KULLIYYAH OF INFORMATION & COMMUNICATION TECHNOLOGY

INFO 4312 INFORMATION VISUALIZATION

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SECTION 2

GROUP PROJECT - REPORT ON CRIME INDEX MALAYSIA FROM 2021-2023

PREPARED BY:

NAME	MATRIC NO.
Ahmad Adlan Bin Abdul Halim	2215775
Muhammad Hafiz Faruqi bin Md Saifuddin	2217241
Muhammad Ikmal Hakimi bin Rosli	2210827
Muhammad Irfan bin Zakaria	2120199

LECTURER: ASSOC. PROF. DR. MADIHAH BT. S. ABD. AZIZ

VIDEO PRESENTATION LINK: https://www.youtube.com/watch?v=Glbiz8HB-O8

1.0 Introduction

1.1 Selected Dataset & Source

The dataset titled "CRIME INDEX IN MALAYSIA (2021-2023)", provided by the Royal Malaysia Police (PDRM), serves as the foundation for this study. It offers a comprehensive overview of crime statistics in Malaysia over three years, categorized by year, states/contingents, districts, and crime types. The dataset divides crimes into two primary categories:

- **Assault Crimes:** Including murder, rape, gang robbery (with/without firearms), robbery (with/without firearms), and causing injury.
- **Property Crimes:** Covering house break-ins, vehicle thefts (e.g., lorry/van, motorcar, motorcycle/scooter), and other thefts.

1.2 Research Question

"How have crime trends and patterns in Malaysia evolved across states and crime types from 2021 to 2023, and what regional insights can be derived to enhance public safety and law enforcement strategies?"

This research question aims to analyze the evolution of crime trends and patterns in Malaysia over a three-year period, focusing on variations across different states and types of crimes. By examining these trends, the study seeks to uncover regional insights, such as crime hotspots, emerging patterns, and state-specific challenges. These insights are crucial for understanding how crime varies geographically and temporally, enabling policymakers and law enforcement agencies to allocate resources effectively, design targeted interventions, and implement strategies tailored to specific regions. Additionally, raising public awareness about high-crime areas and prevalent crime types can promote vigilance and community engagement, fostering safer environments and enhancing trust between citizens and law enforcement. Ultimately, the findings aim to contribute to improved public safety, informed decision-making, and a more resilient society.

2.0 Problem Statement

Crime remains a significant issue in Malaysia, with its impact felt on social, economic, and public safety fronts. Over the past few years, the crime index in Malaysia has shown fluctuations, with certain crime types increasing while others have seen declines. The Royal Malaysia Police (PDRM) reports offer a clear view of these shifts but also indicate areas where crime prevention efforts have been less effective. Understanding the trends and patterns of crime, particularly how they differ by state and crime type, is vital to improving law enforcement practices and ensuring public safety.

The evolution of crime trends from 2021 to 2023 is of particular concern, as there is a need to identify the causes of any uptick or decline in certain types of crimes, particularly those that directly impact people's safety, such as assault crimes and property crimes. Recent news reports highlight the rise of certain crime types, like vehicle thefts, while other areas have witnessed improvements. For instance, a significant increase in vehicle thefts in urban centers has raised concerns, with the authorities now emphasizing targeted patrols and surveillance (The Star, 2024). On the other hand, reports indicate a reduction in certain types of violent crimes in rural states (CNA, 2023).

In parallel, the rise in online crimes, including scams and digital fraud, has shown a worrying upward trajectory. The Department of Statistics Malaysia (DOSM) has reported a 35.5% increase in online crime cases in 2023 (DOSM, 2023), signaling the need for targeted digital crime prevention strategies. These developments suggest that while there have been regional differences in crime rates, the overall picture is one of evolving crime patterns, indicating that crime prevention measures must adapt to the specific challenges faced by different regions. Despite the availability of data, there remains a gap in analyzing how crime trends have evolved across different states and crime types from 2021 to 2023, and how these patterns differ regionally. Identifying these regional variations is crucial for understanding the underlying factors driving these trends, whether they are socio-economic, demographic, or related to law enforcement practices. Furthermore, insights into how crime evolves over time can help refine law enforcement strategies, resource allocation, and crime prevention tactics.

2.1 Recent News Highlights

1. Malaysia Crime Index for 2023 Up 3.2%, Corruption Cases Jumps 25.1% (BusinessToday, 2024):
    - This news report highlights the overall increase in crime rates alongside a significant rise in corruption cases, emphasizing the need for comprehensive strategies that address both issues simultaneously.
2. Online Crime Cases Rose by 35.5% in 2023 (DOSM, 2023):
    - The surge in cybercrime underscores the necessity for law enforcement agencies to adapt to evolving threats posed by digital platforms. This trend reflects broader global shifts towards online criminal activities and necessitates enhanced cybersecurity measures.
3. Vehicle Theft Shifts into High Gear (The Star, 2024):
    - Reports indicate an alarming increase in vehicle theft cases, further complicating the crime landscape in Malaysia. This trend requires immediate attention from law enforcement to develop effective prevention strategies.

2.2 Research Background

This research builds on existing studies that have explored crime trends in Malaysia, such as those by Dass (2019), who highlighted the spatial and temporal factors influencing crime patterns in different regions of the country. Ahmad et al. (2024) also examined the distribution of violent crime within Malaysia's urban areas, focusing on key regions like Selangor, Kuala Lumpur, and Putrajaya. These studies have identified that crime is not uniform across Malaysia and that understanding regional trends can help in developing more effective crime prevention strategies. However, there remains a need for a more detailed, statewide analysis, particularly one that focuses on how crime patterns have changed over a defined period, and how those changes can be used to better allocate law enforcement resources.

2.3 Research Significance

This research is significant for several reasons. First, it will provide valuable insights into the regional differences in crime patterns, offering a deeper understanding of how crime evolves in different areas of Malaysia. By analyzing the crime trends from 2021 to 2023, the study will shed light on which areas are facing increasing crime rates and why, helping policymakers and law enforcement agencies to adjust their strategies accordingly. Furthermore, it will contribute to the growing body of knowledge on crime in Southeast Asia, offering a case study on how data-driven approaches can inform crime prevention policies in developing countries.

Second, this research will be essential for improving public safety. By understanding which regions are most affected by specific types of crime, it will be possible to allocate resources more effectively, deploy targeted interventions, and enhance public awareness of crime risks. Public engagement and cooperation with law enforcement are vital to ensuring community safety, and by identifying crime hotspots and prevalent crime types, this study will aid in fostering a more vigilant and proactive public.

Lastly, the research will inform law enforcement strategies by providing evidence on how crime trends are evolving across time and regions. The findings will enable the government and police forces to evaluate their current approaches, understand the root causes of crime in certain areas, and develop more effective preventive measures.

2.4 Potential Solutions

The findings of this research will offer concrete solutions for addressing crime issues in Malaysia. These solutions will focus on resource allocation, law enforcement strategies, and public awareness. Specifically:

1. **Resource Allocation**: Understanding the regional variations in crime trends will allow law enforcement agencies to allocate their resources more efficiently, deploying officers and implementing interventions where they are most needed.
2. **Targeted Law Enforcement Interventions**: Based on the identified crime hotspots, targeted law enforcement strategies can be developed, such as increased patrols in high-crime areas, surveillance, and the use of crime mapping technologies.
3. **Public Awareness Campaigns**: With better insights into prevalent crime types, law enforcement agencies can design targeted public safety campaigns to raise awareness about specific threats, such as online scams or vehicle thefts, in high-risk areas.
4. **Policy Recommendations**: The study will provide recommendations for policy adjustments at both the national and state levels, ensuring that crime prevention strategies are responsive to the specific challenges faced by different regions

3.0 Research Objectives

1. **To analyze the annual crime trends in Malaysia between 2021 and 2023**, focusing on the evolution of crime rates across different states and crime types.
    - Visualization Techniques: Line charts and bar charts to show changes over time and across regions.
2. **To identify crime hotspots and regional variations in crime patterns** within Malaysia from 2021 to 2023, highlighting differences in crime rates across states and districts.
    - Visualization Techniques: Choropleth maps, line charts and horizontal bar charts for district-level analysis.
3. **To examine the relationship between different types of crime (assault vs property crimes)** and their distribution across states in Malaysia.
    - Visualization Techniques: Stacked bar charts, pie charts, and bubble charts to show the distribution and comparison of crime types.

4.0 Methodology

4.1 Data Selection Process

The dataset used for this analysis originates from the "CRIME STATISTICS 2021-2023.pdf" file, provided by the Royal Malaysia Police (PDRM). The file was chosen due to its comprehensive coverage of crime statistics across Malaysia from 2021 to 2023. The dataset includes detailed crime metrics, such as total crimes, broad categories (e.g., assault, property crime), and further subcategories (e.g., causing injury, robbery).

This dataset was chosen because it provides both temporal (year-wise) and geographic (state and district-level) breakdowns, making it ideal for analyzing crime trends and patterns. Additionally, the structured tabular format of the PDF allowed for efficient extraction and transformation into a machine-readable dataset.

Relevant sections of the PDF, such as "Crime Index by Contingent" and "Assault Crime by Type," were extracted to focus on meaningful and actionable insights. Unnecessary sections, like metadata notes, were excluded to maintain focus on critical data.

4.2 Tools Used

The following tools and technologies were employed in the data selection, cleaning, and preprocessing pipeline:

4.2.1 Adobe Acrobat

Adobe Acrobat's table export feature was used to extract tabular data from the PDF. This tool was instrumental in converting visual data into a raw tabular format for further processing.

4.2.2 Microsoft Excel

Excel was used for:

- Initial Inspection: Identifying structural issues like redundant rows or inconsistent headers.
- Basic Cleaning: Removing non-data rows (e.g., footnotes) and realigning column structures.
- Intermediate Transformation: Splitting merged cells and handling basic formatting inconsistencies.

4.2.3 Tableau

Tableau was employed as a critical tool for data visualization and storytelling. It was used to:

- Create interactive dashboards to display crime trends, such as year-over-year comparisons and geographic crime distribution.
- Develop charts and graphs (e.g., bar charts, line graphs, and pie charts) to highlight key insights like crime category proportions.
- Design maps for geospatial analysis, showcasing crime density across states or districts.
- Build a storytelling dashboard to effectively present findings in a narrative-driven format, making the data accessible to diverse audiences.

4.3 Data Cleaning and Preprocessing Steps

The transformation of raw data into an analyzable format involved several steps:

4.3.1 Data Extraction and Inspection

The tables were extracted from the PDF using Adobe Acrobat, followed by an inspection of the raw data in Excel. Common issues identified included:

- Merged cells that resulted in missing values.
- Headers repeated across pages.
- Non-data rows, such as titles and footnotes, interspersed with data.

4.3.2 Data Cleaning

Cleaning involved addressing the following issues:

1. **Header Standardization**: All headers were standardized for clarity and uniformity. For example, "Jenayah Kekerasan" was renamed to "Assault Crime."
2. **Row Removal**: Redundant rows, such as repeated headers and notes, were removed.
3. **Handling Merged Cells**: Missing values resulting from merged cells were filled based on context (e.g., copying down parent categories).

4. **Date Formatting**: Year values (e.g., "2021") were converted into a standardized MM/DD/YYYY format for consistency.

4.3.3 Data Transformation

Key transformations applied include:

1. **Categorization of Crime Types**: Two broad categories, "Assault" and "Property Crime," were merged into a single column labeled "Category." This column contained either "assault" or "property" as values.
2. **Standardization of Subcategories**: All crime subcategories (e.g., "Causing Injury") were reformatted into lowercase strings with underscores replacing spaces (e.g., "causing_injury"). This ensured uniformity and compatibility with analysis tools.
3. **Numeric Conversion**: All crime counts, originally in string format, were converted to integers for statistical analysis.
4. **Geographic Unification**: Data at the district level was aggregated into state and national levels. This provided a more cohesive view of trends across larger regions.

4.3.4 Validation

Validation was a critical step to ensure data integrity:

- Cross-checking key figures (e.g., total crimes per year) against the original PDF to verify consistency.
- Summing state-level data to validate national-level totals.
- Visual inspections to confirm accurate handling of categories and subcategories.

4.3.5 Final Dataset Structure

The finalized dataset includes the following columns:

- Country: Always "Malaysia."
- State: The state name, or "All" for national data.
- District: District-level data, or "All" for aggregated levels.
- Category: Either "assault" or "property."
- Sub_Category: Detailed subcategories (e.g., "causing_injury").
- Year: Date in MM/DD/YYYY format.
- Total_Crimes: The numerical total of crimes reported.

4.4 Data Visualization and Storytelling

Using the cleaned dataset, the next step was to create compelling visualizations to communicate findings effectively. Tableau was used as the primary tool for this purpose, leveraging its capabilities to:

- Generate Graphs and Charts
- Geographical Maps: Highlighted the distribution of crimes across regions, identifying hotspots and trends.
- Storytelling Dashboards: A sequence of dashboards and visual elements were integrated into a cohesive narrative to present insights, such as key findings on rising or declining crime trends.

4.5 Summary for Methodology

The cleaning and preprocessing workflow transformed raw, unstructured data into a clean and analyzable format. Key enhancements included the consolidation of categories, standardization of subcategories, and numeric formatting, which were essential for efficient analysis. These steps enabled clear insights into Malaysian crime trends over three years, broken down by region and type. The integration of Adobe Acrobat and Microsoft Excel ensured both accuracy and reproducibility throughout the process. With the integration of Tableau, insights were translated into engaging visualizations, enabling clear communication of crime trends and patterns. These steps ensure that findings are accessible and actionable for stakeholders.

5.0 Data Analysis

5.1 Descriptive Analysis:

This section presents an overview of the crime trends and patterns in Malaysia from 2021 to 2023, answering the research question: “How have crime trends and patterns in Malaysia evolved across states and crime types from 2021 to 2023?”

5.1.1 Overview of the Data:

- Total Crimes (2021–2023):
- Assault Crimes: 193,776 incidents reported.
- Property Crimes: 743,979 incidents reported.
- Crime Proportions: Property crimes dominate, constituting approximately 79% of total crimes, while assault crimes make up the remaining 21%.

5.1.2 Key Findings:

1. Highest Crime Rates:

   Selangor: Reports the highest number of crimes, totaling 59,997 incidents in 2021.

2. Lowest Crime Rates:

   Perlis: Reports the lowest crime rate, with only 1,356 incidents in 2023.

3. Dominant Crime Type:

   Motorcycle Theft: Leads all crime subcategories, with 487,977 incidents recorded over the three years.

5.1.3 Trends Across the Years:

- 2021: The year with the highest crime rates, driven by property crimes in urbanized states.
- 2022: A significant dip in crime rates, correlating with pandemic-related restrictions and reduced activity.
- 2023: A resurgence in crime rates, particularly in property crimes, as economic activity normalized post-pandemic.

5.1.4 Regional Insights:

- Urban Areas: Selangor and Kuala Lumpur experience the highest crime rates due to high population density and economic activity.
- Rural Areas: States like Perlis and Terengganu consistently report lower crime rates.

5.2 Diagnostic Analysis:

This analysis explores the factors contributing to the observed crime trends:

- Economic and Social Factors: High economic activity in urban areas correlates with increased property crimes.
- Pandemic Effects: Pandemic restrictions in 2022 resulted in reduced mobility and economic activity, leading to fewer opportunities for crimes.
- Population Density: States with higher population density (e.g., Selangor) experience more interactions, creating opportunities for crimes.

5.3 Predictive Analysis:

This analysis uses current trends to forecast future crime patterns:

- Urban Crime Rates: Urban areas, particularly Selangor and Kuala Lumpur, will likely continue experiencing higher crime rates due to their economic and demographic characteristics.
- Cybercrime: With the increasing digitalization of activities, cybercrimes are projected to rise, potentially surpassing traditional property crimes.
- Regional Disparities: Rural areas are expected to maintain lower crime rates, but targeted interventions are required to address any emerging trends.

5.4 Prescriptive Analysis:

This section provides actionable recommendations based on the analysis:

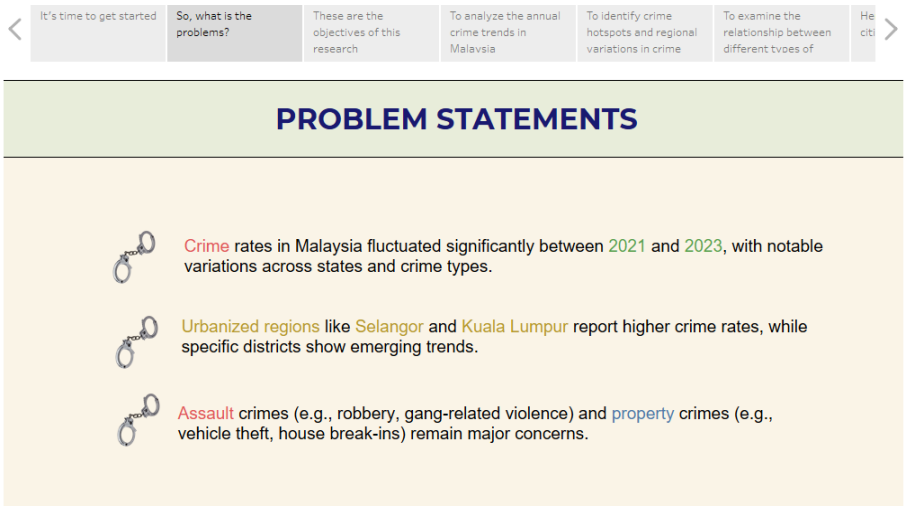
1. Enhance Surveillance: Increase the presence of CCTV cameras and improve street lighting in high-crime areas.
2. Focus on Urban Hotspots: Strengthen law enforcement in states like Selangor and Kuala Lumpur to address property crimes.
3. Public Awareness Campaigns: Launch campaigns to educate citizens on theft prevention and personal safety measures.
4. Cybersecurity Measures: Prioritize initiatives to tackle the anticipated rise in cybercrime.

6.0 Data Visualization and Storytelling

6.1 Cover Page

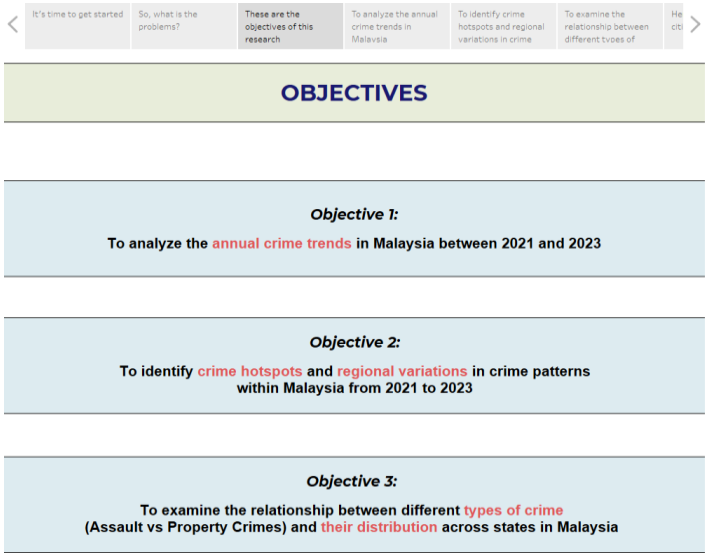
This cover page shows the image of a city which can be imagined as Kuala Lumpur which covers in the red moon and dark background to show how the crime can be visualized.

6.2 Problem Statements



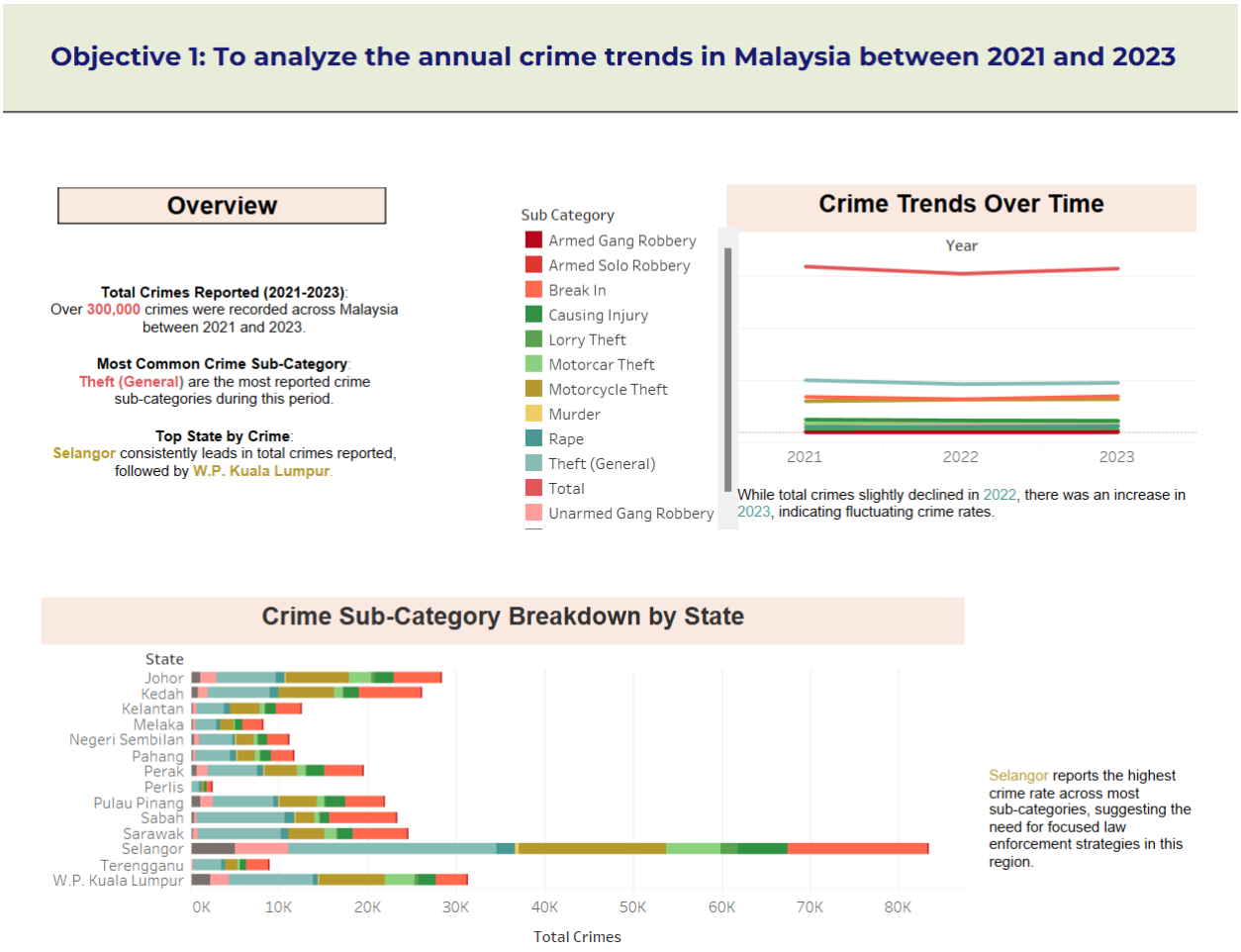
For the problem statements, we combined the font used especially for the Title. We used a different font from the text to show differentiation in the page. Besides, for the word Crime, year , state , assault and property, we specially used their respective color to show some differentiation and importance for this research

6.3 Objectives



These are the objectives of the research in the storyboard

6.4 Objectives 1



Objective 1 aims to analyze the annual crime trends in Malaysia between 2021 and 2023. This dashboard provides insights into the total crimes reported, their sub-category distribution, and crime trends over time across different states. The analysis focuses on identifying the most common crime types, regional disparities, and also the changes in crime patterns over the three years.

6.4.1 Overview Section

Design Choices:

- Text-Focused Layout: Highlights critical statistics in bold and structured text.

- Minimal Design: Simplifies information for quick absorption without overwhelming viewers.

Key Insights:

- Total Crimes: Over 300,000 crimes reported across Malaysia between 2021 and 2023.
- Most Common Sub-Category: Theft (General) is the most reported crime during this period.
- Top Crime State: Selangor consistently leads with the highest total crimes, followed by W.P. Kuala Lumpur.

6.4.2 Line Chart: Crime Trends Over Time

Design Choices:

- Color Scheme: Each sub-category is represented by a unique color to maintain visual distinction.
- Time-Based X-Axis: Years (2021–2023) are highlighted to showcase temporal crime trends effectively.
- Simplified Layout: Focused on readability, with subtle grid lines for better interpretation.

Key Insights:

1. 2022 Decline:
    - Crime rates declined across most sub-categories in 2022, likely due to pandemic-related restrictions and focused law enforcement efforts.

2. 2023 Increase:
    - A significant rebound in crimes, particularly theft-related offenses, occurred in 2023 as normal economic activities resumed post-pandemic.
    - While property crimes increased, assault crimes showed only minor variations, remaining relatively stable.

3. Overall Trends:

- Total crimes fluctuated over the years, with theft-related sub-categories like motorcycle theft consistently leading.

6.4.3 Bar Chart: Crime Sub-Category Breakdown by State

Design Choices:

- Color Palette: Distinct colors assigned to each crime sub-category, ensuring easy differentiation and clarity when comparing state-level data.
- Horizontal Bar Chart: Facilitates direct comparisons of total crimes across states for each sub-category.
- State Labels: Clearly visible names for each state to emphasize regional patterns in crime.

Key Insights:

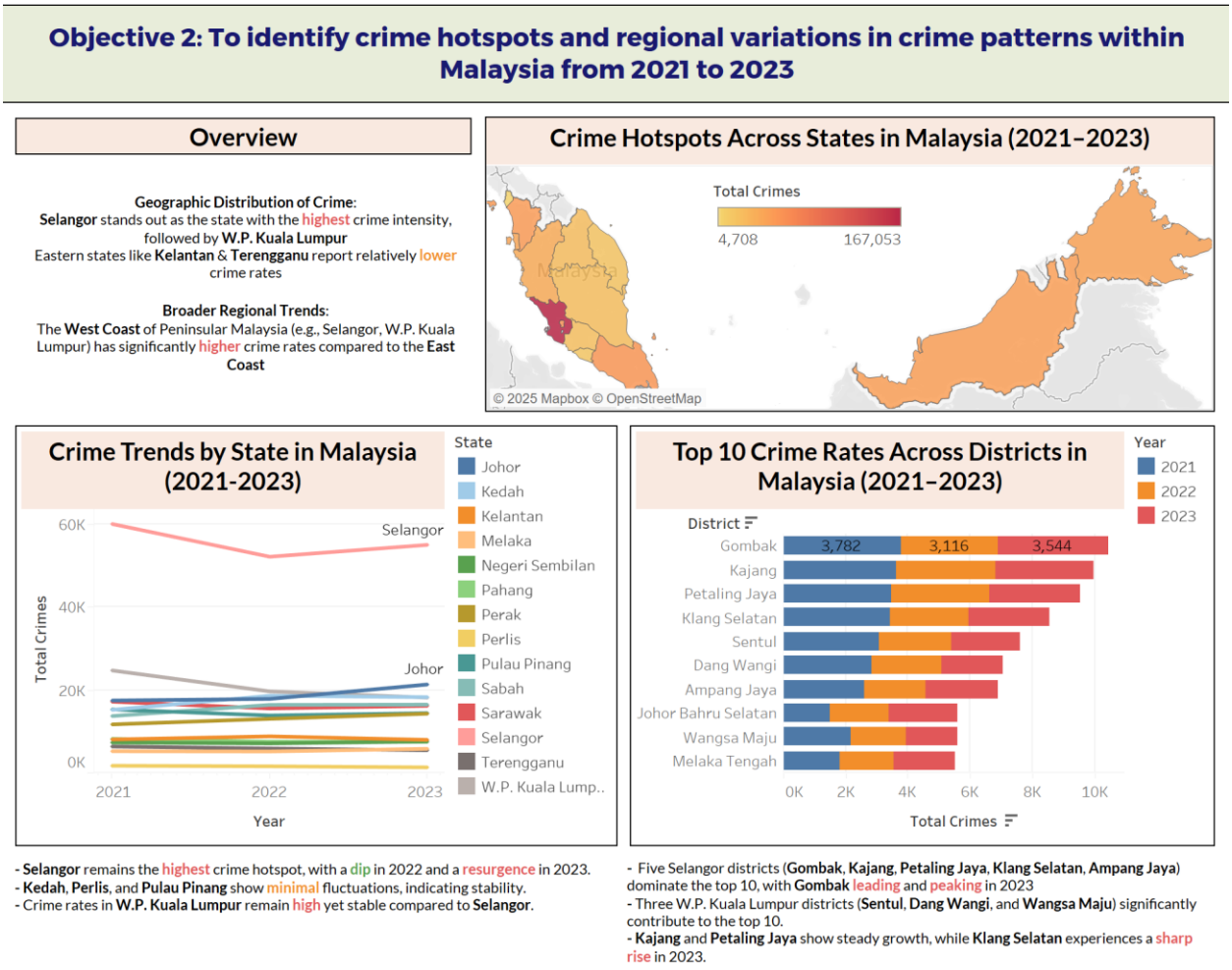
1. Regional Crime Distribution:
   - Selangor: Reports the highest number of crimes across multiple sub-categories, with a notable prevalence of motorcycle theft and general theft.
   - W.P. Kuala Lumpur: Follows closely, reflecting urbanization's impact on crime rates.
   - Perlis: Reports the lowest total crimes, with only 2,354 incidents, followed by Melaka (8,128) and Terengganu (8,882).

2. Dominant Crime Types:
   - Motorcycle Theft: Most prominent in Selangor, W.P. Kuala Lumpur, and Johor, signaling the need for targeted anti-theft initiatives.
   - Theft (General): A widespread issue across most states, emphasizing its universal impact.

3. Urban vs. Rural Dynamics:
   - Urbanized states like Selangor and W.P. Kuala Lumpur dominate in crime rates, attributed to high population density and increased economic activity.

- Rural states like Perlis, Melaka, and Terengganu also have the lowest populations, which likely contributes to their reduced crime figures. Perlis, in particular, has significantly fewer crimes compared to other states, reflecting its smaller population and rural characteristics.

6.5 Objectives 2



The above diagram displays the dashboard used for Objective 2: identifying crime hotspots and regional variations in crime patterns within Malaysia from 2021 to 2023. The dashboard incorporates a filled map, a line chart, and a horizontal bar chart to effectively present the data and support storytelling.

6.5.1 Filled Map: Crime Hotspots Across States in Malaysia (2021-2023)

1. **Design Choices:**
    - **Color:**
        - A gradient from light yellow (low crime intensity) to dark red (high crime intensity) effectively visualizes the severity of crime across states.
        - The red hues help draw attention to the most critical hotspots like Selangor and W.P. Kuala Lumpur.
    - **Layout:**
        - A filled map ensures that spatial data is easily digestible and highlights regional crime variations across states in a geographic context.
        - The map legend is prominently placed on the right to clarify the meaning of color gradients.
    - **Typography:**
        - The bold title clearly states the purpose of the visualization, emphasizing the timeframe (2021–2023) for relevance.
        - Subtle labeling of regions prevents visual clutter while maintaining geographic clarity.
2. **Key Insights**
    - Selangor emerges as the most significant hotspot, with the highest crime intensity across all states, followed by W.P. Kuala Lumpur.
    - States in East Malaysia (Sabah and Sarawak) show moderate crime rates, while eastern states like Kelantan and Terengganu report relatively lower crime levels.
    - A strong West Coast concentration of crime is evident, with the highest crime rates clustering in Selangor and W.P. Kuala Lumpur.
    - This visualization offers a clear geographic perspective, making it easy to prioritize regions for resource allocation and further analysis.

6.5.2 Line Chart: Crime Trends by State in Malaysia (2021-2023)

1. **Design Choices:**
    - **Color:**
        - Each state is assigned a distinct color to differentiate trends and facilitate comparisons. Selangor, the leading hotspot, is represented with a bold and prominent red line.
    - **Layout:**
        - A line chart is chosen to effectively display temporal trends over three years, highlighting changes in crime patterns across states.
        - The vertical axis represents total crimes, while the horizontal axis shows the years (2021–2023), ensuring clarity in trend analysis.
    - **Typography:**
        - The title emphasizes both the focus (crime trends) and timeframe, providing essential context to viewers.
        - Axis labels are simple and legible, ensuring quick comprehension.
2. **Key Insights**
    - **Selangor:**
        - Consistently records the highest crime rates, with a slight decline in 2022 followed by a resurgence in 2023.
    - **W.P. Kuala Lumpur:**
        - Crime rates are consistently high but show less volatility compared to Selangor, indicating stability.
    - **Stability in Smaller States:**
        - States like Kedah, Perlis, and Pulau Pinang exhibit minimal changes in crime rates over the three years, suggesting steady or low crime levels.

- The overall trend highlights Selangor and W.P. Kuala Lumpur as persistent hotspots, demanding continuous attention.

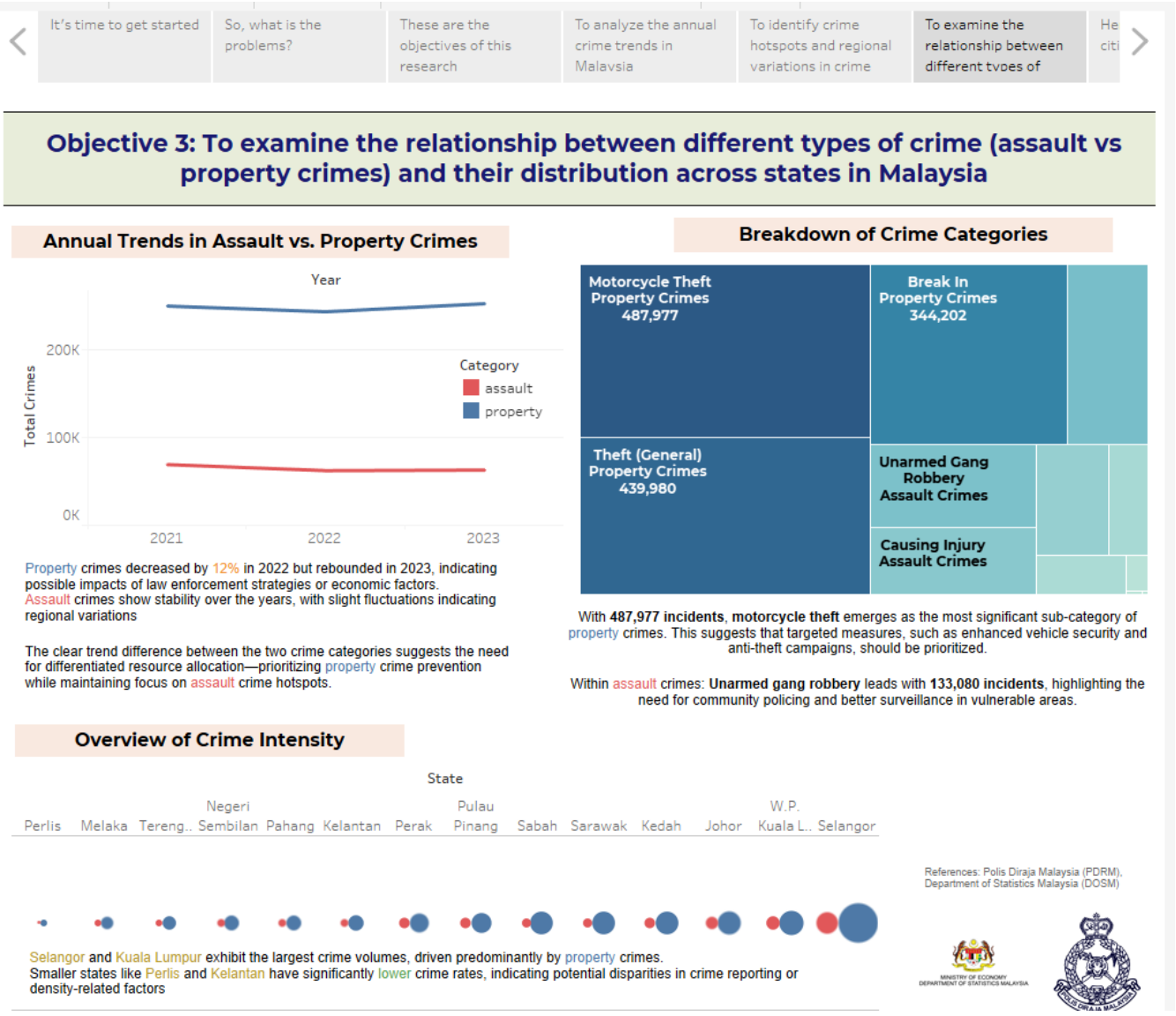
6.5.3 Horizontal Bar Chart: Top 10 Crime Rates Across Districts in Malaysia (2021–2023)

1. **Design Choices:**
    - **Color:**
        - Different colors represent the three years (2021: blue, 2022: orange, 2023: red), enabling an easy visual comparison of yearly trends within each district.
    - **Layout:**
        - A horizontal bar chart is used to rank districts by total crimes, providing a clear and concise snapshot of district-level performance.
        - The use of stacked bars ensures both ranking and temporal changes are captured in a single visualization.
    - **Typography:**
        - A bold title specifies the scope of the data (top 10 districts) and timeframe (2021–2023).
        - Labels on the bars provide exact crime numbers, enhancing clarity.
2. **Key Insights**
    - **Selangor Dominance:**
        - Five of the top 10 districts with the highest crime rates are from Selangor: Gombak, Kajang, Petaling Jaya, Klang Selatan, and Ampang Jaya.
        - Gombak consistently leads with the highest crime rates, peaking in 2023.
    - **W.P. Kuala Lumpur's Contribution:**

- Sentul, Dang Wangi, and Wangsa Maju from W.P. Kuala Lumpur feature prominently in the top 10, underscoring its role as a major hotspot.

- **Emerging Trends:**
  - Kajang and Petaling Jaya show a steady rise in crime rates, while Klang Selatan experiences a sharp increase in 2023, indicating a need for targeted interventions.

6.6 Objectives 3



First of all, these are the dashboard that we are using for objective 3, mainly to examine the relationship between different types of crime which focus on assault vs property crimes and their distribution across states in Malaysia.

6.6.1 Bubble Chart: Overview of Crime Intensity

Design Choices:

- **Color Palette:** Two distinct but cohesive colors (e.g., shades of blue for property crimes and red for assault crimes) to differentiate the two categories while maintaining visual harmony.
- **Bubble Sizes:** Represents the total number of crimes per category (assault vs. property) for each state.
- **State Labels:** Clearly visible state names to emphasize regional crime patterns.

Key Insights

- **Crime Dominance by Category:**
    - Property crimes are generally higher than assault crimes across most states.
    - States like Selangor and Kuala Lumpur have the largest bubbles for property crimes, indicating they experience the highest crime rates.
    - Assault crimes, while lower overall, are still significant in states like Penang and Johor.
- **Regional Disparities:**
    - Urbanized areas (e.g., Selangor, Kuala Lumpur) dominate in terms of total crimes, particularly property crimes, likely due to population density and economic activity.
- **State-Level Prioritization:**

- States with higher property crimes (e.g., Selangor, Kuala Lumpur, Johor, Kedah) may need focused strategies like theft prevention

6.6.2 Line Chart: Annual Trends in Assault vs. Property Crimes

Design Choices:

- Red for Assault Crimes: Represents urgency and attention to violent crimes.
- Blue for Property Crimes: Reflects a calmer but widespread issue.
- Clear Labels: Each line is labeled when hovering for easy differentiation between assault and property crimes.
- Focus on Annual Trends: The x-axis represents the years (2021–2023), and the y-axis shows the total crimes for each category.

Key Insights

- **2022 Crime Drop:**
  - Both assault and property crimes experienced a drop in 2022.
  - This decline may correlate with factors such as pandemic restrictions or intensified enforcement during that year.
- **Recovery in 2023:**
  - A noticeable 12% increase in property crimes in 2023 suggests a significant rebound, possibly due to economic activity normalizing post-pandemic.
  - Assault crimes show only a slight increase, indicating that violent crimes remained relatively stable despite the overall trend.
- **Overall:**
  - Property crimes consistently dominate assault crimes across all years.

- The widening gap in 2023 highlights the increasing challenge of managing theft and property-related offenses.

6.6.3 Treemap: Breakdown of Crime Categories

Design Choices:

- **Monochromatic Blue Color Scheme:**
  - Ranging from dark blue (high intensity) to light blue (low intensity) to emphasize crime subcategories' prevalence.
  - Blue reflects neutrality and professionalism, keeping the focus on the data rather than evoking strong emotional responses.
- **Size and Hierarchical Layout:**
  - Larger rectangles represent crime subcategories with higher total cases, while smaller ones represent less frequent crime types.
- **Simplified Design:**
  - A single-color scheme ensures clarity while maintaining an intuitive visual hierarchy.

Key Insights:

- **Property Crimes Dominate:**
  - The top 3 are from property crimes which: Motorcycle Theft leads with 487,977 cases, representing the most significant share of crimes. Break-Ins (344,202 cases) and Theft (General) (439,980 cases) are also substantial contributors, showing that property crimes overwhelmingly impact the crime landscape.
- **Varied Intensities Among Subcategories:**
  - Assault crimes like Unarmed Gang Robbery (133,080 cases) and Causing Injury (106,824 cases) are present but less frequent compared to property crimes.

- **A Need for Targeted Interventions:**
    - The dominance of theft-related crimes suggests a need for preventive measures like community policing and enhanced security for vehicles and homes.

6.7 Recommendations page

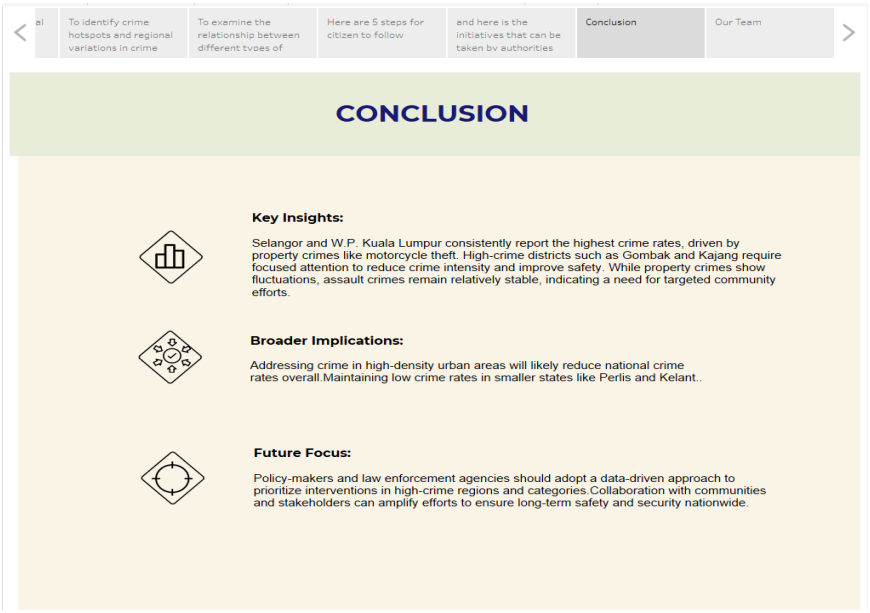
1. 5 Steps for Citizen to Follow

Here we show 5 steps that can be followed by the local citizen, neighborhood for recommendations in helping to reduce crime.

2. Strategic Initiatives for Crime Prevention by Authorities

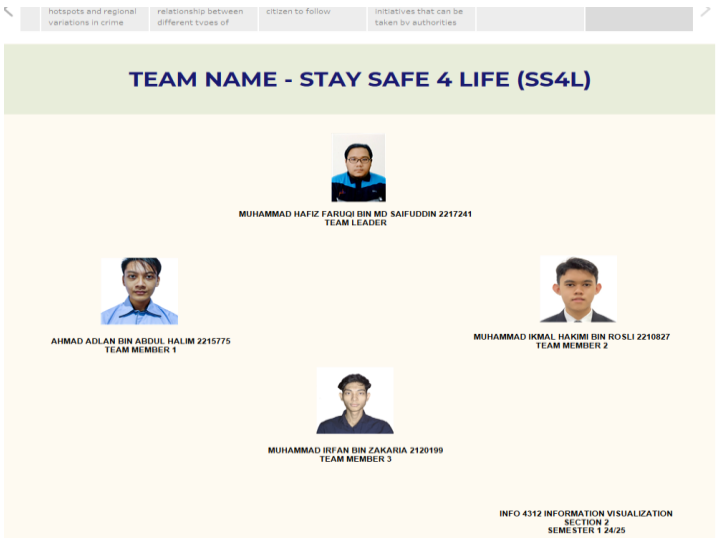
Here are some strategic initiatives for crime reduction that can be enforced by local authorities in helping to reduce crime in the district and city.

6.8 Conclusion page



Here are the conclusions on the key insights, some implications and the focus in the future for the project.

6.9 Team page



Here is the team dashboard page to show the team members of the projects.

7.0 Conclusion

This analysis examines Malaysian crime trends from 2021 to 2023, highlighting that property crimes dominate, accounting for a significant 79% of all reported incidents. Among these, motorcycle theft ranks highest as a sub-category. Assault crimes, while less frequent, remain a concern, especially in urbanized areas where they contribute substantially to the overall crime index. A notable decline in crime rates was observed in 2022, largely attributed to pandemic restrictions and reduced mobility. However, 2023 saw a resurgence, particularly in property crimes, as economic activities normalized.

The findings reveal substantial regional disparities in crime rates. Urban states like Selangor and W.P. Kuala Lumpur consistently recorded the highest crime figures, driven by dense populations and heightened economic activity. In contrast, rural states such as Perlis, Melaka, and Terengganu reported significantly lower crime rates, reflecting their lower population density and less urbanized settings. These variations underscore the importance of implementing crime prevention strategies tailored to the unique dynamics of each region and crime type.

To address these challenges, citizens are encouraged to actively engage in community initiatives, such as neighbourhood watch programs, and invest in personal security measures like vehicle immobilizers and home surveillance systems. For authorities, prioritizing targeted action in high-crime urban areas is crucial. Enhanced technological solutions, such as predictive analytics models and real-time surveillance systems, can play a key role in crime prevention. Additionally, strong public education campaigns and strict legislation against repeat offenders are essential. As the threat of cybercrime grows in the digital era, policymakers and law enforcement must adopt data-driven strategies to combat both traditional and emerging threats. This report serves as a foundation for informed decisions aimed at creating a safer Malaysia for all.

8.0 Work Distribution

Muhammad Hafiz Faruqi bin Md Saifuddin (Team Leader)

1. Coordinating the team and overseeing the entire report.
2. Handling the introduction, problem statement, research objectives, data visualization, and references sections of the report.
3. Creating Tableau visualizations for Objective 3, problem statement, and team page.

Muhammad Ikmal Hakimi bin Rosli (Team Member)

1. Developing Tableau visualizations for Research Objective 2.
2. Preparing the report sections on methodology, data visualization and storytelling, and work distribution.

Ahmad Adlan bin Abdul Halim (Team Member)

1. Developing Tableau visualizations for Research Objective 1 and the cover page.
2. Contributing to the report sections on the cover page, introduction, research objectives, and problem statement.

Muhammad Irfan bin Zakaria (Team Member)

1. Conducting data analysis and creating data visualization and storytelling.
2. Writing the conclusion section of the report.

Names / Tasks	Muhammad Hafiz Faruqi bin Md Saifuddin	Ahmad Adlan Bin Abdul Halim	Muhammad Ikmal Hakimi bin Rosli	Muhammad Irfan bin Zakaria
Cover Page		✓		
1.0 Introduction	✓	✓		
2.0 Problem Statement	✓	✓		
3.0 Research Objectives	✓	✓	✓	
4.0 Methodology			✓	
5.0 Data Analysis				✓
6.0 Data Visualization & Storytelling	✓	✓	✓	✓
7.0 Conclusion				✓
8.0 Work Distribution	✓		✓	
9.0 References	✓			

9.0 References

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