



Stage 6 IPT syllabus support

Supporting syllabus changes in
Information Processes and Technology



Resource book

Technology Unit, Curriculum K–12 Directorate
< <http://www.curriculumsupport.education.nsw.gov.au/> >



Acknowledgements

The Technology Unit of the Curriculum K–12 Directorate has developed professional learning workshops for secondary technology teachers in NSW public schools to provide practical strategies, ICT tools and resources to support teachers of Information Processes and Technology.

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Links

Syllabus, support document, specifications, links to examination notes.

http://www.boardofstudies.nsw.edu.au/syllabus_hsc/syllabus2000_listi.php#informationprocessesestechology

Curriculum support

<http://www.curriculumsupport.education.nsw.gov.au>

Click on Years 7-12 → Technology

IPT Electronic content allocation tool

http://www.curriculumsupport.education.nsw.gov.au/secondary/technology/11_12/information/index.htm

TaLe

<http://www.tale.edu.au/tale/>

Computing Studies Teachers Association

<http://www.csta.org.au/>

NSW Computer Education Group

<http://www.nswceg.org.au>

NSW Department of Education and Training's curriculum planning policy

https://www.det.nsw.edu.au/policies/curriculum/schools/curric_plan/PD20050290.shtml

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Web sites

Curriculum Support web site

www.curriculumsupport.education.nsw.gov.au/secondary/technology/index.htm



The Curriculum Support web site has been designed to support teachers in public schools and is produced by the Technology Unit, Curriculum K-12 Directorate, NSW Department of Education and Training.

The site is organised into syllabus specific areas for Years 7–10 and Years 11–12 and aims to meet syllabus and learning area specific needs.

The technology site also addresses matters such as:

- Safety
- Animal welfare
- Cross curriculum matters
- Professional learning.

The professional learning section provides up-to-date information about the workshops presented by the Technology Unit. Proposed workshops for Semester 1 2009 are:

- Animals and agriculture teaching 7–12
- Quality assessment in technology subjects.

Curriculum Support web site

Information Processes and Technology

http://www.curriculumsupport.education.nsw.gov.au/secondary/technology/11_12/information/index.htm



The IPT page on Curriculum Support's web site contains links to resources, including the Electronic Content Allocation Tool, the Powerhouse Museum, and Board of Studies resources.

Teaching and learning exchange (T@LE)

www.tale.edu.au



TaLe is an education portal offering quality resources for teachers, parents and the community. When you use TaLe you can be assured that all material is authoritative and relevant to learning in NSW schools and TAFE.

Connected Learning Advisory Service (CLAS)

<http://enterprisewin.det.nsw.edu.au/schoolsclas/clas/index.shtm>



The Connected Learning Advisory Service helps teachers make the most of information and communication technologies (ICT) in their classrooms.

CLAS has two main parts. The *Using ICT Framework* and online self-assessment tool (*MyMap*) help teachers evaluate how they use ICT for teaching and learning.

Teachers can create their own log of evidence of ICT capability and identify aspects of their practice for further development. The *learning pathways* provide links to examples of what other teachers are doing, online resources and professional learning activities to help teachers explore new strategies for use with their students.

Centre for Learning Innovation (CLI)

www.cli.nsw.edu.au/cli



The Centre for Learning Innovation was established in 2004 and is part of the NSW Department of Education and Training. Its role is to provide excellence in learning resource production, and leadership in the strategic use of technology in education and training.

CLI develops learning resources across all contemporary media – including web, DVD, video, television and print. Learning design teams are complemented and supported by in-house media-production and information and communication technology (ICT) experts, and broadcast quality production facilities. All resources developed by CLI are available from the TaLE web site: www.tale.edu.au

Professional Learning Exchange (PLE)

www.schools.nsw.edu.au/plesearch/advanced.jsp

To locate specific professional learning opportunities enter a keyword and/or select any combination of the following fields.

Search for:

Focus area:	Location:
☐ Career development	☐ Hunter / Central Coast
☐ Creative Arts	☐ Hunter/Central Coast
☐ English	☐ Illawarra/South Coast
☐ HSE	☐ New England
☐ Leadership and Career Development	☐ North Coast
☐ Literacy and numeracy	☐ Northern Sydney
☐ LOTE	☐ Riverina
☐ Other	☐ South Western Sydney
☐ PDHPE	☐ State wide
☐ Quality teaching	☐ Sydney
☐ Science	☐ Western NSW
☐ Support for beginning teachers	☐ Western Sydney
☐ Support for new teachers	
☐ Syllabus implementation	
☐ TAS	
☐ Technology	

The Professional Learning Exchange (PLE) provides a **search engine** to help pinpoint the most suitable and cost-effective programs to meet professional learning needs.

Phase 1 is the current phase. It represents the pilot phase of the PLE. Here you will find professional learning opportunities offered by Regional Offices and State Office Directorates of the NSW Department of Education and Training.

Phase 2 will provide professional learning opportunities offered by TAFE and external providers including universities, professional teacher associations and through *Educator Network Australia* (EdNA) <http://www.edna.edu.au/edna/page1.html>

Some Professional Technology Teacher Association links:

Association	URL
Australian Council for Computers in Education	http://www.acce.edu.au/
Computer Studies Teachers Association	http://www.csta.org.au
IIATE Institute of Industrial Arts and Technology Education	http://www.hsc.csu.edu.au/pta/members/ite.html
NSW Computer Education Group	http://www.nswceg.org.au/
Technology Educators Association	http://www.pa.ash.org.au/teanews/

Summary of Amendments to the Stage 6 IPT Syllabus and Course Specifications document

- The Preliminary course has been restructured to remove duplicated content.

Outcomes and Topics

- Minor changes have been made to Outcomes to allow teachers to better assess and report on student achievement. Outcomes H5.1, H6.1, H6.2, H7.1 and H7.2 have been included in each of the HSC topics to reinforce the idea that project work is an integral part of that topic.
- A new Preliminary course topic 8.3 'Developing Information Systems' replaces the original topics 8.3 and 8.4. Topic 9.3 'Communication Systems' has been rewritten to include additional dot points.
- Minor changes have been made to the wording of individual dot points to help clarify concepts and remove ambiguity. New dot points have been introduced to help support existing concepts.
- Topic 9.1 has been renamed 'Project Management' to remove the ambiguity relating to Project Work. Content in this topic has been restructured to allow for a more coherent treatment. The topic includes some of the dot points from the original topics 8.3 and 8.4.

Project Work

- Guidelines relating to Project Work have been strengthened, requiring a minimum of 40% of course time to be spent on integrating content into project work.

Assessment

- Assessment component weightings in the Preliminary course have been adjusted to reflect the changes made to course structure.

Glossary

- Course-specific terms have been removed from the Glossary. Critical definitions are found within the body of the syllabus. Only syllabus terminology is included in the Glossary.

Course Specifications Document

- The Course Specifications document provides teachers with better models indicating the depth of treatment of concepts.
- Hardware- and software-specific content has been removed from the syllabus and placed in the Course Specifications document to allow the syllabus to remain current.
- 'Current and emerging trends' have been placed in the Course Specifications document to allow these areas to be updated as the need arises.

Source: http://www.boardofstudies.nsw.edu.au/syllabus_hsc/ipt-amendments.html

Summary of additions to and removals from the syllabus

(Not exhaustive)

Removals from the syllabus

8.1 Intro IS and S	Data quality (new term for data accuracy)	p 17 and p 46
8.2 Tools for IP	Centralised, distributed and parallel processing	p 22
	CPU function	p 22
8.3 Dev IS	Deleted content as treated in greater depth in HSC	pp 26–28
9.1 Project management	System flowcharts (Storyboards added)	p 31
9.4.1 TPS	Create and use Transaction Processing Systems – original syllabus create and use batch and real-time TPS – now scaled back	p 45

Additions to the syllabus

8.1 Introduction to Information Skills and Systems	Information System Diagram	p 14
	Data quality (new term for data accuracy)	p 17 and 46
8.2 Tools for Information Systems	Integration of processes	p 25
8.3 Developing Information Systems	All new dot points	p 26-28
9.1 Project Management	Requirements prototype New system development methods Storyboards	p 30-32
9.2 Information Systems and Databases	Types of relationships, User view, Data dictionary requirements modified	p 35
9.4.1 Transaction Processing Systems	Types of TPS Backup/Recovery techniques	p 44-45
9.4.2	OLAP	p 49
9.4.3 Automated Manufacturing Systems	Examples AMS –practice and additional examples Robotic arms, Conveyor belts, Barcode readers, Radio Frequency Identifier (RFID) tags Inventory tracking and production Construct simple AMS	p 52–54
9.4.4 Multimedia	New areas – ease of distribution. Authority of document	p 55

Unit 5

Making A Movie

Unit overview and rationale

This topic is based on an individual project. The project will focus on collecting, organising, processing, storing and displaying video and audio information. Students will select from a range of predefined topics to allow them to connect with the information. Emphasis will be placed on system documentation following the stages in the traditional system development approach. Students will encounter a number of problems during implementation of their video which will require solutions.

Unit length: 5 weeks

Syllabus topics covered Introduction to information skills and systems • The nature of data and information • Reasons for digital data representation Information processes • Collecting, organising, storing and retrieving, processing, displaying Tools for carrying out information processes • Hardware devices, including keyboards, mice, LCD displays, microphones, digital cameras, video cameras, digital projectors, speakers, CPU, network storage • Software tools, including word processors, graphics software, video processing software, animation software and audio applications • Non-computer procedures	Targeted outcomes (Outcomes in bold font to be assessed) P1.1 describes the nature of information processes and information technology P2.1 identifies and describes the information processes within an information system P3.1 identifies and describes 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, applies and explains management and communication techniques used in individual and team-based project work P7.2 uses and justifies technology to support individuals and teams
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Social and ethical issues • The impact of systems on participants and users • Privacy • Appropriate use of information • Developer responsibilities Traditional stages in developing a system • Understanding the problem • Planning • Designing • Implementing • Testing, evaluating and maintaining System documentation • Diagrammatically represent the information system in context • Produce a report describing the user needs for a system • Interpreting system specifications and Gantt charts	Assessment The unit will be assessed directly through the use of project work. The project will make up 15% of the overall assessment.
Quality teaching focus This unit focuses on connectedness and engagement. Students choose a theme they can identify with to produce a three-minute movie. The project reinforces the stages in the traditional approach to system development and provides students with the opportunity to explore an area they are interested in. The key to the successful completion of the project is how well each student manages their own time.	

Project activities/Integrated learning experiences	Students learn about	Students learn to	Registration
Project description In this unit students are required to create a three- or four-minute movie following the traditional approach to systems development. While <i>‘creating a movie’</i> does not strictly involve the creation of an information system, students will be following the traditional approach throughout this project The key to this activity is the student’s time management and their documentation of what they have done in each stage of the project Students may select from a number of different personal interest themes, such as: • a training video on road safety • recycling • our environment documentary • wildlife in my back yard • a music video • adding a sound track to a cartoon • French manicure made easy			

Project activities/Integrated learning experiences	Students learn about	Students learn to	Registration
• a cooking video • stop motion animation and choose from a variety of system tools Students must demonstrate and document how they manipulate and edit video and audio data, showing an appreciation of digital data representation Teacher • explains the project to students and provides the students with an assessment rubric for the project			
Understanding the problem Teacher • organises a number of small practical exercises to build expertise in manipulating video and audio data. A number of software tools can be used to develop this expertise (the focus should be on the characteristics of audio and video data)	complexity of systems • systems for individuals • systems developed by individuals the nature of data and information • data – the input to an information system • data representation – the different types of media, namely: – images – audio – video		

Project activities/Integrated learning experiences	Students learn about	Students learn to	Registration
Students • watch a series of 'how to' videos demonstrating how video and audio are manipulated • complete small exercises • examine and compare the output from different sources and justify the trends towards digital output • examine the characteristics of information technology which makes it necessary to use digital data Teacher • gives a presentation on the technical aspects of manipulating audio and video, such as frame rates, resolution, compression codecs, scene length, transitions, etc, and social and ethical considerations Students • complete a worksheet designed to reinforce the metalanguage associated with video and audio	reasons for digital data representation • current data digitising trends, for example: – newspapers on the Internet – telephone system – video on DVD – facsimile – media retrieval management social and ethical issues • social and ethical issues arising from the processing of information, including: – privacy of the individual – appropriate information use • the ethical and social responsibility of developers collecting • collecting – the process by which data is captured or entered into a computer system, including: – deciding what data is required – how it is sourced	• ensure that relevant social and ethical issues are addressed • identify, for a given scenario, alternatives for data collection and choose the most appropriate one • describe the operation of a range of hardware collection devices	

Project activities/Integrated learning experiences	Students learn about	Students learn to	Registration
- research how both an analog and a digital video camera captures and stores data - identify the social and ethical issues associated with videoing others or using existing video and audio	- how it is encoded for entry into the system - hardware used for collection - scanners and/or digital cameras to collect images - microphones and/or recording from peripheral devices to collect audio - video cameras and/or peripheral devices with appropriate interfaces to capture video - software used for collection - device drivers that allow hardware to interface with the operating system - software that allows participants to enter or import data - software that allows participants to move data between applications - social and ethical issues in collecting - bias in the choice of what and where to collect data - copyright and acknowledgment of source data when collecting - the rights to privacy of individuals on whom data is collected organising - organising – the process by which data is structured into a form appropriate for use by other	- make predictions about new and emerging trends in data collection based on past practices - identify the privacy implications of particular situations and propose strategies to ensure they are respected	

Project activities/Integrated learning experiences	Students learn about	Students learn to	Registration
	information processes - the way in which the hardware used for collection organises data by digitising images, audio, video, numeric and text - software for organisation - paint and draw software that allows image manipulation - mixing software for audio manipulation - video processing software that allows arrangement of video and audio clips on a time line storing and retrieving - storing and retrieving – the two-step process by which data or information can be saved and reloaded to allow for: - other processing to take place - a temporary halt in the system - backup and recovery - the transfer of data or information - hardware for storing and retrieving - hardware devices - hardware secondary storage devices, including: - magnetic disks - optical disks - network storages - flash memory - magnetic tapes	compare different file formats for storing the same data, explaining the features and benefits of each	

Project activities/Integrated learning experiences	Students learn about	Students learn to	Registration
Teacher - leads discussions about the processing demands of video and audio data and its implications for the project Students - complete two simple exercises: one for video and the other for audio. Using pre-existing footage, students should be given time to familiarise themselves with the editing features of both video and audio processing software	- the characteristics of hardware, including: - random or sequential access - volatile or non-volatile - permanent or non-permanent - the trend to faster and greater storage capacity over time - software for storing and retrieving - hardware interface software - file formats for different data types - social and ethical issues, including: - the security of stored data processing - processing – a method by which data can be manipulated in different ways to produce a new value or result (eg calculating a total, filtering an email, changing the contrast of an image, changing the volume of a wave file) - hardware in processing - hardware with fast processors, a lot of RAM and large storage capacity for image, video and audio processing - increased processing speed, by: - increased clock speeds - increased bus capacity - historical and current trends in CPU development - software for processing text, numeric,	- diagrammatically represent data processing - identify examples of potential human bias in data processing	

Project activities/Integrated learning experiences	Students learn about	Students learn to	Registration
Students - research how speakers work Students (project work) - document their own requirements for their movie, paying particular attention to a set of standards that they can evaluate their movie against - consider and document aspects relating to each of the information processes at this stage	image, video and audio data - non-computer tools and processing - documenting procedures to follow when processing - social and ethical issues associated with processing - ownership of processed data - bias in the way participants in the system process data displaying - displaying – the method by which information is output from the system to meet a purpose - hardware for displaying, including: - screens (LCD, CRT and plasma screens) for displaying images and video - speakers for audio output - digital projectors and interactive whiteboards for displaying text, numbers, images and video - software for displaying - interfaces for hardware display devices - non-computer tools: - traditional methods for displaying the different types of data - social and ethical issues associated with displaying - communication skills of those presenting displays	- describe the operation of display hardware - compare and contrast displays created without a computer to those created with a computer - identify, discuss and appreciate the widespread use of non-computer methods of displaying information	

Project activities/Integrated learning experiences	Students learn about	Students learn to	Registration
	– past, present and emerging trends in displays – appropriate displays for a wide range of audiences, including: - o standards for display for the visually impaired - o displays suitable for young children		
Planning Students (project work) • use the models of Gantt charts presented earlier in the course as a template for developing their own using Word, Visio or MS Project • document the information technology they will need to complete their project • create a document template to keep an electronic log/journal record of what they do each day towards their project	complexity of systems • systems for individuals • systems developed by individuals	• diagrammatically represent the information system in context • read a set of specifications • understand the need for a time schedule • understand the need for journals and diaries • interpret Gantt charts • recognise the resources that are relevant, available and required for use in developing the system • modify or extend an existing system according to specifications	

Project activities/Integrated learning experiences	Students learn about	Students learn to	Registration
	roles of people involved in systems development collecting	- produce a report stating the need, and how an information system will meet it - choose the most appropriate combination of hardware, software and/or non-computer tools to collect data from a given source - predict issues when collecting data that might arise when it is subsequently analysed and processed	
Designing Teacher - outlines the principles of movie making, including types of shots used in video production and the effect each shot has on the audience - discusses the importance of producing a script and what it includes (two-column format describing the audio and image content within a video) - revises storyboard concepts and demonstrates how storyboards are used to plan a video. The discussion should include what is included in a video storyboard: scene description, camera angle, audio, transitions, etc	traditional stages in developing a system collecting organising displaying	- use a variety of design tools to help plan the structure of an information systems - identify existing data that can be collected for an information system for a given scenario - use the Internet to locate data for a given scenario - choose the most appropriate format for a given set of data and identify and describe the most appropriate software and method to organise it - design a display for a wide variety of users	

Project activities/Integrated learning experiences	Students learn about	Students learn to	Registration
- describes and provides students with examples of shot list Students (project work) - create a script, storyboard and shot list for their movie, identifying all the key data elements - enter details in electronic log/journal			
Implementing Students (project work) - collect, organise, process and store the raw images, video and audio data needed for their movie - compile their movie, adding transitions, text and effects, where appropriate - enter details in electronic log/journal	traditional stages in developing a system collecting organising	- use an information system to generate information - use a range of hardware collection devices to collect different data types - describe how different types of data are digitised by the hardware that collects it - compare and contrast different methods of organising the same set of data using existing software applications - assess future implications when making decisions about the way data is organised - choose and justify the most appropriate method for displaying information given a particular set of	

Project activities/Integrated learning experiences	Students learn about	Students learn to	Registration
- process their movie for storage on the network and output this to a DVD - enter details in electronic log/journal	storing and retrieving	circumstances - use software to combine data organised in different formats - document the storage and retrieval process in an information system - describe the characteristics and operation of hardware devices used for storage and retrieval - use a range of hardware devices and associated software to store and retrieve information and data - store and retrieve data using a network - use software features to secure stored data and information - retrieve and use data in an ethical way	
	processing	- select appropriate hardware configurations for a specified type of processing - edit video data using animation packages - edit audio data using mixing software	
	displaying	- use a range of hardware and software combinations to display different types of information - create audio, image and video displays with presentation software	

Project activities/Integrated learning experiences	Students learn about	Students learn to	Registration
Testing, evaluating and maintaining Students (project work) - present their movies to the rest of the class - evaluate each others movies against a given set of criteria and justify what they like and dislike about the organisation of information in the movie			

Source: http://www.boardofstudies.nsw.edu.au/syllabus_hsc/pdf_doc/ipt-st6-support-document.pdf

Electronic Content Allocation Tool

What ECAT is and does

It is an Excel spreadsheet. It can be used as *either*

- a way of checking that your existing course plan (or program) addresses the content (dot points, *learn tos*, *learn abouts*) from the syllabus
- or
- a way of ensuring that a course plan in the process of development covers the content in an even way *as it is written*.

This tool cannot produce a unit of work, course plan or program. It cannot think of strategies or activities. It was never intended to do this.

Provides a somewhat less tedious way (compared to doing it manually) to cross check content from the course plan and the syllabus. It makes it obvious if there is content left out. It also makes the user aware if content is often revisited.

If the course plan or the program is already written, the user would work through the program, entering content in the ECAT. If the plan or program is being developed, the user would work through the ECAT, thinking of strategies and activities.

Instructions

There is an ECAT for the Preliminary course and one for the HSC course. Both spreadsheets work in much the same way. Screen shots are from the HSC course.

Open the file and save it immediately using a different name to be sure you are working with a copy, not the original.

When the document opens, you will see the screen below. As you scroll down you will see that the *Learn abouts* and *Learn tos* from the entire course are listed. Where you find content in the unit of work that matches with the syllabus, fill in a 'Y' in the row matching the syllabus content and in the column matching the unit.

HSC Course		1.	2.	3.	4.	5.
9.1 - Project Management		(refer to Outcomes H1.1, H1.2, H2.1, H2.2, H3.1, H3.2, H4.1, H5.1, H5.2, H6.1, H6.2, H7.1, H7.2)				
techniques for managing a project						
• communication skills necessary for dealing with others	• understand the communication skills required to manage a system development project, such as: – active listening – conflict resolution – negotiation skills – interview techniques – team building					
• the consequences for groups that fail to function as a team, including: – financial loss – employment loss – missed opportunities	• understand the need to apply project management tools to develop a system using a team approach - OOS	y				
• project management tools, including: – Gantt charts – scheduling of tasks – journals and diaries – funding management plan – communication management plan	• appreciate the advantages of groups that function as a team, including: – increased productivity – enhanced job satisfaction – the development of a quality system - OOS	y	y			

In the example above, a 'y' has been entered in three cells. This means that in unit 1, two content areas have been covered. In unit 2, one content area has been covered. Now select the unit you want to work on from the bottom bar. Save the spreadsheet.

Note that content from the syllabus has been copied to this sheet wherever a 'y' was entered on the previous sheet.

HSC Course: Unit 2		
UNIT NAME	Type unit name here	TEACHER
CLASS	Type class name here	Type teacher name here
TIME FRAME	Type the time frame here	ROOM
		Type your room here
Students learn about	Students learn to	NOTES
9.1 - Project Management		
techniques for managing a project		
• project management tools, including: – Gantt charts – scheduling of tasks – journals and diaries – funding management plan – communication management plan	• appreciate the advantages of groups that function as a team, including: – increased productivity – enhanced job satisfaction – the development of a quality system - OOS	
understanding the problem		
planning		

Once the content has been mapped, click on the tab that corresponds to the unit of work. The syllabus content has been copied into this new sheet.

Enter the unit name, class, time frame, teacher and room.

Adjust the height of appropriate cells so that all data can be seen.

You can enter notes that may be useful to you in the programming process.

You can also transfer the syllabus content and comments to a teaching and learning sequence by copying and pasting.

Before you print the document, ensure that the correct print area is set. This may save you accidentally printing pages of empty cells. The simplest way to do this is to *control-click* on each row you want to print before setting the print area (Page Layout group in Excel 2007, File menu Excel 2003).

Check on *Print Preview* which pages you need to print.

Sample Electronic Content Allocation Tool – main page

		1	2	3	4	5
1	HSC Course					
334						
335						
336	other information processes in multimedia systems					
337	- processing: - the integration of text and/or number, audio, image and/or video - compression and decompression of audio, video and images - hypermedia – the linking of different media to one another	describe the process of analog to digital conversion				
338					y	
339	- organising presentations using different storyboard layouts, including: - linear - hierarchical - non-linear - a combination of these	- plan a multimedia presentation using a storyboard - diagrammatically represent an existing multimedia presentation with a storyboard - design and create a multimedia presentation			y	
340					y	
341					y	
342	- storing and retrieving - the different file formats used to store different types of data, including: - JPEG, GIF, PNG, and BMP for images - MPG, Quicktime, AVI and WMV for video and animations - MP3, Wav, WMA, and MID for audio - SWF for animations - compression and decompression	- combine different media types in authoring software - design and create a multimedia world wide web site that includes text and numbers, hypertext, images, audio and video - identify standard file formats for various data types			y	
343					y	
344	- collecting: - text and numbers in digital format - audio, video and images in analog format - methods for digitising analog data	recommend an appropriate file type for a specific purpose			y	
345					y	
346						
347					y	
348					y	
349	issues related to multimedia systems					

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Ready			
File Home Insert Page Layout Formulas Data Review View Add-Ins Window Help			
Normal Layout Page Custom Views Full Screen Workbook Views			
Page Break Preview			
Ruler Gridlines Headings Message Bar Show/Hide			
Zoom 100% Zoom to Selection			
New Window Arrange All Freeze Panes Hide Unhide View Side by Side Synchronous Scrolling Reset Window Position			
Save Switch Workspace Windows			
Macros			
B82 =IPT_HSCIP305			
A B C			
1 HSC Course: Unit 4			
2 UNIT NAME		Multimedia project	
3 CLASS		12 IPT	
4 TIME FRAME		Term 2	
5 Students learn about		Students learn to	
6 Issues related to automated manufacturing systems			
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Sample Electronic Content Allocation Tool – printout page

Activity 1b – Reciprocal Teaching Strategy

OLTP

Databases tend to get split up into a variety of different categories based on their application and requirements. All of these different categories naturally get nifty buzz words to help classify them and make distinctions in features more apparent. The most popular buzz word (well, acronym anyway) is *OLTP* or *Online Transaction Processing*. Other classifications include *Decision Support Systems* (DSS), *Data Warehouses*, *Data Marts*, etc.

OLTP databases, as the name implies, handle real time transactions which inherently have some special requirements. If you're running a store, for instance, you need to ensure that as people order products they are properly and efficiently updating the inventory tables while they are updating the purchases tables, while they're updating the customer tables and so on. OLTP databases must be atomic in nature (an entire transaction either succeeds or fails, there is no middle ground), be consistent (each transaction leaves the effected data in a consistent and correct state), be isolated (no transaction affects the states of other transactions), and be durable (changes resulting from committed transactions are persistent). All of this can be a fairly tall order but is essential to running a successful OLTP database.

Because OLTP databases tend to be the real front line warriors, as far as databases go, they need to be extremely robust and scalable to meet needs as they grow. Whereas an undersized DSS database might force you to go to lunch early an undersized OLTP database will cost you customers. Nobody is going to order books from an online book store if the OLTP database can't update their shopping cart in less than 15 seconds.

The OLTP feature you tend to hear most often is "row level locking", in which a given record in a table can be locked from updates by any other process until the transaction on that record is complete. This is akin to mutex locks in POSIX threading. In fact OLTP shares a number of the same problems programmers do in concurrent programming. Just as you'll find anywhere, when you've got a bunch of different persons or processes all grabbing for the same thing at the same time (or at least the potential for that to occur) you're going to run into problems and raw performance (getting your hands in and out as quick as possible) is generally one of the solutions.

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<http://cuddletech.com/articles/oracle/node67.html>



INTRODUCTION

The design of a data warehouse database and online analytical processing (OLAP) cubes is fundamentally different than a transactional processing database (OLTP). The data warehouse is specifically designed to facilitate super fast query times and multi-dimensional analysis. The following table summarizes the major differences between OLTP and OLAP system design.

	OLTP System Online Transaction Processing (Operational System)	OLAP System Online Analytical Processing (Data Warehouse)
Source of data	Operational data. OLTPs are the original source of the data.	Consolidation data. OLAP data comes from the various OLTP Databases
Purpose of data	To control and run fundamental business tasks	To help with planning, problem solving, and decision support
What the data Reveals	A snapshot of ongoing business processes	Multi-dimensional views of various kinds of business activities
Inserts and Updates	Short and fast inserts and updates initiated by end users	Periodic long-running batch jobs refresh the data
Queries	Relatively standardized and simple queries Returning relatively few records	Often complex queries involving aggregations
Processing Speed	Typically very fast	Depends on the amount of data involved: batch data refreshes and complex queries may take many hours; query speed can be improved by creating indexes
Space Requirements	Can be relatively small if historical data is archived	Larger due to the existence of aggregation structures and history data; requires more indexes than OLTP
Database Design	Highly normalized with many tables	Typically de-normalized with fewer tables; use of star and/or snowflake schemas
Backup and Recovery	Backup religiously; operational data is critical to run the business, significant monetary loss and legal liability	Instead of regular backups, some environments may consider simply reloading the OLTP data as a recovery method

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http://www.rainmakerworks.com/pdfdocs/OLTP_vs_OLAP.pdf

Glossary of terms

Data mart	Can be thought of as a subset of a data warehouse. Smaller and less formally structured.
Data redundancy	Unnecessary repetition of data in a database.
Data warehouse	A very large store of data engineered to be searched for trends the searcher is not necessarily aware are there at all!
IEEE	An international body that sets standards for data handling. Stands for <i>Institute of Electrical and Electronics Engineers</i> .
Inventory	Stock level.
Mutex lock	A contraction of mutual exclusion. Used in programming of searches so that only one user may alter a record at a time.
Normalise	Place data into separate tables to minimise data redundancy.
OLAP	Online analytical processing systems analyse data in batches, performing often complex queries. Results can take minutes, or even hours, to arrive.
OLTP	Online transaction processing systems are databases that handle queries in real time and remotely. They generally respond to a query very quickly – within seconds – because the queries are usually very simple. They work with highly normalised data.
POSIX	A standard (IEEE) for creating programs that search data.
Real time	The opposite of batch processing. Requires a client-server architecture where a request is processed immediately.
Thread	A part of a computer program. Some computers are able to run more than one thread at a time.

Activity 2b – Social and Ethical Issues

This extract from the article “*Big, Friendly Giant... or Big Brother?*” by David Smith, was originally published in the *Good Weekend* supplement to the Sydney Morning Herald on 13th September, 2008.

... Google News, launched in 2002, aggregates breaking stories from traditional media sources around the world. Newspapers complain that their hard-won exclusives are being hijacked to boost Google’s profits. In 2004, Google announced partnerships with leading libraries and universities to scan digitally millions of books from their own collections. Today, a visitor to Google Book Search can read on screen or download the full text of *Oliver Twist*, *The Wealth of Nations*, or innumerable out-of-copyright titles. A search will also bring up parts of books still in copyright. Google Maps and Google Earth, launched in 2005, offer an astonishing interactive map of the planet, stitched together from aerial and satellite footage licensed from NASA and various private companies. Google Street View takes this a step further by providing photographs taken at eye level, which has prompted media alarm about invasion of privacy...

But it was Google’s acquisition of YouTube, the phenomenally popular video sharing site, that caught most attention as a disrupter of the old media landscape. Its willingness to let people post and watch video clips free has panicked the TV and film industries and provoked a \$US1 billion lawsuit from entertainment group Viacom for “massive copyright infringement”.

Google’s tentacles are everywhere. It runs services for blogging, email, instant messaging, shopping and social networking. It offers a suite of word processing, spreadsheet and other tools to rival Microsoft’s products in the workplace. It is building a software platform for mobile phones to rival Apple’s iPhone and others. It has just launched Knol, a peer reviewed encyclopedia to take on Wikipedia. In the US, Google Health allows users to maintain their own medical records. The company is also working on language translation, speech recognition and video search. Brin and Page even have their eyes on space: they have offered a \$US20 million prize to anyone who can make a privately financed spacecraft able to land on the moon...

Activity 3a – A marker's perspective

2007 HSC: Question 21

A family of five people has dial-up internet access at home. They plan to upgrade to cable internet access. The family wants to send text-based email and download podcasts, radio, television and music online. The family has the following table of information about plans offered by an internet service provider.

Upload speed	Monthly data allowance	Monthly price	Plan name
128 kbps	800 MB	\$29.95	Cable Light
256 kbps	800 MB	\$34.95	Cable Light Plus
128 kbps	2 GB	\$39.95	Cable Extra
256 kbps	7 GB	\$49.95	Cable Max

...(c) The family is considering the Cable Light Plus or Cable Extra plans. Which would be the better plan for this family? Justify your answer.

Source: http://www.boardofstudies.nsw.edu.au/hsc_exams/exam-papers-2007/pdf_doc/info-process-tech-07.pdf

Sample scripts – HSC 2007, question 21 c)

A The family should choose the cable light plus plan.

B The family should choose cable extra because it has more data. It's tricky to decide because although it has more data, its speed is lower, so the family would have to wait longer and the computer would be tied up for longer and there might be fights. I would pay the extra 10 bucks myself and get the cable max plan.

C cable light plus plan – higher upload speed so you get music and TV faster.

D Cable extra

- more download needed because the files the family is downloading are large, especially video
- upload speed is less relevant because they're only sending text-based email - small files

Notes from the marking centre

c) Better responses recognised that upload speed was not a significant requirement for the family in the scenario but monthly download allowance was a more important feature. These responses clearly explained the large file sizes associated with downloading podcasts, radio, television and music online.

Mid-range responses were able to identify *Cable Extra* as the most appropriate plan but their justification needed greater depth with regard to the files sizes involved in the downloading process.

Weaker responses often mixed the concepts of uploading and downloading and chose the *Cable Light Plus* plan

Marking Guidelines

Response recommends one of the two plans the family is considering and provides a credible justification. Better responses will provide a thorough justification or provide more than one appropriate reason with justification for their recommendation	2–3
Response provides a weak justification for either plan or states the cable extra plan	1

Source: http://www.boardofstudies.nsw.edu.au/hsc_exams/exam-papers-2007/pdf_doc/information-processes-technology-notes-07.pdf