

Data Sources

- **Data.gov:** Provides retail sales data, economic indicators, and consumer spending statistics.
- **IPUMS:** Offers demographic and socioeconomic data.
- **Data.Seattle.gov:** Supplies local retail performance data, including foot traffic and sales figures.

Data Ingestion

- **ETL Processes:** Extract, Transform, Load (ETL) processes are used to collect data from the various sources. This involves:
 - **Extraction:** Pulling data from Data.gov, IPUMS, and Data.Seattle.gov using APIs and data feeds.
 - **Transformation:** Cleaning and standardizing the data formats, handling missing values, and removing duplicates.
 - **Loading:** Importing the cleaned data into the cloud database.

Data Storage

- **Cloud Database:** A secure cloud-based database is used to store the ingested data. This database is accessible to all team members and supports regular backups to ensure data integrity and security.

Data Processing

- **Data Cleaning:** Further cleaning of the data to ensure high quality, including normalization and standardization.
- **Data Joining:** Merging datasets on common keys such as location, time, and demographic attributes to create a unified dataset.
- **Data Transformation:** Creating new calculated fields, aggregating data as needed for analysis, and preparing the data for analytical processes.

Data Analysis

- **Statistical Analysis:** Applying regression analysis to identify trends and correlations between e-commerce growth and brick-and-mortar store performance.
- **Geospatial Mapping:** Using geospatial analysis to map e-commerce growth against brick-and-mortar sales, providing visual insights into the data.
- **Other Techniques:** Employing additional statistical techniques to quantify the impact of e-commerce on different retail segments.

Data Output

- **Reports:** Generating detailed reports that summarize the findings and provide insights into the impact of e-commerce on brick-and-mortar stores.
- **Visualizations:** Creating visualizations such as charts, graphs, and maps to illustrate the data and findings.
- **Dashboards:** Developing interactive dashboards that allow stakeholders to explore the data and insights in a user-friendly format.
- **Strategic Recommendations:** Formulating strategic recommendations for retailers based on the analysis, helping them adapt to the changing retail environment.

