Information Processes and Technology

Topic 3 - Planning, Design and Implementation

New information systems are created when old systems do not adequately meet the need of users of the information system, or when a need exists that could be met by an information system. The success of a new system depends upon how well the problem is understood, how the system is designed, how it is tested, evaluated and maintained over time. This topic introduces students to the traditional method of developing systems, with other alternatives being presented in the HSC course - see Section 2.

Outcomes - A student:
P1.1 describes the nature of information processes and information technology
P1.2 classifies the functions and operations of information processes and information technology
P2.1 identifies the information processes within an information system
P2.2 recognises the interdependence between each of the information processes
P3.1 identifies social and ethical issues
P5.1 selects and ethically uses computer based and non-computer based resources and tools to process information
P6.1 analyses and describes an identified need
P6.2 generates ideas, considers alternatives and develops solutions for a defined need
P7.1 recognises and applies management and communication techniques to project work
P7.2 uses technology to support group work.

Understanding the Problem to be Solved

New information systems may be created when either -
• a new need exists (a problem)
• an existing information system does not meet one or several specifications (a problem)

Problem finding - is the process of identifying and formulating problems that should be solved. This is the key to effective decision making, since a seemingly good solution to the wrong problem may totally miss the point.

Examples -
• someone may come up with a range of solutions to the problem of how to expand our airports, BUT it may be better to formulate the problem as - ‘how to avoid expanding the airports by using transportation substitutes such as video conferencing’. Thus people may spend a lot of time and effort in solving a problem, though not even see the real problem.

• illegal drug use is a major problem for all age groups and a range of solutions have been suggested. The ‘shooting galleries’ are one idea, so as to cut down on HIV and hepatitis infection with reusing needles (both to users and the public). Shouldn’t we be looking at solutions for the real problem - to reduce or even eliminate drug dependence, rather than making the procedure more sanitary?

A systems analyst is a person who develops solutions to information problems
Problem solving - is the process of using information, knowledge and intuition to solve a problem that has been previously defined.

The System Development Cycle has a range of terms used to describe it, but whether a new system or an old one, the development always goes from problem through some steps to a solution.

![System Development Cycle Diagram]

The success of a new system depends on the degree the -
• problem is understood
• system is designed and implemented
• system is tested and evaluated
• system is maintained over time

Thus system development is represented by the stages of
• understanding the problem
• making decisions
• designing a solution
• implementing the solution
• testing, evaluating and maintaining the solution

Since no system will last forever, new needs create new problems and so the creation of a new system is inevitable.

Note - the finding of the problem or problems is the most critical part of the whole process. Apart from wasting time on designing changes to a system or creating a whole new one, the cost of correcting a mistake goes incredibly higher the later the mistake is found - as shown on the graph below –

![Cost of Correcting a Mistake Graph]
Exercise 3.1 - complete each of the following -

1. Cashless betting on poker machine is coming soon to a pub or club in your area, with a plastic swipe card used to bet with, and no need for cash money. This personal gaming card will have from $200 to $1000 of credit loaded into it, then loaded at $200 per time. A PIN would be used to protect the player’s winnings in the event of the card being stolen or lost.

A representative from Gaming and Racing stated that the new technology contributed to harm minimisation because for the first time club managers would be able to know how much a player was losing and could advise them when to call it a day.

It is your task to -
1. **correctly identify the problem**
2. suggest three other solutions to the problem. (in your order of priority please)

Since it is unlikely that you know all of the solutions (or maybe even don’t yet see the real problem) you will need to use the interview/survey technique outlined below to assist you, as well as an analysis of the old system.

To hand in - one structured survey printed out and responses completed
   - a typed up interview summary
   - your analysis of the old gambling method(s)
   - your problem identification and 3 solutions listed in priority order

To be printed out and handed in by - ....................................................

2. Repeat the above parts for the task given to your IT business (see page 13 and 14) with the scenario for that task.

To be printed out and handed in by - ....................................................

Approaches to Identifying Problems
A number of approaches have been used to help identify the problems in existing systems over the years, including -

- interviews
- surveys
- analysis

**Interviews** - these are a set of questions asked of the users or participants of the system, with the responses written down. They are generally between two people (though if well structured can involve more) with the questions aimed at collecting the required information.

Interviews may be -

- unstructured - like a friendly talk with just overall impressions or ideas gained, or
- semi-structured - where questions are asked but the discussion may go off the topic. Bias may be a problem in this type as may inaccuracies of data.
- structured - where well planned and carefully worded questions are asked and responses written down
A survey is a series of predetermined questions given to users of or participants in a system.

Participants are those who engage in the processes of the system.

Surveys - these are written questions to gather data from a generally larger group of people than interviews, even online these days, and are often termed questionnaires. These can contain either or both types of questions - open questions or closed questions.

- Open questions - these are free response type where the person can write any type or length of answer. This means that the qualitative responses have to be interpreted and this can therefore lead to bias from the reader of the responses - thus making analysis difficult. If employee opinions are sought then open style questions are good - but maybe an interview situation may be better as full ideas can then be found and even solutions expressed.

- Closed questions - these are designed to limit the range of responses, such as multiple choice, yes or no, tick a box, types. Since the data is quantitative it can be analysed much more easily.

A focus group brings together a number of people for a group discussion or interview where all can contribute their ideas.

Analysing a system - is done by determining - how it works
- what it does
- who uses it
Problems in a business situation are everyday occurrences, but we are not concerned with the one-off things like a flat tyre on a delivery truck, or a broken part on a machine that holds up production, or even a shortage of some particular component every now and then. What really concerns a business (and the boss(es) in particular) are the errors in the design of the way the business operates - those that cause continual though often disguised problems.

Lack of profits generally makes the boss suspect that some problem(s) exist, particularly when business improves overall, but profits remain the same or even go down. Sometimes obvious problems are located but make little difference when fixed, or appear unable to be fixed properly. This is when outside help is usually brought in to look at the existing system - a system analyst is the person to do this.

Sometimes the problem is immediately obvious to the analyst and some simple adjustments may solve the problem, though generally detailed further study is required - revealing both the strengths and weaknesses of the business overall.

**System analysis will involve** -

- data gathering - determining what it does and who uses it
- detailed analysis - determining how it works
- reporting on the findings

**Data Gathering** - includes:

1. observations of procedures used in the business, following the flow of data through all of the steps used. Multiple visits at different times would be needed, and staff need to be made aware that they should just work normally (and not feel threatened).

2. documentation, including all manuals, reports, forms used, etc. Skills are needed in examining both paper and database documents for digital data.

3. surveys and interviews as discussed

**Detailed Analysis**

Once all of the data has been collected it must be carefully collated, organised and analysed - (since unorganised pieces of paper and computer printouts will tell the analyst very little), as well as the reliability and validity of the data collected. The analyst then has to document the findings so that trends can be seen and presented to the company management at the end of this part of the procedure. Thus the analyst typically spends sometimes weeks or even months to produce diagrams and charts which can be presented in one or two hours.

To do this a range of tools are generally used to manipulate the complex data into a form that any business person can follow easily.

**These tools include** -

- context diagrams
- decision trees or tables
- system flowcharts
- data flow diagrams
- flowcharts
- organisational charts
- statistical graphs
Context Diagrams
A Context diagram is used to represent a system that uses only a single process together with inputs and outputs (external entities). The external entities are linked to the single process by data flow arrows.

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>![Square or Rectangle]</td>
<td>An external entity - a square or rectangle is used to represent a person or an organisation that sends to or receives data from the system e.g. a student, a teacher or a school.</td>
</tr>
<tr>
<td>![Circle]</td>
<td>A process - a circle is used to represent a process or actions that transform inputs to outputs. A process may consist of any number of sub-processes. e.g. a school reporting process may be made up of formatting, printing and checking the report.</td>
</tr>
<tr>
<td>![Arrow]</td>
<td>Data flow - an arrow is used to represent the flow of data between the process, external entity and data store. The description is given above the arrow e.g. student marks entered onto the report.</td>
</tr>
</tbody>
</table>

Example.

```
Student
          Keywords
          Use search engine
          Internet address
Student
```

Context diagram for searching the Internet
Data Flow Diagrams

Data flow diagrams are used to show, in a picture form, the flow of data through an information system. They have some standard symbols with associated meanings, as follows -

<table>
<thead>
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</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="External Entity" /></td>
<td><strong>An external entity</strong> - a square or rectangle is used to represent a person or an organisation that sends to or receives data from the system e.g. a student, a teacher or a school.</td>
</tr>
<tr>
<td><img src="image" alt="Process" /></td>
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</tr>
<tr>
<td><img src="image" alt="Data Store" /></td>
<td><strong>Data store</strong> – an open rectangle represents the location where data is stored. It could be a filing cabinet, hard disk, or optical drive (CD or DVD).</td>
</tr>
</tbody>
</table>

Example -

![Data Flow Diagram for Searching the Internet](image)

Data flow diagram for searching the Internet
**Organisational Charts**
These are also termed hierarchy charts, and they illustrate the structure of an organisation in pictorial form as well as the working relationships between employees.

![Organizational Chart](image)

**Statistical Graphs**
These illustrate the results of questionnaires and surveys so that all trends or anomalies can easily be seen easily.
System Flowcharts
A system flowchart models a system by representing input and output devices, storage devices and hard copy (printed) documents.

Figure 11.8 System flowchart for borrowing a library book

Exercise 3.2 - complete each of the following -

1. Read pages 333 to 337 of the white Boyd textbook (or in other computing textbooks), check your notes - then create - Data flow diagram, Flowchart, Decision table or Decision tree, Organisational chart and Statistical graph(s) for your IT business.

2. What is a data dictionary? What does it contain? What use is made of it? (see p338 Boyd text)

3. Why do human factors need to be considered in solving problems in information systems? Might these human factors have any real affect? (see p339 Boyd text)

4. What human factors would be important in your IT company? Why?

To be printed out and handed in by - ..........................................................
Requirements of a New System

A new information technology system will need to be defined from a number of different perspectives if it is to accurately reflect the needs of the business. This should include - the people involved, the data/information types to be used, the technology required and the information processes to be adopted.

1. User requirements -
When the initial observation and survey/interview stages take place to try and discover the problem(s), care is taken to reassure the workers that they are not being held responsible for the problem, but are being asked to simply help locate it. Some people will still think that their jobs or at least working conditions are at risk, and may not discuss things they feel might put them in a poor light or even conceal things altogether.

Obviously if a new system is to be designed, then the participants who are to use it should have a hand in the design process. They will be the ones who had to work with the old system and know all of it’s strengths and weaknesses - and so have a valuable contribution to make. Therefore for a well planned design, a report based on observations, comments, interviews and surveys with the users of the system needs to be part of the final recommendations.

2. Data input and output requirements -
How data is to entered into the system and then the various output methods for the information both have to be considered carefully since both software and hardware needs will depend on these. Keyboard entry, voice input, scanning, disk and Internet are but some of the possibilities for the future for input, while paper, screen, disk or Internet are all possibilities for output.

3. Technology requirements -
Processing speeds, storage types and capacities, primary memory capacities, hardware types and compatibilities, software types and compatibilities, etc all have to be considered.

4. Information processes required -
The setting up of the new system must be accompanied by the establishing of procedures and controls. The procedures will set out how tasks are to be performed, so no matter who does the job it is done in the same way within the system. e.g. deleting a product, entering a new customer, backing up the days work, etc.

The controls include such things as data security, so that no data or information can become corrupted or lost.
Analysis Report
When all of the analysis has been completed a report is done to pass on to the management of the company. This report is to answer the initial questions of ‘how it works’, ‘what it does’ and ‘who uses it’, and thus contains a number of the diagrams and charts listed above. The report has to list problems and solutions, along with feasibility, requirements, costs and affect on the people involved.

Exercise 3.3 - complete the following -

You have been appointed to a team (project leader, questionnaire writer/interviewer, data entry/layout designer, etc.) for the task given to your IT business.

Reading from - pages 345 of Boyd text and page 93 of Powers text.

Groups are to (in about 4 periods) complete and print out a report containing the following for their business -
- Gantt chart
- schedule of tasks
- funding management plan
- communication management plan

To be completed and handed in by - ..........................................................
Project Plans

Once a company decides to create a new system, then the project timetable must be planned, generally using a range of project management tools, to help reduce risks associated with the venture, as well as providing feedback on the progress of the project.

These tools include -

- Gantt charts
- Scheduling of tasks
- Journal and diaries
- Funding management plan
- Communication management plan

Gantt charts were discussed and used in topic 1 - as a time planning technique. The project leader begins by breaking down the project into smaller tasks and then scheduling each of the tasks as it needs to be completed along with funding and communication in a planned way so that all are included and timed accurately.

Gantt Chart

[Image of Gantt Chart]

A Gantt Chart shows the timing (start and finish) of the separate tasks in a project.

Journal and diaries

[Image of Journal]

A journal is an informal record of the work of the analyst.

A journal contains the analysts ideas, diagram, informal thoughts and plans. It may contain brief notes of meetings, sketches of data flow diagrams and Gantt charts.

A diary is a personal informal record of the work of the analyst.
Explain: relate cause and effect; make the relationship between things evident; provide why and/or how.

Explain how a private and personal diary of a project can be a useful tool for a systems analyst.

A diary is used to record observations, ideas and discussions that could not be placed into a more public journal. These entries can provide clues on how to deal with certain people, such as difficult managers; observations on the strengths and weaknesses of team members; and personal thoughts on why problems are not being resolved or a project is progressing. The diary can be a useful guide to ways of dealing with problems and particular people.

Funding management plan

A funding management plan estimates the cost of the new system and finds possible sources of funds for development.

A funding management plan will be a vital contribution to the financial decisions taken in the next stage of the cycle. It will estimate the cost of the new system and investigate possible sources of funds for the project. A good management plan will include development costs as well as operating costs.
A Communication Plan provides a clearly understood means of communication between the participants in a development project. It is particularly important in projects with a large number of participants.

A communication plan must include the media channels to be used for communication, such as:
- e-mail
- Internet/intranet
- Mail
- Conferences
- Newsgroups
- Notice boards
- Focus groups

A Report to Management states the problem and recommends a project plan.

Making Decisions

If management decides to go ahead with the new system, the next thing to occur is the feasibility study.

A feasibility study considers contraints that may exist in financial, technical, scheduling and operational areas.

Feasibility Study - this is a short report that analyses possible solutions and makes a recommendation (though not a detailed solution).
Operational

Financial

Technical

Feasibility

Schedule
It will contain –

(i) a statement of the nature of the problem
(ii) outlines of any constraints for the new system development
(iii) statement of aims and objectives of the new system
(iv) a list of possible solutions with a description of each
(v) the recommendation for the chosen solution

The recommendation will be based on a number of criteria -

- economic (costs),
- technical (information technology needs),
- schedule (time) and
- organisational (fits organisation).

Typical Sections of a Feasibility Study

<table>
<thead>
<tr>
<th>Section</th>
<th>Content</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Title page</td>
<td>Project name, report title, authors, date</td>
</tr>
<tr>
<td>2 Contents</td>
<td>A list of report sections and page numbers</td>
</tr>
<tr>
<td>3 Problem definition</td>
<td>Exact nature of the problem</td>
</tr>
<tr>
<td>4 Requirement report</td>
<td>Aims and objectives of the new system</td>
</tr>
<tr>
<td>5 Summary of investigation</td>
<td>Overview of the existing system: benefits, costs and constraints</td>
</tr>
<tr>
<td>6 Alternative solutions</td>
<td>Details of each proposed new system</td>
</tr>
<tr>
<td>7 Recommendations</td>
<td>Recommended course of action, with justification</td>
</tr>
<tr>
<td>8 Project plan</td>
<td>Schedule (if the recommendation is to proceed)</td>
</tr>
<tr>
<td>9 Appendix</td>
<td>Supplementary material such as surveys, Gantt charts and diagrams</td>
</tr>
</tbody>
</table>

On reviewing the report, (particularly the costs) management may decide to act on the recommendations or forget about it, or even seek another analysis from someone else. Sometimes the cost of fixing the problem may be out of proportion to it’s size and so management may decide that it is not feasible to proceed and simply try to reduce the effects of the problem or begin longer range plans to create a new system.

At the completion of the analysis stage, with the report in the hands of management, the choice of which solution to choose takes place. All of the information - in the form of text, charts and graphs - points to what has to be done.

The next stage is to design the solution - that is, how it will be done. This begins with the logical design stage, where overall ideas are worked on, followed later by the physical design stage where the hardware and software must be planned in detail.

Note - with the fast pace of modern business, the requirements for the solution may be a ‘moving target’ and refinements needed all through the subsequent stages - but this is to be avoided if at all possible.

Different designers work somewhat differently, but the same issues need to be considered no matter what design alternatives are used –
• organisational policy - will the new system fit in with long term company policy, or will one or the other have to alter.
• flexibility of the solution - the solution should have enough flexibility to cope with some alterations in the future without having to redesign it (termed ‘future proofing’)
• controls to be put in place - security of information should be ensured but still allow normal work to proceed
• hardware and software considerations - numbers of computers and configurations need to be worked out, as do the software needs (continue with old or create new programs?)
• human considerations - ease of use, retraining needs, staff made redundant or more needed, all have to be planned and staff informed
• financial constraints - the amount spent on the solution must be in line with the extra profits the changes will produce - terms like Return on Investment and Total Cost of Ownership are measurements of such considerations
• prototypes considered - if no clearly best solution presents itself, several alternatives may be modelled on a small scale to see which suits the business the best - termed prototyping.

**Exercise 3.4**

Consider the feasibility of purchasing computers for your IT company from the advertisements page handed out. You should make your decisions based on ALL of the following -

(a) cost  
(b) technical strengths and weaknesses  
(c) time for implementation  
(d) fitting into the system

To be completed by - ..........................
Designing Solutions

Having completed the detailed analysis, the new system is to be designed. This is generally represented as a number of diagrams to aid the design process. Since identifying the participants, the data/information to be used, the information technology and how the information processes will operate, obviously a number of diagrams are needed.

The data flow diagrams, system flowcharts, etc. looked at in Exercise 3.2 are used for this purpose.

People in System Design

People must be considered in the design of the system, as the participants need to have their concerns considered and the design is human centred rather than machine centred. This needs to be documented so that the users of the information system have their needs considered and catered for.

If a new system is to successful, the users of that system need to have the benefits (to them) of that new system explained in the planning and design stages, otherwise fear of change and concerns over job losses, etc. will have serious effects. All participants need to be asked about problems with the old system and what needs to be fixed to make their jobs easier and their work more productive. If the benefits to the day to day users of the system are made plain to them before the system is in operation, then they will give it a fair chance and adapt to it quickly and with little turmoil.

All user interfaces (paper, computer, etc.) should of course be examined and analysed - and if necessary customised to make processes more straightforward.

Software programs need to be -
• purchased and modified
• created from scratch or customised to meet the exact needs of the information system
• Thus the applications programs (word processors, databases, spreadsheets, etc.) form part of the solution.

Hardware devices must be -
• researched for specifications and costing
• matched to the existing devices
• correctly installed (cabled and drivers on all computers)
• well tested before users find the problems

A further aspect of the system design stage, is that the information technology should be easy (or relatively so) to maintain in the future. All participants are disrupted by change, and so after implementing the new system, the last thing that should happen is continual further continual alterations, be they big or small.

Exercise 3.5

For your groups IT business, propose -
(i) A number of user interfaces
(ii) A range of software applications
Discuss which ones you would introduce into the system, and for what purposes they would be utilised in the new system
Implementing

At this stage, the new information system is delivered to the users and the solution is set in motion. This will generally involve some degree of change to the way the business operates, and therefore some conversion, and probably training, is needed.

Conversion Methods include -

• **Direct conversion** - this is where the new system is immediately brought into use, with the data from the old system being transferred and the old system shut down. Despite having low costs, this method allows for no checking of the operation, accuracy and ease of use of the new system - so problems will have to be dealt with and no backup is available.

• **Parallel conversion** - this is where both the old and new systems work together for some time (maybe weeks) and the participants keep comparing the output from both. If any problems are discovered with the new system, they can be fixed before use of the old system is terminated. However, this method involves double the workload for the participants, since two systems are operated. In addition, confusion may arise from the two sets of output - which may be quite different, and only one correct.

• **Phased conversion** - this method involves the gradual implementation of the new system. Some parts of the new system operate with the remainder of the old system, and as each of the new parts proves successful, so another is brought on line, gradually replacing all of the old system. Any serious problems with the new parts and the old part is used until the new one if fixed, but again problems arise with confusion from working on and mixing outputs from the old and new parts of the system.

• **Pilot conversion** - this involves trialling a small version of the new system separate to the old system. Generally a few keen people will try out the new system, which if it works well will have some converts to tell of the benefits of the new system to be introduced.
Training

In virtually all new information systems a degree of training for the participants is essential. The type and length of training will depend on the degree of difference between the old and new systems, the knowledge of the participants and the number of new features of the new system.

Different training models are available, including -

• training of all participants by the hardware suppliers - best if large changes have been made
• one or a few people can be sent to be trained and come back to train the others - less changes
• training teams can come in for on- the- job training
• help desk type assistance over the phone can be extended for any of the above models.

Exercise 3.6

For your group IT business -

(i) Decide on which conversion method you consider best for that particular business and state reasons for your decision - listing both positive and negative aspects for the method chosen.

(ii) Decide on the training method most appropriate for that business and state reasons for your choice

To be handed in by - ....................................................

Testing, Evaluating and Maintaining

For a new system to operate correctly the combination of information technology and participant use must occur. The people responsible for the operation of the system are the computer operators and the managers.

Operators do things like starting up, running jobs and backing up, while managers supervise the effective use of the system.

Testing the system to see that it works under all circumstances and conditions is required, and this process actually occurs throughout the system development cycle. It must meet initial requirements - though sometimes what is expected by this stage may in fact exceed these first details.

The evaluation includes both the effectiveness of the operation of the software and hardware components of the system, and the affect on users of the information system - both participants and people within the environment. This is normally performed by the system analyst.
who conducts interview and surveys of participants, as well as observations and measurements of the system output.

Maintenance involves small adjustments or modifications being made where problems have been found, and along with evaluation this is ongoing throughout the life of the system.

Social and Ethical Issues

Systems can either be designed as - machine-centred or human-centred

**Machine-centred systems** simplify what the computer has to do at the expense of the participants. They assume that people will follow procedures that may be confusing to get to the desired result. Errors are generally blamed on operator error (rather than machine error), and participants are generally not totally happy working in such systems. People and machines have different strengths and weaknesses, with machines being good at repetitive tasks while people are good at innovative ideas and coping with novel situations.

**Human-centred systems make** the participant’s work as satisfying and effective as is possible, without wasting time and effort in dealing with the technology. Human-centred systems are designed to be user-friendly, but to work successfully for people, the development must pay attention to the work environment and participant needs as well as those of the technology.

Effects of the New System may include any alteration to the work environment, such as –

1. A **safe working environment** - considerations - A wide range of factors can effect the long term wellbeing of the worker using information technology in the workplace.

2. **skilling** - either the loss of, or increase of skills associated with a person's work

   **deskilling** is where the skills of the new task are less than formerly and the worker has a job no longer needing their skills

   **upskilling** or **multiskilling** is where a worker is retrained to increase their skills for the new job

3. Impact of the new system on the participants - groups that fail to function as a team within the information system face a range of consequences, including -

   * financial loss for the business
• employment loss for some or all of these workers
• missed opportunities for the business

**Group information systems** include - joint authors writing a book
- a group constructing and operating a community website

**Assignment - each individual student is to answer all of the following -**

1. Ergonomics - (i) what is RSI and what causes it?
   (ii) how can furniture have an effect on the likelihood of RSI?
   (iii) how can the design and positioning of the furniture have an effect
   (iv) what environmental factors effect ergonomics?
   (v) what steps can the worker or employer take to restrict the chances of

2. Skilling - (i) which people in your group IT business may be **deskilled**? Why?
   (ii) which people in your group IT business may be **upskilled**? Why?

3. Systems - (i) would you design your new system for the IT business to be machine-
   (ii) which conversion method would you use for the new system? Why?

To be handed in by - ..............................................................
Scenarios - each class is to divide up into groups of 3 to 4 students. Each group is a company working to improve a given information system for a company working in -

1. Advertising
2. Building construction
3. Retail clothing
4. Vehicle design
5. Book publishing
6. Cosmetics producer
7. Food catering

1. Advertising - you work in the IT section (4 people) of Smith’s Advertising, which has been given the contract to raise awareness of a new product to go on sale across Australia in November 2001. The aim is to sell the product heavily for Christmas and people all need to have heard of it before it is available. The product is called “Feeling Free” and as yet it has been suggested that it could be - any or all of - a 20’s alcoholic drink, a line of lingerie, or a mobile phone.

The budget for the new information system is $200 000 and you have 3 weeks to come up with the product concept, when a board of 5 members will assess your plans and work.

2. Building construction - you work in the IT section (4 people) of Cherry Construction, which constructs buildings and completes large scale renovations. Your company will be involved in the building of an assembly hall for Westfields Sports from architect’s plans devised from the ideas of the school Principal and the Education Dept.

The budget is $1.4 million and the hall needs to be ready for use on 1st June 2008. It is required to have a stage, permanent seating for 800 people, toilets, kitchen, staff rooms and storage rooms, and audio/visual facilities.

3. Retail clothing - you work in the IT section (4 people) with the task of creating a new information system for Wilson Gear, a new surf clothing company (planned to rival Mambo). The company will produce a full range of ‘surfing type’ clothing to be marketed through retail outlets.

The budget is $3 million and the range of both male and female clothing must be out by the end of September for the summer season. The information system is to be up to 10% of the total and must link all aspects of the company, from design, through production, ordering, deliveries and sales.

4. Vehicle design - you work in the IT section (4 people) and have the task of creating a new information system for Russell RV’S, which is to design a new 4WD fun vehicle. Due to the recent interest and high sales of this type of vehicle a totally new one is to be designed to go on sale from January 2003.

The budget for the information system is $500 000 and is to link all aspects of the data collection, design and building of prototypes through to full production by the above date.

5. Book publishing - you work in the IT section (4 people) and have the task of creating a new information system for Blevin Books, to operate in the 5 stores and to introduce an Internet online sales point. The company has operated the book stores with limited information system use, and
management wants a totally new system to link all the stores for all aspects of the ordering, shipping, distribution between stores, etc.

The budget is set at $500 000 and the system needs to be fully operational by the start of November 2001 ready for the Christmas shopping season.

6. **Cosmetics producer** - you work in the IT section (4 people) and have the task of creating a new information system for Lambe Lips, and the new line of cosmetics to be introduced in stores before Christmas, and on the Internet.

The information system budget is limited to $250 000 and must link all aspect of the design, testing and production of the new lipsticks, creams and powders.

7. **Food catering** - you work in the IT section (4 people) and have the task of creating a new information system for Daly Delights a one shop business at Circular Quay catering to workers and tourists near the ferry terminal. It is planned to open 3 more shops within the city and link them in an information system for all possible uses. An Internet ordering system is a possibility, depending on the ability of the information system to cope with ordering and delivery times and costs.

The budget for the whole enterprise is $4 million, with the information system planned for up to 10% of the total.

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