PROJECT DOCUMENTATION
ToyCraft Tales: Tableau’s Vision into Toy Manufacturer Data

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1. Introduction

Project Title:
ToyCraft Tales: Tableau’s Vision into Toy Manufacturer Data

Team Members:
Sai Sumanth – Data Collection, Database Design, SQL Operations, Tableau Visualization, Dashboard Development, Story Creation, Web Integration, Deployment, Documentation.

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2. Project Overview

Purpose:

The purpose of this project is to analyze the US toy manufacturing industry using historical data from 2005 to 2016. The objective is to uncover trends in manufacturer distribution, evaluate regional performance, analyze index-based patterns, and present insights through interactive Tableau dashboards and a structured data story. The project also integrates database management and web deployment to simulate a real-world data analytics workflow.

Features:

- MySQL database integration for structured data storage.
- SQL query execution for aggregation and validation.
- Tableau visualizations for trend and distribution analysis.
- Interactive dashboard with filters and map interaction.
- Story-based analytical presentation.
- Tableau Public publishing.
- Flask-based modern web interface embedding dashboard and story.
- Live deployment of the web application.

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3. Architecture

Frontend:

The frontend is built using HTML5 and modern CSS3 with a minimalist design approach. The UI is inspired by Apple-style design principles, emphasizing whitespace, typography hierarchy, and subtle visual effects. The Tableau dashboard and story are embedded using responsive iframes.

Backend:

The backend is developed using Python and Flask. Flask handles routing and serves multiple pages:

- "/" for Dashboard
- "/story" for Story
- "/about" for project description

The backend does not interact with the database in real time. It is used purely for structured web integration.

Database:

MySQL is used as the relational database. The dataset contains 591 records with the following schema:

- State (VARCHAR)
- Year (INT)
- Number_of_Manufacturers (INT)
- Index_Value (INT)

SQL operations include:

- Record count validation
- Aggregation using GROUP BY
- Null value checking
- Index creation on Year column

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4. Setup Instructions

Prerequisites:

- Python 3.11 or above
- MySQL Server and MySQL Workbench
- Tableau Desktop
- Tableau Public Account
- Git (optional for version control)

Installation Procedure:

Step 1: Install MySQL Server and Workbench.
Step 2: Download dataset from Kaggle.
Step 3: Create a new database in MySQL.
Step 4: Create table schema with appropriate column data types.
Step 5: Import CSV file into MySQL table.
Step 6: Run SQL validation queries.
Step 7: Install Tableau Desktop.
Step 8: Connect Tableau to MySQL database.
Step 9: Create visualizations.
Step 10: Build dashboard and story.
Step 11: Publish to Tableau Public.
Step 12: Install Flask using pip install flask.
Step 13: Build web application.
Step 14: Deploy to Vercel.

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5. Folder Structure

Project Structure:

- app.py
- templates/

    - base.html
    - dashboard.html
    - story.html
    - about.html
- static/
    - css/
        - style.css

The templates folder contains Jinja-based HTML pages.
The static folder contains styling files.
The app.py file handles routing logic.

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6. Running the Application

Database:

Start MySQL Server from system services.

Flask Application:

Open terminal and run:

```
pip install flask
python app.py
```

The application runs at **http://127.0.0.1:5000/**

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7. API Documentation

This project does not expose REST APIs because it is a visualization-focused application. Flask is used only for page rendering and embedding Tableau dashboards.

Routes:

GET "/" → Dashboard page
GET "/story" → Story page
GET "/about" → About page

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8. Authentication

No authentication mechanism is implemented because the Tableau dashboard is published publicly and the web application does not require user login.

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9. User Interface

The user interface includes:

- Sticky navigation bar
- Dashboard page embedding Tableau dashboard
- Story page embedding Tableau story
- About page with project summary
- Responsive layout
- Clean footer section

The interface follows minimalist design principles with consistent spacing, typography, and color palette.

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10. Testing

Database Testing:

- SELECT COUNT(*) validation.
- SUM aggregation checks.
- GROUP BY year validation.
- Null value checks.
- Index creation and validation.

Tableau Testing:

- Verified correct filter behavior.
- Verified correct calculation fields.
- Verified correct dashboard responsiveness.

Web Testing:

- Verified routing works.
- Verified iframe responsiveness.
- Verified mobile responsiveness.
- Verified deployment link loads correctly.

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11. Screenshots or Demo

Tableau Public Dashboard Link:
https://public.tableau.com/views/ToyCraftsTales/ToyCraftTales?:language=en-GB&:sid=&:redirect=auth&:display_count=n&:origin=viz_share_link

Tableau Public Story Link:
https://public.tableau.com/views/ToyCraftsTalesStory/Story1?:language=en-GB&:sid=&:redirect=auth&:display_count=n&:origin=viz_share_link

Live Web Application:
https://toycrafttales.vercel.app

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12. Known Issues

- Pie chart becomes cluttered if too many states are displayed.
- Tableau Public occasionally shows loading delay.

- Index-based visualization is not analytically meaningful but included per requirement.

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13. Future Enhancements

- Add dark mode toggle.
- Replace pie chart with donut or treemap for better clarity.
- Integrate real-time data updates.
- Implement user authentication.
- Add advanced analytics such as forecasting.
- Deploy with custom domain.

Step-by-Step Project Development Procedure Summary

1. Collected dataset from Kaggle.
2. Installed MySQL and created database.
3. Created table schema and imported CSV.
4. Validated data using SQL queries.
5. Installed Tableau Desktop.
6. Connected Tableau to MySQL.
7. Created the following visualizations:
    - Analysis of the number of Manufacturers by Year
    - Analysis of Toy Manufacturer by Index
    - Analysis of Toy Manufacturers in the US State by Index
    - Analysis of Toy Manufacturers
    - Top 10 States Toy Manufacturer in the US State
8. Created dashboard integrating key visualizations.
9. Added filters and interactive elements.
10. Created story with structured analytical flow.
11. Published dashboard and story to Tableau Public.
12. Built Flask-based web interface.
13. Embedded Tableau dashboard and story.
14. Styled UI with modern minimalist design.
15. Deployed application on Vercel.
16. Conducted performance testing and validation.
17. Prepared documentation.