Information Technology VCE Units 1 & 2

# School Assessment Task

## Unit 2 Outcome 1

**On completion of this unit, students should be able to apply the problem-solving methodology and use appropriate software tools to create data visualisations that meets users’ needs.**

In Unit 2 Outcome 1, you are required to produce a data visualisation that meets the needs of a user. This will involve using a complex data set and accessing software or online tools that will enable you to convert this data into a more meaningful format.

### Learning milestones

1. Familiarise yourself with the design brief and analyse the information problem that exists
2. Determine the type of data visualisation that might be needed to solve the information problem
3. Select appropriate sources of data and identify relevant data
4. Determine the suitability of different data types and structures for creating visualisations
5. Select types of visualisations that are appropriate to the data
6. Select and apply appropriate tools to plan the design of the visualisations
7. Apply software functions to locate and acquire data that will be input and manipulated
8. Use appropriate software tools, and select and apply a range of suitable functions

**Case Study**

You have been employed by *Quit Australia* to put together a slideshow they can present to the Board of Directors, which supports the contention that rates of smoking have decreased in Australia since the 1940s **and** which provides information about which regions of Victoria you would advise *Quit* to focus on next.

They have referred you to two sites which they want you to use in your presentation.

1. <http://en.wikipedia.org/wiki/List_of_countries_by_cigarette_consumption_per_capita>
2. <http://www.quit.org.au/resource-centre/fact-sheets/tobacco-fact-sheets/australian-smoking-rates.aspx>

**Software**:

You can use **Excel** for some tasks, but you must make *at least three* of the visualisations using the **Google Docs Spreadsheet** website. All charts are to be appropriately labelled (title, x and y axis) and in the most appropriate format. **Word** can be used for Step 6: Evaluate the **likely impact** on the ability of the user to make clear decisions based on how information is communicated through the data visualisations.

### Steps to be followed

The analysis, design, development and evaluation stages of the problem-solving methodology will be used to create the solution. Carefully follow the steps below.

**TASK 1: ANALYSIS** (Done mostly in SAC books)

1. Analyse and define the problem. From the design brief, **identify** the following:
2. the factors that affect the problem
	* Constraints & Limitations (Page 186 – 187)
3. the data visualisation needs of the user (Requirements) (Page 185)
	* Load up the website at: <http://www.quit.org.au/thebigkill/> and answer the following questions in full sentences in your SAC book or with Excel where required:
4. Click onto the Victoria link. How many deaths can be directly attributed to smoking (number and percentage)
5. What is the most common cause of death amongst smokers?
6. Click onto the statistics for Frankston (Metropolitan area). How many deaths can be directly attributed to smoking (number and percentage)
7. What is the most common cause of death amongst smokers in Frankston?
8. Compile a table in Excel which shows the region, the total number of deaths, deaths from smoking and the percentage for the regions of Horsham, Loddon, Mansfield, Murrindindi, Mildura and Benalla.

|  |  |  |  |
| --- | --- | --- | --- |
| Region | Total deaths | Smoking deaths | Percentage |

1. From your data, compile a chart which shows the deaths from smoking for each region as compared with the whole of Victoria. (Based on Page 180)
	* How is the organisation going to use the information?
	* In what format does the solution need to be presented?
2. the data visualisation products to be produced to meet the user’s needs (Scope) (Page 187 – 196 Types of data visualisations)
* Quit Australia require you to make the following visualisations. Identify the type of visualisation you will design for each one.

A comparison between the rates of smoking in Australia, USA, England, New Zealand, Greece, Japan, Spain, Russia, India and Sri Lanka.

A comparison between Australian male and female smokers for the period 1945 – 2007

A graph showing how adult smoking has declined overall in Victoria between 1983 – 2009

**Two** separate charts showing how the rate of smoking in secondary school students has decreased for both males and females.

A comparison between deaths from smoking for Victorians and other causes such as road accidents, alcohol and other drugs

A word cloud which shows some of the diseases/problems that can result from smoking.

1. appropriate sources of data that must be processed to produce the solution (Quantitative & Qualitative, use of .csv files, etc) (Page 181 – 182). Keep a bibliography and save your data in the correct folder (U2O1\_Your Name\_Visualisations\_SAC) using appropriate file names and formats.
2. Write out a clear Problem Statement. The problem to be solved is best written as a short statement or question. (Page 206) For instance: How can Southside Makers improve the **effectiveness** of their marketing campaign to increase attendance at their markets?
3. List the Evaluation Criteria that will be used to evaluate the solution (Page 205 – 206)

**Time:** 2 x 57 min sessions

**TASK 2: DESIGN**

1. Design the solution. This includes:
2. use of techniques including flowcharts, storyboards or layout diagrams for all aspects of the output, both on screen and in printed reports. **List** all output required and **then** use the techniques (page 203 – 204)
3. a decision about which software and hardware are most suitable for producing the data visualisations. In a 2-column Table, list of the ones you will use for your solution and explain why you have chosen each one (Page 201 – 202, 206 – 207)
4. annotating your output designs with all the formats and conventions that will be used **in the data visualisation** (Page 207 – 208)
5. the selection of the test data and creation of a test table that will be used to conduct tests to check that the data visualisation is producing the information that is required. (page 35 – 37)

eg:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Type of test | Data used | Expected result | Actual result | Correction needed |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
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**Time:** 2 x 57 min sessions

**TASK 3: DEVELOPMENT**

1. Develop data visualisations that can be viewed either on screen or in hard copy, depending on the needs of the user. This includes:
2. producing clear and concise data visualisations
3. showing the source/s of the data that you are using
4. ensuring that you have correct headings, axis labels and measurements to ensure clarity in the data visualisation.( To do this, use *Print Screen* to get Screen shots of **two** of the visualisations and annotate one to show that formats have been applied and the other to show conventions used.)
5. Produce a slideshow (6 slides total) of the required visualisations and your final decision on which regions of Victoria you would advise *Quit* to focus on next.
6. Test the solution. Detail how you have checked that the output produced is working as expected. Test data selected in the design stage will be used. This includes:
7. testing that the source data is displayed correctly in the data visualisations
8. testing the clarity of the data visualisations
9. testing the relevancy of the data visualisations

You will need to provide testing tables showing functions of the data visualisation software tested, results that are expected using the data and the actual result that was observed when using the software to produce the data visualisation.

**Time:** 3 x 57 min sessions

**TASK 4: EVALUATION**

1. Evaluate the solution.

Using the Evaluation Criteria prepared as part of **Analysis step f.,** prepare an evaluation feedback form and gain feedback from the known audience. (page 205 – 206)

1. Discuss the **likely impact** on the ability of the user to make clear decisions based on how information is communicated through the data visualisations. For instance, identify the decisions the user will be able to make with the data visualisations. (Page 202 – 203 Purposes of Visualisations)

**Time:** 1 x 57 min sessions

**Bibliography:**

**Information Technology VCE Units 1 & 2, 5th edition** 9780170187466 © Cengage Learning Australia 2011 2

Data Visualization Exercise – Janet Bane