Software Design Document

New York Restaurant Inspection Results

Kartik Mathur

Manish Shrestha ( s5308120 )

Nivethaa Elangovan ( s5298899 )

Table of Contents

[1.0 System Vision 3](#_Toc46748622)

[1.1 Problem Background 3](#_Toc46748623)

[1.2 System Overview 3](#_Toc46748624)

[1.3 Potential Benefits 3](#_Toc46748625)

[2.0 Requirements 4](#_Toc46748626)

[2.1 User Requirements 4](#_Toc46748627)

[2.2 Software Requirements 4](#_Toc46748628)

[2.3 Use Cases 4](#_Toc46748629)

[3.0 System Components and Software Design 5](#_Toc46748630)

[3.1 System Components 5](#_Toc46748631)

[3.2 Software Design 5](#_Toc46748632)

[4.0 User Interface Design 6](#_Toc46748633)

# System Vision

## Problem Background

The data was collected by the Department of Health in NYC which collected the inspection report for permitted food establishments and graded them on a scale of A-F. Records for each restaurant collected contain the inspection date, type, action, address, cuisine description, violation code and description from January 1, 2010, to August 29, 2017. The dataset provides a vast range of information which when viewed cannot give an idea or provide the user with any knowledge. The dataset needs to be visualized in order to get interesting insights and finding it is very hard without data visualization. So for the Department of Health, it is very easy to get a summary of the data if their dataset is visualized in such a way that it provides a dashboard summary and gives them a data report. Another problem is that the user cannot search by any type or view all of the results after searching. By exhibiting all listings' information, offering a visitation chart, and fetching all records that contain a specific keyword that may be tied to the user input, the built application will enable the delivery of data reports at the selected start and end date.

## System Overview

## Potential Benefits

# Requirements

## User Requirements

In this section you detail how a user is supposed to interact with or use your program. What do they ***need*** to be able to do? This should all be from the end users perspective. Can be a combination of narrative text and listing of needs.

**Assignment note: You have not been given a client/user, so you can make one up. Who do you think would be using your software?**

## Software Requirements

In this section you detail what the requirements for the software are. What functionality will it provide? This is usually a formal listing, with requirements often using the word ‘Shall’. IE:

R1.1 The program shall accept multiple file names as arguments from the command line.

R1.2 Each file name can be a simple file name or include the full path of the file with one or more levels.

etc …

Can be primarily functional requirements, though you may include other types if you think of them.

## Use Cases & Use Case Diagrams

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

# 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

### 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.

In this section, we will discuss in detail the User Interface Design of the proposed software which is used to visualize the New York Restaurant Inspection Results dataset. The actual design is created using Canva, a graphic-design tool and Microsoft Visio is used to design a low-fidelity wireframe and structure of the product. This section comprises of two sub-sections: 1) Structural Design, which will elaborate on the workflow of the product and a detailed analysis of the design and 2) Visual Design, which focuses only on the visual elements of the product.

## 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.

The product is designed in such a way that it is self-explanatory and is user-friendly. It consists of two main pages: 1) Home and 2) Dashboard. We will discuss in detail about each page in this section.

**Basic Structure**

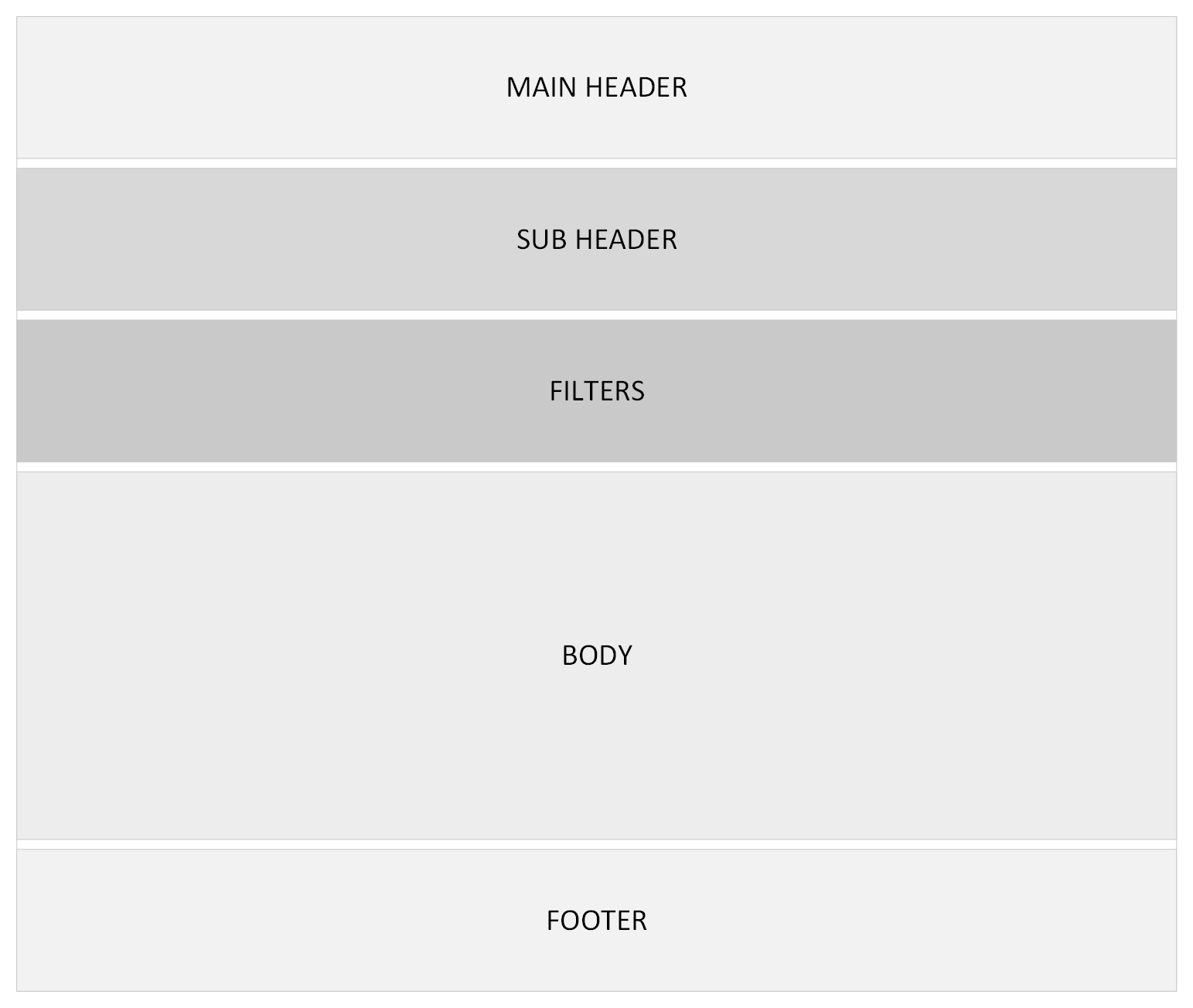


Figure 4a Basic structure of User Interface

Each page is divided into five sections as shown in figure 4a which are explained as follows:

* + Main Header: This section of the page contains the name of the product, the loggedin username and a dropdown-menu for the user ( The dropdown-menu will not be developed in this project as there is no requirement for a user login)
  + Sub header: This part contains the navigation tabs to toggle between pages. It displays the title of the dataset used.
  + Filters: This section contains any filtering options used to filter the dataset as per the user requirements. In addition, it also contains the export option to export the filtered dataset.
  + Body: This section contains the dataset displayed in the form of table or charts.
  + Footer: It contains copyright information and any other additional contact information.

**Detailed Structure**

**Home Page**

****

Figure 4b shows the detailed structure of the main or home page of the product that the user will see initially. The first section will contain the logo and/or the product name on the top left corner and the user icon will be displayed on the right for the loggedin user. Below that is the sub header section, which will comprise of two tabs: Home and Dashboard to toggle between the two pages. On the right side of this section, the title of the dataset will be displayed.

The thrid section will feature any filters that are applied on the dataset. On the left side, there are two date fields which will enable the user to select a start date and an end date from a datepicker, based on which the dataset will be filtered. A view button is provided next to the date fields to initiate the search action. On the right side of the same section, an input box is provided. The dataset will be filtered and displayed based on keyword entered in this section. It also contains an export button which can be used to download the filtered dataset.

The fourth section contains the actual data that is displayed as a table. The table comprises a header ( column headings ), body ( values ) and footer ( pagination ). The table will display only important information related to any search to make it presentable and avoid data congestion that may occur with long text data. Since an export option is provided the user will be able to view all columns by exporting the data. The fifth section will display copyright information and any other contact information.

**Dashboard Page**

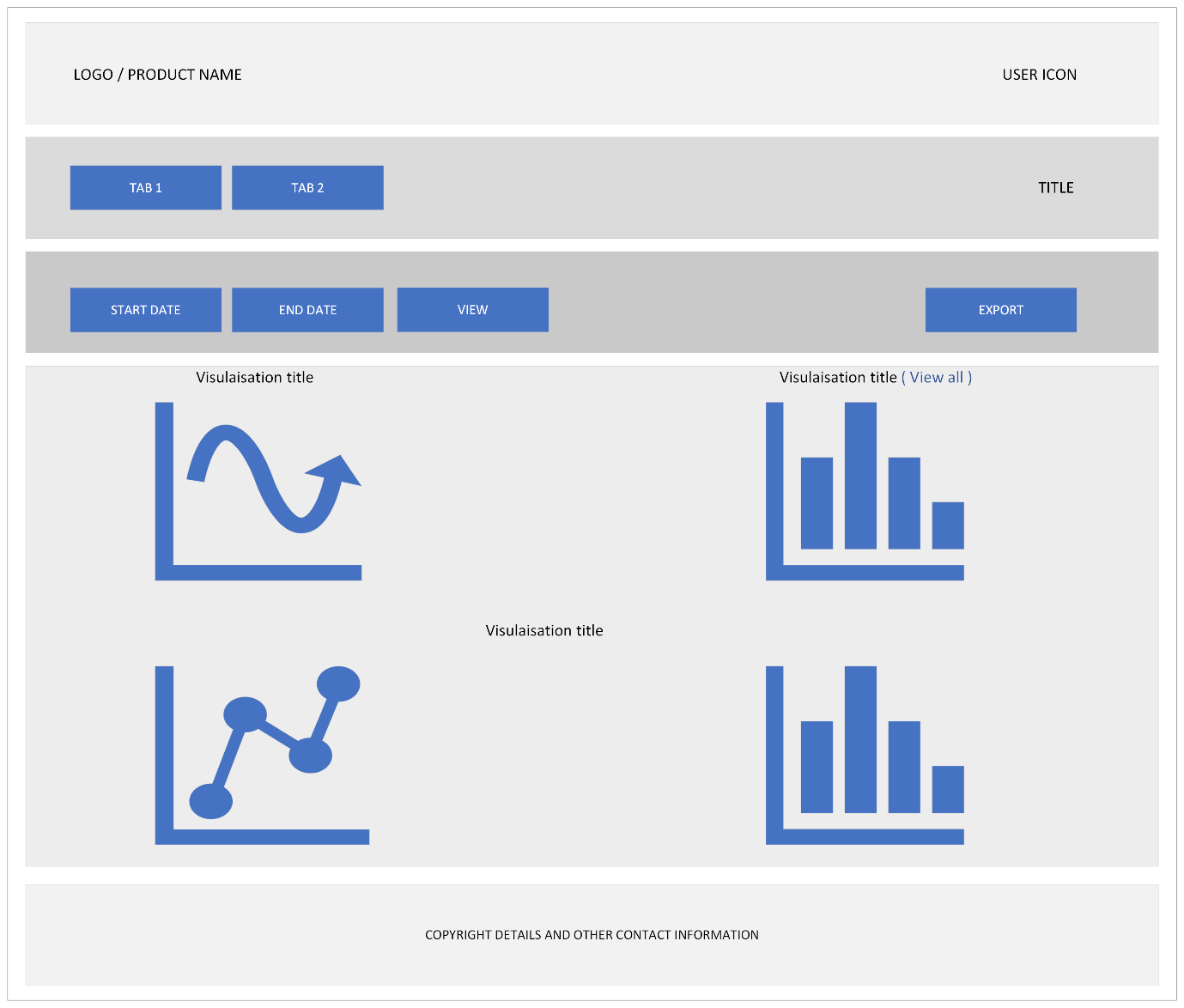


Figure 4c shows the dashboard page which will be displayed when the user selects tab 2. This page will feature all visualizations for the dataset in the body section of the page. The same header, subheader, filter and footer sections are retained. But this page does not have the keyword search option since we have 4 different visualizations and the parameters for each one differs.

* Visualisation 1: Violation Distribution over Suburbs

This plot will visualise the violations across different suburbs. The suburbs will be listed along the x-axis with the numerical values listed along the y-axis. This will be a box and whisker plot.

* Visualisation 2: Violation count per cuisine ( Additional visualization / Inisight )

This plot will visualise the violations across different suburbs based on the cuisine. The data will be plotted as a clustered column chart. The violation will be plotted along the bottom x-axis and the cuisines will be clustered along the upper x-axis. The y-axis will denote numerical values or count of violations. There are numerous violation codes so the initial visualization will feature only a few. The “View all” link next to the visualization title will redirect to a new page where all the violation code will be plotted.

* Visalisation 3: Violation related to animals

There are two visualisations in this part. Firstly, the violation cases related to animals and their trend over time is plotted as a line chart. Each line will indicate an animal. The x-axis will denote time period ( months/years ) and the y-axis will denote numerical values to represent count of cases over time. Secondly, the violation cases related to animals over different suburbs will be displayed as a histogram with suburbs listed along the x-axis and the numerical values denoted along the y-axis.

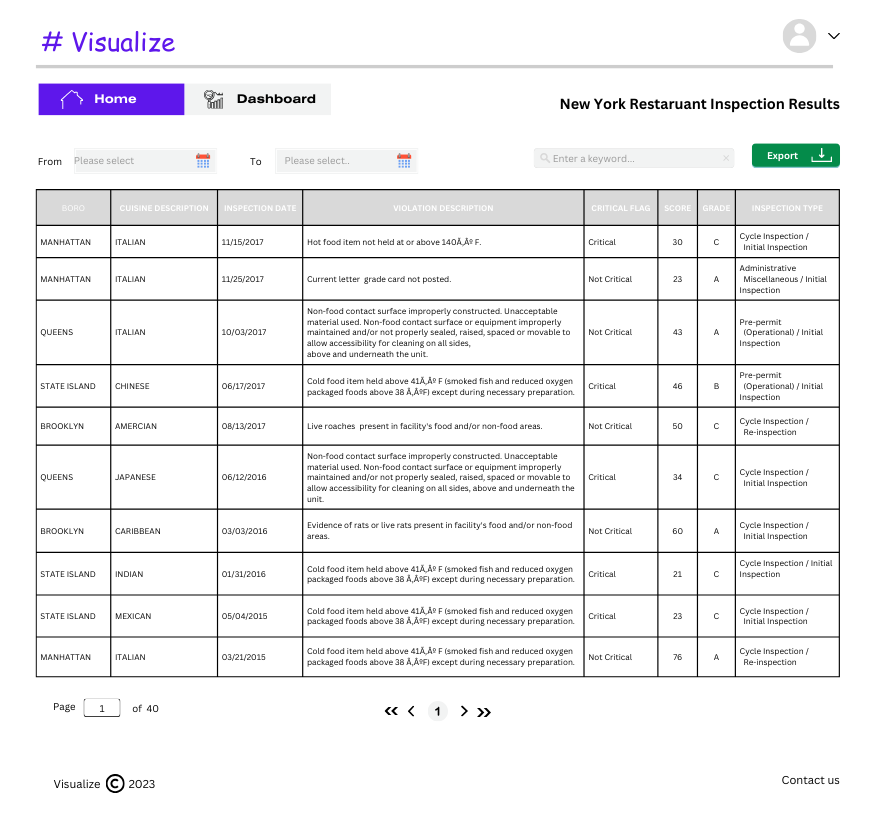
**Conceptual Model**

A diagram of a process

Description automatically generated with medium confidence

## 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.



A screenshot of a graph

Description automatically generated