Software Design Document

*NSW Traffic Penalty Data Search*

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# System Vision

## Problem Background

The dataset that will be analysed is the NSW traffic penalty dataset which include reports from 2011 until 2017. The dataset holds a wide variety of information, including but not limited to, the financial year of the offence, the month of the offence, offence description, offence code, legislation the offence falls under and location.

Users will be able to input selected time periods, penalty codes, keywords, and phrases, if the penalty case was detected by cameras to receive and output of information within the given constraints. This output can be altered to produce information in the form of graphs, with additional information available such as the average value ($AUD) of the penalties.

The program helps solve the issues the user may have with displaying and organising the data to be able to gather useful information that can be used to help change areas of the organisation and see what is working and what needs to focus on more.

This program will be used by government officials such as police departments to keep track of data.

## System Overview

This system will be designed to provide specified data about the NSW traffic penalties to the user. It will be able to produce graphs for greater insight of the information and filter data specified to what is wanted by the user.

The system will include browsing functions which will let the user view all information. This browsing function will include features such as the ability to filter information -this can be by date, case codes, keywords, and phrases, or if the penalty case was detected by cameras-, as well as the ability to generate graphs for the information and calculate the average value ($AUD) of the penalties.

## Potential Benefits

The potential benefits this program proposes is the user has access to data analysis tasks without the need for extensive knowledge of a sorting program such as a database or excel formulas. With the data being displayed and filtered it can be used to in analysis on which area is doing well and which is not as well as the common penalties that are happening which can lead to more understand of what needs to be focused on.

# Requirements

## User Requirements

As a user I can search through the data based on a start and end date.  
As a user I can search through the data based on a keyword.  
As a user I can remove data that is not recorded on camera.  
As a user I can search through the data based on a keyword within a start and end date.  
As a user I can toggle if the data is searched though the last data displayed or though the full dataset.  
As a user I can swap tabs between the data table and the graph tab.  
As a user I can display a bar graph of the case distribution in each offense code within a start and end date .  
As a user I can display a bar graph of the mobile phone penalty data within a start and end date.  
As a user I can display a line graph of the average cost of penalty cases within a start and end date.

## Software Requirements

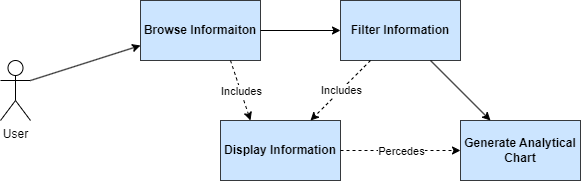
* 1. The program shall be able to load csv files into the required format.
  2. The program shall accept a start and end date as a search parameter.
  3. The program shall accept the start and end date parameter while using other search parameters.
  4. The program shall accept a keyword as a search parameter.
  5. The program shall remove all data not recorded on camera if selected.
  6. The program shall have a toggle to search through the previously searched data or the full dataset.
  7. The program shall display a bar graph of the case distribution in each offense code.
  8. The program shall display a bar graph of the mobile phone penalty data.
  9. The program shall display a line graph of the average cost of penalty cases.

## Use Cases & Use Case Diagrams

In this section you provide some use cases showing how people may use your software.

Look im gonna be real. Not too sure what functions we are going to have.

Example below.



# Software Design and System Components

## Software Design

A block diagram/flowchart of how your software might work

## System Components

### Functions

Preliminary list of all functions in the software. For each function in the list the following information is provided:

* a brief description of what it does (1 or 2 sentences);
* a list of the input parameters, and their data types, and what they are used for;
* a list of any side effects caused by the function (ie change global or member variables, changes data passed by reference from calling function etc)
* a description of the function’s return value

Function Name: Dataframe

Function Description: Converts data from csv to dataframe

Function Inputs: Data from NSW traffic penalty dataset

Function Side Effects: N/A

Function Return Value: Converted data

Function Name: Date Search

Function Description: Used in every other function to select data within a specified period, if left blank this will default to max. Can be searched alone

Function Inputs: Data, Search Dates (Must include start and end date)

Function Side Effects: N/A

Function Return Value: Adjusted Data List

Function Name: Keyword Search

Function Description: Filters data and provides the user with data that contains a specific keyword

Function Inputs: Data, Search Keyword, Search Column

Function Side Effects: N/A

Function Return Value: Adjusted Data List

Function Name: Penalty Code Search

Function Description: Filters through and provides data that contains the penalty case code/s

Function Inputs: Data, Search Code (Can input multiple values. Will need to be separated with a ‘,’ comma), Search Column

Function Side Effects: N/A

Function Return Value: Adjusted Data List

Function Name: Bar graph of case distribution

Function Description: Produces a bar graph of the different case codes within the user selected period.

Function Inputs: Data from previous functions

Function Side Effects: N/A

Function Return Value: Bar graph showing the case distribution

Function Name: Line graph of average penalty case cost

Function Description: Generates a line graph of the average penalty case cost ($AUD) with data produced from the user selected parameters

Function Inputs: Data from previous functions (Requires at least 1 input from another function)

Function Side Effects: N/A

Function Return Value: Line graph showing the average penalty case cost in $AUD

Function Name: Refresh Toggle

Function Description: If on, refreshes the users search parameters so it includes all data. If off, keeps the users previous search parameters when searching again.

Function Inputs: Toggle on/off

Function Side Effects: N/A

Function Return Value: Adjusted Data List

### Data Structures / Data Sources

List of all data structures in the software (eg linked lists, trees, arrays etc) or eternal data sources. For each data structure in the list the following information is provided:

* Type of structure (tree, list etc),
* Description of where and how it is used
* List of data members, and what each one is for do
* List of functions that use it

### Detailed Design

Pseudocode for all non-standard / non-trivial algorithms that operate on data structures

# User Interface Design

This is your initial interface design. Describe the tools you used for this design stage and any key findings that informed your design. This introduction is descriptive and should explain what you have completed for the actual design work you will present in the sub-sections below.

## Structural Design

Structural design refers to the navigational and information structure of your product – the structure that supports the interface layout. How will you structure your product? How will you group your information? How will you navigate through your product? Why? This can take the form of a diagram showing structure and hierarchy, supported by a discussion and justification of your choices. Why have you made these design choices? Describe and outline the structure of your interface and of your information.

## Visual Design

Detail your visual design: Layout, visual elements, icons, graphics, style, colour, fonts general screen designs. This can be sketches, wireframes, mockups etc, supported by a discussion, explanation, and justification of your choices.