Design Report

Designer Information

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- **Link to Demo:** https://interactive-localized-data-bi.vercel.app/
- **Portfolio:** https://qerope.github.io/SEG3525-Assignments/Devoir1/
- **GitHub Repository:** https://github.com/Qerope/InteractiveLocalizedDataBI

Dashboard Goal & Data

Domain

Interactive aviation safety analysis with both single and comparative modes, focusing on crash data visualization to identify patterns, trends, and safety insights through advanced filtering and comparison capabilities.

Dataset

- Aviation crash records including fields: date, aircraft type, registration, operator, fatalities, location, and damage severity.
- Data provided in CSV format with user-friendly damage type labels and interactive filtering capabilities.
- **Source:** Kaggle - Aviation Crashed Flights Data (https://www.kaggle.com/datasets/anandkushawaha/aviation-crashed-flights-data)
- Date: The date of the crash
- Type: Aircraft model/type
- Registration: Aircraft registration code
- Operator: Airline or organization operating the aircraft
- fat: Number of fatalities reported in the crash (passengers + crew)
- Location: Where the crash occurred
- dmg: Damage severity (encoded sub → Substantial Damage, w/o → Write-Off (Total Loss), non → No Damage / Minor)

Data Usage

- Supports single and comparative analysis modes.
- Features interactive temporal trends (line chart) and categorical comparisons (bar chart).
- Includes drag-to-zoom, hide/show functionality, and real-time filtering.

Design Reflection

Charts Selection

Interactive Line Chart (Temporal Analysis)

- Enhanced with brush zoom and hide/show legend functionality.
- Supports single and comparative analysis modes.
- Enables identification of patterns and trends with advanced interactivity.

Interactive Pie Chart (Severity Distribution)

- Visualizes damage severity distribution with interactive pie layout.
- Hoverable segments, legends, and supports both focused and comparative breakdowns.

3Cs Implementation

- **Context:**
  Clear mode indicators, step-by-step filtering, comprehensive tooltips, interactive legends, and brush zoom for data exploration.
- **Clutter-Free:**
  Clean interface with optional comparison mode, hide/show functionality to reduce clutter, and focused data presentation.
- **Contrast:**
  Consistent blue/red color scheme for comparisons, high contrast interactive elements, clear visual distinction between data series and modes.

Layout & Interactions

- Dual-mode system (single/comparison).
- Advanced interactivity: drag-to-zoom brush, hide/show legend items, mode toggle.
- Prevention of duplicate selections in comparison mode.

Internationalization

Languages

- Full English and Russian support.
- User-friendly damage type labels.
- Localized number formatting.
- Fully translated interactive elements.

Translation Method

- Used Google Translate with context-specific refinements for technical aviation terms.

Translation Challenges

- Careful translation of aviation terminology.
- User-friendly damage type labels.
- Consistent translation of interactive element labels across modes.

Localized Elements

- All text, chart labels, tooltips, mode indicators, damage type labels, filter options, and interactive elements localized with proper number formatting.

Visual Design Decisions

- Enhanced visual hierarchy with mode indicators.
- Consistent interactive color schemes.
- Improved language selector with flags.
- Advanced chart interactivity with proper visual feedback for user actions.

Code & Implementation

- Built with React, TypeScript, Tailwind CSS, and Recharts.
- Advanced features: dual-mode analysis, interactive brush zoom, hide/show legend, duplicate selection prevention.
- Comprehensive CSV data processing with user-friendly label mapping.

Generative AI Acknowledgment

Used ChatGPT for advanced code debugging, chart enhancement patterns, and text content in this report and throughout the app.