
Objectives of Business Logistics/SC
Questions and Problems

Introduction

As far back as history records, the goods that people wanted were not always produced where they wanted to consume them, or these goods were not accessible when people wanted to consume them. Food and other commodities were widely dispersed and were only available in abundance at certain times of the year. Early peoples had the choice of consuming goods at their immediate location or moving the goods to a preferred site and storing them for later use. However, because no well-developed transportation and storage systems yet existed, the movement of goods was limited to what an individual could personally move, and storage of perishable commodities was possible for only a short time. This limited movement-storage system generally constrained people to live close to the sources of production and to consume a rather narrow range of goods.

Even today, in some areas of the world consumption and production take place only within a very limited geographic region. Striking examples can still be observed in the developing nations of Asia, South America, Australia, and Africa, where some of the population live in small, self-sufficient villages, and most of the goods needed by the residents are produced or acquired in the immediate vicinity. Few goods are imported from other areas. Therefore, production efficiency and the economic standard of living are generally low. In this type of economy, a well-developed and inexpensive logistics system would encourage an exchange of goods with other producing areas of the country, or even the world.
As logistics systems improved, consumption and production began to separate geographically. Regions would specialize in those commodities that could be produced most efficiently. Excess production could be shipped economically to other producing (or consuming) areas, and needed goods not produced locally were imported. This exchange process follows the principle of comparative advantage.

This same principle, when applied to world markets, helps to explain the high level of international trade that takes place today. Efficient logistics systems allow world businesses to take advantage of the fact that lands, and the people who occupy them, are not equally productive. Logistics is the very essence of trade. It contributes to a higher economic standard of living for us all.

To the individual firm operating in a high-level economy, good management of logistics activities is vital. Markets are often national or international in scope, whereas production may be concentrated at relatively few points. Logistics activities provide the bridge between production and market locations that are separated by time and distance. Effective management of these activities is the major concern of this Program.

**Business Logistic Defined**

Business logistics is a relatively new field of integrated management study in comparison with the traditional fields of finance, marketing, and production. As previously noted, logistics activities have been carried out by individuals for many years. Businesses also have continually engaged in move-store (transportation-inventory) activities. The newness of the field results from the concept of coordinated management of the related activities, rather than the historical practice of managing them separately, and the concept that logistics adds value to products or services that are essential to customer satisfaction and sales. Although co-ordinated logistics management has not been generally practiced until recently, the idea of co-ordinated management can be traced back to at least 1844. In the writings of Jules Dupuit, a French engineer, the idea of trading one cost for another (transportation costs for inventory costs) was evident in the selection between road and water transport:

“The fact is that carriage by road being quicker, more reliable and less subject to loss or damage, it possesses advantage to which businessmen often attach a considerable value. However, it may well be that a saving induces the merchant to use a canal; he can buy warehouses and increase his floating capital in order to have a sufficient supply of goods on hand to protect himself against slowness and irregularity of the canal, and if all told the saving in transport gives him a cost advantage, he will decide in favour of the new route.”

The first textbook to suggest the benefits of co-ordinated logistics management appeared around 1961, in part explaining why a generally accepted definition of business logistics is still emerging. Therefore, it is worthwhile to explore several definitions for the scope and content of the subject.

A dictionary definition of the term logistics is:

“The branch of military science having to do with procuring, maintaining, and transporting material, personnel, and facilities.”

This definition puts logistics into a military context. To the extent that business objectives and activities differ from those of the military, this definition does not capture the essence of business logistics management. A better representation of the field may be reflected in the definition promulgated by the Council of Logistics Management (CLM), a professional organization of logistics
managers, educators, and practitioners formed in 1962 for the purposes of continuing education and fostering the interchange of ideas. Its definition:

“Logistics is that part of the supply chain process that plans, implements, and controls the efficient, effective flow and storage of goods, services, and related information from the point of origin to the point of consumption in order to meet customers’ requirements.”

This is an excellent definition, conveying the idea that product flows are to be managed from the point where they exist as raw materials to the point where they are finally discarded. Logistics is also concerned with the flow of services as well as physical goods, an area of growing opportunity for improvement. It also suggests that logistics is a process, meaning that it includes all the activities that have an impact on making goods and services available to customers when and where they wish to acquire them. However, the definition implies that logistics is part of the supply chain process, not the entire process.

So, what is the supply chain process or, more popularly, supply chain management?

Supply chain management (SCM) is a term that has emerged in recent years that captures the essence of integrated logistics and even goes beyond it. Supply chain management emphasizes the logistics interactions that take place among the functions of marketing, logistics, and production within a firm and those interactions that take place between the legally separate firms within the product-flow channel. Opportunities for cost or customer service improvement are achieved through co-ordination and collaboration among the channel members where some essential supply chain activities may not be under the direct control of the logistician.

Although early definitions such as physical distribution, materials management, industrial logistics and channel management - all terms used to describe logistics - have promoted this broad scope for logistics, there was little attempt to implement logistics beyond a company’s own enterprise boundaries, or even beyond its own internal logistics function. Now, retail firms are showing success in sharing information with suppliers, who in turn agree to maintain and manage inventories on retailers’ shelves. Channel inventories and product stockouts are lower. Manufacturing firms operating under just-in-time production scheduling build relationships with suppliers for the benefit of both companies by reducing inventories.

Definitions of the supply chain and supply chain management reflecting this broader scope are:

“The supply chain (SC) encompasses all activities associated with the flow and transformation of goods from the raw materials stage (extraction), through to the end user, as well as the associated information flows. Materials and information flow both up and down the supply chain.”

“Supply chain management (SCM) is the integration of these activities, through improved supply chain relationships, to achieve a sustainable competitive advantage.”

After careful study of the various definitions being offered, Mentzer and other writers propose the broad and rather general definition as follows:

“Supply chain management is defined as the systematic, strategic coordination of the traditional business functions and the tactics across these 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.”
The supply chain management model in Figure 1-1 viewed as a pipeline shows the scope of this definition. It is important to note that supply chain management is about the co-ordination of product flows across functions and across companies to achieve competitive advantage and profitability for the individual companies in the supply chain and the supply chain members collectively.

![Figure 1-1 A Model of Supply Chain Management](image)

It is difficult, in a practical way, to separate business logistics management from supply chain management. In so many respects, they promote the same mission:

“To get the right goods or services to the right place, at the right time, and in the desired condition, while making the greatest contribution to the firm.”

Some claim that supply chain management is just another name for integrated business logistics management (IBLM) and that the broad scope of supply chain management has been promoted over the years. Conversely, others say that logistics is a subset of SCM, where SCM considers additional issues beyond those of product flow. For example, SCM may be concerned with product pricing and manufacturing quality. Although SCM promotes viewing the supply channel with the broadest scope, the reality is that firms do not practise this ideal. Fawcett and Magan found that companies that do practise supply chain integration limit their scope to one tier upstream and one tier downstream. The focus seems to be concerned with creating seamless processes within their own companies and applying new information technologies to improve the quality of information and speed of its exchange among channel members.

The boundary between the logistics and supply chain management terms is fuzzy. For the purposes of this Program, integrated business logistics management and SCM will be referred to interchangeably. The focus will be on managing the product and service flows in the most efficient and effective manner, regardless of descriptive title. This includes integrating and co-ordinating with
other channel members and service providers to improve supply chain performance when practical to do so.

**The Supply Chain**

Logistics/SC is a collection of functional activities (transportation, inventory control, etc) which are repeated many times throughout the channel through which raw materials are converted into finished products and consumer value is added. Because raw material sources, plants, and selling points are not typically located at the same places and the channel represents a sequence of manufacturing steps, logistics activities recur many times before a product arrives in the marketplace. Even then, logistics activities are repeated once again as used products are recycled upstream in the logistics channel.

![Figure 1-2 The Immediate Supply Chain for an Individual Firm](image)

A single firm generally is not able to control its entire product flow channel from raw material source to points of the final consumption, although this is an emerging opportunity. For practical purposes, the business logistics for the individual firm has a narrower scope. Usually, the maximum managerial control that can be expected is over the immediate physical supply and physical distribution channels, as shown in Figure 1-2.

The *physical supply channel* refers to the time and space gap between a firm's immediate material sources and its processing points. Similarly, the *physical distribution channel* refers to the time and space gap between the firm's processing points and its customers. Due to the similarities in the activities between the two channels, physical supply (more commonly referred to as materials management)
and physical distribution comprise those activities that are integrated into business logistics. Business logistics management is now popularly referred to as supply chain management. Others have used terms such as *value nets*, *value stream*, and *lean logistics* to describe a similar scope and purpose.

The evolution of the management of product flows toward SCM is captured in Figure 1-3.

Although it is easy to think of logistics as managing the flow of products from the points of raw material acquisition to end customers, for many firms there is a *reverse logistics channel* that must be managed as well. The life of a product, from a logistics viewpoint, does not end with delivery to the customer. Products become obsolete, damaged, or nonfunctioning and are returned to their source points for repair or disposition. Packaging materials may be returned to the shipper due to environmental regulations or because it makes good economic sense to reuse them. The reverse logistics channel may utilize all or a portion of the forward logistics channel or it may require a separate design. The supply chain terminates with the final disposition of a product. The reverse channel must be considered to be within the scope of logistics planning and control.

![Figure 1-3 Evolution of Logistics Toward Supply Chain](image)

**The Activity Mix**

The activities to be managed that make up business logistics (supply chain process) vary from firm to firm, depending on a firm’s particular organizational structure, management’s honest differences of opinion about what constitutes the supply chain for its business, and the importance of individual activities to its operations. Follow along the supply chain as shown in Figure 1-2 and note the important activities that take place. Again, according to the CLM:
"The components of a typical logistics system are: customer service, demand forecasting, distribution communications, inventory control, material handling, order processing, parts and service support, plant and warehouse site selection (location analysis), purchasing, packaging, return goods handling, salvage and scrap disposal, traffic and transportation, and warehousing and storage."

Figure 1-4 organizes these components, or activities, according to where they are most likely to take place in the supply channel. The list is further divided into key and support activities, along with some of the decisions associated with each activity.

**Figure 1-4 Logistics Activities in a Firm's Immediate Supply Chain**

**Key Activities**

1. Customer service standards co-operate with marketing to:
   a. Determine customer needs and wants for logistics customer service
   b. Determine customer response to service
   c. Set customer service levels

2. Transportation
   a. Mode and transport service selection
   b. Freight consolidation
   c. Carrier routing
   d. Vehicle scheduling
   e. Equipment selection
   f. Claims processing
   g. Rate auditing

3. Inventory management
   a. Raw materials and finished goods stocking policies
   b. Short-term sales forecasting
   c. Product mix at stocking points
d. Number, size, and location of stocking points

e. Just-in-time, push, and pull strategies

4. Information flows and order processing
   a. Sales order-inventory interface procedures
   b. Order information transmittal methods
   c. Ordering rules

**Support Activities**

1. Warehousing
   a. Space determination
   b. Stock layout and dock design
   c. Warehouse configuration
   d. Stock placement

2. Materials handling
   a. Equipment selection
   b. Equipment replacement policies
   c. Order-picking procedures
   d. Stock storage and retrieval

3. Purchasing
   a. Supply source selection
   b. Purchase timing
   c. Purchase quantities

4. Protective packaging designed for:
   a. Handling
   b. Storage
   c. Protection from loss and damage

5. Co-operate with production/operations to:
   a. Specify aggregate quantities
   b. Sequence and time production output
   c. Schedule supplies for production/operations

6. Information maintenance
   a. Information collection, storage, and manipulation
   b. Data analysis
   c. Control procedures

Key and support activities are separated because certain activities will generally take place in every logistics channel, whereas others will take place, depending on the circumstances, within a particular firm. The key activities are on the “critical” loop within a firm’s immediate physical distribution channel, as shown in Figure 1 to 5. They contribute most to the total cost of logistics or they are essential to the effective co-ordination and completion of the logistics task.
Customer service standards set the level of output and degree of readiness to which the logistics system must respond. Logistics costs increase in proportion to the level of customer service provided, such that setting the standards for service also affects the logistics costs to support that level of service. Setting very high service requirements can force logistics costs to exceedingly high levels.

Transportation and inventories maintenance are the primary cost-absorbing logistics activities. Experience has shown that each will represent one-half to two-thirds of total logistics costs. Transportation adds place value to products and services, whereas inventories maintenance adds time value.

Transportation is essential because no modern firm can operate without providing for the movement of its raw materials or its finished products. This importance is underscored by the financial strains placed on many firms by such disasters as a national railroad strike or independent truckers’ refusal to move goods because of rate disputes. In these circumstances, markets cannot be served, and products back up in the logistics pipeline to deteriorate or become obsolete.

Inventories are also essential to logistics management because it is usually not possible or practical to provide instant production or ensure delivery times to customers. They serve as buffers between supply and demand so that needed product availability may be maintained for customers while providing flexibility for production and logistics in seeking efficient methods for manufacture and distribution of the product.

Order processing is the final key activity. Its costs usually are minor compared to transportation or inventory maintenance costs. Nevertheless, order processing is an important element in the total time that it takes for a customer to receive goods or services. It is the activity triggering product movement and service delivery.

Although support activities may be as critical as the key activities in any particular circumstance, they are considered here as contributing to the logistics mission. In addition, one or more of the support activities may not be a part of the logistics activity mix for every firm. For example, products such as finished automobiles or commodities such as coal, iron ore, or gravel not needing the weather and security protection of warehousing will not require the warehousing activity, even though inventories are maintained. However, warehousing and materials handling are typically conducted wherever products are temporarily halted in their movement to the marketplace.
Protective packaging is a support activity of transportation and inventory maintenance as well as of warehousing and materials handling because it contributes to the efficiency with which these other activities are carried out. Purchasing and product scheduling often may be considered more a concern of production than of logistics. However, they also affect the overall logistics effort, and specifically they affect the efficiency of transportation and inventory management. Finally, information maintenance supports all other logistics activities in that it provides the needed information for planning and control.

The extended supply chain refers to those members of the supply channel beyond the firm’s immediate suppliers or customers. They may be suppliers to the immediate suppliers or customers of the immediate customers and so on until raw material source points or end customers are reached. It is important to plan and control the previously noted activities and information flows if they affect the logistics customer service that can be provided and the costs of supplying this service. Management of the extended supply chain has the potential of improving logistics performance beyond that of just managing the activities within the immediate supply chain.

Importance of Logistics/Supply Chain

Logistics is about creating value - value for customers and suppliers of the firm, and value for the firm’s stakeholders. Value in logistics is primarily expressed in terms of time and place. Products and services have no value unless they are in the possession of the customers when (time) and where (place) they wish to consume them. For example, concessions at a sports event have no value to consumers if they are not available at the time and place that the event is occurring, or if inadequate inventories don’t meet the demands of the sports fans. Good logistics management views each activity in the supply chain as contributing to the process of adding value. If little value can be added, it is questionable whether the activity should exist. However, value is added when customers are willing to pay more for a product or service than the cost to place it in their hands. To many firms throughout the world, logistics has become an increasingly important value-adding process for a number of reasons.

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<thead>
<tr>
<th>Category</th>
<th>Percent of Sales</th>
<th>$/cwt.</th>
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<tbody>
<tr>
<td>Transportation</td>
<td>3.34%</td>
<td>$26.52</td>
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<tr>
<td>Warehousing</td>
<td>2.02</td>
<td>18.06</td>
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<tr>
<td>Customer service/order entry</td>
<td>0.43</td>
<td>4.58</td>
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<tr>
<td>Administration</td>
<td>0.41</td>
<td>2.79</td>
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<tr>
<td>Inventory carrying cost @ 18%/year</td>
<td>1.72</td>
<td>22.25</td>
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<tr>
<td>Total distribution costb</td>
<td>7.65%</td>
<td>967.71</td>
</tr>
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*The statistics are for all firm types; however, they most closely represent manufacturing firms since they dominate the database.

b The authors of this survey claim the totals do not match the sum of the individual statistics due to a different number of data entries in each category.

Costs Are Significant

Over the years, several studies have been conducted to determine the costs of logistics for the whole economy and for the individual firm. There are widely varying estimates of the cost levels. According to the International Monetary Fund (IMF), logistics costs average about 12 percent of the
world’s gross domestic product. Robert Delaney, who has tracked logistics costs for more than two decades, estimates that logistics costs for the U.S. economy are 9.9 percent of the U.S. gross domestic product (GDP), or $921 billion. For the firm, logistics costs have ranged from 4 percent to over 30 percent of sales. The results from a cost survey of individual firms are shown in Table 1-3. Although the results show physical distribution costs at about 8 percent of sales, this survey does not include physical supply costs. Probably another one-third may be added to this total to represent average logistics costs for the firm at about 11 percent of sales.

Over the last decade, physical distribution costs have ranged between 7 percent and 9 percent of sales. There may be a trend of increasing costs for individual firms, although Wilson and Delaney show over the same period that logistics costs as a percent of U.S. GDP have declined by about 10 percent. Logistics costs, substantial for most firms, rank second only to the cost of goods sold (purchase costs) that are about 50 percent to 60 percent of sales for the average manufacturing firm. Value is added by minimizing these costs and by passing the benefits on to customers and to the firm’s shareholders.

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<td>Time, days</td>
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<td>Product availability</td>
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<td>94</td>
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<td>percent line items</td>
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Table 1-4 Average Customer Service Performance Measures for All Firms, Survey Years 1992–2002

Logistics Customer Service Expectations Are Increasing

The Internet, just-in-time operating procedures, and continuous replenishment of inventories have all contributed to customers expecting rapid processing of their requests, quick delivery, and a high degree of product availability. According to the Davis Survey of hundreds of companies over the last decade, world-class competitors have average order cycle times (the time between when an order is placed and when it is received) of seven to eight days and line item fill rates of 90 percent to 94 percent. LogFac summarizes world-class logistics performance for domestic companies as:

★ Error rates of less than one per 1,000 orders shipped
★ Logistics costs of well under 5 percent of sales
★ Finished goods inventory turnover of 20 or more times per year
★ Total order cycle time of five working days
★ Transportation cost of one percent of sales revenue or less, if products sold are over $5 per 500 gms

As might be expected, the average company performs below these cost and customer service benchmarks, when compared with the statistics in Tables 1-3 and 1-4.

Supply and Distribution Lines Are Lengthening with Greater Complexity

The trend is toward an integrated world economy. Firms are seeking, or have developed, global strategies by designing their products for a world market and producing them wherever the low-cost
raw materials, components, and labor can be found (e.g., Ford’s Focus automobile), or they simply produce locally and sell internationally. In either case, supply and distribution lines are stretched, as compared with the producer who wishes to manufacture and sell only locally. Not only has the trend occurred naturally by firms seeking to cut costs or expand markets, but it is also being encouraged by political arrangements that promote trade. Examples of the latter are the European Union, the North America Free Trade Agreement (NAFTA) between Canada, the United States, and Mexico, and the economic trade agreement among several countries of South America (MERCOSUR).

Globalization and internationalization of industries everywhere will depend heavily on logistics performance and costs, as companies take more of a world view of their operations. As this happens, logistics takes on increased importance within the firm since its costs, especially transportation, become a larger part of the total cost structure. For example, if a firm seeks foreign suppliers for the raw materials that make up its final product or foreign locations to build its product, the motivation is to increase profit. Material and labor costs may be reduced, but logistics costs are likely to increase due to increased transportation and inventory costs. The “tradeoff”, as shown in Figure 1-6, may lead to higher profit by reducing materials, labour, and overhead costs at the expense of logistics costs and tariffs. “Outsourcing” adds value, but it requires careful management of logistics costs and product-flow times in the supply channel.

**Logistics/SC Is Important To Strategy**

Firms spend a great deal of time finding ways to differentiate their product offerings from those of their competitors. When management recognizes that logistics/SC affects a significant portion of a firm’s costs and that the result of decisions made about the supply chain processes yields different levels of customer service, it is in a position to use this effectively to penetrate new markets, to increase market share, and to increase profits. That is, good supply chain management can generate sales, not just reduce costs.
Logistics/SC Adds Significant Customer Value

A product, or service, is of little value if it is not available to customers at the time and place that they wish to consume it. When a firm incurs the cost of moving the product toward the customer or making an inventory available in a timely manner, for the customer “value” has been created that was not there previously. It is value as surely as that created through the production of a quality product or through a low price.

It is generally recognized that business creates four types of value in products or services. These are: form, time, place, and possession. Logistics creates two out of these four values. Manufacturing creates form value as inputs are converted to outputs, that is raw materials are transformed into finished goods. Logistics controls the time and place values in products, mainly through transportation, information flows, and inventories. Possession value is often considered the responsibility of marketing, engineering, and finance, where the value is created by helping customers acquire the product through such mechanisms as advertising (information), technical support, and terms of sale (pricing and credit availability). To the extent that SCM includes production, three out of the four values may be the responsibility of the logistics/supply chain manager.

Customers Increasingly Want Quick, Customized Response

Fast food retailers, automatic teller machines, overnight package delivery, and electronic mail on the Internet have led us as consumers to expect that products and services can be made available in increasingly shorter times. In addition, improved information systems and flexible manufacturing processes have led the marketplace toward mass customization. Rather than consumers having to accept the “one size fits all” philosophy in their purchases, suppliers are increasingly offering products that meet individual customer needs.

Companies too have been applying the concept of quick response to their internal operations in order to meet the service requirements of their own marketing efforts. The quick response philosophy has been used to create a marketing advantage. Saks Fifth Avenue applied it, even though big profits are made through big margins and not on cost reductions that might be achieved from good logistics management. Supply chain costs may even rise, although the advantage is to more than cover these costs through increased profits.

Logistics/SC in Non-manufacturing Areas

It is perhaps easiest to think of logistics/SC in terms of moving and storing a physical product in a manufacturing setting. This is too narrow a view and can lead to many missed business opportunities. The logistics/SC principles and concepts learned over the years can be applied to such areas as service industries, the military, and even environment management.

Service Industry

The service sector of industrialized countries is large and growing. In the United States, over 70 percent of all jobs are in what the federal government classifies as the service sector. The size of this sector alone forces us to ask if logistics concepts are not equally applicable here as they are to the manufacturing sector. If they are, there is a tremendous untapped opportunity yet to be fulfilled.

Many companies designated as service firms in fact produce a product. Examples include: McDonald’s Corporation (fast foods); Dow Jones & Co., Inc. (newspaper publishing); and Sears, Roebuck and Co. (merchandise retailing). These companies carry out all the typical supply chain activities of any manufacturing firm. However, for service companies such as Bank One (retail banking), Marriott Corporation (lodging) and Consolidated Edison (electric power), supply chain activities,
especially those associated with physical distribution, are not as obvious.

Even though many service-oriented companies may be distributing an intangible, nonphysical product, they do engage in many physical distribution activities and decisions. A hospital may want to extend emergency medical care throughout the community and must make decisions as to the locations of the centers. United Parcel Service and Federal Express must locate terminals and route pickup and delivery trucks. The East Ohio Gas Company inventories natural gas in underground wells during the off-season in the region where demand will occur. Bank One must locate and have cash inventory on hand for its ATMs. The Federal Reserve Bank must select the methods of transportation to move cancelled cheques among member banks. The Catholic Church must decide the number, location, and size of the churches needed to meet shifts in size and location of congregations, as well as to plan the inventory of its pastoral staff. Xerox’s repair service for copying equipment is also a good example of the logistics decisions encountered in a service operation.

The techniques, concepts, and methods discussed throughout this Program should be as applicable to the service sector as they are to the manufacturing sector. The key, according to Theodore Levitt, may be in transforming an intangible service into a tangible product. Problems will remain in carefully identifying the costs associated with the distribution of an intangible product. Perhaps because of this, few service firms or organizations have a physical distribution manager on their staff, although they frequently do have a materials manager to handle supply matters. However, managing logistics in service industries does represent a new direction for the future development of logistics practice.

Military

Before businesses showed much interest in co-ordinating supply chain processes, the military was well organized to carry out logistics activities. More than a decade before business logistics’ developmental period, the military carried out what was called the most complex, best-planned logistics operation of that time—the invasion of Europe during World War II.

Although the problems of the military, with its extremely high customer service requirements, were not identical with those of business, the similarities were great enough to provide a valuable experience base during the developmental years of logistics. For example, the military alone maintained inventories valued at about one-third of those held by all U.S. manufacturers. In addition to the management experience that such large-scale operations provide, the military sponsored, and continues to sponsor, research in the logistics area through such organizations as the RAND Corporation and the Office of Naval Research. With this background, the field of business logistics began to grow. Even the term logistics seems to have had its origins in the military.

A recent example of military logistics on a large scale was the conflict between the United States and Iraq over Iraq’s invasion of the small country of Kuwait. This invasion has been described as the largest military logistics operation in history. The logistics support in that war is yet another illustration of what worldclass companies have always known: Good logistics can be a source of competitive advantage. Lt General William Pagonis, in charge of logistics support for Desert Storm, observed:

“When the Middle East started heating up, it seemed like a good time to pull out some history books on desert warfare in this region .... But there was nothing on logistics. Logistics is not a best seller. In a couple of his diaries, Rommel talked about logistics. He thought the Germans lost the battle not because they didn’t have great soldiers or equipment - in fact, the German tanks outfought ours almost throughout World War II - but because the British had better logistics.”
Good logistics performance was obvious. The first wave of 200,000 troops and their equipment was deployed in a month and a half, whereas troop deployment took nine months in the Vietnam conflict. In addition, the application of many good logistics concepts was evident. Take customer service, for example:

“We believed that if we took care of our troops, the objectives would be accomplished no matter whatever else happened. The soldiers are our customers. It is no different than a determined, single focus on customers that many successful businesses have. Now, you take care of your soldiers not only by providing them cold sodas, and burgers, and good food; you make sure they have the ammunition on the front line, so that when they go fight the war they know they have what they need.”

This meant that when 120 mm guns rather than 105 mm guns were desired on tanks, they were changed. When brown vehicles were preferred over the traditional camouflage green, they were repainted at the rate of 7,000 per month.

Environment

Population growth and resultant economic development have heightened our awareness of environmental issues. Whether it is recycling, packaging materials, transporting hazardous materials or refurbishing products for resale, logisticians are involved in a major way. After all, the United States alone produces more than 160 million tons of waste each year, enough for a convoy of 10-ton garbage trucks reaching halfway to the moon. In many cases, planning for logistics in an environmental setting is no different from that in manufacturing or service sectors. However, in a few cases additional complications arise, such as governmental regulations that make the logistics for a product more costly by extending the distribution channel.

Business Logistics in the Firm

It has been the tradition in many firms to organize around marketing and production functions. Typically, marketing means selling something and production means making something. Although few business people would agree that their organization is so simple, the fact remains that many businesses emphasize these functions while treating other activities, such as traffic, purchasing, accounting, and engineering, as support areas. Such an attitude is justified to a degree, because if a firm’s products cannot be produced and sold, little else matters. However, such a pattern is dangerously simple for many firms to follow in that it fails to recognize the importance of the activities that must take place between points and times of production or purchase and the points and times of demand. These are the logistics activities, and they affect the efficiency and effectiveness of both marketing and production.

Scholars and practitioners of both marketing and production have not neglected the importance of logistics. In fact, each area considers logistics within its scope of action. For example, the following definition of marketing management includes physical distribution:

“Marketing (management) is the process of planning and executing the conception, pricing, promotion, and distribution of ideas, goods, and services to create exchanges with target groups that satisfy individual and organizational objectives.”

Marketing’s concern is to place its products or services in convenient distribution channels to facilitate the exchange process. The concept of production/operations management often includes logistics activities. For example, “operations management has the responsibility for the production and delivery of physical goods and services.” Production/operations, on the other hand, is likely to be most
interested in those activities that directly affect manufacturing and its primary objective of producing at the lowest unit cost. Now, viewing product flow activities as a process to be coordinated, product flow aspects within marketing, production, and logistics are collectively managed to achieve customer service objectives.

The difference in operating objectives (maximize revenue versus minimize cost) for marketing and production/operations may lead to a fragmentation of interest in, and responsibility for, logistics activities, as well as a lack of co-ordination among logistics activities as a whole. This, in turn, may lead to lower customer service levels or higher total logistics costs than are necessary. Business logistics represents a regrouping, either by formal organizational structure or conceptually in the minds of management, of the move-store activities that historically may have been partially under the control of marketing and production/operations.

If logistics activities are looked upon as a separate area of managerial action, the relationship of logistics activities to those of marketing and production/operations would be as is shown in Figure 1-7. Marketing would be primarily responsible for market research, promotion, sales-force management, and the product mix, which create possession value in the product. Production/operations would be concerned with the creation of the product or service, which creates form value in the product. Key responsibilities would be quality control, production planning and scheduling, job design, capacity planning, maintenance, and work measurement and standards.

Logistics would be concerned with those activities (previously defined) that give a product or service time and place value. This separation of the activities of the firm into three groupings rather than two is not always necessary or advisable to achieve the coordination of logistics activities that is sought. Marketing and production/operations, when broadly conceived and co-ordinated, can do an effective job of managing logistics activities without creating an additional organizational entity. Even if a separate functional area is created for logistics within the firm so as to achieve effective control of the firm’s immediate logistics activities, logisticsians will need to view their responsibility as one of coordinating the entire supply chain process rather than being just a local logistics activity administrator. To do otherwise may miss substantial opportunities for cost reduction and logistics customer service improvement.

![Diagram showing the relationships between production, logistics, and marketing](image-url)
Figure 1-7 also shows activities that are at the interface of marketing and logistics and production/operations and logistics within the immediate firm. An interface activity is one that cannot be managed effectively within one functional area. The interface is created by the arbitrary separation of a firm’s activities into a limited number of functional areas. Managing the interface activities by one function alone can lead to sub-optimal performance for the firm by subordinating broader company goals to individual functional goals—a potential danger resulting from the departmental form of organizational structure so common in companies today. To achieve interfunctional coordination, some measurement system and incentives for cooperation among the functions involved need to be established. This is equally true of the inter-organizational co-ordination required to manage product flows across company boundaries.

It is important to note, however, that establishing a third functional group is not without its disadvantages. Two functional interfaces now exist where only one between marketing and production/operations previously existed. Some of the most difficult administrative problems arise from the interfunctional conflicts that occur when one is attempting to manage interface activities. Some of this potential conflict may be dissipated if a new organizational arrangement is created whereby production/operations and logistics are merged into one group called supply chain.

Just as managers are beginning to understand the benefits of interfunctional logistics management, inter-organizational management is being encouraged. Supply chain management proponents who view the area more broadly than some logisticians have been strongly promoting the need for collaboration among supply channel members that are outside the immediate control of a company’s logistician, that is, members who are legally separate companies. Collaboration among the channel members that are linked through buyer-seller relationships is essential to achieving cost-service benefits unable to be realized by managers with strictly an internal view of their responsibilities. Supply chain managers consider themselves to have responsibility for the entire supply channel of the scope as illustrated in Figure 1-8. Managing in this broader environment is the new challenge for the contemporary logistician.

Objectives of Business Logistics/SC

Within the broader objectives of the firm, the business logistician seeks to achieve supply channel process goals that will move the firm toward its overall objectives. Specifically, the desire is to develop a logistics activity mix that will result in the highest possible return on investment over time. There are two dimensions to this goal: (1) the impact of the logistics system design on the revenue contribution, and (2) the operating cost and capital requirements of the design. Ideally, the logistician should know how much additional revenue would be generated through incremental improvements
in the quality of customer service provided. However, such revenue is not generally known with great accuracy. Often, the customer service level is set at a target value, usually one that is acceptable to customers, the sales function, or other concerned parties. At this point, the logistics objective may become one of minimizing costs subject to meeting the desired service level rather than profit maximization or return on investment.

Unlike revenue, logistics costs usually can be determined as accurately as accounting practice will allow and are generally of two types: operating costs and capital costs. **Operating costs** are those that recur periodically or those that vary directly with variation in activity levels. Wages, public warehousing expenses, and administrative and certain other overhead expenses are examples of operating costs. **Capital costs** are the one-time expenses that do not change with normal variations in activity levels. Examples here are the investment in a private trucking fleet, the construction cost of a company warehouse, and the purchase of materials-handling equipment.

If it is assumed that there is knowledge of the effect of logistics activity levels on revenues of the firm, a workable financial objective for logistics can be expressed in the ratio known as **ROLA (return on logistics assets)**. ROLA is defined as:

\[
\text{ROLA} = \frac{\text{Contribution to revenue} - \text{logistics operating costs}}{\text{Logistics assets}}
\]

The contribution to revenue refers to the sales resulting from the logistics system design. Logistics operating costs are the expenses incurred to provide the level of logistics customer service needed to generate sales. Logistics assets are the capital investments made in the logistics system. ROLA is to be maximized over time.

If the value of money is high, maximizing the present value of cash flows or maximizing the internal rate of return is a more appropriate statement of the objective. Maximizing the cumulative return on investment over time is the single most important objective to ensure the long-run survival of the firm.
REVIEW QUESTIONS

1. What is supply chain management? Contrast it with business logistics management.
2. Describe business logistics, as you would expect it to be practiced in various countries or regions around the world.
3. Summarize the factors and forces that give logistics importance among other functional areas (marketing, finance, production) of a firm.
4. Discuss the similarities and differences between logistics management of a manufacturing firm and
   a. a service firm (bank, hospital, etc.)
   b. a nonprofit organization (symphony orchestra, art museum, etc.)
   c. the military
   d. a retailing firm (general merchandise, fast food, etc.)
5. Discuss the role that efficient and effective logistics systems play in encouraging a high level of foreign trade.
6. Why is it that both marketing and production may claim some or all of logistics activities as part of their area of responsibility?
7. What are the key activities of the business logistics function? Discuss their existence and importance to management.
8. How do you think international logistics differs from logistics for a firm with global operations?
9. Suggest some products that benefit significantly from increased time and place value.
10. Establishing logistics as a separate area for management within a business firm creates an additional set of interface activities. What are interface activities? Why would the creation of an additional set of interface activities cause concern in most companies?
11. The political and economic barriers are continuing to come down among the several countries of the European Union. If you are a manager of physical distribution for a multinational company that sells finished consumer goods (e.g., Procter & Gamble of Italy) within your own country, what distribution decisions are facing you in the future?
CHAPTER 2 Logistics/Supply Chain Strategy and Planning

Corporate Strategy
Logistics/SC Strategy
Logistics/SC Planning
  Levels of Planning
  Major Planning Areas
  Conceptualizing the Logistics/SC Planning Problem
  When to Plan
  Guidelines for Strategy Formulation
Selecting the Proper Channel Strategy
Measuring Strategy Performance
  Cash Flow
  Savings
  Return on Investment
Concluding Comments
Questions

CHAPTER 3 The Logistics/Supply Chain Product

Nature of the Logistics/SC Product
  Classifying Products
  The Product Life Cycle
The 80-20 Curve
Product Characteristics
  Weight-Bulk Ratio
  Value-Weight Ratio
  Substitutability
  Risk Characteristics
Product Packaging
Product Pricing
  Geographic Pricing Methods
Some Legal Concerns
Incentive Pricing Arrangements
  Quantity Discounts
  The Deal
Concluding Comments
Questions

CHAPTER 4 Logistics/Supply Chain Customer Service

Customer Service Defined
Customer Service Elements
  Relative Importance of Service Elements
Order Cycle Time
  Adjustments to Order Cycle Time
Importance of Logistics/SC Customer Service
  Service Effects on Sales
  Service Effects on Customer Patronage
Defining a Sales-Service Relationship
Modeling the Sales-Service Relationship
  Two-Points Method
  Before-After Experiments
  Game Playing
  Buyer Surveys
CHAPTER 5 Order Processing and Information Systems

Defining Order Processing
  Order Preparation
  Order Transmittal
  Order Entry
  Order Filling
  Order Status Reporting
Order-Processing Examples
  Industrial Order Processing
  Retail Order Processing
  Customer Order Processing
  Web-Based Channel Order Planning
Other Factors Affecting Order-Processing Time
  Processing Priorities
  Parallel versus Sequential Processing
  Order-Filling Accuracy
  Order Batching
  Lot Sizing
  Shipment Consolidation
The Logistics Information System
  Function
  Internal Operation
Information System Examples
  A Retail System
  Vendor-Managed Inventory
  E-Commerce
  A Decision Support System
Concluding Comments
Questions

CHAPTER 6 Transport Fundamentals

Importance of an Effective Transportation System
  Greater Competition
  Economies of Scale
  Reduced Prices
Service Choices and Their Characteristics
  Price
  Transit Time and Variability
  Loss and Damage
Single-Service Choices
  Rail
  Truck
Air
Water
Pipeline
Intermodal Services
  Trailer on Flatcar
  Containerized Freight
Agencies and Small Shipment Services
  Agents
  Small-Shipment Services
Company-Controlled Transportation
International Transportation
  Overview
  Physical Plant
  Agencies and Services
Transport Cost Characteristics
  Variable and Fixed Costs
  Common or Joint Costs
  Cost Characteristics by Mode
Rate Profiles
  Volume-Related Rates
  Distance-Related Rates
  Demand-Related Rates
Line-Haul Rates
  By Product
  By Shipment Size
  By Route
  Miscellaneous Rates
Special Service Charges
  Special Line-Haul Services
  Terminal Services
Private Carrier Costing
Documentation
  Bill of Lading
  Freight Bill
  Freight Claims
International Transport Documentation
  Exporting
  Importing
Concluding Comments
Questions

CHAPTER 7 Transport Decisions

Transport Service Selection
  Basic Cost Trade-Offs
  Competitive Considerations
  Appraisal of Selection Methods
Vehicle Routing
  Separate and Single Origin and Destination Points
  Multiple Origin and Destination Points
  Coincident Origin and Destination Points
Vehicle Routing and Scheduling
  Principles for Good Routing and Scheduling
  Methods for Routing and Scheduling
  Route Sequencing
  Implementation of Vehicle Routing and Scheduling Methods
  Ship Routing and Scheduling
Freight Consolidation
Concluding Comments
Questions
SOME TIPS ON ACHIEVING HIGH MARKS IN YOUR FINAL EXAMINATION

There is a vast difference between simply “passing” an Examination, and passing it WELL - with high marks, that is. The basic “key”, of course, is always the THOROUGH STUDY of the relevant CIC Study and Training Manuals, materials or selected publications. But from time to time Members might wonder why their marks were not as high as they had expected. Naturally, there is no one single reason for that, and our explanation and advice in each case is based on a review of each individual Member’s Work submitted. However, some of the most common reasons for the unnecessary loss of marks include:-

✶ Insufficient Study

A dictionary tells us that “to study” means “to apply the mind closely (to books, etc) in order to acquire knowledge and skill”. It does NOT - as fortunately only a very small number of Members appear to think - mean simply a “read through” or a “flick through” the pages of a Publication; what it does mean is a detailed and thorough examination of what is taught therein.

✶ Examination Attempted Too Soon

This follows from the foregoing. Adequate STUDY of the relevant CIC selected Publication - all Chapters - must be undertaken before the Final Examination set on the Program is attempted. We do sympathise with Members who are anxious to progress rapidly - but real progress can only be the result of adequate study.

✶ Answers Brief and/or Incomplete

An Examiner wants to be shown that you really HAVE learned and understood everything taught in the Materials supplied as part of the Program. That can only be done if you write - when required - full, detailed and explanatory answers, containing all relevant facts and information, with examples when appropriate. If less than a full answer is provided, less than the full mark available to that answer will be awarded!

✶ Too Few or Too Many Questions Answered/Attempted

Sometimes Members answer or attempt fewer than the required number of Questions or Exercises than they are instructed to attempt, or they do not answer all parts of a Question or Exercise. An Examiner can award marks only for Questions answered or for Exercises attempted; so marks for omitted Questions or Exercises - or sections of them - are “lost”. In some cases Members answer/attempt more than the required number of Questions or Exercises they are instructed to attempt. That usually results in rushed and brief Work, which loses marks, and an Examiner can only award marks for the required number of Questions or Exercises.
Questions/Exercises not Properly Read, or Misunderstood

It is essential that you understand exactly what Questions or Exercises require you to do or to write about. You must read Questions and Exercises fully and carefully - and not just "glance" at them. Without care, an "answer" you give might be quite irrelevant to a particular Question or Exercise; it might be about quite a different subject or topic. What you have written might be "excellent" and quite correct, but it will still not earn you marks if it does not answer the Question or Exercise SET.

Standard of English

Our Examiners DO appreciate that English is not the national or main tongue of many thousands of CIC Members. Nevertheless, our Examiners need to be able to read quickly and easily what you have written, in order to assess whether you really have learned what has been taught during your Program. So you must take care with your written English, especially with grammar and spelling. CIC Examiners are busy people and simply do not have time available in which to decipher difficult-to-read handwriting or to interpret English of a low standard. If necessary, you are advised to study our ‘Secondary English’ Course or ‘Professional English’ Program, at a specially reduced fee; ask us for details.

Presentation of Work

Our Examiners are most likely to be "pleased" with and attracted by - and, in response, to be more generous in giving marks to - Examination answer papers which are neat and clean and tidy. Then, too, Examiners prefer handwriting which they can clearly and easily read.

Always take TIME and CARE, and PRIDE in your Work.
SITTING YOUR CIC EXAMINATION(S)

A CIC Certificate or Diploma will not be awarded to a CIC Member unless that Member has attempted and passed a CIC Examination. CIC insists that all its Examinations must be sat under ‘approved invigilation’; which term means ‘under the supervision’ of an appointed ‘Invigilator’ (who - in different countries - might be called a ‘Supervisor’ or ‘Mentor’ or ‘Proctor’) and under ‘true Examination conditions’.

You need to secure IN ADVANCE the assistance of a responsible person - who we shall call your ‘Invigilator’ - to carefully supervise you during the time you are attempting the Assigned Work for your CIC Examination. If the Invigilator you designate is acceptable to the College, he or she will be appointed by the College to ensure that you attempt the Assigned Work under ‘true Examination conditions’.

To register your proposed Invigilator in good time, you need (1) his or her full name and full address to be written clearly on the ‘Agreement to Invigilate’ Form below, (2) his or her signature to be written on the Form, and (3) the official stamp or seal of his or her employing organization to be affixed to the Form. You should then airmail or fax or scan and email the completed Form to the College under registered cover. The Examination Booklet (in a sealed envelope) together with “Guidance for the Invigilator” information will be airmailed DIRECT** from the College to your Invigilator by registered post. It is YOUR responsibility to ensure that the ‘Agreement to Invigilate’ Form is returned to the College, at least two months before you want to sit the Examination(s), and at least two months before the “Expiry Date” of your Membership (see your “Confirmation of Membership” particulars).

ACCEPTABLE INVIGILATORS: The following categories of person might be accepted by the College as being “qualified” to Invigilate your Examination(s). Not all categories will necessarily be available in your country, or in the area of it in which you live; if in doubt, ask the College for advice:-

- Executives at CIC Affiliated Organizations.
- Officials of the Examinations Section of your national Department or Ministry of Education in your area.
- Officials of your national Examinations Board, Council or Syndicate.
- An official of the British Council (many offices have an “Examinations Officer”).
- A senior official of an Embassy, High Commission, Consulate or other diplomatic or United Nations mission.
- Principals or Vice/Deputy Principals of schools, colleges or universities recognised by CIC.
- Your employer or a person designated by your employer.
- Senior civil servants or senior officers of the police force or the armed forces.
- Qualified professionals, e.g. lawyers, accountants, and doctors; senior clergy of recognised religious orders.

NOTES:
1. Do not try to arrange the Examination Date too early; wait until you have completed the thorough study of the Study & Training Manuals or other Publications before arranging the Examination Date with your Invigilator. An additional charge will be made to you by the College for new Assigned Work, postage, etc, should you change Invigilators.

2. **If your Fee has been completed when the “Agreement to Invigilate” Form reaches the College, the Examination Booklet(s) will be posted at once; if you are paying by Instalments, despatch will be made when the Fee is completed.

3. Any invigilation or Examination fee charged must be paid by you; it is not included in your Training Fee.

4. Even if you have enrolled for two or more Courses or Programs under your current Membership, only one completed “Agreement to Invigilate” form is required by the College; all Examination Booklets will be sent to the same Invigilator.

5. The Examination Booklet will be despatched under registered cover for safety DIRECTLY to your Invigilator, who will be informed of the despatch date and registration number by separate post. Please ensure that your Invigilator KNOWS to expect the registered packet containing the Examination Booklet and does collect the packet from the post office. The College will NOT be responsible should your Invigilator fail to collect the registered packet, and you will have to pay for the preparation and despatch of a new Examination Booklet.

YOU MAY SIT THE EXAMINATION(S) ONLY IF YOU AGREE TO ABIDE BY ALL THE COLLEGE’S EXAMINATION RULES & REGULATIONS

LSCTMMPD01
RULES AND REGULATIONS GOVERNING
THE INVIGILATION OF CIC EXAMINATION(S)

◆ When you have completed the thorough study of the College’s Study & Training Manuals or other Publications supplied to you by the College, arrange with your appointed Invigilator a place, date and time for you to “sit” your Examination(s). Most Examinations require a period of two hours without any interruptions.

◆ You must NOT take into the “Examination room” the College’s Manuals or other Publications or any other written or printed notes or other publications, or any form of recording device. Unless otherwise stated attempts at Assigned Work must be handwritten.

◆ You should be seated at the desk/table provided by the Invigilator at least five minutes before the agreed starting time. When you are ready, the Invigilator will open a sealed envelope and place an Examination Booklet front page upwards on the desk/table in front of you. This page includes a section for your full name, address and Membership Number; write or check those details carefully, and mark fully and clearly any changes needed. There will also be instructions regarding the Assigned Work to be attempted for the Examination - which you must read carefully, and follow exactly. The Examination Period - the length of time you will have in which to complete the Assigned Work - will also be stated; that is usually two hours (but three hours may be allowed for some Higher or Advanced Examinations).

◆ Inform the Invigilator when you have completed the foregoing, and at the agreed starting time the Invigilator will tell you to turn the page to the actual Assigned Work (Questions and/or Exercises). The Examination Period allowed which is usually two hours (although three hours may be allowed for some Higher or Advanced Examinations) commences immediately you have done that. You may NOT have longer than the stated Examination Period (number of hours.)

◆ During the time you are attempting the Assigned Work, you are NOT permitted to refer to the College’s Training Manuals or to any written or printed notes or other publications - except for an English-English dictionary, if necessary. Should you ignore this very strict rule, the Invigilator has the College’s authority to terminate your Examination.

◆ A few blank sheets of writing paper may be available, in case those supplied by the College in the Examination Booklet are insufficient. ALL sheets supplied (by the College or the Invigilator) must be sent to the College.

◆ At the end of the designated two-hour Examination Period the Invigilator will instruct you to stop writing - which you must do AT ONCE - and the entire Examination Booklet (now containing your written attempts at the Assigned Work) must be collected from you.

◆ Under NO circumstances may you handle the Examination Booklet after the conclusion of the Examination Period. The entire Examination Booklet*, and any other sheets you used, and a completed and signed and stamped ‘Invigilation Certificate’, must be sent by your Invigilator - by registered airmail post (at your expense) - to:-

The Examinations Director,
Cambridge International College,
College House, Leoville,
Jersey JE3 2DB, Britain.

Notes:  * The College cannot accept Examination Work by fax or email

* The College cannot accept Examination Work without a signed and stamped ‘Invigilation Certificate’
AGREEMENT TO INVIGILATE ASSIGNED WORK FOR EXAMINATION(S)

I certify that I agree to invigilate in due course the Examination(s) of the CIC Member whose name and address appear below. A mutually convenient date will in due course be arranged between the Member and me; I note that the Member will need at least two uninterrupted hours in which to attempt the Assigned Work for each Examination. I will be able to provide a suitably quiet room, with a writing desk or table and chair. Invigilation will take place under true Examination conditions, in strict accordance with Instructions to be supplied by the College. I understand that the Examination Documentation will be sent DIRECTLY to me from the College under registered cover (with a separate notification from the College that the packet has been despatched to me) and that I might be required to collect and sign for the registered item from my local post office. Inside the packet will be the Examination Booklet(s) - each in a sealed and unopened envelope - which I shall keep securely until the Examination time. I note that the College does not pay an Invigilation Fee.

Please complete ALL parts and requirements:

Signed: _____________________ Date: _____________________

Position in Organization /Designation: _________________________________

FULL NAME: ______________________________________ (capital letters please)

Qualifications: __________________________ Email address: ______________________________

FULL POSTAL ADDRESS: __________________________________________________________

______________________________________________________________________________

______________________________________________________________________________

Particulars of the Member:

MEMBERSHIP NUMBER ______________________________________

FULL NAME ______________________________________________________

FULL POSTAL ADDRESS __________________________________________

______________________________________________________________________________

______________________________________________________________________________

STUDYING PROGRAM ON LOGISTICS, SUPPLY CHAIN & TRANSPORT

**CIC CANNOT ACCEPT AN ‘AGREEMENT TO INVIGILATE’ FORM NOT BEARING THE OFFICIAL STAMP OR SEAL OF THE ORGANIZATION BY WHICH THE PROPOSED INVIGILATOR IS EMPLOYED OR MANAGES

THE EXAMINATIONS DIRECTOR,
CAMBRIDGE INTERNATIONAL COLLEGE,
College House, Leoville, Jersey JE3 2DB, Britain.