Stage 6 Information Processes and Technology

## System and Data Modelling Tools

The Information Processes and Technology course (IPT) contains many methods to conceptually and diagrammatically represent data within an information system. These modelling tools are essential in the design and development of information systems and are used both to analyse the system and to explain how the information system works to clients, customers and users.

Practise in using these tools to model existing information systems will assist students to understand the information processes and design improved systems.

## Outcomes

* **H1.1** applies and explains an understanding of the nature and function of information technologies to a specific practical situation
* **H1.2** explains and justifies the way in which information systems relate to information processes in a specific context
* **H2.1** analyses and describes a system in terms of the information processes involved
* **H2.2** develops and explains solutions for an identified need which address all of the information processes
* **H6.1** analyses situations, identifies needs, proposes and then develops solutions

[Information Processes and Technology Stage 6 Syllabus](https://educationstandards.nsw.edu.au/wps/portal/nesa/11-12/stage-6-learning-areas/technologies/information-processes-technology-syllabus) © NSW Education Standards Authority (NESA) for and on behalf of the Crown in right of the State of New South Wales, 2009.

## Delivery strategies

The suggested strategy involves using the past HSC questions as a ready source of case studies and scenarios which reflect the standard of understanding required. Teachers could choose to allocate one or two particular questions and have students analyse the system within the scenario, identify and use the most appropriate modelling tool.

Alternatively students could be asked to collate scenarios/case studies and then apply the appropriate system and data modelling tools for teacher and peer review.

The IPT [Course specifications](https://educationstandards.nsw.edu.au/wps/wcm/connect/40f60177-dbbc-4a0a-85c1-8082aeaa478b/information-processes-and-technology-course-specifications.doc?MOD=AJPERES&CVID=) includes the following system and data modelling tools:

* Context diagrams
* Data flow diagrams
* Decision tree
* Decision table
* Schemas
* Data dictionaries
* Normalisation
* Storyboards

This resource is adaptable for teachers to use with online platforms such as Google classroom. Links to the videos and websites could be posted for students to access during learning at home. The activities and questions could be set as classwork documents within Google classroom that the students complete and submit for a grade or feedback. Alternatively, students could receive the activities and questions as worksheets to complete and submit at a later date.

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| Focus area | System and Data Modelling Tools |
| Syllabus content | * Tools used in designing, including:
	+ context diagrams
	+ data flow diagrams
	+ decision trees
	+ decision tables
	+ data dictionaries
	+ storyboards
* Data modelling tools for organising databases, including:
	+ data dictionaries to describe the characteristics of data including:
	+ field name
	+ data type
	+ data format
	+ field size
	+ description
	+ example
	+ schematic diagrams that show the relationships between entities
	+ normalising data to reduce data redundancy
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| Resources | IPT [2019 HSC Examination](https://educationstandards.nsw.edu.au/wps/portal/nesa/resource-finder/hsc-exam-papers/2019/information-processes-and-technology-2019-hsc-exam-pack) and use links to access additional previous years.IPT [Course specifications](https://educationstandards.nsw.edu.au/wps/wcm/connect/40f60177-dbbc-4a0a-85c1-8082aeaa478b/information-processes-and-technology-course-specifications.doc?MOD=AJPERES&CVID=)[Lucidchart](https://www.lucidchart.com/)– access website through Google Apps for Education.[Entity Relationship Diagrams](https://www.youtube.com/watch?v=QpdhBUYk7Kk) from Lucidchart (duration 6:57).[Lucidchart Basic Tutorials](https://www.youtube.com/playlist?list=PLUoebdZqEHTz0aKtk6dygh4dQIz6WDP99) playlist. |
| Activities/questions | 1. Go through IPT examination papers and select and collate all of the questions based on case studies and/or scenarios.
2. For each scenario:
	* underline the external entities. These should be sources and sinks where data goes to and from the system.
	* identify the data and its type, for example: text, numbers, and images.
	* identify (or highlight) any and all the processes (COASPTD). Where the exact process is not mentioned, look for verbs and match to a corresponding process.
	* describe or outline any dataflows.
3. Select the most appropriate data and/or systems modelling tools to visually represent this information system. The IPT [course specifications](https://educationstandards.nsw.edu.au/wps/wcm/connect/40f60177-dbbc-4a0a-85c1-8082aeaa478b/information-processes-and-technology-course-specifications.doc?MOD=AJPERES&CVID=) should guide your choice.
4. Using your @education account, access Lucidchart in Google Apps for Education.
5. Use the data and systems modelling tools in Lucidchart to visually explain each scenario/case study.
6. Export these finished models to a presentation that includes the text in the original case study/scenario.
7. (Optional) Provide an answer to the question
8. Submit this for teacher and/or peer review.
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