

МИНИСТЕРСТВО ОБРАЗОВАНИЯ РЕСПУБЛИКИ БЕЛАРУСЬ

**УЧРЕЖДЕНИЕ ОБРАЗОВАНИЯ
«БРЕСТСКИЙ ГОСУДАРСТВЕННЫЙ ТЕХНИЧЕСКИЙ УНИВЕРСИТЕТ»**

**КАФЕДРА ИНОСТРАННЫХ ЯЗЫКОВ
ПО ЭКОНОМИЧЕСКИМ СПЕЦИАЛЬНОСТЯМ**

Introduction to Logistics

2-е издание, исправленное и дополненное

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Пособие составлено в соответствии с Учебной программой для специальности 1 – 26 02 05 «Логистика».

Основная цель пособия – подготовить студентов к использованию английского языка в их будущей профессиональной деятельности. Пособие направлено на обучение студентов овладению лексикой, используемой в сфере логистических операций, формирование навыков говорения, чтения и письма, развитие грамматических навыков.

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Unit 1. The Context of Logistics

Text 1. Logistics and Supporting Operations

Ex. 1. Before reading the text check the meaning of the following words and word combinations in the dictionary.

Logistics, manufacturer, supplier, customer; deliver, storage, dairy, shopping mall, intangible, warranty, insurance, input, chef.

Ex. 2. Read the text and do the tasks that follow.

All organizations move materials. Manufacturers build factories that collect raw materials from suppliers and deliver finished goods to customers; retail shops have regular deliveries from wholesalers; a television news service collects reports from around the world and delivers them to viewers; most of us live in towns and cities and eat food brought in from the country; when you order a book or DVD from a website, a courier delivers it to your door. Every time you buy, rent, lease, hire or borrow anything at all, someone has to make sure that all the parts are brought together and delivered to your door. Logistics is the function that is responsible for this movement. It is responsible for the transport and storage of materials on their journey between suppliers and customers.

On a national scale, logistics involves a huge amount of effort. The USA has a gross domestic product (GDP) of US\$10 trillion, so its population of 280 million produces and consumes an average of US\$36,000 of goods and services. The world's seven largest economies (USA, Japan, Germany, UK, France, Italy and Canada) have a combined GDP of US\$20 trillion. All of this – whether it is oil produced in Canada, consumer electronics in Japan, cars in the UK or dairy products in France – relies on logistics to collect materials from suppliers and deliver them to customers. Millions of people are involved in this effort, and it costs billions of dollars a year to keep everything moving.

Ordinarily we only notice a small part of logistics. We might see lorries driving down a motorway, visit a shopping mall, drive through a trading estate, or have a parcel delivered to our homes. These are the visible signs of a huge industry. In this booklet you will get a more detailed look at this complex function. We are going to discuss these issues and developments, and see how managers can get the best results from their logistics.

Every organization delivers products to its customers. Traditionally we describe these products as either goods or services. Then manufacturers like Sony and Guinness make tangible goods, while AOL and Vodafone provide intangible services. In reality, this view is rather misleading, and every product is really a complex package that contains both goods and services. Ford, for example, manufacture cars, but they also give services through warranties, after-sales service, repairs and finance packages. McDonald's provide a combination of goods (burgers, cutlery, packaging, and so on) and services (when they sell food and look after the restaurant).

At one end of this spectrum are products that are predominantly goods, such as cars and domestic appliances; at the other end are products that are predominantly

services, such as insurance and education. In the middle are products with a more even balance, such as restaurant meals and hospitals.

At the heart of an organization are the operations that create and deliver the products. These operations take a variety of inputs and convert them into desired outputs. The inputs include raw materials, components, people, equipment, information, money and other resources. Operations include manufacturing, serving, transporting, selling, training, and so on. The main outputs are goods and services. The 'Golden Lion' restaurant, for example, takes inputs of food, chefs, kitchen, waiters, and dining area; its operations include food preparation, cooking and serving; the main outputs are meals, service, customer satisfaction, and so on.

The products created by an organization are passed to its customers, making the cycle. This shows customers' generating demands, with operations using resources to make products that satisfy them. Logistics moves materials around this cycle. The operations are usually divided into a number of related parts, in the way that a hospital has an emergency room, surgical ward, purchasing department, heart unit, operating theatre and so on. So, logistics also moves materials through the different parts of an organization, collecting from internal suppliers and delivering to internal customers. This leads to our basic definition:

Logistics is the function responsible for the flow of materials from suppliers into an organization, through operations within the organization, and then out to customers.

Understanding the main points.

Ex. 3. Scan the text to find the English equivalents to the following collocations.

Доставлять продукты, материальные товары, сложный пакет, производить легковые автомобили, послепродажное обслуживание, бытовые приборы, превращать в желаемую продукцию, приготовление пищи, приемный покой, операционная, отечественные потребители, движение материалов.

Ex. 4. Answer the questions.

1. What functions does logistics perform? 2. Logistics involves a great amount of effort, doesn't it? 3. What countries represent the world's largest economies? 4. What is their combined GDP? 5. What are the visible signs of logistics? 6. In what terms are products usually described? 7. To your mind, is this view misleading? 8. What is the other division of products? 9. What kind of operations make the core of any organization? 10. What do inputs include? Give examples. 11. What is a product cycle? 12. What is logistics in terms of a product cycle?

Ex. 5. Match the words with their definitions.

- | | |
|---------------------------|---|
| 1. supplier | a) the act of keeping or putting something in a place while it is not being used, or the lace used for this |
| 2. customer | b) an area just outside a city or town where there are small factories and businesses |
| 3. gross domestic product | c) a person who buys goods, products, and services for their own use, not for business use or resell |
| 4. manager | d) a company that provides a particular type of product |

5. shopping mall	e) things that are produced in order to be used or sold
6. storage	f) the growth or improvement in something, so that it becomes bigger or more advanced
7. consumer	g) a person or organization that buys goods or services from a shop or company
8. retail shop	h) someone whose job is to manage all or part of a company or organization, or a particular activity
9. goods	i) the sale of goods to customers for their own use, rather than to shops
10. trading estate	j) a large area where there are lots of shops, usually a covered area where cars cannot go
11. development	k) the total value of goods and services produced in a country's economy, not including income from abroad

Ex. 6. Expand on the following statements from the text.

1. Traditionally products are described as goods and services. 2. The idea of dividing all products into either goods or services is rather misleading. 3. Any organization's work is centred on creating and delivering products. 4. The products created by an organization are passed to its customers. 5. Logistics moves material through the different parts of an organization.

7. Work in pairs. Speak about logistics and its supporting operations using the following procedure.

- Before you speak, plan what you are going to say and select words and phrases you have studied so far in this text.
- Speak for about a minute.
- When you are listening to your partner's talk, think of questions to ask at the end of it.

Interesting to know

Самые известные музеи логистики

Музей логистики (Museum of Logistics), Токио, Япония. Музей открыт в 1998 году. Он унаследовал коллекцию музея «Ниппон Экспресс»: более 12 000 статей о транспортировке и 40 000 документальных изображений, отражающих историю фирмы «Ниппон Экспресс». История материально-технического снабжения Японии отображена на втором этаже, а на третьем располагаются читальный зал и комната мультимедиа.

Музей королевского логистического корпуса (The Royal Logistics Corps Museum), Суррей, Великобритания. Экспозиция музея рассказывает о материально-технической поддержке британской армии со времен Оливера Кромвеля до наших дней. Посетители музея узнают, как на протяжении последних 500 лет солдат британской армии транспортировали, кормили, снабжали оружием и снаряжением и как солдаты поддерживали связь с друзьями и близкими.

Музей логистики вооруженных сил Канады (The Canadian Forces Logistics Museum), Монреаль, Канада. В музее представлены более 10 000 экспонатов, относящихся к истории Канадского королевского корпуса материального снабжения и его приемника – Логистического подразделения вооруженных сил Канады. Экспозицию музея дополняет крупнейшая коллекция канадской военной техники и артиллерии канадской провинции Квебек.

Text 2. Aims of Logistics

Ex. 1. Before reading the text check the meaning of the following words and word combinations in the dictionary.

Supply chain, semantics, convention, exactly, distribution, morale, merchandising, manager, efficiently, productivity, inbound, outbound, warehouse, consumables, tangible, intangible, circumstance, courteously, consumables, value, security, grease, shareholder, survive.

Ex. 2. Read the text and do the tasks that follow.

Logistics is responsible for the flow of materials through a supply chain. This function is also called supply chain management. Some people argue that logistics is somewhat narrower and concentrates on the movement within a single organization, while supply chain management takes a broader view of movement through related organizations. This is, however, largely an argument over semantics rather than real differences in practice. In this booklet we will stick to the convention that the two terms refer to exactly the same function. This view is supported by the Institute of Logistics and Transport – the main professional body within the UK – who give the following definitions:

Logistics is the time-related positioning of resources, or the strategic management of the total supply-chain.

The supply chain is a sequence of events intended to satisfy a customer.

Some people also talk about logistics management, business logistics, distribution management, materials management, merchandising, or a series of other terms. Sometimes you have to be careful as these terms can refer to specific parts of the supply chain or slightly different activities. When someone talks about 'distribution management' you should be clear about whether they mean transport, physical distribution, the whole of logistics, or some other function.

With our broad view, logistics managers have two main aims. The first is to move materials into, through, and out of their own organization as efficiently as possible. The second aim is to contribute to an efficient flow through the whole supply chain. Traditionally, managers concentrate on the first of these, focusing on those parts of the supply chain that they directly control. Hopefully, if each organization looks after its own logistics properly, materials will move efficiently through the whole chain, thus achieving the second aim. To some extent this is true. It is not, however, inevitable and organizations really need a more positive approach to co-operation. This will be discussed in a more detailed way in the next units. Here, though, we look at the more immediate aims of logistics within an individual organization.

We have said that managers' aim for an efficient movement of materials – but what exactly do we mean by 'efficient'? There are several answers to this, including fast deliveries, low costs, little wastage, quick response, high productivity, low stocks, no damage, few mistakes, high staff morale, and so on. Although these are all worth-while goals, they are really indicators rather than real aims. To find the real aim of logistics, we must relate it to the wider objectives of an organization.

Moving materials into the organization from suppliers is called inbound or inward logistics; moving materials out to customers is outbound or outward logistics; moving materials within the organization is materials management.

In these definitions we have talked about the movement of materials – but what exactly do we mean by materials? Sometimes this is obvious when, for example, a power station brings coal from a mine, a farmer moves potatoes to a wholesaler, or a computer manufacturer delivers PCs to a warehouse. At other times it is less clear when, for example, a television company delivers entertainment to its viewers, a telephone company provides a communications service, or a research company creates new knowledge. Tangible goods clearly have to be moved, and you can easily see the role of logistics. Even organizations providing the most intangible services move some goods around – perhaps paperwork or consumables – so they still need logistics. However, we can take a broader view and say that logistics also moves less tangible things, such as information and messages. Then a television company uses logistics to move around its production facilities, and also to transmit programmes to customers. In different circumstances, logistics is responsible for moving raw materials, components, finished products, people, information, paperwork, messages, knowledge, consumables, energy, money and anything else needed by operations. To simplify things, we describe all of these as materials.

Materials are all the things that an organization moves to create its products. These materials can be both tangible (e.g. raw materials) and intangible (e.g. information).

Ultimately, the success of every organization depends on customer satisfaction. If it does not satisfy customers, it is unlikely to survive in the long term, let alone make a profit, have high return on assets, add shareholder value, or achieve any other measure of success. So organizations must deliver products that satisfy customers. Unfortunately, customers judge products by a whole series of factors. When you buy a DVD, for example, you judge its contents, appearance, how easy it is to buy, how long you wait, how expensive it is, whether the right DVD was delivered, whether it was damaged, how courteously you were treated by sales staff, and so on. Some of these factors clearly depend on logistics – the availability of the DVD depends on stocks; the delivery time depends on transport; damage is prevented by good material handling; the price is affected by logistics costs. So we can phrase the overriding aim of logistics in terms of customer service. It has to organize the movement of materials in the best way to achieve high customer satisfaction.

Any organization can give outstanding customer service if it is prepared to allocate enough resources. The problem, of course, is that more resources come with higher costs. There is a limit to the amount that customers will pay for a product and, therefore, on the service that can be given. Then a realistic aim for logistics balances the service given to customers with the cost of achieving it.

The overall aim of logistics is to achieve high customer satisfaction. It must provide a high quality service with low – or acceptable – costs.

We can phrase this balance in terms of perceived customer value. Logistics adds value by making products available in the right place and at the right time. If a product is available at the place it is needed, logistics is said to have added place utility; if it is delivered at the right time, logistics has added time utility. Then we can phrase the aim of logistics in terms of getting the highest customer utility or perceived value. In essence, we are trying to maximize the difference between perceived value and actual costs.

People often summarize the aims of logistics as getting 'the right materials, to the right place, at the right time, from the right source, with the right quality, at the right price'. This is broadly correct, but it depends on how we define 'right'. In different circumstances, logistics is judged by completely different measures of performance. When you post letters, you sometimes want them delivered quickly, sometimes as cheaply as possible, sometimes with high security, sometimes at a specified time, and so on. Managers have to design logistics that are flexible enough to satisfy a variety of needs. There are two aspects of this. The first is concerned with planning, when managers take a strategic view and design the best possible supply chain for their circumstances. The second concern is about execution, when materials move through this chain as efficiently as possible. Harrington summarizes this double role by saying that, 'logistics is both the glue that holds the materials/product pipeline together and the grease that speeds product flow along it'.

Ex. 3. Answer the questions.

1. What is the logistics function? 2. What does its narrower definition imply? 3. What definitions of logistics and supply chain does the Institute of Logistics and Transport suggest? 4. What does 'distribution management' mean? 5. What two main aims do logistics managers have? 6. What are the immediate aims of logistics within an organization? 7. What does the success of every organization depend on? 8. Under what condition can an organization provide an outstanding customer service?

Ex. 4. Expand on the following statements from the text.

1. Logistics is responsible for the flow of materials through a supply chain. 2. One has to be careful what terms to use in relation to logistics. 3. Logistics managers have two main objectives. 4. Managers aim at more efficient movement of materials. 5. The success of any company depends on customer satisfaction. 6. Allocating enough resources is the key to any organization's customer service.

Ex. 5. Work in pairs. Describe the aims of logistics. Give examples to support your point of view.

Interesting to know

Слоны и логистика

Слоны живут на земле уже 40 млн лет. В настоящее время Всемирный фонд природы прилагает много усилий для защиты и сохранения в Азии и Африке

слонов, жизнь которых, без сомнения, находится под угрозой. Не везде слонам хватает пищи, так как в день им требуется 150-300 кг еды.

Слоны помогали человеку осваивать труднопроходимые тропические заросли. Многокилометровые тропы, проложенные ими в джунглях, часто так широки, что по ним можно проехать на вездеходе. Эти тропы человек впоследствии использовал для строительства дорог. Дело в том, что тропы слонов повторяют ярко выраженные рельефы местности и проходят, насколько это возможно, на определенной высоте над уровнем моря, т.е. слоны всегда выбирают самые рациональные и экономичные пути. Поэтому слонов можно назвать асами в области логистики.

Text 3. Importance of Logistics

Ex. 1. Before reading the text check the meaning of the following words and word combinations in the dictionary.

Essential, ultimately, point of origin, expensive, overheads, costs, disagreement, precise, expenditure, gravel, jewellery, rule of thumb, turnover, interpret, wholesale, account for.

Ex. 2. Read the text and do the tasks that follow.

Logistics is essential for every organization. M. Christopher says that 'Logistics has always been a central and essential feature of all economic activity'. R.D. Shapiro and J.L. Heskett agree, saying that 'There are few aspects of human activity that do not ultimately depend on the flow of goods from point of origin to point of consumption'. Without logistics no materials move, no operations can be done, no products are delivered, and no customers are served.

Not only is logistics essential, but it is also expensive. Organizations may reduce their overheads as much as possible, but they are often left with surprisingly high logistics costs. Unfortunately, it is difficult to put a figure to these, and there is a good deal of uncertainty in the area. Normal accounting conventions do not separate expenditure on logistics from other operating costs, and there is some disagreement about the activities to include. As a result, very few organizations can put a precise figure on their logistics expenditure, and many have almost no idea of the costs.

The cost of logistics varies widely between different industries. Building materials, such as sand and gravel, have very high logistics costs compared with, say, jewellery, pharmaceuticals and cosmetics. However, one rule of thumb suggests that logistics costs are 15-20 per cent of turnover. The USA has a GDP of \$10 trillion, so it might spend \$1-2 trillion dollars a year on logistics, with half of this spent on transport. You have to interpret such figures carefully as other studies give different views. The UK government, for example, says that 12 per cent of the GDP comes from wholesale and retail trades and 6 per cent comes from transport and storage. These figures suggest that overall logistics costs are considerably higher – perhaps supporting an earlier estimate by A. Childerley that logistics accounted for 32.5 per cent of the UK GDP.

Despite the differences in these figures, everyone agrees that logistics can be very expensive. Whether it is getting more expensive is open to debate. Some people say

that fuel, land, safety, environmental protection and employee costs are all rising and making logistics more expensive. They argue that this is a long-term trend that will inevitably continue. An opposing view says that improvements in logistics are more than compensating for price rises, and the overall cost is falling. By improving methods and replacing outdated practices, logistics costs continue to fall as a proportion of product value. The true picture depends on circumstances within each organization.

Despite its obvious importance, logistics has not always received its fair share of attention. Historically, organizations put all their effort into making products and gave little thought to the associated movement of materials. Managers recognized that transport and storage were needed, but they were viewed as technical issues that were not worth much attention – they were simply the unavoidable costs of doing business. Some early work in the 1920s began to look more carefully at the transport of finished goods. In 1962, though, P. Drucker could still describe logistics as ‘the economy’s ‘dark continent’ and say that this formed ‘the most sadly neglected, most promising area of ... business’. Since then there have been considerable changes.

Perhaps the main reason for change was the recognition that logistics was expensive. By the 1970s and 80s surveys were suggesting that the movement and storage of materials typically accounted for 15-20 per cent of revenue. It is difficult to get accurate figures for this, and in 1994 G.V. Hill could still say that ‘many distributors are unaware of the costs of the distribution service they provide’. However, logistics had been identified as a high cost function and one where organizations can make significant savings.

Ex. 3. Scan the text searching for the English equivalents of the following collocations.

Существенная черта, человеческая деятельность, в конечном итоге, потребление, обслуживать клиентов, снижать накладные расходы, логистические издержки, отделять, бухгалтерские условности, рабочие издержки, не иметь представления, варьировать, тратить, розничная торговля, хранение на складе, смета.

Ex. 4. Answer the questions.

1. How do A. Christopher, R.D. Shapiro and J.L. Heskett define the importance of logistics? 2. Logistics isn’t of great importance only, is it? 3. Does the reduction in overheads always lead to reducing costs? 4. Can all organizations give the exact figure of their expenditure? 5. In what industries are logistics costs high? 6. What is mean percentage of logistics costs? 7. What amount of money is spent on logistics in the USA and UK?

Ex. 5. Expand on the following statements from the text.

1. Logistics is essential for any organization. 2. Logistics is not only essential but expensive, too. 3. The cost of logistics varies significantly between different industries. 4. Logistics costs make 15–20 % of turnover.

Ex. 6. Discuss the importance of logistics in pairs. Follow the usual procedure of preparing your utterance.

Interesting to know

Самый длинный рейс

Долгие годы это звание удерживал рейс Сингапур – Нью-Йорк, запущенный 29 июня 2004 года. Беспересадочный полет длился целую вечность – 19 часов, за это время самолет преодолевал расстояние в 15 345 километров! Специально для этого рейса «Сингапурские авиалинии» закупили четыре гигантских суперлайнера Airbus A340, оборудовав их исключительно под бизнес-класс. Первоначально компания смогла заработать на рейсах неплохие деньги и получила известность как оператора «самого длинного перелета в мире». Но вскоре авиационное топливо подорожало почти на 30%, что сделало обслуживание A340 весьма накладным. При этом спрос на билеты премиум-класса из Азии в Америку напротив значительно упал. В январе 2013 года «Сингапурские авиалинии» объявили о прекращении перевозок по данному маршруту.

В настоящее время самым длинным, а по совместительству и долгим маршрутом в мире является рейс Сингапур – Лос-Анджелес. 14 114 километров и 18 часов полета – испытание не для слабонервных!

Text 4. Organizing Logistics

Ex. 1. Before reading the text check the meaning of the following words and word combinations in the dictionary.

Forklift trucks, pallet, amount, procurement, destination, keep sth safe, truck, perform, arrangement, medium sized, employ, transport fleet, marketing, purchase, stock control, spread, contract, third-party, current trend, human resources, variation, common, overall function.

Ex. 2. Read the text and do the tasks that follow.

It is probably easiest to imagine the activities that make up logistics in a manufacturer, with forklift trucks unloading pallets from lorries and moving them around warehouses. But the same principles apply in any other organization. When a rock band goes on tour they carry huge amounts of equipment. Procurement buys everything that is needed on the tour, transport packs it and moves it to the next destination, receiving makes sure that everything arrives safely, warehousing keeps things safe until they are needed, materials handling moves things between trucks and the stage, location decides where to perform. The same types of decision are made with even the most intangible service. Insurance companies, for example, decide what kind of branch network to have, where to locate offices, who to buy telephone and other services from, how to deliver information to customers, and so on.

You can see logistics in every organization, and it obviously comes in a huge number of different forms. The activities can be arranged in many ways within an organization, and there is certainly no single 'best' arrangement. A small organization might have one person looking after everything. A medium sized organization might have one department with different sections for purchasing, transport, stock control,

distribution, and so on. A large organization might have a logistics division employing thousands of people and running huge transport fleets. Sometimes all the activities are organized in a single department reporting to a logistics director; sometimes they are part of a larger department such as marketing or production; sometimes they are spread out in small pockets throughout the organization; sometimes they are contracted out to third-party suppliers.

The current trend is towards an organization where logistics is a single integrated function, with a logistics director – or equivalent – at its head. This follows a traditional functional structure, with the logistics director working with directors in production, finance, sales, human resources, and so on. There are many variations on this, with a common one found in companies organized around products or projects. Then some logistics might exist in each division, with a matrix structure allowing co-ordination of the overall function.

Ex. 3. Scan the text searching for the English equivalents of the following collocations.

Составлять, автопогрузчик, применять, удивительно, поддон, отправляться в турне, большое количество, размещать офис, доставлять информацию, исполнять, нематериальный, страховая компания, многими способами, большой транспортный парк, предоставлять отчет.

Ex. 4. Answer the questions.

1. Do organizations follow the same principles of organizing logistics activities?
2. Do the same principles apply to services as well? 3. Logistics comes in a huge number of different forms, doesn't it? 4. Is there any single 'best' logistics arrangement? 5. What is the current trend of organizing logistics activities?

Ex. 5. Expand on the following statements from the text.

1. The activities that make up an organization's logistics apply in any other organization. 2. Logistics comes in a huge number of different forms. 3. In current conditions logistics is a single integrated function.

Ex. 6. Work in pairs. Describe an organization's logistics organizing activities.

Interesting to know

Панамский канал

Строительство Панамского канала стало одной из важнейших вех в мореплавании. Введенный в эксплуатацию в 1914 году (первое судно прошло по нему в 1914, но из-за схода оползня осенью того года, официальное движение было открыто лишь шестью годами позже), канал в несколько раз сократил путь между портами Тихого и Атлантического океанов. Прежде, чтобы попасть из одного океана в другой, судам нужно было обогнуть Южную Америку аж вокруг мыса Горн. Сегодня Панамский канал — один из главных мировых морских путей, через который ежегодно проходит около 18 тысяч

судов (нынешняя пропускная способность канала – 48 судов в сутки), что составляет значительную часть мирового грузооборота.

Text 5. Effects on Financial Performance

Ex. 1. Before reading the text check the meaning of the following words and word combinations in the dictionary.

Impact, financial performance, return on assets, earn, profit, measure, property, improve, amount of stock, fixed assets, lower (v.), borrow, resources, attractive, available, facilities, premium prices, increase profits, consequently, lead times,

Ex. 2. Read the text and do the tasks that follow.

As an expensive function, logistics has an impact on an organization's overall financial performance. We can give many illustrations of this, but will start with the effects on the return on assets (ROA).

The return on assets is defined as the pre-tax profit earned by an organization divided by the value of the assets employed. It can be computed as

$$\text{ROA} = \frac{\text{Net Income}}{\text{Average Total Assets}}$$

This gives a measure of how well available resources are used and, in general, the higher the value, the better the organization's performance. Assets are usually described as current (cash, accounts receivable, stocks, and so on) or fixed (property, plant, equipment, and so on). Improving the flow of materials reduces the amount of stock. This clearly lowers current assets, but we can argue that it also reduces fixed assets and increases profit.

◇ *Current assets.* More efficient logistics reduces the current assets through lower stock levels. Reducing the investment in stock can also free up cash for other more productive purposes and reduce the need for borrowing.

◇ *Fixed assets.* Fixed assets include property, plant and equipment. Logistics is a heavy user of these resources, and the warehouses, transport fleets, materials handling equipment and other facilities needed to move materials through the supply chain form a major part of fixed assets.

◇ *Sales.* By making a more attractive product, or making it more readily available, logistics can increase sales and give higher market share.

◇ *Profit margin.* More efficient logistics gives lower operating costs, and this in turn leads to higher profit margins.

◇ *Price.* Logistics can improve the perceived value of products – perhaps making them more easily available, giving faster delivery or shortening lead times. More attractive products can get premium prices.

As you can see, the first two points give lower assets, while the last three increase profits. All of these effects raise ROA, and consequently affect other measures of performance, such as share price, return on investment, borrowing, and so on.

Ex. 3. Match the words with their definitions.

- | | |
|----------------|--|
| 1) impact | a) the way sb deals with or treats a situation, a person, an animal, etc. |
| 2) resources | b) sth that you can get, buy or find |
| 3) available | c) taking and using sth that belongs to sb else, and returning it to them at a later time |
| 4) performance | d) a supply of goods that is available for sale in a shop/store |
| 5) facilities | e) a thing or things that are owned by sb |
| 6) stock | f) the money that you make in business or by selling things, especially after paying the costs involved |
| 7) handling | g) a supply of sth that a country, an organization, or a person has and can use, especially to increase their wealth |
| 8) borrowing | h) the powerful effect that sth has on sb/sth |
| 9) profit | i) to become or to make sth greater in amount, number, value, etc. |
| 10) increase | j) the part that is not included into the main part of a group or situation |
| 11) property | k) buildings, services, equipment, etc. that are provided for a particular purpose |
| 12) margin | l) how well or badly sth works |

Ex. 4. Answer the questions.

1. Logistics affects an organization's overall financial performance, doesn't it?
2. How is 'return on assets' defined?
3. What does this index show?
3. What kind of assets do you know? Give examples.
4. What do current and fixed assets lead to?
5. How do all these five points affect ROA?

Ex. 5. Work in pairs. Describe logistics effects on enterprises' financial performance.

Interesting to know

Интересные логистические факты

Для логистики, транспорт – это движение товара средствами и конечно же людьми из точки А к точке В по воздуху, морю, железной дороге, трассе. Без этого процесса наш современный ритм жизни не был бы таковым. И чтобы все было доставлено в неиспорченном первоначальном виде, работники этой сферы серьезно заботятся о Ваших грузах. Так, например, в Японии все мелкие грузы перевозят в емкостях наполненных нежнейшей рисовой шелухой. Сложно представить добычу этого сырья. Но это не самая большая забота, проявленная по отношению к товарам. В США сделаны 600 специальных железнодорожных грузовых путей протяженностью более 173 000 миль (Мексика, США и Канада). По этим рельсам отправляют 70% произведенных Северной Америкой автомобилей. Общий объем дохода равен \$42 млрд. в год. А первое место среди продуктов питания занимает замороженный картофель, его 95% от общего объема перевозок. А если смотреть на всю логистику в мире, и собрать цепочку всех перевозимых колбас, то длина превысит 400 000 км. Это расстояние от Земли до Луны и немного обратно.

Text 6. Pressures to Improve Logistics

Ex. 1. Before reading the text check the meaning of the following words and word combinations in the dictionary.

Savings, encourage, pressure, knowledgeable, quality, fierce, competition, remain competitive, opportunity, customization, growth, improvement, offer, pollution, congestion on roads, concern, environmental, privatization, deregulation, fluctuate, exchange rate, respond.

Ex.2. Read the text and do the tasks that follow.

As well as potential savings, many other factors are encouraging organizations to improve the management of their supply chains. The following list suggests some of these pressures:

◇ Customers are more knowledgeable, and demand higher quality, lower costs and better service.

◇ Competition is getting fiercer, and organizations must look at every opportunity to remain competitive.

◇ There is changing power in the supply chain. Very large retail chains, such as Wal-Mart, Tesco, Toys-R-U's and McDonald's, demand customized logistics from their suppliers.

◇ Other changes in retail markets include the growth of 24-hour opening, home deliveries, out-of-town malls, retail parks, telephone and on-line shopping.

◇ International trade continues to grow. This is encouraged by free trade areas such as the European Union and North American Free Trade Area.

◇ Organizations are introducing new types of operation, such as just-in-time, lean operations, time compression, flexible manufacturing, mass customization, virtual operations, and so on.

◇ Some organizations are turning from a product focus (where they concentrate on the end products) to a process focus (where they concentrate on the way products are made). This encourages improvement to operations, including logistics.

◇ There have been considerable improvements in communication. These allow electronic data interchange (EDI), item coding, electronic fund transfer (EFT), e-commerce, shared knowledge systems, and other new practices.

◇ Organizations are outsourcing peripheral activities and concentrating on their core operations. Logistics is a useful area for third-party operators, with specialized companies offering a range of services.

◇ Organizations are increasing co-operation through alliances, partnerships, and other arrangements. This integration is important for logistics, which is usually the main link between organizations in a supply chain.

◇ Managers are recognizing the strategic importance of the supply chain.

◇ Attitudes towards transport are changing, because of increased congestion on roads, concerns about air quality and pollution, broader environmental issues, government policies for the real cost of road transport, privatization of rail services, deregulation of transport, and a host of other changes.

This is, of course, only a partial list and there are many other pressures for change, including uncertain market conditions, political change, deregulation of business, rising costs, shortage of skilled staff, fluctuating exchange rates, and so on. In the next section, we will see how logistics is responding to these pressures.

Ex. 3. Answer the questions.

1. Are there any factors that encourage improvement in supply chain? 2. What do customers demand? 3. What encourages internal trade? 4. What other changes in retail markets occur? 5. What improvements in communication do we witness now? 6. What are the attitudes to import determined by? 7. How do companies increase their cooperation? 8. What other pressures can you add to the list which may help improve logistics?

Ex. 4. Work in pairs. Speak on the pressures that may help improve an organization's logistics.

Interesting to know

Берегитесь паллет – это очень опасно для здоровья!

Готовясь к переезду в новый офис, группа компаний Apply Logistic Group решила воплотить несколько интерьерных идей с помощью паллет. Такие рекомендации были получены от испанских дизайнеров, которые принимали участие в разработке интерьера нового офиса. Ведь Apply Logistic Group – что ни на есть занимается логистикой! Однако, немного подумав, сотрудники Apply Logistic Group приняли решение отказаться от данной затеи. Дело в том, что паллеты – это очень опасная вещь для здоровья человека. Мы знаем, что идея паллет в интерьере – это актуальный дизайнерский тренд последних нескольких лет, но он неизбежно привел бы к тому, что многие люди находились бы в постоянном контакте с активными канцерогенами, токсичными пестицидами и вредоносными бактериями.

POINTS FOR DISCUSSION

1. Is it true that every organization has to move materials to support its operations? What do service companies like Internet service providers move? Give some examples from different types of organization to support your views.

2. How important is logistics to the national economy? What proportion of employment and gross domestic product is due to logistics? How has this proportion changed over time?

Unit 2. THE SUPPLY CHAIN

Text 1. Notion of Supply Chain

Ex. 1. Before reading the text check the meaning of the following words and word combinations in the dictionary.

Focus, work in isolation, act as sb/sth, deliver, manufacturer, sell, a series of organizations, dairy, distributor, journey, extract crude oil, refinery, emphasize, refer (to), satisfy, unique supply chain, chocolate, move 'from dirt to dirt', go beyond sth.

Ex. 2. Read the text and do the tasks that follow.

So far, we have focused on the movement of materials through a single organization. In reality, organizations do not work in isolation, but each one acts as a customer when it buys materials from its own suppliers, and then it acts as a supplier when it delivers materials to its own customers. A wholesaler, for example, acts as a customer when buying goods from manufacturers, and then as a supplier when selling goods to retail shops. A component maker buys raw materials from its suppliers, delivers these into components, and passes the results to other manufacturers. Most products move through a series of organizations as they travel between original suppliers and final customers. Milk moves through a farm, tanker collection, dairy, bottling plant, distributor, and supermarket before we buy it. A toothbrush starts its journey with a company extracting crude oil, and then it passes through pipelines, refineries, chemical works, plastics companies, manufacturers, importers, wholesalers and retailers before finishing in your bathroom. A sheet of paper moves through several organizations before it reaches our desk.

People use different names for these chains of activities and organizations. When they emphasize the operations, they refer to the process; when they emphasize marketing, they call it a logistics channel; when they look at the value added, they call it a value chain, when they see how customer demands are satisfied, they call it a demand chain. Here we are emphasizing the movement of materials and will use the most general term of supply chain.

A supply chain consists of the series of activities and organizations that materials move through on their journey from initial suppliers to final customers.

Every product has its own unique supply chain, and these can be both long and complicated. The supply chain for Cadbury starts with cocoa beans growing on farms and ends with the delivery of bars of chocolate to hungry customers. The supply chain for Levi jeans starts with cotton growing in a field and ends when you buy the jeans in a shop. The supply chain describes the total journey of materials as they move 'from dirt to dirt'. Along this journey, materials may move through raw materials suppliers, manufacturers, finishing operations, logistics centres, warehouses, third party operators, transport companies, wholesalers, retailers, and a whole range of other operations. Sometimes, the supply chain goes beyond the final customer to add recycling and re-use of materials.

Ex. 3. Answer the questions.

1. Do organizations work as customers as well as suppliers simultaneously?
2. What way do products have to travel from suppliers to customers?
3. What way does milk travel before we buy it? A toothbrush?
4. What names are used to describe these activities when we emphasize different aspects of organizations' activities?
5. What term is used in relation to the movement of materials?
6. Do products have similar supply chains? Give examples.
7. What stages do materials pass as they move 'from dirt to dirt'?
8. Does the supply chain always finish with the final customer?
9. Supply chains can be both long and complicated, can't they?

Ex. 4. Expand on the following statements from the text.

1. Organizations do not work in isolation. 2. Most products move through a number of organizations on their way to final consumers. 3. Different names are used to describe this movement of materials and an organization's activities. 4. The supply chain may go beyond the final customer.

Ex. 5. Work in pairs. Describe the notion of a supply chain.

Text 2. Structure of Supply Chain

Ex. 1. Before reading the text check the meaning of the following words and word combinations in the dictionary.

Single, inwards, upstream, downstream, tiers of suppliers, original source, fairly easy, general approach, hub, local feeder services, cheque, blood transfusion, wholesaler, complicated, grow cotton, provide, garage, individual customers, separate strand, alternative route, mergers and divisions, countless, information transfer, complex pattern.

Ex. 2. Read the text and do the tasks that follow.

The simplest view of a supply chain has a single product moving through a series of organizations, each of which somehow adds value to the product. Taking one organization's point of view, activities in front of it – moving materials inwards – are called upstream; those after the organization – moving materials outwards – are called downstream.

The upstream activities are divided into tiers of suppliers. A supplier that sends materials directly to the operations is a first tier supplier; one that send materials to a first tier supplier is a second tier supplier; one that sends materials to a second tier supplier is a third tier supplier, and so on back to the original sources. Customers are also divided into tiers. One that gets a product directly from the operations is a first tier customer; one that gets a product from a first tier customer is a second tier customer; one that get a product from a second tier customer is a third tier customer, and so on to final customers.

In practice, most organizations get materials from many different suppliers, and sell products to many different customers. Then the supply chain converges as raw materials move in through the tiers of suppliers, and diverges as products move out through tiers of customers. A manufacturer might see sub-assembly providers as first tier suppliers, component makers as second tier suppliers, materials suppliers as third tier suppliers, and so on. It might see wholesalers as first tier customers, retailers as second tier customers, and end users as third tier customer.

It is fairly easy to imagine the shape of a manufacturer's supply chain, but most other organizations use the same general approach. Airlines, for example, move passengers from pick-up points, through local feeder services to major 'hub' airports, on to another hub, and then back out through local services to their destinations; banks collect all cheques in central clearing houses before sending them back to branches and customers; blood transfusion services have regional centres that act as wholesalers for plasma.

Each product has its own supply chain, and there is a huge number of different configurations. Some are very short and simple – such as a cook buying potatoes directly from a farmer. Others are surprisingly long and complicated. An everyday product like a shirt has a long journey from the farm growing cotton through to the final customer. It also has several chains merging as buttons, polyester, dyes and other materials join the main process. In the same way, when you buy a computer, many strands of the supply chain merge as Intel provide the processor, Matshita the DVD drive, Agfa the scanner, Hewlett-Packard the printer, Microsoft the operating system, and so on.

Supply chains diverge to meet demand from different types of customer. Manufacturers of car components, for example, sell some products to car assembly plants, some to wholesalers for garages doing repairs, some to retail shops for individual customers, and some directly to customers through websites. Then the supply chain divides into separate strands with the same product following alternative routes.

As you can see, our picture of supply chains is getting more complicated, with various mergers and divisions along their length. The reality is even more complex, as each organization works with many – often thousands – of different products, each of which has its own supply chain. The French company Carrefour is Europe's largest retailer, and this comes at the end of tens of thousands of supply chains; Corus makes steel that is used in countless final products, DEL makes computers that are used for huge amounts of information transfer.

Some people argue that the term 'supply chain' gives too simple a view, and they prefer to talk about a supply network or supply web. However, we will stick to the usual name, and recognize that it refers to a complex pattern of movements. You can get some idea of the size and complexity of these from the 'Logistics in Practice' section on the example of Wal-Mart.

Ex. 3. Answer the questions.

1. What is the simplest way to imagine a supply chain? 2. What is added to a product as it moves from organization to organization? 3. What terms are used to describe the movement of materials with reference to an organization's positioning? 4. Into what are the upstream activities divided? What about the downstream activities? 5. How does the supply chain behave when we talk of many different suppliers and customers? 6. There is a great number of different supply chain configurations, isn't there? 7. What is the reason for dividing supply chains? 8. What makes the real picture of supply chain so complex?

Ex. 4. Expand on the following statements from the text.

1. A single product movement through a series of organizations can give the simplest idea of a supply chain? 2. The upstream activities are divided into tiers of suppliers. 3. Customers are also divided into tiers. 4. Most organizations cooperate with many suppliers, and sell to many customers. 5. It's fairly easy to imagine the shape of a manufacturer's supply chain. 6. Each product has its own supply chain. 7. Supply chains diverge to meet customers' demands. 8. Supply chains is quite a complicated phenomenon.

Ex. 5. Work in pairs. Describe the structure of a supply chain.

Wal-Mart

In 1962 Sam Walton opened a discount store in Rogers, Arizona. He attracted customers with a combination of low prices, a wide range of goods and friendly service. Sam called his store Wal-Mart, and was so successful that he quickly opened more branches. In 1983 he opened a SAM'S Club warehouse for members, and in 1988 the first 'Supercenter' selling groceries. By 1991 Wal-Mart had become the leading retailer in the USA, and started its international expansion. It moved into Mexico, Puerto Rico and Canada, and then into South America, Asia and Europe. Most of its later expansion came through buying local companies, such as ASDA in the UK.

Wal-Mart always kept the same emphasis on low prices, a wide range of products and friendly service. The scene is set at the front door of each store, where a staff member greets customers and tells them about special offers and promotions. By 2000 Wal-Mart was the world's largest retailer with 4000 stores, serving 100 million customers a week, employing 1.2 million staff – or 'associates' – an annual turnover of US\$175 billion and profit of US\$6 billion a year.

You can imagine the size of the logistics in Wal-Mart. On mainland USA they have 85,000 suppliers sending \$1.5 billion dollars' worth of materials a week to 62 main distribution centres, and on to 1800 Wal-mart stores, 800 Supercenters, 460 SAM's clubs and 13 Neighbourhood Markets. A large part of Wal-Mart's operating expenses depend on the efficiency of their logistics. When margins are tight, a small change in logistics performance and costs has a considerable effect on profit. This is why Wal-Mart use the 'industry's most efficient and sophisticated distribution system'. Their success can be judged by continuing expansion, with annual sales up 20 per cent in the first quarter of 2000, and like-for-like sales up 5 per cent.

Text 3. Benefits of Supply Chains

Ex. 1. Make sure you know the following words and word combinations.

Wonder, avoid, though, author, suppose, deliver, be plentiful, divert, processing plant, coffee beans, fuel supplies, allow for mismatches, throughout, sugar cane, beet, harvest, delivery routes, wholesaler, intermediary, regardless (of), facilities, get economies of scale, stocks of finished goods, place an order, have short lead times, develop expertise.

Ex. 2. Read the text and do the tasks that follow.

Supply chains are so complicated that you might wonder if there is some way of avoiding them. Sometimes this is possible, when we move products directly from initial producers to final customers - when, for example, farm shops sell vegetables directly to consumers, or authors publish their works on the Internet. In general, though, there are very good reasons for having a longer supply chain. Suppose the population of a town decides to buy vegetables from a farm shop. This would have a minimal supply chain, but the whole population would travel separately to the farm.

It would make more sense to have a transport company collect the vegetables and deliver them to a central location in the town – like a supermarket. If the transport company delivers to one town, it can easily deliver to other nearby towns, perhaps stopping at a depot to organize local deliveries. As there is a depot, vegetables can be put into storage while the supply is plentiful, and removed when there are shortages. If the vegetables need cleaning or preparation, the transport company can divert to a processing plant. Continuing in this way, you can see why a long supply chain develops, and what benefits it brings.

Supply chains exist to overcome the gaps created when suppliers are some distance away from customers. They allow for operations that are best done – or can only be done – at locations that are distant from customers or sources of materials. For example, coffee beans grow in South America, but the main customers are in Europe and North America. The best locations for power stations are away from both their main customers in cities and their fuel supplies.

As well as moving materials between geographically separate operations, supply chains allow for mismatches between supply and demand. The demand for sugar is more or less constant throughout the year, but the supply varies with the harvesting of sugar cane and beet. When there is excess supply, stocks are built-up in the supply chain, and these are used after the harvests finish. Supply chains can also make movements a lot simpler. Imagine four factories directly supplying products to eight customers. Logistics has to organize 32 different delivery routes but, if the factories use a central wholesaler, the number of routes is cut to 12.

The following list suggests some other benefits of well-designed supply chains (where we use the terms 'wholesaler' and 'retailer' as a convenient label for intermediaries):

- ▶ Producers locate operations in the best locations, regardless of the locations of their customers.

- ▶ By operations in large facilities, producers can get economies of scale. Producers do not keep large stocks of finished goods, as these are held further down the supply chain nearer to customers.

- ▶ Wholesalers place large orders, and producers pass on lower unit costs in price discounts.

- ▶ Wholesalers keep stocks from many suppliers, giving retailers a choice of goods.

- ▶ Wholesalers are near to retailers and have short lead times.

- ▶ Retailers carry less stock as wholesalers provide reliable deliveries.

- ▶ Retailers can have small operations, giving a responsive service near to customers.

- ▶ Transport is simpler, with fewer, larger deliveries reducing costs.

- ▶ Organizations can develop expertise in specific types of operation.

Ex.3. Answer the questions.

1. Is it possible to refuse supply chains? 2. Can you give reasons in favour of having a supply chain? Supply examples. 3. Why supply chains exist? 4. Do supply chains allow for mismatches between supply and demand? 5. What are the benefits of well-designed supply chains?

Ex. 4. Expand on the following statements from the text.

1. Sometimes it is possible to avoid supply chains. 2. There are good reasons for having supply chains. 3. Supply chains help to overcome the distance between suppliers and customers. 4. Supply chains allow for mismatches between supply and demand. 5. A well-designed supply chain brings more benefits to an organization.

Ex. 5. Work in pairs. Describe the benefits of supply chains.

Worked

Example 1

J. Mitchell currently has sales of £10 million a year, with a stock level of 25% of sales. Annual holding cost for the stock is 20% of value. Operating costs (excluding the cost of stocks) are £7.5 million a year and other assets are valued at £20 million.

What is the current return on assets? How does this change if stock levels are reduced to 20% of sales?

Text 4. Logistics Separate Activities

Ex. 1. Before reading the text check the meaning of the following words and word combinations in the dictionary.

Include, initiate, procurement, find suitable suppliers, negotiate terms and conditions, insurance, process orders, clerical job, give attention, purchase, recognize, traffic, transport operator, meet requirements, reasonable, correspond, vehicle, damage, acknowledges receipt, unload, emit fumes, inventory, consolidate, departure, wrap, appropriate, align, significant role, exchange of information, sales forecasting, production scheduling, consider the problems.

Ex. 2. Read the text and do the tasks that follow.

Logistics is responsible for the movement and storage of materials as they move through the supply chain. But what activities does this include? If you follow some materials moving through an organization, you can see that the following activities are normally included in logistics.

☐ *Procurement or purchasing.* The flow of materials through an organization is usually initiated when procurement sends a purchase order to a supplier. This means that procurement finds suitable suppliers, negotiates terms and conditions, organizes delivery, arranges insurance and payment, and does everything needed to get materials into the organization. In the past, this has been seen as a largely clerical job centered on order processing. Now it is recognized as an important link with upstream activities, and is being given more attention.

☐ *Inward transport or traffic* actually moves materials from suppliers to the organization's receiving area. This has to choose the type of transport (road, rail, air, and so on), find the best transport operator, design a route, make sure that all safety and legal requirements are met, get deliveries on time and at reasonable cost, and so on.

☐ *Receiving* makes sure that materials delivered correspond to the order, acknowledges receipt, unloads delivery vehicles, inspects materials for damage, and sorts them.

☐ *Warehousing or stores* moves materials into storage, and takes care of them until they are needed. Many materials need special care, such as frozen food, drugs, alcohol in bond, chemicals that emit fumes, animals, and dangerous goods. As well as making sure that materials can be available quickly when needed, warehousing also makes sure that they have the right conditions, treatment and packaging to keep them in good condition.

☐ *Stock control* sets the policies for inventory. It considers the materials to store, overall investment, customer service, stock levels, order sizes, order timing and so on.

☐ *Order picking* finds and removes materials from stores. Typically materials for a customer order are located, identified, checked, removed from racks, consolidated into a single load, wrapped and moved to a departure area for loading onto delivery vehicles.

☐ *Materials handling* moves materials through the operations within an organization. It moves materials from one operation to the next, and also moves materials picked from stores to the point where they are needed. The aim of materials handling is to give efficient movements, with short journeys, using appropriate equipment, with little damage, and using special packaging and handling where needed.

☐ *Outward transport* takes materials from the departure area and delivers them to customers (with concerns that are similar to inward transport).

☐ *Physical distribution management* is a general term for the activities that deliver finished goods to customers, including outward transport. It is often aligned with marketing and forms an important link with downstream activities.

☐ *Recycling, returns and waste disposal*. Even when products have been delivered to customers, the work of logistics may not be finished. There might, for example, be problems with delivered materials – perhaps they were faulty, or too many were delivered, or they were the wrong type – and they have to be collected and brought back. Sometimes there are associated materials such as pallets, delivery boxes, cable reels and containers (the standard 20 foot long metal boxes that are used to move goods) which are returned to suppliers for reuse. Some materials are not reused, but are brought back for recycling, such as metals, glass, paper, plastics and oils. Finally there are materials that cannot be used again, but are brought back for safe disposal, such as dangerous chemicals. Activities that return materials back to an organization are called reverse logistics or reverse distribution.

☐ *Location*. Some of the logistics activities can be done in different locations. Stocks of finished goods, for example, can be held at the end of production, moved to nearby warehouses, put into stores nearer to customers, passed on to be managed by other organizations, or a range of alternatives. Logistics has to find the best locations for these activities -or at least play a significant role in the decisions. It also considers related questions about the size and number of facilities. These are important decisions that affect the overall design of the supply chain.

▣ *Communication.* Alongside the physical flow of materials is the associated flow of information. This links all parts of the supply chain, passing information about products, customer demand, materials to be moved, timing, stock levels, availability, problems, costs, service levels, and so on. Coordinating the flow of information can be very difficult, and logistics managers often describe themselves as processing information rather than moving goods. M. Christopher supports this view by saying that, 'Supply chain competitiveness is based upon the value-added exchange of information'. The Council of Logistics Management also highlights the combination of materials and information flow in their definition:

Logistics is the process of planning, implementing and controlling the efficient, cost-effective flow and storage of raw materials, in-process inventory, finished goods and related information from point of origin to point of consumption for the purpose of conforming to customer requirements.

Depending on the circumstances, many other activities can be included in logistics. Sometimes an organization might include sales forecasting, production scheduling, customer service management, overseas liaison, third party operations, and so on. The important point is not to draw arbitrary boundaries between functions, but to recognize that they must all work together to get an efficient flow of materials.

Ex. 3. Match the words with their definitions.

- | | |
|--------------|---|
| 1) recycling | a) likely to injure or harm sb, or to damage or destroy sb |
| 2) waste | b) a heavy wooden or metal base that can be used for moving or storing goods |
| 3) pallet | c) a hard, usually transparent substance used for making windows or bottles |
| 4) disposal | d) opposite to what has been mentioned |
| 5) faulty | e) treating things that have already been used so that can be used again |
| 6) reel | f) not perfect, not working or made correctly |
| 7) container | g) the act of using smth in a careless or unnecessary way, causing it to be lost or destroyed |
| 8) glass | h) a round object around which you can wind such things as the thread, wire or film |
| 9) dangerous | i) the act of getting rid of smth |
| 10) reverse | j) in which smth can be stored or transported |

Ex. 3. Answer the questions.

1. What activities does logistics include as materials move through the supply chain? 2. Where does procurement start? 3. What is its essence? 4. What makes receiving an important aspect of logistics? 5. What stage do moving of materials and taking care of them mark? 6. What is the purpose of stock control?

Ex. 4. Decide which of the following statements are either true or false.

1. Order picking considers customer service, order sizes and stock levels.
2. Material handling moves materials from suppliers. 3. Outward transport moves

materials into storage. 4. The term 'physical distribution management' sets policies for finding suitable suppliers. 5. All organization's logistics activities must be done in one location.

Ex. 5. Expand on the following statements from the text.

1. Logistics normally include many different activities. 2. The work of logistics is not finished after products have been delivered to customers. 3. Some logistics activities may be carried out in different locations. 4. Logistics is associated with the flow of information between different parts of the supply chain. 5. Logistics may include many different activities.

Ex. 6. Work in pairs. Describe different other activities that logistics normally include.

Logistics in practice

Konigshaven Suppliers

Konigshaven Suppliers is a food wholesaler, delivering to supermarkets in southern Denmark. Its standard accounting systems do not identify separate logistics costs, and this makes it difficult to identify areas with particularly high costs, or those that need improving. To get a clearer picture, the company ran a survey in one main warehouse. It used some estimates and simplifications, but feels that the following figures give a reasonable view. These figures show the costs incurred for each €100,000 of net sales.

a. *Cost of sales: €58,000* (The cost of purchasing products sold on to customers, including administration of the purchasing office)

b. *Transport inwards: €3000* (Cost of bringing goods from suppliers and delivering to the warehouse)

c. *Other costs of delivery to warehouse: €4000* (A general category covering any other costs of relations with suppliers)

d. *Warehousing and handling: €7000* (Costs of receiving materials, checking, sorting, moving to the warehouse and storing)

e. *Stock financing: €1000* (The cost of financing stock, including debt charges)

f. *Sales force: €12,000* (Salaries and costs of the sales office)

g. *Special promotions: €3000* (Including presentations, visits and samples)

h. *Delivery to customers: €5000* (Costs of taking goods out of the warehouse and delivering to customers)

i. *Debt financing: €2500* (Costs of financing plant and equipment)

j. *Information processing: €2000* (Including all aspects of order processing)

k. *Returns and recycling: €500* (Cost of recovering pallets and any other materials returned to the warehouse)

These figures are open to some interpretation, but they show that transport accounts for 12 per cent of sales and warehousing for 8 per cent. Several other costs might be included in logistics, including some purchasing, sales, information processing and recycling.

Case study

Ace Dairies

Ace Dairies gives a home delivery service for milk, dairy products and a range of related goods. Roger Smitheram has run the dairy for the past twelve years. His product is a combination of goods (the items he delivers) and services (the delivery and associated jobs he does for customers).

At the heart of operations is an information system which contains full details of all Roger's 500 customers, including their regular orders, special orders, where to deliver, how they pay, and so on. Every day the system calculates the likely sales of all products in two days time. Roger adds some margin of safety, allows for likely variations and passes his order to Unigate Dairy in Totnes in Devon (about 150 km away). This Unigate depot acts as a wholesaler for milkmen in Wales and the southwest of England. The following evening it delivers to a holding depot in Camborne, and then takes Roger's goods 10 km to a cold store in Hayle. At 5.30 the following morning Roger collects the order from his cold store and starts delivering to customers. This normally takes until 1.30 in the afternoon, but on Fridays he spends more time collecting money and often finishes after 5.00 pm.

There are several specific problems facing Ace Dairies. There is, for example, some variation in daily demand, so Roger has to carry spare stock. He cannot carry too much, as dairy products have a short life and anything not delivered quickly is thrown away. Roger aims at keeping this waste down to 2 per cent of sales. There are also problems maintaining a service during holidays, or when Unigate has difficulties with their deliveries.

Perhaps Roger's main concern is maintaining his sales over the long term. Demand for doorstep deliveries is declining, as people buy more milk at supermarkets. The number of milkmen in Hayle has declined from ten in 1987 to three in 2002. Most of Roger's customers have been with him for many years, but he generates new custom by canvassing, delivering leaflets, special offers, carrying a range of other products, and so on.

Answer the questions.

1. Describe the supply chain for milk. 2. Where does Ace Dairies fit into this? 3. What specific activities form the logistics in Ace Dairies? 4. What are the main problems that Ace Dairies has with logistics?

**Worked
Example 1**

JL Francisco & Partners run a wholesale fruit business around Rio del Plata. In normal circumstances the company makes a gross profit of 5% of sales. A consultant's report has recently suggested that 22% of their operating costs are due to logistics, and that improved efficiency might reduce this by 10%. How much extra profit would this generate? If they do not improve logistics, how much would sales have to rise to get the same increase in profit?

POINTS FOR DISCUSSION

1. The supply chain is a convenient notion, but organizations are only really interested in making products that they can sell to customers. Provided they have reliable supplies of materials, and reasonable transport for finished products, logistics is irrelevant. Do you think this is true?

2. Very few organizations deal with the final customer for a product. Most operations work upstream and form one step of the supply chain, often passing materials to internal customers within the same organization. How does the type of customer affect the organization of logistics and the measures of customer satisfaction?

3. The cost of logistics varies widely from organization to organization. What factors affect these costs? Are the costs fixed or can they be controlled?

4. How could you find the best balance between service level and costs?

Unit 3. INTEGRATING ALONG THE SUPPLY CHAIN

Text 1. Improving Communications

Ex. 1. Before reading the text check the meaning of the following words and word combinations in the dictionary.

Challenge, obvious change, satellite tracking of lorries, automatic guidance systems, generate, invoice, time-consuming, be worth, rather than, enter information, electronic data interchange, order processing system, worldwide, associate, debit, loop, arrange payment.

Ex. 2. Read the text and do the tasks that follow.

Logistics continually meets new challenges, and is changing faster now than at any time in the past. Perhaps the most obvious change is the increasing use of technology. Some of this appears directly in the movement of goods – such as electronic identification of packages, satellite tracking of lorries and automatic guidance systems – but the greatest impact has come with communications.

When a company wants to buy something, it typically has to generate a description of the goods, request for price, purchase order, order confirmation, contract terms, shipping papers, financial arrangements, delivery details, special conditions, invoices, and so on. In the past, all of these – and mountains of other

paperwork – had to be printed and posted between organizations. This could make even a simple transaction seem complicated and time-consuming. Telephones did not help much, as Sam Goldwyn pointed out, 'a verbal contract isn't worth the paper it's written on'.

In the past few years technology has revolutionized these communications. Initial progress came with fax machines that could send electronic copies of documents between distant locations in seconds rather than days. The drawback with fax machines is that documents produced by one computer still have to be printed, fed into a fax machine, transmitted over telephone lines to someone else who reads the text and enters the information to their own computer.

By the 1990s the obvious next step had arrived with electronic data interchange (EDI). This allowed remote computers to exchange data without going through any intermediaries. Early users were supermarkets who linked their stock control systems directly to suppliers' order processing systems. The supermarket checkouts recorded sales of each item, and when stocks got low the system automatically sent a message asking for another delivery. This use of EPOS – electronic point-of-sales data – gave less paperwork, lower transaction costs, faster communications, fewer errors, more integrated systems, and closer business relations.

By 1997 about 2000 companies in the UK used EDI for trade with suppliers. Over the next few years electronic trading became more sophisticated and widespread. The mushrooming of e-mail was followed by all kinds of e-business, e-commerce – and soon 'e-anything'. The efficient transfer of information has been particularly useful for purchasing, which has developed into e-purchasing or e-procurement. This comes in many forms, all based on the direct exchange of data between a supplier's computer and a customer's. Two main versions are B2B (business-to-business, where one business buys materials from another business) and B2C (business-to-customer, where a final customer buys from a business). By 2002 around 83 per cent of UK suppliers used B2B, and the worldwide value of B2B trade was over US\$2 trillion.

Two associated technologies have developed to support EDI. The first is item coding, which gives every package of material moved an identifying tag. The tag is usually a bar code or magnetic stripe that can be read automatically as the package moves through its journey. Then the logistics system knows where every package is at any time, and automatic materials handling can move, sort, consolidate, pack and deliver materials.

The second technology is electronic fund transfer (EFT). When the delivery of materials is acknowledged, EFT automatically debits the customer's bank account and credits the supplier's. This completes the loop, with EDI to place orders, item coding to track the movement, and EFT to arrange payment.

Ex. 3. Answer the questions.

1. Why is logistics changing faster now? 2. Where can the most obvious change be seen? 3. What must a company do if it intends to buy something? 4. How was all this information concerning the purchase of goods processed in the past? 5. What technological changes have taken place recently? 6. What developments marked the beginning of 1990ies? 7. What changes were observed in about 2000 UK companies by 1997? 8. What technologies were developed to keep up EDI?

Ex. 4. Find English equivalents.

Отвечать на новые вызовы, все возрастающее использование технологии, автоматическая система управления, электронная идентификация пакетов, давать описание, условия контракта, простая сделка, устный контракт, недостаток, вводить информацию, удаленный компьютер, обмен данными, передача информации, идентифицирующий ярлык, штрих-код, подтвердить, кодирование отдельного товара, урегулировать оплату.

Ex. 4. Expand on the following statements from the text.

1. Logistics continuously meets new challenges. 2. In the past a company had to generate mountains of paperwork. 3. The arrival of electronic data interchange marked a new stage in improving communications. 4. After 1997 electronic trading became more sophisticated and widespread. 5. Two related technologies were developed to support EDI.

Ex. 5. Work in pairs. Describe measures that are taken to improve communications.

Text 2. Improving Customer Service

Ex. 1. Before reading the text check the meaning of the following words and word combinations in the dictionary.

Remain competitive, affect, comparable, obviously, maintain a service level, be willing, different circumstances, synchronize, personalize, customization, virtual integration, volume, flexible, company.

Ex. 2. Read the text and do the tasks.

It is normally in everyone's interests to make logistics costs as low as possible. Logistics managers want low costs so that they remain competitive, and their users want to pay as little as possible. Many organizations have reduced their logistics costs to levels that affect their whole operations. Lower transport costs, for example, make it feasible to sell products over a wider geographic area. The cost of transport for, say, Japanese manufacturers is so low that they can offer goods at prices that are comparable to those offered by domestic companies. Similarly, efficient transport can move products quickly over long distances, so there is no need to build traditional warehouses close to customers.

While striving for lower costs, organizations obviously have to maintain their service levels. Improved logistics means giving the service that customers want at the lowest possible cost. A problem, of course, is finding the features that customers really want and the level of service they are willing to pay for. These vary widely in different circumstances, but a key factor is the lead time. This is the total time between ordering materials and having them delivered and available for use. Again, it is normally in everyone's interest to make this delay as short as possible. When customers decide to buy something, they want it delivered as soon as possible; suppliers want to keep customers happy with fast service, and with no products hanging around and clogging the supply chain. Ideally, the lead time should be as

close to zero as possible, and one approach to this uses synchronized material movement. This makes information available to all parts of the supply chain at the same time, so that organizations can coordinate material movements, rather than wait for messages to move up and down the chain.

Another key factor for customer satisfaction is personalized products. Instead of buying a standard textbook, for example, you describe the contents you want and a publisher supplies a volume with exactly these specifications. This is mass customization, which combines the benefits of mass production with the flexibility of customized products. It uses B2C to give direct communications between a final customer and a manufacturer, and it needs supply chains that are flexible, that move materials very quickly, and respond to varying conditions.

Dell Computers was one of the first companies to use mass customization. They do not build standard computers, but wait until a customer places an order on their website. Then they build a computer for the specific order. Logistics makes sure that the necessary materials are always available for manufacturing, and it delivers the finished machine quickly to the customer.

Dell work so closely with their suppliers that they have developed 'virtual integration', where they all seem to be part of the same company. This works well with Dell, who have 50 main components, but would it work with a car manufacturer and their three thousand components? Flexible manufacturing here would put severe pressures on the supply chain, but the '3DayCar Programme' suggests that 80 per cent of cars in the UK could be built to order by 2010.

Ex. 3. Derive nouns from the following adjectives.

Competitive, feasible, comparable, efficient, obvious, willing, available, possible, synchronized, exact, flexible, customized, varying, specific, necessary, close, virtual, same, maintain, severe.

Ex. 4. Answer the questions.

1. What is the main aim of logistics managers? 2. What is logistics users' goal? 3. What do lower transport costs help to achieve? 4. Maintaining their service levels should be provided while striving for lower costs, shouldn't it? 5. What is the key factor in improving logistics? 6. What lead time do they have to strive for? 7. What is a personalized product? 8. What formula is used to describe the direct correspondence between a final customer and a manufacturer? 9. What company was the first to use mass customization? 10. How did they achieve this? 11. What is 'vertical integration'?

Ex.5. Expand on the following statements from the text.

1. It is in everyone's interest to make logistics costs as low as possible. 2. While lowering logistics costs, organisations have to maintain their service levels. 3. Personalized products is another key to customer satisfaction. 4. Dell Computers was one of the first to use mass customization.

Ex. 6. Work in pairs. Describe the ways to improve customer service.

Text 3. Other Significant Logistics Trends

Ex. 1. Before reading the text check the meaning of the following words and word combinations in the dictionary.

Emphasis, mean, competitor, be likely, restrict, free trade, removal of import quotas and trade barriers, look for competitors, unit production cost, encourage, expenditure, postponement, dye, yarn, sweater, cross-docking, quantity, drop-shipping, access, vendor, courier, consumption, recognize.

Ex.2. Read the text and do the tasks.

Apart from increasing technology and emphasis on customer satisfaction, there are several other important trends in logistics. The following list includes some of the most significant.

◇ *Globalization:* Improved communications and better transport mean that physical distances are becoming less significant. Organizations can become global in outlook, buying, storing, manufacturing, moving and distributing materials in a single, worldwide market. As a result, international trade and competition are continuing to rise. Organizations used to look for competitors in the same town, but now they are just as likely to come from another continent.

Efficient logistics makes a global market feasible, and other factors that encourage international trade include less restricted financial systems, consumer demand for imported products, removal of import quotas and trade barriers and the growth of free trade areas. You can see the effects in manufacturing, where producers look for economies of scale in large facilities located in areas with low production costs. The unit production cost is low, and efficient logistics keeps the delivered price down. This is the reason why German companies open large plants in Poland, American companies work in Mexico and Japanese companies work in China.

◇ *Reduced number of suppliers:* In the past, organizations have used a large number of suppliers. This encouraged competition, ensured that they got the best deal and maintained secure deliveries if one supplier ran into difficulties. The current trend, however, is to reduce the number of suppliers and develop long-term relationships with the best. As we shall see later, working closely with a small number of organizations can bring considerable benefits.

◇ *Concentration of ownership:* Large companies can get economies of scale, and they have come to dominate many supply chains. There are, for example, many shops and transport companies – but the biggest ones continue to grow at the expense of small ones. The result is a continuing concentration of ownership, which you can see in many logistics sectors ranging from food wholesalers to cruise lines.

◇ *Outsourcing:* More organizations realize that they can benefit from using specialized companies to take over part, or all, of their logistics. Using a third party for materials movement leaves an organization free to concentrate on its core activities. M.C. McKinnon says that, 'Outsourcing has been one of the dominant business trends of the 1980s and 1990s' and surveys suggest that around 30 per cent of logistics expenditure is outsourced in the EU.

◇ *Postponement*: Traditionally, manufacturers move finished goods out of production and store them in the distribution system until they are needed. When there are many variations on a basic product, this can give high stocks of similar products. Postponement moves almost-finished products into the distribution system, and delays final modifications or customization until the last possible moment. You can imagine this with 'package-to-order', where a company keeps a product in stock, but only puts it in a box written in the appropriate language when it is about to ship an order.

Manufacturers of electrical equipment, such as Phillips and Hewlett-Packard, used to build into their products the transformers and plugs needed for different markets. Then they had to keep separate stocks of products destined for each country. Now they make the transformer and cables as separate, external units. They only keep stocks of the basic, standard products, and customize them for different markets by adding the proper transformers and plugs at the last minute. The result, of course, is much lower stocks. In the same way, Benetton used to dye yarn different colours, knit sweaters and keep stocks of each colour to meet varying demand. Now they knit sweaters with undyed yarn, keep much smaller stocks of these, and dye the finished sweaters to meet actual orders.

◇ *Cross-docking*: Traditional warehouses move materials into storage, keep them until needed, and then move them out to meet demand. Cross-docking co-ordinates the supply and delivery, so that goods arrive at the receiving area and are transferred straight away to a loading area, where they are put onto delivery vehicles. This dramatically reduces stock levels and associated administration.

There are two basic forms of cross-docking. In the first, packages are moved directly from arriving vehicles and onto departing ones. This does not really need a warehouse and a simple transfer point is enough. In the second form there is some additional work as materials arrive in larger packages which are opened, broken into smaller quantities, sorted, consolidated into deliveries for different customers and transferred to vehicles.

Cross-docking can develop to the point where nothing actually moves through a warehouse. Any stock is kept within vehicles, giving stock on wheels. A related arrangement uses drop-shipping, where wholesalers do not keep stock themselves, but co-ordinate the movement of materials directly from upstream suppliers to downstream customers. As warehousing is expensive and time-consuming, these methods can give much more efficient flows, and allow methods such as quick response and efficient customer response.

◇ *Direct delivery*: More customers are buying through the Web, or finding other ways of trading earlier in the supply chain, such as mail order or buying directly from manufacturers. This has the benefits of reducing lead times, reducing costs to customers, having manufacturers talking directly to their final customers, allowing customers access to a wider range of products, and so on. It also means that logistics has to move small deliveries quickly to final customers. This has encouraged the growth of couriers and express parcel delivery services such as FedEx, UPS and DHL.

◇ *Other stock reduction methods:* Keeping stock is expensive, so organizations continually look for ways of reducing the amount stored in the supply chain. There are many ways of doing this. One approach uses just-in-time operations to coordinate activities and minimize stock levels.

Another approach has vendor managed inventory, where suppliers manage both their own stocks and those held further down the supply chain. Improved coordination reduces overall costs and can give economies of scale.

◇ *Increasing environmental concerns:* There is growing concern about air pollution, water pollution, energy consumption, urban development and waste disposal. Logistics does not have a good reputation for environmental protection - demonstrated by the emissions from heavy lorries, use of green field sites for warehouses, calls for new road building, use of extensive packaging, ships illegally flushing their fuel tanks, oil spillages from tanker accidents, and so on.

On the positive side, logistics is moving towards 'greener' practices. Operators use more energy efficient vehicles, control exhaust emissions, reuse packaging, switch to environmentally friendly modes of transport, increase recycling through reverse logistics, add safety features to ships, develop brown-field sites, and so on. They increasingly recognize that careful management can bring both environmental protection and lower costs. A fair assessment might be that logistics is making progress on environmental issues, but it has some way to go.

◇ *More collaboration along the supply chain:* Organizations in a supply chain increasingly recognize that they have the same objectives – which are satisfied final customers. They should not, therefore, compete with each other, but should cooperate to get final customer satisfaction. This is an important point. It means that competitors are not other organizations within the same supply chain, but are organizations in other supply chains. Christopher summarizes this by saying that 'supply chains compete, not companies'.

Ex. 3. Answer the questions.

1. What are other important trends in logistics apart from increasing technology and emphasis on customer satisfaction? 2. How does globalization tell on logistics? 3. What is the current tendency in relation to suppliers? 4. Concentration of ownership leads to the formation of economies of scale, doesn't it? 5. In what way does using a third party for material movement benefit organizations? 6. What does postponement help to achieve? 7. Cross-docking coordinates the supply and delivery, doesn't it? 8. What benefits does direct delivery give? 9. How is logistics moving towards 'greener' practices? 10. How can final customer satisfaction be achieved?

Ex. 4. Expand on the following statements from the text.

1. There are several other important trends in logistics apart from increasing technology expansion and customer satisfaction. 2. Globalization shortens physical distances between organizations. 3. Postponement moves almost finished products into the distribution system. 4. Cross-docking coordinates the supply and delivery. 5. There is a growing concern about environmental issues.

Ex. 5. Work in pairs. Describe other significant trends that may help the integration along the supply chain.

Text 4. Fragmented Logistics

Ex. 1. Before reading the text check the meaning of the following words and word combinations in the dictionary.

Unfortunately, come into conflict, frequent shortage, similarly, inevitably, run a department, fragmented, suppose, seamlessly, chance of error, emergency order, delay, disadvantage, obscure, remove boundaries, value enhancement, internal integration, ten extra units, rising demand, amplify.

Ex.2. Read the text and do the tasks.

A general overview of successive logistical operations within an organization represents a series of related activities that add value to the final product. These activities have traditionally been managed separately, so that an organization might have a distinct purchasing department, transport department, warehouse, distribution fleet, and so on. Unfortunately, dividing up logistics in this way creates a number of problems.

Purchasing might look for the most reliable suppliers, inventory control for low unit costs, warehousing for fast stock turnover, materials management for easy handling, transport for full vehicle loads, and so on. These aims all seem worthy, so it might be sensible for each activity to judge its own performance in the most appropriate way. Unfortunately, we soon hit problems when the aims come into conflict. For example, warehousing might save money by reducing the stock of raw materials - but this leads to more frequent shortages and raises the costs of expediting for purchasing and emergency deliveries for transport. Similarly, purchasing can reduce its administrative costs by sending fewer, larger orders to suppliers – but this increases stock levels and raises the amount of money tied up in the warehouse. Using sea transport rather than airfreight reduces transport costs - but increases the amount of stock held in the supply chain. In reality, the different activities of logistics are very closely related, and policies in one part inevitably affect operations in another.

The problems at RP Turner are almost inevitable if logistics is divided into separate functions. Each part will move in a different direction, and there is duplicated effort and wasted resources. Imagine a wholesaler who has one fleet of vehicles run by materials management to bring materials in from suppliers, and a separate fleet run by distribution to deliver the same goods out to customers. This might work, but you can picture the duplicated effort and waste in managing two separate vehicle fleets. Another organization might have three stocks – raw materials, work in progress and finished goods – each run by different departments and using different standards and systems.

A fragmented supply chain also makes it difficult to co-ordinate the flow of information through different systems. Suppose a production department knows that it is running short of a material and needs a new delivery. This information should pass seamlessly to purchasing. If, however, it has to pass from one system to another there is a greater chance of error, uncertainty, delay and inefficiency – resulting in late delivery, emergency orders, expediting and shortages.

To put it briefly, fragmenting logistics into different parts has the disadvantages of:

- giving different, often conflicting, objectives within an organization duplicating effort and reducing productivity
- giving worse communications and information flows between the parts
- reducing co-ordination between the parts - leading to lower efficiency, higher costs and worse customer service
- increasing uncertainty and delays along the supply chain making planning more difficult
- introducing unnecessary buffers between the parts, such as stocks of work in progress, additional transport and administrative procedures
- obscuring important information, such as the total cost of logistics giving logistics a low status within an organization.

We have described the benefits of integrating logistics within an organization. Now we can extend this argument, and suggest the same benefits for integrating logistics along more of the supply chain. If each organization only looks at its own operations, there are unnecessary boundaries between them, disrupting the flow of materials and increasing costs. External integration removes these boundaries to improve the whole chain. M. Christopher advises this move, saying that 'Most opportunities for cost reduction and/or value enhancement lie at the interface between supply chain partners'.

This effectively gives three levels of integration. The first has logistics as separate activities within an organization; the second has internal integration to bring them together into a single function; the third has external integration, where organizations look beyond their own operations and integrate more of the supply chain.

Organizations within the same supply chain should co-operate to get final customer satisfaction.

They should not compete with each other, but with organizations in other supply chains.

Forrester described one interesting effect of a fragmented supply chain. Imagine a retailer who notices that demand for a product rises by 5 units in a week. When it is time to place the next order, the retailer assumes that demand is rising, and orders ten extra units to make sure it has enough. The local wholesaler sees demand rise by ten units, so it orders an extra 15 units to meet the growth. The regional wholesaler sees demand rise by 15 units, so it orders another 20 units. As this movement travels through the supply chain, a relatively small change in final demand is amplified into a major variation for early suppliers.

Ex. 3. Answer the questions.

1. How do they manage the activities within an organization that add value to the final product? 2. Does this way of dividing up logistics contribute to better organization's performance? Why? 3. What kind of example does RP Turner give? 4. What happens if each part of a company works in isolation? 5. What are other drawbacks of fragmented supply chain? 6. Under what condition is there a greater chance of information error or delay? 7. What does this all result in? 8. What is the most important disadvantage of fragmented logistics that the above list gives? 9. What helps remove these boundaries? 10. Why does M. Forrester give his definition of a fragmented supply chain?

Ex. 4. Expand on the following statements from the text.

1. Related activities which give additional value to the final product of a company have been treated differently. 2. Aims of different parts of a company may come into a conflict. 3. Dividing logistics into separate functions inevitably brings about problems. 4. A fragmented supply chain complicates the coordination of information flow.

Ex. 5. Work in pairs. Describe all the problems that fragmented logistics brings with itself.

Logistics in practice

RP Turner Corp.

RP Turner Corp. makes pipeline valves for the oil industry in western Canada. It buys materials from Japan, the USA and eastern Canada, manufactures valves in Edmonton, Alberta and ships the finished products to oil fields in the North.

The company grew by emphasizing the high quality of its products, which work reliably in the harsh weather conditions of the Arctic. Transport to remote customers is expensive, and in 2000 the company looked for ways of reducing the cost of logistics. It soon found that separate functions worked more or less independently. This was sometimes all too obvious when the three main departments - Marketing, Production and Finance - were in different locations. Production was in Edmonton, as the nearest major city to the oil fields; Marketing was in Calgary near to oil company headquarters; Finance (including procurement) was in Vancouver near the port and financial centre. To appreciate the potential problems, you have to remember that Canada is a big country, so Production was a thousand kilometres away from Finance, 500 km away from Marketing and over two thousand kilometres from delivery points.

The company was rewarding different departments for different types of performance. Not surprisingly, when the departments were asked for their priorities, they had different views.

Marketing wanted:

- high stocks of finished goods to satisfy customer demands quickly
- a wide range of finished goods always held in stock
- locations near to customers to allow delivery with short lead times
- production to vary output in response to customer orders
- emphasis on an efficient distribution system
- an optimistic sales forecast to ensure production was geared up for actual demand.

Production wanted:

- high stocks of raw materials and work in progress to safeguard operations
- a narrow range of finished goods to give long production runs
- locations near to suppliers so that they could get raw materials quickly

- stable production to give efficient operations
- emphasis on the efficient movement of materials through operations
- realistic sales forecasts that allowed efficient planning.

Finance wanted:

- low stocks everywhere
- few locations to give economies of scale and minimize overall costs
- large batch sizes to reduce unit costs
- make-to-order operations
- pessimistic sales forecasts that discouraged underused facilities.

Despite good communications, the company felt that it was too widely spread out. It decided to centralize operations at its main plant in Edmonton. This brought the logistics functions geographically closer together, and major reorganization over the next two years brought a unified view of the supply chain.

Text 5. Integrating Activities

Ex. 1. Before reading the text check the meaning of the following words and word combinations in the dictionary.

Reach, obvious, avoid problems, a vital prerequisite, tackle a problem, overall benefit, develop over time, take over, artificial, essential, responsible for, obvious benefit, enthusiasm, considerable, authority, self-interest, logistics overheads, airfreight, expensive, transaction, benchmarking, identify, evolve.

Ex. 2. Read the text and do the tasks that follow.

The obvious way of avoiding these problems is to consider logistics not as a series of distinct activities, but as a single integrated function. Then all the parts work together to get the best overall result for the organization. This is why P. Sheehy, former chairman of BAT, could say, 'I believe that a well designed, integrated logistics system is a vital prerequisite for commercial success'.

Integrating logistics within an organization has all the related activities working together as a single function.

This is responsible for all storage and movement of materials throughout the organization.

It tackles problems from the viewpoint of the whole organization, and looks for the greatest overall benefit.

In practice, it is difficult to integrate all the logistics within an organization. The supply chain consists of many different activities, with different types of operation, using different systems and geographically dispersed. The usual approach has the integration developing over time. One department might slowly take over all aspects of ordering and receiving raw materials. Another department might slowly take over all aspects of delivering finished products to customers. Some organizations are tempted to stop when they reach this stage, and they work with two functions:

- *materials management*, aligned with production and looking after the inwards flow of raw materials and their movement through operations;
- *physical distribution*, aligned with marketing and looking at the outward flow of finished goods.

However, this still leaves an artificial break in what is essentially a continuous function. The obvious step is to combine the two into a single function responsible for all material movement into, through and out of the organization. This completes the internal integration of an organization's logistics.

Despite the obvious benefits of integrated logistics, there can still be practical difficulties. Perhaps the obvious one is finding someone with the knowledge, enthusiasm, ability and authority to carry through necessary changes. This needs a senior manager who has the necessary power to start the changes – with effects then percolating through all levels of the organization. New practices and relationships come from individuals working together, developing a culture that is based on teamwork and co-operation rather than self-interest and conflict.

Another factor that encourages internal integration is the analysis of total logistics cost. We can define this as:

total logistics cost = transport cost + warehouse cost + stock holding cost + packaging cost + information processing cost + other logistics overheads

The traditional view considered each of these separate costs as independent, so reducing, say, the transport cost automatically lowered the total cost. In the 1960s organizations began to take a 'systems' view of logistics, and analyze the interactions between activities. It became clear that reducing the cost of one activity increased the cost of another – and the total logistics cost might be reduced by increasing the amount spent on certain activities. H.T. Lewis gave an early example of this. They found that airfreight was much more expensive than alternative road transport, but faster delivery eliminated the need for local stocks and warehouses, and gave considerable overall savings.

One other important factor for integration is the availability of integrated information and control systems. Managers need a system to collect, store, analyze, distribute and present information ranging from the strategic aims of the organization down to details of each transaction. Most organizations use local networks or intranets for this, but the Internet is increasingly seen as an efficient route for logistics information. The information can be used by a control system that assesses current circumstances, makes decisions and implements the results. An information system might show that stocks are running low, and a control system uses this information to place an order with suppliers.

We have now described how logistics has moved from being a low priority, fragmented function, to a strategic, integrated one. This is a major change, which typically goes through the following stages:

Stage 1. Separate logistics activities are not given much attention or considered important.

Stage 2. Recognizing that the separate activities of logistics are important for the success of the organization.

Stage 3. Making improvements in the separate functions, making sure that each is as efficient as possible.

Stage 4. Internal integration – recognizing the benefits of internal co-operation and combining the separate functions into one.

Stage 5. Developing a logistics strategy, to set the long-term direction of logistics.

Stage 6. Benchmarking – comparing logistics' performance with other organizations, learning from their experiences, identifying areas that need improvement and finding ways of achieving this.

Stage 7. Continuous improvement – accepting that further changes are inevitable and always searching for better ways of organizing logistics.

By Stage 4 an organization has integrated logistics, and the last three stages show how the function can be improved. Stage 5 emphasizes the need for a strategic view, Stage 6 looks at other organizations for comparisons and lessons, and Stage 7 recognizes that logistics must continually evolve. However, this is not the end of the story. Once an organization has efficient, integrated and strategic logistics, it can start looking at integration along more of the supply chain.

Ex. 3. Answer the questions.

1. What is the main way of avoiding the disadvantages of fragmented supply chain? 2. What does a former BAT chairman think on this score? 3. Why is it difficult to integrate the organization's logistics? 4. What are the two functions within which organizations work? 5. What is the obvious step to eliminate a break between these two functions? 6. What are the essential difficulties of integrated logistics? How can they be overcome? 7. What measure can encourage internal integration? 8. How does the traditional view consider these costs? 9. How did the situation change in 1960ies? 10. Can you recall H.T. Lewis' example? 11. Why does a second important factor for integration acquire such an importance? 12. How many stages did logistics have to go on its way from fragmented to strategic integrated function? 13. What happens if an organization has boundaries between operations?

Ex. 4. Expand on the following statements from the text.

1. It is difficult to integrate all the logistics within an organization. 2. There still are practical difficulties in integral logistics. 3. Gradual change in the treatment of the traditional view on logistics costs. 4. The availability of integrated information and control systems is yet another important factor for integration. 5. The stages that describe the transition of logistics from being a low priority to acquiring a strategic function.

Ex. 5. Work in pairs. Describe the circumstances that helped to work out a concept integrating logistics.

Logistics in practice

International Business Systems

International Business Systems (IBS) is the largest international vendor of software for supply chain management. It is listed on the Stockholm Stock Exchange,

but works internationally with more than 5000 customers in 40 countries. It was formed in 1969, and now has 2400 employees working in 90 offices.

IBS offer many software products including a range of fully integrated modules that improve performance of the supply chain. In other words, they provide the information and management controls for looking after 'the flow of goods and information in such a way that you give better customer service and achieve shorter lead times, with less capital tied up, thereby releasing resources for more profitable activities'.

The IBS system has modules based around core activities such as purchasing, distribution, sales, finance, production, and so on. These modules contain many different components for order processing, forecasting, sales analysis, Internet trading, bar coding, warehouse management, bar codes, inventory management, vendor managed inventory, spare part handling, customer supply chain helps organizations to manage relations management, after sales support, project management, and so on.

The aim of IBS is to give a sophisticated system that is comprehensive, but easy to run and use. Concise, well-presented and rapid information about all aspects of the their integrated logistics and 'puts them in control of the supply chain'.

Worked

Example 3

In a simple supply chain, each organization holds one week's demand in stock. In other words, each buys enough materials from its suppliers to make its closing stock at the end of the week equal to the demand during the week. Demand for a product has been steady at 100 units a week. One week, demand from final customers is five units higher than usual. Assuming that deliveries are very fast, how does this affect movements in the supply chain?

Text 6. Benefits of Integration

Ex. Before reading the text check the meaning of the following words and word combinations in the dictionary.

Brewery, joint, a margin of safety, genuine co-operation, due (to), more accurate forecasts, external, be reluctant, trust other members, quarter, sufficient trust, priority, achieve, benefit sb, adversary, get a good deal, lose out, assume, loyalty, objective, long-term interest, specific adjustments.

Ex. 2. Read the text and do the tasks.

Confederated Bottlers used to deliver bottles from their main plant in Elizabethville to a brewery in Johnston, 115 miles away. The brewery filled the bottles and took them to a distribution centre 20 miles outside Elizabethville. Both companies used their own trucks to deliver products, returning empty. Eventually,

they formed a joint transport company that used the same trucks for both deliveries. Not surprisingly, the transport costs almost halved. This example shows one obvious benefit of integration, but there are many others.

Any uncertainty in the supply chain – such as the amplified variation of demand seen in the last example – encourages organizations to hold higher stocks to give themselves a margin of safety. These stocks increase costs and make the chain slow to react to changing conditions (when customers demand new products, all the stocks of old products in the supply chain have to be sold-on before the new ones appear). If you continue thinking along these lines, you find the following benefits from external integration:

- genuine co-operation between all parts of the supply chain, with shared information and resources

- lower costs – due to balanced operations, lower stocks, less expediting, economies of scale, elimination of activities that waste time or do not add value, and so on

- improved performance – due to more accurate forecasts, better planning, higher productivity of resources, rational priorities, and so on improved material flow, with co-ordination giving faster and more reliable movements

- better customer service, with shorter lead times, faster deliveries and more customization

- more flexibility, with organizations reacting faster to changing conditions

- standardized procedures, becoming routine and well-practiced with less duplication of effort, information, planning, and so on

- reliable quality and fewer inspections, with integrated quality management programmes.

Many organizations have moved towards external integration and a survey by P-E Consulting in 1997 found that 57 per cent of companies had some form of integration of their supply chains. More than 90 per cent of companies expected further integration, with a quarter looking for 'fully integrated' systems (although there were clearly different opinions about what this meant).

The benefits of external integration may be clear, but there are many practical difficulties of achieving them. Many organizations simply do not trust other members of the supply chain, and they are reluctant to share information. Even with sufficient trust, there can be problems with different priorities, competition, data exchange, appropriate systems, skills, security, the complexity of systems, and so on. This raises the obvious question of how to achieve integration?

Normally, a supply chain consists of distinct organizations, each working for their own benefit. So why should they co-operate? Why should one company work to benefit another? The answer is that external integration brings benefits that can be shared among all members of the supply chain.

The first problem with external integration is overcoming the traditional view of organizations as adversaries. When an organization pays money to its suppliers, people assume that one can only benefit at the expense of the other. If the organization gets a good deal, it automatically means that the supplier is losing out: if the supplier makes a good profit, it means that the organization pays too much. This

adversarial attitude has major drawbacks. Suppliers set rigid conditions and, as they have no guarantee of repeat business, they see no point in co-operation and try to make as much profit from each sale as possible. At the same time, organizations have no loyalty, and they shop around to get the best deal and remind suppliers of the competition. Each is concerned only with their own objectives and will – when convenient to themselves – change specifications and conditions at short notice. The result is uncertainty about the number and size of orders, constantly changing suppliers and customers, changing products and conditions, different times between orders, no guarantee of repeat orders and changing costs.

To avoid these problems, organizations have to recognize that it is in their own long-term interest to replace conflict by agreement. This often needs a major change of culture. The following table suggests some specific adjustments.

Factor	Conflict view	Co-operation view
Profit	One organization profits at the expense of the other	Both share profits
Relationship	One is dominant	Equal partners
Trust	Little	Considerable
Communication	Limited and formal	Widespread and open
Information	Secretive	Open and shared
Control	Intensive policing	Delegation and empowerment
Quality	Blame for faults	Solving shared problems
Contract	Rigid	Flexible
Focus on	Own operations	Customers

Ex. 3. Answer the questions.

1. How did the Confederated Bottlers cooperate with a brewery in Johnstown?
2. Whose transport did they use to deliver their products?
3. Why do you think they formed a joint company?
4. What result did their effort bring about?
5. In what cases do companies try to give themselves a margin of safety?
6. What happens if customers demand new products?
7. What benefits can external integration bring?
8. What did the survey carried out by PE Consulting show?
9. What difficulties do organizations have to face on the way to external integration?
10. Why should companies overcome the traditional view of organizations as adversaries? How can they achieve this?

Ex. 4. Expand on the following statements from the text.

1. Trying to improve their logistics companies resort to various forms of integration.
2. Uncertainties in the supply chain force companies to build a margin of safety.
3. External cooperation brings benefits to each party.
4. There are many obstacles on the way to external integration.

Ex. 5. Work in pairs. Describe the benefits of external integration and practical difficulties of achieving them.

Logistics in practice

Perman Frère

Perman Frère is a small manufacturer based in Brussels. It exports most of its products and has a finished goods warehouse near the port of Ostende. Van Rijn is one of its customers, also based in Brussels. It imports most of its materials and has a raw materials warehouse near the port of Rotterdam.

The two companies have traded for many years and in 2001 they started looking for ways of increasing co-operation. It was soon obvious that they could make a number of small adjustments to improve logistics. As an example, some parts were made by Perman Frère in Brussels, sent to their warehouse in Ostende, delivered to van Rijn's warehouse in Rotterdam, and then brought back to Brussels. It was fairly easy to organize deliveries directly between the companies. This gave a much shorter journey across Brussels, reduced transport and handling costs, removed excess stocks, simplified administration, and reduced the lead time from five days to three hours. They also coordinated deliveries to towns in northern France, so that one vehicle could deliver time, but could not find any mechanism for products from both companies.

Both companies benefited from these changes. When they were introduced people in both companies said that they had been aware of the problems for a long overcoming them.

Text 7. Different Types of Cooperation

Ex. 1. Before reading the text check the meaning of the following words and word combinations in the dictionary.

Experience, valuable, agreed package sizes, make joint purchases, commitment, preferred suppliers, be obliged, partnership, informal arrangement, to supply, at a fixed price, impose, rigid conditions, long-term contract, to cover rising costs, neither, guarantee, common, supplier partnering, mutual, sharing of information, senior manager, fair pricing, specialize, quality service, implication, timetable, contribute, compatibility, facilitator, alliance, growing consensus.

Ex. 2. Read the text and do the tasks.

There are several ways that organizations can co-operate. They can, of course, simply do business together. If an organization has a good experience with a supplier, it will continue to use them and over some period will develop a valuable working relationship. Sometimes the cooperation is more positive, such as small companies making joint purchases to get the same quantity discounts as larger companies; EDI links to share information; combining loads to reduce transport costs; agreed package sizes to ease material handling, lists of preferred suppliers, and so on. The key point with these informal arrangements is that there is no commitment. This is probably how you shop, as you have favourite shops but are not obliged to use them. Japanese

companies take this approach further forming *Keiretsu* – which are groups of organizations that work together without actually forming partnerships.

An informal arrangement has the advantage of being flexible and non-binding. On the other hand, it has the disadvantage that either party can end the co-operation without warning, and at any time that suits them. This is why many organizations prefer a more formal arrangement, with a written contract setting out the obligations of each party. These are common when organizations see themselves as working together for some time. An electricity company, for example, might agree to supply power at a fixed price for the next three years, provided a customer buys some minimum quantity. More formal agreements have the advantage of showing the details of the commitment, so that each side knows exactly what it has to do. On the other hand, they have the disadvantage of losing flexibility and imposing rigid conditions. In 2001, for example, there were power cuts in California when electricity suppliers found that their long-term contracts with customers specified prices that were too low to cover the rising costs of generation.

When an organization and a supplier are working well together, they may both feel that they are getting the best possible results and neither could benefit from trading with other partners. Then they might look for a long-term relationship that will guarantee that their mutual benefits continue. This is the basis of a strategic alliance or partnership.

The supplier knows that it has repeat business for a long time, and can invest in improvements to products and operations; the organization knows that it has guaranteed - and continually improving – supplies. These arrangements are now common, and you often hear statements like 'Abbey National treats its suppliers as partners'. L.M. Ellram and D.R. Krause prefer the term 'supplier partnering' and give the following definition.

Supplier partnering is 'an ongoing relationship between firms, which involves a commitment over an extended time period, and a mutual sharing of information and the risks and rewards of the relationship.'

The following list gives the main features of alliances:

- organizations working closely together at all levels
- senior managers and everyone in the organizations supporting the alliance
- shared business culture, goals and objectives
- openness and mutual trust
- long-term commitment shared information, expertise, planning and systems
- flexibility and willingness to solve shared problems
- continuous improvements in all aspects of operations
- joint development of products and processes
- guaranteed reliable and high quality goods and services
- agreement on costs and profits to give fair and competitive pricing
- increasing business between partners.

Partnerships can lead to changes in operations. For example, the stability of a partnership might encourage suppliers to specialize in one type of product. They give such a commitment to the alliance that they reduce their product range, make these as

efficiently as possible, and concentrate on giving a small number of customers a very high quality service. They share information with customers without the threat that this will be used to get some form of trading advantage. At the same time, customers reduce their number of suppliers, as they no longer need to look around to get the best deals. Japanese companies were among the first to develop strategic alliances, and at the time when Toyota had formed partnerships with its 250 suppliers, General Motors was still working separately with 4000 suppliers.

It can be difficult to form a successful partnership. A useful starting point is to analyze current operations and future plans to see if alliances would be useful. A company cannot really expect any benefits from an alliance if it only buys a few materials, or is changing its manufacturing base, or is sensitive about confidentiality, or cannot find reliable suppliers. Most organizations, however, can see potential benefits, and they should start looking at possible arrangements. Typically they form a project team to identify potential partners, define objectives, set timetables, list resource implications, negotiate terms, and so on. When this project team makes its initial report, potential partners can be approached and negotiations begin. The following example shows how one company set about this.

Of course, forming a partnership is only the first step, and it still needs a lot of effort to make it a success. Some factors that contribute to a successful partnership include a high level of achieved service, real cost savings, a growing amount of business, compatibility of cultures, and so on. J. Rowley gave a more general list of key factors as management commitment, a contract specifying costs and responsibilities, agreed performance indicators, agreed objectives, shared culture and joint information systems. Lambert summarized these as:

- ▣ *drivers*, which are the compelling reasons for forming partnerships, such as cost reduction, better customer service, or security;

- ▣ *facilitators*, which are the supportive corporate factors that encourage partnerships, such as compatibility of operations, similar management styles, common aims, and so on;

- ▣ *components*, which are the joint activities and operations used to build and sustain the relationship, such as communication channels, joint planning, shared risk and rewards, investment, and so on.

Alliances are certainly not the best answer in every circumstance. Some purchases are so small, or materials are so cheap, that the effort needed for an alliance is not worthwhile; sometimes managers do not want to lose control or share information; sometimes an organization may not be able to find a partner willing to make the necessary commitment; organizational structures or cultures may be too different; it may be impossible to reach the necessary level of trust; there may be nobody with the necessary skills and enthusiasm, and so on. Several years after starting its supplier partnership initiative, Petro-Canada still bought 20-40% of materials through traditional supplier-customer relationships.

However, it is clear that alliances are becoming increasingly popular. As Ewer says, we have 'the powerful combination of improved technology which can enable better partnering, a growing consensus that partnering enabled by e-B2B is essential, and a growing public profile for partnering issues in general'.

Ex. 3. Answer the questions.

1. In what ways can companies cooperate? 2. Under what conditions can this cooperation bring better results? 3. What is the key point in this kind of informal arrangements? 4. How do Japanese companies use this approach? 5. What is the drawback of such informal arrangement? 6. What are the measures to make this arrangement more formal? 7. What is the basis for making a strategic alliance or partnership? 8. How is supplier partnering defined? 9. What are the main characteristics of alliances?

Ex. 4. Expand on the following statements from the text.

1. There are several ways for companies to cooperate. 2. No commitment is the main point of informal arrangements. 3. Disadvantages of informal arrangement. 4. A long-term relationship can be basis for making a strategic alliance. 5. Partnerships can lead to changes in operations. 6. It often involves certain difficulties to form a successful partnership. 7. Forming a partnership is the first step in strengthening cooperation between companies.

Ex. 5. Work in pairs. Describe different ways in which organizations can successfully cooperate.

Logistics in practice

Petro-Canada

Petro-Canada (PC) is the largest oil company in Canada, with 4500 employees and over \$6 billion in sales. It owns 750 million barrels of proved reserves, but its main income comes from 1700 retail petrol stations. The Canadian government originally founded PC to compete with major international companies, and it still owns 18% of the shares.

In the 1990s PC started to form strategic alliances with its major suppliers. It was looking for ways of reducing costs, and supplier partnerships were a clear option for a company that spent over \$2 billion a year on materials other than oil.

To find the best way of forming strategic alliances, PC benchmarked other companies who reported a history of successful partnerships, including Motorola and Dow Chemicals. In practice, growing pressure to improve performance meant that PC had to get results quickly, and they developed their own approach. This had targets of reducing costs by 15% in a first phase, and eventually by 25%.

PC quickly realized that without guaranteed product quality it could make no further progress, so it consolidated its use of total quality management. This included Deming's '14 principles' which advise organizations not to buy products on the basis of cost alone, but to include a range of factors such as quality, reliability, timing, features, trust, and so on.

Now it had done the preparation, PC could start talking to prospective partners. It chose these from companies that it currently did most business with, and those whose products were critical. There were already long-standing, informal relationships with

many of these, and PC extended them to create more formal alliances. Important considerations were that the suppliers were committed to high quality, emphasized customer satisfaction, and had the potential to become 'the best of the best'.

This gave PC its likely partners, and the next stage was to form joint development teams, including representatives from the purchasing and user departments. Because of the time pressure, this team looked for quick improvements. Their aim was to get the initiative moving, get some quick returns, generate enthusiasm for the ideas, and then move the partnership forward over the longer term.

We can summarize PC's approach to developing partnerships in the following stages:

1. prepare the organization for alliances with research, training, systems and practices
2. assess the risk and benefits of partnerships, setting aims and targets
3. benchmark other partnership arrangements
4. select qualified suppliers
5. form joint teams to manage the initiative and move it forward
6. confirm the partnership's principles, commitments, relationships and obligations
7. formalize the terms and conditions
8. continue training and improving.

Text 8. Vertical Integration

Ex. 1. Before reading the text check the meaning of the following words and word combinations in the dictionary.

Go beyond partnership, own, minority share, joint venture, thinly, steel mill, canner, backward, desirable, necessarily, bake.

Ex. 2. Read the text and do the tasks.

If an organization wants to go beyond partnerships, it has to own more of the supply chain. One common arrangement has an organization taking a minority share in another company. This gives it some say in their operations, but it does not necessarily control them. A manufacturer, for example, might take a minority share in a wholesaler, to get some influence in the way that its products are distributed.

Another option is for two organizations to start a joint venture, where they both put up funds to start a third company with shared ownership. A manufacturer and supplier might together form a transport company for moving materials between the two.

The most common arrangement has one organization simply buying other organizations in the supply chain. This increases its level of vertical integration.

Vertical integration describes the amount of a supply chain that is owned by one organization.

If an organization buys materials from outside suppliers and sells products to external customers, it does not own much of the supply chain and has little vertical integration. If the organization owns initial suppliers, does most of the value adding

operations, and distributes products through to final customers, it owns a lot of the supply chain and is highly vertically integrated. If the organization owns a lot of the supply side it has backward or upstream integration; if it owns a lot of the distribution network it has downstream or forward integration.

In some circumstances vertical integration is the best way of getting different parts of the supply chain to work together. Ford of America, for example, has at different times owned everything from steel mills through to distributor networks and repair shops. More often, widespread vertical integration would be very expensive, leading to huge organizations that spread their resources too thinly, needing specialized skills and experience that one organization does not have, reducing flexibility to respond to changing conditions, and so on. So vertical integration is not necessarily desirable, and it is usually impossible for even the biggest organization to own much of their supply chains. Heinz, for example, cannot buy all the farmers, processors, steel mills, canners, wholesalers, retailers and other organizations in the supply chain for their baked beans.

Ex. 3. Answer the questions.

1. What should companies do if they want to go beyond partnerships? 2. What are the rights of an organization which has a minority share in another company? 3. What rights do companies enjoy if they set up a joint venture? 4. What is the most common arrangement of solving the problem of vertical integration? 5. What is vertical integration? 6. In what case does a company own a lot of the supply chain and is highly vertically integrated? 7. Is vertical integration in many cases the best way of making the supply chain parts work together? 8. What makes widespread vertical integration very expensive?

Ex. 4. Expand on the following statements from the text.

1. Vertical integration is one of the ways to go beyond partnerships. 2. Starting a joint venture is yet another option on this path. 3. Vertical integration means the amount of a supply chain which an organization owns. 4. Vertical integration helps bring different supply chain parts together. 5. Widespread vertical integration is quite expensive.

Ex. 5. Work in pairs. Describe the peculiarities of vertical integration.

Logistics in practice

GZ Rexam

In 1996 Rexam Pharmaceutical Packaging and Grafica Zannini formed a joint venture called GZ Rexam. Its primary aim is to supply packaging to the pharmaceutical industry in Europe. This is an important area, as over 50% of pharmaceutical companies' product recalls are caused by faults in printed material, and each recall costs several million pounds.

GZ Rexam looks for the benefits of partnerships with its customers. John Stevenson, the Sales and Marketing Director, says, 'The days of the conventional supply chain where everyone existed as an independent entity ... are no longer'. He quotes three reasons for partnerships:

- Lower costs – due to better co-ordination, elimination of duplicated effort, less bureaucracy, quantity discounts, and economies of scale. GZ Rexam estimates that it can save up to 60% of packaging costs through partnerships.

- Shorter lead-times – from improved coordination, procedures and administration. With Eli Lilly they reduced lead times from six to two weeks, with just-in-time deliveries for specific orders.

- Higher quality – with uniform standards, collaboration in quality initiatives, less reliance on inspections and a commitment to long-term improvements.

Once the objectives of a partnership have been agreed, the two key factors for success at GZ Rexam are commitment to the long-term success of the partnership and good communication between everyone concerned.

Case study

Friedland Timbers asa

Johann Klassen is the Managing Director of Friedland Timbers asa. which makes specialized wood products for the construction industry. He has recently been worried by late deliveries to some important customers. The industry is very competitive, and Johann knows that customers will go to other suppliers if he cannot guarantee deliveries. The marketing manager is particularly upset because he has worked with these customers for a long time, and promised deliveries that were not made.

Johann asked the production manager for an explanation. She told him that 'Our own suppliers were late in delivering certain types of wood. This shortage of a key raw material disrupted our production plans. We cannot be blamed for this. If anyone in the company is to blame, it is the warehouse manager who does not keep enough stocks of raw materials to cover for late deliveries.'

Johann then went to the warehouse manager to see what was happening. 'There can't be anything wrong here', he was told. 'Stocks have been climbing for the past year, and last month they were at an all time high. In part, this is a deliberate decision, as I want to improve service levels to production. In part, though, stocks seem to have just drifted upwards. Now we have high stocks of most items, but there are still occasional shortages. These high stocks are causing me problems with space, and are stretching my budget. I think that the blame lies in purchasing, who do not order the amounts that we request.'

Johann saw that some stocks were drifting upwards because purchasing were buying large quantities of some materials. At the same time, they were delaying some purchases, and this produced the shortages. The purchasing manager explained to Johann, 'Let me remind you that eight months ago you instructed me to reduce materials costs. I am doing this by taking advantage of the discounts given by suppliers for larger orders. Often I order more than requested under the assumption

that we will need the material at some stage, so I get a discount and the material is already in stock when we need it. Sometimes keeping things in stock would take too much space or be too expensive, so then I might delay an order until I can combine it with others to get bigger discounts.'

Johann thought that he was near the source of his problems, and might ask for the purchasing policies to be reviewed. Then he talked to the transport manager who was not so sure. 'It is much more efficient for me to bring larger quantities into the company', he said. 'If you reduce the average order size, the transport costs will rise. Our budget is already being squeezed, as we have to pay for expensive express deliveries of materials that production classify as urgent. If you lower the order size, there will be more shortages, more express deliveries and even higher costs.'

Johann talked to some major suppliers to see if they could somehow improve the flow of materials into the company. Unhappily, while he was talking to one company, they raised the question of late payments. This was contrary to Friedland's stated policy of immediate payment of invoices, so he asked the accounting section for an explanation. He was given the unwelcome news that 'The company's inventory and transport costs are so high that we are short of cash. We are delaying payments to improve our cash flow. As it is, we had to use a bank overdraft to pay suppliers for last month.'

Later that day Johann found that the late customer deliveries which had started his investigation, were actually caused by poor sales forecasts by the marketing department. They had seriously underestimated demand, and planned production was too low. All the employees at FT were doing their best, but things seemed to be going wrong.

Answer the questions.

1. Why do all the logistics costs seem to be rising at the same time? 2. What do you think are the basic problems in Friedland? 3. What would you recommend Johann do?

Project

Supply Partnerships

Find a particular product whose supply chain is easy to study, such as petrol, a telephone service, cars, a restaurant chain, or a computer game. Discuss the amount of integration in the supply chain. What alternatives are there for integration? See if different organizations making similar products have the same approach, and explain any differences. Say why the existing patterns of logistics have developed, and discuss the benefits of this level of integration.

POINTS FOR DISCUSSION

1. What do you think are the main factors that encourage logistics to change? How is it responding to these pressures? What changes do you think there will be in the next decade?

2. When logistics is divided into separate functions, each is likely to have its own objectives. Is this necessarily a bad thing, or can there be positive benefits?

3. An integrated supply chain is a convenient notion, but it does not reflect real operations. An organization is only really concerned with its own customers and suppliers, and does not have time to consider other organizations further along the chain. Do you think that this is true?

4. When M. Christopher says that 'supply chains compete, not companies' what exactly does he mean?

5. H. Decker and A. van Goor say that integration in the supply chain can be at the level of:

☐ Physical movement ☐ Shared information ☐ Integrated control

☐ Integrated infrastructure.

What do they mean by this?

Unit 4. STRATEGIC DECISIONS

Text 1. Types of Decisions

Ex. 1. Before reading the text check the meaning of the following words and word combinations in the dictionary.

Consequence, implement, concern, medium term, make a decision, constraint, middle manager, armed forces, rigid organization, pass down a decision, growing recognition, junior manager, remote, closely, lean organization, corporate, evidence, review, impact, environmental issues, mention, treat, important developments, relevant information, periphery.

Ex. 2. Read the text and do the tasks that follow.

Some decisions are very important to an organization, with consequences felt over many years. Other decisions are less important, with consequences felt over days or even hours. We can use their importance to classify decisions as:

- *Strategic decisions* are most important and set the overall direction of the organization; they have effects over the long term, involve many resources and are the most risky.

- *Tactical decisions* are concerned with implementing the strategies over the medium term; they look at more detail, involve fewer resources and some risk.

- *Operational decisions* are the most detailed and concern activities over the short term; they involve few resources and little risk.

A traditional view has senior managers making the strategic decisions that set their organization on its course. These strategic decisions give the objectives, constraints and context for the tactical decisions made by middle managers. These, in turn, give the objectives, constraints and context for operational decisions made by junior managers. This is still the usual approach to decisions, but new styles of management and improved technology have encouraged changes. Now you rarely see such a strict hierarchy, even among conventionally rigid organizations like the armed forces. Most decisions are discussed, negotiated and agreed rather than simply passed

down. There is also a growing recognition that the best person to make a decision is the person most closely involved - and this is often a junior manager who is on the spot rather than a remote, senior manager. You can see this effect with empowerment (which devolves decisions to the lowest possible level) 'delaying' (to remove unnecessary layers of management) and lean organizations (which remove all unnecessary activities).

There are several types of strategic decision. People use different names for these, but the most common are:

- *mission* – a statement to give the overall aims of the organization;
- *corporate strategy* – which shows how a diversified corporation will achieve its mission;
- *business strategy* – which shows how each business within a diversified corporation will contribute to the corporate strategy;
- *functional strategies* – which describe the strategic direction of each function, including logistics.

Essentially the higher strategies set the goals and general direction of the organization, and the functional strategies show how to achieve these. So the business strategy shows what has to be done, and the logistics strategy shows how the supply chain will help achieve this. If an organization has a business strategy of being the lowest cost provider of some product, the logistics strategy shows how it will reduce logistics costs to a minimum; if the organization is working to get fast deliveries to customers, the logistics strategy defines policies for achieving this. This assumes, of course, that logistics really has a strategic role. Perhaps we should review the evidence to support this.

The last two chapters showed that logistics is essential for every organization, even those supplying intangible services. We said that it is concerned with major decisions that have a clear strategic impact, such as the design of the supply chain, size and location of facilities, relations with other organizations, partnerships and alliances. We showed that logistics is a major user of resources, including transport and storage; it has an impact on organizational performance, including profit and financial measures such as the return on assets; it affects lead time, perceived product value, reliability and other measures of customer service; it gives public exposure, raises safety and environmental issues, encourages some operations and prohibits others.

You can see more evidence of the strategic role of logistics in mission statements, which often have some explicit reference to the supply chain. It is, of course, not surprising that companies offering specialized logistics services refer to the supply chain in their missions. The mission of Roadway Express, an American transport company, says:

We will contribute to customer success and satisfaction by providing reliable, responsive, and efficient service. Our principal product will be less-than-load transportation on 2-day and longer lanes within North America, and on international lanes to and from North America.

Similarly, Mercia Software is the largest Europe-based provider of software for supply chain management, and they say that:

Mercia's mission is to provide customers with optimum value business solutions in demand and supply chain planning.

Retailers often form the links to final customers, and their long-term survival depends on their ability to manage supply chains and move materials efficiently. Boots the Chemist says:

Our vision is to be the world's leading retailer of products and services that help make our customers look good and feel good.

Sainsbury's objectives include:

To provide unrivalled value to our customers in the quality of the goods we sell, in the competitiveness of our prices and in the range of choice we offer.

To achieve efficiency of operation, convenience and customer service in our stores ...

Neither of these statements mentions logistics directly, but they both emphasize the supply of products to customers, and their implicit reliance on logistics. The point, of course, is that the long-term survival of every organization depends on the flow of materials through its supply chains. The strategic importance of logistics stems from the basic fact that without logistics there can be no operations - and no organization. You can see this message clearly in many mission statements. GKN, for example, include a commitment:

To treat our suppliers fairly as an integral part of our total capability to serve our customers.

We could continue discussing the evidence for a strategic role for logistics, but the facts are so clear that there is little point. This is, however, a relatively new opinion. For many organizations the recognition that logistics has a strategic impact is one of the most important developments of recent years. It changes the way that they manage the supply chain, and links it more closely with other strategic decisions. Logistics has a new, prominent role and gets the same attention as other core functions. Senior managers make the decisions, based on more relevant information and a broader view of the organization's objectives. The recognition that logistics has a long-term effect on overall performance has moved it from the periphery to the centre of decision making.

Ex. 3. Answer the questions.

1. Into what groups can all decisions be divided? 2. What makes strategic decisions so important? 3. How are operational decisions characterized? 4. What is the traditional view on decision making? 5. What encourages changes in approach to decisions? 6. What types of strategic decisions are singled out? 7. What is the difference between a business strategy and a logistics strategy? 8. How are these two strategies combined in an organization's activities? 9. Can you show a strategic role of logistics that reflected in mission statements of different organizations? 10. The recognition of logistics strategic impact on a company's activities is one of the most important developments in recent years, isn't it?

Ex. 4. Expand on the following statements from the text.

1. Decisions are classified on the basis of their importance. 2. Many companies adopt a traditional approach to decision making. 3. Higher strategies set goals for an organization. 4. Logistics strategic role is seen in a company's strategic mission statements. 5. Recognizing logistics long-term effect on overall performance marks the change in the attitude to decision making.

Ex. 5. Work in pairs. Describe the role of various types of decisions that affect a company's activities.

Text 2. Logistics Strategy

Ex. 1. Before reading the text check the meaning of the following words and word combinations in the dictionary.

Consist, policy, link, support, respond, achievable, outstanding, aiming at, significant effect, accept, survive, availability, minimize logistics costs, competitive advantage, timing, facet, rapid supply, rush hour, choose.

Ex. 2. Read the text and do the tasks.

All the long-term decisions about logistics form a logistics strategy.

The logistics strategy of an organization consists of all the strategic decisions, policies, plans and culture relating to the management of its supply chains.

The logistics strategy forms a link between the more abstract, higher strategies and the detailed operations of the supply chain. While the corporate and business strategies describe general aims, the logistics strategy concerns the actual movement of materials needed to support these aims. The business strategy of UPS calls for 'outstanding service' to its customers, and this translates into a logistics strategy of organizing a very fast parcel delivery service to almost any point in the world.

The higher strategies set the context for the logistics strategy. However, logistics managers do not simply respond to this context, they actively contribute to its formulation. Their views on what levels of performance are actually achievable by logistics form one of the inputs for the design of higher strategies. For UPS the recognition that it really can achieve efficient logistics allows it to have a business strategy of aiming at outstanding service.

There are, of course, many factors other than logistics to consider in designing a business strategy. But the amount that logistics contributes to the formulation of higher strategies can have a significant effect on operations. At one end of a spectrum are organizations where logistics contributes hardly anything to the higher strategies. Logistics managers simply accept the higher strategies designed by others, and design operations to make sure these can be achieved. At the other end of the spectrum are organizations whose logistics really dictate the higher strategies. The Channel Tunnel, for example, offers a unique logistics service, and all its higher strategies are based on its logistics operations.

Organizations can only survive by supplying products that customers view as somehow better than those from competitors. Logistics affects the lead time, availability, cost, customer support, damage, and so on - and hence the customers'

view of a product. In this sense, logistics actually contributes to the design, quality, perceived value and success of a product. But which factors are most important for this contribution and should be emphasized in a logistics strategy? We can start to answer this by taking a traditional view from marketing which says that organizations compete by concentrating on the 'four Ps' – product, place, promotion and price. Here logistics has a role in the 'product' (through its contribution to the overall product package), 'place' (through its delivery of materials) and 'price' (through its effect on operating costs). A logistics strategy could usefully emphasize these features.

A broader view says that customers are concerned with cost, quality, service level, reliability, availability, flexibility, delivery speed, location, sourcing, supplier relations, environmental impact, recycling, and a whole range of other things. These all depend on different aspects of logistics. In different circumstances, therefore, almost any facet of logistics can be important for customer satisfaction, and could be emphasized by the logistics strategy. In practice, a logistics strategy is most likely to emphasize the following issues:

Cost: Most organizations want low costs, but some adopt a positive strategy of minimizing their logistics costs. This leads to higher profits for the organization and lower prices for customers.

Customer service: Logistics controls stock levels, delivery times, speed of response, and other measures of customer service. By concentrating the logistics strategy on customer service, organizations can get a long-term competitive advantage.

Timing: Customers generally want products as soon as possible, so a common logistics strategy guarantees fast deliveries. Timing can also mean rapid supply of new products, or delivering at the time specified by a customer.

Quality: Customers demand higher quality in all products. A common logistics strategy guarantees high quality service, even though it can be difficult to say exactly what we mean by 'high quality logistics'.

Product flexibility: This is the ability of an organization to customize products to individual specifications. One logistics strategy is based on a specialized or customized service, such as Pickfords' removals.

Volume flexibility: Changing levels of business can cause severe problems for logistics, as you can see during the morning rush hour in any major city. Volume flexibility allows an organization to respond quickly to changing levels of demand.

Technology: Logistics uses a wide range of technologies for communications, tracking loads, sorting parcels, identifying products, recording stock movements, and so on. Some organizations have a strategy of developing and using the latest technologies.

Location: Customers generally want products to be delivered as close to them as possible. This might mean that a book club delivers directly to your door, a shop has a convenient location in a town centre, or a wholesaler has a regional logistics centre near to major cities. One logistics strategy is to provide a service in the best possible location, such as bus stations in town centres.

In principle, organizations should do everything well, giving low cost, good customer service, fast delivery, flexibility, using high technology, and so on. In practice, this is unrealistic. Organizations have to compromise, perhaps balancing the level of service with the cost of providing it. Effectively they choose a specific focus

for their logistics strategy, showing which factor they consider to be most important. Some organizations, such as Ryanair, focus on cost, giving a cheap service; others, such as FedEx, focus on delivery speed; others focus on reliability; or a customized service, and so on. One of the key decisions for logistics managers is choosing the strategic focus.

Ex. 3. Answer the following questions.

1. What forms a logistics strategy? 2. What is the condition of an organization's successful work? 3. What role does logistics play in determining a customer's view of a product? 4. What does a traditional marketing view say? 5. How is logistics related to all the 'four Ps'? 6. What does a broader view say about customer's concerns? 7. How are these principles realized in practice in connection with logistics strategy? 8. Are all these principles realistic?

Ex. 4. Expand on the following statements.

1. All long-term logistics decisions form a logistics strategy. 2. Designing a logistics strategy means taking into account many factors. 3. Logistics affect the customer's view of a product. 4. Customer's concerns depend on different aspects of logistics. 5. In a particular situation any facet of logistics may be important for a customer's satisfaction. 6. In reality it is difficult to accept all these principles as realistic.

Ex 5. Work in pairs. Describe the importance of a company's logistics strategy in determining a company's successful activities.

Logistics in practice

The Schenker Group

The Schenker Group was founded in Germany more than 125 years ago, and has been working internationally ever since. They employ 28,000 people, serving customers in 1000 locations. Schenker now provide a range of logistics services, including international air and ocean freight, logistics management and land transport. They provide seamless movement of customer products and information across global supply chains, using the latest technology and developing sophisticated systems for e-commerce. However, their strategic focus is on customer service.

Schenker opened in the USA in 1947 and now have 46 offices in major cities. All of these are ISO 9002 certified, which is in line with their strategy of complete customer satisfaction. This strategy is clear from their statement that, 'Our customers are our future. Without them – there is no future.' To support this view, the company gives a number of guarantees, starting with:

Our customers will always be the centre of our complete attention.

We will earn our customers' trust everyday, and we will never take their business for granted.

Our customers are our partners in business. Their needs will be our needs.

Schenker also describe the ways that they will achieve customer satisfaction, such as:

We will service our customers in an innovative, pro-active manner. We will always be aware of how our service impacts their business.

This overriding strategy of customer satisfaction sets the scene for all other logistics activities. When they work with Copeland Corporation in Alabama, their primary goal remains customer satisfaction, but to achieve this they have to attain the secondary goals of shorter stock cycles, faster delivery, lower stocks and lower costs.

Text 3. Strategy Options

Ex. 1. Before reading the text check the meaning of the following words and word combinations in the dictionary.

Cheap, ensure, acceptable, waste, spread, enterprise, design, customer demand, requirement, pull through, eliminates delays, warn, current operations, occur, arrive, eliminate waste, greengrocer, transfer, alternative, agility, agile, versus, sophisticated and demanding customers, capacity, cope, variety, check, ability to tailor logistics, unit, prime concern, justification, obvious, sustain, exceed demands, rule of thumb, potential customer.

Ex. 2. Read the text and do the tasks.

Each organization designs its own logistics strategy, but they often move along similar lines. The logistics strategies of Ford and Volkswagen, for example, are broadly similar, as are the strategies of Lufthansa and Air France. This allows us to describe a few generic strategies. M. Porter suggested that there are two basic strategies:

- *cost leadership*, makes the same, or comparable, products more cheaply;
- *product differentiation*, makes products that customers cannot get from other suppliers.

Lyons Bakeries compete by cost leadership, selling standard cakes at low prices; La Patisserie Française competes by product differentiation, selling cakes that are not available anywhere else. Similarly, easyJet compete by cost leadership, offering the cheapest fares; Execujet compete by offering a uniquely luxurious service.

In logistics, these two approaches are usually phrased in terms of lean and agile strategies. Organizations with a focus on lean logistics are aiming at low costs; those with a focus on agile logistics are aiming at high customer satisfaction.

Lean strategies

No organization can completely avoid the cost of logistics, so the next best option is to make it as cheap as possible. Then a reasonable objective is to minimize the total cost of logistics, while ensuring acceptable levels of customer service. This approach is generalized into lean logistics.

The aims of a lean strategy are to do every operation using less of each resource – people, space, stock, equipment, time, and so on. It organizes the efficient flow of materials to eliminate waste, give the shortest lead time, minimum stocks and minimum total cost.

Early work on lean operations was done in the motor industry, led by Toyota. This work concentrated on 'lean production' but the methods got such good results that they spread into other areas, eventually developing a 'lean enterprise'. The approach is summarized in five main principles:

- *value* – designing a product that has value from a customer's perspective
- *value stream* – designing the best process to make the product
- *value flow* – managing the flow of materials through the supply chain
- *pull* – only making products when there is customer demand
- *aim of perfection* – looking for continuous improvements to get closer to the aim of perfect operations.

The first of these principles, 'value', sets the target for the organization, seeing how to add value for the final customer of the product. The second principle, 'value stream', designs a means of making this product, and effectively sets the requirements of the supply chain. The last three principles refer directly to the supply chain. The third, 'value flow', gets an efficient flow of materials, eliminating waste, interruptions, waiting and detours. The fourth principle, 'pull', shows how to control the flow of materials by pulling them through. The fifth principle, 'aim of perfection', describes a continuing search for improvement. This is a common theme for management initiatives which often say that areas of waste should be continually identified and eliminated.

R. Townsend says that 'All organizations are at least 50% waste – waste people, waste effort, waste space and waste time'. During their development work, Toyota identified the following areas of the supply chain where this waste is most likely to occur:

- *Quality* – that is too poor to satisfy customers (either external or internal).
- *Wrong production level or capacity* – making products, or having capacity, that is not currently needed.
- *Poor process* – having unnecessary, too complicated or time-consuming operations.
- *Waiting* – for operations to start or finish, for materials to arrive, for equipment to be repaired, and so on.
- *Movement* – with products making unnecessary, long, or inconvenient movements during operations.
- *Stock* – holding too much stock, increasing complexity and raising costs.

A lean strategy looks for ways of eliminating this waste. The typical approach does a detailed analysis of current operations, and then removes operations that add no value, eliminates delays, simplifies movements, reduces complexity, uses higher technology to increase efficiency, looks for economies of scale, locates near to customers to save travel, and removes unnecessary links from the supply chain.

One warning is that low costs do not automatically mean lean operations. Lean operations maintain customer service while using fewer resources – they do not just minimize costs. A greengrocer could minimize its inventory costs by having no stock, but it would not generate much customer satisfaction. Some people also suggest that lean operations might work in the mass production car industry, but lessons do not necessarily transfer to other supply chains. In particular, lean operations might not work when there are variable and uncertain conditions. An alternative is a more flexible strategy based on agility.

Agile strategy

An agile strategy concentrates on the other side of the 'efficient versus responsive' – or lean versus agile – debate. Its supporters say that lean operations put too much emphasis on costs, and cannot deal with changing conditions, increasing competition, or more sophisticated and demanding customers. If demand for a product is steady at 100 units a week, lean logistics will remove all the waste and have enough capacity to deliver these 100 units. Unfortunately, if demand suddenly rises to 110 units, lean operations cannot cope. As markets are demanding more variety and customization, logistics should be more flexible.

The aim of an agile strategy is to give a high customer service by responding quickly to different or changing circumstances.

There are two aspects of agility. First, there is the speed of reaction; agile organizations keep a close check on customer demands and react quickly to changes. Second, is the ability to tailor logistics to demands from individual customers. These are, of course, different aspects of customer service, and the implication is that end-customer satisfaction is a prime concern, even if this comes at somewhat higher price.

Organizations that put a lot of emphasis on customer satisfaction are said to have a customer focus. The justification for this strategy comes from the obvious importance of customers. Without customers an organization has no sales, no income, no profit, no business -and soon no organization. As M. Perry of Unilever says, 'To sustain competitive advantage requires a total commitment to your customer'. Organizations with a customer focus will typically:

- aim for complete customer satisfaction
- allow customers easy access to the organization
- find exactly what they want
- design logistics to meet, or exceed, these demands be flexible and respond quickly to changing customer demands
- get a reputation for outstanding quality and value
- do after-sales checks to make sure the customers remain satisfied
- look outwards so that they are always in touch with customers, potential customers, competitors, and so on.

Organizations with satisfied customers have the obvious benefit of bringing them back with repeat business - remembering the rule of thumb that it costs five times as much to attract a new customer as it does to retain an existing one. Satisfied customers also attract new business, as they recommend a good service to four or five other people - compared with dissatisfied customers who warn a dozen potential customers about a bad experience.

Lean versus Agile

At first sight the aims of lean and agile operations seem contradictory. One looks to minimize costs, and sees customer service as a constraint; the other looks to maximize customer service, and sees costs as a constraint. This seems to lead to important differences.

Factor	Lean logistics	Agile logistics
Objective	Efficient operations	Flexibility to meet demands
Method	Remove all waste	Customer satisfaction
Constraint	Customer service	Cost
Rate of change	Long-term stability	Fast reaction to changing circumstances
Measures of performance	Productivity, utilization	Lead time, service level
Work	Uniform, standardized	Variable, more local control
Control	Formal planning cycles	Less structured by empowered staff

In practice, of course, there is not such a clear divide between the two strategies. If a supplier improves EDI links with its customers, it can both reduce costs and increase customer service – becoming both leaner and more agile. Similarly, a manufacturer selling materials through a website and a wholesaler introducing cross-docking become both leaner and more agile. Both strategies accept that customer satisfaction and low costs are dominant themes, but they use different descriptions of the process to achieve them. Organizations need not choose one strategy at the expense of the other. B. Evans and M. Powell discuss the use of both strategies and conclude that 'lean and agile are not mutually exclusive, they both have their merits, but also limitations, especially if an individual aspect is taken, in isolation, to the extreme'.

Ex. 3. Answer the questions.

1. Do organizations follow similar lines in designing their logistics strategy?
 2. What is the difference between cost leadership and product differentiation strategies?
 3. How are these two approaches phrased in logistics?
 4. What does 'lean logistics' mean? What is its aim?
 5. Where did this strategy originate?
 6. What are the five principles of this approach?
 7. How are these principles connected?
 8. How did the work along these lines at Toyota begin?
 9. Do low costs necessarily mean lean operations?
 10. What is the agile strategy?
 11. What are its two aspects?
 12. What does an organization's focus on a customer mean?
 13. How important for an organization are satisfied customers?
 14. Are there any basic differences between lean and agile strategies? If yes, which?

Ex. 4. Expand on the following statements.

1. Each organization works out its own strategy.
 2. It is hardly possible to completely avoid the costs of logistics.
 3. Toyota was a pioneer in adopting lean strategies.
 4. Agile strategy puts a lot of emphasis on a customer satisfaction.

Ex. 5. Work in pairs. Describe the main strategy options that companies use to improve their performance.

Ellis and Everard

Ellis and Everard is a major distributor of chemicals. It has a turnover of £600 million working from 70 locations in the USA and Europe, and employing 2000 people.

The company has been developing long-term partnerships for many years, and is considered a leader in the field. It has partnerships forward with customers (such as Merck, 3M and Sterling organics) and backward with suppliers (such as ICI, Solvay Interox and Junbunzlauer). Around 95% of its supplies, and 6% of customer demand are met through partnerships. Chris Whincup, Director of Sales, says that, 'Partnerships make our lives simpler, and as such more productive and effective'.

Among the benefits Ellis and Everard get from partnerships are:

- faster decision making
- higher sales and easier introduction of new products
- stability, making long-term planning easier and more reliable
- removal of unproductive administration
- on-time payments from customer
- easier introduction of new initiatives, such as EDI for stock levels and automatic delivery scheduling.

Text 4. Strategic Alliances and Other Strategies

Ex. 1. Before reading the text check the meaning of the following words and word combinations in the dictionary.

Integration, put much emphasis, reason, share benefits, include, area for collaboration, mention, speed-up order processing, feel uncomfortable, rush passengers, shipping, simplification, concurrent, remove bottlenecks, smooth flow of materials, time compression, emissions, road vehicles, heating bill, diversification.

Ex.2. Read the text and do the tasks.

A third strategy develops the ideas of integration that were discussed in the preceding unit. An organization can put so much emphasis on close co-operation with other parts of the supply chain that it has a strategy of forming alliances with suppliers and customers. The purpose of this strategy is to get efficient supply chains, with all members working together and sharing the benefits of long-term co-operation.

Usual reasons for a strategy of forming partnerships include better customer service, increased flexibility, reduced costs, avoidance of investment in facilities, and lack of expertise within the organization. In Europe over a quarter of all logistics expenditure uses specialized contract suppliers, usually in some form of long-term partnership. The most common area for partnerships is transport, where around three quarters of companies use contract providers. Other areas for collaboration include warehousing, import/export services, materials storage and information processing.

We have described three general strategies based on leanness, agility and alliances. There are several other general strategies, where organizations emphasize other aspects of performance. Here we will mention a few of the more common.

► *Time-based strategies.* In the simplest view, time-based strategies aim for a guaranteed faster delivery of products. Benefits from these strategies include lower costs (by having less stock in the supply chain, less expediting, and so on), improved cash flow (by not having to wait so long for payment), less risk (by reducing changes to orders, obsolete stock, and so on) and simpler operations (by eliminating delays and unnecessary stores). The main assumption, though, is that faster delivery gives better customer service. This is not necessarily true, and you can find many examples of faster logistics reducing the quality. A delivery company might speed-up order processing, but increase the number of mistakes; an airline might rush passengers and make them feel uncomfortable; a shipping line might reduce delays by stopping in fewer ports.

One important strategy based on time is time compression. This is similar to the lean strategy, but concentrates on wasted time in the supply chain. Its aim is to eliminate all the non-value-adding time. A. Beesley says that 'In typical UK manufacturing supply chains at least 95% of the process time is accounted as non-value adding'.

There is clearly scope for reducing the time materials spend in the supply chain and getting the associated benefits. Carter discusses seven ways of doing this:

1. *simplification* - making operations simpler
2. *integration* - improving information and material flows
3. *standardization* - using standard procedures and materials
4. *concurrent operations* - moving away from serial operations and towards parallel working
5. *variance control* - ensuring high quality and avoiding waste
6. *automation* - to improve effectiveness and efficiency
7. *resource planning* - to remove bottlenecks and ensure a smooth flow of materials.

As you can see, most of these are general suggestions for improvement rather than specific features of time compression. You would, of course, expect this. A strategy that focuses on one aspect of performance cannot ignore all the others; it still has to achieve performance that is acceptable when judged by a range of different criteria.

► *Environmental protection strategies.* A small, but increasing, number of organizations are developing strategies based around environmental protection. The Body Shop, for example, designs products with natural ingredients and based on sustainable development. It uses the same principles in its logistics, with reusable containers and recycling of materials. There are good reasons for other organizations to adopt similar policies of environmental protection.

In 1993 a survey of UK companies suggested that most were aware of environmental pressures – mainly from EU and government regulations – but they only changed their practices when there were significant cost benefits. The major environmental concerns were waste and packaging disposal (25% of respondents), noise and emission (23%), public perception of HGVs (15%), fuel use (12%) and

road congestion (11%). Only 19% of companies reported a logistics environmental policy. Despite huge amounts of discussion in the area, there have been relatively few changes since this survey.

Most organizations assume that 'going green' raises costs. There may be some benefits from customer approval, but in a competitive environment it is difficult to justify the higher overheads. The reality, though, is that many programmes for environmental protection actually reduce costs. Better insulation of warehouses, for example, gives lower heating bills. In the same way, regular maintenance of road vehicles reduces both fuel consumption and emissions, as does minimizing the distance travelled, avoiding congestion, travelling outside peak hours and avoiding built-up areas. Packaging is another area with large potential savings. You may be surprised when a pack of chocolate biscuits has three layers of wrapping – but this is only the consumer wrapping, and you do not see the three layers of industrial packaging that protects goods during transport. Careful design and reusable containers can save much of this packaging and considerably reduce costs.

► *Increased productivity strategies.* These strategies use available resources as fully as possible. Facilities, such as warehouses, have high fixed costs and using them at full capacity spreads these costs over more units. It follows that increasing the utilization of resources reduces the delivered cost of products. This is really a variation of a lean strategy, but there are important differences. Imagine a facility that is working at 60% of capacity. Obviously, there is spare capacity that is raising unit costs. The lean approach would look for ways of removing the 40% spare capacity - and then continue looking for further reductions over time. A high productivity strategy is more likely to accept the present capacity, and start looking for alternative uses for the excess. An office or warehouse might rent out space, while a vehicle fleet might carry materials for other organizations.

► *Value-added strategies.* The supply chain consists of a series of activities, each of which adds value to the final product. Then a reasonable strategy has an organization adding as much value as possible. This value is, of course, taken from the customer's perspective. Organizations can also add value by adding time and place utility, or doing more work on the product. Imagine a company that delivers washing machines to customers' houses. It adds value by delivering to the place and at the time preferred by customers, or by doing more work such as installing the machines, testing them, giving instructions on their use, removing old machines, offering service contracts, and so on.

► *Diversification or specialization strategies.* These strategies look at the range of services offered by logistics. Some organizations have strategies of diversification, offering the widest range of services and satisfying as many customers as possible. This is the approach of a department store which sells every product you can imagine. Other organizations have a strategy of specializing in a very narrow range of services, but being the best provider in their chosen area. They target a few customers and provide a service that cannot be found anywhere else – like a bespoke tailor. Some transport companies, for example, have a strategy of diversification and move every kind of load from letters through to oversize loads. Others have a strategy of specialization in, say, small packages, high security or tanker deliveries.

► *Growth strategies.* Many aspects of logistics get economies of scale, and larger operations can give both lower costs and better service. One common strategy, then, is based on growth. There are several ways of achieving growth, perhaps taking over competitors, expanding the geographical area covered, diversifying into more logistics activities, moving different types of materials, or simply increasing market share.

Ex. 3. Answer the questions.

1. What is the purpose of making alliances? 2. What are the reasons for the strategy of forming partnerships? 3. What amount all logistics expenditure uses specialized contract suppliers? 4. What industry is the most suitable for partnerships? 5. What other strategies except for leanness, agility and alliances may contribute to a company's better performance. 6. What are the ways of reducing the time, materials spend in the supply chain and getting the associated benefits? 7. What do environmental protection strategies help to achieve? 8. Does 'going green' inevitably leads to rising costs? 9. What do increased productivity strategies presuppose? 10. How do value-added strategies work? 11. Diversification and specialization strategies are connected with a range of services offered by logistics, aren't they? 12. What are the ways of achieving growth?

Ex. 4. Expand on the following statements.

1. Developing the idea of integration leads to forming partnerships. 2. Time-based strategies aim at guaranteeing faster delivery of products. 3. Environmental protection strategies come to the fore in an organization's activities. 4. Using the available resources is another important strategy. 5. Value-added strategies are achieved through various activities. 6. Diversification and specialization include a range of logistics services. 7. There are several ways of achieving a company's growth.

Ex. 5. Work in pairs. Describe various additional strategies that organizations choose for themselves.

Logistics in practice

Tesco plc

Tesco is the largest supermarket chain in the UK, with 700 stores taking 16% of the food retail market. It also has stores in Asia and central Europe, giving total sales of £25 billion a year in 1000 stores, with 250,000 employees. Their strategy is based on low cost, but also includes growth, high customer service and increasing product range.

The core purpose of Tesco is, 'Creating value for customers, to earn their lifetime loyalty'. This leads to a business strategy based around four elements - strong UK core business of food retailing, non-food sales, retail services such as personal finance and international operations. The logistics strategy supports this business

strategy, with a huge logistics network. This has evolved over time to meet changing customer demands, 'Following the customer -as customers' shopping habits change, we change and respond by providing new products and services'.

You can see this effect in their stores. In the 1970s most of Tesco's sales were in fairly small supermarkets in town centres. Over the next 20 years it closed many of these smaller stores and focused on larger ones -up to 100,000 square feet – in out-of-town developments. More recently, Tesco has adopted a flexible approach, building a range of shops to suit various needs. In 2001 it had 18 million square feet of sales area in:

- 23 Extras at around 100,000 square feet
- 274 Superstores at around 40,000 square feet
- 96 Compact superstores at around 20,000 square feet
- 38 Metro stores at around 2000 square feet
- 45 Express stores at around 2000 square feet
- 216 other stores.

The range of products offered by these stores has also changed, with the Extras and larger superstores offering a full range of non-food products, and growing sales of services from personal financial service to pharmacies. There are plans to open 100 more Express stores on Esso petrol station forecourts, and extending opening hours so that 300 stores are open 24 hours a day.

For the longer term, a significant change for Tesco's logistics is the growth of e-commerce. This business grew from 13,500 customers in 1999, to 370,000 in 2000, and a million in 2001. With £300 million of annual sales and 70,000 deliveries a week, Tesco has become the largest on-line grocer in the world.

Text 5. Setting the Scene for a Strategy

Ex. 1. Before reading the text check the meaning of the following words and word combinations in the dictionary.

Mission, examine, suffer, set a target, flowery statement, vague, clear, organization's internal strengths, desired outcome, rate of growth, external constraints, return on investments, succeed, distinguish, distinctive, cash flow, patent, In essence.

Ex. 2. Read the text and do the tasks.

The important point about a logistics strategy is that it does not happen by chance, but needs careful decisions. So we can ask, 'How do organizations make these decisions?' Why should a company base its logistics strategy on flexibility rather than cost? Why does one company choose to specialize, while a similar one chooses to diversify?

The starting point for designing a logistics strategy examines the higher strategies and sees how logistics can contribute to these. Then we can summarize the results in a logistics mission. This gives a simple statement of the aims for supply chain management, like the following example.

Our mission in logistics is to contribute to corporate aims by moving the materials needed by production into the company, moving work in progress through the

company, and moving finished products out to customers. We aim to give a flexible, reliable and cost effective service that completely satisfies our customers, both internal and external.

Logistics missions are useful for setting the scene, and showing the overall direction and priorities. They are much less common than mission statements for the whole organization, but they can suffer from the same weaknesses. Organizations tend to be ambitious and include aims of being 'acknowledged leaders', 'the best', 'world class', and so on. Smith says that such flowery statements fail in three ways. First, they are over-ambitious, setting targets that the organizations cannot realistically achieve. Second, they are so vague that no one can tell whether the mission is actually being achieved or not. Third, they miss the opportunity of using a powerful tool that can really help manage the logistics.

It is useful to start designing a strategy with a logistics mission, but the next steps are less clear. There is certainly no single best strategy for any particular circumstance, and there is no standard procedure for designing a good strategy. G. Gooderham says: No one 'right' way to develop and implement strategy exists. The key to successful planning is to get the best fit between the chosen tools and techniques, the organization's current culture capabilities and business environment and the desired outcome.

This leads to the usual advice of finding the best balance between the organization's internal strengths and the external constraints – matching what the organization is good at to what customers want. So now we have three factors that managers must consider when designing a logistics strategy – the higher strategies, the business environment and the organization's distinctive competence.

Higher strategies set the organization's goals and the context for all logistics decisions. The mission sets the overall aims, and the corporate and business strategies show how these aims will be achieved. The logistics strategy must support these higher strategies. If, for example, the business strategy calls for high customer service, the logistics strategy must show how logistics will achieve this.

The *business environment* consists of the factors that affect logistics, but over which it has no control. These include:

- *customers* – their expectations, attitudes, demographics
- *market conditions* – size, location, stability
- *technology* – current availability, likely developments, rate of innovation
- *economic climate* – gross domestic product, rate of growth, inflation
- *legal restraints* – trade restrictions, liability and employment laws
- *competitors* – number, ease of entry to the market, strengths
- *shareholders* – their target return on investments, objectives, profit needed
- *interest groups* – their objectives, strengths, amount of support
- *social conditions* – customers' lifestyles, changing demands, significant trends
- *political conditions* – stability, amount of governmental control, external relations.

All competing organizations work in a similar business environment. Each can only succeed if it has a *distinctive competence* that sets it apart from competitors. This is defined by the factors that are under the organization's control, and which it uses to distinguish itself. A distinctive competence stems from an organization's assets, which include:

- *customers* – their demands, loyalty, relationships
- *employees* – skills, expertise, loyalty
- *finances* – capital, debt, cash flow
- *organization* – structure, relationships, flexibility
- *products* – quality, reputation, innovations
- *facilities* – capacity, age, reliability
- *technology* – currently used, plans, special types
- *processes* – structures, technology used, flexibility
- *marketing* – experience, reputation
- *suppliers* – service, flexibility, partnerships
- *other assets* – knowledge, innovation, patents.

In essence, the business environment and distinctive competence show where an organization is now, and the higher strategies show where it wants to be in the future. The logistics strategy shows how to move from one to the other.

Ex. 3. Answer the questions.

1. Logistics strategy needs careful decisions, don't they? 2. Are the higher strategies summarized in a logistics mission? 3. What are logistics missions useful for? 4. What aims do organizations include in their mission statements? 5. What steps are taken when designing an organization's strategy? 6. What are the three factors that managers have to consider while designing a logistics strategy? 7. What do the business environment and distinctive competence show?

Ex.4. Expand on the following statements.

1. A logistics strategy does not happen by chance. 2. Logistics missions are useful for setting the lines along which to build a logistics strategy. 3. It is useful to start designing a strategy with a logistics mission. 4. It is advisable to consider three factors when designing a logistics strategy.

Ex.5. Work in pairs. Describe the steps that have to be taken into account while designing a logistics strategy.

Text 6. Logistics Audit

Ex. 1. Before reading the text check the meaning of the following words and word combinations in the dictionary.

Audit, review, areas for improvement, relevant internal information, competence, innovation, weakness, threat, to bridge a gap.

Ex.2. Read the text and do the tasks that follow.

We can get a clear idea of current operations by doing a logistics audit. This describes the details of all current logistics activities.

The purpose of a logistics audit is to collect relevant information about existing practices and performance of logistics. It gives a systematic review of current operations, describing the procedures, costs, resources, utilization, performance, products, and all other relevant details.

There are two main parts to a logistics audit, essentially getting information about the business environment and distinctive competence. First, an external audit looks at the environment in which logistics work. This reviews the nature of customers, types of demand, accepted service levels, locations, competitors and their operations, benchmarks and comparisons, services available, trends in the industry, economic conditions, geographical and political constraints, and any other relevant external information. Second, an internal audit looks at the way things are done within the organization and identifies areas for improvement. It reviews the structure of the supply chain, warehouse locations and size, stock holdings, methods of materials handling, achieved service levels, lead times, transport arrangements, order processing, damage, productivity, and any other relevant internal information.

You can see that this approach is similar in principle to a SWOT analysis, which lists an organization's:

- ◆ *Strengths* – what the organization does well, features it should build on
- ◆ *Weaknesses* – problems the organization has, areas it should improve
- ◆ *Opportunities* – openings that can help the organization
- ◆ *Threats* – hazards that can damage it.

Strengths and weaknesses concern the organization's internal operations and show its distinctive competence. Opportunities and threats relate to external features, concentrating on the business environment. A SWOT analysis by Synergistic Logistical Services listed their strengths as expertise, innovation and local contacts; weaknesses as small size, local operations and gaps in experience; opportunities from the increasing use of information technology, growing interest in logistics, and service-based local economy; threats from larger competitors, high overheads and a possible take-over.

By this stage we have the aims of logistics set out in a logistics mission. We also have details of current performance from the audit. We know where we want to go, and where we are at the moment. The next stage is to identify gaps between these two and show how to bridge the gaps.

Ex. 3. Answer the questions.

1. What does a logistics audit mean? 2. What is the purpose of logistics audit? 3. What are the two parts of logistics audit? 4. What is the essence of SWOT analysis?

Ex. 4. Expand on the following statements.

1. Doing a logistics audit may help a better understanding of current organization's operations. 2. Logistics gives a systematic review of current operations. 3. The information about the business environment and distinctive competence is received through logistics audit. 4. What are the basic principles of this approach?

Ex. 5. Work in pairs. Describe how logistics audit is normally organized.

Text 7. Developing the Strategy

Ex. 1. Before reading the text check the meaning of the following words and word combinations in the dictionary.

Predictable, commodity, vary, fashion industry, staple food items, formal procedure, give a solution, measure customer needs, simplify, systematic, analysis, achieve a goal, look for improvements, guideline, monitor performance, ultimate success, belief.

Ex. 2. Read the text and do the tasks.

Usually, the single most important factor for a logistics strategy is the type of demand. A lean strategy, for example, works best when demand is stable – or at least predictable. It is most successful when there are few changes to customers, products, or logistics, and when price is an important factor for competition. This is typical of commodities or staple food items, where the lowest cost is the main determinant of success. On the other hand, an agile strategy works best for organizations offering a wider range of products, where demand varies and is less predictable. It is most successful for organizations that do not really know demand until customers place orders, with make-to-order operations or mass-customization, such as the fashion industry.

It would be useful to have some formal procedure that considers factors such as the type of demand, and then suggests the best logistics strategy. Unfortunately, we have already said that there is no single 'best' strategy, and no method that always gives a good solution. The best that we can do is use some guidelines. N.S. Novich, for example, recommends four steps for designing a strategy – understand and measure customer needs, find the weaknesses of current logistics, benchmark, and simplify the whole logistic system. A more systematic approach builds on the analyses we have already mentioned, and has the following eight steps:

1. Do a logistics audit. The external audit gives an analysis of the business environment in which logistics work. It shows the factors that lead to success in this environment, and the importance of each one.

2. The internal audit analyses higher strategies from a logistics viewpoint, giving the context and overall aims for logistics, its strategic focus and perhaps includes a logistics mission.

3. Design the general features of supply chains that can best deliver the desired services. This includes the design of the network, location of facilities, capacity, technology used, and so on.

4. Set specific goals to show what each logistics activity must achieve. The internal audit shows how well the current logistics achieve these goals, and identifies areas that need improving.

5. Design the best organizational structure, controls and systems to support the logistics network.

6. Benchmark logistics, looking at the performance of leading organizations, defining measures to compare actual performance with planned, optimal and competitors' performances.

7. Implement the strategy, setting the conditions for lower levels of logistics decisions.

8. Monitor actual performance, continually look for improvements, keep the strategies up to date, and give feedback.

These steps give a guideline for designing and implementing a logistics strategy. The first two points focus on current circumstances, and are based on a logistics audit. Steps 3 to 5 design the logistics strategy, describing the general features of the supply chain, goals and supporting structures. Remember that the strategy only deals with broad principles over the long term, and does not get involved with the tactical and operational detail. Step 6 looks at operations in the best competitors and sees if there are any lessons to learn. The last two steps are concerned with implementation, and adjustments to keep the strategy up to date.

We discuss some issues of implementation in the next chapter. Before we go there, however, we should mention the presentation of the logistics strategy. This might seem a minor concern, but the way the strategy is presented can be an important factor in its ultimate success.

A logistics strategy consists of a set of aims, procedures, structures, facilities, beliefs, systems, and so on. These are typically presented in a logistics plan. This plan might contain many parts, with the following list including the most common.

- a broad summary, giving an overview of the logistics strategy and how this relates to other parts of the organization;
- the aims of logistics within the organization, what performance levels are needed and how these can be measured;
- a description of the way that logistics as a whole will achieve these aims, what changes are involved and how these will be managed;
- a description of how the separate functions of logistics (procurement, transport, inventory control, materials handling, and so on) will contribute to the plan, the changes involved and how operations can be integrated;
 - projections to show the resources needed by the strategy;
 - projections of the costs and financial performance;
 - a description of the way that this strategy affects the rest of the business, particularly in terms of performance achieved and contribution to customer value and satisfaction.

Ex. 3. Answer the questions.

1. What is usually the single most important factor for logistics strategy? 2. What formal procedure is normally adopted when designing the best logistics strategy? 3. What steps should be taken into account while designing a logistics strategy? 4. Is the strategy presentation an important factor for its ultimate success? 5. What main points does a logistics plan include?

Ex. 4. Expand on the following statements.

1. The most important factor for a logistics strategy is the type of demand. 2. While designing a logistics strategy some formal factor should be included. 3. A more systematic approach to developing a logistics strategy should necessarily include eight most important items. 4. The presentation of logistics strategy is important for ultimate success.

Ex. 5. Work in pairs. Describe the measures that are to be undertaken when designing a good logistics strategy.

*Logistics
in practice*

Bjorg's Pharmaceuticals

Bjorg's Pharmaceutical (BP) is a biotechnology company that develops and markets specialized drugs for Alzheimer's disease. It is one of the smaller companies competing against giant internationals, and its success comes from concentrating on a niche market.

Last year, BP was concerned that a major competitor was introducing a treatment that was similar to one of its own best-selling products. BP felt that the best way to compete was to improve its customer service by opening regional warehouses in its major markets of Northern Europe. These warehouses would guarantee same day delivery. To make sure that this was a sensible move, the company did a survey of 60 major customers. This survey confirmed that delivery time was by far the most important factor to them. The following

table summarizes the results when customers were asked to rate the importance of factors on a scale of 1 (not important) to 5 (very important).

Factor	Average response
Same day delivery	3,1
Next day delivery	4.9
Delivered when promised	2.7
Products delivered from stock	3.4
Cost of products	1.3
No errors in delivered products	2.8
No errors in paperwork	1.5
Ease of order entry	1.7
Ease of payment	1.4
Ease of access to customer relations	2.1
Knowledge of customer relations	2.5

Although same day delivery was fairly important, it seemed that most customers would be happy with next day delivery. From the survey, BP also found that its competitors only guaranteed next day delivery for 60% of orders. Another interesting finding was the perception that BP did not share information with customers, and did not publish details of product lead times, products that might have shortages, likely delays, and so on.

Based on this information, BP adopted new policies to meet the competition. First, it cancelled the planned regional warehouses, saving over a million dollars a year. Second, it adopted a policy of next day delivery for 95% of orders, giving it the best logistics performance in the industry. Third, it improved its communications, publishing more material on its websites and encouraging customers to contact them.

*Case
study*

Hessingen Herb Farm

Conrad and Elizabeth Kole moved into Hessingen Farm in 1983. Over the past few years their income from milk and traditional crops has dropped because of lower

market prices. They have supplemented this income from other sources, including the conversion of old barns into holiday homes.

Eight years ago Elizabeth took over a small field and started growing herbs. She sold a small range of herbs to local people who wanted fresh, organic produce for cooking. Passing tourists would also buy an unusual souvenir, and the herb business began to grow. Five years ago Elizabeth started growing more unusual herbs, expanded her growing area into a second field and opened a visitors' centre. People now came to look at the growing and preparation of herbs, and taste samples in various foods. Three years ago Elizabeth introduced a new range of herb products. This was a major expansion, converting some of the farm buildings into a 'herb kitchen' and making products for cooking (sauces, dressings and marinades), perfumes (posies, pot-pourri and sachets of dried herbs) and what she called 'healthy stuff' (herb mixtures traditionally said to have beneficial effects). The farm is now widely advertised as a tourist attraction. The website is particularly useful, as Elizabeth uses it to collect orders. She currently delivers 100 parcels a week to regular locals (up to about 50 km away) and posts 200 parcels to more distant customers.

Herbs started as a small business to generate additional income for the farm, but have now become its main activity. Elizabeth is considering another expansion. She could expand the product range even further and move all the processing to an industrial estate 15 km away. Supporting this would need sales around ten times the current postal sales. Elizabeth plans to generate these by introducing a mail order catalogue and increasing use of the website.

Answer the questions.

1. How does Elizabeth currently organize her logistics? 2. What do you think are her aims and priorities? 3. What would be the effect of the expansion on logistics? 4. What problems would Elizabeth face, and what options does she have to overcome them?

Project

Many organizations refer, either explicitly or implicitly, to logistics in their mission. Sometimes you can find statements about the role of logistics in corporate strategies, objectives, aims, publicity and related documents. Search through the documents published by different types of organization, and see how they mention the strategic role of logistics. You might, for example, look for references made by certain types of manufacturer, airlines or banks. What differences are there between different industries, and companies in the same industry?

POINTS FOR DISCUSSION

1. To what extent is logistics a strategic function? Does it really have a long-term effect on an organization? Is it possible to be 'essential' but not 'strategic'?

2. When customers judge products, they include factors like availability, lead time and after-sales service – and these are part of logistics. Is it reasonable to say, therefore, that logistics plays a role in the design of a product?

3. What are the main options for a logistics strategy?

4. What factors affect the choice of logistics strategy? Take an organization that you are familiar with, and say exactly how you would set about designing a logistics strategy.

5. There is only one 'best' logistics strategy in any circumstances, and managers should look for this. Do you think this is true?

6. In 1996 a survey of Canadian logistics companies listed the main benefits expected from outsourcing logistics as follows.

Factor	% of companies
Reduce total cost	79
Focus on core competency	67
Improve financial performance	66
Improve customer service	53
Improve flexibility	53
Access to new technology or systems	41
Enhance competitiveness	41
Increase capacity	37
Provide alternative logistics channels	29
Increase market share	21
Broader market coverage	20

Are these benefits likely to be different in your country, or to have changed over the past few years?

Unit 5. Warehousing

Text 1. Nature and Importance of Warehousing

Ex. 1. Before reading the text check the meaning of the following words and word combinations in the dictionary.

Warehousing, facility, garage, customer service, facet, requirement, inventory, allocation, consistent, consolidation, performance, phase, although, dispose, fluctuation, commensurate, multiple, shipment, breakbulk, short haul, long haul.

Ex. 2. Read the text and do the tasks.

Warehousing is an integral part of every logistics system. There are an estimated 750,000 warehouse facilities worldwide, including state-of-the-art, professionally managed warehouses, as well as company stockrooms, garages, self-store facilities, and even garden sheds. Warehousing plays a vital role in providing a desired level of customer service at the lowest possible total cost. Warehousing activity is an important link between the producer and the customer. Over the years, warehousing has developed from a relatively minor facet of a firm's logistics system to one of its most important functions.

We can define warehousing as that part of a firm's logistics system that stores products (raw materials, parts, goods-in-process, finished goods) at and between point of origin and point of consumption, and provides information to management on the status, condition, and disposition of items being stored. The term distribution center (DC) is sometimes used, but the terms are not identical. Warehouse is the more generic term.

Warehouses store all products, DCs hold minimum inventories and predominantly high-demand items. Warehouses handle most products in four cycles [receive, store, ship, and pick], DCs handle most products in two: receive and ship. Warehouses perform a minimum of value-added activity. DCs perform a high percentage of value adding, including possible final assembly. Warehouses collect data in batches, DCs collect data in real-time. Warehouses focus on minimizing the operating cost to meet shipping requirements, DCs focus on maximizing the profit impact of meeting customer delivery requirements.

With an increasing interest in improving inventory turns and reducing time to market, the role of distribution increasingly focuses on filling orders rapidly and efficiently.

Effective warehouse management involves a thorough understanding of the functions of warehousing, the merits of public versus private warehousing, and the financial and service aspects of warehousing decisions. Managers need knowledge of the methods that can improve warehousing performance and a strategy for locating warehousing facilities at optimal locations.

Warehousing decisions may be strategic or operational. *Strategic* decisions deal with the allocation of logistics resources over an extended time in a manner consistent and supportive of overall enterprise policies and objectives. They can take either long-range or project-type forms.

An example of a long-range strategic decision is the choice of a logistics system design. A project-type decision might deal with consolidation of branch warehouses into a regional distribution center. Other examples of typical strategic questions include the following:

Should warehousing be owned, leased, rented, or some combination of these? Should the warehousing functions be "spun off"; that is, contracted out to a third-party provider? Should the company install new materials handling equipment or continue to hire more labor?

Operational decisions are used to manage or control logistics performance. Typically, these decisions are routine in nature and involve time spans of one year or less. They relate to the coordination and performance of the logistics system. For example, a warehouse manager would be concerned with how to best utilize labor in the shipping department. Due to the short time horizon involved, these decisions have more certainty than strategic decisions.

Warehousing has traditionally provided storage of products (referred to as inventory) during all phases of the logistics process. Two basic types of inventories can be placed into storage: (1) raw materials, components, and parts (physical supply); and (2) finished goods (physical distribution). Warehousing has traditionally provided storage of products (referred to as inventory) during all phases of the logistics process. Two basic types of inventories can be placed into storage: (1) raw materials, components, and parts (physical supply); and (2) finished goods (physical distribution). Also, there may be inventories of goods-in-process and materials to be disposed of or recycled, although in most firms these constitute only a small portion of total inventories.

Traditionally, the warehousing of products has occurred for one or more of the following reasons:

- Achieve transportation economies.

- Achieve production economies.
- Take advantage of quantity purchase discounts and forward buys.
- Maintain a source of supply.
- Support the firm's customer service policies.
- Meet changing market conditions (e.g., seasonality, demand fluctuations, competition).
- Overcome the time and space differentials that exist between producers and consumers.
- Accomplish least total cost logistics commensurate with a desired level of customer service.
- Support the just-in-time programs of suppliers and customers.
- Provide customers with a mix of products instead of a single product on each order.
- Provide temporary storage of materials to be disposed of or recycled (i.e., reverse logistics).

Warehouses can be used to support manufacturing, to mix products from multiple production facilities for shipment to a single customer, to breakbulk or subdivide a large shipment of product into many smaller shipments to satisfy the needs of many customers, and to combine or consolidate a number of small shipments into a single higher-volume shipment.

Warehousing is used increasingly as a "flow-through" point rather than a "holding" point, or even bypassed (e.g., scheduled deliveries direct to customers), as organizations increasingly substitute information for inventory, purchase smaller quantities, and use warehouses as "consolidation points" to receive purchased transportation rates and service levels.

The traditional method [of distribution] is a push system. Production plans are based on capabilities and capacities of the plant, and product is produced in the expectation that it will sell. When it is produced faster than it can be sold, it is stockpiled at plant warehouses. If sales cannot be accelerated, then the plant will be slowed down until supply moves into balance with demand. In this system, warehousing serves to absorb excess production. Today's pull system depends on information. It is based on a constant monitoring of demand. . . . With a pull system, there is no need for a reservoir. Instead, the warehouse serves as a flow-through center, offering improved service by positioning inventory closer to the customer.

In supporting manufacturing operations, warehouses often play the important role of inbound consolidation points for the receipt of shipments from suppliers. Firms order raw materials, parts, components, or supplies from various suppliers, who ship truckload (TL) or carload (CL) quantities to a warehouse located in close proximity to the plant. Items are transferred from the warehouse to the manufacturing plant(s).

From a physical distribution or outbound perspective, warehouses can be used for product mixing, outbound consolidation, or breakbulk. Product mixing often involves multiple plant locations (e.g., plant A, plant B, and plant C) that ship products (e.g., products A, B, and C) to a central warehouse. Each plant manufactures only a portion of the total product offering of the firm. Shipments are usually made in large quantities (TL or CL) to the central warehouse, where customer orders for multiple products are combined or mixed for shipment.

When a warehouse is used for outbound consolidation TL or CL shipments are made to a central facility from a number of manufacturing locations. The warehouse consolidates or combines products from the various plants into a single shipment to the customer.

Breakbulk warehouses are facilities that receive large shipments of product from manufacturing plants. Several customer orders are combined into a single shipment from the plants to the breakbulk warehouse. When the shipment is received at the warehouse, it is broken down into smaller LTL shipments which are sent to customers in the geographical area served by the warehouse. Breakbulk operations are sometimes carried out by using transportation innovations rather than warehousing.

Understanding the main points.

Ex. 3. Answer the questions.

1. What do warehouse facilities include? 2. How can you characterize the role of warehousing in a logistics system? 3. How is warehousing defined? 4. What is the difference between the terms 'distribution centre' and 'warehousing'? 5. What does effective management imply? 6. What decisions are made in warehousing? 7. Why do companies hold inventories in storage? 8. For what purposes can warehouses be used? 9. In what way does warehousing support manufacturing? 10. What does product mixing involve? 11. How is outbound consolidation realized? 12. How can you characterize breakbulk warehouses?

Ex. 4. Expand on the following statements from the text.

1. Warehousing is an integral part of every logistics system? 2. 'Distribution centre' and 'warehousing' are not identical terms. 3. Warehousing decisions may be strategic and operational. 4. Warehousing of products occurs for different reasons. 5. Warehousing can be used to support manufacturing, to mix products, to break a large shipment.

Ex. 5. Work in pairs. Describe the essence and importance of warehousing in modern conditions.

Text 2. Types of Warehousing

Ex. 1. Before reading the text check the meaning of the following words and word combinations in the dictionary.

Provide, acceptable, emphasize, efficient, accurate, goal, delivery, damage, verification, putaway, transfer, paramount, commonplace, approximately, eliminate, immediately, physically, pallet, permanent, replenishment, erratic, simultaneously, administer, utilization, personnel, accuracy, automate, completion, previous, perform, inefficiency, excessive, obsolete, routine, precise, vital.

Ex. 2. Read the text and do the tasks.

In general, firms have a number of warehousing alternatives. Some companies may market products directly to retail customers (called direct store delivery), thereby eliminating warehousing in the field. Mail-order catalog companies, for example, utilize warehousing only at a point of origin, such as sales headquarters or plant.

Another alternative is to utilize **cross-docking** concepts, whereby warehouses serve primarily as 'distribution mixing centers.' Product arrives in bulk and is immediately broken down and mixed in the proper range and quantity of products for customer shipment. In essence, the product never enters the warehouse.

Cross-docking is becoming popular among retailers, who can order TL, then remix and immediately ship to individual store locations. Products usually come boxed for individual stores from the supplier's location. For example, Laney & Duke, Hanes's third-party warehousing company in Jacksonville, Florida, tickets merchandise, places it on hangers, and boxes it up for individual Wal-Mart stores to replace items sold. The trailer leaves Jacksonville for the Wal-Mart DC where product is cross-docked to trucks for stores. At stores, the boxes are opened and garments are immediately ready to hang on display racks.

Most firms warehouse products at some intermediate point between plant and customers. When a firm decides to store product in the field, it faces two warehousing options: rented facilities, called public warehousing, or owned or leased facilities, called private warehousing.

Another option exists, termed **contract warehousing**, which is a variation of public warehousing. Contract warehousing is an arrangement between the user and provider of the warehousing service. It has been defined as:

... a long-term mutually beneficial arrangement which provides unique and specially tailored warehousing and logistics services exclusively to one client, where vendor and client share the risks associate with the operation. [There is a] focus on productivity, service and efficiency, not the fee and rate structure itself.

Firms must examine important customer service and financial considerations to choose between public and private warehousing. For example, operating costs for a public warehouse tend to be higher because the warehouse will attempt to operate at a profit; it may also have selling and advertising costs. However, a firm makes no initial investment in facilities when it uses public warehousing. From a customer service perspective, private warehousing can generally provide higher service levels because of its more specialized facilities and equipment, and its better familiarity with the firm's products, customers, and markets.

The two options must be examined closely. In some instances, innovative public warehouses can provide higher levels of service owing to their expertise and strong competitive drive to serve the customer.

There are many types of public warehouses, including: (1) general merchandise warehouses for manufactured goods, (2) refrigerated or cold storage warehouses, (3) bonded warehouses, (4) household goods and furniture warehouses, (5) special commodity warehouses, and (6) bulk storage warehouses. Each type provides users with a broad range of specialized services.

The general merchandise warehouse is probably the most common form. It is designed to be used by manufacturers, distributors, and customers for storing almost any kind of product.

Refrigerated or cold storage warehouses provide a temperature-controlled storage environment. They tend to be used for preserving perishable items such as fruits and vegetables. However, a number of other items (e.g., frozen food products, some pharmaceuticals, photographic paper and film, and furs) require this type of facility.

Some general merchandise or special commodity warehouses are known as *bonded warehouses*. These warehouses undertake surety bonds from the U.S. Treasury and place their premises under the custody of an agent of the Treasury. Goods such as imported tobacco and alcoholic beverages are stored in this type of warehouse, although the government retains control of the goods until they are distributed to the marketplace. At that time, the importer must pay customs duties to the Internal Revenue Service. The advantage of the bonded warehouse is that import duties and excise taxes need not be paid until the merchandise is sold, so that the importer has the funds on hand to pay these fees.

Household goods warehouses are used for storage of personal property rather than merchandise. The property is typically stored for an extended period as a temporary layover option. Within this category of warehouses, there are several types of storage alternatives. One is the open storage concept. The goods are stored on a cubic-foot basis per month on the open floor of the warehouse. Household goods are typically confined to this type of storage. A second kind of storage is private room or vault storage, where users are provided with a private room or vault to lock in and secure goods. A third kind, container storage, provides users with a container into which they can pack goods. Container storage affords better protection of the product than open storage.

Special commodity warehouses are used for particular agricultural products, such as grains, wool, and cotton. Ordinarily each of these warehouses handles one kind of product and offers special services specific to that product.

Bulk storage warehouses provide tank storage of liquids and open or sheltered storage of dry products such as coal, sand, and chemicals. These warehouses may provide services such as filling drums from bulk or mixing various types of chemicals with others to produce new compounds or mixtures.

Understanding the main points.

Ex. 3. Answer the questions.

1. Are warehousing activities limited to storage only? 2. What are the aims of every logistics system? 3. What are the main warehousing functions? 4. What does movement function include? 5. How can a storage function be performed? 6. Information on inventory levels is vital to the operation of a warehouse, isn't it? 7. How can inefficiencies in warehousing operations be eliminated?

Ex. 4. Expand on the following statements from the text.

1. Warehousing plays an important part in a firm's logistics system. 2. Movement function is in the focus of improving inventory turns and speeding orders. 3. Storage is another important function of warehousing. 4. Information transfer is vital to the successful operation of a warehouse.

Ex. 5. Work in pairs. Discuss the three important functions of warehousing operations.

Text 3. Functions of Warehousing Operations

Ex. 1. Before reading the text check the meaning of the following words and word combinations in the dictionary.

Proper, standpoint, executive, disadvantages, contractual, amount, arrangement, conservation, requirement, flexibility, minimization, seasonality, constraint, expand, variation, assume, obsolete, nonlinear, administrative, association, quantity, carload, congestion, burden, necessitate, commitment, available, various, substantial, currently, provision, precisely, compatible, occur, possession, feasible, expansion, facilitate, achieve, appropriate, intangible, permanence, associate, drawback, increase, decrease, adapt, customize, private, corporate-owned, advantageous, justify, insufficient, hundredweight, sufficiently.

Ex. 2. Read the text and do the tasks.

Warehousing serves an important role in a firm's logistics system. In combination with other activities, it provides the firm's customers with an acceptable level of service. The obvious role of warehousing is to store products, but warehousing also provides break-bulk, consolidation, and information services. These activities emphasize product flow rather than storage.

Fast and efficient movement of large quantities of raw materials, component parts, and finished goods through the warehouse, coupled with timely and accurate information about the products being stored, are the goals of every logistics system. These goals have received increasing attention from the top management of many organizations.

Warehousing has three basic functions: movement, storage, and information transfer. Recently, the movement function has been receiving the most attention as organizations focus on improving inventory turns and speeding orders from manufacturing to final delivery.

The movement function can be further divided into several activities, including: receiving; transfer or putaway; order picking/selection; cross-docking; shipping.

The *receiving* activity includes the actual unloading of products from the transportation carrier, the updating of warehouse inventory records, inspection for damage, and verification of the merchandise count against orders and shipping records.

Transfer or *putaway* involves the physical movement of the product into the warehouse for storage, movement to areas for specialized services such as consolidation, and movement to outbound shipment. Customer *order selection* or *order picking* is the major movement activity and involves regrouping products into the assortments customers desire. Packing slips are made up at this point.

Cross-docking bypasses the storage activity by transferring items directly from the receiving dock to the shipping dock. A pure cross-docking operation would avoid putaway, storage, and order picking. Information transfer would become paramount because shipments require close coordination.

Cross-docking has become commonplace in warehousing because of its impact on costs and customer service. For example, approximately 75 percent of food distribution involves the cross-docking of products from supplier to retail food stores. Eliminating the transfer or putaway of products reduces costs and the time goods remain at the warehouse, thus improving customer service levels.

Cross-docking should be considered as an option by firms meeting two or more of the following criteria:

- inventory destination is known when received.
- customer is ready to receive inventory immediately.
- shipment to fewer than 200 locations daily.
- daily throughput exceeds 2,000 cartons.
- more than 70 percent of the inventory is conveyable.
- large quantities of individual items received by firm.
- inventory arrives at firm's docks prelabeled.
- some inventory is time sensitive.
- firm's distribution center is near capacity.
- some of the inventory is prepriced.

Shipping, the last movement activity, consists of product staging and physically moving the assembled orders onto carrier equipment, adjusting inventory records, and checking orders to be shipped. It can consist of sortation and packaging of items for specific customers. Products are placed in boxes, cartons, or other containers, placed on pallets, or shrinkwrapped (i.e., the process of wrapping products in a plastic film), and are marked with information necessary for shipment, such as origin, destination, shipper, consignee, and package contents.

Storage, the second function of warehousing, can be performed on a temporary or a semi-permanent basis. Temporary storage emphasizes the movement function of the warehouse and includes only the storage of product necessary for basic inventory replenishment. Temporary storage is required regardless of the actual inventory turnover. The extent of temporary inventory storage depends on the design of the logistics system and the variability experienced in lead time and demand. A goal of cross-docking is to utilize only the temporary storage function of the warehouse.

Semi-permanent storage is the storage of inventory in excess of that required for normal replenishment. This inventory is referred to as buffer or safety stock. The most common conditions leading to semi-permanent storage are (1) seasonal demand, (2) erratic demand, (3) conditioning of products such as fruits and meats, (4) speculation or forward buying, and (5) special deals such as quantity discounts.

Information transfer, the third major function of warehousing, occurs simultaneously with the movement and storage functions. Management always needs timely and accurate information as it attempts to administer the warehousing activity. Information on inventory levels, throughput levels (i.e., the amount of product moving through the warehouse), stockkeeping locations, inbound and outbound shipments, customer data, facility space utilization, and personnel is vital to the successful operation of a warehouse. Organizations are relying increasingly on computerized information transfer utilizing electronic data interchange (EDI) and bar coding to improve both the speed and accuracy of information transfer.

In spite of numerous attempts by firms to reduce the flow of paperwork, the amount of paperwork is still significant. For this reason and many others, management in many firms has attempted to automate the clerical function whenever possible. The developments in electronic communications have been instrumental in reducing the clerical activities in all aspects of warehousing.

Successful completion of all of the warehousing activities already mentioned eliminates the need for checking. However, errors and mistakes do occur within any warehouse operation, usually making it necessary to conduct a check of previous activities. In some instances, this activity can be minimized in operations where employees are empowered to perform quality control at their respective levels within the warehouse. This activity may be performed by teams, instead of individuals.

It is important to eliminate any inefficiencies in movement, storage, and information transfer within the warehouse. These can occur in a variety of forms:

- Redundant or excessive handling.
- Poor utilization of space and cube.
- Excessive maintenance costs and downtime due to obsolete equipment.
Dated receiving and shipping dock conditions.
- Obsolete computerized information handling of routine transactions.

The competitive marketplace demands more precise and accurate handling, storage, and retrieval systems, as well as improved packaging and shipping systems. It is vital for a warehouse operation to have the optimal mix of manual and automated handling systems.

Understanding the main points.

Ex. 3. Answer the questions.

1. What is one of the most crucial decisions that any company has to take?
2. What may help logistics executives to make the right decision?
3. What are the advantages of public warehousing?
4. What are the disadvantages of public warehousing?
5. What are the advantages of private warehousing?
6. What are the disadvantages of public warehousing?

Ex. 4. Expand on the following statements from the text.

1. One of the most important warehousing decisions is to decide what kind storage facilities to use.
2. Public warehousing has a number of benefits.
3. Disadvantages associated with the use of public warehousing are not so numerous compared to advantages.
4. Private warehousing present certain benefits to a company.
5. Alongside with advantages private warehousing is associated with a number of disadvantages.

Ex. 5. Work in pairs. Describe the advantages and disadvantages of public and private warehousing.

Text 4. Facility Development

Ex. 1. Before reading the text check the meaning of the following words and word combinations in the dictionary.

Determine, maximize, measure, footage, dimension, capability, aisle, require, illustrate, affect, utilization, counterbalance, turret, alternative, perspective, fluctuate, unpredictable, hypothetical, requirement, accommodate, simulate, wholesale, extremely, lease, eventually, curve, quantity, schedule, dissemination, sourcing, pinpoint.

Ex. 2. Read the text and do the tasks.

One of the more important decisions a logistics executive faces is how to develop an optimal warehousing network for the firm's products and customers. Such a decision encompasses a number of significant elements. Management must determine the size and number of warehouses, and ascertain their location. Each warehouse must be laid out and designed properly in order to maximize efficiency and productivity.

Two issues that must be addressed are the size and number of warehouse facilities. These are interrelated decisions because they typically have an inverse relationship; that is, as the number of warehouses increases, the average size of a warehouse decreases.

Many factors influence how large a warehouse should be. First, it is necessary to define how size is measured. In general, size can be defined in terms of square footage or cubic space. Most public warehouses still use square footage dimensions in their advertising and promotional efforts.

Unfortunately, square footage measures ignore the capability of modern warehouses to store merchandise vertically. Hence, the cubic space measure was developed. Cubic space refers to the total volume of space available within a facility. It is a much more realistic size estimate than square footage because it considers more of the available usable space in a warehouse. Some of the most important factors affecting the size of a warehouse are:

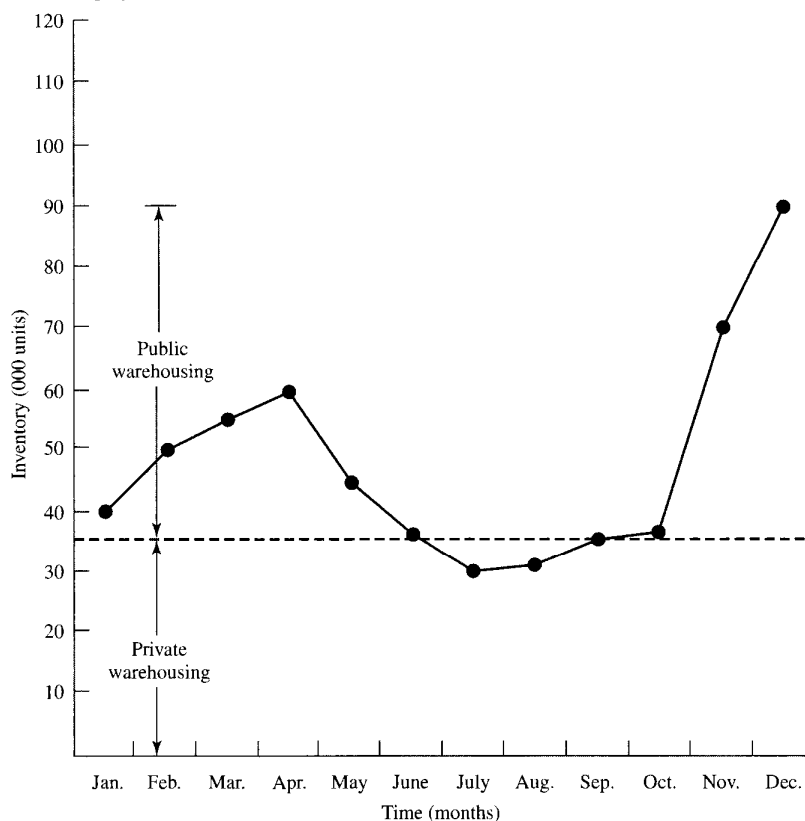
- Customer service levels.
- Size of market or markets served.
- Number of products marketed.
- Size of the product or products.
- Materials handling system used.
- Throughput rate.
- Production lead time.
- Economies of scale.
- Stock layout.
- Aisle requirements.
- Office area in warehouse.
- Types of racks and shelves used.
- Level and pattern of demand.

As a company's service levels increase, it typically requires more warehousing space to provide storage for higher levels of inventory. As the market served by a warehouse increases in number or size, additional space is required. When a firm has multiple products or product groupings, especially if they are diverse, it needs larger warehouses to maintain at least minimal inventory levels of all products. In general, greater space requirements are necessary when products are large; production lead time is long; manual materials handling systems are used; the warehouse contains office, sales, or computer activities; and demand is erratic and unpredictable.

To illustrate, consider the relation of warehouse size to the type of materials handling equipment used.¹⁶ As Figure 1 shows, the type of forklift track a warehouse employs can significantly affect the amount of storage area necessary to store product. Because of different capabilities of forklift tracks, a firm can justify the acquisition of more expensive units when it is able to bring about more effective utilization of space.

Figure 1

The relationship of demand to warehouse size



The simplest type of forklift truck, the counterbalanced track, requires aisles that are 10 to 12 feet wide. At \$30,000, it is the least expensive forklift. The turret truck requires aisles only 5 to 7 feet wide to handle the same amount of product, but it costs \$65,000 or more. The warehouse decision maker must examine the cost trade-offs for each of the available systems, and determine which alternative is most advantageous from a cost-service perspective.

Demand also has an impact on warehouse size. Whenever demand fluctuates significantly or is unpredictable, inventory levels generally must be higher. This results in a need for more space and thus a larger warehouse. All the warehousing space need not be private. Many firms utilize a combination of private and public warehousing.

The hypothetical firm depicted in Figure 1 utilizes private warehousing to store 36,000 units of inventory. This results in full utilization of its facilities all year, with the exception of July and August. For months when inventory requirements exceed private warehousing space, the firm rents short-term storage space from one or more public warehouses. In essence, the firm develops private facilities to accommodate a maximum level of inventory of 36,000 units.

Inventory velocity (as measured by turnover) and the maximization of "direct deliveries" to customers (bypassing a regional or wholesaler's warehouse) can have a great impact on the size of a warehouse. Whirlpool Corporation developed a computer program to simulate these two characteristics, as well as the cubic warehousing space requirements of its total channel network, including wholesale distributors. The company calculated the square footage required for each of its factory-controlled and wholesale warehouses. It added space to the base requirements

of each of its major product categories in order to provide for aisles and docks, and unused (empty) vertical and horizontal storage bays. By manipulating planned sales volumes, inventory turns, and orders shipped directly to dealers, Whirlpool was able to accurately project future warehousing needs.

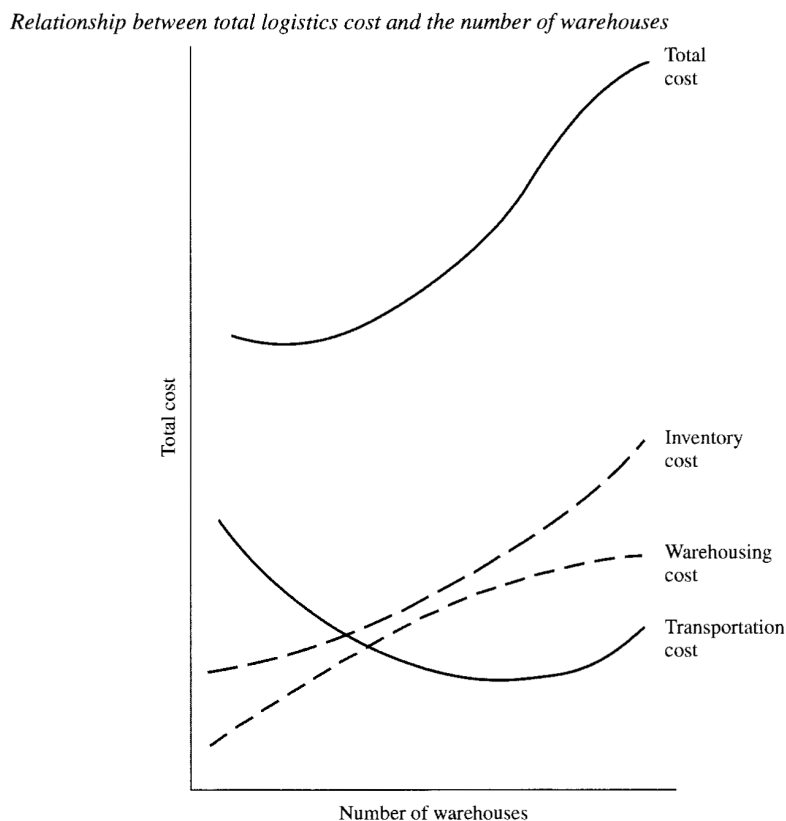
Four factors are significant in deciding on the number of warehousing facilities: cost of lost sales, inventory costs, warehousing costs, and transportation costs. Although lost sales are extremely important to a firm, they are the most difficult to calculate and predict, and they vary by company and industry. If the cost of lost sales appeared in Figure 2, it would generally slope down and to the right. The degree of slope, however, would vary by industry, company, product, and customer.

Inventory costs increase with the number of facilities because firms usually stock a minimum amount (e.g., safety stock) of all products at every location, although some companies have specific warehouses dedicated to a particular product or product grouping. This means that both slow and fast turnover items are stocked; thus, more total space is required.

Warehousing costs increase, because more warehouses mean more space to be owned, leased, or rented, but they decrease after a number of warehouses are brought on-line, particularly if the firm leases or rents space. Public and contract warehouses often offer quantity discounts when firms acquire space in multiple locations.

Transportation costs initially decline as the number of warehouses increase, but they eventually curve upward if too many facilities are employed owing to the combination of inbound and outbound transportation costs. A firm must be concerned with the total delivered cost of its products, not simply the cost of moving products to warehouse locations. In general, the use of fewer facilities means lower inbound transport costs due to bulk shipments from the manufacturer or supplier.

Figure 2



After the number of warehouses increases to a certain point, the firm may not be able to ship its products in such large quantities and may have to pay a higher rate to the transportation carrier. Local transportation costs for delivery of products from warehouses to customers may increase because of minimum charges that apply to local cartage.

If the cost of lost sales is not included, the slopes shown in Figure 2, taken together, indicate that fewer warehouses are better than many warehouses. However, customer service is a critical element of a firm's marketing and logistics systems. In general, if the cost of lost sales is very high, a firm may wish to expand its number of warehouses or use scheduled deliveries. There are always cost-service trade-offs. Management must determine the optimal number of warehouses given the desired customer-service level.

Value of Computers. Computers can help minimize the firm's number of warehouses by improving warehouse layout and design, inventory control, shipping and receiving, and the dissemination of information. Coupled with more efficient warehouses, the substitution of information for inventories tends to reduce the number of warehouses needed to service a firm's customers. In essence, the more responsive the logistics system, the less need there is for warehousing.

Location Analysis. Where would be the best place to build a warehouse that would service the greatest number of U.S. consumers? Bloomington, Indiana, would be closer, on average, to the U.S. population than any other location. If a firm wished to locate facilities closest to its potential customers, using one or more warehouses in their logistics network, a number of sites would be possible.

The site-selection decision can be approached from macro and micro perspectives. The macro perspective examines the issue of where to locate warehouses geographically within a general area so as to improve the sourcing of materials and the firm's market offering (improve service and/or reduce cost). The micro perspective examines factors that pinpoint specific locations within the large geographic areas.

Macro Approaches. In one of the best-known macro approaches to warehouse location, Edgar M. Hoover, an American location theorist, identified three types of location strategies: (1) market positioned, (2) production positioned, and (3) intermediately positioned. The market-positioned strategy locates warehouses nearest to the final customer. This maximizes customer service levels and enables a firm to utilize transportation economies — TL and CL shipments — from plants or sources to each warehouse location.

The factors that influence the placement of warehouses near the market areas served include transportation costs, order cycle time, the sensitivity of the product, order size, local transportation availability, and levels of customer service offered.

The *production-positioned strategy* locates warehouses in close proximity to sources of supply or production facilities. These warehouses generally cannot provide the same level of customer service as market-positioned warehouses; instead, they serve as collection points or mixing facilities for products manufactured at a number of different plants.

For multiproduct companies, transportation economies result from consolidation of shipments into TL or CL quantities. The factors that influence the placement of warehouses close to the point of production are perishability of raw materials,

number of products in the firm's product mix, assortment of products ordered by customers, and transportation consolidation rates.

The *intermediately positioned strategy* places warehouses at a midpoint location between the final customer and the producer. Customer service levels are typically higher for intermediately positioned warehouses than they are for the production-positioned facilities and lower than for market-positioned facilities. A firm often follows this strategy if it must offer high customer service levels and if it has a varied product offering manufactured at several plant locations.

Understanding the main points.

Ex. 3. Answer the questions.

1. Developing an optimal warehousing network is one of the most important decisions for logistics executives, isn't it? 2. What factors influence the size of a warehouse? 3. What factors affect a warehouse size? 4. Why may a company need additional warehousing space? 5. How is a warehousing size related to the materials handling equipment used? 6. How do fluctuations in demand affect a warehouse size? 7. What factors influence the number of warehouses? 8. Where is the best place to locate a warehouse? 9. What are the site selection factors from a micro perspective? 10. What are the benefits of a good warehouse layout?

Ex. 4. Expand on the following statements from the text.

1. Developing an optimal warehousing network is one of the most important decisions for logistics executives. 2. Warehousing size may be defined in terms of square footage or cubic space. 3. Warehousing size is related to the materials handling equipment used. 4. Demand fluctuations impact a warehouse size. 5. Four factors influence the number of warehouses. 6. Factors to be considered when choosing the best place to locate a warehouse. 7. The intermediately positioned strategy places warehouses at a midpoint location between the final customer and a producer.

Ex. 5. Work in pairs. Describe how an optimal warehousing network can be developed.

Text 5. Improving Warehouse Productivity and Financial Dimensions

Ex. 1. Before reading the text check the meaning of the following words and word combinations in the dictionary.

Prior, multinational, preeminent, immense, intermediary, abundance, request, gain, utilization, performance, corrective, highlight, merely, contingency, institute, significant, impact, aware, alternative, obsolescence, router, retrieval, assess, frequently, assign, unbundle, sophistication, aggregate, categorize.

Ex. 2. Read the text and do the tasks.

Products must be stored at some point prior to their final consumption. Depending on the particular conditions in effect in each foreign market, products may be stored at different points within the channel of distribution.

In the European Union (EU), Philips, a large multinational electronics firm, must store and warehouse a variety of products at factories throughout Europe.

Philips has poured impressive sums into the establishment of superautomated international distribution centers, or "Eurostores," for each of its product divisions.

A typical Eurostore is that of Philips's Lighting Division, located in the Dutch city of Roosendaal. Its preeminent features are an immense high-bay warehouse and an all-encompassing computer system that runs the entire operation on an ORFO (order of forwarding) basis. The Eurostore is a study in quiet, rhythmic efficiency, with human management evident only at critical monitoring locations.

If a firm is involved in exporting, it may store items domestically and ship them only after it receives orders. Thus, no foreign storage is necessary.

If distributors or other intermediaries are used, inventories will have to be stored or warehoused at other locations within the channel. The ability of the manufacturer or supplier to push the inventory down the channel of distribution varies from market to market, depending on the size of the channel intermediaries, customer inventory policies, demand for the product by final consumers, storage costs, and customer service levels necessary to serve each market.

In Japan and most European countries, the retail network is composed of a great number of small shops, each having little capacity for inventory storage. As a result, these shops order frequently from distributors, manufacturers, or other channel intermediaries. The burden of storage is carried by the manufacturer or other channel members instead of by the retailer. In the United States, where retail stores are fewer in number but much larger, the storage function is more easily shifted from the channel intermediaries directly to the retailer.

When an international firm needs warehousing facilities in a foreign market, it may find an abundance of sophisticated, modern warehouses in some industrial nations. In Japan, for example, many companies use high-cube automated warehousing. On the other hand, storage facilities in many developing countries may be nonexistent or limited in availability or sophistication. In the latter instance, the product package or shipping container may have to serve the warehousing purpose. Third-party providers such as CTI, Exel, GATX, and Ryder Integrated Logistics have begun operations in Latin America and Asia at the request of their North American customers.

In the United States, many public warehouses provide services such as consolidation and breakbulk, customer billing, traffic management, packaging, and labeling. Public warehouses in many foreign markets also may provide services in addition to storage.

Like all logistics activities, the warehousing and storage activity must be administered differently in each foreign market. The logistics executive is responsible for recognizing how the storage activity differs and adjusting the firm's strategy accordingly.

To obtain maximum logistics efficiency, each component of the logistics system must operate at optimal levels. This means that high levels of productivity must be achieved, especially in the warehousing area. Productivity gains in warehousing are important to the firm in terms of reduced costs and to its customers in terms of improved customer service levels.

Productivity has been defined in many ways, but most definitions include the notions of real outputs and real inputs, utilization, and warehouse performance. One study defined those elements as follows:

▶ *Productivity is the ratio of real output to real input. Examples are cases handled per labor-hour and lines selected per equipment-hour.*

▶ *Utilization is the ratio of capacity used to available capacity. Examples are the percent of pallet spaces filled in a warehouse and employee-hours worked versus employee-hours available.*

▶ *Performance is the ratio of actual output to standard output (or standard hours earned to actual hours). Examples are cases picked per hour versus standard rate planned per hour, and actual return on assets employed versus budgeted return on assets employed.*

Any working definition of productivity probably includes all three components because they are interrelated. Most firms utilize a variety of measures. Firms tend to use more sophisticated productivity measures over time.

A multitude of warehouse productivity measures are used although they can be grouped into major categories such as labor cost per unit handled, amount of space needed to store each unit, and frequency of errors. Performance data must be available and used as the basis for corrective action and proactive improvement.

The general management notion that "you can't manage what you don't measure" is an important warehousing performance concept. Some of the most important areas of measurement that highlight problems or opportunities include customer service (e.g., shipping performance, error rates, order cycle time), inventory accuracy (e.g., the quantity of each SKU is correct at all warehouse locations), space utilization (e.g., having the right inventory, square foot or cube utilization of facilities), and labor productivity (e.g., throughput rates).

It is not enough to merely identify problem areas; rather, it is vital that the firm take appropriate actions to improve poor performance whenever possible. A company should develop decision strategies to handle most problem areas before the problems develop. This is the essence of contingency planning. Once issues are pinpointed, the firm can institute various controls or corrective actions to improve warehouse productivity.

Because warehousing is such a significant component of the logistics process in terms of its cost and service impacts, logistics executives are acutely aware of the need to improve warehouse productivity. Productivity can be improved in many ways, including methods-related, equipment-related, systems-related, and training/motivation-related programs.

Methods-related programs consider alternative processes for achieving desired results. They include those involving warehouse cube utilization, warehouse layout and design, methods and procedures analysis, batch picking of small orders, combined putaway/picking, wrap packaging, inventory cycle counting, product line obsolescence, standardized packaging, and warehouse consolidation.

Equipment-related programs include the use of new technology such as optical scanners, automatic labeling devices, computer generated putaway and pick lists, automated materials handling equipment, communications devices, computers and automated storage/ retrieval systems (AS/RSs), carousels, and conveyors. The Technology box shows how a grocery chain used a radio-frequency system to track its products.

Systems-related programs include the use of router/location systems, geographic or zone picking, and random location of products in the warehouse. These are systems related because they directly affect the way that different components of the logistics system interact.

Training/motivation-related programs include employee training, management development programs, work teams, incentive systems, and awards recognition. These programs can improve warehouse productivity by empowering those closest to the activity to make improvements in operations.

The preceding approaches can be implemented individually or in combination. Most firms utilize several methods simultaneously to improve warehouse productivity.

Financial control of warehousing is closely tied to logistics productivity and corporate profitability. Before the various activities of warehousing can be properly integrated into a single unified system, management must be aware of the risks and costs of each activity.

Many warehouse decisions involve risk. The risks can be of many types, but all eventually will result in some impact on costs or revenues. For example, making a capital investment in automated storage and retrieval systems increases both risk and the level of expected return on investment. Firms must be able to justify such investments financially. The more quickly the cost of the equipment can be recovered, the less risk associated with the decision. Financial accounting and control techniques are very important in assessing the risks and rewards associated with warehousing decisions.

One approach that has proven successful in the financial control of warehousing activities is activity-based costing (ABC). Accurate and timely financial data allow warehouse executives to properly plan, administer, and control warehousing activities. Traditional costing systems, in place at many firms, often do not provide financial data in the proper form for use in making warehousing decisions. Frequently, it is difficult to identify how warehousing costs impact overall corporate profitability and how changes in costs in one area affect costs in another. Some companies are implementing ABC in order to have better warehousing cost information.

With ABC, costs are determined by specific products, services, or customers. It utilizes a two-stage process. The first stage assigns resource costs according to the amount of each resource consumed in performing specific warehousing activities. The second stage assigns warehousing activity costs to the products, services, or customers consuming the activities.

Proponents of ABC state that it unbundles traditional cost accounts and shows how resources are consumed.

Companies are often at various levels of sophistication in terms of warehouse accounting and control. Four levels have been identified:

Level I. Warehouse costs are allocated in total, using a single allocation base.

Level II. Warehouse costs are aggregated by major warehouse function (e.g., handling, storage, and administration) and are assigned using a separate allocation base for each function.

Level III. Warehouse costs are aggregated by major activity within each function (e.g., receiving, putaway, order pick) and are allocated using a separate base for each activity.

Level IV. Costs are categorized in matrix form, reflecting each major activity, natural expense, and type of cost behavior. Separate allocations are developed for each cost category, using bases that reflect the key differences in warehousing characteristics among cost objectives.

Accounting and control require having the right kind of financial data available when and where they are needed, and in a form that is usable by as many functional areas of the firm as possible. Ultimately, these data are essential to making the necessary cost-service trade-offs within the warehousing activity and between other logistics functions.

Understanding the main points.

Ex. 3. Answer the questions.

1. When and why must product be stored? 2. How does Philips tackle the warehousing issue? 3. What does the manufacturer's/supplier's use of inventory depend on? 4. How is retail network organized in Japan and most European countries? 5. How is storage issue solved by retail stores in the United States? 6. How does an international company solve the warehousing issue in a foreign market? 7. What kind of services do public warehouses in the US provide? 8. How can maximum logistics efficiency be achieved? 9. How can you define productivity, utilization and warehouse performance? 10. Why do logistics executives seek to improve warehouse productivity? 11. In what ways can it be improved? 12. Why are financial accounting and control techniques important in assessing the risks of warehousing decisions? 13. What techniques help to financially control warehousing activities? 14. What is the essence of ABC technique? 15. What are the levels of warehousing accounting and control?

Ex. 4. Expand on the following statements from the text.

1. Products may be stored at different points within the distribution channel. 2. Each component of the logistics system must operate at optimal levels. 3. Warehousing is a significant component of the logistics process in terms of costs and service inputs. 4. Warehousing financial control is closely linked to logistics productivity and corporate profitability.

Ex. 5. Work in pairs. Describe how warehouse productivity can be measured and improved.

Creative Solutions

Less Warehousing, Better Distribution

Lincoln Electric is the world's leading manufacturer of welding equipment and supplies, as well as a major producer of electric motors. The company used to have 36 to 40 small warehouses scattered around the country. Pricing policies were designed to encourage large orders that would simplify manufacturing and shipping to end users and stocking distributors.

Because the firm's local warehouses were not large enough to carry a complete stock to supply the growing needs of the distribution network, the company decided to consolidate its distribution in a much smaller number of larger, well-stocked regional distribution centers.

The first distribution center (DC) was set up in Cleveland, Ohio, toward the end of 1989. New DCs were added to cover the rest of the country and corresponding local warehouses were closed when they became redundant. Not only did the consolidation reduce the degree to which inventory was dissipated in multiple locations, but it provided an opportunity to refocus the local facilities.

Lincoln Electric has six regional distribution centers located across the United States and two in Canada. Others are planned for Philadelphia and Mexico, as well as parts of Europe and South America. The U.S. distribution centers range in size from 30,000 to 100,000 square feet and are operated by staffs that vary from three to about a dozen employees.

To get up and running faster, the operations of some new DCs were contracted out, although each has at least one Lincoln Electric employee at the location.

By working more effectively with its distributors and helping them serve their end users better, Lincoln Electric is able to meet the broader needs of the entire arc welding market more effectively. Independent welding distributors can carry a lower level of inventory and rely on a Lincoln Electric DC to provide most items their customers need, usually in 24 to 72 hours.

With minimal delay, customers receive more of the products they need to keep operating. Distributors can provide better customer service and turn inventories more often while maintaining smaller stocks and relying on the distribution centers for backup.

By improving the way it serves customers, Lincoln Electric gains greater efficiency, increased sales, and positive customer relations.

Technology

Radio to the Rescue

"Software can be a real space saver in the warehouse today. Especially when it's combined with a radio-frequency (RF) system to track product instantly. At least that's what West Coast grocery chain Smart and Final discovered.

Faced with a space shortage, the company installed a radio-frequency inventory management system to provide a 'real time' fix on its inventory. Thanks to that up-to-the-minute information about stock on hand, the company was able to use warehouse space better. ... How much better? Smart and Final estimates that the radio-frequency inventory management system brought about a 10 to 15 per cent increase in space utilization.

The West's oldest and largest grocery retailer, Smart and Final earned roughly \$1.1 billion last year [1995]. The Los Angeles-based company, which operates a chain of approximately 150 non-membership warehouse stores up and down the West Coast, ships more than 400 outbound loads of dry goods and health and beauty care products weekly from its distribution center in Los Angeles. A private fleet delivers product to the stores and picks up some inbound shipments on backhauls as well. The company moves freight seven days a week, shipping full trailerloads whenever possible.

Due to growing business, however, the company faced a space shortage at its distribution center three years ago. It had begun considering relocating to a new warehouse when managers decided that a real-time inventory software system just might do the trick. [The company] purchased a radio-frequency (RF) control system that would enhance the company's existing computer system. In an RF setup, workers scan bar-coded items. The scanned data then are fed continuously via radio waves to a computer that monitors stock level and location.

As impressive as the inventory-related improvements may be, they're not the whole story. For one thing, the radio-frequency inventory system also has increased productivity by 25 percent. Today, the center completely turns its inventory 26 times a year.

But most importantly of all, the system increased space utilization at Smart and Final's distribution center to such a degree that a new warehouse is no longer needed."

BBN Communications Serves Customers Worldwide

BBN Communications of Cambridge, Massachusetts, manufactures high-value telecommunications and networking equipment, "including components that allow a firm's satellite offices to combine all computer traffic on a local area network and communicate with the home office to share information." The firm searched for ways to improve service levels to customers located in North America and Europe.

"BBN Communications' remote warehousing solution relies on same-day shipping and delivery of ... components. BBN has established sites in London and Stuttgart for warehousing its high-value materials. London currently is the larger of the two sites.

"Not only do these sites build a comfort level for the parts managers, but also they make life easier on the BBN sales staff ... There are hidden dollar savings to using a location within the [EU] for warehousing parts. One never knows to which country a part might be sent and it is impractical to establish warehouses in every country. By establishing parts centers within the [EU], BBN pays duties only once on materials shipped into [another country] and stored at a parts bank.

"So successful has the European parts bank been [that the company] is considering establishment of a similar depot in Asia ... either Singapore or Hong Kong — to take advantage of the duty free ports there, again bringing cost savings into the warehousing and distribution network."

Target Stores Discover There is More to Site Selection Than Running the Right Models

In choosing a location for a major distribution center to serve the Chicago region, Target Stores considered 55 sites in three states. It did all of the right things: considered proximity to market, transportation costs, labor availability, and tax incentives offered by each community. It narrowed the pool of prospects to three sites, then chose an industrial park in Oconomowoc, Wisconsin. What Target didn't anticipate was landing in the middle of a battle between politicians over environmental concerns.

Target had gone through all the necessary legal and environmental processes to break ground on the Wisconsin site. Yet the environmental groups weren't satisfied. What about groundwater runoff? What about air pollution and congestion from truck and employee traffic? These groups believed the Target project was rushed — "ramrodded" through the state with minimal public awareness or input. To complicate matters further, a neighboring town was protesting this development because of an old battle with Oconomowoc on water and sewer lines. Wisconsin politicians were upset about the impact that this battle would have on the state's "aggressive pro-business attitude."

What did Target learn from this process? Target management would have taken more time to meet in advance with local groups if they had realized the extent of these concerns. Second, going through all the 'right' steps in the political process — dealing with regulators and local governments — is not enough. Third, citizens in small towns such as Oconomowoc, population 7,000, are even more sensitive to the impact of a new facility in their town. Adding more housing, schools, roads, and general infrastructure might change the atmosphere of the town in a manner that would be viewed unfavorably by current residents. Local businesses might feel threatened that their longtime employees may be stolen away by the new employer in town.

Once a facility is in place, its long-range success and viability depends on maintaining and enhancing its good citizenship. Target is committed to this policy. As part of this commitment, it donates 5 percent of its pretax income each year to communities where it has facilities. This story has a happy ending. The Oconomowoc facilities were built and are operational. A great deal of expense and delay could have been avoided by involving the community and concerned citizens and groups in the process at an earlier stage.

How Moore Keeps Its Operations in Top Form

A Canadian corporation headquartered in Toronto, Moore Business Forms and Systems manufactures custom business forms and documents. Corporate sales in 1994 topped \$2.3 billion.

To serve customers in the United States, Moore operates 18 U.S. distribution centers. Although some 75 percent of products are shipped directly from the factory to the purchaser, another 25 percent go into storage for later shipment.

Moore developed six critical measurements designed to maximize warehouse efficiency and effectiveness while maintaining a high level of customer service. The six-element program (referred to as the RSVP program) consists of the following:

1. Safely — zero safety incidents or accidents; the OSHA employee logbooks that report accidents are used for evaluation.

2. Shipping Errors — zero shipping errors in the firm's pick and pack activities (i.e., ship exactly what was ordered to the customer); financial statement information indicates whether orders have been filled completely.

3. On-Time Shipments — delivery of freight precisely when requested because customers are operating JIT operations; warehouse records on shipping performance are used for evaluation.

4. Customer Problems — customer feedback is periodically requested for every shipment, and summary statistics are compiled for management review.

5. Cost per Line Shipped — based on the number of items shipped in a period, the company came up with a cost per line and measures that expense against a pre-established objective; financial statements and the firm's computerized inventory system measure costs in this area.

6. Total Warehouse Expenses — an overall measure of warehouse efficiency which determines whether workers kept warehousing costs in line with company standards and projections.

At the end of each quarter, Moore measures each warehouse's performance against the criteria and issues bonuses to the employees, managers, and directors. During 1994, more than a third of the warehouses met all six objectives. At the end of the year, 99.6 percent of Moore's customers rated their service level as good or better.

Warehousing in the High-Fashion Goods Industry

Fashion is a very perishable commodity ... a hot-selling fashion item is a loser ... unless it is on the selling floor precisely when it is most in fashion. In some cases, that can be as little as 7 to 10 days.

Saks Fifth Avenue operates 69 stores served by two distribution centers. One is in Yonkers, New York, close to Saks's flagship store on New York City's Fifth Avenue. The second is in Ontario, California, well situated to serve the trendy Southern California market.

Neither of these operations is in any sense a warehouse ... Items generally move through these centers on a 24-hour turnaround. There is an emphatic realization ... that every hour that a rack of \$800 dresses sits in a distribution center can represent a lost sale and lost profit.

Speedy transit starts at the beginning of the pipeline. About 80 percent of Saks's imported items move into one of these centers by air freight. Imports move to one of the distribution centers based on the region where they originate: Yonkers handles the European imports and Ontario covers the Far East.

Items are exchanged between the two centers by air freight, with a dedicated flight in each direction between New York and Los Angeles every business day.

The distribution centers then serve their local stores with a combination of air freight and trucking.

POINTS FOR DISCUSSION

1. Warehousing is used for the storage of inventories during all phases of the logistics process. Since inventory carrying costs can be so high, why is it necessary for a firm to store inventories of any kind?

2. What are the differences between private and public warehousing? What are the advantages and disadvantages of each type?

3. What is meant by a cost trade-off analysis within the context of warehousing? Give two examples of the cost trade-offs involved in a firm's decision to use a combination of public and private warehousing rather than public or private warehousing alone.

4. What are the three basic functions of warehousing? Briefly describe each.

Identify and describe some of the more important factors that affect the specific size of a firm's warehouse or warehouses.

5. What are the differences between the following types of facility location strategies: (a) market positioned, (b) production positioned, and (c) intermediately positioned?

6. How can layout and design affect warehouse efficiency and productivity?

7. Productivity has been defined as the ratio of real output to real input. In terms of the warehousing function, how could a firm measure the productivity level of its storage facilities?

8. Discuss the reasoning behind the following statement: 'Financial control of warehousing is closely tied to logistics productivity and corporate profitability.'

Clues to Worked Examples

Worked example 1

Solution

Taking costs over a year, the current position is:

Cost of stock	= amount of stock x holding cost	
	= 10 mln x 0.25 x 0.2	= £ 0.5 mln a year
Total costs	= operating costs + cost of stock	
	= 7.5 mln + 0.5 mln	= £ 8 mln a year
Profit	= sales – total costs	
	= 10 mln – 8 mln	= £ 2 mln a year
Total assets	= total assets + stock	
	= 20 mln + (10 mln x 0.25)	= £ 22.5 mln
Return on assets	= profit / total assets	
	= 2 mln / 22.5 mln	= 0.089 or 8.9%

The new position with stock reduced to 20% of sales has:

Cost of stocks	= 10 mln x 0.2 x 0.2	= £ 0.4 mln a year
Total costs	= 7.5 mln + 0.4 mln	= £ 7.9 mln a year
Profit	= 10 mln – 7.9 mln	= £ 2.1 mln a year
Total assets	= £ 20 mln + (£ 10 mln x 0.20)	= £ 22 mln
Return on assets	= 2.1 mln / 22 mln	= 0.095 or 9.5%

Reducing stocks gives lower operating costs, higher profit and a significant increase in ROA.

Worked example 2

Solution

Gross profit is 5% of sales, so if we take sales of \$100, operating costs amount to \$95. At present, 22% of this, or $95 \times 0.22 = \$20.90$, is due to logistics.

If the company reduces the cost of logistics by 10%, it would save $20.90 \times 0.1 = \$2.09$. Assuming that there are no changes to the selling price or other costs, this is a

direct contribution to profit. A 10% reduction in logistics costs raises profit from \$5 to \$7.09, or an increase of 42%.

Without the reduction in logistics costs, the company would have to increase sales by 42% to get the same increase in profit.

Worked example 3

Solution

The spreadsheet shows this for the first week when demand of 100 units moves through the supply chain. For each tier, you can see:

- demand - which equals the amount bought by the next tier of customers
- opening stock at the beginning of the week - which equals its closing stock in the previous week
- closing stock at the end of the week - which must equal demand in the week
- number of units bought - which equals demand plus any change in stock:
buys = demand met + (closing stock - opening stock)

In week 1 everything is going smoothly, with the usual 100 units flowing down the supply chain. Then in week 2 customer demand goes up to 105 units. The retailer must buy 105 units to meet this demand, plus an additional 5 units to raise its closing stock to 105. So it buys 110 units from the local wholesaler. The local wholesaler has to supply this 110 units, plus an additional 10 units to raise its closing stock to 110 units. So it buys 120 units from the regional wholesaler. The regional wholesaler has to supply this 120 units, plus another 20 units to raise its closing stock to 120 units. So it buys 140 units from the manufacturer.

In week 3 we get the reverse effect as customer demand returns to 100 units. The retailer now reduces closing stock to 100 units, so it only has to buy 95 units from the local wholesaler. The local wholesaler reduces its closing stock by 15, so it only has to buy 80 from the regional wholesaler. The regional wholesaler reduces its closing stock by 40, so it only buys 40 from the manufacturer. The manufacturer would like to reduce its closing stock by 100 units, but its demand is only 40 units so it stops production and meets all demand from stock.

A variation in customer demand of five units in one week has made manufacturing vary by 180 units a week, with an effect continuing for several more weeks.

A List of Abbreviations

ABC – activity based costing

AOL – an American multinational mass media corporation based in New York City

AS – automated storage

BAT – the **Bloomberg Aptitude Test** – is an aptitude test owned, published, and developed by Bloomberg Institute – an educational division of Bloomberg LP. It is used by employers in the business world to evaluate employment candidates. (Bloomberg L.P. is a privately held financial software, data and media company headquartered in New York City).

BBN Communications (formerly Bolt, Beranek and Newman) – a technology company in Cambridge, Massachusetts.

B2B – **business-to-business** – is commerce transactions between businesses, such as between a manufacturer and a wholesaler, or between a wholesaler and a retailer.

B2C – **business-to-consumer** – is a transaction that occurs between a company and a consumer, as opposed to a transaction between companies. The term may also describe a company that provides goods or services for consumers.

CL – carload

CTL – a British computer manufacturer of the 1970s and 1980s.

DC – distribution centre

DEL – **Dell Inc.** – is an American privately owned multinational computer technology company based in Round Rock, Texas, United States, that develops, sells, repairs and supports computers and related products and services. Bearing the name of its founder, Michael Dell, the company is one of the largest technological corporations in the world, employing more than 103,300 people worldwide

DHL – a division of the German logistics company **Deutsche Post DHL** providing international express mail services

DVD – (**digital versatile disc** or **digital video disc**) is a digital optical disc storage format, invented and developed by Philips, Sony, Toshiba, and Panasonic in 1995.

EDI – electronic data interchange

EFT – electronic fund transfer

EPOS – electronic point-of-sales data

EU – the **European Union** – is a politico-economic union of 28 member states that are located in Europe.

Excel – a spreadsheet application by Microsoft Corporation.

FedEx – **FedEx Corporation** – is an American global courier delivery services company headquartered in Memphis, Tennessee. The name “FedEx” is a syllabic abbreviation of the name of the company's original air division, Federal Express, which was used from 1973 until 2000.

GATX – an equipment finance company based in Chicago, Illinois. Founded in 1898, GATX's primary activities consist of railcar operating leasing in North America and Europe. In addition, GATX leases locomotives in North America, and also has significant investments in industrial equipment and marine assets, including ownership of the American Steamship Company, which operates on the Great Lakes.

GDP – **Gross Domestic Product** – is defined by the Organization for Economic Co-operation and Development as "an aggregate measure of production equal to the sum of the gross values added of all resident, institutional units engaged in

production (plus any taxes, and minus any subsidies, on products not included in the value of their outputs)

GKN – **GKN plc** – is a British multinational automotive and aerospace components company headquartered in Redditch, Worcestershire.

HGV – **heavy goods vehicle** – a truck category

IBS – IBS Software Services is an Indian multinational IT solutions provider to the Travel Transportation and Logistics (TTL) industry. The company is headquartered at Technopark, Trivandrum India.

IRS – **The Internal Revenue Service** – the revenue service of the United States federal government. The government agency is a bureau of the Department of the Treasury, and is under the immediate direction of the Commissioner of Internal Revenue. The IRS is responsible for collecting taxes and the administration of the Internal Revenue Code. It has also overseen various benefit programs, and enforces portions of the Affordable Care Act.

ISO 9002 – model for quality assurance in production, installation and servicing

JIT – **just in time** – is a methodology aimed primarily at reducing flow times within production as well as response times from suppliers and to customers.

PC – **personal computer** – is a general-purpose computer whose size, capabilities and original sale price make it useful for individuals, and is intended to be operated directly by an end-user with no intervening computer operator

PRISM Team Services – is a clandestine surveillance program under which the United States National Security Agency (NSA) collects internet communications from at least nine major US internet companies.

RF – radio frequency

ROA – **return on assets** – shows the percentage of how profitable a company's assets are in generating revenue.

Ryder Integrated Logistics – a popular truck rental and leasing company for companies' distribution and supply chain efforts.

RSs – retrieval systems

RSVP – request for response (French: *répondez s'il vous plaît*)

TL – truckload

UK – the United Kingdom of Great Britain and Northern Ireland, commonly known as the **United Kingdom** or Britain, is a sovereign state in Europe.

UPS – **United Parcel Service, Inc.** – is the world's largest package delivery company and a provider of supply chain management solutions

US – the United States of America, commonly referred to as the **United States** or America, is a federal republic consisting of 50 states and a federal district.

PART II.

REVIEWING GRAMMAR

Word order. Sentence structure.

Ex. 1. Find a suitable place for the adverbials in brackets.

1. He worked (hard, today, in the garden). 2. He climbed (awkwardly, out of the window). 3. He just walked, not waiting for the bus (quite often). 4. Don't worry, I get enough exercise – I walk (quite often). 5. He walked there only to enjoy the quietness of the place (often). 6. They lived there (for a year, quite happily). 7. But I doubt whether I shall ever visit Canada again (very much). 8. She looked up (in surprise). 9. He queued up (at the bus stop, every day, patiently). 10. She lives (next door, actually). 11. They knew the town (apparently, well). 12. He couldn't run (enough, quickly). 13. Tom couldn't get the money (honestly, anywhere). 14. I'll buy one apple (just). 15. We came to the place where they were to wait for us (too early). 16. They stood (side by side, for a moment, in the doorway).

Noun (Number. Case. Article)

Ex. 1. Change the number form of the nouns in bold type for the plural.

1. This place can well be called an oasis of culture. 2. The atomic nucleus must not be used as a medium of destruction, but rather as a medium of construction. 3. Every heavenly body revolves around its axis. 4. Through a microscope we can see such a tiny living thing as a bacillus, a bacterium, or a larva. 5. A more detailed analysis of this phenomenon can be found in a specialised encyclopedia. 6. A fungus is a kind of a poisonous mushroom. 7. There is a strict criterion, which makes it possible to support this hypothesis and to present it in the form of mathematical formula. 8. An abacus is a very simple instrument for doing arithmetic. 9. A nebula is a cloudlike group of stars, too far away to be seen singly. 10. An alumnus of a university is a person who has attended, or is a graduate, of this particular institution.

Ex. 2. Replace the of-phrases by the possessive where possible.

1. We walked a little along the bank of the river. 2. Let's climb onto the roof of the house and lie in the rays of the sun. 3. Would you like a cup of milk? 4. The school is at the distance of two miles from the Town Hall. 5. The taming of animals requires great patience and self-possession. 6. How great is the population of our country now? 7. What is the height of this old oak tree? 8. We were rather tired after a walk for an hour. 9. There was a heap of books under the table. 10. The tides of the ocean are caused by the movement of the Moon. 11. Corporal punishment of children has long been prohibited in schools. 12. We examined the places of interest of London, which are near Trafalgar Square. 13. Your treatment of my younger brother is something shameful. 14. What will mankind do when the resources of the world are all exhausted? 15. Who was the discoverer of the ancient Greek City of Troy in the 19-th century?

Ex. 3. Use the right article to show whether the noun is used as countable or uncountable.

1. ... ironmonger is ... person dealing in goods made of ... iron, such as pots and pans. 2. ... iron is an instrument for pressing and smoothing our clothing. 3. One of

the greatest figures in ... Greek thought was Aristotle. 4. He hasn't ... thought in his head. 5. I need ... needle and ... thread to sew up button. 6. Your silly mistake makes all our plans hang by ... thread now. 7. In the darkness of the hall only ... thread of ... light came through the keyhole. 8. The Greek myth says Prometheus stole ... fire from Olympus to give it to men. 9. When ... night came, the scouts put up ... fire to frighten off the wolves. 10. There was ... fire in the coal-mine the other day. 11. When Western Allies waged ... war against Hitler, it was not ... war within Europe only. 12. I can do with ... hard-boiled egg for breakfast. 13. Wipe your chin: you've got ... egg there. 14. He began with ... red wine, bad olives and other obscure foods. 15. This was ... wine he had never tasted before. 16. He saw ... light in the distance and felt more assured. 17. Could you give me ... light? 18. What is the speed of ... light?

Pronoun

Ex. 1. Insert the proper form of the personal pronoun in brackets.

1. I had turned and faced (he). He was taller than (I) 2. I only mean I'm sorry the captain's (I). 3. He'll be between (you) and (I), anyway. 4. It was (he) before whom she felt defeat. 5. It was (she) who asked the next question. 6. It's (they) whom I pity desperately. 7. 'She's better at it than (we) are', said Nora. 8. It was (I), not Martin who had insisted on seeing (he) that night – because I wanted his support. 9. I recalled, too, there had been some talk between Tom Wells and (she). 10. Now here you are, safe and sound. And you have your home and Eliza and (he). 11. This is (I) who can help you.

Ex. 2. Choose the appropriate form of the possessive pronoun.

1. I went (my, mine) way, and she went (her, hers). 2. He left (her, hers) with (their, theirs) child. 3. What was the experiment of (your, yours)? 4. He slipped (his) arm in (her, hers). 5. From this point onward (their, theirs) story comes in two versions, (my, mine) and (her, hers). 6. The Minister's room was only two doors from (my, mine). 7. 'That thought is not (my, mine),' he said to himself quickly. 6. Where's (your, yours) seat? I shall go to (my, mine). 9. Call me what you like. You have chosen (your, yours) part, we have chosen (our, ours). 10. His nature was harder than most of (their, theirs).

Ex. 3. Choose 'this', 'that', 'these', 'those' or 'it'.

1. Will ... pair suit you? Or maybe ... one, over there? 2. Thank you, ... will do, take your seat, please. 3. Look at ... flowers! Aren't they lovely? 4. Look at ... bright stars! How magnificent! 5. She knew Mother would least of all expect her to leave the farm on ... morning. 6. Martin had married Irene ... autumn, but I could not visit them for some time afterwards. 7. Well, yesterday he closed up his shop business altogether. Didn't somebody mention ... to you? 8. I'll tell you ... : there's no smoke without fire! 9. I can't be sure, ... is only what he himself said. 10. But she opposed her own strength, ... someone who had gone into the world and could imagine no other life. 11. The architectural monuments of Moscow have little resemblance to ... of Petersburg. 12. I request from all ... present a minute's silence, please. 13. Don't tell me, I know all 14. Don't tell me, I know ... all. 15. When she's had five or six cocktails she always starts screaming like 16. If I were to prepare one immaculately phrased generality, it would be ... : we are a new breed.

Ex. 4. Fill in 'few', 'a few', 'little', 'a little'.

1. I can't go yet, there are still ... things left undone. 2. The forces were obviously unequal: we were many, they were 3. Many members of the audience were silent, and some ... had left at intervals throughout the speech. 4. Of course, there were ... wrong spellings, but not too many. 5. When women place their secret lives in the hairdresser's hands, he gains an authority ... other men ever attain. 6. I don't deny that perhaps Amy took her husband ... too much for granted. 7. ... did he know what was in store for him. 8. I must admit, this problem has given me not ... trouble, yet I have solved it. 9. Unfortunately, there were quite ... mistakes in your paper. 10. I'm a newcomer to the town, I know only ... here. 11. I must say I know only ... more than you. 12. He feels rather lonely, he has ... friends in his class. 13. I feel much better now that I already have ... friends. 14. Is there any time left still? – Just 15. So ... people came that we had to cancel the meeting. 16. Everyone was there – Tom, Paul, Jenny, to name but 17. Many shall be called, but ... chosen. 18. We need one more player, we are one too ... for this game.

Adjective. Adverb

Ex. 1. Use the adjectives in the comparative or superlative degree.

1. I am sure he is the (true) friend I have. 2 It is (true) to say that British English is influenced by American, rather than the other way round. 3. Walking, for many, the (pleasant) kind of physical exercise. 4. It is much (pleasant) to walk in bright weather than in the rain. 5. I haven't seen a (stupid) person than he in my life. 6. He is surely (stupid) than he tries to seem. 7. You could not find an (unhappy) fate than hers. 8. He felt still (unhappy) after what he had heard. 9. There has never been a (cruel) regime than in that country. 10. A defeat in a war makes the dictator even (cruel) than does victory. 11. Today he has been (quiet) than ever before. 12. I wish to live in the (quiet) street of the (quiet) little town. 13. He seemed to be (glad) than I had expected. 14. Here was one of the (handsome) specimens of humanity he had ever seen.

Ex. 2. Choose the right word.

1. (cold/coldly) a) What a ... day it is! b) Why did you speak to me so ... ?
2. (sad/sadly) a) She was very ... when I saw her last. b) She looked ... about her before leaving the place. 3. (silent/silently) a) He was ... for a time. b) Then he turned round ... and left the room. 4. (good/well) a) Your English is very b) You speak English very 5. (simple/simply) a) How did you find my place? – Quite b) This exercise is very c) It was not so ... to understand you. 6. (terrible/terribly) a) There was a ... storm at night. The wind blew b) I am ... sorry to hear it. 7. (quick/quickly) a) He can run very b) What a ... runner he is! 8. (high/highly) a) The boy was ... praised for his singing. b) The plane flew very ... in the sky. 9. (close/closely) a) Let's look at the problem more b) He lives quite ... to my place. c) These things are ... connected. 10. (deep/deeply) a) They buried the gold ... in the ground. b) Her feelings were ... hurt. 11. (right/rightly) a) Go on straight, then turn b) The table stands ... in the middle of the room. c) I'm afraid you didn't get me I didn't mean that. d) The newspapers quite ... criticize the government. 12. (pretty/prettily) a) The girl likes to be ... dressed. b) Your English is ... good now. 13. (hard/hardly) a) Just what he wanted, Presley ... knew. b) You have been working very ... lately. c) He was so tired that he could ... move.

Numeral

Ex. 1. Write in words.

4, 14, 40; 5, 15; 50; 8, 8th, 18th, 80th; 9, 19, 90, 9th, 90th.

Ex. 2. Fill in appropriate articles where necessary.

1. It was only ... fifth of July, and no meeting was fixed with Fleur until ... ninth.
2. June walked straight up to her former friend, kissed her cheek, and ... two settled down on a sofa never sat on since the hotel's foundation. 3. He'd catch ... two o'clock train back to New York. 4. She's quite aged for ... seventy, isn't she? What I would call ... old seventy. 5. The letter bored him, and when it was followed next day by another, and the day after by ... third, he began to worry. 6. Philip looked at his uncle with disapproval when he took ... second piece of cake. 7. He walked along thoughtfully. He wasn't going to be one of ... lucky ten who were going to be taken back. 8. 'Miss Luce will be ... second mother to the children,' she said. 9. They talked of ... thousand things, and they all talked at once. 10. James looked at her sideways, and placed ... second piece of ham in his mouth. 11. The phone rang almost immediately ... third time. 12. The phone ringing for ... fourth time, interrupted his thoughts. 13. ... three times I have already done that. Everything! Then this time will make ... fourth. 14. That question, too, he had asked himself ... thousand times. 15. Once more he had used the service stairs from ... eighth floor ... ninth.

Modal verbs

Ex. 1. Fill in the blanks with the verbs can or may.

1. It ... have been anything serious, or I should have remembered. 2. You ... have noticed that I happen to wear my hair rather long. 3. She ... never remember clearly what came after. 4. You ... have noticed he was not himself at lunch. 5. If she ... only see what he's really like! 6. ... I now and then come and sit here and talk to you? 7. I ... have more questions to ask you later. 8. ... you possibly lend us a hundred pounds? 9. It ... have been some days ago – weeks perhaps. Or – it ... have been yesterday afternoon. 10. One ... not know, you see, what is important. 11. He chose an inside table against the back wall where he ... look over the other tables to the people walking in the street. 12. Of course, I ... be imagining it, but I don't think I am. 13. Be careful – did you hurt yourself? You ... have struck your head on that marble chimney-piece. 14. 'Shirley, don't hate me.' – 'Hate you? How ... I hate you?' 15. I ... have one or two people coming in tomorrow evening. Why not join us? 16. I ... not bring myself to forgive him. 17. ... I order you something? 18. Shirley ... have told you what she wouldn't like to tell me. 19. She ... see no harm in just bringing Josephine on the terrace. 20. You ... have seen Mr de Winter's name in the papers recently. 21. She turned on the light as though it ... warm her. 22. Yes, it was awful, but what ... I do? – You ... have asked my advice!. 23. Harry ... often be seen sitting on the porch with a pipe in his mouth.

Ex. 2. Fill in the blanks with the verbs can, may or must.

1. Perhaps he went to the beach by another way, I ... have missed him. 2. They ... not have had the key. It never left me day and night. 3. 'Impossible,' I cried. 'You ... be making a mistake.' 4. Will you give him these cards and ask if we ... see him for a

moment? 5. You ... go upstairs and use our bathroom. 6. But surely he ... have gone to the wrong flat. That is the only possible solution. 7. Yes, you ... leave the room now. But be careful. 8. She ... have been talking to your father, she ... not have been talking to anyone else. 9. He's honest enough, whatever else he ... be. 10. You absolutely ... come and see that place. 11. He was a nice-looking young fellow with a touch of graying hair at the temples though he ... not have been much over thirty. 12. I strolled across the lawn to the house, aware that they ... be watching me still from a chink in the shutters. 13. Let me introduce you to Monsieur Poirot, of whom you ... often have heard. 14. But it ... not have been anything serious, or I should have remembered. 15. Some astonishment ... have shown itself on his face, for she looked at him and paused. 16. Perhaps it ... have been better if you hadn't written letters to us. 17. She asked the fishmonger if she ... leave the basket with him while she got some other things. 18. ... I have some more of that delicious salad, do you think? 19. Helena, you ... not leave him. He needs you, I know he needs you. 20. I adore Scarlatti. Partly because only musicians ... play him. 21. I ... have been the first person to put on that mackintosh since the handkerchief was used. 22. What you tell me ... be true, but it happened many years ago. 23. Her hair hung down so that Anne ... not see her face. 24. It ... have been twenty minutes past seven when he heard the call. That ... be a fact useful to the police if anything ... be discovered. 25. I ... swim when I was five. Daddy taught me. 26. You ... also address me as Aunt Augusta for the future.

Ex. 3. Fill in the blanks with must, have to or be to.

1. To work with method, one ... begin from the beginning. 2. I ... be getting sentimental. 3. Nowadays one ... do nearly everything oneself. 4. I ... think who she was talking about. She ... have meant your father. 5. He ... leave the vessel at Melbourne and go off at once to the gold-fields. 6. I had left my key at home, and my servant ... let me in. 7. I ... be mad, coming here like this. 8. We ... dine together and then go to the Opera. 9. But who was it – Daniels or O'Murphy? It ... have been one of the two. 10. The man lost his way and ... drive back half a mile. 11. It seemed horrible to him that it was here the fatal portrait ... be hidden away. 12. The man ... touch him twice on the shoulder before he woke. 13. This was comedy, one ... not make it into tragedy. 14. Two days ago I asked Sybil to marry me. I am not going to break my word to her. She ... be my wife. 15. I am afraid that you ... go back the way you came. There is no through road. 16. She ... not to return to dear Mamma or to Sheffield, not ever again. 17. The next afternoon there ... be an attack up the river. 18. The carriage ... have come back by this time. 19. Sooner or later we all ... pay for what we do. 20. I asked what time the attack ... be and they said as soon as it was dark. 21. I was very hot and ... take a drink of beer to cool my mouth.

Ex. 4. Fill in the blanks with the verbs can, may, must, should, ought, need, have to, be to.

1. At this time Strickland ... have been nearly forty-seven. 2. 'Real friends ... have everything in common, ' the Miller used to say. 3. Surely he ... have stayed with her on her birthday! 4. She ... never have married him! 5. You ... not bother with these things here for you are among friends. 6. If anything ... happen to me, my wife will be left very badly off. 7. That young American chap ... have overheard

something too. 8. Tell him I'd wait twenty years for him if I .. do. 9. This ... be the very last dinner he would ever eat at Ella's. 10. He ... go to business, why ... other people stay in bed merely because it was dark and foggy? 11. I ... have insisted on going by myself and who knows I ... have got a job when I got to London. 12. You ... not be afraid, I never cry. 13. Why ... you and I talk about it? 14. He suggested that I ... stay with him for a few days so that he ... show me something of the surrounding country. 15. It ... be a tiny path, or it ... extend for miles. 16. I think I ... find some girl, who'll just look after me. 17. Well, my dear fellow, you ...not eat as if you were going to eat it all. 18. Harris said there ... have been twenty people following him in all. 19. It was of himself and his own future, that he ... think. 20. It's not my secret. But I'll see what I ... do, because I think both you and John ... be told. 21. I ... say that you ... have shown more consideration. 22. It's absurd to have a hard and fast rule about what one ... read and what one ... not.

Verb (Tense. Voice)

Ex. 1. Use the required present tense instead of the infinitives in brackets.

1. I (to be) here too long. I (to want) to get away. 2. What he (to do) for a living? – He (to sing) and (to play) the guitar. – He (to play) for his friends or just for money? – I (not to know). – He (to have) a commercial concert soon? – Yes, on Saturday. 3. Where you (to be), Tommy? Look at your face! You're a sight! – Mummy, you always (to grumble)! 4. Everybody (to be) here? – No, Mr Black (not to come) yet. I think he (not to return) from abroad yet. He (to arrive) on Saturday. 5. The old man (to sit) in front of the fire since dinner-time. 6. I (not to have) a holiday fir two years. 7. 'Gentlemen,' Andrew said. 'I just (to wait) for a good position – such as this – to get married.' 8. We (to take) two rooms in Dabney Street and we (to furnish) them now. 9. 'What you (to write) to him about?' she asked looking over my shoulder. 10. What you (to tell) me (to be) quite a romance. 11. For years you (to say) you (to be) trapped out, but you always (to get) through. 12. I (to read) the book you (to hold). 13. You always (to forget) something! 14. I (to grow) too fat! 15. Something (to worry) me all day! 16. All I (to know) is that somebody (to stick) pins into my wax image for years.

Ex. 2. Use the Past Indefinite instead of the infinitives in brackets.

1. Mrs Sunbury (to cut) the cake and (to put) a large piece on Betty's plate. 2. He (to look) at her for a moment with surprise. 3. Eric (to switch) on the wireless and (to sit) down beside it. 4. She (not to smile) when she (to see) him. 5. On the way home she usually (to buy) a slice of honeycake at the baker's. It (to be) her Sunday treat. 6. Three o'clock (to strike) , and four, and the half hour (to ring), but Dorian Gay (not to stir). 7. When he (to arrive) he (to find) the patient to be a small boy of nine years of age. 8. A little before nine o'clock I (to descend) to the ground floor. 9. When Eddy (to leave) in the morning he (to take) her photograph with him. 10. The girls (to sit)side by side at their desks, they (to lunch) together every noon, together they (to set) out for home at the end of the day's work. 11. A quarter of an hour later he (to hear) voices. 12. On the fifteenth of October Andrew (to set) out alone for London. 13. Bart's train (to get) into Central about half past five, and he (to go) to the servicemen's hostel and (to have) a both and a sleep. 14. The stranger (to climb) into

his car and (to drive) away, and when he (to notice) later that his speedometer (to indicate) seventy-five, he (to laugh) at himself but (not to slow) down. 15. Clapper (to stare) at the photograph without a change of expression for at least half a minute.

Ex. 3. Use the Present Perfect or the Past Indefinite instead of the infinitives in brackets.

1. You (to behave) like this ever since I first (to come) here. 2. It (to happen) when I (to be) out. 3. She just (to remind) me that we (to be) at school together. 4. I never (to have) the slightest desire to be an actress. 5. I (to meet) Tom this morning at the station. 6. I'm very sorry, Doctor, but Doctor Griffiths (to go) to Swansea on important business. 7. She (to finish) cleaning the bathroom, then she (to begin) peeling potatoes. 8. I (to see) her name in the (papers) rather often of late. 9. They (to leave) just a week ago today. 10. Most of the children here (to have) measles already. 11. They (to talk) much that evening. 12. 'I (to do) something,' he (to think). 'Oh, I (to do) something real at last.' 13. The bell (to ring) repeatedly, but they (not to answer) it, and presently it (to stop). 14. You can't see Herb. He (to be) out. – No, he (not to be). I (to watch) him to go in with his dad and he (not to come) out yet. 15. She (to lift) her bag from the sideboard and (to take) out a two-shilling piece.. 16. 'Good morning, Mrs Watt,' she said. 'Eric (to tell) you what to do? 17. I (to love) you since I (to see) you walk into that classroom. 18. I don't think I (to be) out more than a couple of minutes. 19. The thing is that I (to come) to have a talk. 20. I'm her sister, and we (to have) only each other since Dad (to die).

Ex. 4. Use the Past Indefinite or the Past Continuous instead of the infinitives in brackets.

1. She (to go) to the back door, and as she (to raise) her hand to knock, the young man (to open) the door suddenly. 2. While the eggs (to boil) I (to go) out into the hall and (to phone) Jo. 3. He (to begin) to walk fast down the hedge; he couldn't see where he (to go). 4. She (to invite) him to the party she (to give) on Saturday. 5. He (to pause). They all (to look) at him now, interested. 6. She (to have) the satisfaction of seeing that Betty (to get) more and more ill at ease. 7. I (to wash), (to brush) my hair and we (to start). 8. It (to rain) hard and she (to run) for taxi. 9. Near her a small boy (to play) silently. 10. She (to look) up to see if we (to listen). 11. Next day, when the car (to come) we (to vanish) into the bush. 12. And all the while she (to think) how to get the money from Christie. 13. For the first time he (to notice) Heidi (to wear) a new dress: a simple affair of dep blue. 14. Lizzi (to eat) busily and (not to raise) her head. 15. It so (to happen) that she (to dine) that very evening at Timothy's. 16. Mrs Pimley (to come) into the drawing-room where we all (to sit) reading the papers after breakfast.

Ex. 5. Use the Past Indefinite or the Past Perfect instead of the infinitives in brackets.

1. Suddenly he (to grit) his teeth in angry exasperation. Not only he (to omit) to leave his card; he (to forget) to tell them who he (to be). 2. It (to be) perfectly true that he never (to take) the slightest interest in his clothes, a suit off the peg always (to serve) him excellently, (to cover) him, (to keep) him warm without elegance. 3. It (to be) nine o'clock and we (to come) to her room two hours before, as we (to do) often

on those winter evenings. 4. At once Helen (to smile) at me; yet I (to see) that it (to be) an effort for her to clear her mind of what (to go) before. 5. Gideon (to wake) early that morning possibly because the ringing of the fire alarm (to be) in his mind most of the night. 6. He (to graduate) from Queen's College before he (to take) his master's degree at Christ Church, Oxford. 7. 'What he (to say)? Tell us! Tell us!' He (to tell) them what he (to say) and what the rector (to say) and, when he (tell) them, all the fellows (to fling) their caps and (to cry): 'Hurroo!' 8. When he (to come) back to his seat his manner (to change). He (to be) gentle and kind. 9. He (to see) he (to be) already further out than he (to hope) to be at this hour. 10. By the time Fenella (to take) off her coat and skirt and (to put) on her flannel dressing-gown, grandma (to be) quite ready. 11. No sooner we (to put) down our glasses than the waiter (to refill) them. 12. Inquiring for her at tea-time Soames (to learn) that Fleur (to be) out in that car since two.

Ex. 6. Use the Present Indefinite or the Future Indefinite instead of the infinitive in brackets.

1. I (not to mention) it unless he (to do). 2. You go home and if we (to see) Tommy Flynn we (to tell) him. 3. Within a week you (to agree) with me. 4. Of course it can't last, but when it (to come) to an end it (to be) a wonderful experience for him. It really (to make) a man of him. 5. He (to dance) attendance upon her as long as she (to let) him. 6. I (not to work) any more today; I (to stay) with you. 7. I (not to want) Eliza to have the shock of your news until she (to make) it up with these two gentlemen. 8. He (to let) Mrs Rodd go free tonight – on condition that we all (to leave) tomorrow. 9. If you (not to intend) to go in for the whole day you'd better let me know and I (to ring) up when I (to get) to work and tell them you (to be) sick. 10. You just stay there until I (to tell) you, my girl, and I (to clean) up the house. 11. If you (to wait) ten minutes, I (run) both of us round in the car. 12. When you (to be) up in the sanatorium it (not to seem) so bad, I (to be) sure. 13. Now I (to tell) you a secret if you (too promise) not to tell anyone. 14. It (not to be) so long till we (to be) together and then it (not to be) so hard for him. 15. Once I (to get) her into one of those sanatoria, you (to have) no expenses at all, but until there (to be) a vacancy I can't get her in.

Ex. 7. Use the required future or present tense instead of the infinitives in brackets.

1. I expect we (to see) a lot of each other. 2. I (to get) old and (to have) children by then. 3. In a minute I (to join) you, my friend. 4. She knows that if she (to come) she (to have) a chance of a happier and surer life than she has had. 5. You don't think it (to rain), do you? 6. In a week you (to drive) with this woman in the Park. She (to be) your constant guest, your dearest friend. 7. I (to start) out on my round by the time you (to go). 8. I (to think) of you day and night. 9. If you (to mention) her name again, I (to knock) you down. 10. You (to stay) in Rome long? 11. Why, we (to work) all night and (to finish) everything by midday tomorrow. 12. Bart and your mother (to come) to dinner. 13. I (to stink) American until I (to drop) dead. 14. Our people (to wait) at the emergency entrance. 15. Mum, I think we (to leave) for Chicago sooner than we thought. We (to start) getting ready tomorrow morning.

Ex. 8. Use the required tense of the Passive Voice instead of the infinitives in brackets.

1. Each candidate (to question) in turn by two separate examiners. 2. Andrew saw at once that she (to instruct) carefully beforehand. 3. He insisted on seeing the article before it (to publish). 4. While the meal (to prepare) the mother sat by the sick child's bedside. 5. Jennie (not to forget). We all remember her. 6. He opened his eyes and (to blind) by a circle smaller than the moon. 7. Not a single copy of the books he spoke of ever (to ask). 8. I (to inform) that you (to see) in Church Street in conversation with a young gentleman. 9. The room just (to move) into, it smells wet paint. 10. He didn't utter a word, knowing that whatever he said (to meet) by the same silence. 11. My question (not to answer) properly yet. 12. The shop looked shabbier in artificial light: the shelves were dusty and the ceiling (not to paint) since I went there.

Ex. 9. Use the required passive forms instead of the infinitives in brackets.

1. Her brother (to elect) president of the new concern. 2. Do you know how pictures (to sell) nowadays? 3. She stared at the picture that (to snap) the night before at Morocco. 4. Back in the living-room, when coffee (to pour), Lily excused herself and left us. 5. Soames thought that perhaps Irene knew she (to shadow). 6. Then he wanted tools and nails, and soon all the closets and shelves (to put) in order. 7. As his eyes cleared he saw that the lantern (to hold) in the air. 8. He felt he (to enlist) for the fight, that some duty (to lay) upon his shoulders. 9. The lists (to send) to both newspapers and now (to print). 10. There was vibration on the ground floor, and even more on the second, where I (to take). 11. When the goods (to pay) for a heavy freight wagon halted in front of the store. 12. In company with Suel James they ate dinner. While cigarettes (to roll) after the meal, Nowlen and his foreman went into the office. 13. All the things that Roberta and Harmon did for Ted (to do) for themselves long before Ted was born. 14. The ash-trays still held last night's cigarette ends, the sofa pillows (not to straighten), and there were two magazines on the floor in the exact position in which they (to leave) the previous night. 15. Don't keep telling me I'm pretty. I (to tell) that ever since I was twelve. 16. The letter said that for his thesis Andrew (to award) his M.D. 17. She looks like a spoiled child who (to punish). 18. Do you realize that these animals (to use) to save men's lives, perhaps your own lives?

Ex. 10. Use the required active or passive forms instead of the infinitives in brackets.

1. He (not to waste) time with foolish questions like why, when and where. He (to do) as he (to tell). 2. Always a punctual woman, she (to come) downstairs as the front door (to open) for Charles. 3. Some kind of public demonstration (to plan) to take place at the airport tonight. 4. The flight (not to announce) yet. It (not to announce) for another half-hour, at least. 5. The message, as Tanya (to dictate) it, (to type) by a girl clerk in New York. 6. She could tell by the inclination of his head that he (to listen) intently to everything that (to say). 7. It (to be) an old house that (to divide) into flats. 8. Julia can't know what (to say) about her, and someone must tell her. 9. Each apartment usually (to share) by two or three girls. They (to know) as stewardess' nests. 10. Inez (to occupy) a chair in the room's centre to which she (to guide) on arrival. 11. He (to see) that the doors of Trans America Flight Two (not to close) yet, and a few remaining passengers still (to check) in.

Non-Finite Forms

Infinitive

Ex. 1. Insert the infinitive with the particle to before it where necessary.

1. She began (to talk) of Moscow. 2. I don't want them (to think) you in the wrong. 3. It was a command from her mother, and there was nothing for her (to do) but (to obey) it. 4. You must (to take) care not (to offend) her. 5. I'd rather not (to go) home that way. 6. 'I think we'd better (to go) and (to get) dry,' he said. 7. I stood by the door and watched him (to take) the drinks over to Wells. 'Do you want (to write)?' – 'Of course.' – Then why not (to write) it?' 9. It heartened Mary (to hear) him (to speak) so lightly. 10. How dare you (to interfere) with my private concerns? No, don't speak. Don't try (to excuse) yourself. 11. Liza felt herself (to grow) red to the tips of her toes. 12. I had not seen Jimmie (to lose) his temper before. 13. Mrs Carey rose (to help) her (to lay) the cloth. 14. Why not (to make) him a doctor like his father? 15. He would never cease (to regret) his lost opportunities. 16. I want (to begin) (to earn) my corn. 17. I used (to spend) a lot of time in Robison's rooms. 18. He never let himself (to be) angry.

Ex. 2. Use the required form of the infinitive in brackets. Insert the particle to where necessary.

1. I want (to go) to the East. 2. That was the last thing she expected (to hear) him (to say). 3. At that hour she was unaccustomed (to disturb) by anyone. 4. She could not let herself (to cry). 5. He wished (to make) the most of his opportunity. 6. He seemed (to think) over what he wanted (to say). 7. I watched the shore (to come) close, then (to swing) away, then (to come) closer. 8. He wants (to congratulate) you in person. 9. 'As soon as Joe gets here,' Mel instructed, 'I want (to notify) whenever I am.' 10. The question is, what had I better (to do) with this house? 11. Wrap up my lunch, child. I must (to go) now. 12. He doesn't like (to keep) waiting. 13. I don't like (to see) men (to cry). 14. I hate (to leave) our fine house. 15. They do nothing but (to talk) about it all day long. 16. There was nothing (to do) but (to knit) all day long. 17. His face showed his grief and how upset he was, and his eyes seemed (to ask) for consolation. 18. He had felt that they should (to bring) up by their mother. 19. But he dared not (to ask) what was in her mind. 20. He felt that her friends ought (to choose) for her. 21. 'We're just going in,' he said to Bosinney. 'You'd better (to come) back to dinner with us.' 22. The street and the house were quiet, but from St Charles Avenue and beyond could (to hear) distant sounds of the awakening city. 23. I have never heard anyone but them (to do) so.

Ex. 3. Use the required form of the infinitive in brackets. Insert the particle to where necessary.

1. I decided (to make) a fuss, and went (to look) for Robinson. 2. We walked to the door and I saw her (to go) in and down the hall. I liked (to watch) her (to move). 3. Let's (to go) and (to find) him, he's sure (to be) in front of his picture. 4. It's very interesting (to hear) you (to say) that. 5. Some important decisions must (to make) soon. 6. You must (to do) something heroic at that time. 7. I think he must (to suffer) from injury now. 8. You must (to dream) of it long. 9. She liked, passionately (to like), (to think) worthy of confidence. 10. Let me (to hold) the baby, Scarlett. Oh, I know how (to hold) babies. 11. She noticed that he seemed (to look) at the sideboard and with her engaging smile leaned forward. 12. Do you want (to make) something (to happen)? 13. But there is

something else (to do). 14. I have not done much for you. You might (to ask) much more at that time. 15. 'If you've got nothing to say,' I said, 'why (to try) (to say) it? Why not (to have) a little rest?' 16. There was one announcement (to make).

Ex. 4. Complete the sentences choosing a suitable infinitive phrase from the following list:

when to come, how to phrase, how to keep, how to handle, what to do, which to choose, where to put, whether to stay here or go back, where to go, what to say

1. He asked his mother ... back. 2. We know ... snow and ice; we live with it. 3. There were a lot of books on the shelves. We did not know 4. We were not sure 5. Show me please 6. I did not know ... the baby warm. 7. She did not Her head swam and she was afraid she was going to faint. 8. I was helping her to put away the clean linen. She was telling me ... it. 9. He did not know ... his faith in her. 10. I'm so bewildered, I don't know

Ex. 5. Paraphrase the following sentences using the complex subject with the infinitive.

a) 1. He marched into the hall. She heard him lift the receiver and give the number. 2. He did not expect her to write often, for he knew that the letter-writing came difficult to her. 3. He saw those three return together from the other room and pass back along the far side of the screen. 4. 'Oh, I didn't hear you come in.' – 'I came to see if I could be of any help to you,' said Race. 5. A voice on the stairs behind made us all start. 6. He made the boy take off his boot and stocking.

b) 1. It seemed that her dinner party went on too long to her, as it did to you. 2. It seemed that she sensed the purpose of his question. 3. It seemed that he did not notice that I was in outdoor clothes. 4. 'It seems that you know a lot of Robinson,' Tom Wells observed. 5. It was so wonderful to see old George. It seems he needs a friend.

c) 1. It appeared that George was talking to Mr Smiss persuasively. 2. 'I don't think you should blame yourself.' It appeared that the man had not heard. He went on as if in a daze. 3. When she passed by it appeared that they looked at her attentively. 4. It appeared that they were coming down when I left the room. 5. It appeared that he did not see at all why he should explain his disappearance.

d) 1. It was likely that he had hidden my journal under his mattress. 2. It was unlikely that she would come across him by accident. 3. It is quite likely that a motor containing two boys has been noticed. 4. It is unlikely that he will come and see us soon. 5. I think, it is likely Peter will make that mistake.

e) 1. It is believed that John has arrived in London. 2. It is known that Jack is good at painting. 3. It is reported that the spaceship has landed successfully. 4. It is believed he is clever. 5. They say that he is the best teacher at our school.

f) 1. It happened that his father came. It was raining and he had not been able to play golf, and he and Walter Fane had a long chat. 2. It happened that everybody had taken the problem seriously. 3. It happened that I saw them at the theatre. 4. It happened that I mentioned your brother's name. 5. It happened that I knew Eliza's brother well.

Ex. 6. Paraphrase the following using complex objects with the infinitive.

1. He heard how one of the other girls in the shop addressed Jane. 2. He felt that the eyes of his fellow-students rested on him. 3. He saw that the door of the sitting-

room opened and her mother entered. 4. What I want is that your uncle shouldn't be left alone. 5. She smiled when she heard how he locked the door loudly. 6. What she wanted was that he would come and see her. 7. Jack watched how Eliza left, then he walked slowly down the hall to his father's room. 8. I've never heard him how he spoke of his life in Canada.

Gerund

Ex. 1. Use the indefinite gerund of the verb in brackets in the active or passive voice.

1. He looked forward to (to meet) his parents. 2. You can't be afraid of (to hurt) unless you've been hurt. 3. He took his time about (to answer). 4. Robinson could not live in the caves. They aren't for (to live). They're for (to go) through. 5. But in fear of (to recognize) she lowered her gaze. 6. So I see. You're good at (to make) yourself at home. 7. Jack would have gone to his bedroom without (to see). 8. My sister would never leave without (to see) me. 9. Jennie sat them up to their dinner, and Jeff presently stopped (to cry). 10. She couldn't help (to like) the look in his brown eyes. 11. He had got out of the habit of (to ask) questions by demonstrators. 12. I've always liked (to take) risks. 13. I seem to remember (to tell) not to grumble by someone. 14. She had not even got round to (to ask) for anything yet, because she was too busy to tell him about her grandmother. 15. At his departure Rose had continued to weep, largely through fury at (to leave) alone with Nurse Williams.

Ex. 2. Use the gerund from the following list as:

a) subject

continuing, going, riding, keeping, finding

1. Robinson thought at the time that ... a journal would be an occupation for my mind. 2. My brother always said that ... is the best exercise. 3. I'm afraid it's no use ... this discussion. 4. It's no use ... over old ground. 5. ... him there surprised me greatly.

b) direct object

sitting, opening, hearing, being, doing

1. I remember ... her complain to Joe. 2. The box was stoutly made and resisted 3. I intend ... it tomorrow. 4. Would you mind ... over here? 5. Now I had resolved, if possible, to avoid ... alone with any of these men, these strangers.

c) prepositional object

shaking, stopping, calling, getting, drinking, missing, dealing, being, saying, twisting

1. She was afraid of ... Miller in the crowd. 2. He was fond of ... : 'The superstition of today is the essence of yesterday.' 3. Thank you for 4. On the way home Sally insisted on ... in front of our college. 5. I assure you I am quite capable of ... with the matter. 6. After that, of course, I had difficulty in ... off Tom Wells. 7. I am sick and tired of ... tea without milk. 8. Surely that prevents the day from ... ordinary. 9. They were certainly clever at ... one's remarks.

d) attribute

eating, coming, getting, reading, going, greeting, discussing

1. The surgery opened at five-thirty, and I made a point of ... along there quite promptly. 2. The only way of ... to the dance was on our bicycles. 3. They talked and

laughed and shouted, and there was the clatter of knives and forks, and strange sounds of 4. Philip had few friends. His habit of ... isolated him. 5. He could not bear the thought of ... his situation. 6. There were cries of ... from a dozen voices and they moved toward her. 7. Philip could never tell lies without embarrassment, and he was scarlet when he finished his explanation for not

e) adverbial modifier of time

hearing, answering, leaving, passing, looking, reading, racing

1. She looked at the paper, after ... out this question. 2. Before ... , the little old lady grasped his arm. 3. He spent those nights after ... at his mother's house in Green Street. 4. He found an endless excitement in ... at their faces and ... them speak. 5. Tom considered before 6. She seemed excited on ... this. 7. Poirot had looked up at the staircase in ... , and shook his head in a dissatisfied manner.

f) adverbial modifier of manner, attending circumstances or cause

*noticing, having, disguising, bringing, answering,
working, coughing, laughing, breaking*

1. Cindy glanced up, then away, without 2. Lize was able to make her own living by ... at a factory. 3. Eventually Selvyn couldn't laugh for ... , and again, he couldn't cough for 4. Can't we even laugh properly without ... trouble? 5. Was he trying to escape by ... himself? 6. Major Pennyman went on without ... her interruption. 7. We might be fined for ... the Press along, George. 8. You might ruin all my life by ... your promise.

g) part of a compound verbal predicate

pacing, shaking, saying, looking, reproducing, eating, chatting, knitting

1. Teddy Lloyd continued ... Jean Brodie in his paintings. 2. He began ... the words aloud to himself. 3. They went on ... their dinner. 4. The old man stopped ... her fist and stick. 5. Sandy kept ... ahead, Mary tried to keep up with her. 6. Anson Harris had ceased ... out and was flying on instruments alone. 7. Two weeks old this child was, and the lady had just finished ... her a pram-cover in stripes of white and blue. 8. The twins started ... about their school life.

Ex. 3. Change the construction of the sentences using the gerund.

1. She bowed her head but she did not speak. 2. I like when I do everything myself. 3. Philip was tired because he talked too much. 4. She insisted that she should be called Joyce Emily. 5. Within less than a minute, after she apologized to her guest, she was in the express lift to the main floor. 6. When he returned she went immediately into the dining-room. 7. I don't remember that I met him in London. 8. Little Jane liked when she was clean. 9. After he examined the patient he said it was simply a case of nerve strain. 10. I'm so tired because I sit at home. 11. I am still a little afraid to be late. 12. I like to get hold of nice things. 13. The younger man hesitated before he answered. 14. When he entered the room, he addressed Alec Warner without preliminaries. 15. I suggested that I should visit the Smiths. 16. She glanced round the comfortable consulting room before she answered. 17. He went on and did not pay any attention to her interruption. 18. He barely skimmed through his next letter before he handed it over to Raymond. 19. She stepped back and did not say a word. 20. After he left his friends at the university he bought copies of the early editions of the post. 21. Tom realized that he had seen Jane before but he did not recognize her. 22. When he realized this his first thought was to leave the vicinity of the house as quickly as possible.

Ex. 4. Complete the sentences using the gerundial complexes from the following list: your thinking, her talking, my bringing, our waiting, his being taken, my not sitting, our keeping, your being left alone, your hearing

1. 'You do not mind ... Graham,' said Daniel. 'I find it best to keep him under my eye.' 2. It is true she had prevented ... to a mental home for treatment. 3. I like the idea ... of other projects. 4. Some people, it seems, don't like ... to the rules. 5. But that doesn't excuse ... to Mrs Leidner as though Mrs Leidner were her great aunt. I could see that Robinson was making an effort to form some communal for the period of ... on the island. 7. 'You don't mind ... at one of your tables this afternoon?' he asked once, when he was walking to the station with her. 8. There must be something wrong with ... , Godfrey. 9. I should have thought that ... alone has given you a lot of opportunities.

Ex. 5. Use the required form of the gerund and insert prepositions where necessary.

1. Good-bye, and thank you ever so much ... (to come) with me. 2 She was afraid... (to go) on public transport. 3. She began to have frightful pains all over her, and she held her breath to prevent herself ... (to cry) out and (to wake) her mother. 4. This was Daphne's only chance ... (to tell) them of her college life. 5. She had the local habit ... (to place) the word 'eh' at the end of her remarks, questions and answers alike. 6. I was aware ... (to plunge) into a network of fresh difficulties. 7. His mother would not like the idea ... (to eat) fruit unwashed. 8. 'It seems to me an awfully selfish way ... (to look) at things,' said Philip. 9. 'I don't see the use ... (to read) the same thing over and over again,' said Philip. 10. Sandy could not remember ... (to ask) about it. 11. I had not asked for advice, I was quite capable ... (to advise) myself. 12. That's no reason ... (to give) up. 13. It would be better to wait for him on the terrace where she was fond ... (to sit) toward evening (to enjoy) the view of which she was never tired. 14. Dad would not dream ... (to say) such a thing to anyone. 15. Mrs Brodie was greatly taken aback and suffered greatly from a sense ... (to betray). 16. He was looking forward ... (to take) the tickets. 17. Are you thinking, Sandy, ... (to do) a day's washing? 18. And then a minute or two afterwards someone else entered the room and expressed his surprise ... (to find) Griffiths there. 19. She was on the point ... (to obtain) permission to go for walks alone. 20. Jane, your nose wants ... (to blow). 21. 'That child needs ... (to take) care of,' said Eliza. 22. He felt that life was worth ... (to take) care of. 23. The night seemed very long. He shivered. He was ashamed ... (to sleep) on the Embankment. 24. They were busy ... (to find) some food. 25. Did he suspect her ... (to see) him enter the room? 26. Thank you ... (to give) me this book. 27. His heart sank at the thought ... (to go) out into the bleak darkness. 28. These girls did not say anything to the others ... (to paint) by the art master. 29. 'I'm not very good ... (to guess),' I said, with a laugh. 30. Ann was such a friendly, pretty child, few people could resist ... (to talk) to her. 31. The baby was round and very red, with dark curly hair. 'Fancy her ... (to have) hair. I thought they were born bald,' said Raymond. 32. I don't like ... (to wear) a black tie to movies. I enjoy ... (to see) my movies when I eat popcorn. 33. But I can't tell you how grateful I am to you ... (to listen) to me. I had to talk about it and it was so kind of you to listen.

Participle I

Ex. 1. Use the appropriate form of participle I of the verb in brackets.

1. Poirot and I behaved in the customary fashion of people (to show) over the houses. 2. I felt a bitter envy towards the two small boys (to walk) along the path. 3. (To greet) her, he turned the key in the only door with a certain skill. 4. (To have) tea she went early to Victoria Station. 5. There was a noise of curtain-rings (to run) back along the rods, of water (to splash) in the basins. 6. She had a pale face and dark hair (to turn) grey. 7. (To pick) up his coat, he walked on into the field. 8. The dog Balthasar, (to walk) round the three small flower-beds, had also taken a seat in front of old Jolyon. 9. He and Soames stood in the drawing-room (to wait). 10. Not for one moment did he show surprise at the wedding gift (to present) to him personally. 11. (To dry) his hands, Tom came across from the washstand. 12. The major was at the telephone (to sit) on a box. 13. She had a hand on his shoulders and was including herself in the pictures (to take). 14. He crossed the room to the long buffet (to stand) beside the girl he picked up a sandwich. Then, (to turn) and (to speak) nervously and with an effort he said, 'I say, do you mind if I speak to you?' 15. (To think) this, with some comfort, she fell asleep. 16. (To see) Fleur and his grandson off to the sea that morning, he felt flat. 17. Miss Lindey, (to see) Rose, smiled. 18. Miss Swiss poured out another cup of tea for herself, and (to taste) it, plunged into further confidences. 19. (To walk) longside, Dan inclined his head towards the building they had left. 20. (To jump) down from the stairs, he went over to the driver. 21. (To lift) the telephone, Peter asked for the director.

Ex. 2. Use the infinitive or participle I of the verb in brackets.

1. He watched McNeil (to cross) the room and (to go) out of the door. 2. She saw his teeth (to gleam) in what must be a smile. 3. 'Some stairs here,' said Calvin. Hunter saw him (to vanish) down a twist of two stairs. 4. He lifted his head quickly and saw Annette (to stand) just outside the drawing-room windows. 5. This phrase made Jane (to sigh) deeply as she poured out the coffee. 6. The noise in the entrance hall continued, and more vehicles could be heard (to arrive) at the door. 7. 'Hold the print with these tons,' said Calvin, 'and move it in the solution as I told you. Soon you'll see the picture (to appear). It's like magic. I never get tired of seeing the picture (to come). 8. As Rosa watched Jan (to disappear) round the corner fifty yards away down the workroom, she smiled violently to see his face. 9. Calvin departed laughing, and could be heard (to laugh) and (to sneeze) all the way down the stairs. 10. Looking toward the door, he saw Lucy (to come) in. 11. He walked through the drawing-room into the garden. In the last light he saw the flowers (to close) up.

Ex. 3. Point out the complex object with the participle. Translate the sentences into Russian.

1. I heard him moving about, and presently he was back with some hot soup. 2. When Mary opened her eyes she saw Nina standing by her side. 3. Simon shortly found her having coffee in the sitting-room. 4. She felt her cheeks blushing a little. 5. I noticed Tom Wells standing in the shadow of the mountain. 6. She liked to watch him doing things, digging, planting, trimming.

Participle II

Ex. 1. Pay attention to the use participle II in the following sentences and translate them into Russian.

1. The answer to this was unexpected. 2. You didn't look so interested. 3. There was a stillness in the small intimate dining-room, broken only by the subdued ticking of a Dutch clock upon the wall. 4. He replaced used ash-trays on the table with fresh, and refilled Dodo's coffee cup, then the others. 5. He entered, puzzled but interested. 6. She always became impatient when asked to define a word of whose definition she was not sure. 7. Puzzled by the dim light, Sanders turned his attention to the inshore areas. 8. 'Tell you what,' said Gideon, as if struck with a new idea. 9. You could have passed me by unnoticed. 10. Presently he came to a standstill, with his hands deep plunged into his pockets. 11. She had no photographs of herself taken since her marriage.

Ex. 2. Point out the complex object with participle II. Translate the sentences into Russian.

1. I am not accustomed to having my word doubted. 2. I want my head examined for making this dangerous journey. 3. 'I want to get the grass cut,' he said. 4. 'Do people have their own photographs taken?' said Paul. 5. Your sister would like the bottle opened. 6. I want Jane and her husband moved into one of the new houses on the hill. 7. Eliza, as she did on most days, had coffee and a sandwich sent in. 8. At last she heard her name called. 9. He also kept his hair dyed black. 10. Shall we have Nevill brought down to say good night? 11. She ordered the calf driven from the yard. 12. If you insult me I shall have you turned out of here.

Ex. 3. Point out the absolute participial phrase and translate the sentences into Russian.

1. He reached out across the table, his hand covering Marsha's. 2. Iris stared out over the landscape, her chin cupped in her hand. 3. She stopped, a red spot on each cheekbone. 4. Old Jolyon stood at the bottom of the bed, his hands folded in front of him. 5. And, cigar in mouth, old Jolyon said: 'Play me some Chopin.' 6. Chance was silent, his eyes intent on Silvertip. 7. They set out with a lantern, Boddick telling his tale. 8. Treleaven stood by the radio panel, his fingers fixed on the clock. 9. He stood, his hands behind him. 10. One night, Winifred having gone to the theatre, he sat down with a cigar, to think. 11. He looked at her intently, his curiosity reviving. 12. They were on the porch and Rhett was bowing right and left, his hat in his hand, his voice cool and soft. 13. Less than half an hour ago, after Dodo's leave-taking, he had paced the suite living-room, his thoughts confused and troubled. 14. Archie sat on a stool by the hearth, his back against the fireplace.

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