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ПРОИЗВОДСТВО
И ПРОИЗВОДСТВЕННЫЙ
МЕНЕДЖМЕНТ

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Настоящее учебно-методическое пособие представляет собой обобщенный практический материал по модулю «Производство, производственные процессы и производственный менеджмент» в рамках учебной дисциплины «Английский для специальных целей». Предназначено для студентов как технических, так и гуманитарных специальностей (уровень Intermediate и выше) и может использоваться для обучения на экономических факультетах.

Пособие имеет практическую направленность и будет интересно преподавателям дисциплины «Английский для специальных целей», ориентированных на активные и интенсивные методы обучения иностранному языку.

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Introduction

PRODUCTION and PRODUCTION MANAGEMENT is a specially designed course for Intermediate and Upper Intermediate students of both humanitarian and scientific and technical faculties. Each of the 9 units focuses on a theme, which is explored through reading, writing, listening and speaking activities followed up by vocabulary and grammar tasks. Study guide PRODUCTION and PRODUCTION MANAGEMENT offers 60-80 hours of classroom work.

PRODUCTION and PRODUCTION MANAGEMENT aims to broaden and enrich students’ language in such fields as management theory, production management, quality standards, human resource management, etc. It also aims to sort out persistent errors and to increase students’ ability in the four main skills. PRODUCTION and PRODUCTION MANAGEMENT also has the further objective to be creative and responsible learners of English for Specific Purposes.

Key Features

- A wide range of authentic reading listening texts.
- Opportunities for learning maximised through group and pair work.
- Copious use of graphs, flow diagrams, tables, charts.
- A real variety of speaking activities ranging from innovative guided work on producing functional language to free speaking tasks.
- A practical approach to the analysis and recreation of coherent written texts.
Components of the manual

STUDY GUIDE Nine units of teaching material:

Unit 1: Production Process
Unit 2: Factory Location
Unit 3: Factory Layout
Unit 4: The Manufacturing Cycle
Unit 5: The Product
Unit 6: Production and Operation Management
Unit 7: Quality
Unit 8: Quality Standards
Unit 9: Just-In-Time Production

Designed for gap activities, follow-up work, answer keys, transcripts of dialogues for speaking activities, ideas on how to organise your projects.

CD Authentic conversations and interviews for the listening exercises, dialogues and exercises for speaking, grammar and vocabulary work.

Авторы-составители
Unit 1 Production Process

Reading/Vocabulary

Read the text and do the tasks below

Once businesses have the necessary financing, they can begin production. Production is the process of changing resources into goods that satisfy the needs and wants of individuals and other businesses. Businesses may produce one of two kinds of goods. Goods that are produced for individuals are called consumer goods. They are sold directly to the public to be used as they are. Goods produced for businesses to use in making other goods are called producer goods. The machines used in an auto assembly line are examples of producer goods.

Steps in production operations

Besides the actual manufacturing of a good, the production process for both types of goods involves several operations. Planning includes choosing a location for the business and scheduling production. Where a business is located is directly related to how successful the business will be. This fact is as true for a company that is opening its first factory or store as it is for an older business that is expanding into a new area. Among the factors to consider are nearness to markets, raw materials, labor supply, and transportation facilities. In the past, most cities grew up near waterways. Today, with railroads, airlines, and pipelines, it is not so important to be located near waterways.

Scheduling production operations involves setting beginning and ending times for each step in the production process. It includes planning and checking the use of labor, machinery, and materials so that production moves
smoothly. Scheduling ensures that work will be finished on time whether it is manufacturing automobiles or books or dry cleaning a blouse or shirt.

**Purchasing** In order to do business, a company needs the raw materials to produce its goods or offer its services. It also must have machinery, office supplies, and any other supplies it uses. Obtaining raw materials, machines, and supplies is the purchasing function of the production process and involves getting the best deal for the company. The people who buy goods for a business have to decide what to buy, from whom, and at what price. The following major factors are to be considered when making purchasing decisions.

- **Price**
  Is this the best price?

- **Quality**
  Are these goods made well? Will they last?

- **Number of suppliers**
  Should the company buy from several suppliers to encourage competition?

- **Services**
  Does this supplier offer such services as equipment repair?

**Quality control**

Quality control is checking the quality of the goods produced. It involves overseeing the grade or freshness of goods, their strength or workability, the workmanship or design, harmlessness, adherence to federal or industry stan-
dards, and many other factors. Quality control systems may be as simple as testing the thousandth item produced or testing each product as it is finished.

**Inventory control**

Almost all manufacturers and many service businesses, such as dry cleaners, need inventories, or stockpiles, of the materials they use for making their products or offering their services. Manufacturers and businesses, such as supermarkets, also keep inventories of finished goods on hand for sale, but inventories are costly. The more inventory a business has, the less capital it has for other activities. For example, it costs money to warehouse and insure goods against fire and theft. Some goods such as film and medicines spoil if kept beyond a certain period of time. Other goods such as cars and stylish clothes become obsolete, or out of date, in time. In deciding how much inventory to keep on hand, those in charge of inventory control also have other costs to consider. If the price of a raw material is expected to rise, a business may stockpile it to keep future costs down. Often a supplier will discount large orders. Some businesses may decide that the discounts outweigh the other costs of maintaining a large inventory.

**Technology and methods of production**

Technology is the use of science to develop new products and new methods for producing and distributing goods and services. Technology influences businesses in many ways. The use of technology on a large scale began in the textile industry in England in the late 1700s. From there the machine-powered textile industry spread to the United States. From the time of the Industrial Revolution, methods of production have been changing. Five major advances in technology have most affected this proc-
These are mechanization, the assembly line, division of labor, automation, and robotics.

**Mechanization** The Industrial Revolution, as beginning of the factory system is called, came about through mechanization, which combines the labor of people and large power-driven machines. For example, with the introduction of spinning and weaving machines in factories, entrepreneurs replaced skilled handwork with machines run by unskilled workers. The rate of output per labor hour increased greatly as a result.

**The Assembly Line**

An outgrowth of mechanization is the assembly line. An assembly line is a production system in which the good being produced moves on a conveyor belt past workers who perform individual tasks in assembling it. The Ford Motor Company developed the modern assembly-line process at the beginning of the twentieth century. Because the assembly line results in more efficient use of machines and labor, the costs of production drop.

**Division of labour** Assembly-line production is only possible with interchangeable parts made in standard sizes and with division of labor, the breaking down of a job into small tasks. A different worker performs each task.

**Automation**
Mechanization combines the labor of people and machines. In automation, machines do the work and people oversee them.

**Robotics** Robotics refers to sophisticated computer-controlled machinery that operates the assembly line.

<table>
<thead>
<tr>
<th>1. production</th>
<th>Match each item in column A with the items in column B</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. consumer goods</td>
<td>a. goods produced for businesses to use in making other goods</td>
</tr>
<tr>
<td>3. producer goods</td>
<td>b. the breaking down of a job into small tasks</td>
</tr>
<tr>
<td>4. division of labor</td>
<td>c. the process of changing resources into goods that satisfy the needs and wants of individuals and other businesses</td>
</tr>
<tr>
<td>5. automation</td>
<td>d. use of machines supervised by people to replace human labor</td>
</tr>
<tr>
<td></td>
<td>e. goods that are produced for individuals</td>
</tr>
</tbody>
</table>

___

**Choose the letter that best completes the statement or answers the question**

6. What step in production operations is involved in choosing a location for a business?
   a. Product design  
   b. Purchasing  
   c. Planning  
   d. Quality control

7. Obtaining raw materials is the
   a. quality control function of the production process.  
   b. product design function of the production process.  
   c. inventory control function of the production process.  
   d. purchasing function of the production process.

8. What step in a production operation is involved in overseeing the grade or freshness of goods?
a. quality control  
 b. planning  
 c. purchasing   
 d. product design  

9. Methods of production have been changing as a result of  
 a. lack of financing.   
 b. technology.  
 c. a decrease in workers.   
 d. a decrease in new businesses.  

10. An information revolution refers to  
 a. the change in the production of goods.  
 b. the development of the assembly line.  
 c. the use of computers   
 d. the use of automation to produce goods  

**Vocabulary**

1. Match the words in the box with the definitions below: 

<table>
<thead>
<tr>
<th>delivery</th>
<th>discounts</th>
<th>inventory</th>
<th>production run</th>
</tr>
</thead>
<tbody>
<tr>
<td>obsolescence</td>
<td>opportunity cost</td>
<td>storage</td>
<td>theft</td>
</tr>
<tr>
<td>shortages</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1. a business's stock of raw materials, component parts, supplies, work in process, or finished products  
2. a period of producing one particular product without adapting the production equipment  
3. becoming out of date; being replaced by something newer and better or more fashionable  
4. keeping things for use in the future  
5. taking something that belongs to someone else; stealing  
6. supplying the customer with something that has been ordered  
7. the benefits or advantages lost by spending money in one way rather than another  
8. price reductions  
9. insufficient supply to meet demand  

2. Complete the text using the words in the box above
There are obviously advantages to having a large (1)........ of raw materials and component parts. It gives you protection against temporary price rises, and delays in the (2) ........ of raw materials, due to (3) ........ strikes, orders that get lost, incorrect or defective shipments, and so on. You can also take advantage of quantity (4) ........ in purchasing. Having a large inventory of finished goods allows you to meet variation in product demand, and to be more flexible in product scheduling, with longer production lead times and reduced costs because of larger (5) ........ with fewer set-ups. If you have a long delivery lead time there is always a risk that some customers may go to other suppliers, or that new competitors will enter the market.

On the other hand, keeping an inventory involves various costs. (6) ........ requires warehousing facilities, handling goods involves labour costs, and unsold goods have to be insured. All this money could perhaps be more profitably spent in other ways: it is always necessary to consider the (7) ........ of the capital involved.

Furthermore, there is always a risk of (8) ........ especially for high-tech products with a short life cycle, and of (9) ........ or breakage. If an inventory of finished goods gets too large, it may be necessary to reduce prices to stimulate demand.

All these disadvantages led to the development of the just-in-time (JIT) production system, which does away with inventories.
Unit 2 Factory Location

Reading/Vocabulary

Read the following statement that Mr. Leonard Soames, the Chairman of Keynsworth International, gave to the management team of Keynsworth (UK) Ltd. and do the tasks below.

The Manufacturing Division of Keynsworth (UK) Ltd has been situated in Wembley, London, since 1957. During this time, the Company has achieved a record of steady growth. Indeed, since 1975, output has increased by over three hundred and fifty per cent. This has put increasing pressure on the facilities at the Wembley factory. The Board of Directors, which includes the Managing Director of Keynsworth (UK) Ltd, is aware of the difficult working conditions that all personnel have experienced for many years. The problem is serious because we must have the potential to expand our productive capacity in order to keep our competitive position in the market.

For the past year, we have been examining the possibilities of expanding our UK operations. If we had been able to purchase more land in Wembley, we would have expanded our present site. Our attempts to do this have failed. Consequently, a number of alternative locations have been considered. The important factors in these location studies have been the availability of skilled labour, transport, materials, and government grants.

The Board of Directors has now reached a decision. The new location of the Manufacturing Division will be at Peterhead, Scotland. The Wembley site will be kept only as a service and warehouse centre, and the Company will do its best to limit the number of redundancies by offering to the staff alternative employment where this is possible. Unfortunately, the majority of the workforce cannot be offered new jobs.

The Board hopes that its successful management team will transfer to Peterhead. We fully understand the effect that such a move will have on your
lives. However, we would not have taken this difficult decision if there had been any **viable** alternative. Peterhead, which is a very pleasant town, has excellent housing, schools and sports facilities. The Company intends to give as much help as it can in order to make relocation as smooth as possible. We hope that you will all join us in this move and that you will play an important part in the future development of the Company.

**Explain the meaning of the words in bold**

**Complete the table**

<table>
<thead>
<tr>
<th>Cause</th>
<th>Situation</th>
<th>Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. ............</td>
<td>Pressure on Wembley facilities</td>
<td>Board examines other locations</td>
</tr>
<tr>
<td>b. ............</td>
<td>Relocation of manufacturing facility to Peterhead</td>
<td>c. ............</td>
</tr>
</tbody>
</table>

**Answer the questions**

1. Why must Keynsworth’s have the ability to expand their output?
2. What factors made the Board choose Peterhead as a new location?
3. What choice does the management team face?
4. What is meant by (1) location study, (2) service and warehouse centre, and (3) viable alternative?

**Vocabulary**

**Exercise 1**

Match the words in the box with the definitions below:

<table>
<thead>
<tr>
<th>components</th>
<th>facility</th>
<th>infrastructure</th>
</tr>
</thead>
<tbody>
<tr>
<td>layout</td>
<td>lead time</td>
<td>retailers</td>
</tr>
<tr>
<td>subcontractors</td>
<td>utilities</td>
<td>wholesalers</td>
</tr>
</tbody>
</table>

1. ............ - a factory or plant in which production is carried out
2. ............ - companies providing goods or services for another organization
3. . . . . . . . . . . - shops and stores which sell to the final customer or end-user
4. . . . . . . . . . . - roads, railways, airports, telecommunications, and so on
5. . . . . . . . . . . - services supplied to houses, factories and public buildings, such as electricity, gas, water and sewage, and telephone lines
6. . . . . . . . . . . - intermediaries between producers and retailers, who stock goods, and deliver them
7. . . . . . . . . . . - the pieces or parts that make up a manufactured product
8. . . . . . . . . . . - the placement of departments, workstations, machines and so on in a factory
9. . . . . . . . . . . - the time needed to manufacture or deliver a product

Exercise 2

Complete the text using the words in the box above.

The decision to make a new product usually involves changing equipment and altering the (1) . . . . . . . . . of an existing factory, or constructing a new production (2) . . . . . . . . . . When deciding where to locate a plant or factory, a company has to take into consideration a number of factors, including the efficiency of the regions (3) . . . . . . . . . . including telecommunications, and road and rail transport; its (4) . . . . . . . . . . - the supply of energy and so on; the cost of land and construction; and local tax rates. Land usually becomes cheaper the further you go from a city centre, but a company must make sure that it will be able to find appropriate labour skills at a suitable price. It also needs to determine the availability and cost of raw materials, (5) . . . . . . . . . . and supplies, and the (6) . . . . . . . . . . to acquire them. The company must also take into account the cost of transporting raw materials and components from suppliers and (7) . . . . . . . . . . and shipping or distributing products to (8) . . . . . . . . . . 'warehouses, (9) . . . . . . . . . . or other plants in the network. Transport costs and time constraints make it logical to produce close to the customer.
After the factors have been weighted, each location is assessed on a scale of 1 to 5, and this number is then multiplied by the weight. For example, location B is best in terms of labour and therefore merits 5, which, when multiplied by the weight, gives 40. Study the table below and decide which location is the best one. Give your reasons.

<table>
<thead>
<tr>
<th>Factor</th>
<th>Weight</th>
<th>Alternative Locations</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>a</td>
<td>b</td>
</tr>
<tr>
<td>Labour</td>
<td>8</td>
<td>2/16</td>
</tr>
<tr>
<td>Housing</td>
<td>6</td>
<td>3/18</td>
</tr>
<tr>
<td>Transport</td>
<td>7</td>
<td>1/7</td>
</tr>
<tr>
<td>Materials</td>
<td>2</td>
<td>3/6</td>
</tr>
<tr>
<td>Services</td>
<td>4</td>
<td>4/16</td>
</tr>
<tr>
<td>Planning</td>
<td>4</td>
<td>3/12</td>
</tr>
<tr>
<td>Expansion</td>
<td>3</td>
<td>3/9</td>
</tr>
<tr>
<td>Cost</td>
<td>4</td>
<td>5/20</td>
</tr>
<tr>
<td>Market</td>
<td>3</td>
<td>1/3</td>
</tr>
<tr>
<td>Port facilities</td>
<td>2</td>
<td>2/4</td>
</tr>
<tr>
<td>Government Grants</td>
<td>1</td>
<td>1/1</td>
</tr>
</tbody>
</table>
While you are listening to the conversation between Stanley Hymes, a Methods Engineer, and Raymond Stack, a Production Supervisor, complete the table below. In the following table some information refers to Stanley Hymes and some to Raymond Stack. Place a tick in the appropriate column.

<table>
<thead>
<tr>
<th>Information</th>
<th>Hymes (✓)</th>
<th>Stack (✓)</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. He is not surprised at the news of relocation.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. His wife is not happy about the relocation.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. He has a mother of seventy five.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>d. He will find it difficult to find another job in Leeds.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>e. He has lived in Leeds for over forty years.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>f. He has worked for Masterton’s for less than three years.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>g. He has a good chance of becoming a manager in Forningsby.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

On balance, do you think Ray will stay in Leeds or make the transfer to Forningsby? Why?
**Grammar**

1. **Past Time**

Notice, in the following examples, that we use the Simple Past tense to refer to completed past time, the Present Perfect tense with since to refer to a particular point in time, and the Present Perfect tense with for to refer to a particular period or length of time.

Keynsworth (UK) Ltd. built their Wembley factory in 1957.
Keynsworth (UK) Ltd. has been situated in Wembley **since** 1957.
Keynsworth (UK) Ltd. has been situated in Wembley **for** twenty four years.

Complete the following sentences where necessary using **since**, **for** and **in**.

a. There has been talk of relocation . . . years and years.
b. Stack has lived in Leeds . . . he was a child.
c. He was recruited into the Training Department . . . 1976.
d. They began work on the computer break . . . last month.
e. Output has increased by 25% . . . the new procedures were introduced.
f. The negotiations have been going on . . . more than twelve hours.
g. We have been waiting for a decision from management . . . the 14th of last month.
h. New working methods were introduced . . . two months ago.
i. They have been discussing the new factory site . . . I joined the company.

2. **Past Intentions**

Notice how the Conditional form is used to rewrite the example.

**Example:**
We were not able to purchase more land in Wembley in order to expand the present site.

**If we had been able** to purchase more land in Wembley, **we would have expanded** the present site.

Change the following sentences in a similar way.
a. Since we were not able to call in a consultant, the problem of the salary structure has not been solved. (If, however, we . . .)
b. We were not able to employ more staff, and as a result the training programmes did not improve. (If, however, we . . .)
c. The company was not able to increase its production in order to improve the supply position. (If, however, we . . .)
d. As we were not able to introduce a computer system, the administration remained inefficient. (If, however, we . . .)

3. Adding Information

Notice how we can combine these two sentences by using who:

(1) Relocation for a middle-aged employee such as Raymond Stack is always a problem.
(2) Raymond Stack is fifty years old.
Relocation for a middle-aged employee such as Raymond Stack, who is fifty years old, is always a problem.

Using who or which, combine the following sentences in a similar way.

a. (1) The Board of Directors is aware of the difficult situation. (2) The Board of Directors includes the Managing Director of Keynsworth (UK) Ltd.
b. (1) Peterhead has excellent housing, schools and sports facilities. (2) Peterhead is a very pleasant town.
c. (1) The pay offer made by the Personnel Director has not been accepted by the Union Representatives.
(2) The Personnel Director leads the negotiating team.
d. (1) The various redundancy payments were negotiated and agreed with the Unions in April. (2) The various redundancy payments can be seen on the notice board.

Listening

1. While you are listening to the telephone conversation between Marie Pinet, an Administration Manager, and Charles Bond, a Marketing Manager, decide what the two important subjects of the conversation
are. Describe (a) the subject introduced by Marie Pinet and (b) the subject introduced by Charles Bond.

2. When he arrives in Paris, Charles Bond will have to stay in a hotel for two months. What advantages does Marie Pinet think this will have?
Unit 3 Factory Layout

Warm-up

Look at RIV Industries proposed layout of a light industrial plant. Find words on the plan which correspond to the explanations below. Example **Loading bay** = Point where finished goods leave plant.

a) Point where finished goods leave plant.
b) Storage area for tools and other technical equipment.
c) Part of a video terminal where messages appear.
d) A device which carries items along the production line.
e) Machine to move goods on the shop floor.
f) Large storage area, separated from production unit.
g) A sophisticated device for cutting or drilling the product.
h) Main open work area.
i) Key positions occupied by workers.
j) Separate areas outside the production flow.

k) Basic materials from which products are manufactured.

**Reading/Vocabulary**

Read the text and do the tasks below.

It is usual to classify types of production as job production, batch production and flow production. In job production, products are supplied to the special requirements of a customer, and the whole project is undertaken as one operation which is completed before passing on to the next. A good example of this kind of work is shipbuilding.

![Job production](image)

*Job production*

In job production a single item is produced at a time, whereas in batch production a number of similar items are produced in order to meet a continuing sale demand. Batch sizes vary, but the quantity which is produced amounts to more than immediate requirements, and the surplus production is stored. Finally, in flow production, the manufacture of a product proceeds from one operation to another at a planned rate of output.
Batch production

It is argued that the type of production method which is employed depends on the development of an individual company. That is to say, many factories begin manufacturing on a job production basis and proceed, as the volume of production increases, to batch and flow production methods. This is not always the case, however, since the type of production is not necessarily determined by the product volume which is aimed at. In fact, in the car industry, tools are produced by jobbing methods, components are produced by batch methods, and the final product is assembled by flow methods.

Flow production is associated with flow layouts, whereas job and batch production are associated with process layouts. In a process layout, machines of a similar type are grouped together in the same section of the factory, and work in progress is moved from one part of the factory to another.

Flow production

In a flow layout scheme, the manufacturing equipment is arranged in the same sequence as the operations performed on the product. Each of these operations must be capable of processing work at the rate required for as-
sembly of the final product, and the output for each operation must be balanced in order to provide a smooth flow of work.

There are advantages in both types of layout. In a process layout system there is more flexibility, and a greater specialization of machines and labour is possible, while in a flow layout system it is not necessary to maintain a high level of stocks or to demand great skill in the workforce.
Complete the table

<table>
<thead>
<tr>
<th>Types of production</th>
<th>Industry Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Job</td>
<td>a. ... b. ...</td>
</tr>
<tr>
<td>Batch</td>
<td>c. ...</td>
</tr>
<tr>
<td></td>
<td>Number of similar items produced, above immediate requirements</td>
</tr>
</tbody>
</table>

Answer the following questions.

1. What disadvantages are there in the two layout schemes?

2. Explain why the type of production method is not dependent on the development or size of an individual company.

3. Decide whether the following statements are true or false?

   a. Job production is aimed at the manufacture of a surplus.
   b. A single product requires a single production method.
   c. Process layouts are appropriate to both job and batch production.
   d. The author argues that production methods depend on individual company development.
   e. Manufacturing which begins on a job production basis may, if production volume increases, proceed to batch and flow production methods.
**Listening**

Listen to the following conversation and complete the chart below:

<table>
<thead>
<tr>
<th>Present Situation</th>
<th>Product volume not maintained</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reason</td>
<td>1. ............</td>
</tr>
<tr>
<td>Decision</td>
<td>Change manufacturing layout</td>
</tr>
<tr>
<td>Method</td>
<td>Change to flow system</td>
</tr>
<tr>
<td></td>
<td>Improve present system</td>
</tr>
<tr>
<td>Advantages</td>
<td>2. ............</td>
</tr>
<tr>
<td></td>
<td>4. ............</td>
</tr>
<tr>
<td>Opinion of</td>
<td>3. Mr. ........</td>
</tr>
<tr>
<td></td>
<td>5. Mr. ............</td>
</tr>
</tbody>
</table>

What do you think King means by *de-skilling*? When would de-skilling be necessary?

**Reading/Vocabulary**

Complete the text using these words
<table>
<thead>
<tr>
<th>batches</th>
<th>changeover</th>
<th>construction</th>
<th>continuous</th>
</tr>
</thead>
<tbody>
<tr>
<td>equipment</td>
<td>flexibility</td>
<td>functions</td>
<td>location</td>
</tr>
<tr>
<td>placement</td>
<td>rehandling</td>
<td>series</td>
<td>shut-downs</td>
</tr>
</tbody>
</table>

The layout of a production facility - the (1) ........ of departments, workstations, machines, stockholding points, and so on - obviously depends on the type of production being carried out. Some plants, especially those involving furnaces that take a long time to heat up, as in steel and glass production, are designed for a single (2) ........ process, without any start-ups and (3) ........ . Other plants are designed for assembly line production, in which the same (4) ........ of steps is repeated again and again, but not 24 hours a day. Yet assembly lines are, generally designed and equipped to give the (5) ........ to make different products without needing to change the layout, and with (6) ........ times between production processes that are as short as possible. This is especially the case today when product life cycles are tending to shorten.

There are three basic production layouts. The first is product layout or flow-shop layout, as in a standard production line or assembly line, in which (7) ........ or work processes are arranged according to the progressive steps by which the product is made. The ideal is perhaps a straight-line flow pattern, in which workstations are close together, and there is a smooth work flow between departments and work centres, without any backtracking or (8) ........ of materials, or the need to store materials between different stages of production.
Some assembly lines produce the same basic product for months at a time; others are used to making of different products, or even smaller job lots.

The second basic production layout is process layout or job-shop layout or layout by function, in which similar equipment or are grouped together. This layout is used in some factories and, outside of manufacturing, in buildings such as schools and hospitals. Schools, for example, often have classrooms close together in one part of the building, science laboratories in another, offices in a third, and so on; hospitals have general wards, specialised departments, operating theatres, and so on.

The third production layout is fixed position layout, in which the product remains at one because of its large size or shape. This is used, for example, in shipbuilding and on sites.

Since it is not always possible to use one layout exclusively, many manufacturing facilities are a combination of two types. For example, some car factories are based on a flow-shop layout with an assembly line, but also have elements of a process layout, such as separate areas for spray-painting and vehicle testing.

**Listening**

Listen to the conversation between Mr. Banks, a Production Manager, and Jim Carter, a Production Foreman, and complete the table below:

<table>
<thead>
<tr>
<th>Problem</th>
<th>Excuse /reason</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Last Week: Held up final assembly</td>
<td>1. ............</td>
</tr>
<tr>
<td>twice</td>
<td>2. ..........</td>
</tr>
<tr>
<td>---------------------</td>
<td>-------------</td>
</tr>
<tr>
<td>b. Last month: Unsatisfactory performance</td>
<td>1. ..........</td>
</tr>
<tr>
<td></td>
<td>2. ..........</td>
</tr>
</tbody>
</table>
The Manufacturing Cycle both begins and ends with customers, in the sense that new product ideas often come from customers, via the sales and marketing departments, and because, of course, when it is made, the new product is sold to these customers.

The marketing people have a big input into product design, but of course, the designers have to work with the manufacturing engineering people,
who have to make sure that the product is producible, who in turn work
with the industrial engineering department, which is responsible for acqui-
ring the machines and equipment necessary to make the new product.

Central to the manufacturing process is production planning and control,
which has direct links with the procurement of supplies of materials or
components, with production, and with inventory control.
Of course quality control is necessary in several areas: the supply of com-
ponents, the receiving of components, the production department itself, and
the shipping of the finished product.

Listening & Reading

Describing a production process

Pre-listening

Answer the following questions

• How is chocolate produced?
• Which of these items are ingredients of chocolate?
cocoa coffee sugar fat milk vitamins tea eggs malt

• How does chocolate get its characteristic taste and texture?

Listening

You’ll hear an expert explaining how chocolate is produced and the vari-
ous operations involved in its manufacture. Listen to the recording.
1. Look at the stages of the process and number them according to the re-
cording.

Ingredients

Processes
Stages of chocolate production
roasting ___
cleaning ___
conching ___
grinding ___
kibbling 3
mixing & evaporating 7 8
paste___
pressing___
tempering___
winnowing 4

COCOA BEANS

1.

2.

3. KIBBLE

4. WINNOW

5.

6. NIBS

7&8

MIX & EVAPORATE

6.

MIX & EVAPORATE

CRUB

COCOA BUTTER

7.

8.

9.

10.

11.

12.

MILK SUGAR

MILK

SUGAR

CADBURY’S DAIRY MILK (bar)
2. Which of the stages apply to the actual chocolate production process? Which apply to the preparing of the ingredients?

Reading

Read the description of the latest production developments. Point out the expressions which are used to describe the new plant in a POSITIVE WAY.

Cadbury and New Technology

Cadbury operate three chocolate factories in the UK. Two are at Bournville producing chocolate bars and chocolate assortments; the other, the Somerdale factory, produces bars such as Double Decker, Crunchie and Fry's Turkish Delight which are known as 'countlines'.

The modernization programme at Bournville, begun in 1980, has involved the rationalization of production. This consisted in bringing together individual product processing, on the one hand, and the most modern processing and control technology, on the other. The specialist machinery comes from Britain and abroad and a number of these machines have been produced to Cadbury's own design and specification.

The new plants operate 24 hours a day producing Cadbury products to the highest standards of quality control. The Wispa plant produces 1,680 bars per minute with such precision that the size of the tiny air bubbles in the choco-
late is controlled. The Creme Egg plant will produce more than 350 million eggs a year at the rate of 1,100 per minute, and has the capacity to produce 370 million. By comparison the machinery which it replaced was capable of producing only 257 million eggs annually.

Each week the Bournville site alone produces 1,500 tonnes of chocolate - 1.6 million bars of various kinds plus 50 million Hazelnut Whirls, Almond Clusters and other individual chocolates.

Conching. A process which breaks down the various particles making up chocolate by gentle heating and agitating the paste.

Computer controlled measures
Before the automation programme, manufacture was a series of operations individually supervised at separate control points. Now one person supervises the whole operation from a control room full of computer terminals and TV screens.
In the Wispa plant, individual microprocessors monitor temperature at about 1,000 different points and information is fed into the central computers that can deal with some 360,000 instructions per minute.

**High speed packaging**
A major revolution has been the automation of the packing systems. Where previously chocolates were individually placed by hand in the boxes, machines now do this. New high speed chocolate bar packing plants have been introduced which are capable of making and wrapping 800 chocolate bars a minute and considerably more of the treat size bars. These variable high speed systems will check the weight, and where chocolate is produced with added fruit and nuts will also check for even distribution of these additional ingredients. The automation programme means that a dozen individual manufacturing plants will have replaced 37 old plants.

**What is the most positive aspect of the process from the point of view of the company?**

**Decide whether the following statements are true or false.**

1. The Bournville factory produces countlines.
2. The specialist machinery is produced by Cadbury.
3. The size of air bubbles in the chocolate is precisely controlled.
4. The old machinery could only produce 257 million eggs annually.
5. Chocolates are no longer individually packed.
6. Individual microprocessors control temperature changes.
7. The packing systems check the weight of the additional ingredients.

**Speaking**

Discuss whether what you have just read represents the future for all manufacturing processes. Consider these questions.

1. What advantages and disadvantages do you see with the introduction of more automated plants?
2. Can you agree on areas where you think it is a good idea to use them?
3. What will industrial workers then do?
4. Is it the end of work, as we understand it? And the beginning of the Leisure Society?
5. What are the advantages and disadvantages of manufacturing processes where only one person is needed?
6. What prospects do you see for spreading such processes and operations in your country?

**Vocabulary**

The following diagram shows how copper is manufactured. Complete the sentences with the words from the box. In some cases the passive form is needed.

<table>
<thead>
<tr>
<th>drain off</th>
<th>remove</th>
<th>contain</th>
<th>concentrate</th>
<th>crush</th>
</tr>
</thead>
<tbody>
<tr>
<td>sink</td>
<td>cast</td>
<td>refine</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Copper ores often ….. very low concentrations of the metal. Because of this, many stages of the production process ….. eliminating impurities. The ore ….. and milled before entering a flotation chamber, in which copper will ……… at the top while unwanted fragments ….. Next, the concentrate, now called charge, will enter a reverberatory furnace, where more impurities ….. During smelting, waste gases are removed, and the material forms a molten pool of copper and iron, called the matte, at the bottom of the furnace. The orange layer of impure metal on top of the matte is slag, which is ….. while the copper matte continues on to a converter. Molten copper from the converter ….. and must ….. once more by electrolysis before it is ready for use in the manufacture of products such as electrical wire and utensils.

writing

The following picture shows the pencil making process. Write a report describing the information shown below. You should write at least 150 words.
Speaking

Think of a service or manufacturing process you know about. Describe the process, together with a flowchart, if possible.
Unit 5 The Product

Warm-up

The chart below shows the standard product design and development sequence. Match up the sentences below with the different stages of the sequence.

The Product Design and Development

1. Idea generation
2. Product selection
3. Preliminary design
a. Carry out a market analysis, an economic analysis, and a technical feasibility study.

b. Determine production capacity and production schedule.

c. Develop and test preliminary designs, and make final specifications.

d. Evaluate alternative designs in terms of reliability, maintainability, and so on, and their producibility.

e. Evaluate alternative technologies and methods, and decide whether to develop them or license them from other companies; select specific equipment and process flow.

f. Search for consumer needs, consider alternatives, select best idea.

g. Select production facility.

**Speaking**

Give three examples of brands to which you are loyal (i.e. which you buy without giving it a moment thought). Why are you loyal to them?

Are there any products for which you have no brand preference or loyalty but are what marketers call a 'brand-switcher'?

Can you think of any products for which the name of the brand is totally unimportant, so that you do not even notice it? (There may be some in your bag or briefcase.)

Give an example of a product line (a group of related products made by the same company). Think of clothes, cosmetics, food, and so on.
**Reading**

Read the following text, and do the tasks below.

**PRODUCTS AND BRANDS**

Marketing theorists tend to give the word *product* a very broad meaning, using it to refer to anything capable of satisfying a need or want. Thus services, activities, people (politicians, athletes, film stars), places (holiday resorts), organizations (hospitals, colleges, political parties), and ideas, as well as physical objects offered for sale by retailers, can be considered as products. Physical products can usually be augmented by benefits such as customer advice, delivery, credit facilities, a warranty or guarantee, maintenance, after-sales service, and so on.

Some manufacturers use their name (the 'family name') for all their products, e.g. Philips, Colgate, Yamaha. Others, including Unilever and Procter & Gamble, market various products under individual brand names, with the result that many customers are unfamiliar with the name of the manufacturing company. The major producers of soap powders, for example, are famous for their multi-brand strategy which allows them to compete in various market segments, and to fill shelf space in shops, thereby leaving less room for competitors. It also gives them a greater chance of getting some of the custom of brand-switchers.
Most manufacturers produce a large number of products, often divided into product lines. Most product lines consist of several products, often distinguished by brand names, e.g. a range of soap powders, or of toothpastes. Several different items (different sizes or models) may share the same brand name. Together, a company's items, brands and products constitute its product mix. Since different products are always at different stages of their life cycles, with growing, stable or declining sales; profitability, and because markets, opportunities and resources are in constant evolution, companies are always looking to the future, and re-evaluating their product mix.

Companies whose objectives include high market share and market growth generally have long product lines, i.e. a large number of items. Companies whose objective is high profitability will have shorter lines, including only profitable items. Yet most product lines have a tendency to lengthen over time, as companies produce variations on existing items, or add additional items to cover further market segments. Additions to product lines can be the result of either line-stretching or line-filling. Line-stretching means lengthening a product line by moving either up-market or down-market, i.e. making items of higher or lower quality. This can be carried out in order to reach new customers, to enter growing or more profitable market segments, to react to competitors' initiatives, and so on. Yet such moves may cause image problems: moving to the lower end of a market dilutes a company's image for quality, while a company at the bottom of a range may not convince dealers and customers that it can produce quality products for the high end. Line-filling - adding further items in that part of product range which a line already covers - might be done in order to compete in competitors' niches, or simply to utilize excess production capacity.

Answer the questions

1 Why do the big soap powder producers have a multi-brand strategy?
2 Why do companies' product mixes regularly change?
3 What factors influence the length of companies’ product lines?
4 What are the potential dangers of line-stretching?
5 Why might companies undertake line-filling?

Find words or expressions in the text which mean the following.

1 the possibility of paying for a product over an extended period
2 a promise by a manufacturer or seller to repair or replace defective goods during a certain period of time
3 a surface in a store on which goods are displayed
4 consumers who buy various competing products rather than being loyal to a particular brand
5 the standard pattern of sales of a product over the period that it is marketed
6 the extent to which an activity provides financial gain
7 possibilities of filling unsatisfied needs in sectors in which the company can produce goods or services effectively
8 the sales of a company expressed as a percentage of total sales in a given market
9 the set of beliefs that the public at large holds of an organization
10 a small, specialized, but profitable segment of a market

Listening

Developing a New Product

You will hear Joglshwar Singh, a director of the Swiss holding company Tege, talking about the forthcoming launch of 'Fresh Fries', a fast food product that will be sold in vending machines.
Pre-listening

Do you ever use vending machines? If so, what for, why and when?

What are the potential advantages and disadvantages of this form of distribution, for both the seller and the customer?

Listening

Listen to the interview. Which of the alternative answers is correct?

1 Fresh Fries machines will be installed
   A in cafes and restaurants and other public places.
   B in all kinds of places where people come to eat.
   C in places where there are lots of people.

2 Fresh Fries are made from
   A dried potatoes and water.
   B fresh potatoes and oil.
   C powdered potatoes and various secret ingredients.
3 The vending machine will be followed by a smaller machine

A for home and commercial use.
B for people to use at home.
C for smaller restaurants.

4 The machine has been through a series of prototypes because

A the inventor came up with further inventions.
B the inventor made design improvements.
C other people gave the inventor new ideas.

5 Inventors usually do not know enough about

A industrial engineering.
B raising finance.
C the economics and realities of industrial production.

6 Jogishwar Singh thinks the most important reason the product will succeed all over the world is

A its speed in delivering the fries.
B the fact that the fries will always have exactly the same quality.
C the quality of the fries and especially their crispness.

Vocabulary

Look at the following words and expressions, and then listen to the interview again and write down the words and expressions used in the interview that mean nearly the same.

1. a serving of food designed for one person
2. an alternative British word for what Americans call french fries
3. eye-catching, noticeable
4. from which water has been removed
5. the components of which a food product is made
6. a small booth used for selling newspapers, cigarettes, ice cream, and so on
7. the owners of a company
8. a large amount of money
9. uniformity, regularity, sameness (of a product sold worldwide)
10. a symbol or design or the particular form of lettering of a trade mark

**Writing**

Imagine that an international vending machine operator is hoping to increase its activities in your country, and has hired you to report on the existing market and to suggest new products that could be distributed via vending machines. Consider the following aspects:

- which products are currently sold in vending machines in your country
- where such machines are usually situated
- what kind of customers generally use them
- in what circumstances

Then you have to suggest further products that could perhaps be distributed in this way.

**Speaking & Vocabulary**

You will see some information about a product. Decide which product is being referred to. Choose the product from the following list. Each product is referred to once only.

**Answers**

<table>
<thead>
<tr>
<th>Desktop publishing at an affordable price. High resolution. Compatible with a wide range of systems.</th>
<th>With built-in pre-record message or facility to record your own. Speaker volume control.</th>
</tr>
</thead>
<tbody>
<tr>
<td>answering machine</td>
<td>computer</td>
</tr>
<tr>
<td>briefcase</td>
<td>cordless phone</td>
</tr>
<tr>
<td>burglar alarm</td>
<td>daily planner</td>
</tr>
<tr>
<td>clock</td>
<td>fax machine</td>
</tr>
<tr>
<td>photocopier</td>
<td>pocket calculator</td>
</tr>
<tr>
<td>table lamp</td>
<td></td>
</tr>
</tbody>
</table>

47
<table>
<thead>
<tr>
<th>1.</th>
<th>2.</th>
</tr>
</thead>
<tbody>
<tr>
<td>The infra-red sensors detect any intruders. A message is immediately sent to the control.</td>
<td>Make calls anywhere inside or within 100 feet outside. Paging feature.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>3.</th>
<th>4.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Make calls anywhere inside or within 100 feet outside. Paging feature.</td>
<td>High resolution colour monitor. Comes complete with word-processing and other business software.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>5.</th>
<th>6.</th>
</tr>
</thead>
<tbody>
<tr>
<td>60 gray shaders for better transmission of photographs. One touch dialing.</td>
<td>High resolution colour monitor. Comes complete with word-processing and other business software.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>7.</th>
<th>8.</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>9.</th>
<th>10.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Receives messages up to 45 miles. 4 lines text. Beep or vibrate mode.</td>
<td>The efficient answer to high volume duplication. Adjustable speeds. Quality reproduction.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>11.</th>
<th>12.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Durable self-adhesive letters, numbers and symbols in a variety of sizes. Can be used indoors and out.</td>
<td>White face with black numerals. Battery included.</td>
</tr>
<tr>
<td>Document folio in lid. Pockets for calculator, pens, etc. Combination locks.</td>
<td>Solar powered. 8-digit LCD display.</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>13…………….</td>
<td>14……………..</td>
</tr>
<tr>
<td>15…………….</td>
<td>16……………..</td>
</tr>
</tbody>
</table>
Unit 6 Production and Operation Management

**Reading**

Read the text and answer the questions below

**WHAT IS PRODUCTION MANAGEMENT?**

Production management is also called operations management. It includes planning, co-ordination and control of industrial processes. The aim of production management is to ensure that goods are produced efficiently to the satisfaction of the customer at the right price, of the right quality, in the right quantity, at the right cost and on time.

In manufacturing production manager is responsible for product and process design, planning and control issues involving capacity and quality, and organization and supervision of the workforce.

The scope of the job of production manager depends on the nature of the production system: jobbing production; mass production; process production; and batch production. Many companies have several types of production, so the job of production manager becomes more complex.

**Typical work activities of production manager**

Depending on the size of the organization the functions of production manager are:

- to draw up a production schedule;
- to work out the needed resources;
• to estimate how long a job will take, to estimate the cost of it, and to set the quality standards;
• to monitor the production processes and adjust schedules as needed.
At the pre-production stage the production manager has responsibility for the selection and design of equipment, the plant layout and materials handling, and production planning (including demand forecasting, production scheduling and the ordering of material).
During the production stage the responsibilities of the production manager include production control (the sequencing of jobs, updating time schedules, etc), stock control, quality control and the maintenance and replacement of production equipment. Production managers are also concerned with product design and purchasing.

large firm senior production manager plays a more strategic role estimating future capacity, coordinating the work of planners and supervisors and working with buyers, sales and engineering staff.
In progressive firms the production manager's role is tending to be more closely integrated with other functions, such as marketing and finance.

**Typical work activities of factory (or operations) manager**

Much of the work involves full operational control over what happens at the plant/works including engineering, output, personnel and often logistics and other commercial activity (sales and marketing).
Typical work activities of factory manager are:
• to review and approve plans for the control of planned output, budget spending, material efficiency, engineering effectiveness, and human resources;
• to supervise employees;
• to establish strong working relations with other functional managers;
• to report regularly to the production manager.

**Typical work activities of production supervisor**
A production supervisor is sometimes known as a shift manager or team leader. He reports to the production manager or plant manager and is responsible for achieving immediate and short-term objectives laid down by the production manager, for example output, quality, waste, yield, safety and overtime costs. In particular, the supervisor can have a significant effect on how effectively their production staff perform as a team. Much of the work requires the ability to make immediate decisions.

Typical activities of production supervisor include:
- at the beginning of each shift, checking on absences (e.g., through sickness);
- reallocating tasks or rescheduling production, where necessary;

Supervisors are responsible for production plant or equipment, too. The responsibility they carry again varies with the situation. In some cases they may have to take technical decisions on a regular basis, whereas in others they may call upon maintenance or other technical staff for backup when necessary.

1. What is the aim of production management?
2. What is production manager responsible for?
3. What kinds of production systems there exist?
4. What are typical work activities of production manager?
5. What are the responsibilities of a production manager at the pre-production stage?
6. What is the role of a senior production manager in a large firm?
7. What are typical work activities of factory manager?
8. What are typical work activities of production supervisor?
THE "FIVE M'S IN THE PRODUCTION MANAGEMENT

Production management's responsibilities are summarized by the "five M's": men, machines, methods, materials, and money. "Men" refers to the (1)…….. in operating systems. Since the majority of manufacturing personnel work in the physical production of goods, "people management" is one of the production manager's most important (2)………… Production managers must also choose the machines and methods of the company, first selecting the equipment and technology to be used in the manufacture of the product or service and then planning and controlling the methods and procedures for their use. The flexibility of the production process and the ability of workers to (3)........... to equipment and schedules are important issues in this phase of production management. The production manager's responsibility for materials includes the management of (4)......... -both physical (raw materials) and (5).......... (paper-work). The (6)......... of resource movement and data flow is determined largely by the fundamental choices made in the design of the product and in the process to be used. The manager's (7)........... money is explained by the importance of financing and asset utilization to most manufacturing organizations. A manager who allows (8)....... inventories to build up or who achieves production level and steady operation by (9).......... good customer service and timely delivery runs the risk that overinvestment or high (10)......... will (11)........ any temporary (12)........... advantage that might have been obtained.
While you are listening to the conversation between Jeff Lyon, a Methods Engineer, and Tom Francis, a Production Foreman, complete the following sentences.

1. The quality control inspector rejected ......................................... the production facility did.
2. The tool number that has been put on the press is.............
3. The name of the person who has been operating the press for this job is ............
4. The problem with the pieces that have been run through the press is ........ coming down on this side of the plate.
5. The tool requires some........... 
6. The second problem concerns .......... 
7. The trouble is that operators are having great difficulty in keep- ing.........
8. It is hard to position the ........ and hold it in line.
9. The possible reason for this is that the press is ..........
10. The press weighs ..........

Why does Lyon ask about the press operator?

**Reading**

Read the following report on the use of computer facilities for the control of production at Lindquist Limited and do the tasks below.

1. *Terms of Reference*
   On the instructions of the Production Director, to report on the failure of real time computing facilities to improve the control of production.

2. *Procedure*
The report was made after investigation and analysis of all the production functions and the Management Services Department.

3. **Findings**
   
3.1 **Background**
Five years ago the company had a real time EDP system installed in order to (1) make the measurement of performance against established standards more efficient and in order to (2) have any deviations from those standards corrected quickly. The availability of data on such things as the status of production programmes and the number of labour hours worked were expected to improve the control of production.

3.2 **Present Situation**
The real time system has provided good measurement data and it has been able to identify deviations from standards. Although this quick identification of problems has been a valuable service, the development of corrective programmes has still been required. What is more, the implementation of these programmes has been a time-consuming job. For example, in the simple case of quality control, although factory rejects have been quickly noticed, it has taken a lot of time to identify the causes of those rejects and to implement corrective programmes.

4. **Conclusions and Recommendations**
It is suggested that there has been too much dependence on statistical data. Secondly, there has been too little consideration of the cost of collecting real time data and not enough savings in terms of time to justify the cost.

Information on the results of a programme is not good enough. Management require a system of control that will inform them of how to deal with potential problems. This means altering our methods to more future-directed means of control.

It is recommended that more consideration is given to the status of the company's network planning techniques, such as critical path analysis and programme evaluation and review technique (PERT).

**Answer the questions.**

1. Why did the production director request the report?
2. How long have Lundquist’s been using the real time system?
3. What has the real time system been able to do? Has this been enough for the Lundquist’s? Why?
4. What is needed in addition to programme results?
5. What conclusion does the report come to?
6. Complete the following table.

<table>
<thead>
<tr>
<th>verb</th>
<th>noun</th>
</tr>
</thead>
<tbody>
<tr>
<td>…………….</td>
<td>identification</td>
</tr>
<tr>
<td>…………….</td>
<td>improvement</td>
</tr>
<tr>
<td>…………….</td>
<td>installation</td>
</tr>
<tr>
<td>deviate</td>
<td>…………….</td>
</tr>
<tr>
<td>implement</td>
<td>…………….</td>
</tr>
<tr>
<td>consider</td>
<td>…………….</td>
</tr>
<tr>
<td>instruct</td>
<td>…………….</td>
</tr>
<tr>
<td>sum up</td>
<td>…………….</td>
</tr>
<tr>
<td>…………….</td>
<td>suggestion</td>
</tr>
<tr>
<td>…………….</td>
<td>justification</td>
</tr>
</tbody>
</table>

Decide whether the following statements are true or false.

1. If the real time computing facilities in Lundquist had improved their control of production, there would have been no justification for this report.

2. If the real time computing facilities in Lundquist had improved their control of production, there would have been no justification for a report.

3. The real time system at Lundquist has identified problems quickly.

4. The real time system at Lundquist has enabled the quick implementation of corrective programmes.

5. PERT is one of the techniques in Lundquist’s network planning.

Grammar

1. Getting Things Done
   There are different ways of expressing the idea of ordering, instructing or arranging for someone else to perform a service for us. Notice how the examples have been re-written using the Causative form.

   Examples:
The Methods Engineer arranged for the improvement of the tooling. **The Methods Engineer had the tooling improved.**

Lundquist's instructed a specialist computer firm to install the real time system. **Lundquist's had a real time system installed by a specialist computer firm.**

Now change the following sentences in a similar way.

a. The foreman ordered some minor alterations to the tooling.
b. The company instructed a Business Consultant to write a report.
c. The Production Manager arranged for an outside company to repair the press.
d. The Production Director instructed management to introduce a new production control system.
e. The foreman instructed the operator to do the job again.

### 2 Sentence Links

Notice how we can link these two sentences by using although:

(1) The real time system has been able to identify problems quickly.
(2) The development of corrective programmes has been a time-consuming job.

**Although the real time system has been able to identify problems quickly, the development of corrective programmes has been a time-consuming job.**

Use **although** to link the following sentences.

a. (1) The tooling has been changed twice. (2) The end-plates are still not meeting specifications.
b. (1) The Production Manager instructed D Department to clean the components. (2) The Foreman in D Department did not remember to schedule the work.
c. (1) Raymond Stack was rather old. (2) Raymond Stack was able to find a new job in Leeds.

### 3 Degree

If, for example, we want to describe the weight of a press, we can say:
It is a fairly heavy press.
It is a very heavy press.                      STRONGER
It is an extremely heavy press.

If, however, we want to show that the weight of the press is not acceptable for a certain job, we can say:

**The press is too heavy./The press is not light enough.**

Now complete the following sentences using very, too, or enough.

a. The new operator is a ... hard-working member of the department.
b. The matter was not given . . . consideration to make a reasonable decision.
c. The system was . . . complicated for the staff to operate efficiently.
d. Although the applicant had . . . good qualifications, they were not good ... for the job.
e. The company did not allow . . . time to complete the job.
f. The scheme has failed to work because there has been …. much dependence on statistical data.

**Writing**

**Drafting and composing a report**

Read the following extract from the newspaper report.

**Breakdown leads to bottleneck**

17 March 2005
Delta Tools were yesterday unable to meet their daily deadline. After a sudden, inexplicable breakdown at their Southford site the main assembly line was put out of action. Components from supplying firms continued to be delivered, but despite determined attempts to utilize all the available space the plant was soon brought to a halt. The late shift had to be sent home and production was…..

Imagine you work for a multinational manufacturing company at one of its *European* plants. You are the personal assistants of the Chief Executive Officer. There have been a number of delays and breakdowns in
production recently which have been reported in the press. You have been asked to consider what steps can be taken to prevent the same problem happening again.

1. What happened, according to the newspaper report? Now read the consultant's report and the internal memos below. Highlight key sections and try to agree what really happened

Industrial Research Consultants Inc.
Buffalo Grove Il 60090 USA

Consultant’s Report
April 5, 2005

You have a wide range of equipment on the site at this point, as you can see from the attached drawing. All available space has to be utilized. So we must restrict the number of materials which are actually present at any given time. Clearly if a particular component is not available when it is required on the assembly line that might lead to a hold-up. In most production units you will, of course, have bottlenecks. But we should not allow any gaps to occur, if possible. The latest conveyor technology is clearly required.

A further point concerns production time. The machines do not operate night and day at the moment and the operators work a two-shift system at present. We are hoping to put forward a plan to streamline production in the coming months. Once we have solved the technical problems - and our designers are currently working on a project to modernize your handling equipment - all the facilities in the plant will be co-ordinated to enable you to step up production of the new range of products.

Unfortunately, as you know, there has been a major problem with reorganizing the maintenance schedule. In the past two years standby crews were on duty around the clock. But………

Memorandum
From; Chief Executive To: Production Director
April 10, 20_
This is a great idea, Ralph. Please investigate fully automated handling equipment and the possibility of installing new robots for finishing and assembly shops. Also make sure the recommendations of the consultant are put into practice.

INTERNAL MEMO
FROM: Production Director
TO: Personnel Director  
April 15, 2005

John. As you know we're working under great pressure in all departments at the moment to keep up the output for the export and US orders. The new jobs are needed badly. All our maintenance staff are extremely overworked. Can you please readvertise the vacant jobs for the additional maintenance engineers and the five new technicians. Things cannot go on as they are now. We're badly understaffed. One day the new robots are going to break down, when the line is not covered by the service department. You know how much we need people with all-round electronic and mechanical qualifications so that the wide range of machines we operate are fully supervised at all times. We must introduce a three-shift system for the maintenance people. They never have time to put the faults right at the moment. You should emphasize the large bonus payments for working unsocial hours and nights.

2. Write a report to your European regional director explaining what happened.

Speaking

Production problems –what if ?

Look at the following list of problems that a production manager might face. Match each problem with the proper solution from the second list.
Problems
1. What do you do if your machines keep breaking down?
2. What do you do if there are shortages of materials?
3. What do you do if there is absenteeism in your works?
4. What do you do if your transportation breaks down?
5. What do you do if quality falls?
6. What do you do if productivity falls?
7. What do you do if your supplier's workforce keeps going on strike?
8. What do you do if your supplier sends you sub-standard materials?
9. What do you do if your workers refuse to do overtime?

Solutions
A  redesign manufacturing procedures to improve quality
B  get replacement deliveries or modify the product
C  introduce bonus schemes
D  do more preventive maintenance or hire replacements
E  try to improve labour relations
F  use temporary labour or recruit more people and try to improve labour relations
G  use other materials, get new deliveries or modify existing parts
H  use alternative suppliers, make sure you have emergency stocks
I  use alternative methods, for example air instead of sea
Listening

Listen to the following conversation and do the tasks below.

1. Decide the job title for each of the speakers.

<table>
<thead>
<tr>
<th>Names of Speakers</th>
<th>Job Titles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mr. Fanfoni</td>
<td>Management Services Manager</td>
</tr>
<tr>
<td>Mr. Simms</td>
<td>Production Director</td>
</tr>
<tr>
<td>Mrs. Barnett</td>
<td>Production Manager</td>
</tr>
</tbody>
</table>

2. Decide if the relationships between the speakers are friendly, unfriendly, neither friendly nor unfriendly.

3. What is the purpose of the meeting?

4. What is the important point of disagreement during the meeting?
Unit 7 Quality

Reading/Vocabulary

Read the text and do the tasks below

In production and operations management, over the past few decades, there has been increasing (1) emphasis on quality, as defined by the consumer, in terms of features offered, appearance, reliability, durability, serviceability, and so on.

Production control

An important concept has been Total Quality Management (TQM), according to which management should ensure that quality extends throughout the organization in everything it does, or at least in (2) features of products and services that are important to the customer. Rather than aiming for the best quality compatible with low unit costs, the company should aim for the highest quality possible, because a lack of quality can be more (3) expensive than achieving high quality. As the production theorist Philip Crosby puts it, quality is free.

What he means is that there are many (4) costs that result from production that is not 100% perfect: inspecting, testing, identifying the causes of defects, implementing corrective action, training and retraining personnel, redesign-
ing a product or system, scrapping, reworking or repairing defective products, replacing products in accordance with a (5) warranty, dealing with complaints, losing customers or their goodwill, and so on. Quality theorists such as Joseph Juran, Deming, and Crosby have shown that prevention is usually much cheaper than failures. Every extra dollar spent on prevention might save $10 spent on inspection and failure costs. Furthermore, even if the (6) current quality level appears perfect, the company should still continuously look for product improvement, and aim to be the best in the industry. Companies should always engage in benchmarking.

**Integrated circuit quality control**

Although management is responsible for designing and (7) installing an overall system which excludes defects and low quality, everyone within that system, in the entire supplier-producer-customer chain, should be responsible for quality. In TQM, every worker is a quality inspector for his or her own work, trying to get it right the first time, aiming for zero defects. This approach, often described as "quality at the source," removes the need for the kind of "over the shoulder" inspection that is usually (8) resented by workers. Of course this often requires training, and depends on a co-operative attitude.

Many large Japanese companies - especially those guaranteeing (9) lifetime employment - have been able to (10) attain high quality, because of the motivation of their staff, and the long-term nature of nearly all the relationships among employees, suppliers, distributors, owners and customers. The Japanese invented quality circles: voluntary groups of six to twelve people, who
are usually given training in problem-solving, analysis, and reporting methods, and who then meet once a week, during paid hours, to discuss their department and the problems they are encountering. If there are problems with quality variations, the group will try to identify their (11) sources, find solutions to eliminate them, and propose these to management. There are an estimated one million quality circles with ten million members in Japan. Quality circles have been less successful in the more (12) individualistic cultures of America and Europe.

1. Match up the following words with the underlined words in the text:

   a) achieve        b) aspects        c) costly        d) disliked
   e) expenses       f) guarantee      g) origins       h) permanent
   i) present        g) selfish        k) setting up   l) stress

2. Complete the following collocations from the text:

   1. operations .......... 
   2. compatible .......... 
   3. unit .................. 
   4. ................. level 
   5. corrective ............ 
   6. ........ with complaints 
   7. ........ improvement 
   8. overall ............... 
   9. the supplier-producer-customer .................. 
   10. ................. defects 
   11. lifetime ............. 
   12. ................. circles 

3. Complete the following collocations from the text and translate the expressions:

   1. to retrain ........ 
   2. to repair ........
3. to deal with ........
4. to lose customers’ ........
5. to install ........
6. to eliminate ........

**Vocabulary**

1. Match the words in the box with the definitions below:

<table>
<thead>
<tr>
<th>benchmarking</th>
<th>to scrap</th>
<th>goodwill</th>
</tr>
</thead>
<tbody>
<tr>
<td>reliability</td>
<td>durability</td>
<td>warranty</td>
</tr>
<tr>
<td>defect</td>
<td>serviceability</td>
<td></td>
</tr>
</tbody>
</table>

1. a fault or imperfection or deficiency
2. a promise that goods will meet a certain specified quality level, or be repaired or replaced free of charge
3. customers’ satisfaction with and loyalty to a company
4. ease of maintenance and repair
5. going outside the firm to see what excellent competitors are doing, and adopting the best practice
6. performance over a long period of time
7. regular performance according to specification
8. to sell defective goods for the price of the recyclable materials they contain

**Speaking**

1. When consumers talk about *quality*, what different criteria do they have in mind? How would you define *quality* in relation to the following?

- a fast-food snack
- a restaurant meal
- a tennis club
- a small car (US automobile)
- a raincoat
- hi-fi equipment
2. A well-known book on production is called *Quality is Free*, in which Philip B. Crosby argues that what costs money is a lack of quality – not doing things right the first time. List some of the expenses a company can avoid by preventing poor quality before it happens.

**Listening**

You will hear part of an interview with Alan Severn, the Quality Manager of Arcam, a British manufacturer of specialized, high quality hi-fi equipment: CD players, amplifiers, tuners and cassette decks. Listen to the interview and then answer these questions.

1. How many people work for the quality manager?

2. What are the two important aspects of the design of Arcam products that Alan Severn mentions?

3. According to what Alan Severn says, does quality begin with (a) the design or (b) the suppliers of components?

4. What does Alan Severn mean by total Quality Management at Arcam?

5. What is his definition of success in terms of quality?
Unit 8 Quality standards

Reading

Read the text and do the tasks below

ISO standards make a positive contribution to the world we live in. They ensure vital features such as quality, ecology, safety, economy, reliability, compatibility, interoperability, efficiency and effectiveness. They facilitate trade, spread knowledge, and share technological advances and good management practices.

ISO make transparent the requirements that products must meet on world markets, as well as the conformity assessment mechanisms for checking that those products measure up to standards. As a result, suppliers from developed and developing countries alike can compete on an equal basis on markets everywhere.

ISO – a non-governmental organization – is a federation of the national standards bodies of 157 countries, one per country, from all regions of the world, including developing and transitional economies.

Each ISO member is the principal standards organization in its country. The members propose the new standards, participate in their development and provide support in collaboration with ISO Central Secretariat for the 3000 technical groups the actually develop the standards.

The ISO 9000 and ISO 14000 families of management system standards have spearheaded a widening of ISO's scope to include managerial and organizational practice. (ISO does not carry out certification to these or any other of its standards, nor does it control the certification business sector.)

Complementing the above is a "toolbox" of ISO standards and guides for conformity assessment - covering all aspects from supplier's declaration of conformity to third-party certification and accreditation - which is becoming
a vital component of business transactions, global trade and regulatory re-
quirements.

**ISO's partners**

ISO collaborates with its partners in international standardization, the IEC
(International Electrotechnical Commission) and the ITU-T (International
Telecommunication Union), particularly in the field of information and
communication technology. They have established the World Standards Co-
operation (WSC) as the focus for their combined strategic activity.

ISO has a strategic partnership with the World Trade Organization (WTO)
aiming to promote a free and fair global trading system. Signatories to the
WTO Agreement on Technical Barriers to Trade (TBT) commit themselves
to promoting and using international standards of the type developed by ISO.
ISO cooperates closely with most of the specialized agencies and bodies of
the United Nations that are involved in technical harmonization and assis-
tance to developing countries.

ISO also maintains close working relations with regional standards organi-
zations, many of whose members also belong to ISO. In addition, several
hundred specialized organizations representing trade or regulatory sectors
participate in developing ISO standards.

**ISO's path forward**

New growth areas for ISO standards in the coming years include:

- **the environment** - with standards for meeting new requirements such as
greenhouse gas verification (climate change mitigation) and for other as-
pects of sustainable development;

- **the service sectors** - with standards already being developed for personal
financial services, market opinion, social research and tourism;

- **security** - among aspects already addressed are maritime port security,
freight transport and countering illegal trafficking of radioactive materi-
als ;

- **good managerial and organizational practice** - such as the guidelines ISO
is developing on social responsibility.

In addition, ISO is well placed to provide voluntary standards for formerly
regulated areas such as energy, water supply or transportation.
Answer the following questions:

1. What is ISO?
2. What is the main contribution of the International Organization for Standardization?
3. What are the responsibilities of ISO members?
4. What are the ISO 9000 and ISO 14000?
5. What is the main objective of ISO and WTO?
6. What are the new areas for ISO standards?

**Vocabulary**

Read a short paragraph about ISO 9000 and fulfill the following exercise:

The 2000 version of the ISO 9000 standards put particular importance on:

a  the role of the top management in setting policies for quality

   Top managers have to be seen to be involved in quality issues, not leaving this to middle management

b statutory and regulatory requirements – for example, the car industry has to pay particular attention to safety and environmental laws and standards in relation to the components that they use

c measurable objectives – we have to be able to measure quality and by how much it is improving

d resource management – how we manage the inputs to our products, for example human resources and materials

e monitoring customer satisfaction – customers are the ultimate judges of quality and we have to constantly check and improve the ‘score’ that they give us

f training effectiveness – the training of our staff is an investment and we have to measure how effective it is in terms of our future profitability
continual improvement – 100 per cent quality is never achieved – there is always room for improvement.

Look at the examples of work on quality at a company producing car components. Match each one to an aspect of a quality (a-g).

1 All the people in the call centre were sent on a course to develop their sense of team work, and this increased sales by 15 per cent.

A call centre

2 The senior managers invited a well-known quality expert to do a consultancy project on production quality.

3 The production manager looked at the latest regulations on car safety on a government Ministry of Transport website.

4 Employees are always paid bonuses for suggesting improvements, however small.
5 The company developed new software to analyze quality data more closely.

6 They have checked the quality procedures in place at all of their suppliers.

7 The car firms who buy the company's components are totally satisfied.

**Writing**

Find out information and write a report about an organization that has adopted standards such as ISO 9000. How have they changed the way the company works?
Unit 9 Just-In-Time Production

Vocabulary

1. Match up these words with the definitions which follow

capacity component inventory lead time location
outsourcing or contracting out plant subcontractor

1. any company that provides goods or services for another one
2. any of the pieces or parts that make up a product, machine, etc.
3. buying products or processed materials from other companies rather than manufacturing them
4. the (maximum) rate of output that can be achieved from a production process
5. the buildings, machines, equipment and other facilities used in the production process
6. the geographical situation of a factory or other facility
7. the stock of any item or resource used in an organization (including raw materials, parts, supplies, work in process and finished products)
8. the time needed to perform an activity (i.e. to manufacture or deliver something)
2. After it has been decided what IP manufacture, operations managers have to decide where to manufacture the different products, how much productive capacity their factories and plants should have, and how much inventory to maintain. Read the 15 sentences below, and classify them under the following six headings. Some sentences may fall under two headings.

A The consequences of insufficient capacity
B The consequences of excess capacity
C The advantages of large facilities
D The disadvantages of large facilities
E The advantages of having a large inventory
F The disadvantages of having a large inventory

1. A long lead time may allow competitors to enter the market.
2. Average fixed cost per unit drops as volume increases because each succeeding unit absorbs part of the fixed costs, giving economies of scale.
3. Finding staff and coordinating material flow become expensive and difficult.
4. If lead time increases, some customers may go to other suppliers.
5. Lost sales and market share are usually permanent.
6. The working environment might worsen and industrial relations deteriorate.
7. There are costs of storage, handling, insurance, depreciation, the opportunity cost of capital, and so on.
8. You can be more flexible in product scheduling, and have longer lead times and lower cost operation through larger production runs with fewer set-ups.
9. There is always a risk of obsolescence, theft, breakage, and so on.
10. You can meet variation in product demand.
11. You may be under-utilizing your work force.
12. You have protection against variation in raw material delivery time (due to shortages, strikes, lost orders, incorrect or defective shipments, etc.).
13. You may be forced to produce additional less profitable products.
14. You can take advantage of quantity discounts in purchasing.
15. You may have to reduce prices to stimulate demand.

**Reading**

Read the text below, and insert the following eight words.

---

74
JUST-IN-TIME PRODUCTION

Manufacturing companies are faced with a 'make-or-buy decision' for every item or component they use (as well as for every process and service). Do they make it themselves or do they outsource, and buy from a subcontractor? If a company assembles products supplied by a large number of subcontractors, they face the problem of how much they require.

In Just-In-Time (JIT) production - also called lean production, stockless production, and continuous flow manufacture - nothing is bought or produced until it is needed. Each section of the production process makes the necessary quantity of the necessary units at the necessary time - which is when it is required by the next stage of the manufacturing process, or by distributors or customers.

The JIT system is usually credited to Taiichi Ohno, who was vice-president for manufacturing with Toyota in Japan in the early 1950s - although he stated that he got the idea from American supermarkets! JIT is wholly contrary to the European and American logic of encouraging greater productivity, and welcoming production that exceeds the agreed schedule or quota, and stocking extras in case of future problems.

JIT minimizes the cost of holding inventories, which are regarded negatively, as avoidable costs, rather than as assets. The large Japanese manufacturing companies have long practiced, and generally use extensive networks of small subcontractors. Of course, if a single subcontractor fails to deliver a component on time, the whole production process is sabotaged, but the Japanese industrial system relies on mutual trust and long-term relationships.

Small suppliers often attempt to situate their facilities close to the plants of a larger company with which they work.

The Japanese also prefer small, specialized production with a limited scope, in which, wherever possible, all the machines required for a certain job are grouped together. This avoids all the waiting and moving time involved in sending half-finished items from one department to another, although it often requires flexible, multi-skilled employees.

JIT thus greatly reduces transportation and inventory costs, and should ensure that there is no waste from overproduction, or from idle workers waiting for parts. It allows increased productivity because of shortened throughput time. If factories are equipped so that setup times are short, very small production runs are possible. Any quality problems or product defects should be noticed.
more quickly, production (8) ......... are reduced, and the firm can react more rapidly to demand changes.

Speaking

According to the text, are the following sentences TRUE or FALSE? If they are false, say why.
1 In JIT, products are 'pulled' through the manufacturing process from the end, rather than 'pushed' through from the beginning.
2 JIT originated in American manufacturing.
3 JIT encourages production workers to exceed their production targets.
4 Companies using the JIT system and outsourcing many of their components are highly dependent on their subcontractors.
5 In a JIT system, a delivery of defective components can be replaced from the reserve inventory.
6 JIT depends on harmonious partnerships between a company and its suppliers.
7 Japanese production systems generally speed up the entire manufacturing process.
8 JIT leads to economies of scale.

Vocabulary/Reading

Read short texts about TQM and JIT and do the task below.

Total quality management
Total quality management, or TQM, was fashionable in the 1980s. This often involved quality circles, groups of workers who were encouraged to contribute ideas on improving the products that they made. Some companies had quality circles of production workers who suggested better ways of organizing the production line.

Employee participation, for example getting employees to suggest improvements to production methods, as in total quality management, is a form of empowerment: employees have a voice in quality improvements, rather than just following managers' instructions.

Kaizen

The TQM approach was designed to bring about gradual, step-by-step or incremental improvements in quality. Continuous improvement is what the Japanese call kaizen. An essential part of kaizen is gemba - 'the place where things happen'. In manufacturing, this is, of course, the factory floor. The idea is that continuous improvements can best be made by the people directly involved with production.

Kaizen

Just-in-time production

Originating in Japan, and then adopted all over the industrialized world, TQM forms part of lean production, making things with the minimum of time, effort and materials. Instead of producing components in large batches, they are delivered or produced just in time (JIT), only as they are needed. Employees are empowered to correct problems on the spot. Things must be done right first time (RFT). There should be no reworking to correct defects on finished products.

Production is seen as a continuous process of sequential rather than isolated steps, and the production, or assembly line is laid out in a logical way. Stocks of components are kept to a minimum. Manufacturing organized in steps like this is flow production.
1. What aspects of Quality Management are these employees talking about? Complete the sentences, with expressions from the texts above.

1. 'Our bosses encourage us to make suggestions about improving the production process if it's good for quality. We have a high level of................ .................................... .'
2. 'We feel that we ........................................................................and that we are listened to.'
3. 'Do it............................... and you don't have to do it again.'
4. 'Products being worked on move a minimum distance to the next step in the production process. This ..................................... means there is minimum time lost between each step.'

**Listening**

Before you listen to the recording, look at this ‘golden rules’. Which do you think is the most efficient way of organizing a manufacturing process?

- Use your machines and workers as much as possible – they should always be working
- Keep a good stock (inventory) of products in your warehouse so that you can supply whatever your customers demand.
- Keep a good supply of materials in your warehouse so that you never run short.
- Don’t run a machine unless you are making a product that has been ordered

Now listen to the recording. Here is a list of 12 points that could be made about J.I.T. - many of which you may agree with. Tick ✓ the points that are mentioned and put a cross X beside the points that are not mentioned in the interview. The first is done for you as an example.

1. J.I.T. stands for 'Just in Time'.
2. Capital tied up in stored materials is wasted.
3. Only a large company has enough influence and muscle to introduce J.I.T.
4. The J.I.T. philosophy was 'discovered' in the USA by Japanese engineers,
5. Workers are laid off when there are no orders to fill.
6. Some products take weeks or months to manufacture- you can't apply
   J.I.T. methods to such products.
7. In manufacturing, materials account for about 60% of the running costs.
8. Employees must be fully informed of how the system works if they are to
   be required to use this technology.
9. Training and maintenance can be carried out if there are no orders.
10. Workers have to be trained to operate many different machines.
11. In bad times, suppliers have to suffer and lose money.
12. Suppliers and customers have to co-operate very closely.

Writing

Write about **180-200** words on the following topic. Do you think it is always
possible to go on improving quality incrementally, or can you reach a state
where it is so good that further improvement is impossible?
Tape Scripts and Keys

Unit 1 Production Process

Reading /Vocabulary
1. c; 2. e; 3. a; 4. b; 5. d; 6. c; 7. d; 8. a; 9. b; 10. c.

Vocabulary (Inventory)
Exercise 1
1. inventory; 2. production run; 3. obsolescence; 4. storage; 5. theft; 6. delivery; 7. opportunity cost; 8. discounts; 9. shortages.

Exercise 2
1. inventory; 2. delivery; 3. shortages; 4. discounts; 5. production runs; 6. Storage; 7. opportunity cost; 8. obsolescence; 9. theft.

Unit 2 Factory Location

Reading /Vocabulary

Table Completion

<table>
<thead>
<tr>
<th>Cause</th>
<th>Situation</th>
<th>Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Large increase in output</td>
<td>Pressure on Wembley facilities</td>
<td>Board examines other locations</td>
</tr>
<tr>
<td>b. Unable to purchase more land in Wembley</td>
<td>Relocation of manufacturing facility to Peterhead</td>
<td>c. Majority of workforce redundant</td>
</tr>
</tbody>
</table>

Answers to the questions

1. To keep their competitive position in the market.
2. The availability of skilled labour, transport, materials, and government grants.
3. To be redundant or to move to Peterhead.

Vocabulary

Exercise 1
1. facility; 2. subcontractors; 3. retailers; 4. infrastructure; 5. utilities; 6. wholesalers; 7. components; 8. layout; 9. lead time.

Exercise 2
1. layout; 2. facility; 3. infrastructure; 4. utilities; 5. components; 6. lead time; 7. subcontractors; 8. wholesalers; 9. retailers.

Speaking
Location B. Highest points total out of 182.

Listening
Tapescript

Stan Well, Ray? What do you think of the news?
Ray I'm not very surprised. Are you?
Stan Yes I am, a little.
Ray Why? We've known since last year that the company had plans for expansion.
Stan Expansion, sure. But I didn't expect the company to close down completely here in Leeds.
Ray At least they want people like you and me to make the transfer with them. Stan Is that what you're going to do? Transfer to Forningsby?
Ray I'm not really sure. My wife's not happy about the idea. She has her own job, and all of her friends are here. Then too there's the problem of her mother, who's almost seventy-five now. That puts pressure on us to stay in Leeds.

Stan It won't be easy to find another job, you know.
Ray  I know it won't.
Stan  There's a lot of unemployment in engineering at the moment.
Ray  I know that, too. And I'm fifty-one, remember. Not the best age to, er, start looking around for a new job.
Stan  Does that mean you may make the move, after all?
Ray  I really don't know, Stan. Really I don't. I've lived here since I was a child. It would be difficult for me to make a change like that at my time of life.
Stan  Well, they've given us a year to make up our minds. That's something, anyway.
Ray  What about you, Stan?
Stan  I'll tell you one thing. I wouldn't have joined Masterson's if I had known about the possibility of relocation.
Ray  How long have you been working here now?
Stan  Two and a half years.
Ray  Yes, well, you're young. You'll be all right.
Stan  That's not the point. I could have joined Talbot's.
Ray  I'm not with you.
Stan  When I left college two and a half years ago, both Talbot's and Masterson's offered me a position. I accepted this one, unfortunately.
Ray  Oh well, that's all in the past. It's the future you should think about.
Stan  In Forningsby?
Ray  Why not? The company is providing good grants for housing, and transport, and things like that. And special bonuses will be given to those who say yes to the transfer early.
Stan  But I like Leeds.
Ray  Forningsby is not a bad place.
Stan  How do you know? Have you been there?
Ray  Okay, no, I haven't. But according to the information in the company statement, it seems to be quite a nice place. If you want my advice, Stan, for someone of your age, well, I think you should relocate with the company.
Stan  Should I?
Ray  Yes. If you don't, you may find that there's no alternative work in this area. After all, you have been doing your job for only about—what?—thirty months? That's not a lot of experience.
Stan  But I have done very well since I joined. I've learned a lot, Ray, you can't say I haven't.
Ray You have, but will it be enough if you leave? If you go out to look for a new job, you'll have to compete against engineers who have a lot more experience than you.
Stan True.
Ray And there's another point you should consider. If you go along with the company on this, you'll be in an excellent position in your department, with a much better chance of becoming a manager.
Stan Years and years from now, maybe.
Ray Time flies, Stan.
Stan True, Ray.


It is probable that Ray will move because he is young, because Forningsby is pleasant, and because he has a good chance of becoming a manager.

Listening
Tapescript

Secretary: Good morning. Can I help you?
Charles Bond: I’d like to speak to Mrs. Marie Pinet, the Admin Manager.
Secretary: I’ll put you through to administration, Sir. Hold a line, please. Are you holding, caller?
Susan Park: Administration office, Susan Park speaking.
Charles Bond: Mrs. Pinet, please.
Susan Park: Who is calling, please?
Charles Bond: Charles Bond.
Susan Park: One moment, please Mr. Bond. You are through now. Go ahead please.
Marie Pinet: Mr Bond? Hello, Marie Pinet here.
Charles Bond: Ah, Mrs. Pinet, good morning. How are you?
Marie Pinet: Very well, thanks. And how are things in London?
Charles Bond: Very, very busy for the past two or three weeks.
Marie Pinet: I can understand that. There are a lot to do when you hand over your job to someone new.
Charles Bond: There is, indeed, but the operation is running quite smooth, ha? How’s everything in Paris?

Marie Pinet: Fine. I’ve nearly completed the arrangements for you transfer here. I do, however, need those personal details for the Police Department and our company records. If you remember, I sent you a form four or five weeks ago.

Charles Bond: The form? I have not seen one. Are you sure it was sent? If I’d received it, I would’ve sent it back to you by now.

Marie Pinet: That’s strange. I did send one to you on the …let me see…on the 24th of last month.

Charles Bond: I’ll check it with my secretary, all right?

Marie Pinet: Yes, please. And if you don’t find would you let me know or if you can’t find it.

Charles Bond: I will, of course. What about the house? Have you found us anything yet?

Marie Pinet: As a matter of fact we found two. The trouble is, however, they won’t be available until the end of August.

Charles Bond: Oh, Dear! That means a hotel for a couple of month.

Marie Pinet: I’m afraid so, but there is an advantage that you’ll have time to get to know Paris and the different areas of the city, and then you’ll be in a better position to make the right choice when the time comes.

Charles Bond: Yes, but what about our furniture and things?

Marie Pinet: We’ve made the necessary arrangements and put them in to store until you’re ready to move into your house.

Charles Bond: Good. I’ll pass it along to my wife. Is there is anything else I should do for now?

Marie Pinet: No. Everything else has been taken care of. The only thing is that form I mentioned.

Charles Bond: I see to it this morning. If I can’t find it, I’ll ask you to send me another.

Marie Pinet: Thank you Mr. Bond.

Charles Bond: And thank you Mrs. Pinet. Thank you for your help.

Marie Pinet: Not at all.

Charles Bond: Bye for now, then.

Marie Pinet: Good-bye, Mr. Bond.

Keys:
1. (a) Marie Pinet requires the form recording personal details form the Police Department and company records. (b) Charles Bond wants to know about his Paris house.
2. She thinks that Charles Bond will get to know Paris and be in a better position to make a choice between the two houses.

Grammar

1. Past Time
   a. for  b. since  c. in  d. -  e. since  f. for  g. since  h. -  i. since

2. Past Intentions
   a. If, however, we had been able to call in a consultant, the problem of the salary structure would have been solved.
   b. If we had been able to employ more staff, the training programmes would have been improved.
   c. If the company had been able to increase its production, the supply position would have been improved.
   d. If we had been able to introduce a computer system, the administration would have been efficient.

3. Adding Information

   a. The Board of Directors, which includes the Managing Director of Keynsworth (UK) Ltd, is aware of the difficult situation.
   b. Peterhead, which is a very pleasant town, has excellent housing, schools and sports facilities.
   c. The pay offer made by the Personnel Director, who leads the negotiating team has not been accepted by the Union Representatives.
   d. The various redundancy payments, which can be seen on the notice board were negotiated and agreed with the Unions in April.

Unit 3 Factory Layout

Warm-up
   a. loading bay;  b. toolroom;  c. screen;  d. conveyor belt;  e. trolley;  f. warehouse;  g. machine tool;  h. shopfloor;  i. job stations;  j. workshops, jobbing shop, toolrooms, benches;  k. raw materials.
Reading /Vocabulary

Table Completion

<table>
<thead>
<tr>
<th>Types of production</th>
<th>Industry</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Job</td>
<td>a. shipbuilding</td>
<td>b. one project completed at a time</td>
</tr>
<tr>
<td>Batch</td>
<td>c. car components</td>
<td>Number of similar items produced, above immediate requirements</td>
</tr>
<tr>
<td>Flow</td>
<td>car</td>
<td>d. product produced at a planned rate of output.</td>
</tr>
</tbody>
</table>

Answers to the questions

1. *Process:* high level of stocks needed/skilled workforce needed
   *Flow:* little flexibility/little specialisation of machines and labour.

2. Because different products can be efficiently produced by different production methods.

3. a. False  b. False  c. True  d. False  e. True

Listening

*Tapescript*

**Pearson** And what are your feelings about it, Mr. King?

**King** I must say that I agree with the findings.

**Pearson** Mr. Cairns?

**Cairns** The report makes good sense, er, generally speaking.

**Pearson** But?

**Cairns** It is stated here that we have difficulty in meeting our product volume because our production processes are, it is pointed out, inefficient ... er ...
Pearson  And you disagree?
Cairns  Not disagree, no. It's just that this is, um, nothing new. I mean, we have been aware of this situation for a very long time, after all.
King  I think I see what Mr. Cairns is getting at. He means, I think, that the report gives a good description of the present situation, but it does not say very much about the future.
Pearson  Perhaps not, but it would be impossible for us to make decisions about the future if we did not have a detailed analysis of the system as it is now. We would not have called the consultant in, gentlemen, if we had been able to define the problem ourselves.
King  Quite so, Mr. Pearson. But can we take it that, as a result of these findings, the company is going to make a decision about the reorganization of the manufacturing layout?
Pearson  That's right. And I think, in a way—if you don't mind my saying so—that you have both misunderstood the purpose of this report. We aim to use it as the basis for some immediate future decisions. Immediate ones.
King  I see.
Pearson  Now notice that it is, um, recommended in the report that we change over, for example, from a process system to a flow system. Mr. Cairns, what do you think about that one?
Cairns  From the point of view of systems, um, all right, I suppose. I think I agree that our industrial pumps could all be manufactured more efficiently if we employed flow methods.
King  That's true from the demand point of view as well. We have a high and steady demand for our products. We would be able to work at capacity, and what's more—
Pearson  Just a moment, Mr. King. Mr. Cairns, I have the feeling that you don't agree one hundred per cent with the idea of such a changeover.
Cairns  I do have some worries, sir.
Pearson  Let's hear what they are.
Cairns  In my view, the report gives an unbalanced opinion about the advantages that a flow system would bring, if one was introduced. We all know that in a flow system we don't need to maintain a high level of stocks, we don't need to provide such a large manufacturing area, and we don't need to train our personnel to such a high degree of skill.
King  And production control is easier, too. That all sounds very advantageous to me, I must say.
Pearson  Now then, Mr. Cairns, what is it that you, um, seem to think would be disadvantageous to us if the new scheme came in?
Cairns  Well, as I said, in a flow system a highly skilled labour force isn't necessary. But here at Renco, that's exactly what we've got. It seems reason-
able to me that we should use the skills and resources that the company has built up over the past several years.

**Pearson** Ah, but the question is, how? As you yourself have pointed out, everybody has been aware of our inefficient methods, but very little has been done about them.

**King** Sir. If a system is basically inappropriate, then it is very difficult to make it work better by changing minor aspects of it.

**Pearson** So you would go along with the recommendation in the report and change over completely to a flow layout, Mr. King.

**King** Certainly. I see no reason why it can not be done.

**Pearson** What about Mr. Cairns's point about the use of the skilled labour which we already have?

**King** I don't see that as a great problem. Naturally, there will be some de-skilling over the years. But we can manage any problems that come up as a result of that.

**Cairns** Sorry, but I can't agree. First, I think we would face serious problems associated with job grades, responsibilities, salaries, et cetera. But more importantly, I really do think we should look at our present factory layout again.

**King** Again? We have tried to do that—what?—four or five times already?

**Pearson** Excuse me, Mr. King. What exactly do you have in mind, Mr. Cairns?

**Cairns** To begin with, I think we should regroup the mills and drills in F Department, as, um, here, in this diagram I've prepared. As you can see, if this were done . . .

**Keys:**
1. Production processes inefficient.
2. Low level of stocks/ smaller manufacturing area/ lower degree of skill/
   production control easier
3. **King**
4. use skills and resources that exist at Renco/no problems with job grades,
   responsibilities and salaries
5. **Cairns**

Less degree of skill required by the employees in order to produce the product. It would be necessary when flow methods and more automated machinery were introduced.
Reading / Vocabulary


Listening

Tapescript

Jim Carter  You wanted a word with me, Mr. Banks?
Mr. Banks  Ah…, Jim…, yes. Sit down. Yeh. …… Just a minute while I get this. Hello. Yes. Look, I’ll be busy for a little while. Can you come over to my office later? Say, at eleven o’clock? We’ll sort it out then. I know… no, you don’t need to bring the report. Right, Charley. All right, Jim, I’ll come straight to the point. I want to know, what’s wrong in your department? Come on, what is it?

Jim Carter  I’m not sure what you mean, Mr. Banks.

Mr. Banks  Don’t give me that. I’m talking about the general performance in G Department. Time after time we have to wait for work to be completed by your department.

Jim Carter  Well, I suppose, there have been one or two problems recently. Nothing very much, though.

Mr. Banks  Nothing much! What about this report then? Final assembly was held up twice last week waiting for your department to deliver components!

Jim Carter  We weren’t responsible for that hold-up.

Mr. Banks  You don’t have to make excuses, Jim. I just want to know the reason for all these problems so that we can sort them out.

Jim Carter  Mr. Banks, I’m not making excuses. These hold-ups have not been caused by my department.

Mr. Banks  Who’s been causing them then? Take the trouble last week.

Jim Carter  Now, that was nothing to do with us down in G. We didn’t receive a batch of parts from Leeds until Wednesday. Three days late! And when we did receive them we found that half of the metal plates were not drilled to the correct specifications.

Mr. Banks  Ah…. Oh, dear! That again! Explain something to me. Whereas our outside manufacturers always say that they deliver on time, our foremen always say that haven’t received the parts that the manufacturers are talking about. How is that?
Jim Carter I don’t know, Mr. Banks. I only know that we didn’t receive the plates until Wednesday. Three days late and not up to spec.
Mr. Banks All right, all right. Let’s take last month then. All the problems your department had at that time.
Jim Carter I’ve explained that already, Mr. Banks. Two of our machines broke down and were out of use for over a week. And we also had trouble with the parts that were sent to us from the presses in B department!
Mr. Banks Trouble? What kind of trouble? This the first time I’ve heard about it.
Jim Carter The parts were stored outside in the open. When they got to us, we had to send them to J department for cleaning.
Mr. Banks How long did that take?
Jim Carter A couple of days.
Mr. Banks I’m not satisfied that… This explains that very bad record that your department is building up, Jim….
Jim Carter I don’t think we are the cause of it all, Mr. Banks.
Mr. Banks I’m sure, you don’t. Look, Jim. Every department has to face the kinds of problems that you’ve described to me, and every one of them, except yours, seems to find ways of dealing with them. I’m not happy with the way things are going in G department and that’s that. The only question is, what are we going to do about it?

Keys: a. 1. The parts arrived three days late from Leeds.
2. Half of the plates were not drilled to the correct specification
b. 1. Two machines were broken down for over a week.
2. Parts were sent to J department for cleaning.

Unit 4 The Manufacturing Cycle

Reading

Listening/Reading

Pre-listening

The first and the last questions are open-ended. Only the second has predictable answers: cocoa, sugar and milk.

Tapescript

Speaker: In the case of all Cadbury's chocolate products the basic ingredients are, of course, cocoa beans. We buy our cocoa beans from Ghana and some from Malaysia. 50,000 tonnes of cocoa beans are processed each year at the factory but that's before the actual chocolate-making process can be started. When they arrive at the cocoa factory the cocoa beans are sorted and cleaned [1]. And then they're roasted [2] in revolving drums at a temperature of about 135 degrees. The actual time for roasting depends on whether the use at the end is for cocoa or chocolate. Now after that, the next processes are called kibbling [3] and winnowing [4]. Well first, in the kibbling stage the beans are broken down into small pieces. And at the same time the shells are blown away by air currents. The technical term for that process is 'winnowing'. And so, then you've got the broken pieces of cocoa beans. And those are known as 'nibs'. OK? Well, now in the next stage the nibs are taken and ground [5] in mills until the friction and the heat of milling reduces them to a thick chocolate coloured liquid. The result of the grinding stage is known as 'mass'. Now, this contains 55 to 58% cocoa butter and, of course, that solidifies as it cools. And it's the basis of all chocolate and cocoa products. Cocoa powder is made by extracting about half the cocoa butter through pressing [6] in heavy presses. And that cocoa butter is later added back in the chocolate-making process. Right then, now after the mass has been produced, we come to the actual chocolate-making process itself. I'm going to tell you about the production of milk chocolate. Well, at the milk factory the mass, the cocoa mass, is mixed [7] with liquid full cream milk and sugar which has already been evaporated [8] to a very thick liquid. The resulting chocolatey creamy liquid is then dried. At that
stage it's called 'chocolate crumb'. Then that's taken to our factories at Bournville and Somerdale in Bristol. There, the 'crumb' is mixed with the additional cocoa butter and special chocolate flavourings. And this is then turned into a kind of paste [9]. And it's ground [10] again and pulverized further. The chocolate, which has had sugar and cocoa butter added to the mass before grinding and pulverizing, now undergoes the final special production stages. Now, the most important component of chocolate as far as the texture is concerned, is the addition of fats. The final processes of 'conching' [11] and then ‘tempering’ [12] are essential in the process: they control the texture and viscosity of the chocolate before it can be used in the manufacturing process. Are you with me so far? Good! Now 'conching' involves mixing and beating the semi-liquid mixture to develop flavour and reduce the viscosity and the size of the particles. Well basically, what this means is that it stops it becoming too sticky and enables it to be manipulated. And then comes the tempering. This is the last stage and it's crucial: what it means is mixing and cooling the liquid chocolate under very carefully controlled conditions to produce chocolate in which the fat has set in its most stable crystalline form. It is the tempering of the chocolate that gives it the famous Cadbury smoothness, and gloss and the snap. Without this last process the chocolate would be very soft and gritty, and there'd be large crystals inside it and it would have a very dull grey appearance. Well then, there we are, that's how milk chocolate is made . . .

**Keys:** Stages 1-8 refer to the preparing of the ingredients  
Stages 9-12 refer to the actual chocolate production process  
The stages are all numbered in the tapescript.

**Reading**

1. **Suggested answers**
   - modernization programme
   - the rationalization of production
   - individual product processing
   - the most modern processing and control technology
• specialist machinery
• the highest standards of quality control
• with such precision
• automation
• one person supervises the whole operation
• automation of the packing systems

2. True: 3 4 5 6 7
False: 1 2

Vocabulary

1. contain 2. focus on 3. is crushed 4. concentrate 5. sink. 6. are removed
7. drained off 8. is cast 9. be refined

Unit 5 The Product

Warm-up

1. f  2. a  3. d  4. c  5. g  6. e  7. b

Reading

1. Possible Answers

1. Because this allows them to cover several market segments, leaves less space for competitors’ products, and makes it more likely that brand-switchers will occasionally buy their products.

2. Because they usually include products that are reaching the end of their life cycle, and because consumer needs, market opportunities, and the company’s possibilities are always evolving.
3. Overall company objectives, such as whether they are looking for a large market share, or market growth, or high profitability, and so on.

4. Stretching a line to the lower end of a market may damage a company’s image for quality. Conversely, companies making cheap products might not convince the market that they can also make quality products.

5. Companies might fill their product lines in order to compete in niches previously occupied by competitors, or in order to use spare production capacity.

2. 1. credit facilities  2. warranty or guarantee  3. shelf  4. brand-switchers  5. (product) life cycle  6. profitability  7. opportunities  8. market share  9. image  10. niche

**Listening**

**Pre-listening (Discussion)**

The advantages of vending machines include:

- They can be installed almost anywhere.
- You don't have to pay sales staff, just someone to fill, clean and maintain the machine.
- They can function 24 hours a day, 365 (or 366) days a year.

The disadvantages include:

- They can be vandalized.
- If they are broken, the customer can lose his or her money.
- It must be possible to adjust prices on machines because of inflation and changes of coinage or currency.

**An additional discussion question**

If, like many people, you only use vending machines when shops and stores are closed, do you agree with the laws regulating the opening hours of stores in your country? What are the reasons for such laws?
(Answer: To protect retail employees: to make sure that they are not obliged to work long, antisocial hours. In some countries, these laws apply to employees, but not to members of the family of the owner of a small business.)

Listening
Tapescript

INTERVIEWER Jogishwar Singh, I recently read a newspaper article in which one of your business partners announced, 'We are going to invade the whole world with a revolutionary product that is going to be more popular than McDonalds.' Could you explain exactly what this product is?

JOGISHWAR SINGH This product is crisp, hot, fresh French fries, which will be delivered by a vending machine. All that the customer has to do is choose the number of portions, one, two, three or four, pay the corresponding amount which he can see on the machine because the amount will vary according to the country, put the money in, wait 64 seconds for the first serving, and then eat the chips which will come out nicely in a very beautiful looking, striking container, a cup.

INTERVIEWER So this machine can be installed in the street, as well as in restaurants, or cafes...

JOGISHWAR SINGH Well, the idea is to install it in public places, you know, not so much inside restaurants, but, you know, anywhere where people gather you can install the machine: airports, railway stations, football stadiums, sports centres, service stations, cinema halls, anywhere, literally anywhere where people want a nice cup of french fries.

INTERVIEWER And these fries are made from powdered, a powdered potato mixture?

JOGISHWAR SINGH That is correct. They are made from dehydrated potato powder, to which we add certain ingredients, you know, which are subject, well, which are secret, which we keep to ourselves.

INTERVIEWER So this is a vending machine; there are no plans to make a smaller version, to put it in your kitchen?

JOGISHWAR SINGH There is. We are, after the proper launching of the vending machine, the inventor is already working on a what he calls a tabletop machine, you know, which will be for kitchens or for kiosks or smaller places, yes.

INTERVIEWER And could you talk perhaps about all the various stages that come between an inventor - this is an American inventor...

JOGISHWAR SINGH Yes, Mr Richard Sorensen.
INTERVIEWER ...having the idea and then now your company launching this product?

JOGISHWAR SINGH Well, the inventor had the idea and he did the first, I mean he developed obviously his ideas, he's been working on it for the last eight or nine years. He got into touch with people who subsequently became shareholders in the holding company Tege, and he went through a series of at least five prototypes, each time modifying the design because, you know he found new, not really inventions, but new technical support to improve the functioning, to reduce the time of delivery, and the problem is basically financing, you see. It's extremely difficult for an individual to finance such a major project. So he was looking for partners. And we have put, you know, experts and engineers at his disposal. This is important because an inventor is not an industrial engineer, you know. He might be a brilliant inventor but he doesn't have much of an idea, well in this case of industrial production, and the economics of the whole project. So we surrounded him with very capable people who are costing us a fortune, and the machine will be manufactured by Zanussi, one of the two leading vending machine manufacturers in Europe and the world.

INTERVIEWER So for you the technological advance is the machine, rather than the product, because powdered chips sounds quite revolutionary as well?

JOGISHWAR SINGH That is correct. It's the machine; its the time in which you can deliver the chips; it's the crispiness and the quality with which you can deliver the chips; and more than these things it's the consistency. You see, if we can manage to deliver the same product in 180 countries in the world, I think that's where the success of this project will lie.

INTERVIEWER And you're aiming at 180 countries?

JOGISHWAR SINGH Oh, yeah, yeah. Doubtlessly, certainly. Over... Not immediately, but I am sure we will see our vending machines with the same logo, the same colour scheme, whether you are in Bangladesh or Taiwan or the US or Europe or wherever, Africa, I mean, you know, it might take us some time getting to Rwanda but we will get there.

Answers
1. C ('the idea is to install it in public places, you know, not so much inside restaurants, but, you know, anywhere where people gather')
2. C ('They are made from dehydrated potato powder, to which we add certain ingredients, you know, which are subject, well, which are secret, which we keep to ourselves')
3. A ('a table-top machine, you know, which will be for kitchens or for kiosks or smaller places')
4. B ('he found new, not really inventions, but new technical support to improve the functioning, to reduce the time of delivery')
5. C ('an inventor is not an industrial engineer, you know. He might be a brilliant inventor but he doesn't have much of an idea, well in this case of industrial production, and the economics of the whole project')
6. B ('more than these things it's the consistency. You see, if we can manage to deliver the same product in 180 countries in the world, I think that's where the success of this project will lie')

Vocabulary
1 portions  2 chips  3 striking  4 dehydrated  5 ingredients  6 kiosk
7 shareholders  8 fortune  9 consistency  10 logo

Speaking & Vocabulary
1. laser printer  2. answering machine  3. burglar alarm  4. cordless phone
5. fax machine  6. computer  7. daily planner  8. office chair  9. pager
10. photocopier  11. signmaking kit  12. clock  13. briefcase  14. pocket calculator
15. pen  16. table lamp

Unit 6 Production and Operation Management

Reading
Answers
1. The aim of production management is to ensure that goods are produced efficiently to the satisfaction of the customer at the right price, of the right quality, in the right quantity, at the right cost and on time.

2. In manufacturing production manager is responsible for product and process design, planning and control issues involving capacity and quality, and organization and supervision of the workforce.

3. There exist the following basic types of the production system: jobbing production; mass production; process production; and batch production.
4. Depending on the size of the organization the functions of production manager are:
• to draw up a production schedule;
• to work out the needed resources;
• to estimate how long a job will take, to estimate the cost of it, and to set the quality standards;
• to monitor the production processes and adjust schedules as needed.

5. At the pre-production stage the production manager has responsibility for the selection and design of equipment, the plant layout and materials handling, and production planning (including demand forecasting, production scheduling and the ordering of materials).

6. In a very large firm senior production manager plays a more strategic role estimating future capacity, coordinating the work of planners and supervisors and working with buyers, sales and engineering staff.

7. Typical work activities of factory manager are:
• to review and approve plans for the control of planned output, budget spending, material efficiency, engineering effectiveness, and human resources;
• to supervise employees;
• to establish strong working relations with other functional managers;
• to report regularly to the production manager.

8. Typical activities of production supervisor include:
• at the beginning of each shift, checking on absences (e.g. through sickness);
• reallocating tasks or rescheduling production, where necessary;
• controlling production plant and equipment.

Vocabulary


Listening
Tapescript

Lyon  Hello, Tom. What seems to be the problem?
Francis  Two things, Jeff. First, job 272D, these small end-plates here. They're not meeting the specifications.
Lyon  Let me see one. H'mm. They don't look too bad to me.
Francis  Well, they're not good enough for the quality control inspector. He rejected the whole of the last batch we did. Lyon  Didn't we have trouble with this part the last time it came up? I seem to remember we did.
Francis  You're right. It was about three months ago.
Lyon  We had the tooling changed in order to correct the trouble, I remem-

ber.
Francis  Now it's happening again.
Lyon  Are you sure that you had the right tool put on the press this time?
Francis  I think so.
Lyon  Let's check it to make sure.
Francis  Just a second . . . Here. The tool number is T219973.
Lyon  That's the correct tool according to the job card, Tom.
Francis  Do you want to have a look at it?
Lyon  Tell me, um, who's been operating the press for this job?
Francis  Oakes. John Oakes.
Lyon  Experienced?
Francis  He's an experienced press operator, although he is new to this de-
partment. Lyon  Okay, Tom. Could you run a few pieces through the press? I'd like to have a quick look at them.
Francis  Here we go ... There. Have a look.
Lyon  H'mm. Yes. I think I've got it. There's too much pressure coming down on this side of the plate. See? Here.
Francis  What can we do about it?
Lyon  We'll send the tool up to the toolroom and have some minor altera-
tions made to it.
Francis  Will it take long?
Lyon  No, I've just said, there's not a lot of work required.
Francis  All the same, you know what they are like in the toolroom. It may be a week before I get it back.
Lyon  Don't worry. I'll have a word with the foreman up there, see what I can do for you. Okay? Right. Now what else did you want to see me about?
Francis  We're having problems with job 764B.
Lyon  What's 764B?
Francis  The small covers for the J2 pump.
Lyon  What's the trouble?
Francis  The operators are having great difficulty in keeping the work up to standard.
Lyon  You think it's a methods problem?
Francis  I do, yes. It's a very difficult job to perform on the press, and it's very time-consuming.
Lyon  Can you give me a few more details?
Francis  It's hard to position the material on the press and hold it in line. We have to work very slowly, if we don't want rejects all the time. In fact, the tooling doesn't seem right to me.
Lyon  What's wrong with it?
Francis  It's hard to tell. Perhaps the press is too light for the job.
Lyon  What kind of press are we using?
Francis  Forty tons. You think that's heavy enough?
Lyon  I think so, although I'll need to check the job in order to be 100% sure.
Francis  Could you come down next time the job is running and see if you can put your finger on the problem?
Lyon  I'll do that. Next time you have a batch ready, give me a call.
Francis  Thanks very much, Jeff.
Lyon  It's what I'm paid for, Tom. See you later.
Francis  See you later.

Answers
1. the whole of the last batch
2. T219973
3. John Oakes
4. too much pressure
5. minor alterations
6. job 764B
7. the work up to standard
8. material on the press
9. too light for the job.
10. 40 tons

Answer to the additional question
To check if he could be responsible for the bad work.
Reading
Answers to the questions
1. Because of the failure of the real time computing system to improve the control of production
2. Five years
3. It has provided good measurement data and identified deviations from standards. The development of corrective programmes has still been required.
4. A future-directed means of control. This will provide the quick implementation of corrective programmes.
5. That more use is made of network planning techniques.
6. *verbs*: identify, improve, install, suggest, justify
   *nouns*: deviation, implementation, consideration, instruction, summing up

True \ false statements

1. True  2. False  A report on the system may have been required  3. True  4. False  This implementation has been slow  5. True

Grammar
1. Getting Things Done
a. The foreman had the tooling altered slightly.
   b. The company had a report written by a Business Consultant.
   c. The Production Manager had the press repaired by an outside company.
   d. The Production Director had a new production control system introduced by management.
   e. The foreman had the job done again.

2. Sentence Links
a. Although the tooling has been changed twice, the end-plates are still not meeting the specifications.
   b. Although the Production Manager instructed D Department to clean the components, the foreman there did not remember to schedule the work.
   c. Although Raymond Stack was rather old, he was able to find a new job in Leeds.

3. Degree
a. very  b. enough  c. too  d. very/enough  e. enough  f. too

Speaking
Possible solutions
Fanfoni I think it’s time we got started, don’t you? Mrs. Barnett, Mr. Simms… very good. Just a moment. Ms. Samson?
Samson Yes, Mr. Fanfoni.
Fanfoni Please, don’t let anyone disturb us for the next hours, Ms. Samson.
Samson Very good.
Fanfoni Now then…. I’ve called this meeting in order to discuss with you some of the major problems that we are experiencing in both quality control and production control. At this point in time, I am asking for the opinions of various members of the management team for the purpose of identifying the problem areas that require investigation and beginning work on corrective programmes immediately. I’d like to begin with you, Mr. Simms. And to come straight to the point, I’d like to ask you how bad you think the situation is.
Simms Well, say, in general terms, I am sorry to say that the situation is very bad indeed.
Fanfoni You agree, Mrs. Barnett?
Barnett I’m afraid, so.
Fanfoni Please, continue, Mr. Simms.
Simms In the last six months so that we have complete figures, our unit output is steadily falling. Falling in our staffing figures showed an increase of forty five employees and our productive capacity has increased with the purchase of the number of new machines. I think, we all agree that this poor performance is the result of inefficient control of production.
Fanfoni Can you offer us any explanation for this?
Simms Unfortunately, Mr. Fanfoni, the problem is rather complex. I feel, there are number of different causes and none of them is simple.
Fanfoni Yes. Very well. But can you not give us some examples?
Simms Well, I’m sorry to say this, but I think, I really do believe, that the Management Services Department has failed to provide the factory with the good enough service. Especially, in relation to computer facilities.
Barnett Excuse me, Mr. Simms. I really don’t think that is the case at all! Not at all. How can you justify such a statement?
Fanfoni One moment, please, one moment. I must say to you both that we really must be prepared to have an open discussion here. It is not the purpose of this meeting to cause arguments, however. So, then, Mr. Simms, I think
that if you want to say anything useful about our EDP systems, you will really have to be more specific.

Simms   Very well, I will. Now, without going into too many details, it seems to me that the basic problem is that since we had new computer systems put in, there’s been too much general uncertainty in the organization. Information on such things as rejects, labour hours, and the status of our production programmes has been incomplete. The necessary data are just not getting to the right people at the right time! In my opinion, that’s the whole problem right there, in Management Services.

Barnett  I can’t tell you how surprised I am to hear Mr. Simms saying these things. If what he is saying is true, why then hasn’t he attempted to communicate his worries to me during the past few months?

Fanfoni  Please, Mrs. Barnett…..

Barnett  No! I’m sorry! I think these things should be said. Certainly, I agree that the introduction of the new computer system has caused a degree of disorganization. But we all expected it! And, I disagree completely with Mr. Simms’s suggestion that this and only this is the cause for all our problems in recent months. In fact, what we should consider, is not the new computer system but the quality…..

Answers
1. Mr. Fanfoni- Production Director
   Mr. Simms- Production Manager
   Mrs. Barnett- Management Services Manager

2. Fanfoni-Barnett: neither friendly nor unfriendly;
   Fanfoni-Simms: neither friendly nor unfriendly;
   Barnett-Simms: unfriendly.

3. To discuss the major problems in quality control and production control in order to begin corrective work.

4. The computing service provided by the Management Services Department.

Unit 7 Quality

Reading/Vocabulary
1. stress; 2. aspect; 3. costly; 4. expenses; 5. guarantee; 6. present; 7. setting up; 8. disliked; 9. permanent; 10. achieve; 11. origins; 12. selfish.

2. management; 2. with; 3. costs; 4. quality; 5. action; 6. dealing; 7. product; 8. system; 9. chain; 10. zero; 11. employment; 12. quality.

3. to retain personnel; 2. to repair defective products; 3. to deal with complaints; 4. to loose customers’ goodwill; 5. to install a system; 6. to eliminate problems.

Vocabulary
1. defect; 2. warranty; 3. goodwill; 4. serviceability; 5. benchmarking; 6. durability; 7. reliability; 8. to scrap.

Listening
Tapescript

Alan Severn I'm Alan Severn, I'm the Quality Manager at Arcam, and my responsibilities are exactly that, for the quality of the product, the quality of the services, and the quality of all interfaces which involve the customer and our customers.

The word 'quality' is a very easy one that slips off the tongue, it is quite easy to say but it means an awful lot of things. I have a department of three people, but in essence, everybody in the company works for me, because everybody works for the word 'quality'. Quality starts and must start at the conception of everything and goes through every department within the company.

You can't pack quality into a box at the end of the line. You have to implant it at the start of a process, and it knocks on through every process until it goes into a box, into your home, into your living room, and you switch it on and you're a happy person.

The two aspects of quality are that we must reproduce, must, sorry, design to reproduce excellent hi-fi equipment, and that must be a design which has got quality built into it in terms of the performance of the product, but also must have the ability to be produced in volume. Er, now, that means the designers have to have restraints put on them, and that restraint means that they must work to quality standards to ensure that their designs are reproducible in vol-
They must design for manufacture. Now that's one part of the quality aspect and that's where it starts within Arcam, the ability to have (a) a perfect design and (b) that the design is reproducible. They hand that information on to the manufacturing departments. Now the manufacturing departments have the same, erm, the same message, the same cause in life, to them, to make sure that the designs that are now designed for manufacture are designed, sorry, are manufactured, for production. Now that may sound a bit daft, but when you move; in to the next stage you have to productionize the designs, you have to ensure that the thing will go together every time on the line. And that's a function of design, it's a function of manufacture, that when two pieces of metal come together, that they go together every time, five hours a day, ten hours a day, 28 days in a month, etc., etc.

And to that end we have to then implant into our suppliers, and our manufacturing people, the quality standards which will that aim, our goals. So, our message spreads then from our designers into our manufacturers and our subcontractors who make the metalwork, who make the printed circuit boards, who assemble the printed circuit boards, etc., etc.

Quality's a very well-worn word and in this business, certainly in Arcams business, it is an ongoing activity within the company, and it's called TQM, Total Quality Management, that we improve our quality on a daily, weekly, monthly, yearly basis. So we never stop refining the process. Erm...we don't know when we're going to arrive there because we don't know what the ultimate quality is. I guess the ultimate quality is that we build a thousand units, we ship a thousand units, and we don't get any of them back, and they last for ten years. That I think is probably...you've arrived.

**Keys:**

1. Alan Severn says that he has three members of staff in his department, working directly for him, but it could also be said that everybody in the company works for him, because everybody in the company – in design, production, marketing, and so on – is concerned with quality.

2. The products must, obviously, include a high quality of sound reproduction (they must come as close as possible to perfect design), but it is also important that this design is reproducible, i.e. it must be possible to ‘productionize’ the design, to produce a large volume of equipment with the same quality.

3. Quality begins with the designers, who have to design manufacturable, high quality products. The designers’ quality specifications are then explained to the suppliers of components.
4. By TQM, Alan Severn means the never-ending process of continuously improving and refining quality.

5. Although you can never know if you have achieved the ultimate level of quality, Alan Severn says that if the company builds and sells a thousand units, and none of them are returned as defective, and all of them last for ten years, he would accept this as a sign of perfect quality.

**Unit 8 Quality standards**

**Vocabulary**
1f, 2a, 3b, 4g, 5c, 6d, 7e

**Unit 9 Just-In-Time Production**

**Vocabulary**
1.
1. subcontractor; 2. component; 3. outsourcing or contracting out; 4. capacity; 5. plant; 6. location; 7. inventory; 8. lead time

2.

**Reading**

1. component; 2. subcontractor; 3. inventory; 4. outsourcing; 5. location; 6 plants; 7. capacity; 8. lead times

**Speaking**

1. True (‘Each section of the production of the production process makes the necessary quantity of the necessary units at the necessary time – which is when it is required by the next stage of the manufacturing process, or by distributors or customers.’)

2. False (Ohno mentioned American retailing.)

3. False (Quite the contrary; it encourages them to produce exactly the amount required.)
4. True (‘...if a single subcontractor fails to deliver a component on time, the whole production process is sabotaged.’)
5. False (There is virtually no inventory.)
6. True (‘...the Japanese industrial system relies on mutual trust and long-term relationships.)
7. True (‘This avoids all the waiting and moving time involved in sending half-finished items from one department to another. JIT... should ensure that there is no waste...from idle workers waiting for parts.’)
8. False (‘The Japanese also prefer small, specialized production plants with a limited capacity...very small production runs are possible.’)

Vocabulary/Reading

1. employee participation; 2. have a voice; 3. right first time; 4. flow production

Listening

Tapescript

**Interviewer** One of the phrases that we're hearing more and more in business these days is 'Just in Time' - it's an idea that seems to be overturning traditional ideas of industrial production. Carl Feldman is research adviser to the Industrial Association. Carl, what exactly is 'Just in Time'?

**Carl Feldman** Well, the underlying philosophy of 'J.I.T.', as we now call it, is that of eliminating waste. Manufacturing, ideally, should work on a day-to-day basis. Depending on the type of industry this might be stretched up to a week-by-week basis, but not any longer. A manufacturer should only manufacture a product that he has an order for and should only carry a stock of materials for what he will make on a single day. Now, most companies carry stock for several days, even for several weeks - fearing that if they...if they run short of a particular material, their entire production process will be disrupted.

**Interviewer** Yes, but surely this is true? If just one component is lacking, then production does have to stop.

**Carl Feldman** Yes, but the point is that it's a waste of money, having capital tied up in materials that won't be used for several days. And you save money if your materials arrive just in time to be used in the manufacturing process.

**Interviewer** Where does J.I.T. originate from?
Carl Feldman The story is that a group of Toyota engineers from Japan were touring industrial plants in the USA, on the lookout for new methods of improving efficiency - this was in the 1970s. They were impressed by what happened in the supermarkets they went into: they noticed that as soon as a shelf in a supermarket was nearly empty, a shelf-filler came along and topped it up. They simply applied this principle to manufacturing. So that's how it all started.

Interviewer Now, an accountant would insist that you have to keep your workforce busy all the time and keep your machines running at all times. This maximizes your efficiency.

Carl Feldman With J.I.T. you only run machines if you have a product to make. In most manufacturing, the cost of materials is around 60% of the total costs of running the business, so any materials sitting unused in a warehouse can't begin to repay their costs until they have been turned into a product. The traditional accountant's view has to be reassessed.

Interviewer But in any industry there are fluctuations in demand. How does J.I.T. cope with this?

Carl Feldman In the same way that capital tied up in materials is being wasted, making products for stock also ties up capital. If there are no orders for a particular day, there is no logic in making for stock. Both machines and workforce have to be grouped by product, not by function, so that they're flexible enough to deal with fluctuations - which may mean more work on some days and less on others.

Interviewer So how do you keep the workforce busy on a slack day?

Carl Feldman There's time then for maintenance, training and so on - particularly important these days is quality.

Interviewer So, to come back to the supply of materials, this depends on the co-operation of your suppliers, then?

Carl Feldman Absolutely! And changes in philosophy are essential here too. Most major companies obtain materials from over 2,000 different suppliers, with J.I.T. this number has to be cut down to around 200. The benefit to the supplier is that he will get more orders from you if he can work with you in this way. Inevitably, this involves very close co-operation on the design and quality of the materials he supplies and he must adopt the J.I.T. philosophy in his own plant. If not, he'll find that the pressure is on him to hold stock for his customers - and this will clearly not be economic.

If a supplier can't cope with J.I.T, then he'll find that major companies will simply find other suppliers who can.

Keys: The points were mentioned: 1  2  4  7  9  12
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