Unit 1

Passage A Introduction to Logistics

1. Definition of Logistics

Logistics, the logistics center and its flow characteristics of materials, called logistics. Logistics originally formed in the United States Called "physical distribution" (PD) "distribution in kind" or "goods delivery". Japan imported after the 1960s as :"the link between the production and consumption of goods custodian, transportation, handling, packaging, processing functions and control such functions as a backup to the information role. It played a role as a bridge in sales material [1].

Logistics is the hot topic in China and the whole world. Although it is anything but a newborn baby, lots of people still have limited awareness of, and knowledge about logistics [2] — the subject matter of this textbook. People tend to refer logistics as the flow of goods, yes, it is partly right, but logistics is much more than that. So what logistics realty is?

When you look up the term "logistics", you might surprise to find out there are various definitions of different editions, each have slightly different meaning.

To avoid potential misunderstanding about the meaning of logistics this book adopts the current definition provided by the Council of Supply Chain Management Professionals (CSCMP) (known as "Council of logistics Management") — one of the world's most prominent organizations for logistics professionals [3].

According to CSCMP, logistics is the process of planning, implementing and controlling the efficient, effective flow and storage of goods, services and related information from point of origin to point of consumption for the purpose of meeting customer requirements. It is quite a long definition, to understand it better, let's analyze it in closer details.

(1) It is a process of "plan Implement and control"

First, logistics is a process of "plan, implement, and control". Of particular importance is the word "and", which suggest that logistics should be involved in all three activities planning, implementing, controlling — not just one or two [4]. Some suggest, however, that logistics is more involved in the implementation than in the planning of certain logistical policies.

(2) Refer to "efficient and effective flow and storage"

Note that the definition also refers to "efficient and effective flow and storage". Broadly speaking, effectiveness can be thought of as "how well does a company do what they say they are going to do?" For example, if a company promises that all orders will be shipped within 24 hours

of receipt, what percentage of orders are actually shipped within 24 hours of receipt? In contrast, efficiency can be thought of as how well (or poorly) company resources are used to achieve what a company promised it can do.

(3) Involves "goods, services, and related information"

The definition also indicates that logistics involves the flow and storage of "goods, services, and related information". Indeed, in the contemporary business environment, logistics is as much about the flow and storage of information as it is about the flow and storage of goods. Advances in information technology make it increasingly easy — and less costly — for companies to obtain important information to make logistical decision.

(4) Purpose of logistics is to meet customer requirements

Finally, the definition indicates that the purpose of logistics is to meet customer requirements. This implies that logistics strategies and plans should be based upon customer wants and needs. Therefore, management must first find out what those wants and needs are, and to meet their requirement.

Logistics starts with the provision of raw materials and semi-finished goods for the manufacturing process, and finishes up with the physical distribution and after sales service of the products.

Economically, this creates a new source of profit characterized by the development of mass distribution and attention to service quality. The two basis objectives in practicing business logistics, cost reduction and time saving have enabled companies to profit not only in performance and quality but also in customer satisfaction.

Operationally, companies realize that by regrouping the different aspects of logistics and instead of viewing them as separate processes, substantial savings can be made within their business' outgoing expenditure.

In a more practical sense, logistics refers to the systematic management of the various activities required to move benefits from their point of production to the customer. Often these benefits are in the form of a tangible product that must be manufactured and moved to the user; sometimes these benefits are intangible and are known as services. They too must be produced and made available to the final consumer. But logistics encompasses much more than just the transport of goods.

The concept of benefits is a multifaceted one that goes beyond the product or service itself to include issues regarding timing, quantity, supporting services, location, and cost. So a basic definition of logistics is the continuous process of meeting customer needs by ensuring the availability of the right benefits for the right customer. In the quantity and condition desired by that customer, at the time and place the customer wants them, all for a price the buyer is willing to pay. These concepts apply equally well to profit industries and non-profit organizations, as the earlier discussion on military requirements illustrated.

2. Definition of Terms

Material flow is the linking of all processes for the acquiring, processing, matching and

distribution of material goods within defined areas.

An important aspect of the definition of the term is its limitation to material goods, therefore excluding the transport of energy or of information. However, material goods are not restricted solely to materials forming part of the production process, i.e. raw materials, semi-finished and finished products, but also other materials such as, for instance, waste, pallets and packaging [5].

Roughly speaking, differentiation is made in material flow between handling, conveying and transporting.

- **Handling** — handling refers to all motion sequences used for the starting or ending of production processes and also of transporting and storage. This includes, for instance, the insertion of a work piece in a work piece retainer or the stacking of work pieces at a storage place. Handling therefore includes all material flow processes taking place at a workstation.
- **Conveying** — conveying is the movement in horizontal or vertical direction via limited distances and is therefore generally restricted to in-plant processes. Examples are: The supply of screws by means of a vibratory bowl feeder and the transporting of vehicle bodies by means of overhead conveyors.
- **Continuous conveyor** — these examples immediately highlight an important difference: in the first example, a continuous conveyor is used. Continuous conveyors operate continuously (at least over an extended time period). The second example involves an intermittent-flow conveyor. Each cabin of the overhead conveyor has its own timetable, to which it operates, with alternating travel operation, empty running and stops.
- **Steady-flow** — conveyors are generally more economical to operate than intermittent-flow conveyors. Being of identical dead weight, these have greater conveyor capacity whilst requiring less drive power [6]. This is partly due to the continuous operating mode, thereby eliminating the continuous starting and decelerating of the drive, handling equipment and material to be conveyed.

On the other hand, intermittent-flow conveyors are frequently more flexible in application. As shown by the example, these are predominantly used for heavy individual loads.

Conveyors often have yet a secondary function resulting from the dwell time of the material being conveyed. For example, in the case of a refrigerated conveyor, parts cool down to a point where they reach the temperature required for further processing. Conveyors are also used as buffers in order to harmonize the working cycle of several processing stations.

3. Analysis of Material Flow

The terms handling, conveying and transporting are contrasted in different stages of material flow. The first stage of material flow includes transport between the factory and its suppliers or customers. This stage of material flow involves location planning, which does not form part of MPS training and is therefore not discussed here. The second stage of material flow includes movement within the factory site between the various sectors of the operation, e.g. factory building.

Factory planning again takes into account material flow and evolves an appropriate building plan. Again, this stage of material flow will not be dealt with at this point. The third stage of material flow includes the movement between the individual departments of an operational area and, within the departments, the movements between the various workstations, machine groups and storage areas, etc. This stage can be dealt with as part of MPS. The fourth stage of material flow involves movement on the workstation itself. This stage deals primarily with handling equipment for the automation of material flow on the workstation. This represents a major aspect of MPS.

In order to determine the optimum layout of equipment and the respective handling equipment involved, plus the possibly required storage and buffer stores, it is necessary to establish the material flow. The first step towards this involves the structure of the material flow.

4. Constitution of A Logistics System

In a typical logistics system, there are mainly seven basic function factors, including transportation, warehousing, delivering, packing, loading (unloading) and handling, distribution processing, as well as information managing, which are actually interacting or interdependent group of items forming a unified whole. They work together as a mechanism or interconnecting network.

New Words and Expressions

1. custodian 英 [kʌ'stəʊdiən] 美 [kʌ'stoʊdiən] *n.* 保管人；监护人；管理人；看门人
2. council ['kaunsil] *n.* 理事会，委员会，参议会，讨论会议，顾问班子，立法班子
3. prominent ['prɔminənt] *adj.* 卓越的，显著的，突出的
4. implement ['implimənt] *vt.* 贯彻，实现；*v.* 执行
5. consumption [kən'sʌmpʃən] *n.* 消费，消费量
6. involve [in'vɔlv] *vt.* 包括，笼罩，潜心于，使陷于
7. receipt [ri'si:t] *n.* 收条, 收据，收到；*v.* 收到
8. indicate ['indikeit] *vt.* 指出，显示，象征
9. vibratory ['vaibrətəri] *adj.* 振动的，振动性的
10. intermittent [ˌintə(:)'mitənt] *adj.* 间歇的，断断续续的
11. steady ['stedi] *adj.* 稳固的，稳定的，坚定的，扎实的，坚定不移的
12. optimum ['ɔptiməm] *n.* 最适宜；*adj.* 最适宜的
13. semi-finished *adj.* 半成品的
14. dead weight 重物，重载

Notes

1. Japan imported after the 1960s as “the link between the production and consumption of goods custodian, transportation, handling, packaging, processing functions and control such functions as a backup to the information role. It played a role as a bridge in sales material”.

在 20 世纪 60 年代后，日本引入了物流的概念，将其定义为“在生产与消费之间实现的货物管理、运输、搬运、包装、流通加工以及控制这些功能的信息活动。它在销售物流中起到桥梁作用”。

2. Logistics is the hot topic in China and the whole world. Although it is anything but a newborn baby, lots of people still have limited awareness of, and knowledge about logistics.

物流在中国乃至全世界已经是一个热门话题。虽然它已经不是一个新生事物，但是不少人对物流的认识仍然有限。

be aware of something — 意识到

Example: John has been aware of having done something wrong.约翰已意识到自己做错了事情。

3. To avoid potential misunderstanding about the meaning of logistics, this book adopts the current definition provided by the Council of Supply Chain Management Professionals (CSCMP) — one of the world's most prominent organizations for logistics professionals.

为了避免可能发生的对物流含义的误解，本书采用美国供应链管理专业协会（前身为美国物流管理协会)目前的定义，该协会是全世界物流专业领域中最著名的组织之一。

to avoid something(doing something)　避免，避开

Example: She tried to avoid answering my questions.　她试图避而不答我的问题。

4. First, logistics is a process of “plan, implement, and control”. Of particular importance is the word “and”, which suggests that logistics should be involved in all three activities, planning, implementing, controlling — not just one or two.

首先，物流是一个“计划、执行与控制”的过程。特别重要的是这个“与”字，它指出物流应该包括所有这三方面——计划、执行和控制——而不仅仅是其中一个或两个方面。

5. However, material goods are not restricted solely to materials forming part of the production process, i.e. raw materials, semi-finished and finished products, but also other materials such as, for instance, waste, pallets and packaging.

然而，物品不仅局限于生产过程中形成的物料，即原材料、半成品、成品，还包括如废料、托盘及包装物之类的其他物料。

6. Being of identical dead weight, these have greater conveyor capacity whilst requiring less drive power.

在相同的载重量之下，这些输送机（恒定速度的输送机）拥有更大的输送能力而所需驱动力更小。

Topics for Discussion

1. Is logistics a new concept? If it is not, do you know anything about the origin and history of logistics? Please share the information you have with your group member.

2. How much do you know about the literal meaning of logistics?

3. Why do the advances in information technology make it increasingly easy — and less costly — for companies to obtain important information to make logistical decision?

4. What is the difference made in material flow between handling, conveying and transporting according to the text?

5. Why are "material flow" divided into four stages? Can you make an analysis of material flow in yourself way?

Passage B Activities of Logistics Engineering

Logistics engineering is resulted from the combination of logistics, management, systems engineering and information engineering. At present, there is no accurate definition, however, it can be explained as follows according to the functions it serves: logistics engineering is an active process, seeing logistics as a systematic whole, applying the theory and method of systems engineering management, carrying through the layout, design, managing and control, choosing excellent scheme, offering help for the social economic system and enterprises with low cost, high efficiency and high quality.

1. Synopsis of Logistics Engineering

Logistics Engineering is to solve the following problems:

(1) The layout and design of logistics system, including collocation, the choice of location, the design of plane collocation, etc. To acquire a best logistics system;

(2) Material portage, transportation, storage design and management, and the choice or management of the corresponding logistics equipment and apparatus;

(3) The design and management of logistics information system, to get the total control of the information system during the operation of the logistics system.

Logistics Engineering embodies the following characteristics of the intersectional fringe subjects of physical science and social science[1]:

- The theory of Logistics Engineering is based on the integration of many subjects;
- The object that Logistics Engineering studies is usually a complicated dynamic system with many goals for decision-making;
- Logistics Engineering is an intercross subject.

After a few decades' development, Logistics Engineering in our country has a preliminary scale now. While compared with other advanced countries in logistics such as the USA, Europe and Japan, there is still a gap which couldn't be ignored. The developing trend of Logistics Engineering in our county reflects in the following sides:

- Systematization of logistics;
- Logistics information;
- Socialization and specialization of logistics;
- Modernization of warehousing and logistics equipment;

- Integration of logistics, commodity distribution and information flow;
- Flexibility of logistics system.

2. Main Activities of Logistics System

To play features of a logistics system, lots of activities such as demand forecasting, transportation, warehousing, inventory control, material handling, packaging, information processing, procurement, production planning, customer service must be executed together[2].

(1) Demand forecasting

Demand forecasting refers to efforts to estimate product demand in a future time period. Therefore, company can make decision such as what kinds and how many raw materials should be ordered form it's suppliers; when to start manufacturing and how many finished goods should be transported or held in each market.

(2) Transportation

Transportation refer to the physical movement of goods from one point to another point, it involves selection of the transport mode, routing of the shipment, complicate with regulation in the region of the country, and selection of carriers.

Transportation is often the most costly logistics activity and can range from 40%-60% of a firm's total logistics cost.

(3) Inventory management

Inventory refers to stocks of good that are maintained for a variety of purposes, such as for resale to others, as well as to support manufacturing or assembling processes1. To achieve good inventory management, logisticians need to balance the cost of maintaining additional products on hand against the risk of not having those items when the customer wants them.

(4) Warehousing

Warehousing refers to places where inventory can be stored for a particular period of time. In the past decades, important changes have occurred with respect to the role of warehousing in contemporary logistics system.

(5) Packaging

Packaging can have both marketing (consumer packaging) and logistical (industrial packaging) dimensions. Industrial packaging focuses on protecting the product while it is being shipped and stored. Too much package increases costs, while inadequate protection may result in merchandise damage and, ultimately, customer dissatisfaction.

(6) Materials handling

Materials handling refers to the short-distance movement of products within the confines of a facility (e.g. plant, warehouse). Since materials handling tends to add costs (e.g. labor cost, product loss and produce damage) rather than value to logistics systems, managers tends to minimize the number of handling whenever possible.

(7) Information management

Information is what links all areas of the logistics system together[3]. The development of IT

technology resulted in price reduction of computers and software, founding an information system become affordable even to small organizations. Indeed, firms are linking their internal logistics information systems with those of their suppliers, customers and other partner. Such an open exchange of information can result in faster order placement, quicker delivery, and greater accountability throughout the logistics process.

(8) Procurement

Procurement refers to the raw materials, component parts, and supplies bought from outside organizations to support a company's operation. These inputs have direct impact on both the cost and quality of the final product/service offered to the customer, this activity is important to the overall success of the logistics effort.

(9) Production planning

It can be concluded under logistics because manufacturing component and raw materials in order to make finished goods that are, in turn, demanded by a customer. Thus, production planning is at the center of the entire logistics process. Yet it is often view as a stand-alone entity with its own objective and agenda.

(10) Customer service

There can be many definition of customer service, such as "keeping existing customer happy". Customer service involves making sure that the right person receive the right product with the right quantity at the right place at the right time in the right condition at the right cost.

Some of these activities have traditionally had a well-defined stand-alone role within a company (procurement, production planning, information processing), while others have generally been more closely associated with logistics (transportation, warehousing, inventory management, packaging), what ties all these functions together is their ability to impact customer satisfaction, and this can be achieved through good customer service.

It must be kept in mind that one logistics system does not fit all companies[4]. The number of activities in a logistics system can vary from company to company.

New Words and Expressions

1. systematic [sɪstə'mætɪk] *adj.* 系统的，体系的
2. layout ['leɪaʊt] *n.* 布局，设计，安排
3. acquire [ə'kwaɪə] *vt.* 获得，取得
4. portage ['pɔrtɪdʒ] *n.* 运输，存储
5. apparatus [ˌæpə'reɪtəs] *n.* 装置，设备
6. intercross [ɪntə'krɒs] *vi.* 交叉，杂交
7. forecasting ['for,kæst] *n.* 预测
8. Inventory ['ɪnv(ə)nt(ə)rɪ] *n.* 存货，存货清单
9. affordable [ə'fɔːdəbəl] *adj.* 负担得起
10. procurement[prə'kjʊəmənt] *n.* 采购，获得，取得

Notes

1. Logistics Engineering embodies the following characteristics of the intersectional fringe subjects of physical science and social science.

物流工程是自然科学和社会科学交叉的边缘学科，体现了如下特点。

2. To play features of a logistics system, lots of activities such as demand forecasting, transportation, warehousing, inventory control, material handling, packaging, information processing, procurement, production planning, customer service must be executed together.

要发挥物流系统的功能，就必须将需求预测、运输、仓储、库存控制、物料搬运、包装、信息处理、采购、生产计划以及客户服务等活动整合起来。

3. Information is what links all areas of the logistics system together.

信息是将物流系统中所有环节联系在一起的纽带。

4. It must be kept in mind that one logistics system does not fit all companies.

一个物流系统不会对所有的物流企业都适用，这一点是可以肯定的。

Topics for Discussion

1. What's logistics engineering?
2. What's the difference between logistics engineering and logistics system engineering?
3. What are the main characteristics of logistics engineering?