



Information Processes and Technology

Stage 6

Support Document

1999

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1 Introduction

This support document is designed to assist teachers as they plan for the implementation of the *Information Processes and Technology Stage 6 Syllabus*.

This support document provides programming and assessment ideas for selected syllabus content. Each unit of work relates to an area of study; however teachers may elect to teach the areas of study in an integrated manner.

Resources related to each unit of work are included. However, it should be noted that a more extensive list of subject specific resources is provided on the Board of Studies website (<http://www.boardofstudies.nsw.edu.au>).

2 Information Specific to the Units of Work

Resources

Each unit of work has a variety of resources listed. The intention is that teachers may select from the list provided to assist in the delivery of the unit. While every care has been taken to ensure that the websites listed in each unit address the content, there may be other websites that are also appropriate. Teachers should also be aware that websites change and new ones become available over time.

Unit Length and Sample Teaching Program

A suggested unit length has been provided; however, teachers may elect to alter this. In some cases, certain aspects of a unit can be integrated or combined. Teachers may also find it appropriate to delete suggested activities depending on the focus of the unit for a particular situation, or to expand certain activities.

Programmed Units of Work

3.1 Preliminary Course: Information skills and systems

Suggested Time Allowed: 10 weeks.

Rationale

Information systems are developed to meet the needs of users and consist of data, processes and technology. Data includes text, numeric data, images, audio and video. The processes of collecting, organising, analysing, storing and retrieving, processing, transmitting/receiving and displaying are all performed by the information system. This unit seeks to develop an understanding of the individual components of the system and how they work together to form the complete system. A knowledge and appreciation of the importance of social and ethical issues is necessary.

A 'student activity' approach has been taken, and teachers need to ensure that the relevant theory is covered to enable students to successfully cover the activities.

Resources

Books

1. Boyd, G S, *Computing Studies Preliminary Course*, Cockatoo Computing Services Pty Ltd, Sydney 1994, ISBN 0 6461 6584 4
2. Boyd, G S, *Computing Studies 2 Unit HSC Course*, Cockatoo Computing Services Pty Ltd, Sydney 1994, ISBN 0 6461 8932 8
3. Chivers, B et al *Computing Studies*, Jacaranda Press, 1995, Sydney ISBN 0 7016 3265 8
4. Chivers, B et al, *Computing Studies, Preliminary Course*, Jacaranda Press, 1994, Sydney, ISBN 0 7016 3280 1

Websites

5. UNESCO Observatory on the Information Society:
<http://www.unesco.org/webworld/observatory/index.html>
6. Privacy International Home Page: <http://www.privacy.org/pi>
7. Electronic Frontiers Australia: <http://www.efa.org.au/>

Possible Assessment Strategy — using a portfolio

Students could present a portfolio on a specific project. This portfolio could include a range of tasks such as:

- alphabet exercise (see p 9)
- brochures exercise (see p 10)
- data flow diagram exercise (see p 10)
- design an office exercise (see p 14)
- global positioning system exercise (see p 16)
- theory test.

Outcomes A student:	Students learn about:	Students learn to:	Strategies, activities and related resources
<p>P1.1 describes the nature of information processes and information technology</p> <p>P1.2 classifies the functions and operations of information processes and information technology</p> <p>P2.1 identifies the information processes within an information system</p> <p>P2.2 recognises the interdependence between each of the information processes</p> <p>P3.1 identifies social and ethical issues</p>	<p>information systems in context</p> <ul style="list-style-type: none"> • diagrammatic representation of an information system in context <ul style="list-style-type: none"> • the environment is everything that influences, and is influenced by the information system and its purpose <ul style="list-style-type: none"> • the purpose as who the information system is for and the need they have 	<ul style="list-style-type: none"> • diagrammatically represent a given scenario that involves an information system <ul style="list-style-type: none"> • explain how an information system impacts on its environment and how it in turn impacts on the information system <ul style="list-style-type: none"> • describe the environment and purpose of an information system for a given context 	<p>Travel Agent Scenario</p> <p>Teacher:</p> <ul style="list-style-type: none"> • introduces the system functions of input, processing, output, storage and control (resource 4, p 46) • introduces the five main system components and represents them diagrammatically (resource 4, p 47) <p>Teacher:</p> <ul style="list-style-type: none"> • introduces the scenario of a travel agent starting up a business in relation to: <ul style="list-style-type: none"> – purpose – people and their needs – data involved – information technology to be used • outlines the historical methods used to store and manipulate data and relates this to changes that have occurred through technological development. <p>Students:</p> <ul style="list-style-type: none"> • record a brief outline about <ul style="list-style-type: none"> – the purpose of the enterprise – the people and their needs – the data involved (accommodation, transport, local attractions etc) – the information technology to be used

Outcomes A student:	Students learn about:	Students learn to:	Strategies, activities and related resources
<p>P4.1 describes the historical developments of information systems and relates these to current and emerging technologies</p>	<ul style="list-style-type: none"> • who the information system is for, including: <ul style="list-style-type: none"> – individuals – organisations (individuals with a common goal, eg business, government agency or charity) • the information system as a set of information processes requiring participants, data/information and information technology to take place • information processes involving computer and non-computer activities • information technology as hardware and software used in information processes 	<ul style="list-style-type: none"> • explain how a given need can be supported by an information system • describe an information system in terms of its purpose • for a given scenario, identify the people who are: <ul style="list-style-type: none"> – in the environment – users of the information system – participants in the information system 	<ul style="list-style-type: none"> • prepare a set of traditional paper forms which could be used by the travel agent to collect the information required in the running of the business • visit a travel agency, having prepared a questionnaire to gather information <p>Students:</p> <ul style="list-style-type: none"> • from their survey of a travel agency, represent the parts of the information system, • construct a list of hardware and software actually used in travel agencies • compare the effects of the information system on the users and the participants.

Outcomes A student:	Students learn about:	Students learn to:	Strategies, activities and related resources
	<ul style="list-style-type: none"> • data/information as raw material that information processes deal with • participants as the people who carry out the information processes within the information system <p>information processes</p> <ul style="list-style-type: none"> • collecting, as the process that: <ul style="list-style-type: none"> – defines the required data – identifies the source for the data – determines how the data will be gathered – gathers the data 	<ul style="list-style-type: none"> • distinguish between, and categorise, the activities within an information system in terms of the seven information processes • use an existing information system to meet a simple need • manually step through a given information system identifying the information process 	<p><i>At the end of the collection process several packages to a range of local destinations either as one-day tours or as overnight tours with accommodation will be developed.</i></p> <p>Teacher:</p> <ul style="list-style-type: none"> • introduces data and discusses processing of information. <p>Students:</p> <ul style="list-style-type: none"> • outline the various sources and types of data • outline the method for obtaining travel and accommodation data.

Outcomes A student:	Students learn about:	Students learn to:	Strategies, activities and related resources								
	<ul style="list-style-type: none"> • organising as the process that: <ul style="list-style-type: none"> - determines the format in which data will be represented in the information system • analysing as the process that: <ul style="list-style-type: none"> - interprets the data, transforming it into information • storing and retrieving as the process that: <ul style="list-style-type: none"> - saves data and information for later use - obtains data and information previously saved • processing as the process that: <ul style="list-style-type: none"> - manipulates data and information • transmitting and receiving as the process that: <ul style="list-style-type: none"> - sends and receives data and information, within and beyond information systems • displaying as the process that: <ul style="list-style-type: none"> - decides on the form in which the information will be displayed - displays the information 	<ul style="list-style-type: none"> • for a given information system, describe how <ul style="list-style-type: none"> - participants - data/information - information technology relate to the information processes 	<p><i>From the above activity</i> Students:</p> <ul style="list-style-type: none"> • complete, for each letter of the alphabet, a word for a type of data and the actual example of the data that applies to the word <table style="margin-left: 40px; border: none;"> <tr> <td style="padding-right: 20px;">eg Type</td> <td>Data</td> </tr> <tr> <td style="padding-right: 20px;">Airline</td> <td>Qantas</td> </tr> <tr> <td style="padding-right: 20px;">Boat</td> <td>Captain Cook Cruises</td> </tr> <tr> <td></td> <td>etc</td> </tr> </table> • organise data into the following groupings <ul style="list-style-type: none"> - text, number, image, audio, video. <p>Teacher:</p> <ul style="list-style-type: none"> • reviews the use of word processor, database and spreadsheet. The depth of review will depend upon existing computing knowledge of students. 	eg Type	Data	Airline	Qantas	Boat	Captain Cook Cruises		etc
eg Type	Data										
Airline	Qantas										
Boat	Captain Cook Cruises										
	etc										

Outcomes A student:	Students learn about:	Students learn to:	Strategies, activities and related resources
		<ul style="list-style-type: none"> schematically represent the flow of data and information through a given information system, identifying the information processes 	<p>Students:</p> <ul style="list-style-type: none"> prepare a range of brochures to advertise the travel agent's tours. These are to be presented in printed and electronic form. For example: <ul style="list-style-type: none"> one-page flyer, word-processed document, 3-fold A4 pamphlet, poster, newspaper advertisement, TV/Radio advertisement, slide show, video, CD-Rom etc. <p>These brochures could incorporate such features as:</p> <ul style="list-style-type: none"> text, images (downloaded, scanned or captured), video clips, sounds, etc. <p>Teacher:</p> <ul style="list-style-type: none"> models a data flow diagram. <p>Students:</p> <ul style="list-style-type: none"> to draw up a data flow diagram relating client, travel agent, transport supplier, accommodation provider, tour operator. (resource 3, p 21 and resource 2, p 15)

Outcomes A student:	Students learn about:	Students learn to:	Strategies, activities and related resources
	<p>the nature of data and information</p> <ul style="list-style-type: none"> • data as the input to an information system • the different types of media, namely: <ul style="list-style-type: none"> - image - audio - video - text - numbers • information as the output from an information system • the transformation of data into information via the information processes • how information from one information system can be data for another information system <p>digital representation of data</p> <ul style="list-style-type: none"> • the necessity to represent data in a digital format for use by information technology 	<ul style="list-style-type: none"> • distinguish between data and information in a given context • categorise data as image, audio, video, text and/or numbers • identify the data and the information into which it is transformed for a given scenario • identify examples of information systems that use information from another information system as data <ul style="list-style-type: none"> • explain why information technology uses digital data • describe advantages and disadvantages for the digital representation of data 	<p>Refer to alphabet activity above.</p> <p>Teacher:</p> <ul style="list-style-type: none"> • introduces the concept of the binary number system and what is meant by such terms as binary, bit, byte (resource 1, chapter 2; resource 3, chapter 2).

Outcomes A student:	Students learn about:	Students learn to:	Strategies, activities and related resources
	<ul style="list-style-type: none"> • current data digitising trends, for example: <ul style="list-style-type: none"> - newspapers on the Internet - telephone system - video on DVD - facsimile - media retrieval management <p>classification of information systems</p> <ul style="list-style-type: none"> • personal information systems: <ul style="list-style-type: none"> - where the end user is an individual • group information systems: <ul style="list-style-type: none"> - where the participants in the information system work as a group 	<ul style="list-style-type: none"> • classify a given information system as either: <ul style="list-style-type: none"> - personal - group 	<p>Students:</p> <ul style="list-style-type: none"> • to demonstrate a general understanding of conversion of decimal to binary and complete a number of exercises on conversion of decimal/binary. <p>Students:</p> <ul style="list-style-type: none"> • list current uses of digitised data such as Internet resources: magazines, newspapers and TV (eg Herald and ABC on line), fax, etc. <p>Students:</p> <ul style="list-style-type: none"> • analyse the features of a personal information system, such as an address book or a personal information manager • compare features of personal information system with those required managing a travel agency. <i>(The travel agency would likely use a database to manage this data. The computers in a larger agency would probably be networked and data accessed by more than one employee.)</i>

Outcomes A student:	Students learn about:	Students learn to:	Strategies, activities and related resources
	<p>social and ethical issues</p> <ul style="list-style-type: none"> • social and ethical issues arising from the processing of information, including: <ul style="list-style-type: none"> - privacy of the individual - security of data and information - accuracy of data and information - changing nature of work - appropriate information use - health and safety - copyright laws • the people affected by social and ethical issues, including: <ul style="list-style-type: none"> - participants within the information system - those with the purpose - those in the environment • the responsibility of system designers to create information systems that are socially and ethically acceptable • current government legislation to protect the individual 	<ul style="list-style-type: none"> • describe social and ethical issues that relate to: <ul style="list-style-type: none"> - information system users - participants • ensure relevant social and ethical issues are addressed • identify and explain reasons for the expansion of information systems, including: <ul style="list-style-type: none"> - advances in technology - suitability of information technology to repetitive tasks 	<p>Students:</p> <ul style="list-style-type: none"> • complete a household survey with areas including – income, expenditure, family members, etc. • take part in a class discussion on the ethical issues raised. For example, <ul style="list-style-type: none"> – who has access to the information? – how is the information validated? – what will the information be used for? • investigate current laws relevant to Occupation Health and Safety and Privacy (resource 4). <p>Teacher:</p> <ul style="list-style-type: none"> • introduces the concept of appropriate office design by providing examples of good and poor office design • demonstrates the use of a software package to assist in designing the office layout.

Outcomes A student:	Students learn about:	Students learn to:	Strategies, activities and related resources
	<ul style="list-style-type: none"> the use of information systems in fields such as manufacturing as well as the traditional fields of observation and recording 		<p>Students:</p> <ul style="list-style-type: none"> brainstorm and record ideas about possible office designs use a software package to design an office for the travel agent taking into account such issues as: <ul style="list-style-type: none"> the use of ergonomic furniture to avoid injury from RSI the security of client's personal information list the software required for the travel agency and discuss issues related to copyright. <p><i>Case Study</i></p> <p>Students:</p> <ul style="list-style-type: none"> compare a range of manufacturing systems and their use of information systems eg two case studies at: www.proxim.com/markets/warehousing/redcross.shtml <p>www.proxim.com/markets/warehousing/avon.shtml</p>

Outcomes A student:	Students learn about:	Students learn to:	Strategies, activities and related resources
	<ul style="list-style-type: none"> • global information systems: <ul style="list-style-type: none"> - where the purpose involves international organisations, or - where one of the participants, data/information or information technology is international 		<p>Teacher:</p> <ul style="list-style-type: none"> • gives the outline of a situation which relies on an International Agreement eg IOC for Olympic Games • discusses methods of communication, including post, telephone, fax, telex, WWW, e-mail, video conferencing. <p>Students:</p> <ul style="list-style-type: none"> • carry out an evaluation of the Global Positioning System, and list its benefits to industry including: <ul style="list-style-type: none"> – accurate map information – surveying and navigation by sailors and aircraft • examine the military requirements and restrictions on the above data.

3.2 HSC Course: Project Work

Suggested Time Allowed: 6 Weeks

Rationale

Students are required to develop an information system using the stages detailed in the preliminary topic, *Planning, Design and Implementation*.

The students will be given a scenario of an information system and are required to develop a prototype. The project will allow the students to see the information system in its full context. Students will identify the purpose of the information system, the participants, the data/information and the information technology that works with the information processes. The example given here of a video shop is linked to the topic *Information Systems and Databases*.

Resources

Books

1. Chivers, B, Lawrence, E, Ware, P, Regan, N, et al, *2/3 Unit (Common) HSC Course*, Jacaranda Press, Sydney, 1995, ISBN 0 7016 3265 8
2. Baker, M & Frost, N, *New Senior Computing Studies: The Preliminary Course*, McGraw Hill, Sydney, 1994, ISBN 0 074 70032 4
3. Boyd, G S, *Computing Studies 2 Unit HSC Course*, Cockatoo Computing Services, Sydney, 1994, ISBN 0 646 18932 8
4. Boyd, G S & Scott, I, *Computing Studies, HSC General*, Cockatoo Computing Services, Sydney, 1995, ISBN 0 646 22903 6

Possible Assessment Strategies

The project can be based on one HSC topic or a number of topics. The project would be complete when sufficient work is covered to match the topic area(s).

Scenario

Terry runs a local video rental shop and rents out videos, mostly overnight but also weekly to the people of Beach Town. The store also sells some videos, drinks and snacks.

Videos are purchased from the distributors for \$80 each and are rented out for \$4 per night, with weeklies at \$7. The shop has over 4000 video titles (up to 20 copies of some titles) and around 800 regular customers. Each video has a barcode to identify it (individually and for the title) and each customer has a membership card which also contains a barcode.

Five years ago when the store first opened, Terry could not afford a computer and he did not understand computerised information processing, so he set up a manual card file system to process the data/information.

This manual system worked in the following way:

1. The new customer filled in their details on a customer record card (see diagram 1).
2. Each customer was given a membership card which contained a barcode (diagram 2).
3. When Terry purchased a video he attached a sticker to it with its title and a reference number (diagram 3).
4. A video card (diagram 4a) was created and put in a pocket on the video case.
5. When a video was rented, the video card was taken from the pocket, the renter's membership number and the date were written on it and the card was put in the file box for loaned videos (diagram 4b).
6. The number of the video and the rental date were added to the customer card (diagram 4c).
7. When the customer returned the video, the video card was put back in the pocket and the video was put back on the shelves. The return date was checked off the customer card.

Diagram 1: Customer Record Card

Name	M. Delli Pizzi	□□□□□□
I.D. No	1546	
Address	23 Hamilton Rd Beach Town	
Phone	1234 5678	
Date	Video #	Returned

Diagram 2: Customer ID Card



Diagram 3: Video Label

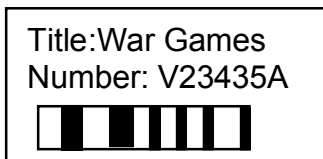


Diagram 4a: Video Card

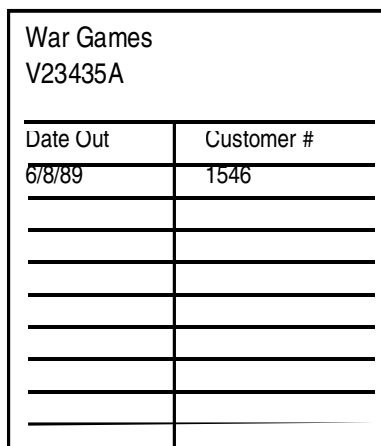


Diagram 4b: Rental Cards

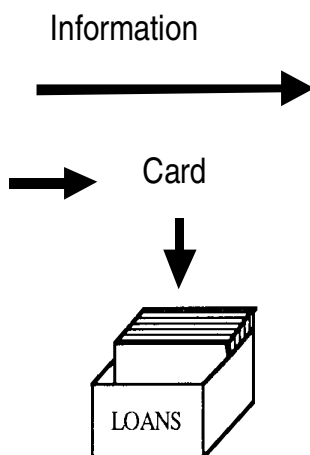
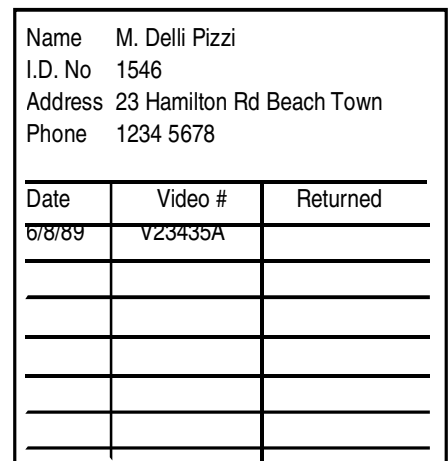


Diagram 4c: Customer Card with loan recorded



If a customer rang up to find out the availability of a particular video, Terry looked up the number and checked through the box of loan cards for videos currently out.

A tally was kept of the number of videos rented in a day to check the balance of the till. Any customer more than two days overdue in returning a video received a short, typed letter requesting the return of the video and indicating that a fine was being imposed of \$4 per day.

Terry spent hours per day putting the cards back in order in each card box, and sorting the videos on the shelves to see the more and less popular ones. At busy times casual workers were employed. They often lost track of the number of videos being rented because of the number of customers.

Outcomes A student:	Students learn about:	Students learn to:	Strategies, activities and related resources
<p>H1.1 applies an understanding of the nature and function of information technologies to a specific practical situation</p>	<p>project management</p> <ul style="list-style-type: none"> • developing a project plan • communication skills necessary for dealing with others 	<ul style="list-style-type: none"> • develop and apply a project management plan that incorporates communication strategies with participants in the process such as <ul style="list-style-type: none"> – active listening – conflict resolution – negotiation skills – interview techniques – team building 	<p>Teacher:</p> <ul style="list-style-type: none"> • discusses with class the reasons for developing a project plan • discusses the time frame by which new system must be operational • outlines the use of project journal or diary. <p>Teacher:</p> <ul style="list-style-type: none"> • monitors progress of students by checking journal/diary on a regular basis. <p>Students:</p> <ul style="list-style-type: none"> • produce Gantt chart to show scheduling of tasks (to be included in project journal) • role-play to illustrate the need to use communication skills when dealing with people; for example, an interviewer using ambiguous questions or having an aggressive attitude compared with an interviewer who has well prepared questions and who listens to the interviewer <p>Teacher:</p> <ul style="list-style-type: none"> • introduces scenario for video rental shop project • describes and outlines the purpose of the system.

Outcomes A student:	Students learn about:	Students learn to:	Strategies, activities and related resources
<p>H1.2 explains and justifies the way in which information systems relate to information processes in a specific context</p> <p>H2.1 analyses and describes a system in terms of the information processes involved</p> <p>H2.2 develops solutions for an identified need which address all of the information processes</p> <p>H3.1 evaluates the effect of information systems on the individual, society and the environment</p>	<p>understanding the problem</p> <ul style="list-style-type: none"> • prototypes, a working model of an information system, built in order to understand the requirements of the system <ul style="list-style-type: none"> – used when the problem is not easily understood – repetitive process of prototype modification and participants' feedback until the problem is understood – can be the basis for further system development 	<ul style="list-style-type: none"> • apply the steps in understanding the problem • identify, communicate with and involve participants of the current system • create a prototype from applications packages that provide: <ul style="list-style-type: none"> – screen generators – report generators • use a prototype to clarify participants' understanding of the problem 	<p>Class discussion of the operation of a video rental store including:</p> <ul style="list-style-type: none"> • processes of borrowing a video • people involved in the process • data required and how it is stored • workings of manual system. <p>Students:</p> <ul style="list-style-type: none"> • set up a card file model to simulate the workings of the manual system • role-play the working of the video rental shop using the card file model to identify problems with the manual system. <p>Teacher:</p> <ul style="list-style-type: none"> • guides discussion of problems with the manual system with questions such as: <ul style="list-style-type: none"> – how does the manager know which new release videos to purchase? – how are old titles selected to be sold off? – how would late returns be identified and dealt with? – how would you go about finding videos starring Pierce Brosnan?

Outcomes A student:	Students learn about:	Students learn to:	Strategies, activities and related resources
<p>H3.2 demonstrates ethical practice in the use of information systems, technologies and processes</p>	<p>social and ethical design</p> <ul style="list-style-type: none"> • identifying social and ethical issues 	<ul style="list-style-type: none"> • assess the social and ethical implications of the solution throughout the project 	<p>Students:</p> <ul style="list-style-type: none"> • write a report discussing the problems of the current manual system • list the requirements of the new system including: <ul style="list-style-type: none"> – who the participants are and their needs – data/information used – the required information processes. <p>Teacher:</p> <ul style="list-style-type: none"> • discusses the issue of privacy of borrowers' personal details and videos borrowed • discusses the methods of ensuring privacy, eg passwords and access privileges • discusses the issue of copyright of videos.
<p>H4.1 proposes ways in which information systems will meet emerging needs</p>	<p>making decisions</p> <ul style="list-style-type: none"> • feasibility studies of preposed solutions and the judging criteria: <ul style="list-style-type: none"> – is it economically feasible? – is it technically feasible? 	<ul style="list-style-type: none"> • conduct a feasibility study to determine if a proposed solution is feasible • report on the benefits, costs and risks of projects that are to proceed 	<p>Students:</p> <ul style="list-style-type: none"> • produce a feasibility study on upgrading the information system for the video rental store.

Outcomes A student:	Students learn about:	Students learn to:	Strategies, activities and related resources
<p>H5.1 justifies the selection and use of appropriate resources and tools to effectively develop and manage projects</p> <p>H5.2 assesses the ethical implications of selecting and using specific resources and tools</p>	<ul style="list-style-type: none"> – does it fit the objectives of the owners of the information system? – can it be implemented in the available time frame? – are there participants who can operate it? <ul style="list-style-type: none"> • choosing the most appropriate solution based on feasibility (and prototyping) 	<ul style="list-style-type: none"> • develop a project plan 	<p>Teacher:</p> <ul style="list-style-type: none"> • discusses with the class the relative merits of proposed solutions and ensures the most appropriate solution is selected
<p>H6.1 analyses situations, identifies a need and develops solutions</p>	<ul style="list-style-type: none"> • the project plan that: <ul style="list-style-type: none"> – details the time frame – details the subprojects and the time frame for them – identifies participants – identifies information technology – identifies data/information 		<p>Students:</p> <ul style="list-style-type: none"> • produce a project plan for the implementation of the computerised video rental shop information system. (Gantt chart should be included.)

Outcomes A student:	Students learn about:	Students learn to:	Strategies, activities and related resources
<p>H6.2 selects and applies a methodical approach to planning, designing or implementing a solution</p> <p>H7.1 implements effective management techniques</p> <p>H7.2 uses methods to thoroughly document the development of individual and/or group projects</p>	<p>designing solutions</p> <ul style="list-style-type: none"> • solutions based on further development of prototypes already created 	<ul style="list-style-type: none"> • develop a solution to a problem from a prototype • use a guided process in an application to create all or part of a solution 	<p>Students:</p> <ul style="list-style-type: none"> • draw a context diagram to model the old manual system • design a data dictionary and a system flow chart for the new computerised video rental information system

Outcomes A student:	Students learn about:	Students learn to:	Strategies, activities and related resources
	<ul style="list-style-type: none"> • participant development, when people within the information system develop the solution <ul style="list-style-type: none"> – participant-designed solutions – tools for participant development such as guided processes in application packages • acquiring information technology and making it operational • tools used in designing, including: <ul style="list-style-type: none"> – context diagrams – data flow diagrams – decision trees – decision tables – data dictionaries – system flow charts 	<ul style="list-style-type: none"> • use system design tools to; <ul style="list-style-type: none"> – better understand the system – assist in explaining the operation of the new system – document the new system 	<ul style="list-style-type: none"> • develop a prototype of the new video rental information system, eg a database with a limited number of sample records. <p><i>(If necessary, the teacher could allow students to trial a flat file database and discuss problems encountered and the limitations of this prototype.)</i></p> <p>Students:</p> <ul style="list-style-type: none"> • compare the merits of a flat file and relational database • investigate hardware and software requirements and cost, eg internet research, company catalogues, phoning or visiting stores. <p>Teacher:</p> <ul style="list-style-type: none"> • prepares and distributes a partially completed spreadsheet template to provide a starting point for students. <p><i>(Income and costs can be compared, for renting videos nightly versus weekly, as well as drinks and snacks – to check profitability.)</i></p>

Outcomes A student:	Students learn about:	Students learn to:	Strategies, activities and related resources
	<p>implementing</p> <ul style="list-style-type: none"> • an implementation plan that details; <ul style="list-style-type: none"> – participant training – the method for conversion – how the system will be tested – conversion to the new system 	<ul style="list-style-type: none"> • develop an implementation plan for the project • convert from the old to the new system • determine training needs arising from the creation of a new system 	<p>Students:</p> <ul style="list-style-type: none"> • divide into groups and devise a plan for implementation. Each group to present to the class the strengths and weaknesses of one of the conversion methods • select an appropriate conversion method based on strengths and weaknesses presented.
	<p>testing, evaluating and maintaining</p> <ul style="list-style-type: none"> • testing and evaluating the solution with live test data • checking to see if the original objectives of the project have been achieved • the operation manual detailing procedures participants follow when using the new system 	<ul style="list-style-type: none"> • compare the new system to the old and evaluate whether objectives for the project have been met • document the new system 	<p>Students:</p> <ul style="list-style-type: none"> • brainstorm as a class to design questions for evaluating the information system • complete a peer evaluation of the information system using an evaluation sheet • modify the information system where problems are identified • complete documentation of evaluation and modifications.

4 Project Management

4.1 Purpose of Project Management

Project management involves the coordination of a number of phases to successfully achieve identified goals. These phases include understanding the problem, making decisions, designing solutions, implementing and testing, evaluating and maintaining.

The example projects presented in this document, computerising a travel agency and a video store, demonstrate the phases of project management.

4.2 Tools for Project Management

4.2.1 Gantt Charts

A Gantt chart allows project progress (eg task scheduling and time management) to be monitored (refer to syllabus, pages 27 and 34). Students may elect to use this tool to assist in their own project management.

‘This is essentially an activity bar chart indicating scheduled activity dates and durations frequently augmented with activity floats.’ (Cotterell, M & Hughes, B, *Software Project Management*, International Thomson Computer Press, United Kingdom, 1999, ISBN 1 8503 2190 6)

4.2.2 Logbooks, journals and diaries

Logbooks, journals or diaries, must be used by students to detail at regular intervals, activities undertaken in the planning, design, and implementation of their projects.

The purpose of journals and diaries (which are essentially the same), is to:

- act as a record of what a student has attempted (successfully or unsuccessfully)
- identify the types of research undertaken by the student, eg people, text, electronic and industry
- provide a formal documentation of the phases involved in project management (refer to syllabus pages 32, 33 and 34).

Teachers may use the journals and diaries to monitor and/or assess student progress and achievement of particular outcomes.

An example of how students may approach journal and diary entries is through the use of a scaffold. The scaffold identifies the main headings on which students can focus their entries. It may be presented in either text or table format. These headings might include:

- date
- the task that was attempted
- how the task was achieved
- the end result of the task
- the follow-up required and resulting action
- signature of teacher to confirm entry.

4.3 Steps in Project Management

Refer to syllabus, pages 32, 33 and 34.

Steps in project management:

- understanding the problem
- making decisions
- designing solutions
- implementing
- testing, evaluating and maintaining.

4.4 Teaching Strategies for Group Work

Teachers need to ensure that individual and group progress is monitored in relation to the achievement of outcomes and the study of specified syllabus content.

The teacher needs to ensure that the group understands the nature of the activity, what the intended outcomes are and the need for individual and group goals.

This may be achieved in the following ways:

- teacher-student interviews
- teacher-group interviews
- teacher observation
- peer observation
- peer discussion.

4.5 Group Projects

4.5.1 Forming student work groups

Work groups for project work may be established in a number of ways and the method used will depend on what the purpose of the task is. Some examples of how to form groups are listed below:

- random selection — for example, by giving each student a number and having students with the same number form a group
- selection based on interests — teacher presents topics and the groups form on the basis of shared interests
- friendship groups — a commonly used method where students form their own groups. (If this method is used, the formation of heterogeneous groups should be encouraged)
- teacher-selected groups based on student skill or knowledge — in certain situations, this may ensure the achievement of specific outcomes by all groups (from Mannison, M, *Innovative Teaching Strategies*, Nice Business, Queensland, 1992, ISBN 0 6460 8689 8).

4.5.2 Roles of individual students

Within each group, individuals must have an identified role which has been decided through negotiation among the members. However, depending on the purpose of the group activity, teachers may choose to allocate the tasks.

4.6 Monitoring of Student Progress (individual/group)

When all students have clarified group and individual tasks, the teacher must develop a recording system for monitoring achievement of both group and individual outcomes.

This could be done with a table that indicates task descriptions, outcomes, and possible indicators of achievement. An example is shown below:

Group task description: group project to computerise a video rental shop

<i>Students</i>	<i>Syllabus Outcome: H6.2 Possible Indicators: - communicates in both written and oral form ideas about planning and uses negotiation skills</i>	<i>Syllabus Outcome Possible Indicators</i>	<i>Syllabus Outcome Possible Indicators</i>
Student A	Does not contribute to group planning activities		
Student B			
Student C	Is prepared to offer suggestions about how the group can work toward the goals of implementation		
Student D			

4.7 Assessment (individual and group)

The allocation of formal marks (as well as documentation of achievement of outcomes), should occur for tasks which are part of the school's internal assessment program.

Teachers may provide other opportunities for students to demonstrate achievement of outcomes through normal day-to-day classroom activities. In these cases, marks need not be formally allocated, however teachers should document student progress.

4.8 Project Ideas

Athletics carnival

Criminal records

Payroll system

Sporting averages

Appointment system

Swimming carnival

Library system

Hotel bookings

Ten pin bowling scoring

Stock control

4.9 Sample Project

Video Store

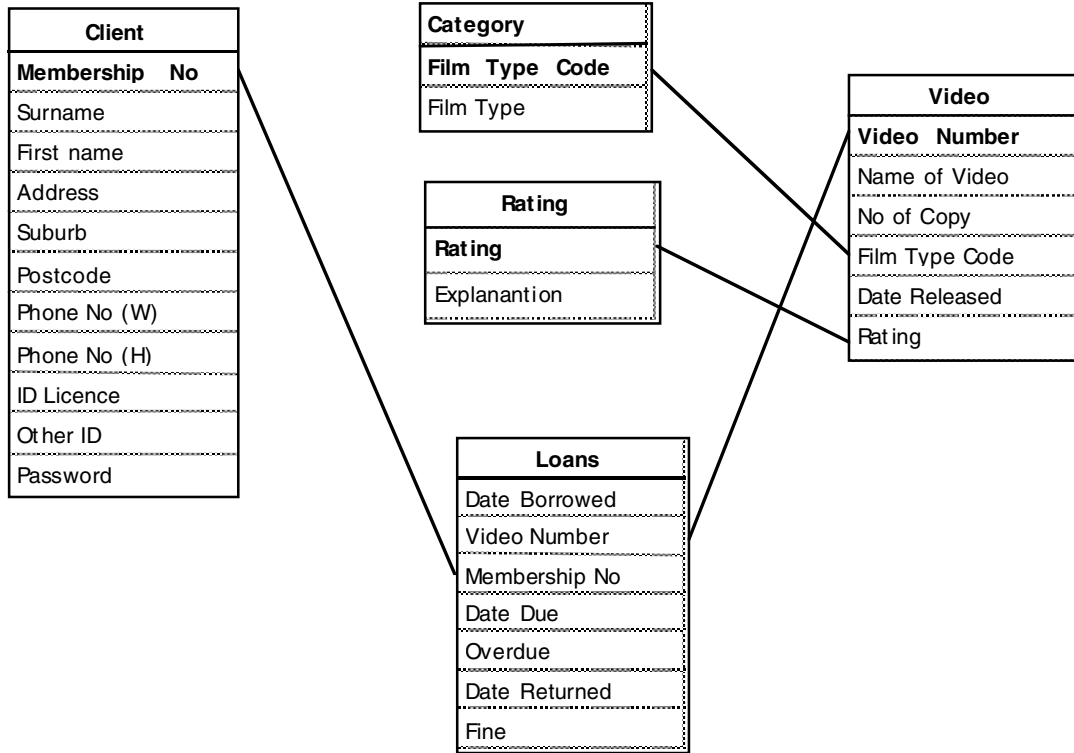
4.9.1 Introduction

The forms required for a manual video store information system are included with the scenario, along with enough detail to allow a deal of extension to the project area if required. Examples of completed sections of journal, schema, context and Gantt diagrams and data dictionaries are also included.

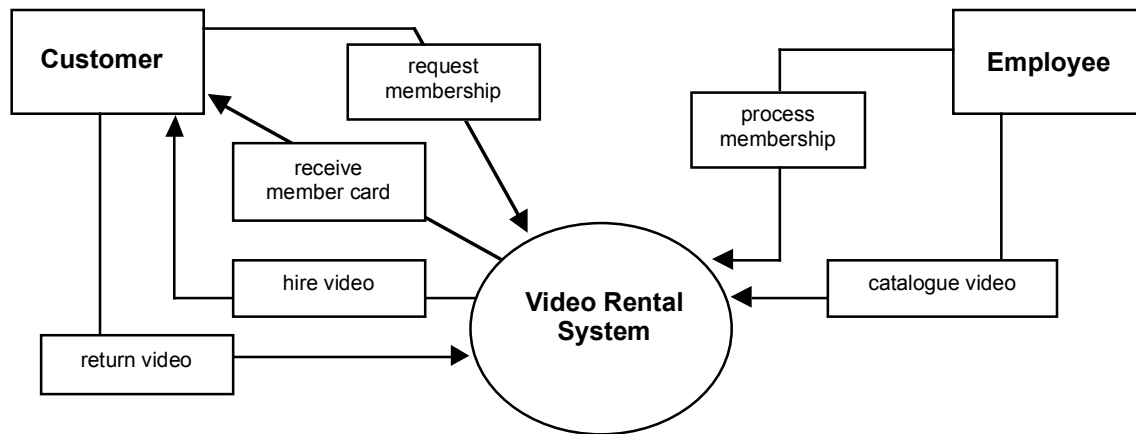
4.9.2 Sample Journal/ Diary

<i>Date</i>	<i>Task</i>	<i>How</i>	<i>End Result</i>	<i>Follow-up/ Next Task</i>	<i>Signature/ Completed by</i>
2/3/2000	Complete form to get information on videos	Create table in word with field names as headings for columns	Finished	Gather information from video shop	John
4/3/2000	Visit video shop to get information on videos	Fill out printed form	Finished	Enter data into database	John and Charles (friend)
6/3/2000	Enter video data into database	Typed in by John	Not finished	Continue entering data	John
7/3/2000	Enter video data into database	Typed in by John	Finished	Enter information on clients	John Progress checked by teacher 8/3/2000

4.9.3 Schema for Relational Database

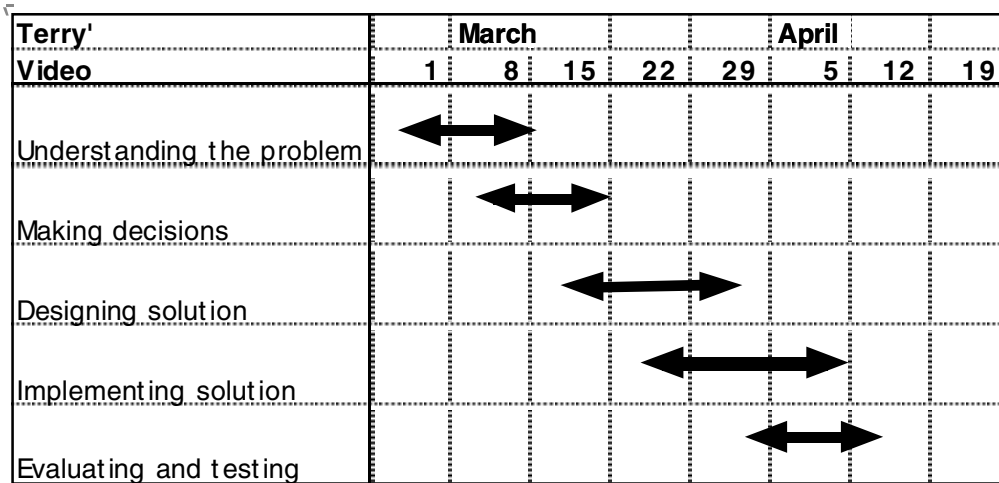


4.9.4 Context Diagram



4.9.5 Gantt Diagram

Gantt Chart



4.9.6 Data Dictionaries

Customer Details

Field Name	Data Type	Field Size	Description
Membership No	Text	4	4 digit number
Surname	Text	25	Last name of customer
First Name	Text	20	First name of customer
Number/Street	Text	30	Street number and name
Suburb	Text	25	Suburb/town
Postcode	Text	4	4 digit number
Phone No (W)	Text	12	No spaces, brackets, etc
Phone No (H)	Text	12	No spaces, brackets, etc
ID Licence	Text	10	Drivers licence ID no
Other ID	Text	10	Type of ID eg Visa card
Password	Text	8	Max of 8 characters

Video

Field Name	Data Type	Field Size	Description
Video number	Text	7	Letter to indicate video plus 5 digits plus letter to indicate film type, eg V23435A
Name of Video	Text	40	Title of film
No of Copies	Number	2	No of copies for rent
Film Type Code	Text	2	1 or 2 letters to represent film type eg A for Action
Date Released	Date	4	Year, eg 1999
Rating	Text	3	Letter(s) to represent rating, eg M

Category

Field Name	Data Type	Field Size	Description
Film Type Code	Text	2	1 or 2 letters to represent film type, eg A for Action
Film Type	Text	10	Type of film in full, eg Action

Rating

Field Name	Data Type	Field Size	Description
Rating	Text	3	Letter(s) to represent rating, eg M
Explanation	Text	40	Description of what rating means, eg R18 over 18 can view video

Loans

Field Name	Data Type	Field Size	Description
Date Borrowed	Date	dd/mm/yy	Date the video was borrowed
Video Number	Text	7	Letter to indicate video plus 5 digits plus letter to indicate film type, eg V23435A
Membership No	Number	5	Number up to 5 digits
Date Due	Date	dd/mm/yy	Date the video is due back
Overdue	Boolean		Y or N
Date Returned	Date	dd/mm/yy	Date the video is actually returned
Fine	Currency	3	\$3 (no cents)

5 Preliminary Assessment Scheme

5.1 Example

Assessment Components	Syllabus Weightings	Task 1 Individual project	Task 2 Half-yearly exam	Task 3 Oral presentation	Task 4 Group project	Task 5 Yearly exam
		Due Date T1 W9	Due Date T2 W7	Due Date T2 W5	Due Date T3 W7	Due Date T3 W9
Introduction to Information Skills and Systems	20	4	4	4	4	4
Tools for Information Processes	40	6	9	9	6	10
Planning, Design and Implementation	20	5	2	2	5	6
Personal and Group Systems and Projects	20	5		5	5	5
Course Outcomes		P1.1, P2.1, P2.2, P3.1, P5.1, P6.2	P1.1, P1.2, P2.1, P2.2, P3.1, P4.1, P5.1, P6.1	P1.1, P1.2, P3.1, P4.1, P5.1	P1.1, P2.1, P2.2, P3.1, P5.1, P6.1, P6.2, P7.1, P7.2	P1.1, P1.2, P2.1, P2.2, P3.1, P4.1, P5.1, P6.1, P6.2, P7.1
Marks	100	20	15	20	20	25

5.2 Task Outlines

- Task 1 – Individual Project: Students work independently to design and implement an information system such as planning an 18th birthday party.
- Task 2 – Half-yearly exam: written paper.
- Task 3 – Oral presentation: students present a 5-minute PowerPoint presentation to discuss social and ethical issues and /or historical aspects of an information system.
- Task 4 – Group project: students work in cooperative groups to develop an information system on a given scenario such a travel agency.
- Task 5 – Yearly exam: written paper.

6 HSC Assessment Scheme

6.1 Example

Assessment Components	Syllabus Weightings	Task 1 Major Project	Task 2 Practical test	Task 3 written report	Task 4 Practical Assignment	Task 5 Trial HSC
		Due Date T1 W7	Due Date T2 W2	Due Date T2 W9	Due Date T3 W2	Due Date T3 W5
Project Work	20	15				5
Information Systems and Databases	20	5	10			5
Communication Systems	20		10	5		5
Option Strands	40			15	15	10
Course Outcomes		H1.1, H1.2, H2.1, H2.2, H3.1, H3.2, H5.1, H6.1, H6.2, H7.1, H7.2	H1.1, H2.2, H5.1, H6.1, H6.2	H1.2, H2.1, H2.2, H3.1, H4.1, H5.2, H6.1	H1.1, H2.2, H3.2, H5.1, H6.2, H7.1, H7.2	H1.1, H1.2, H2.1, H2.2, H3.1, H3.2, H4.1, H5.1, H5.2, H6.1, H6.2, H7.2
Marks	100	20	20	20	15	25

6.2 Task Outlines

The tasks have been based on the type of task rather than a task relating to a particular topic. These tasks can be adapted to suit any topic and/ or option.

- Task 1 – Major project: Students work independently to develop and implement an information system for a given scenario such as a video store, following the steps in the development of an information system.
- Task 2 – Practical test: Students are required to perform a series of activities in a given time to ascertain their ability to carry out information processes and choose appropriate software to perform a task. This test is designed to relate to the two core topics.
- Task 3 – Written report: Students account for the processes carried out in relation to an information system in either Option 1: Transaction Processing System OR Option 4: Multimedia Systems.
- Task 4 – Practical assignment: Students carry out a number of practical activities which use a variety of software and a number of information processes to develop a simple information system in one of the options.
- Task 5 – Practical Assignment: Students carry out a number of practical activities which use a variety of software and a number of information processes to develop a simple information system in one of the options.