



A Study of the Design and Development of a Crime Data Visualisation Dashboard for UK Cities

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1 - Introduction

This project focuses on the design, development, and evaluation of an interactive crime data dashboard for UK cities. The system integrates publicly available crime datasets and transforms them into a structured analytical model that allows for the dynamic exploration of crime trends and how they have developed over time. The project is an applied computing investigation into how data modelling, visual design, and user interaction principles can combine to increase decision support and public understanding of a complex social issue.

3- Research

Research conducted on crime mapping illustrates the significance of spatial visualisation when it relates to identifying crime hotspots and supporting informed decision making. There are often limitations due to the anonymisation of crime data, effectively meaning that precise locations are often generalised to protect privacy. This subsequently reduces spatial granularity and could in turn affect the interpretation of patterns. Ethical considerations should also be a key factor in crime data visualisation. Including sensitive categories, such as violence and sexual offences, requires careful handling to avoid misrepresentation or unnecessary alarm. Additionally, a wide range of user groups may have different needs that should be considered. A large portion of public users may prioritise a simple and easy to use interface, while more advanced users may prefer more detail and interactive features. This reinforces the significance of understanding your users and tailoring your design to them when developing a public-facing dashboard.

4 – Design & Implementation

Several visualisations were chosen to represent various aspects of the data. Each visual was carefully selected dependent on its suitability for conveying information and its alignment with best practices in data visualisation. For instance, crime trends over time were illustrated through a line chart. This visualisation allowed users to identify fluctuations in crime rates. The design decisions chosen during the implementation stage were guided by the need to balance, usability, performance, and analytical depth. The use of aggregation and data transformation techniques ensured that dashboard responsiveness despite the large dataset. At the same time, including interactive filters and clearly structured visuals supported user engagement and ease of use. The decision to include a key insights panel represents a shift from purely descriptive visualisation towards interpretative analytics. This aligns with the broader objective of enabling users to derive meaningful conclusions rather than simply observe data patterns. In future versions of the dashboard, there may be opportunities to make the key insights dynamic, possibly adjusting with filter adjustments.

5 - Testing

There is a strong level of functional correctness in the dashboard. The visual components respond dynamically to user input, with filters consistently applied across the map, visualisations, and key performance indicators. This confirms that the underlying data model and relationships were implemented successfully. Preliminary testing involved applying a range of filters, including crime type, date range, and geographic region, to confirm that all visuals updated appropriately. For instance, selecting a specific crime type resulted in corresponding change across the map, trend line, and visualisations. Similarly, restricting the date range to a single month produced accurate adjustments in temporal trends and total crime counts.

6 - Conclusion

The final dashboard represents a successful outcome, as it showcases the ability to integrate data preprocessing, modelling, and visualisation into an understandable and user-friendly system. Nonetheless, the reflective process has illustrated areas for improvement and provided a basis for how to effectively develop a dashboard. Overall, the project has reinforced how important it is to be adaptable, think critically, and consider user-focused design in the development of data-driven solutions, which aligns with wider perspectives on professional growth and reflective practice

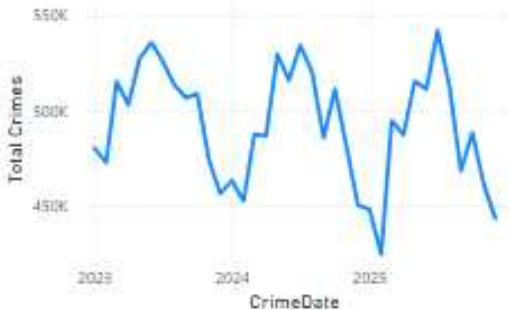
2 – Aims and Objectives

Aim:
To design and develop an interactive data visualisation web-based dashboard that presents crime data for cities within England, Wales, and Northern Ireland, enabling users to analyse crime distributions, trends and hotspots effectively.

- Objectives:**
1. To collect and review open crime datasets from official UK police sources.
 2. To design and develop an interactive web-based dashboard using a modern data visualisation library (Power BI).
 3. To implement data filtering and mapping features that allow users to filter crime by type, area, and date.
 4. To evaluate the usability and effectiveness of the dashboard using user feedback and data accuracy checks.

Dashboard Visualisations

Crime Trends Over Time



Total Crimes by Crime Type

