

The logo for TOPAZ Management Simulation features the word "TOPAZ" in a bold, sans-serif font. The letters "T", "O", "P", and "A" are blue, while the "Z" is a bright yellow-green. Below "TOPAZ" is the text "Management Simulation" in a smaller, blue, sans-serif font.

TOPAZ

Management Simulation

MANUAL

TOPAZ Management Simulation

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Part I

INTRODUCTION

The TOPAZ Management Simulation - a strategic business management simulation - is based on a realistic business situation in which a number of virtual companies, represented by the teams taking part, compete against one another in a common business environment. A sophisticated and comprehensive computer model simulates the interactions of the various parts of each company, the competitive relationships between the companies and the background economic situation.

The task facing your team is to take charge of one of these simulated companies and manage it as if it were a real live business.

This Manual explains how to take part. It explains the organisation of the simulation, what your team has to do, how your imaginary company works, and how it relates to the other team companies. The Manual is organised into four parts:

- **Introduction**
- **The Business Environment, which explains the internal functions and interactions between the companies and the market**
- **The Management Report, which explains the contents of the Simulator output**
- **The Decision Sheet, which explains how you prepare your decisions for submission to the Simulator.**

The company, which you have to run, is complex and although it is fairly easy to understand its broad structure there are many subtle aspects to the way in which it works.

Part II of the manual describes the structure of the company that you are going to run. In doing this it looks at the four main management functions of Marketing, Production, Human Resource Management and Finance, explains how these functions work and lays emphasis on the interactions between them.

One of the main aims of this simulation is to illustrate these interactions and to demonstrate that when it comes to managing a company, achieving a proper balance is fundamental to success and that this can best be achieved by teamwork, good organisation, and effective communication.

Your team needs to organise itself to carry out the duties of senior management of the company it is controlling. Precisely how you organise yourselves is left up to you. You can set yourselves up along functional lines, with each person responsible for looking after one aspect of the business. You will probably need a chairman who will ensure that everyone's views are brought together to make a coherent whole. Alternatively you may wish to have a more relaxed setup with everybody involved in a broadly based committee.

There is no constraint on what technical aids you use. If you want to write your own 'spreadsheet' models you will find the detailed definitions in Part Three of the manual useful.

Control of your company is exercised through two documents:

- a) The quarterly **Management Report**, produced by the Simulator, showing how your company has performed in the period just completed.

- b) The **Decision Sheet**, in which decisions you have made about the way your company is to operate in the next period are recorded for transmission to the Simulator.

So that you know exactly what is happening, it has been necessary to describe the way in which your company works in great detail, and this makes the Manual look very complicated; the broad structure of the simulation is, however, simple. You are trying to win by maximising your company's prospects for the future, so that at the end of the simulation you have the highest share price. This means setting up a strategy, which points you towards this long-term goal.

Once you have a strategy you can work out the business tactics to make that strategy happen. (If you find that you are running into difficulties the strategy can always be revised to make it achievable.)

One approach is for marketing to consider the overall market and, having done so, prepare a marketing plan. The very act of doing so must imply that they are forecasting what is likely to be achieved in terms of volumes sold. Production makes and ships these quantities providing it has the necessary resources of labour and machines. Human Resource Management must view this with concern because whatever is worked out between marketing and production will affect the earnings and working conditions of the labour force. Finally, the finance department should be vetting the whole process to make sure that it is profitable and can be operated within the available financial resources.

This is the basis of teamwork, and the nature of the need to compromise to find the best corporate solution not only in the short term, but also one that fits into the longer-term strategy.

So that you can make some preliminary assessment of how things work, you are given a **history of your company** covering a period immediately before the simulation starts, together with the decisions, which generated these results. When studying this Manual it will be useful to use the history to illustrate the points, which are discussed. The histories are identical for all the companies taking part, as all companies start from exactly the same position. Part III of the Manual describes the contents of the Management Report in detail.

Many of the relationships used in the simulation are purely arithmetic (e.g. the financial information), but the remainder are of a kind which cannot be derived exactly, even in real life (e.g. how many orders are you likely to get; what will the effect of maintenance be?). To operate effectively it is necessary to identify and explore these imprecise elements as the simulation develops, test their sensitivity, and discover how they react and affect the way your company runs. This type of analysis will allow you to draw broad conclusions about what is likely to happen when you make a particular set of decisions.

Once you have assessed the situation and decided what you want to do, complete your first Decision Sheet and submit it for processing, in accordance with the published timetable. In return, you will receive a Management Report, which tells you what has happened to your company as a result of the decisions you have taken. Use this information to improve your knowledge of the workings of your company and of the market. Then make the next set of decisions... and so on to the end of the simulation.

Before proceeding to the main part of the Manual there are a number of general concepts and points which need to be explained:

- a) The object of the simulation is for companies to achieve the highest 'Share Price', as quoted in the Management Report at the end of the simulation. Since this is a forward looking concept, the share price reflects the future prospects for your company and you should therefore try to get your company into the best possible shape towards the end of the simulation.

- b) Some companies have been known to make large losses during the simulation. Even so, you will never be declared bankrupt. By permitting companies to continue to operate on massive borrowings, which might not be tolerated in real life, all teams taking part are at least able to reach the end.
- c) The simulation proceeds in steps of one quarter of a calendar year. Once decisions have been taken for the coming quarter there is no way in which they can be altered before the next. The simulation is made up to five quarters, and you will be given a timetable detailing when Decisions must be sent in for processing on the Simulator and when you should expect the resulting Management Report to reach you. A quarter is taken to be twelve weeks long.
- d) Management Reports are received and Decision Sheets submitted in the imaginary instant of time between the end of one quarter and the next. For clarity, quarters in the past, and in the future, are strictly defined in relation to this imaginary instant of time, and all references to them in this Manual will be in these terms: Last Quarter - the quarter just completed, to which the most recent Management Report refers. Quarter Before Last - the quarter before 'Last Quarter'. Next Quarter - the quarter just about to come, to which the current Decision Sheet will apply. Quarter after Next - the quarter immediately following 'Next Quarter'. There is no such quarter as 'This Quarter'.

During the course of the simulation the Controller will not intervene in any way to affect its development. Things like market trends, interest rates, labour availability, and so on, are set before the simulation begins. The Controller will never arbitrarily interfere. There are sufficient random effects created by the activities of the competing companies, without adding more.

To help you make effective use of this Manual, the paragraphs beginning from Part II onwards are numbered serially, and are referenced together with a page number in the contents table. By following the chain of cross-references, which you are given, you can explore any facet fully. Reference to particular decisions, which are made in the general text, will be cross-referenced to the appropriate line on the Decision Sheet by an alphabetic character. Costs and other fixed parameters are gathered together in a series of tables on the appendix attached to the Manual, and are referenced by a table number.

This simulation includes the Internet as a marketing and distribution channel available to the participating teams. The real-life technical processes of e-commerce are notoriously difficult to define and measure; hence the model used here is necessarily simplified to enable the simulation to be run with as few parameters as possible.

Part II

THE BUSINESS ENVIRONMENT & ECONOMIC BACKGROUND

Your company operates in direct competition with a number of other companies, which manufacture and sell the same products as yours, in the same geographic areas. Your company can make up to three products, which are not specifically defined. They are three different, but related, types of consumer durables, which are generally thought to be desirable by the public.

Your market is divided into two geographic areas for traditional retail trade - the Euro-market, which is taken to be Europe; and the Dollar-market, which is taken to be the North America Free Trade Agreement (NAFTA) area, the United States, Canada and Mexico. At the same time, you are able to reach these areas and the rest of the world through the Internet. You have direct competition in all areas from the other companies taking part in the simulation. Other competition exists in all of the areas but is not directly involved in the simulation.

ECONOMIC PATTERNS

1. The sale of products in the various areas will be affected by the population size and social make-up of each market. See Table 1.
2. All markets are affected in common by normal economic cycles of growth and decline, but they cannot be assumed to reflect the present-day, real life economic situation; nor do real-life Government Policies have any bearing on the simulation.
3. Superimposed on the general economic trend is a strong seasonal pattern of demand for the industry's products. This is repeated each year, and is the same for all products in all market areas. The seasonal peak is in the fourth quarter of each year.
4. Within the European market trade is conducted in euros. In NAFTA trade is in U.S. Dollars Trade on the Internet is in Dollars.
5. All monetary decisions that you are required to take will be in euros, including decisions affecting NAFTA and the Internet, even though the final transaction may be in Dollars. Trading will therefore be affected by the rate of exchange between the Euro and the Dollar.
6. Economic statistics and reports will be issued during the course of the simulation to help you assess trends and economic movements and how exchange rates may change. This takes the form of economic data in the form of deseasonalised, official statistics, for both the European market and NAFTA, for last quarter, covering:
 - Gross Domestic Product
 - Percentage Unemployment
 - Balance of External Trade
 - Central Bank annual base interest rates at the end of last quarter, which will apply next quarter.
 - Exchange rate of the Euro against the Dollar at the end of last quarter, which will apply next quarter.

More limited information on some of these topics is also available about the rest of the developed world.

7. In addition, short extracts of political, economic and commercial commentary from the press will be given in a quarterly Business Report to assist you to forecast the way in which economies and markets are likely to move.

Important Detail

8. The exchange rate is quoted in euros per Dollar: i.e. the price paid in euros for one US Dollar. When the Euro-cost of a Dollar is falling you will be paying fewer euros per Dollar hence the Euro is strengthening and the Dollar weakening, and you can expect to sell fewer products in the Dollar area (all other things being equal). If the Euro-cost of a Dollar is rising the opposite effect occurs.

9. The exchange rate quoted is fixed at the end of last quarter and will be used in exchange transactions throughout next quarter. The rate used last quarter (i.e. in the latest management report that you have) will have been quoted in the report for the quarter before last.

10. The economic statistics are given in deseasonalised form, so that underlying economic trends can be deduced from them directly, with no need to worry about smoothing.

11. You may receive brief extracts of current economic information extracted from the financial press, which may help you to forecast economic trends and warn of business problems ahead.

WORLD EVENTS

All of the companies can be affected by significant world events. These events can be the result of political upheaval, economic or environmental developments, wars, physical disasters such as volcanic eruptions or earthquakes, epidemic disease, etc. They can have a serious effect on companies' ability to operate, and can also affect the product markets. For instance: an outbreak of an infectious disease which has a global impact could not only affect the market for your products, but also significantly upset your ability to make products because your labour force is unable to get to work.

Externally, the level of disruption should affect all companies equally, but the level of internal disruption that such an event may cause to a particular company will depend on how well the company is ready to cope with what happens. For instance: where adequate reserve stocks of raw material and finished products are held by a company, it may be able to continue to trade, when another company with lower levels of stock may find itself in difficulty.

These events may occur suddenly, giving management little chance to take action. However, it is more likely that at least some information taken from the press and appearing in the Business Report, ahead of an event will give a hint that it may happen. The effect of world events on a company's operations will be marked by an '!' sign on the management reports except where markets and the economy are involved. **IT IS IMPORTANT THAT YOU READ THE REPORTS IN "BUSINESS REPORT"**, since they may carry important information that can affect the calculation of the Management Reports, e.g. changes in raw material price which override prices quoted earlier.

Management should bear in mind that although this kind of physical disruption might not affect the consumer market directly, there may be an indirect effect on consumer confidence, which will lead to a fall in orders.

Note that although there is a possibility that events of this kind can happen, it does not mean that they WILL happen.

MARKETING

Your company's marketing department is responsible for creating demand for, and selling the company's products successfully in the face of competition from rival companies. To do this successfully, it must review the marketplace and the competition; prepare strategic marketing plans and make decisions to put them into operation both in the long term and short term. It must also work with the company's other functional departments, to make sure that sales are profitable and that the company runs efficiently.

12. In Europe and NAFTA, you sell through agents and distributors to retailers, who, in turn, sell to the general public. In those areas, retailers are the prime target of your marketing effort. You can also sell directly to the public worldwide through the Internet to people who have appropriate computer access. Selling through the Internet will also reach Europe and NAFTA, so that, in a sense, you will be competing against your own agents in these areas. Public demand will vary according to the economic climate and the marketing effort of the competing companies. The retailers and the general public are also the target of direct competitors selling similar products in competition with yours.

13. Each product has a marketing image, which you are seeking to promote in order to attract sales. This image is affected by a number of factors, which are of varying importance, relative to similar factors in your competitors' products. Some of these factors are directly under your control and are decided by you as part of your marketing plan. Others, such as movement in the economy and the activities of your competitors must be taken into account as you prepare the plan. This can only be done by trying to forecast how they are likely to behave in the future and making allowance for them in your plans.

14. To help you make forecasts, certain economic and competitive information about your competitors' activities last quarter is available to you, free of charge. This consists of the kind of information that would normally be available through the business grapevine:

- Product selling prices
- Total number of employees
- Basic skilled wage rates
- Number of agents and distributors

15. Apart from this free information, you can decide (Decision Sheet line S) to subscribe to 'Audit Research', an organisation which monitors the sales of each product and provides information about how the market is divided between you and your competitors. This will cost you a fixed sum (given in Table 2) each time you ask for it. The information gives market shares by volume of sales by each of the competing companies in:

- The European market.
- The NAFTA market.
- The Internet

16. You can also decide (Decision Sheet line S) to commission research about your competitors' activities and products. This information costs you a fixed sum (given in Table 2) every time you ask for it. It includes:

- Total amounts spent on advertising
- Total amounts spent on product research and development
- A consumer assessment rating of the product design quality
- A consumer assessment of the quality of your website (if you are selling on the Internet)

Important Detail

17. Free information consists of:

- a) Prices, which are quoted by company, by product, by sales area (European market, NAFTA and Internet)
- b) Total number of employees, which includes unskilled machinists and skilled assembly workers.
- c) The basic wage rate is the rate for assembly workers, decided by each company
- d) Total number of agents (Europe) and distributors (NAFTA) last quarter.

18. Market shares: for each of your direct competitors based on the number of sales made last quarter (not orders received, which can be significantly different). The percentages given relate company shares to total sales in each market area. These totals will include sales made by your direct competitors, plus the other background companies not involved directly in the simulation. As a result, the percentages will not add up to 100.

19. Other company activities are:

- a) The figures for spending on advertising and research are totals. There is no breakdown by product.
- b) The consumer assessment rating of the design quality of your own and your competitors' products takes the form of the award of 'stars', varying in number from five stars for a superlatively designed, technically advanced, well-made product; to one star for an obsolete, shoddily made product. This information is gathered from consumer panels and reflects the views of the general public. Consumer assessments should be viewed with a little caution, as they come from an analysis of subjective discussion between small sample groups of consumers.
- c) An assessment rating based on the same 5-star system, of the attractiveness, effectiveness and ease-of-use of your website (if you are trading on the Internet).

20. Using a combination of the available economic and business information, plus any conclusions you may have drawn from the Company History and your experience in running the company so far, you should be able to prepare a detailed marketing plan for each of your products in each market. The marketing plan should involve:

- Pricing
- Product design and reliability policy
- Advertising schedule
- Agency and distributor policy
- Internet trading policy
- Availability

The preparation of this plan must imply that you have an expectation of how many orders you will get for each product. That expectation will in turn become your forecast, which you should use to discuss your plans with the company's other functional departments.

PRICING

21. Each quarter you must review and decide the price at which you will sell your products (Decision Sheet line C)

22. The price that you decide for each product is the amount you will charge your agents and distributors for each unit delivered. It is also intended as a guide to the price, which should be charged in the shops. Your agents in the EU and distributors in NAFTA make most of their profit from the commission you pay them, based on the value of orders and sales (see paras 57 and 59). On the Internet, the price you decide will be the price which the consumer will pay, plus a delivery charge. The products are quite price sensitive, though not all equally so, with relatively high prices leading to fewer orders and low prices yielding more.

23. All prices are decided in Euros regardless of where they are to be sold. Since NAFTA and Internet prices are decided in Euros and passed to the end customer in Dollars, they will be affected by fluctuations in the Euro/Dollar exchange rate. This will affect your ability to compete in these markets and should be taken into account when fixing your prices.

Important Detail

24. Price reduction only works as a means of gaining more orders up to a point - the public becomes suspicious of very low prices.

25. If you decide not to offer any of a particular product for sale, enter a zero price on your Decision Sheet. You will then get no new orders for that product from that market next quarter.

PRODUCT QUALITY

26. The quality of the products you offer to the market can be controlled by decisions (line E) taken at production time. In general, the longer you allow your skilled workers to assemble each product from its component parts, the better finish it will have, and the more reliable it will be.

27. It can happen that you release products to the public with serious environment faults. Apart from the cost of physically putting things right, serious damage can be done to your marketing image, leading to loss of public confidence and consequent loss of orders.

28. The more attention you pay to quality the better your product image will be, and the more products you should be able to sell. For a more detailed description of the quality control process, see paras 93 and 103.

29. Products, which are found to be faulty by consumers, can be sent back under the company's 12-month guarantee for repair or replacement. The better their quality, the fewer product units will be returned. Repairs are carried out by a sub-contractor, who bills you for the work at an agreed cost (see Table 9). Internet sales can be returned under a no-quibble guarantee and are sent back to your distribution agent and repaired for you by a local sub-contractor.

RESEARCH AND DEVELOPMENT

30. One of the main ways in which your company's products hold their share of the market is by keeping up with, or being ahead of, competitors' developments in technology and design. This is done by regular investment in the Research and Development of each product (R & D).

31. This tends to have uncertain results, so that regardless of how much you decide (Decision Sheet line G) to spend, there is no absolute certainty that your research teams will contribute anything new that will help to improve your products' image in the short term. However, there is no doubt that the more you spend, the greater the chance in the long term of making advances that can be incorporated into your products, and that steady expenditure is more effective than sporadic spending. The effect of R&D is cumulative, so that if you do spend, sooner or later that expenditure will pay off.

- 32.** Success in your company's research effort produces either 'Minor' or 'Major' product improvements for each product.
- 33.** Minor improvements are reported by your research team. They are incorporated into your products immediately and automatically, without any positive decision being required by you, and have a small but immediate effect on your sales.
- 34.** Major improvements, which are reported, require further consideration before you decide to incorporate them into a product. The introduction of a major improvement to a product is of such significance that it renders existing models of the product obsolete. You may wish to take time to run down stocks of the existing product, or to build up your marketing effort to introduce the improved product effectively. You are therefore given the opportunity to decide (Decision Sheet line F) when to take up the improvement, either immediately or at some future quarter.
- 35.** Your R&D department may have had no success last quarter, in which case it will have reported 'NONE'. This in itself is not a bad thing, since R&D is a cumulative process, and following a success the team starts on a fresh research project which may take two or more quarters to come to fruition. The more you invest, the shorter this fallow period is likely to be.
- 36.** The effect of the introduction of improvements to your products is to enhance your marketing image in the eyes of the consumers, so that your consumer assessment rating - the number of stars awarded as a result of discussions with the consumer committees - will be likely to go up. If your research effort is small, or if it has little success, then your products will tend towards obsolescence, with consequent decline in their marketing image and a reduction in the number of stars awarded. If one or other of your products is found to be environmentally unsound, the accompanying bad publicity will usually lead to loss of stars.
- 37.** A minor product improvement requires no further decision to be made. If one is reported it will already have been incorporated into the product automatically and have added to the product's image in a small way.

Important Detail

- 38.** Each quarter the degree of success that your R&D department has had is notified at the bottom of the 'Products' section of the Management Report, where the words 'MAJOR', 'MINOR', or 'NONE' are printed.
- 39.** You must have had a Major improvement reported before you can take one up. If you start the process to take one up without having had one reported, it goes ahead anyway and existing inventories are sold off, but there is no corresponding marketing advantage.
- 40.** A Major product improvement is only reported one time only. If you do not take it up immediately next quarter your R&D department will have started a new project, with the report showing how it is progressing. You must remember if you have improvements in hand, not yet implemented.
- 41.** Major improvements that are not taken up immediately do not fade away. They continue to be available until you make a decision to take them up. If you do not take them up soon, however, you are likely to find that rival companies get similar improvements to the market before you and seize the marketing advantage.
- 42.** It is possible to leave a major improvement for so long that a second one is reported. In this case when you do take one up, you automatically take both with an increased marketing effect.
- 43.** Taking up a major improvement has no effect on any backlog of unfulfilled orders you may have.

- 44.** Minor improvements are a by-product of the research on the way to a major improvement, and do not interfere with the progress of that research.
- 45.** Following the report of a major improvement, R&D starts work on a new project from the next quarter, depending on the level of research investment you make.
- 46.** The quality of your management will affect the department's chances of success.
- 47.** The process of taking up a Major product improvement is as follows:
- a)** Each quarter you decide (Decision Sheet line G) to invest a certain amount of money in R&D on one or more of your products.
 - b)** After a number of quarters this investment pays off and your R&D department reports a Major product improvement for one of the products.
 - c)** Next quarter, or in some later quarter, you decide (Decision Sheet line F) to implement that improvement. It is important to weigh up the marketing benefits an improved product will bring against the potential loss of sales revenue in selling off obsolete inventories of old product cheaply, and that will depend on how much old inventory you currently have in hand.
 - d)** Once you decide, at the beginning of next quarter any inventories of that product are sold off at the valuation price, outside the normal markets (See Table 21).
 - e)** Your production department begins to make the new product and marketing begins to sell it.
 - f)** The consumer assessment committees look at the new product and will probably revise its star rating.
-

ADVERTISING

- 48.** For each product, in each area, you must decide (Decision Sheet line D) how much money to spend on advertising:
- 49.** On promoting sales of your products in the short term by providing television commercials, material for press advertising, and so on. This type of advertising has a limited effect on Internet business.
- 50.** On promoting your company's corporate image in each area, regardless of product, in order to create long-term confidence and goodwill. Corporate image advertising is cumulative, needing steady expenditure over a period to be effective. Not only does it extend the market for your own company's products, but also, combined with all advertising, it tends to contribute to the general growth of the market. A strong corporate image is the main influence which persuades people to visit your website, so it is important for your Internet business.
- 51.** In addition to direct advertising, it is important for users of the Internet that your website reflects and maintains your company's marketing image. You can decide (Decision Sheet line L) how much to spend each quarter on enhancing the efficiency and attractiveness of your site.
- 52.** There is no precise information about the effects of advertising, except that it affects sales of products differently in different areas. Advertising in NAFTA and the Internet areas will also depend on the relative movements in the Euro/Dollar exchange rate.

SELLING

53. In general, you can sell your products in two ways:

- a) To retailers in the European and NAFTA areas who then sell to their customers in the traditional way
- b) Directly to customers worldwide (including the European and NAFTA areas) through the Internet.

European Market Sales Agents

54. In the European market you appoint agents who will act for you to sell and distribute your products. Three decisions (line J) are required each quarter:

55. The number of agents you want to represent you in the European market (in total) from the beginning of the quarter after next.

56. The amount that you are prepared to spend on behalf of each agent, each quarter. This covers basic payments for sales aids, supervision and accounting, market research, etc. This includes a minimum quarterly payment for each agent, to cover certain administrative expenses. Any decision to spend more than this minimum will allow a larger geographic area to be covered by each agent and improve selling on your behalf. (See Table 3)

57. The percentage you will pay to the agents in commission on the value of orders received each quarter. Commission is the agents' main source of income. Higher commission motivates them to sell harder on your behalf and will compensate them for the fact that price of products sold through the Internet prices will tend to be lower than normal retail prices.

58. Because the European market is large, you may need several agents to provide complete coverage of the area. Their effectiveness will depend on the amount of support you give them. Low support implies that they will only work within a limited radius. Greater support extends the area they can cover. The higher the commission they are paid, the greater will be their selling motivation within this area, especially if they are supported by an adequate level of advertising.

NAFTA Distributors

59. The NAFTA market is more difficult and costly to penetrate because of distribution difficulties. To reach this market you appoint distributors, each of whom have an established network of retailers. The decisions required for NAFTA Distributors are:

- a) The number you wish to act for you (in total).
- b) The level of support payments you decide to make, per distributor, subject to a minimum payment to cover basic overheads (see Table 3). Support payments are intended to cover basic costs of handling your product. The efficiency of the operation on your behalf will increase as support payments go up but will also be affected by movements in the relative price indices and the exchange rate.
- c) The percentage you will pay to the distributors in commission on the value of sales made.

60. In general the same factors that motivate selling agents in the European market apply to distributors in the NAFTA area. However distributors are not active sellers of your products. Instead they respond to demand created by your advertising. Commission is not intended to

stimulate demand for your products, but contributes to the distributors' profit, and other variable costs.

The Internet

61. You can sell directly to consumers worldwide through the Internet. The number of orders you get will depend not only on the usual marketing factors of price (plus delivery charge), advertising, quality and availability, but also on the attractiveness, ease-of-use and selling power of your website, backed by a strong corporate image. The function of short-term advertising is to remind people what is available on your website.

62. One problem with e-commerce is that consumer access to the Internet depends on the general availability of computers, which is by no means universal. Another is that you will compete against your own products available through normal retail outlets. The advantages are that you are not dependent on middlemen to sell for you and those customers pay by credit card and therefore you get paid at the same time as the goods are delivered.

63. Order processing and credit card payments are handled for you by secure e-commerce software. Orders are then passed to a single distribution agent to be made up, packaged and delivered. The efficiency and care with which this is done will affect your marketing image, so that poor service from your distribution agent will reflect badly on the company and its products. Conversely, prompt and efficient service will boost your image.

64. Your distribution agent is paid a basic sum each quarter, which is equivalent to the retail agents' support payments, plus a percentage of the value of products processed which covers packing, delivery, administrative expenses and profit. The value of these parameters is decided by you each quarter (Decision Sheet line J) and the amount paid will influence the agent's efficiency and care.

Important Detail

65. If you have no agents or distributors working for you will get no orders from the European or the NAFTA markets. Should you have no agents or distributors and you want to appoint some, you must decide one quarter in advance how many agents and distributors you want to try to recruit, and what support and commission you are offering, so that potential agents and distributors can see what the terms are before joining your network. Support and commission are paid when starting operating in the market.

66. Reduction in the number of agents you have must also be notified one quarter in advance.

67. There are fees to be paid for recruiting, and for closing down agents and distributors (see Table 3).

68. The same should apply to Internet operations, but you only need one distribution agent. The agent is appointed automatically when you start to operate on the internet, and should you close down your Internet operation the agent will be dismissed.

69. If you wish to start up an Internet operation for the first time, you must decide how many Internet Ports your system will operate. Making this decision will signify the start of your operation: a distributor will be recruited automatically, and you will link with an Internet Service Provider. Orders should begin to flow in the following quarter.

70. Starting an Internet operation incurs substantial cost, including at least a minimum support payment to the distributor (see Table 4).

71. Closing an Internet operation requires one quarter's notice, and is signalled by reducing the number of ports to zero.

72. Commission paid to agents in the European market is based on the value of orders received. Distributors in NAFTA are paid commission based on the value of sales made. The Internet distribution agent is paid a percentage of the value of sales. Agents and Distributors are sensitive to the rewards they receive compared with your Internet operation. If they feel that the Internet operation is competing against them unfairly and undermining their profitability they become unhappy and may leave your organisation. This situation can be controlled by the level of commission paid.

73. The capacity of your website to handle potential customers at peak times is critical to your marketing image. People who can't reach your website because of lack of capacity are turned off, and will go elsewhere. Statistics are available for you to monitor the situation and take action if you think it is necessary. Adding extra ports to an existing system will only have a partial impact on the number of orders received in the quarter they are opened.

PRODUCT AVAILABILITY

74. Product availability has an effect on the number of orders received, and the ability of your production department to keep up with orders is important. Completed products are shipped to agents' warehouses in the European market, to distributors in NAFTA and to your Internet distribution agent. All orders are intended for delivery as soon as possible in the same quarter in which they are received. Consequently you should try to keep an adequate stock of products available in all areas so that deliveries can be made promptly. Orders are only converted into sales when the goods have been delivered. Failure to meet orders received, through shortage of finished products shipped to the European and NAFTA agents, will result in a queue of customers awaiting delivery, leading to dissatisfaction and lost sales, which will adversely affect your marketing image. The greater the number of orders outstanding, the greater this adverse marketing effect will be.

75. Product availability also affects your ability to trade on the Internet. Goods for sale on the Internet are sent to your Distribution Agent's warehouse from the factory for this purpose. If demand is greater than the availability of products then no further orders can be taken, and potential customers are lost. Because of this, the company's image as an efficient Internet trader will decline.

76. It is of prime importance that marketing works closely with the production department, providing the best possible forecasts of demand so that adequate quantities can be shipped to the areas. Problems in production, which affect availability, also become problems for marketing, which must be solved by mutual agreement.

Important Detail

77. At the end of each quarter, at least half of any orders, which remain outstanding in the European and NAFTA areas, will be cancelled by your potential customers, and those orders left for you to supply in the next quarter will be carried forward as a backlog to be cleared as soon as products are available. If you decide (Decision Sheet line C) to raise your price in the meantime, or to reduce the quality of your products in some way, still more of your backlog will be cancelled at the beginning of next quarter and the total number of orders cancelled will then be greater than half. Should you decide to stop production of a product, any backlog of orders which you may have at that time will remain to be satisfied at last quarter's price. Cancelled orders will not go directly to your competitors, but will tend to go to them in future quarters due to your poor delivery image.

78. On the Internet, if there is a shortage of product, no further orders can be taken. Hence, although there can be no backlog, there is a negative effect on your marketing image.

MARKETING MANAGEMENT

79. The whole of your marketing effort depends on good management. The amount you decide (Decision Sheet line R) to allocate to your management budget will therefore have an important effect on the quality of your sales management, and hence on the success of your marketing effort as a whole.

80. Your company's selling effort has an indirect cost which covers the expense of running a sales office, and of supervising your marketing effort. This is calculated as one percent of the value of orders obtained in each quarter.

81. Most of the marketing factors (e.g. advertising, quality, commissions, etc.) are subject to the law of diminishing returns, so that increased effort does not necessarily bring proportionately increased results.

PRODUCTION & DISTRIBUTION

Your company's production department is responsible for making and distributing the company's products as efficiently and cheaply as possible within the quality standards set down by marketing. This implies working with the marketing department to ensure that their forecasts of likely demand can be met by a sufficient flow of products, both in the short term and the long term. It also implies working with the personnel department to ensure that there is sufficient labour to do the job at reasonable cost. And further implies proper forward planning to ensure that there is sufficient machinery and efficient buying of raw material.

82. The three types of product that your company sells are manufactured in your own factory, from one basic type of raw material. The products are made in two sequential processes:

83. Machining, in which components are made on machines, each operated by four unskilled machinists. Shift working is possible in the machine shop.

84. Assembly, where the machined components are assembled into finished products, and packed by skilled assembly workers, who only work single shifts.

85. The minimum times taken to process one unit of each product through each of these stages, and the raw material contents of each are given in Table 5.

86. There is no work-in-progress, hence the number of products that can be made in your factory in any quarter will depend either on the capacity of your machine shop to produce component parts, or on the number of completed product units that can be put together in the assembly shop, whichever is least. Your production capacity will never be limited by a lack of raw materials, because any shortfall is purchased automatically on the Spot Market, although at a premium price.

MACHINING

87. The total capacity of your machine shop in terms of productive hours, depends on the number of machines you decide (Decision Sheet line K) to have in the factory, the level of shift working at which you decide (Decision Sheet line N) to operate, diminished by the number of hours lost through breakdown and slower machine speeds brought about by ageing. Machine time can also be seriously reduced by catastrophic machine failure leading to loss of production time for more than just a few days, while the machine is brought back into production. If this lost time leads to a loss of sales, incurring backlog, the value of lost sales can be recovered from your insurance company. The cost of such repairs can also be recovered.

88. Table 7 sets out the maximum number of hours each quarter that are available for production from each machine, for each of the three levels of shift working that you can decide (Decision Sheet line N) to work.

Important Detail

89. The machining times, given in Table 5 are for producing a set of parts ready to be assembled into the finished product. These are the times expected from 100% efficient, new machines. As machines get older, or are used more, they become less efficient, and take longer to make the component parts for each product. This process of deterioration may be slowed or even reversed by the introduction of a preventive maintenance programme, but eventually each machine will reach a level of inefficiency at which it may be better to sell it and replace it with a new one. A further consequence of ageing is that a machine will tend to break down more often, and productive hours will be lost till it can be repaired. Insurance assessment of lost sales looks first at Product 3 in EU, then NAFTA, and finally Internet; then Product 2 and

finally Product 1, until all lost sales specifically attributable to loss of machine capacity are covered.

MACHINE MAINTENANCE

90. Independent maintenance contractors carry out maintenance of your machines. Each quarter you must decide (Decision Sheet line M) how many hours of maintenance per machine you wish to contract out. There is a fixed cost per contract hour for each machine (Table 6) and this covers labour, spares, materials, tools and supervision. The first priority of the maintenance effort will be to repair broken down machinery; any hours left over within the contract will be used on preventive maintenance outside normal working hours. When there is a catastrophic machine failure, repairs are carried out by the normal maintenance contractors, in the usual way. The cost of this work (which may need to be done at the emergency rate) is then added to your quarterly insurance claim to be settled by your insurance company.

91. The more preventive maintenance you are able to do, the fewer breakdowns there will be, and if a breakdown does occur, the shorter the time before the machine is back in service again. Preventive maintenance also slows the rate at which machines become less efficient.

92. If your allocation of hours to contract maintenance is not even sufficient to cover basic repair times, any additional hours required to meet this primary effort will be charged at a higher rate per contract-hour (see Table 6).

ASSEMBLY

93. As well as being limited by machine capacity, your factory's output also depends on the ability of your skilled workers to assemble the machined components into finished products. Table 5 gives the minimum times for the assembly of each product. However, the actual times taken will be decided (Decision Sheet line E) as part of your marketing policy. The longer the assembly times which you allow, the better the quality of your products will be (up to a point).

94. Having decided the time that it should take to assemble one unit of each product, the number of each that you can make, and the product mix, will then depend on the number of skilled workers which you employ, diminished by absenteeism and industrial unrest. Assembly workers only work on the day shift (single shift), to a maximum number of hours per quarter (see Table 16), but there is no limit to the number that you can employ provided that you can persuade them to come and work for your company. Your assembly workers are prone to serious accident like any one else, both at work and at home. Prolonged absence can seriously affect your production schedule and lead to loss of sales. When this happens, temporary assembly workers are brought in from an agency service, which charges twice the hourly wage rate paid to your own workers. Meanwhile, you continue to pay your own employee who is off sick. Having decided the time that it should take for assembly the additional agency costs are added to the company's insurance claim to be settled by your insurance company.

PRODUCTION SCHEDULING

95. The main set of decisions (line B) that concerns the production department each quarter is the production schedule. This should be prepared in cooperation with the marketing department, because it reconciles its sales forecast with the production department's ability to make products for shipment to the sales areas. The production schedule is simply the number of each product that you wish to make and ship to each area, next quarter.

96. When planning your production schedule, you must remember to modify marketing's demand forecasts by:

- a) Adding in products outstanding as backlog from last quarter, or;

- b) Deducting inventories of product left unsold in the warehouse from last quarter. (Take care not to allow for inventory which will be written off should you take up a major product improvement.)

97. Normally, the number of each product actually produced will be those scheduled to be shipped plus those which have had to be remade because the original was rejected as defective, either at the assembly stage or the inspection stage in quality control.

98. Apart from labour and raw material costs that are discussed elsewhere, there are certain semi-fixed costs, which are charged to your production department. These are:

- a) a cost per shift for supervision;
- b) cost per machine for production overheads;
- c) charge per machine hour for running costs;
- d) a production planning charge for each unit requested for delivery (see Table 10 for details of these charges).

Important Detail

99. If your production schedule is too ambitious, because you do not have sufficient skilled labour or machine capacity, the number of products made will be restricted to whatever quantities you can produce. Quality control will reject any sub-standard products and the remainder will be shipped in proportion to the number asked for in your original production schedule. A properly planned production schedule will take into account the resources available to you, and allow for all the factors that may constrain the utilisation of these resources. When your production schedule is cut back in this way, you will find that where your decisions are reproduced in the Management Report for next quarter, the affected numbers will be starred (*).

100. Any inventory of product left unsold in an area at the end of a quarter will be kept in the warehouse to be sold in the following quarter. However, you can take a decision (line B) to return excess inventory from your Internet distribution agent and/or European selling agents to the factory for redistribution to other areas, by specifying a negative quantity on the Decision Sheet (line B). Goods cannot be returned from NAFTA. The quantity of product that you return from an area should not exceed the number held in inventory at the end of the previous quarter.

101. If you have no agents acting for you in a market you will neither be able to produce nor to ship products to these areas, since there is no one there to handle your goods. Decisions to try and do so will be set to '0' and the affected numbers will be starred (*).

102. Rejects found in the production process are sold for scrap at values given in Table 8, and reduce the number of product units available for delivery, though if you have sufficient capacity, extra products to replace those rejected will be produced automatically, so that deliveries can be completed.

GUARANTEES & QUALITY

103. Your company offers a 12-month guarantee with its products. Inevitably some will develop faults after they have reached the customer, and be returned under the terms of the guarantee. The servicing of products returned under guarantee from the EU and NAFTA is carried out by local service agents in the areas, who make a charge to the company for work carried out. Those charges are given in Table 9. Products returned to your Internet distributor are repaired locally by a sub-contractor at a cost (including delivery) given in Table 9.

104. It is possible that your products are shipped with unsuspected design faults, or are made from sub-standard materials, so that they become a danger to those members of the public who buy them. If this happens, products are returned under guarantee for repair in large numbers, and also require you to examine and repair all units of product currently in the distribution system. This work is done by the normal repair contractor, who (because of the volumes involved) charges 75% of the normal fee per unit repaired. The additional cost of repair work done under an incident of this kind is added to your company's quarterly insurance claim for settlement by your insurer.

105. The proportion of substandard products reaching the customers and then returned for repair under your guarantee will affect your product image and hence your ability to market the product successfully in the future.

106. The number of products returned for repair under your guarantee depends partly on the time that you allow your skilled workers to assemble the products. The longer they have, the more defective parts they will find and the better the assembly will be.

107. Your Quality Control Department has a fixed cost per quarter. (See Table 10)

DELIVERY, WAREHOUSING

& DISTRIBUTION

108. The number of products delivered to the EU, NAFTA and your Internet distribution agent will be as decided (Decision Sheet line B) in your production schedule, unless your production resources limit your ability to manufacture these quantities. Products are shipped to warehouses controlled by the agents and distributors, who make a charge for storage (Table 13).

109. In your distribution system, units of finished product can be lost, stolen or broken so that they do not reach their final destination in usable condition and have to be written off. Depending on the level of inventory in your warehouse, losses of this kind can lead to backlog and loss of sales. If a backlog occurs because of loss of product, your insurer is prepared to cover the full sales price of all sales lost. Products units which do not lead to loss of sales (because you have sufficient inventory in the system) are insured at the valuation price (Table 21). These valuations are added to your company's quarterly insurance claim.

110. Deliveries to the agents and distributors are made in standard size transport containers carried by hired transport. The capacity of the containers is set out in Table 11. Mixed product loads can be carried. Part loads are charged at the full load rate. Delivery charges are given in Table 12.

111. Journeys to your Internet distributor and to the port used to ship to NAFTA, are of a fixed length (see Table 12). NAFTA distributors are responsible for transport from the port in NAFTA. Journeys to Europe are made as round trips and depend on the number of agents you have selling for you

Important Detail

112. Delivery has an all-in cost per day covering the hire of the container and transport costs. (see Table 12). The total cost of delivery to your Internet distribution agent and to NAFTA distributors will depend on the number of loads required to deliver the number of products you specified for delivery, and the fixed journey length. In Europe it also depends on the number of agents in the European market (assuming them to be evenly distributed throughout the area). The cost per day and average speed per container is given in Table 12.)

113. Finished product units are warehoused in the European market (including products for the Internet distributor) and NAFTA at a cost per unit, based on the average quarterly holding (see Tables 13 and 14). Warehousing in NAFTA is charged in Dollars and converted to euros at the rate quoted in last quarter's management report.

RAW MATERIAL PURCHASE

& WAREHOUSING

114. All three products use the same basic raw material, in the quantities given in Table 5.

115. Raw material can be ordered (H) on the Futures Market for three months' or six months' delivery, or it can be ordered at the current Spot Price for delivery next quarter. Prices for each are quoted at the end of last quarter. Material ordered for future delivery incurs no storage charges, but all material becomes your property from the time it is ordered, and is valued on your balance sheet. Once material is delivered you may have to pay storage costs.

116. Your ability to buy effectively will depend on the accuracy of your forecasts of the likely sales of your products, your use of the economic indicators to predict how material prices are going to move, and your use of a sensible buying strategy.

Important Detail

117. Raw material ordered next quarter is invoiced next quarter, based on prices quoted in Dollars last quarter. The equivalent amount in euros is then paid in two parts; 50% immediately and 50% in the following quarter. No adjustment is made for a change in the exchange rate between these part-payments. The second part of the payment is carried forward in the Balance Sheet as part of trade payables until it is paid in the quarter after next.

118. If your production plan requires more raw materials than you have available for next quarter, a sufficient quantity to complete production is bought automatically on the Spot Market, but at a premium price (see Table 13).

119. Your buying and warehouse department incurs an administrative cost per quarter (see Table 13).

120. Material is stored in covered space in your own factory area, up to a maximum number of units given in Table 13. Anything in excess of this must be stored in commercial warehouses nearby. Maintaining your own storage area has a quarterly cost, regardless of the quantity held. Commercial storage is charged at a rate per unit, based on the average quarterly quantity held (see Tables 13 and 14).

INFORMATION TECHNOLOGY

121. If you are trading on the Internet you must have sufficient capacity on your website to cope with the volume of traffic that it generates. The volume of traffic on the Internet will vary a good deal and there will be extended periods when your system will be underused, but there will also be short periods of high usage when the traffic load approaches, or exceeds, capacity. Your system's ability to cope with peak demand is critical for the efficient image that you must try to present to potential customers. Lack of capacity at these times can damage the company's marketing image.

122. Access to the Internet is provided for you by an Internet Service Provider (ISP), who sells you capacity on a continuing basis.

123. The capacity of your website is defined in terms number of access "ports" it has. You obtain additional ports through your ISP in order to increase capacity for next quarter, as the

result of a Decision (line K) taken by you. Clearly the capacity that you have available should depend on how much traffic you expect at peak times - which implies that your decision is the result of a forecast on your part. To help you make this forecast you are given three statistics at the end of last quarter which show:

- a) The capacity of your system as decided by you at the end of last quarter, in terms of its number of ports
- b) The number of visits made to your website last quarter.
- c) The percentage of potential visits to your website that failed to connect.
- d) Adding a port to your system means that you will add to capacity 24 hours per day, but because of the uneven nature of traffic flow it will rarely be used to the maximum, and in any case, it will not be fully effective until the quarter after the next.

124. The all-in quarterly cost of running a unit of capacity (a port) is given in Table 4. This involves a cost per port, and a volume cost to pay for security, credit card banking and other features of commercial use. The total quarterly cost is treated as a marketing expense and is paid to your ISP in the same quarter. Changes in the number of ports require one quarter's notice.

125. Software is also important. It underpins the efficiency of your system and can also enhance the marketing image of your operation. Visitors to your website will be encouraged to buy your products by the impression it gives. Updating your software, in order to keep the information relevant and present a modern image, is a continuous task, and you must decide how much to spend on it each quarter. The money is spent on programming and design expertise, and on software tools. The more you spend relative to rival companies, the more your image will be enhanced, and the more successful your Internet marketing will be. Regular independent surveys are carried out and give a "Star Rating", which shows what the computer-using public thinks of your website. Five stars are the best possible; one star is the worst. High development spending on a regular basis should increase your star rating. Low or falling expenditure can lose you stars.

Important Detail

126. If you want to start trading on the Internet for the first time, you must start setting up your operation in the quarter before. To set up links with an Internet Service Provider (ISP), you must make a decision on how many ports you want. When you make this decision for the first time you pay a joining fee. Your system will then be available for commercial use from the beginning of the following quarter (See Table 4 for costs).

127. A distributor will also be recruited during this preliminary quarter, and will require a support payment that you should decide; otherwise the minimum will be paid. There are also recruitment costs.

128. You will also need to design and develop website software. This takes one quarter to do and hence you must make a decision on development costs at the same time as you decide what capacity you want.

129. Deciding how many ports to install is not straightforward. A single port operating on its own is much less able to handle the varying website traffic than a system of multiple ports. As a result, a realistic average capacity for a single port is only about one fifth of its stated maximum capacity. As the number of ports operating in parallel increases the average capacity rises more quickly because the larger numbers allow more efficient use of the ports. With a large number of ports, the average approaches the maximum (See Table 25).

130. Closing down your Internet operation also requires one quarter's notice, and is signalled by a decision to change to zero ports. The existing ports will continue to function until the end of next quarter. There are closing down fees to pay to your ISP and distributor (See Tables 3 and 4).

PRODUCTION MANAGEMENT

131. The whole of your production effort depends on good management. The amount you decide (Decision Sheet line R) to allocate to your management budget will therefore have an important effect on the quality of your production management, and hence on the success of your ability to meet demand.

HUMAN RESOURCE MANAGEMENT

Human Resource Management (HRM) is responsible for ensuring that the company has sufficient workers to function properly, and that the workforce is well motivated and efficient. Workers must be found in a competitive labour market, within which people can move from company to company seeking the best terms and conditions. The supply of people in the labour market can significantly affect your company's ability to operate efficiently. Human resource management implies monitoring the labour market, working with the other functional departments in the company to forecast what demand for labour will be, and taking steps both in the long and short term to make sure that HRM targets are met.

132. The company's labour force can be divided into four sections:

- Unskilled machine operators who make the parts for the company's products.
- Skilled assembly workers who produce the completed products from parts made in the machine shop.
- Ancillary workers - store people, clerks, junior management, etc.
- Senior management.

133. In the simulation, ancillary workers are dealt with in the context of their own departments and their costs are linked directly with departmental costs.

134. Senior management is dealt with later, see Para. 163.

135. The assembly workers require to be managed actively as part of the simulation and there are two aspects specific to HRM - Recruitment and Motivation.

136. The company's products are made by unskilled machine operators and assembled by skilled workers. In order to meet your delivery schedule, skilled workers need to be recruited in sufficient numbers to cope with any expansion in production which may be planned, and to counteract the loss of any workers retiring or leaving to work for other companies.

137. All grades of workers, whether unskilled or skilled, may leave because of retirement, sickness or because they have gone to work for rival companies that seem to be offering better conditions. The main reasons for leaving are low average earnings, excessive overtime working, colleagues being dismissed, poor quality products and poor management; all relative to the same factors at other companies may also have an effect. Skilled workers who leave do so at the end of a quarter.

138. It is therefore essential for HRM to work as part of the management team to ensure that labour requirements are met, and that those who are working for the company do so under the best conditions that the company can afford.

LABOUR SUPPLY

Assembly Workers

139. Skilled assembly workers are the product of intensive training and may be difficult to recruit. Skilled assembly workers are needed to match the flow of parts coming out of the machine shop to be made up into finished goods.

140. Recruitment of assembly workers needs careful planning, in cooperation with the other functional departments of the company. HRM decisions (line P) to recruit, train or dismiss should be taken within the management team.

141. To find skilled assembly workers, decisions (Line P) can be taken to try to recruit them directly, either from the pool of unemployed labour, or from skilled assembly workers already employed by other companies. Trying to recruit people does not necessarily mean that you will get the number you want (you may not get any at all!). Because of the time taken to advertise for, and interview workers, anyone you recruit will not begin to work for you until the beginning of the quarter after next.

142. Success in recruiting depends on the current level of average earnings (not the basic wage rate) of the workers you employ already, the quality of goods, which you produce, and the ability of your personnel management, all compared with the same factors in the other companies.

143. Recruitment is also dependent on the number of unemployed available in the labour pool. If there is high unemployment, recruitment will tend to be easier; if unemployment is low, recruitment can become very difficult and will depend on your ability to tempt people away from other companies; all of which leads to a very unstable labour market.

144. As an alternative to direct recruitment of experienced people, unskilled unemployed people can be trained to the standard required for assembly workers. Training takes place in the company's own training school at the factory. This limits the number that can be trained to nine per quarter. After decisions (line P) to train people have been taken, they are brought in from the local unemployed labour pool at the beginning of next quarter, complete the course and become available to work at the beginning of the quarter after next. The cost of training (see Table 15) covers the trainees' wages, materials and training-staff. Training people is more expensive than recruiting them directly, but it ensures that you get the number you want, and that they stay and work for you for at least one quarter after training is complete before they can be tempted away by better conditions at other companies.

Important Detail

145. The cost of recruitment (see Table 15) includes the cost of advertising and interviewing expenses, even if recruitment is not successful.

146. Skilled workers can be dismissed by making the appropriate decision (Line P). The decision to dismiss implies that notice is given at the beginning of next quarter, and that the workers continue to work for the remainder of the quarter before leaving at the end of it. Those who are dismissed are given a lump sum compensation payment (see Table 15). Dismissing people tends to make the remaining workers restive, and some may leave to find jobs elsewhere.

147. The same general causes which influence people to leave and go to work for other companies will also create discontent among those skilled workers who remain, leading to industrial unrest and strikes in the assembly shop. Official strike notice from the trade union is given in one quarter, determining the length of the strike (in weeks). This then takes place at the beginning of the next quarter, regardless of any changes you may make to improve wages and conditions, and involves all your skilled workers. Unskilled workers do not belong to the same trade union, and are content to stay at work while benefiting from any wage increases or improvements which may be won by the skilled workers.

148. When the assembly workers take industrial action, the total number of hours which can be worked is reduced by forty nine hours per person, per strike-week (thirty five hours basic, seven hours on Saturdays at 50% additional rate and seven hours on Sundays at 100% additional rate).

149. The number of hours of work from a given size of work force can also be reduced by absenteeism. In the case of unskilled workers, this has no apparent effect, but it does affect skilled workers. Hours can be lost in the assembly shop because of genuine sickness,

disaffection caused by too much overtime, and low motivation brought on by poor quality products and poor management.

150. Assembly workers may become ill, or suffer serious accidents so that they are off work for a significant length of time. When this happens, you continue to pay them as normal, but their post is temporarily filled with skilled workers hired from an agency, who charge twice the assembly wage rate. The cost of the agency workers can be covered by insurance.

Unskilled Machine Operators

151. Each machine owned by your company requires to be manned by four unskilled machine operators on each shift. Any change in the number of machines you have, or in the level of shift working, will mean that more or fewer unskilled workers are needed.

152. As with assembly workers, unskilled operators can leave if they feel that working conditions in your factory are not as good as can be found elsewhere. These people will need to be replaced.

153. Because there are always unskilled workers available in the local pool of unemployed labour, any requirement for new or replacement people is handled automatically at a lower level of management in the company, and does not need active decisions by senior management. When more people are needed, the shift supervisor will always be able to find the number required from the pool of unemployed, at the start of next quarter.

Important Detail

154. Reductions in the number of machines or in the shift level means that you will have surplus unskilled labour. Because of a trade union agreement, only half of these workers can be dismissed at the beginning of next quarter. Any surplus still remaining are given labouring jobs around the factory, and paid the same average earnings as those workers who are still manning the machines. Half of this surplus will then be dismissed at the beginning of the quarter after next, and so on until all have gone, or an increase in the number of machines or shift level enables them to go back to productive work again. Unskilled workers who are forced to leave are paid compensation. (See Table 15).

PAY & CONDITIONS

155. As well as ensuring that you have enough workers, HRM must manage the cost of the workforce, while at the same time trying to keep it happy. Although decisions are available which control wage rates, the way in which the workers are used can also have a significant effect on earnings. Overtime, and shift payments are variable, but can be controlled to keep costs down. Of course, these elements can only be managed effectively in the context of current economic conditions, but the mode of operating the Marketing and Production Departments also has a strong effect.

Assembly Workers

156. Skilled assembly workers are paid at a basic hourly rate, decided (Decision Sheet line N) at the beginning of each quarter. This basic rate is subject to an agreement with the trade union, which does not permit wage rates to be reduced. At the same time, the employers' association works together to hold wages down, so that any wage increase decided is held to a maximum of approximately 15% of the highest rate last quarter. An increase in the basic wage rate is implemented at the beginning of next quarter.

Machine Operators

157. You can change the capacity of your machine shop by installing more machines, by selling machines off (L), or by changing shift levels (N). Changes of these kinds will directly affect working conditions and pay.

Important Detail

158. Assembly workers and machine operators are paid up to a maximum number of hours per person at basic rates of pay (See Table 16). Thereafter the rate is increased for additional hours worked on compulsory overtime on Saturdays, which is paid at 50% more than the basic rate, and on Sundays, which is paid at 100% more than the basic rate. No decision needs to be taken about overtime working, which is applied automatically at a lower management level. Basic hours are applied first, then Saturday working, then Sunday working up to the limits shown in Table 16. After that, no further work can be done, even though your delivery schedule may call for a larger number of products to be made than your labour force can produce. For this reason the size of your skilled workforce needs to be well managed, based on strategic forecasts of demand worked out in cooperation with the other functional departments.

159. The skilled assembly workers operate only a single shift, but they can work overtime up to the limit shown in Table 16. They are paid only at the single shift rate. There is no guaranteed minimum number of hours worked for skilled workers, but a trade union agreement requires that the average weekly earnings of skilled employees (based on the number of weeks out of twelve worked) should not be less than that paid to unskilled workers, and any deficiency that occurs is made up by a 'parity payment'.

160. If you decide to work double or treble shifts, all of your machines are manned fully on all of the shifts, and the rates of pay for all unskilled workers are increased by a shift premium (see Table 16). Unskilled workers are paid at a basic rate, agreed with the trade union, which is set as a fixed proportion of the basic skilled rate (see Table 17).

161. Table 16 sets out the maximum hours that each person can work, and the rates paid. Unskilled workers are paid for hours worked, but each quarter there is a guaranteed minimum number of hours work per person (see Table 17). Unskilled workers are paid for the time that machines are broken down and under repair, but not for maintenance time, which is carried out when the factory is not working.

Ancillary Staff

162. The cost of other workers in your company is included in the various costs associated with the departments in which they are employed. These include: clerical and accountancy staff, buyers, warehouse staff, researchers, etc.

SENIOR MANAGEMENT

163. Your team assumes the role of the company's Board of Directors and can consist of a Chief Executive, and executives who are responsible for Marketing, Production, HRM and Finance. You share a management budget, which determines your level of spending on outside services and expertise, directors' salaries, and general management expenses. The management budget influences the general quality of management, and this in turn affects efficiency in all parts of the company.

Important Detail

164. There is a minimum allowable management budget per quarter (see Table 17). Any increase in expenditure will be implemented at the beginning of next quarter, but a decrease requires one quarter's advance notice and is limited to 10% reduction in any one quarter.

FINANCE, ASSETS & ACCOUNTING

The Finance Department is responsible for ensuring that the company's funds are managed efficiently, in line with corporate strategy. This implies a variety of roles, which include monitoring profitability, managing investment and borrowings, managing the company's fixed assets, taxation, and dividend policy. Importantly, it must work closely with the management team to maximise the company's share price, against which performance is judged.

165. The company is financed by shareholders' capital, consisting of shares with a value of 1 Euro each to the amount shown on the company's balance sheet.

166. The company's shares are quoted on the Stock Exchange, and the latest share prices for all companies are quoted each quarter on the bottom line of the Management Report. Share price is influenced by several factors which include:

- The company's net assets
- Profitability
- Dividend performance
- Liquidity
- Ability to pay interest charges
- Use and availability of resources
- Marketing and selling capability
- Ability to satisfy orders promptly

SHARE PRICE AT THE END OF THE SIMULATION IS THE CRITERION BY WHICH COMPANIES' PERFORMANCE IS JUDGED.

DIVIDENDS

167. Every first and third quarter of each calendar year you must decide (Decision Sheet line R) the percentage of the share capital to be paid to your shareholders as dividend. Regular, predictable and competitive dividend payments will have a positive effect on share price. Erratic and low dividends have a negative effect.

168. Dividend payments are made at the beginning of odd quarters. The total dividend paid in any one quarter may not exceed the company's Retained earnings, as shown in the Balance Sheet of the previous quarter. No dividend may be paid if Retained earnings were shown to be negative last quarter.

INVESTMENT

169. You can decide (Decision Sheet line Q) to invest funds (or add to existing investments) in the financial institutions, or you can withdraw all or part of such investments at the beginning of next quarter. This is not done automatically. You must make a decision to invest or withdraw money. Otherwise the money will remain inert as cash, earning no interest. (See Paras. 175 & 178)

BORROWING – Term Loans

170. A decision (line Q) can be made to start, or add to, a medium term loan at a fixed interest rate (see Table 20). In this type of loan, the money comes from investment institutions that are prepared to commit themselves to your company in long term, and become part of the funding structure of your company. The money is credited to you immediately at the beginning of next quarter as cash (or automatically used to repay all or part of any outstanding overdraft or

unsecured loan which you may have [See Paras. 171 & 172].) These loans are long term and cannot be repaid during the period of the simulation.

BORROWING - Overdraft

171. Additional finance is also available in the form of an overdraft (i.e. a flexible bank loan). Your bank sets a maximum limit for overdraft next quarter based on your company's short term assets and liabilities as shown in your balance sheet for last quarter. (See Table 19)

BORROWING - Unsecured Loans

172. If you need more funds than your overdraft limit permits, your company will continue to be funded by loans provided by finance houses, without security. These loans are available in unlimited amounts at an annual interest rate (See Table 20) above the current European Central Bank Rate. Interest on unsecured loans is calculated in a similar way to the interest on overdraft. Unsecured loans will continue to be granted even although you might, under normal circumstances, be considered to be insolvent. No one is declared bankrupt in the simulation, though your share price may crash.

173. Both overdrafts and unsecured loans are issued and repaid automatically as your cash requirements require, unsecured loans being granted last and repaid first. No decisions are needed.

Important Detail

174. At the beginning of next quarter, the value of your overdraft and any unsecured loans shown on last quarter's Balance Sheet will be immediately adjusted to take account of any cash movements resulting from new decisions involving investments and/or medium term loans. The flow of cash into and out of your company for all other reasons is assumed to be at a steady rate across the rest of the quarter. Interest on overdraft and unsecured loans is then calculated on the average of the revised opening balances and the level of overdraft and unsecured loans at the end of next quarter. Averages are calculated as shown in Table 14.

175. Investments earn interest at the same annual rate as the European Central Bank Rate for next quarter. Interest on investments is calculated from the first day of each quarter. If you do not have cash available, any decision you make to invest will be implemented from your overdraft, up to the level of your overdraft limit set last quarter (see Para. 178).

176. The total medium term loan (or addition to an existing loan) that can be taken out in any quarter is limited to your Borrowing Power (see Table 19). This varies from quarter to quarter and depends on the value of your company's shares on the Stock Exchange, the amount of any existing term loans, and the overdraft limit, which your Bank has set. Your Borrowing Power for next quarter is shown in the Management Report for last quarter.

177. Interest on term loans is fixed (Table 20) and is calculated from the first day of each quarter. Term loans are credited at the beginning of the quarter, immediately before investments are bought, so that cash available from the loan will be invested immediately, provided you make the appropriate investment decision.

178. The maximum overdraft available to you next quarter is shown in the Management Report for last quarter. This limit is calculated as shown in Table 19. Additional funds available through your overdraft will be automatically credited to your account as needed, up to the maximum allowed, to cover the balance of your funding requirements.

179. Interest on overdraft is charged at an annual rate four percentage points above the European Central Bank Rate given for the quarter. The amount of interest is then be added to the overdraft itself.

FIXED ASSETS - Property

180. The company's fixed assets consist of property and machines. While the value of property is fixed and unchanging, machines require to be managed in line with the company's development strategy.

181. The company's factory is wholly owned and has a fixed value as specified in your company's balance sheet.

FIXED ASSETS - Machines

182. Machines can also be bought, at a price given in Table 18, but the process of buying a machine, once you have taken the decision (line K) to do so, is fairly complex, and needs to be planned well ahead. You may not be able to place orders for some or all of the machines you require unless your company's financial position is sound.

Important Detail

183. Using information from last quarter's balance sheet, the machine supplier checks your ability to pay by calculating your credit-worthiness. This is defined as your Borrowing Power (see Para. 176), plus any cash and investments less any unsecured loans at the end of last quarter, less any payment outstanding on machines already ordered but not yet installed (see below). If your credit-worthiness is at least equal to the total price of the machines you want, the supplier will take your order, together with a first payment of half of the purchase price. If your credit-worthiness is less than the purchase price, the supplier will only take orders for that number of machines which your credit-worthiness covers (which may, of course, be none).

184. Once ordered, the machine is delivered and installed in the quarter after next, at which time a second payment of half of the purchase price is made. The machine becomes available for use in the quarter after that. The installation of machines already ordered will not be affected by any fall in your creditworthiness during the installation period.

185. During its life, the value of a machine depreciates by the decreasing balance method, at a quarterly rate given in Table 18.

186. When a decision (line L) is taken to sell a machine, the oldest is sold first at the beginning of next quarter, at its depreciated value last quarter. However, because of new legislation on environmental issues, the potential for contamination and the need for safe waste disposal, there will be a decommissioning charge (see table 18) whenever a machine is removed for sale. Any decommissioning costs are included under 'Other miscellaneous costs' (para 272).

ACCOUNTING PRACTICE

Important Detail

- a) Depreciation of the company's machines is calculated each quarter, at a quarterly rate given in Table 18, by the decreasing balance method.
- b) Inventories of material held, or on order in the futures market, at the end of each quarter are valued at a fixed proportion (see Table 21) of the lowest raw material price (spot, 3-month or 6-month), quoted at the end of last quarter, for future quarters. This price, in Dollars, will be converted to euros using the Euro/Dollar exchange rate, quoted last quarter.

- c) Inventories of finished products held in the area warehouses at the end of a quarter, are valued in the balance sheet as set out in Table 21.
 - d) Company tax is levied on taxable profit at a rate given in Table 20. The tax year is the same as the calendar year, and an assessment of tax is made at the end of the fourth quarter. Any tax assessed is deducted immediately from the company's profit/loss for the period. Tax is then entered as a liability on the balance sheet, where it remains, until it is automatically paid in the second quarter of the following year. Losses are accumulated from previous years and are offset against future taxable profit.
 - e) Purchases made by your company are either paid in the same quarter in which the purchase was made, or in later quarters, in which case the amount owed by you will be carried forward as a liability (trade payables) in the Balance Sheet. Table 24 lists all types of purchase that can be made, and the timing of respective payments. Trade payables cannot be manipulated to assist your cash flow.
 - f) Sales made by your company are invoiced to customers for future payment. Amounts due, but not paid, before the end of a quarter, are carried forward as trade receivables on your balance sheet. Payments from the different markets are expected in full within the target periods given in Table 23. However, not all customers pay promptly, so these targets are never quite met. This does not apply to Internet customers, who pay the full amount in advance by credit card.
 - g) There is a cost associated with cash collection and credit control, which is a fixed amount per unit of product sold through European and NAFTA agents, plus a fee for servicing credit card payments by Internet customers, which has a cost per unit sold (see Table 20).
 - h) Finally there are certain fixed administrative expenses associated with running your company, which have not been included so far. These include fixed cost items such as local property tax, audit fees and others, and are shown in Table 20.
 - i) There are other variable administrative expenses, such as telephones, stationery, heat and light, postage, building maintenance, clerical support, etc. which are charged as a percentage of all administrative expenses (including the fixed cost elements listed above), at a rate given in Table 20.
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INSURANCE

187. Your company's activities are at risk from a variety of random events which can disrupt its operations:

- a) Some or all of the raw materials held in your own warehouse can be accidentally destroyed by careless handling, theft, flooding or fire
- b) Similar risks can destroy all or part of inventories of raw material in transit or in your own local warehouse
- c) Key assembly workers can suffer from serious home or workplace accidents, which might disrupt your production capacity
- d) Machines can suffer from catastrophic breakdown, which takes them out of production for periods of time
- e) Badly designed products can be distributed or sold which are later found to be environmentally dangerous, and need to be withdrawn for modification.

These events can be identified in the Management Reports by "!" (exclamation sign) alongside relevant figures.

188. To guard against such incidents you can decide to take out insurance which will cover you for financial loss caused by them. The insurance company offers a range of plans to give you cover. You must decide (Decision Sheet line T) which plan you want to operate; Table 22 lists the plans available.

189. Insurance premiums are calculated as a percentage of the value of certain of your fixed assets taken from last quarter's Balance Sheet - the total of Property, Machines, Material inventories and Product inventories. The percentage that is applied varies with the amount of insurance excess that you are prepared to accept yourself, before a claim is passed to the insurance company. The larger the proportion of the risk that you are prepared to take on, the less the insurance premium will be on the remaining asset value to be covered. Table 22 lists four plans, in which the proportion of insurance excess which your company takes on itself rises successively from 0.1% to 0.4%, and the corresponding percentage premium which the insurance company will charge to cover the remaining asset value.

190. A fifth option is to take out no insurance at all, in which case you are exposed completely to the dangers of random disruption without insurance cover.

191. Global disruptive events are relatively rare, and the effects of each are described in the relevant parts of the manual. Your insurance will cover any physical loss which is caused to your existing property, in these cases.

192. The other factor affecting the risk of random disruption will be the level of your Management Budget (R). Good management leads to safer working environment, ensures that Health and Safety procedures are properly implemented and that your products are properly designed. Poor management tends to lead to a high-risk company.

Important Detail

193. When disruption does occur, it is shown in the Management Report in various ways. Physical loss of raw material and product inventories are reported directly in the report. Loss of machine time and assembly time are shown under Breakdown Time and Absenteeism respectively, and are not separated from routine minor problems.

194. Dangerous or ecologically unsound products are included in Guarantee Servicing, and are usually large quantities. If disruption occurs in any of these functions the symbol “!” will occur alongside the relevant figure in the Management Report.

195. The total notional cost of disruption is added into a single claims figure each quarter. If the total sum of money is greater than the value you have decided (Decision Sheet line T) to underwrite yourself, you will then be paid the difference, immediately. If you have no insurance cover you cannot make a claim.

Part III

THE MANAGEMENT REPORT

This part of the manual is concerned with the Management Report. It describes each entry on the report, and defines the arithmetic derivation of each value, where possible.

196. The Management Report is in six parts, consisting of a reprint of the decisions entered to the Simulator, resource statistics, product statistics, accounts, business intelligence and economic information. This description of the contents of the Management Report assumes that you have just received it. What follows therefore refers to the contents of the latest Report as being last quarter's data. You should use the information in the Report to help you make decisions for next quarter.

197. On receipt of the Report, first check that the copy you have received is for you, that it has your group and company number on it, that it has your team leader's name and that it is for the correct quarter. If any of these are incorrect please contact the Controller as quickly as possible.

198. The first section of the Report reprints the decisions which you entered. Normally they will be the same as your own, but there are four ways in which they might differ:

199. A decision put forward by you was invalid in terms of the current simulation, e.g. trying to fire five assembly workers when you only have four, or more likely, trying to buy a machine when your credit-worthiness was not adequate. It may also differ because a decision did not achieve the desired effect; for instance you may have been able to recruit only three assembly workers when you tried to recruit five. In such cases the Simulator will have edited your decision to the nearest possible value, and printed an asterisk (*) immediately after the edited number on the Management Report.

200. A decision by you was invalid because it lay outside the limits allowed for the simulation. A hash (#) is printed as a default value as defined in Part Four.

201. Your Decisions were not received. Default values, as defined in Part Four, will have been put in and a hash (#) printed as an error indicator.

202. If a number is different, and there is no error indicator, contact the Controller immediately. Errors due to electronic communication problems can only be corrected if communicated within a 24-hour period after delivery of the Management Report.

203. The rest of the Report gives you information about the state of your company and the simulation. It will tell you what happened last quarter, the state of some parameters of your company now, and say something about next quarter. It also gives you information about your competitors and the economic environment. The remainder of Part Three of the Manual examines each of the headings of the Report in turn and explains how the corresponding figure was obtained.

AVAILABILITY & USE OF RESOURCES

204. 'Machines Available Last Quarter': the number of machines which you had available for production last quarter. 'Machines Available Next Quarter' from the quarter before last, less any machines sold at the beginning of last quarter.

205. 'Machines Available for Next Quarter': the number of machines which will be available for you to use next quarter. 'Machines Available Last Quarter' plus any new machines ordered in the quarter before last and installed last quarter.

206. 'Assembly Workers Hours: Available Last Quarter': the number of skilled workers you had available last quarter, multiplied by the maximum number of hours which each could have worked (Table 16), less a fixed number of hours per worker for each strike week notified at the end of the quarter before last (see Table 17).

207. 'Hours Absenteeism': the number of skilled man-hours lost through workers being sick, or not turning up for work for other reasons. Where part of absenteeism is due to serious illness or accident, the cost of cover may be covered by insurance. Look for "!" alongside to show that you have had a problem which may be covered by insurance if your cover is sufficient. The precise number of hours attributable to serious illness is not shown.

208. 'Hours Worked Last Quarter': the total number of paid hours worked by skilled assembly workers last quarter. Defined as, the number of products you produced last quarter, multiplied by the assembly time for each product, as specified by you last quarter.

209. 'Notice of Strike Weeks Next Quarter': The number of weeks' work which will be lost by each skilled worker next quarter, due to intended industrial action. This is irrevocable and is a fixed number of hours per person per week (see Table 17).

210. 'Machine Hours, Available Last Quarter': the number of machines available to you last quarter, multiplied by the maximum number of hours each could work under the shift system decided (see Table 7).

211. 'Hours Breakdown': the total number of hours during which machines were out of production due to breakdown and repair. Where part of Breakdown Time is due to catastrophic failure of a machine, you may be able to claim the cost of repair against your insurance. Look for the "!" sign to see if this is the case.

212. 'Hours Planned Maintenance': the total number of hours of preventive maintenance given to your machines, outside normal production time. The number of preventive maintenance hours decided multiplied by the number of machines available, less breakdown time. If total breakdown time exceeded the total number of maintenance hours allocated, no maintenance will have been done.

213. 'Hours Worked Last Quarter': the total number of hours machine time used to produce products last quarter. The number of units of each product which were produced, multiplied by the machining time appropriate to each, extended by the effect of loss of machine efficiency.

214. 'Machine Efficiency %': the theoretical minimum number of machine hours which should have been taken to manufacture your products last quarter, divided by the actual time, expressed as a percentage.

RAW MATERIAL

215. 'Opening inventory Available': the number of units of raw material carried forward from the quarter before last, plus any material ordered in earlier quarters for delivery last quarter. The sum of Closing inventory and the two values under For Delivery Next Quarter, taken from the Report for the quarter before last.

216. 'Bought Spot Last Quarter': Material ordered at the beginning of last quarter for delivery last quarter.

217. 'Bought Default Last Quarter': Material bought last quarter to make good any shortfall in material ordered. Materials used from Paras. 218 & 219, less the total of materials from 215 & 216, if positive.

218. 'Lost / Destroyed': The number of raw material units lost, stolen or spoiled in your own warehouse last quarter. (Look for the “!” sign).

219. 'Used Last Quarter': The total number of units of raw material used last quarter. The number of each product produced, multiplied by the material content of each.

220. 'Closing inventory Last Quarter': the number of units of raw material on hand at the end of last quarter, to be carried forward into next quarter. The sum of materials listed in Paras. 215-217, less Paras. 218 & 219.

221. 'For Delivery Next Quarter': the number of units of raw material ordered and bought by you last quarter for delivery next quarter; and the number of units ordered and bought in the quarter before last for next quarter.

222. 'For Delivery Quarter After Next': the number of units of raw material ordered and bought last quarter for delivery in the quarter after next.

HUMAN RESOURCE MANAGEMENT

223. 'Personnel at Start of Quarter': the number of skilled assembly workers and unskilled machine operators available to you at the beginning of last quarter. This is the number of skilled workers that worked for you throughout last quarter. For unskilled workers, this is simply the number that was available at the start of last quarter.

224. 'Recruited': the number of each type of worker which you successfully recruited last quarter. Skilled workers were recruited at the end of last quarter, and hence did not work during that period. Unskilled workers were recruited automatically at the beginning of the quarter, to make up the number required to operate your machines at the shift level decided (4 workers per machine, per shift).

225. 'Trained': the number of workers taken on from the pool of unemployed labour and trained last quarter to be skilled assembly workers. These workers will be available to work for you in the next quarter.

226. 'Dismissed': the number of each type of worker which you decided to dismiss last quarter. Skilled workers were dismissed at the end of last quarter and hence worked for you during that period. Unskilled workers were dismissed at the beginning of last quarter. Unskilled workers are dismissed only as a result of a reduction in the number of machines, or a lowering of shift level, but as only half of any surplus labour can be dismissed in one quarter it is possible to have more unskilled workers than you need.

227. 'Quit': the number of each type of worker who left because of retirement, or sickness, or who went to work for rival companies. All of these would have left at the end of last quarter.

228. 'Available for Next Quarter': the number of each type of worker who will be available to you at the beginning of next quarter. The number of unskilled workers may then change immediately due to changes in the number of machines or in the level of shift working. This figure is the total of 'Personnel at Start of Quarter' plus 'Recruited' and 'Trained', less 'Dismissed' and 'Left'.

AGENTS & DISTRIBUTORS

229. Details of recruitment and withdrawal of sales agents in the European market and distributors in NAFTA.

230. 'Agents (or Distributors) Available Last Quarter': The number of agents and distributors who represented you last quarter. Equal to 'Available next quarter' from the quarter before last.

231. 'Quit': The number of agents and distributors who decided to stop representing you. This is possibly because they felt that they were not making sufficient profit, or are not being supported sufficiently by your advertising or commission levels, compared with other companies.

232. 'Dismissed': The number of agents and distributors who you decided should stop representing you at the end of last quarter by a decision taken at the beginning of last quarter

233. 'Recruited': The number of new agents and distributors who have agreed to represent you from the beginning of next quarter. They were recruited last quarter to fulfil your decision on the target size of your network taken at the beginning of last quarter. You may not have got all the agents and distributors you are seeking. Agents and distributors are attracted to your network for broadly the opposite reasons that make them leave.

234. 'Available for next quarter': The number of agents and distributors who will be selling for you next quarter.

INFORMATION TECHNOLOGY

235. This section gives performance statistics relating to your Internet operation. If you are not operating a website, the statistics will show as 0.

236. 'Number of Internet Ports Operated': The number of communications ports which you decided last quarter. This is a measure of the capacity of your system.

237. 'Number of Internet visits last quarter': The total number of successful visits made to your website last quarter. This shows the degree of interest in your website. Your success in turning these visits into orders for products will then depend on the selling effect of the website and on the marketing image of your products.

238. '% of Potential Internet visits that failed to connect': the number of failed attempts to visit your website last quarter divided by the total number of attempts. This statistic is the result of technical surveys carried out routinely by your staff.

PRODUCTS

239. 'Scheduled': the total number of each product which you decided in your 'Production' decisions last quarter, summed across all areas.

240. 'Produced': the number of products which were actually produced in your factory last quarter, including those which were rejected and those made again to replace rejects. This may be less than the number scheduled if you did not have sufficient production capacity to make the number you wanted.

241. 'Rejected': the number of each product rejected from these produced because they were discovered to be substandard in your Quality Control department. These are sold off at scrap value (Table 8). If you have sufficient resources your production department will produce extra to replace the rejects.

242. 'Lost/Destroyed': the number of each product lost, stolen or destroyed within your distribution system, last quarter, for which insurance may pay if you are covered (Look for the "!" sign).

243. 'Shipped to': the number of each product made and actually shipped to each marketing area and to your Internet distributor. This may be less than the number originally decided if your factory did not have sufficient production capacity, or products are lost or destroyed, as described above. Products will not be sent to markets where you do not have an organisation.

244. 'Orders from': the number of orders received for each of your products in each area last quarter. These are new orders and do not include any backlog of orders waiting to be satisfied from the quarter before last.

245. 'Sold to': the number of each product sold in each area last quarter. Calculated as the lesser of: new orders plus any backlog from the quarter before last; or, deliveries last quarter plus any product inventory carried forward for sale from the quarter before last.

246. 'Order Backlog': the number of unsatisfied orders (backlog) for each product in Europe and NAFTA carried over from last quarter because of poor delivery. There can be no backlog of orders on the Internet. Note that these quantities are only half of the actual number of dissatisfied orders, as the other half will have cancelled their order. These have not gone directly to your competitors, but are likely to do so indirectly at some time in the future. If, in the meantime, you decide to raise your price, or reduce the assembly time for your products, your backlog of orders may fall still further at the beginning of next quarter (See next paragraph for method of calculation.).

247. 'Warehouse inventories': the number of each product warehoused in each area and available for sale next quarter. Redundant inventories of any product may be sold at the beginning of next quarter if you decide in the meantime to take up a reported major product improvement for that product. 'Warehouse inventories' or 'Backlog' for each product in each area, is calculated as:

- Product inventories from the quarter before last,
- plus Deliveries last quarter,
- minus Backlog from the quarter before last
- minus Orders received last quarter.

A positive result means that you have product inventories in that area available for sale next quarter. A negative result means that you had unsatisfied orders in that area, half of which will have been cancelled, so that the result will have been divided by two before being shown as Backlog, to be carried forward. A negative result in the Internet area will be ignored.

248. 'Product Improvements': three words can appear here, for each product, either:

- **'None'** indicating that no product improvement suggestions have come out of your research and development department last quarter.
- **'Minor'** indicating that your research and development department has made a relatively minor improvement to your product, which will already have been incorporated into the product last quarter, and begun to affect your marketing image. No further action is needed.
- **'Major'** indicating that your research and development department has come up with an improvement of major significance, which now awaits your decision, to be implemented when you are ready to do so. A product improvement is only listed once, at the time it is reported, though it remains available until you decide to take it up. Indeed further major improvements may be notified before an earlier one has been implemented, and when this happens all available improvements are introduced at the same time, when you do make the decision.

249. 'Serviced under Guarantee': The number of each product serviced to correct defects, under the company's 12-month guarantee, by local servicing agents. This may include products returned for repair, resulting from poor design or inherent ecological problems in the

products, and also similar repairs to product inventory still in your distribution system (look for the “!” sign). The number of units returned for this reason is not given separately.

250. 'Internet Service Complaints': The number of complaints received by the Internet Distributor because of inability to deliver, poor packaging, incorrect addressing, or other delivery technicality. These numbers give an indication of the efficiency of the Internet distributor's operation, which can have an affect your marketing image.

251. 'Transport - Average Journey Distance (Km)': the average length of journey made when delivering your products to the agents and distributors. The trips to your Internet Distributor and to the port used for shipping to NAFTA are of a fixed length given in Table 12. For Europe, the average number of days taken per journey will be the average journey distance by the daily mileage given in Table 12. Part days will be rounded up, to cover maintenance, loading, etc.

252. 'No. of Loads': The number of container loads of products sent to each area. Part loads are rounded up to full loads. This is equivalent to the number of journeys.

ACCOUNTS (Euros)

253. The final part of the Management Report is the company accounts, under the headings 'Administrative Expenses', 'Income Statement', 'Balance Sheet' and 'Cash Flow'. These are dealt with in detail, below. All transactions are recorded in euros. Where payments are due in Dollars, these will have been converted to euros at the exchange rate in operation last quarter.

ADMINISTRATIVE EXPENSES

254. The administrative expenses items are for costs incurred last quarter.

255. 'Advertising': the total cost of advertising all products in all areas, as decided.

256. 'Internet Distribution Agent.': the total support payment and commission paid to your Internet distribution agent for handling your products (see Table 3). The value of sales last quarter times the percentage rate decided; plus the lump sum support payment which you decided. There is only one agent. If you open an Internet operation, or close it down, there are associated one-off costs. (see Table 3)

257. 'Internet Service Provider': the cost of your operation's link to the Internet, which depends on the number of ports you have installed, plus a variable charge for specialist services such as network security which is taken to be a percentage of the value of Internet sales (see Table 4) If you open an Internet operation, or close it down, there are associated one-off costs. (see Table 4)

258. 'Selling Agents & Distributors': the total cost of support payments and commission paid to EU agents and NAFTA distributors last quarter; plus the cost associated with a decision made by you to reduce the number of agents and distributors at the end of last quarter; plus the cost of attempting to recruit new agents and distributors to bring the number up to your requirements. The number you tried to recruit (and hence had to pay recruitment charges for) was the target number you decided to try to obtain last quarter, less the number in your network at the end of the quarter before last (see Table 3). Agents' commission is paid on the value of orders. Distributors' commission is paid on the value of sales. There is no cost associated with agents who made their own decision to stop working for you last quarter.

259. 'Sales Office': sales administration costs 1% of the total value of orders taken in all areas last quarter.

260. 'Guarantee Servicing': the total cost of repairing products returned last quarter as faulty, within the company's one year guarantee. The number serviced last quarter multiplied by their

respective costs (see Table 9). Items repaired as a result of a product recall are charged at 75% of the standard cost.

261. 'Shipping and Hired Transport': The cost of using hired transport to deliver of your company's products to the Internet distributor and European agents and last quarter, plus the cost of shipping container loads of products to NAFTA.

- a) The cost of hired transport within the European market is the number of container-days needed; all multiplied by the daily container hire rate given in Table 12.
- b) The cost of shipping to NAFTA and the Internet distributor is the number of container-days needed to transport product to the NAFTA port, and/or to the Internet distributor; multiplied by the daily cost per container.

262. The number of container-days can be calculated by dividing the distances by the daily maximum allowed (rounded up), multiplied by the number of loads. In all cases, mixed product loads can be carried (see Table 12).

263. 'Product Research': the total amount spent last quarter on research to improve your products, as decided.

264. 'Website Development': Each quarter you decide how much money to invest in the development and maintenance of your website (if you have one). Money is spent on updating the information presented, and on software development to make the site more attractive. There is an in-built obsolescence factor, which will tend to make the site look old fashioned and out of date. You should invest to overcome this tendency. The "Website Star Rating" depends on how much and how regularly you spend.

265. 'Personnel Department': the total cost last quarter of training, trying to recruit and dismissing personnel. The number decided under each category multiplied by the appropriate cost given in Table 15.

266. 'Machine Maintenance': the cost of maintaining and repairing the company's machines. The number of contract hours decided, multiplied by the number of machines, multiplied by the hourly cost. If the number of breakdown hours exceeds the total contract hours decided the difference will be paid for at a premium hourly rate (see Table 6).

267. 'Warehousing and Purchasing': the cost of operating your own storage area per quarter, and administrative costs, plus a cost for each of the average number of units of raw material delivered and held in commercial warehouses (any quantity over the maximum space at the factory), plus a cost for each of the average number of product units warehoused in the sales areas at their respective costs (see Tables 13 and 14).

268. 'Business Intelligence': the cost of buying information last quarter, as decided (see Table 2).

269. 'Credit Control': the cost of collecting money from your company's debtors; plus the bank charges paid for handling Internet credit card payments (see Table 20).

270. 'Insurance': the amount paid, as a proportion of your insured risk, to provide insurance cover. The total from the Balance Sheet in the quarter before last of Fixed Assets, Product Stocks and Material Stocks, all multiplied by the rate for insurance under the insurance plan which you decided. If you have not taken out insurance cover this will be zero.

271. 'Management Budget': the cost of your company's management last quarter, as decided.

272. 'Other Miscellaneous Costs': the total of other miscellaneous costs not included so far. A fixed cost plus a percentage of all costs included in Administrative Expenses so far (including the fixed cost) (see Table 20). See also para. 186.

273. 'Total administrative expenses': the total of all administrative expenses items listed in paras. 255 - 272.

274. 'Taxable Profit/Loss Accumulated': The amount of accumulated profit (or loss, if negative) up to the end of last quarter. This is calculated as taxable profit/loss from the quarter before last, plus gross profit, interest and insurance payments received; less interest paid, administrative expenses and depreciation from last quarter. If this value is positive when tax is assessed in the fourth quarter of the year, then tax will be payable on a percentage of the value, and the figure for 'Taxable Profit/Loss Accumulated' will be carried forward to the next quarter as zero. If it is negative (a loss) when the tax assessment is made, no tax will be payable and the loss carried forward to the next quarter. In the fourth quarter of each year the figure shown is its value immediately before tax is assessed. Once tax has been assessed and charged, taxable profit is reset to zero at the start of the first quarter. See Table 20 for the tax rate.

275. 'Insurance Claimed': the total assessed value of claims for losses incurred last quarter. If you did not take out insurance cover this will be zero.

276. 'Insurance Excess': the amount of insured risk which your company agreed to underwrite itself, before receiving payment from the insurers. By applying the percentage agreed under the insurance plan decided, it is possible to use this figure to work back to the value of the total insured risk.

INCOME STATEMENT

277. The income statement account is set out in two parts. The first part calculates the gross profit, the second gives the Profit/loss for the period.

278. 'Sales Revenue': total revenue from all trading last quarter. The number of each product sold in the European, NAFTA and Internet markets multiplied by the appropriate prices; plus the number of each product sold off at their valuation price after introducing a major product improvement (Table 21); plus the sale of any product rejects at their scrap value (Table 8).

279. 'Opening Inventory Value': the total value of product and material stocks held or on order at the beginning of last quarter. Given as Closing Inventory Value in the balance sheet for the quarter before last.

280. 'Materials Purchased': the cost of materials ordered last quarter, in the quantities decided, and at the prices announced in the quarter before last. Materials ordered for future quarters are included in this figure at the future prices quoted. Material units purchased to make up shortages last quarter are charged at last quarter's spot price plus a premium given in Table 13. Note that material is priced and paid for in US Dollars, but appears in the accounts in euros, converted at the rate of exchange used last quarter.

281. 'Assembly Wages': the number of skilled hours used last quarter on basic working, Saturday overtime working and Sunday overtime working, all multiplied by the basic skilled wage rate, or increments of it, as appropriate. If this total, converted into the average wage per worker, per week worked, is less than a similar figure for unskilled workers, the unskilled rate of average weekly earnings is used instead, multiplied by the total number of weeks worked.

282. 'Machinists' Wages': the number of machine hours used last quarter plus breakdown time, at the basic rate, Saturday overtime rate and Sunday overtime rate, for the shift level being worked, multiplied by the appropriate wage rate (based on a proportion of the skilled wage rate, see Table 17), all enhanced by the shift premium, and multiplied by four workers

per machine. If the number of unskilled workers employed was greater than the number needed to operate your company's machines at the shift level being worked, these surplus workers are paid at the same average rate as those manning the machines. Unskilled workers are paid for a minimum number of hours each, per quarter (see Table 17).

283. 'Machine Running': the cost of running your machines last quarter. The number of machines available to you multiplied by the cost of machine overheads, plus the cost per shift for supervision, plus the number of machine hours used multiplied by the machine rate, plus a charge for each unit of product requested for production planning charges (see Table 10).

284. 'Quality Control': The fixed cost of your quality control department, given in Table 10.

285. 'Closing Inventory Value': the total value of material in hand and on order at the end of last quarter, plus the value of product inventories at the end of last quarter (see Paras. 302 and 301 respectively).

286. 'Cost of Sales': the cost of producing the products sold last quarter. The total of values for Paragraphs 279 - 284, less Paragraph 285.

287. 'Gross Profit/Loss': Sales Revenue, less Cost of Sales.

288. 'Insurance Receipts': the amount your insurance company paid to you in settlement of your claims last quarter. The total amount claimable less the percentage of the total insured risk which you agreed to meet under the insurance plan (Table 22) that you decided (Decision Sheet line T).

289. 'Finance income': interest earned on investments held during the quarter.

290. 'Finance expense': interest paid on any bank overdraft and unsecured loans by the company last quarter, plus interest paid on medium term borrowing. The calculation of interest assumes an initial re-organisation of borrowings, cash and investments from the balance sheet position at the end of the quarter before last, due to investment and loan decisions made at the beginning of last quarter. Overdraft and unsecured loan interest is then calculated on the assumption of a steady flow of funds into and out of the company during last quarter, as detailed in Table 14. Interest on Unsecured Loans is added to Unsecured Loans; interest on Overdraft is added to Overdraft. If either of these types of borrowing is eliminated during the quarter, any interest on Unsecured Loans is added to Overdraft and any interest on Overdraft is deducted from Cash.

291. 'Administrative Expenses': see Paragraph 273.

292. 'Depreciation': the total amount by which your machines depreciated last quarter. Calculated as a fixed percentage of: the value of machines shown in the balance sheet for the quarter before last, plus the second payment on any machines installed last quarter, less the value of any machines sold last quarter. Depreciation percentages are given in Table 18.

293. 'Tax Assessed': the amount of tax on profits which your company must pay is assessed at the end of the fourth quarter each year. This is calculated on any positive value of taxable profit accumulated at the rate of tax given in Table 20. Tax assessed is immediately deducted from the profit and loss account, and carried forward as a liability in the balance sheet until it is paid in the second quarter of the next year.

294. 'Profit/Loss of the period': gross profit, plus interest and insurance payments received; less interest paid, administrative expenses, depreciation and tax assessed.

295. 'Dividends': the amount paid out to your shareholders following a decision in the first or third quarter to pay a dividend. Your share capital multiplied by the percentage dividend

decided. The amount of dividend paid may have been limited to retained earnings in the quarter before last.

296. 'Transferred to Retained earnings': Profit/Loss of the period less Dividend. Net Assets at the end of last quarter will equal Net Assets from the quarter before last plus this amount, plus any additional Term loan taken out last quarter.

BALANCE SHEET

297. 'The Balance Sheet': this is in three parts – assets, liabilities, and equity.

298. 'Value of Property': the fixed value of the company's factory building and other fixtures.

299. 'Value of Machines': the current depreciated value of your company's machines. The value of machines shown in the balance sheet for the quarter before last, plus the second part payment for any machines installed last quarter, less the depreciated value of any machines sold last quarter all reduced by the quarterly rate of depreciation; plus the full value of any first payment made on machines newly ordered last quarter. The depreciation rate is given in Table 18.

300. 'Total Fixed Assets': The total value of Property, Machines.

301. 'Value of Product Inventories': the value of product inventories held in the various sales areas at the end of last quarter. The number of each product held multiplied by their appropriate valuation (see Table 21).

302. 'Value of Raw Material Inventories': the value (in euros) of material inventories held in or near your factory at the end of last quarter, plus units already ordered for next quarter and the quarter after next. The total number of units held and on order, multiplied by a percentage (see Table 21) of the lowest of the spot, 3-month or 6-month price for raw material next quarter given in the Management Report for last quarter. This price, in US Dollars, is converted to euros using the exchange rate quoted last quarter.

303. 'Trade receivables': the value of money owed to your company by its customers. Trade receivables in the balance sheet for the quarter before last, plus sales last quarter, less trading receipts (see Para. 318).

304. 'Cash': the amount of cash held and not earning interest. Cash from the quarter before last, less any cash needed to fund the company's operations and investments last quarter; or, plus any surplus funds generated by the company's operations, sale of investments or additional medium term loans received last quarter. Note that the amount of cash held will vary automatically with the company's need for liquid funds.

305. 'Investments': the value of investments held in bank deposits. Investments from the quarter before last, less any investments you decided to sell, or plus any new investments you decided to buy at the beginning of last quarter. Interest on investments varies with the current interest rate (see Table 20). Interest is paid into the company's day-to-day cash flow. New investments may have been constrained by your overdraft limit.

306. 'Total Assets': the sum of all assets from Paras. 298 through 305.

307. 'Tax Assessed': the amount of tax assessed in the fourth quarter as due for payment in the following second quarter. If tax is due to be paid, a figure will only appear here in the fourth and first quarter of each year.

308. 'Trade payables': the amount of money owed by the company for goods and services supplied last quarter. The cost of advertising, plus guarantee servicing, hired transport,

website development, maintenance, part of warehousing and purchasing, business intelligence, and 50% of materials purchased (see Table 24).

309. 'Overdraft': the amount of money loaned by the bank on variable interest, secured against the company's short term assets. This is limited to the Overdraft Limit given in the report for the quarter before last. However, the interest payable on the overdraft from last quarter is also added to the amount due, so that if your borrowing is near the limit it may appear to be over the maximum allowed. Should the overdraft be repaid in full, any interest will be deducted from cash. Funds are moved into and out of overdraft automatically (up to the limit), depending on the company's operational requirements.

310. 'Unsecured Loans': the amount of money loaned to the company for a short term, without security, to fund its operations over and above any funding provided from internal resources, bank overdraft and Medium Term Loans. The interest on this type of loan is added to the amount of the loan, unless the loan is repaid in full in which case any interest is added to Overdraft. Unsecured loans are provided and repaid automatically depending on the company's operational requirements, only after the available overdraft is exhausted.

311. 'Total Current Liabilities': the total of liabilities from Paras. 307 through 310.

312. 'Term Loans': the total value of loans which your company has decided to borrow from investment institutions, in the long term.

313. 'Net Assets': the total of the company's assets, less its total current liabilities. Net Assets are equal to Net Assets from the quarter before last, plus transferred to retained earnings last quarter, plus any additional term loan which your company has successfully taken at the beginning of last quarter.

314. 'Share Capital': the original shareholders' funds in the form of 1 Euro shares, which were used to provide starting capital for the company.

315. 'Retained earnings': undistributed profits accumulated during the lifetime of the company. Calculated as Net Worth less Share Capital. Retained earnings also are equal to retained earnings from the quarter before last plus profit (or loss), transferred to retained earnings last quarter. Retained earnings can be negative. See also para. 296.

316. 'Shareholder's Funds': The total of Share Capital plus Retained earnings; also equal to Net Assets.

CASH FLOW

317. The 'Cash Flow Analysis' is the final part of the accounts and shows how the company's funds flowed into and out of its operation during the last quarter.

Operating activities

318. 'Trading Receipts': payments made to the company by its trade receivables last quarter. A proportion of the total of 'Trade receivables' from the quarter before last and sales last quarter. The receipt of sales revenue from the various areas last quarter is the subject of target credit periods given in Table 23. These targets are never met in full, and outstanding receivables are carried forward to next quarter as trade receivables on the balance sheet.

319. 'Insurance Receipts': (see Para. 288 above).

320. 'Trading Payments': payments made for wages, goods and services supplied to the company. Administrative expenses, 50% of materials purchased, total wages, machine running, quality control, plus trade payables from the quarter before last, less administrative expenses trade payables from last quarter (i.e. excluding the cost of materials last quarter).

321. 'Tax Paid': in the second quarter only, tax assessed from the balance sheet in the quarter before last.

Investment Activities

322. 'Interest Received': interest earned from investments last quarter.

323. 'Asset Sales': the value of machines sold at the beginning of last quarter at their depreciated value.

324. 'Assets Purchased': sums paid as part payments made for machines ordered or installed last quarter (See Table 18).

Financing Activities

325. 'Additional Loans': the total of bank overdraft, term loans and unsecured loans last quarter, less the total of the same items from the quarter before last; if positive.

326. 'Interest Paid': the cost of borrowing last quarter. Interest is paid on Term Loans, Overdraft and Unsecured Loans at varying rates given in Table 20.

327. 'Dividends Paid': (see Para.295).

328. 'Net Cash Flow': The positive difference between cash inflows (Paras. 318 through 321), less cash outflows (Paras. 322 through 326). A positive value indicates a net inflow of funds to your company's Cash in Hand. A negative value indicates an outflow of cash, and is usually shown as zero.

329. 'Overdraft Limit Next Quarter': the maximum amount of overdraft which your bank will be prepared to lend you next quarter. Based on your balance sheet at the end of last quarter, and calculated as shown in Table 19.

330. 'Borrowing Power': the maximum additional amount of medium term loan which you can raise next quarter. This is dependent on the value the Stock Market puts on your company's shares, the amount of any existing term loan and the overdraft limit which the bank may have offered to you. It is calculated as shown in Table 19.

331. 'Share Prices': The price quoted on the Stock Market for each company's shares at the end of last quarter, given in euros.

332. '% Dividend Paid': The percentage of each company's share capital paid out in dividend as decided last quarter (odd quarters only).

SHARE PRICE AT THE END OF THE SIMULATION IS THE CRITERION BY WHICH YOUR COMPANY'S PERFORMANCE IS JUDGED

BUSINESS INTELLIGENCE

333. The fifth part of the Management Report is concerned with general information, either given to you for free, or requested by you in return for a payment (Table 2).

334. Company information which would be available to you in the normal course of events is given free of charge:

- a) 'Prices': charged for each product in the European, NAFTA and Internet markets by each company, last quarter.

- b)** 'Total Employed': the total of skilled assembly workers and unskilled workers employed by each company last quarter.
- c)** 'Assembly Wage Rate': the basic hourly rate paid to skilled workers in each company last quarter.
- d)** 'Agents and Distributors': The total number of agents and distributors operating for each company in the EU and NAFTA last quarter.

335. 'Business Activity': this information must be paid for (see Table 2):

- a)** advertising expenditure
- b)** research and development expenditure
- c)** star ratings for each product, as assessed by a consumer panel
- d)** an assessment of the effectiveness of the websites.

In all cases star ratings range from one to five, where one is poor and five is excellent.

Other requested (paid for) information consists of:

336. '% Market Share of Sales': Market shares are calculated on the number of sales, and not on orders. The information is given in three parts, for each product:

- a)** Each company's share of the total European Retail Shop Market. Apart from you and your direct competitors there is also the other competition selling imported products, hence the total will be less than 100%.
- b)** Each company's share of the total NAFTA Retail Shop market. Again, these sum to significantly less than 100%.
- c)** Each company's share of the Internet market. Again, the total comes to considerably less than 100% because of the existence of other competitors, worldwide.

ECONOMIC INTELLIGENCE

337. A Financial Statement of all the companies is supplied every six months.

338. Various official statistics covering both the European market and NAFTA are given to you free of charge each quarter. These give an indication of the relative performance of the European and export economies, and hence where market growth is likely. These statistics are:

- a)** 'Gross Domestic Product': in an adjusted form to smooth out the quarterly seasonal variation. This gives an indication of the underlying trend of economic growth (or decline) in the markets, and of changes in that trend.
- b)** '% Unemployed Rate': this gives the percentage of unemployed people in both market areas and gives an indication of likely movements in spending power. It also gives a guide to the availability of labour in the European market. It is given in a deseasonalised form.
- c)** 'Balance of External Trade': a measure of the competitive strength of the European and NAFTA economies.

- d)** '% Annual Central Bank Rate Next Quarter': this gives the rate of annual interest set by the Central Bank in each area at the end of last quarter, which will apply next quarter. The European rate is the base on which all other interest calculations in the simulation are made.
- e)** 'Exchange Rate': Quoted in Euros, gives the Euro-cost of buying one Dollar. This is the rate which will be used throughout next quarter, and which was used to value raw material at the end of last quarter. Given as euros per Dollar.
- f)** '% Access of Population to PCs'
- g)** Economic Information about the other markets outside Europe and NAFTA is patchy. To give some idea of how its economy is functioning, estimates of the corresponding economic statistics where applicable are given for the "Rest of the Developed World". It may be dangerous to rely on this information.

339. 'Prices of Raw Material (US\$ per 1000)': Prices quoted for 1000 units of raw material, if ordered next quarter for delivery next quarter (spot price), for delivery in the quarter after next (3-month price), or for delivery in the quarter after that (6-month price).

340. These are the only items in the Report which are quoted in US Dollars. A percentage of the lowest of spot, 3-month or 6-month price was used to value raw material at the end of last quarter (see Table 21).

341. 'Business Report': Finally, you may receive brief extracts of current economic information extracted from the financial press, which may help you to forecast economic trends and warn of business problems ahead.

Part IV

THE DECISION SHEET

The Decision Sheet is the form by which the decisions taken by your company each quarter are submit to the Simulator.

Once your Decision Sheet is processed by the Simulator it cannot be changed.

There are some simple, basic points to watch.

- a) Where decisions can be negative you must put a minus sign. If you leave this sign blank the field will be entered as positive.
- b) If you wish to make a nil decision, enter a zero.
- c) If you enter a number which is not acceptable in terms of the current simulation, e.g. trying to sell two machines when you only own one, the Simulator will replace the wrong entry by the nearest acceptable value. Also some decisions you try to implement may not succeed, e.g. you may try to recruit five workers and only get three. Errors or differences of these types will be indicated by *.
- d) The table overleaf gives the units, the upper and lower limits, which can be entered for each item on the Decision Sheet and its default value. The responsibility for entering the data accurately rests with you. A decision is invalid if it lies outside the limits allowed for the simulation. A hash (#) is printed to indicate a default value.
- e) A specimen Decision Sheet is shown immediately after the Decision Values table.
- f) Before the competition starts, you will have been allocated to a group of teams within which you will compete, and given a group and company number, as well as a personal identification code number. These must be on all your Decisions so that the Simulator knows whose decisions it is dealing with. When entering these use the Year and Quarter for the simulation, not the real-life ones, and remember that quarter '1' follows quarter '4'.

DECISION VALUES

		Units	Minima	Maxima	Default Value
A 1	Identification Data (Group, Company and Identity as advised)				
A 2	Year and Quarter. Year must be given a 4 characters				
B 1	Number of product units to make and ship to EU	Quantity	-995	9999	As before
B 2	Number of product units to make and ship to NAFTA	Quantity	0	9999	As before
B 3	Number of product units to make and ship to Internet	Quantity	-995	9999	As before
C 1-3	Product prices	Euros	0	999	As before
	<i>Note that if Price is zero, you get no orders at all</i>				
D 1-3	Advertising all products in all areas, plus corporate advertising	E'000s	0	99	As before
E 1	Product 1 assembly time	Minutes	100	999	As before
E 2	Product 2 assembly time	Minutes	150	999	As before
E 3	Product 3 assembly time	Minutes	300	999	As before
F	Take up a notified Major Product Improvement and/or Sold Off Product Inventories Yes=1; No=0		0	1	zero
G	Research and Development expenditure	E'000s	0	99	As before
H	Raw material to order for quarter after next and future quarters	Quantity. '000s	0	99	zero
J 1	European Agents decision				
	a) How many to employ in total in the quarter after next	Quantity	0	99	As before
	b) Quarterly support payment (0 minimum if no agents)	E'000s	5	99	As before
	c) % Commission	Per-cent	0	99,9	As before
J2	NAFTA Distributors - the same as European Agents				
J 3	If you decide to trade on the Internet you automatically get 1 distributor				

	a) Quarterly support payment (0 minimum if no Internet Agent)	E'000s	5	99	As before
	b) % Commission	Per-cent	0	99,9	As before
K 1	Machines to Buy	Quantity	0	99	zero
K 2	Number of Ports to operate next quarter. Activating your first Port implies that you want to trade on the Internet	Quantity	0	99	As before
L 1	Machines to Sell	Quantity	0	99	zero
L 2	Web-site development expenditure	E'000	0	999	As before
M	Maintenance hours per machine	Hours	0	99	As before
N 1	Assembly Hourly Wage Rate	E.cents	4	99,99	As before
N 2	Shift Level		1	3	As before
P 1	Number of assembly workers to hire (+) or fire (-)	Quantity	-9	99	zero
	Number of assembly workers to train	Quantity	0	9	zero
Q 1	Additional funds to be invested (+) or withdrawn (-)	E'000s	-9995	99999	zero
Q 2	Additional term loans to be taken	E'000s	0	9999	zero
R 1	Management Budget	E'000s	30	999	As before
R 2	% Dividend to be paid (quarters 1 and 3 only)	Per-cent	0	99	zero
S 1	Information wanted on other companies' activity (Yes=1; No=0)		0	1	zero
S 2	Information wanted on market shares by volume (Yes=1; No=0)		0	1	zero
T	Number of the insurance plan to operate		0	4	As before

Note that the maxima and minima are theoretical. The context of the Simulation may apply other values.

e.g. You could not sell 9 machines if you only had 8 available. Decision values, which exceed these practical values, will be corrected and marked with *

Decision values that lay outside the limits allowed are substitute by the default value and marked with #

(Example) TOPAZ MANAGEMENT SIMULATION

10G2

HISTORY
HISTORY
HISTORY
HISTORY
HISTORY

Group Company Identity Year 2010 Quarter 4

This is the fifth part of the
GMC History

PLEASE CHECK THE DECISIONS GIVEN BELOW

AVAILABILITY & USE OF RESOURCES

PRODUCT MOVEMENTS & AVAILABILITY

Quantities of Product to		Product 1	Product 2	Product 3
<i>make and ship to:</i>	EU Agents	1060	750	300
<i>(Not delivered in</i>	Nafta Distributors	600	420	120
<i>full if starred)</i>	Internet Distributor	1250	853	314

Machines Available Last Quarter	14
Machines Available for Next Quarter	14

	Product 1	Product 2	Product 3
Quantities:			
Scheduled	2.910	2.023	734
Produced	3.006	2.088	755
Rejected	96	65	21
Lost/Destroyed	0	0	0

Prices (€):	EU	Nafta	Internet
	295	410	790
	300	415	800
	290	405	780

Assembly Workers Hours	
Total Hours Available Last Quarter	18.816
Hours Absenteeism/Sickness	434
Total Hours Worked Last Quarter	16.207
Notice of Strike Weeks Next Quarter	0

Shipped to:		Product 1	Product 2	Product 3
EU Agents	1.060	750	300	
Nafta Distributors	600	420	120	
Internet Distributor	1.250	853	314	

Advertising (€ '000)	Corporate Image	Direct Product Advertising		
EU	18	15	15	18
Nafta	18	15	15	18
Internet	20	15	15	20

Machine Hours	
Total Hours Available Last Quarter	8.232
Hours Breakdown	36
Hours Planned Maintenance	314
Total Hours Worked Last Quarter	7.800
Average Machine Efficiency %	91

Orders from:		Product 1	Product 2	Product 3
EU	1.138	788	271	
Nafta	558	452	129	
Internet	1.298	853	319	

Assembly Times (minutes)	110	170	380
Take up Product Improvements	0	0	0
R & D Expenditure (€ '000)	25	25	25

Raw Material Units Used & Available

Opening Inventory Available	2.537
Bought Spot Last Quarter	0
Bought Default Last Quarter	6.910
Lost/Destroyed	0
Used Last Quarter	9.447
Closing Inventory Last Quarter	0
For Delivery Next Quarter	
Bought Last Quarter	10.000
Bought Quarter before Last	0
For Delivery Quarter after Next	
Bought Last Quarter	0

Sold to:		Product 1	Product 2	Product 3
EU	1.118	788	271	
Nafta	587	420	121	
Internet	1.250	853	316	

Purchasing	Next Quarter	3-months hence	6-months hence
Raw Materials Ordered ('000)	0	10	0

Agents and Distributors	Total Number Wanted for Next Quarter	Support Payments (€ '000)	% Commission
EU Agents	3	12	11,0
Nafta Distributors	4	12	7,5
Internet Distributor	xxxxxxxxxx	12	7,5

Order Backlog		Product 1	Product 2	Product 3
EU	10	0	0	
Nafta	0	40	4	

Production Machines to Buy	0	Number of Ports Operated	12
Machines to Sell	0	Web-site Development (€ '000)	25
Maintenance Hours per Machine	25		
Assembly Hourly Wage Rate (€c)	13,50	Shift Level	1
Assembly Workers Hired (+) / Fired (-)	0	Assembly Workers Trained	0

Human Resource Management

	Assembly	Machinists
Personnel at Start of Last Quarter	32	52
Recruited during Last Quarter	0	4
Trained from Unemployed	0	xxxxxxxx
Dismissed	0	0
Quit at end of Last Quarter	0	4
Available for Next Quarter	32	52

Warehouse Inventories		Product 1	Product 2	Product 3
EU	0	66	45	
Nafta	13	0	0	
Internet	0	0	0	

Investments (+/- € '000)	0	Term Loans (€ '000)	0
Management Budget (€ '000)	180	% Dividend Paid	0
Information on Corporate Activity	1	Information on Market Shares	0
Insurance Plan Number	4		

Agents & Distributors

	EU	Nafta	Internet
Available Last Quarter	3	5	1
Quit Last Quarter	0	0	xxxxxxxx
Dismissed Last Qtr.	0	1	0
Recruited for Next Qtr.	0	0	0
Available for Next Qtr.	3	4	1

Product Improvements		Product 1	Product 2	Product 3
Improvements	MINOR	MINOR	NONE	

Information Technology Report for Last Quarter		Product 1	Product 2	Product 3
Number of Internet Communications Ports Operated		12		
Number of Internet Visits carried through successfully		72170		
% of Potential Internet Visits that failed to connect		1,0		

Serviced under Guarantee		Product 1	Product 2	Product 3
Guarantee	103	68	21	

Internet Service Complaints		Product 1	Product 2	Product 3
Complaints	176	97	29	

Transport		EU	Nafta	Internet
Average Journey(km)	1381	500	300	
No. of Loads	8	4	9	

TOPAZ MANAGEMENT SIMULATION REPORT - PART 2

Group Company Year 2010 Quarter 4

Accounts (Euros)

Administrative expenses Advertising 202.000 Internet Distribution Agent 83.582 Internet Service Provider 40.632 Selling Agents & Distributors 230.554 Sales Office 23.017 Guarantee Servicing 21.630 Shipping & Hired Transport 63.850 Product Research 75.000 Web-Site Development 25.000 Personnel Department 4.000 Machine Maintenance 29.750 Warehousing & Purchasing 13.025 Business Intelligence 7.500 Credit Control 5.724 Insurance 3.513 Management Budget 180.000 Other Miscellaneous Costs 33.116 Total administrative expenses 1.041.893 Taxable Profit/Loss Accumulated -60.872 Insurance Claimed 0 Insurance Excess 14.055		Income statement Sales Revenue 2.280.185 Opening inventory values 99.651 Materials Purchased 594.127 Assembly Wages 238.005 Machinists Wages 323.079 Machine Running Costs 129.567 Quality Control 8.000 less closing inventory values 311.351 Cost of Sales 1.081.078 Gross Profit/Loss 1.199.107 Insurance Receipts 0 Finance income 0 Finance expense 0 Administrative expenses 1.041.893 Depreciation 77.228 Tax Assessed 0 Profit/loss for the period 79.986 Dividends Paid 0 Transferred to retained earnings 79.986		Balance Sheet Assets Value of Property 325.000 Value of Machines 3.011.901 Property, plant and equipment 3.336.901 Value of product inventories 24.280 Value of material inventory 287.071 Trade receivables 1.088.776 Cash 759.875 Investments 0 Total Assets 5.496.903 Liabilities Tax Assessed & Due 0 Trade payables 647.318 Bank Overdraft 0 Unsecured Loans 0 Current liabilities 647.318 Term Loans 0 Net Assets 4.849.585 Equity: Share Capital 4.500.000 Retained earnings 349.585 Total equity 4.849.585		Cash Flow Statement Operating activities: Trading receipts 2.172.856 Insurance receipts 0 Trading payments 2.047.122 Tax paid 0 Net cash flow from operations 125.734 Interest received 0 Asset sales 0 Assets purchased 0 Net cash flow from investing 0 Financing activities: Additional loans 0 Interest paid 0 Dividends paid 0 Net cash flow from financing 0 Net cash flow 125.734 Overdraft limit for next quarter (€) 651.000 Borrowing power next quarter (€) 1.884.000					
ALL-COMPANY SHARE PRICES & DIVIDENDS Company Number 1 2 3 4 5 6 7 8 Share Price (€.) 1,126 1,126 1,126 1,126 1,126 1,126 1,126 1,126 % Dividend Paid NO DIVIDEND THIS QUARTER								% of Market Share by Products Sold - Paid for Information Company NOT REQUESTED Product 1: EU Nafta Internet Product 2: EU Nafta Internet Product 3: EU Nafta Internet			
BUSINESS INTELLIGENCE Free Information on Companies' Activity Company Number 1 2 3 4 5 6 7 8 Product 1: EU Price (€) 295 295 295 295 295 295 295 295 Nafta Price (€) 300 300 300 300 300 300 300 300 Internet Price (€) 290 290 290 290 290 290 290 290 Product 2: EU Price (€) 410 410 410 410 410 410 410 410 Nafta Price (€) 415 415 415 415 415 415 415 415 Internet Price (€) 405 405 405 405 405 405 405 405 Product 3: EU Price (€) 790 790 790 790 790 790 790 790 Nafta Price (€) 800 800 800 800 800 800 800 800 Internet Price (€) 780 780 780 780 780 780 780 780 Total Number Employed 84 84 84 84 84 84 84 84 Assembly Wage Rate (€.) 13,50 13,50 13,50 13,50 13,50 13,50 13,50 13,50 Number of Agents/Distributors 8 8 8 8 8 8 8 8								ALL COMPANY BALANCE SHEETS Company Number NOT AVAILABLE THIS QUARTER Assets Value of Property Value of Machines Value of product inventories Value of material inventory Trade receivables Cash and cash equivalents Liabilities Tax Assessed & Due Trade payables Bank Overdraft Unsecured Loans Term loans Net assets Share capital Retained earnings Total equity			
Business Activity - Paid for Information Company 1 2 3 4 5 6 7 8 Total Advertising Spend (€) 202000 202000 202000 202000 202000 202000 202000 202000 Total Research Spend (€) 75000 75000 75000 75000 75000 75000 75000 75000 Consumer Star Ratings Product 1 ** ** ** ** ** ** ** ** ** ** ** ** Product 2 ** ** ** * * * * Product 3 * * * * * * * * Web-site Star Rating **** **** **** **** **** **** **** ****								BUSINESS REPORT Workers are annoyed at companies where their wages are being fixed or cut while chief executives are receiving increases and bonuses. Union chiefs are demanding wage increases.			
ECONOMIC INTELLIGENCE Gross Domestic Product Last Quarter (deseasonalised) 1355 % Unemployment Rate Last Quarter (deseasonalised) 8,7 Balance of External Trade Last Quarter 16 % Annual Central Bank Base Rate for Next Quarter 1,7 Exchange Rate of 1 USD quoted in Euros, Next Quarter 0,82 % Access of Population to PCs 62,0 Raw material prices (\$ per '000 units) Spot 42.580 3-Month 40.451 6-Month 38.898		EU 1380 NAFTA 9,3 -300 1,4 28,0 77,0 38.898		Rest of Developed World 27334							

TOPAZ Management Simulation - DECISION SHEET



A	Group <input style="width: 20px;" type="text"/>	Company <input style="width: 20px;" type="text"/>	Identity <input style="width: 20px;" type="text"/>	Year <input style="width: 20px;" type="text"/>	Quarter <input style="width: 20px;" type="text"/>
B	Quantity of Product to make and ship to:		Product 1	Product 2	Product 3
		EU Agents	<input style="width: 20px; height: 20px;" type="text"/>	<input style="width: 20px; height: 20px;" type="text"/>	<input style="width: 20px; height: 20px;" type="text"/>
		NAFTA Distributors	<input style="width: 20px; height: 20px;" type="text"/>	<input style="width: 20px; height: 20px;" type="text"/>	<input style="width: 20px; height: 20px;" type="text"/>
		Internet Distributor	<input style="width: 20px; height: 20px;" type="text"/>	<input style="width: 20px; height: 20px;" type="text"/>	<input style="width: 20px; height: 20px;" type="text"/>
C	Prices (€)	EU	<input style="width: 20px; height: 20px;" type="text"/>	<input style="width: 20px; height: 20px;" type="text"/>	<input style="width: 20px; height: 20px;" type="text"/>
		NAFTA	<input style="width: 20px; height: 20px;" type="text"/>	<input style="width: 20px; height: 20px;" type="text"/>	<input style="width: 20px; height: 20px;" type="text"/>
		Internet	<input style="width: 20px; height: 20px;" type="text"/>	<input style="width: 20px; height: 20px;" type="text"/>	<input style="width: 20px; height: 20px;" type="text"/>
D	Advertising (€'000)	<i>Corporate Image</i>	<i>Direct Product Advertising.....</i>		
		EU	<input style="width: 20px; height: 20px;" type="text"/>	<input style="width: 20px; height: 20px;" type="text"/>	<input style="width: 20px; height: 20px;" type="text"/>
		NAFTA	<input style="width: 20px; height: 20px;" type="text"/>	<input style="width: 20px; height: 20px;" type="text"/>	<input style="width: 20px; height: 20px;" type="text"/>
		Internet	<input style="width: 20px; height: 20px;" type="text"/>	<input style="width: 20px; height: 20px;" type="text"/>	<input style="width: 20px; height: 20px;" type="text"/>
E	Assembly Times (Minutes)		<input style="width: 20px; height: 20px;" type="text"/>	<input style="width: 20px; height: 20px;" type="text"/>	<input style="width: 20px; height: 20px;" type="text"/>
F	Take up Product Improvements and/or Sold Off Product Inventories (Yes = 1; No = 0)		<input style="width: 20px; height: 20px;" type="text"/>	<input style="width: 20px; height: 20px;" type="text"/>	<input style="width: 20px; height: 20px;" type="text"/>
G	Research & Development Expenditure (€'000)		<input style="width: 20px; height: 20px;" type="text"/>	<input style="width: 20px; height: 20px;" type="text"/>	<input style="width: 20px; height: 20px;" type="text"/>
H	Forward Purchasing for:		<i>Spot</i>	<i>3 Months</i>	<i>6 Months</i>
	Raw Material Units to Order ('000)		<input style="width: 20px; height: 20px;" type="text"/>	<input style="width: 20px; height: 20px;" type="text"/>	<input style="width: 20px; height: 20px;" type="text"/>
J	Agents and Distributors		<i>Total Number Wanted Next Qtr.</i>	<i>Support Payments (€'000)</i>	<i>(%) Commission</i>
		EU Agents	<input style="width: 20px; height: 20px;" type="text"/>	<input style="width: 20px; height: 20px;" type="text"/>	<input style="width: 20px; height: 20px;" type="text"/>
		NAFTA Distributors	<input style="width: 20px; height: 20px;" type="text"/>	<input style="width: 20px; height: 20px;" type="text"/>	<input style="width: 20px; height: 20px;" type="text"/>
		Internet Distributor	<input style="width: 20px; height: 20px;" type="text"/>	<input style="width: 20px; height: 20px;" type="text"/>	<input style="width: 20px; height: 20px;" type="text"/>
K	Production	Machines to Buy <input style="width: 20px; height: 20px;" type="text"/>	Number of Ports to Operate Next Qtr. <input style="width: 20px; height: 20px;" type="text"/>		
L		Machines to Sell <input style="width: 20px; height: 20px;" type="text"/>	Web-site Development (€'000) <input style="width: 20px; height: 20px;" type="text"/>		
M	Maintenance Hours per Machine	<input style="width: 20px; height: 20px;" type="text"/>			
N	Assembly Hourly Wage Rate (E.c)	<input style="width: 20px; height: 20px;" type="text"/>	-	<input style="width: 20px; height: 20px;" type="text"/>	Shift Level (1 - 3) <input style="width: 20px; height: 20px;" type="text"/>
P	Assembly Workers	To Hire (+) To Fire (-) <input style="width: 20px; height: 20px;" type="text"/>	Assembly Workers to Train <input style="width: 20px; height: 20px;" type="text"/>		
Q	Investments (+/- €'000)	<input style="width: 20px; height: 20px;" type="text"/>	Term Loans (€'000) <input style="width: 20px; height: 20px;" type="text"/>		
R	Management Budget (€'000)	<input style="width: 20px; height: 20px;" type="text"/>	Dividend to Pay % <input style="width: 20px; height: 20px;" type="text"/>		
S	Information wanted on:	Companies' Activity (Yes = 1; No = 0) <input style="width: 20px; height: 20px;" type="text"/>	Market Shares (Yes=1; No=0) <input style="width: 20px; height: 20px;" type="text"/>		
T	Insurance Plan Number (0 - 4)	<input style="width: 20px; height: 20px;" type="text"/>			

MANAGEMENT PARAMETERS

TABLE 1	Demography	
	Area (square Km.)	Population (Millions)
European Union (EU)	3 228 000	368
North American Free Trade Area (NAFTA)	21 457 000	278
Rest of Developed World	44 120 000	2 486

TABLE 2	Marketing Costs
Information on competitors' activities	€ 7 500
Market Share information	€ 5 000

TABLE 3	Agents (EU), Distributors (NAFTA) & Internet Distributor Costs
Minimum Support cost per Agent/Distributor per quarter	€ 5 000
Cost of setting up an Agent/Distributor	€ 7 500
Cost of terminating an Agent/Distributor	€ 5 000

TABLE 4	Internet Costs
% of value of Internet sales as Service Provider's fee	3 %
First time joining fee to Internet Service Provider	€ 7 500
Quartely cost per Internet Port	€ 1 000
Cost of closing down an Internet operation	€ 5 000

TABLE 5	Manufacturing Parameters		
	Product 1	Product 2	Product 3
Machining time per unit	60 min.	75 min.	120 min.
Minimum assembly time per unit	100 min.	150 min.	300 min.
Raw material content per unit	1 unit	2 units	3 units

TABLE 6	Maintenance Costs
Maintenance cost per machine, per hour	€ 85
Cost per hour of emergency maintenance (not contracted for)	€ 175

TABLE 7	Maximum Hours Available per Machine per Quarter, relative to Shift Level Worked	
Shift Level	Maximum hours per quarter that each machine can accumulating hours to each successive level of shift	Unskilled workers needed for each machine
1	588	4
2	1 092	8
3	1 638	12

TABLE 8	Scrap Values for Rejected Products		
	Product 1	Product 2	Product 3
Scrap Value per product unit	€ 40	€ 80	€ 120

TABLE 9	Charge for Guarantee Repairs & Servicing		
	Product 1	Product 2	Product 3
Retail Servicing Cost, per unit	€ 60	€ 150	€ 250

(Note that repairs carried out as a result of a product recall are charged at 75% of normal charge)

TABLE 10	Production Costs
Cost of supervision per shift	€ 12 500
Production overheads per machine	€ 3 500
Running costs per machine hour	€ 8
Production planning cost per unit requested	€ 1
Cost of quality control department	€ 8 000

TABLE 11	Container Capacity		
Container capacity in terms of products	Product 1	Product 2	Product 3
	500	250	125

(Note that mixed loads can be carried: eg 1 unit Prod. 3 = 2 units Prod. 2 or 4 units Prod. 1)

TABLE 12	Transport Costs
Daily all-in hire cost of container	€ 650
Distance to NAFTA shipping port	250 Kms
Cost of container hire across N. Atlantic	€ 8 000
Distance to Internet Distribution Agent	150 Kms
Legal distance limit per day on each vehicle	400 Kms

TABLE 13	Warehousing & Purchasing
Available raw material storage at factory (units)	2 000
Quarterly cost of factory warehouse and administration	€ 12 500
Cost of external storage per raw material unit	€ 2,50
Cost of storage per product unit at EU Agents and Internet Distributor	€ 3,50
Cost of storage per product at NAFTA Distributor	\$USD 4
Premium charge for unplanned material purchase	10 % on Spot Price

TABLE 14	Method of Calculating Average Quarterly Inventory Holdings, and Interest
0.5 x (Opening value + Closing value)	

TABLE 15	Human Resource Department Costs		
	Recruitment	Dismissal	Training
Skilled assembly workers	€ 2 000	€ 5 000	€ 8 500
Unskilled machinists	€ 1 000	€ 2 000	--- ---

TABLE 16	Maximum Hours each Production Worker can Work; and Pay Premiums			
Shift Level	Hours per worker at basic rate	Hours per worker at Saturday rate (Basic pay + 50%)	Hours per worker at Sunday rate (Basic pay + 100%)	Machinists Shift Premiums
(Single)1	420	+ 84	+ 84	0
(Double)2	420	+ 42	+ 84	1/3
(Treble)3	420	+ 42	+ 84	2/3

TABLE 17	Minimum Hours & Salaries
Unskilled machinist's minimum paid hours per quarter	350
Skilled assembly worker's strike hours per week	49
Skilled assembly worker's minimum hours per quarter	0
Skilled assembly worker's minimum hourly rate of pay	€ 4
Minimum Management Budget per quarter	€ 30 000
Ratio of unskilled machinists' rate of pay to skilled rate	65 %

TABLE 18	Cost of Machines
Total cost of a machine	€ 350 000
Payable at time of order	€ 175 000
Payable on installation	€ 175 000
Machine rate of depreciation per quarter	2,50 %
Decommissioning Charge	€ 70.000

TABLE 19		Method of Calculating Financial Limits Overdraft
		50% of value of (Property + Raw Material Inventory + Product Inventory)
PLUS		90% of Trade receivables
LESS		100% of Tax Due
LESS		100% of Trade payables
Note: All of these values are taken from last quarter's Balance Sheet		
Borrowing Power		
		50% of (Share Price at the end of last quarter x number of shares)
LESS		100% of (Term Loans already in place + Bank Overdraft Limit as Calculated above)
Creditworthiness for Buying Machines		
		Borrowing Power + Cash + Investments - unsecured loans (all from last quarter's Balance Sheet)
LESS		50% of the value of each machine due to be installed next quarter
Note: If any of the limits defined in Table 19 works out to be less than 0, the limit will be set to 0		

TABLE 20		Financial Parameters
Tax Rate per annum (assessed in the fourth quarter of the year, and paid in the second)		30 %
Fixed administrative expenses per quarter		€ 30 000
Variable administrative expenses rate per quarter		0,3 %
Credit Control Cost per unit sold in EU and NAFTA		€ 1,0
Credit Card Rate on Internet Sales		€ 1,0
Interest rates on:		
Investments		Annual EU base rate announced last quarter
Overdraft		Annual EU base rate announced last quarter plus 4%
Unsecured Loans		Annual EU base rate announced last quarter plus 10%
Term Loans		Fixed annual rate of 12%

TABLE 21		Product Inventory & Raw Material Inventory Valuation
PRODUCT Inventory		
		110% of the total cost of all products, with each product calculated as:
		The Raw Material content valued at six-month price quoted last quarter
PLUS		The basic skilled wage rate times the assembly-time for the product;
PLUS		(The machining time for the product x 4) x (65% of the basic wage rate)
		x (the % shift premium)
RAW MATERIAL Inventory		
90% of the lowest of the Spot, 3-month or 6-month quoted last quarter, times the number of units in Inventory or due to be delivered.		
Note: If any product Inventory is brought forward from the quarter before last, then the valuation will be the weighted average of the opening Inventories plus new deliveries.		

TABLE 22		Insurance Options	
Insurance Plan Number	Insurance Excess	INSURANCE PREMIUM	
0	100 %	no insurance	
1	0,10 %	0,60 %	
2	0,20 %	0,35 %	
3	0,30 %	0,20 %	
4	0,40 %	0,10 %	
Note: The monetary value of the primary risk is calculated as:			
the quoted percentage of Property plus Machines plus Raw Material Inventory plus Product Inventory taken from the quarter before last's Balance Sheet			

TABLE 23		Target Payment Periods for Trade receivables
Internet		0 days (credit card)
EU Agents		60 days
NAFTA Distributors		90 days

TABLE 24	Timing of Payments to Trade payables	
EXTERNAL COST ITEMS (internal and labour cost omitted)	If goods are delivered or services are provided next quarter the charged amount will be paid	
	Next Quarter	Quarter After Next
Advertising		100%
Guarantee Servicing		100%
Internet Service Provider	100%	
Payments to Agents & Distributors	100%	
Transport Costs		100%
Warehousing Costs		100%
Personnel Costs	100%	
Research & Development	100%	
Maintenance		100%
Business Intelligence		100%
Web-site Development		100%
Other miscellaneous costs	100%	
Raw Materials (1)	50%	50%
Machines (2)	50%	50%
Interest	100%	
Insurance	100%	
<p>Note 1: All materials ordered next quarter, (regardless of date of future delivery) will be paid 50% next quarter, and 50% in the quarter after next. The second payment will not be affected by changes in the exchange rate in the meanwhile.</p> <p>Note 2: Machines will be ordered next quarter and a 50% deposit paid; and installed in the quarter after next at which time the second 50% of the payment will be made.</p>		

TABLE 25	Web-site Capacity					
Demand on your web-site will vary considerably from hour to hour across the day. If you are not able to give quick and efficient service to visitors at peak times your marketing image can decline quite sharply. However it is difficult to assess the capacity of your web-site which depends on the number of ports linking you to your ISP. The following table gives a guide to the link between ports and service.						
Number of Ports in Parallel	1	2	5	10	20	50
Maximum Theoretical Capacity Number of Visits per Hour	12	24	60	120	240	600
Practical Working Capacity Number of Visits per Hour	2	7	31	81	190	537