**Data Visualization and Storytelling 2: Designing Interactive Dashboards**

**Dashboard Blueprint**

**Domain: Medicine**

*By*

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**Dataset Information**

**Dataset source**: <https://www.fda.gov/drugs/drug-approvals-and-databases/national-drug-code-directory>

The FDA's National Drug Code (NDC) Directory provides information on finished, unfinished, and compounded drug products. Drugs are identified using a unique three-segment number. The directory includes product listing data submitted electronically by labelers, covering both prescription and over-the-counter drugs.

**Dataset Summary**: The dataset provides detailed information on pharmaceutical products, including identifiers, names, and types (e.g., prescription or OTC). It covers attributes like dosage form, route of administration, marketing dates, and active ingredients. Manufacturer details and pharmacological classes are also included. Each row represents a unique product entry, often with varying strengths and formulations.

**Number of rows**: 113253

**Number of columns**: 20

columns\_to\_drop = [  
'PROPRIETARYNAMESUFFIX', 'ENDMARKETINGDATE', 'APPLICATIONNUMBER',  
'DEASCHEDULE', 'NDC\_EXCLUDE\_FLAG', 'LISTING\_RECORD\_CERTIFIED\_THROUGH'

#### **Summary**

This dashboard presents a comprehensive overview of various medical products, focusing on different types and leading manufacturers. Key Performance Indicators (KPIs) such as the number of Human OTC Drugs, Human Prescription Drugs, Non-Standardized Allergenic products, Plasma Derivatives, Vaccines, Standardized Allergenic products, and Cellular Type Therapy products are highlighted.

#### **KPIs Explained**

1. **Human OTC Drugs (55,736)**:
   * Represents the total count of Over-The-Counter drugs available.
   * Highlights the extensive range of readily accessible medication.
2. **Human Prescription Drugs (54,617)**:
   * Indicates the total number of prescription-required drugs.
   * Reflects on the vast array of regulated medications.
3. **Non-Standardized Allergenic (2,044)**:
   * Shows the count of allergenic products that are not standardized.
   * Emphasizes specialized treatments for allergies.
4. **Plasma Derivatives (326)**:
   * Lists the number of plasma-derived products.
   * Essential for treatments involving blood components.
5. **Vaccines (147)**:
   * Displays the total count of vaccines.
   * Crucial for public health and immunization efforts.
6. **Standardized Allergenic (126)**:
   * Represents the number of standardized allergenic products.
   * Important for consistent allergy treatments.
7. **Cellular Type Therapy (23)**:
   * Indicates the number of cellular therapy products.
   * Highlights advanced therapeutic approaches.

#### **Manufacturers Analysis**

The line graph on the right shows the top 10 manufacturers of tablet dosage forms, with Bryant Ranch Prepack leading significantly. This visual analysis helps in understanding the market dominance and production scale of key pharmaceutical players.

This dashboard serves as a valuable tool for healthcare professionals, policymakers, and researchers by providing insights into the pharmaceutical landscape, product availability, and industry leaders.

**Columns Present in dataset**:

 PRODUCTID: Unique identifier for each product.

 PRODUCTNDC: National Drug Code (NDC) for the product.

 PRODUCTTYPENAME: Type of product (e.g., Human Prescription Drug, Human OTC Drug).

 PROPRIETARYNAME: Brand name or proprietary name of the product.

 PROPRIETARYNAMESUFFIX: Suffix to the proprietary name.

 NONPROPRIETARYNAME: Generic name or active ingredient of the product.

 DOSAGEFORMNAME: Form of the dosage (e.g., injection, solution).

 ROUTENAME: Route of administration (e.g., subcutaneous, intravenous).

 STARTMARKETINGDATE: Date when the product started being marketed.

 ENDMARKETINGDATE: Date when the product stopped being marketed, if applicable.

 MARKETINGCATEGORYNAME: Marketing category (e.g., NDA, BLA).

 APPLICATIONNUMBER: Application number associated with the product.

 LABELERNAME: Name of the company labeling the product.

 SUBSTANCENAME: Active substance(s) in the product.

 ACTIVE\_NUMERATOR\_STRENGTH: Strength of the active ingredient.

 ACTIVE\_INGRED\_UNIT: Unit of measurement for the active ingredient's strength.

 PHARM\_CLASSES: Pharmacological class and mechanism of action.

 DEASCHEDULE: DEA schedule classification, if applicable.

 NDC\_EXCLUDE\_FLAG: Indicates if the product is excluded from certain NDC listings.

 LISTING\_RECORD\_CERTIFIED\_THROUGH: Date through which the listing record is certified.

**Business Questions / Possible Visualisations**

**How do the marketing categories (e.g., NDA, BLA) distribute across different products?**

**Visualization:** Pie chart or stacked bar chart showing the proportion of products in each marketing category.

**\*\*What is the distribution of pharmaceutical products by route of administration over time?**

**Visualization**: A stacked area chart showing the count of products on the y-axis, time on the x-axis, and different colors representing each route of administration.

**How do the proprietary and non-proprietary names differ in terms of their pharmacological classes?**

**Visualization:** Dual-axis bar chart with proprietary names on one axis and non-proprietary names on the other, showing counts of pharmacological classes. Interactive filters for product type and labeler.

**How do different dosage forms correlate with the strength of active ingredients across various products?**

**Visualization:** Scatter plot with dosage form on the x-axis and active ingredient strength on the y-axis, color-coded by product type. Interactive tooltips to display additional product details.

**What is the distribution of product types among different labelers?**

**Visualization:** Stacked bar chart showing the count of each product type (e.g., Human Prescription Drug, Human OTC Drug) for each labeler. Interactive filters for product type and labeler.

**What are the trends in the listing record certification dates for different labelers and product types?**

**Visualization:** Gantt chart displaying the certification dates for each labeler and product type over time. Interactive filter to select specific labelers or product types.

**How do active ingredient strengths and units differ between proprietary and non-proprietary products?**

**Visualization:** Split bar chart showing proprietary and non-proprietary products side by side, with active ingredient strengths and units as segments. Interactive filter for labeler and product type.

**Initial Dashboard Idea**

*Possible Dashboard Layout and Components*

**Title and Overview**

Title: Pharmaceutical Product Analysis Dashboard

Subtitle: Interactive dashboard analyzing various aspects of pharmaceutical products, including marketing categories, routes of administration, pharmacological classes, and more.

**Filter Section**

Global Filters: Interactive filters at the top of the dashboard to allow users to filter data by:

**Additional Interactive Elements**

Dynamic Tooltips: Provide detailed information on hover for each visualization, including product names, strengths, and additional attributes.

Reset Button: Include a button to reset all filters to default settings.