Data Analytics with Tableau

Project Development report

• Project Title:

ToyCraft Tales: Tableau's Vision into Toy Manufacturer Data

• Team Members:

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1. INTRODUCTION

1.1 Project Overview :

- This project explores the US toy manufacturing industry using Tableau. It focuses on analyzing patterns, trends, and state-wise performance from the years 2005 to 2016.
- The dashboard and storyboards help stakeholders derive insights for strategic decisions.

1.2 Purpose:

1. Visualize Market Trends

Gain insights into historical toy manufacturing data by analyzing patterns across time and geography. This helps identify growth areas, declines, and key shifts in production trends.

2. Support Strategic Decision-Making

Use data to inform decisions about where and when to produce. Identify

top-performing states, high-index manufacturers, and seasonal demand to optimize operations and investments.

3. Understand Consumer Behavior

Explore toy category popularity, purchasing patterns, and demographic influences. This enables manufacturers to align products with customer preferences and improve market fit.

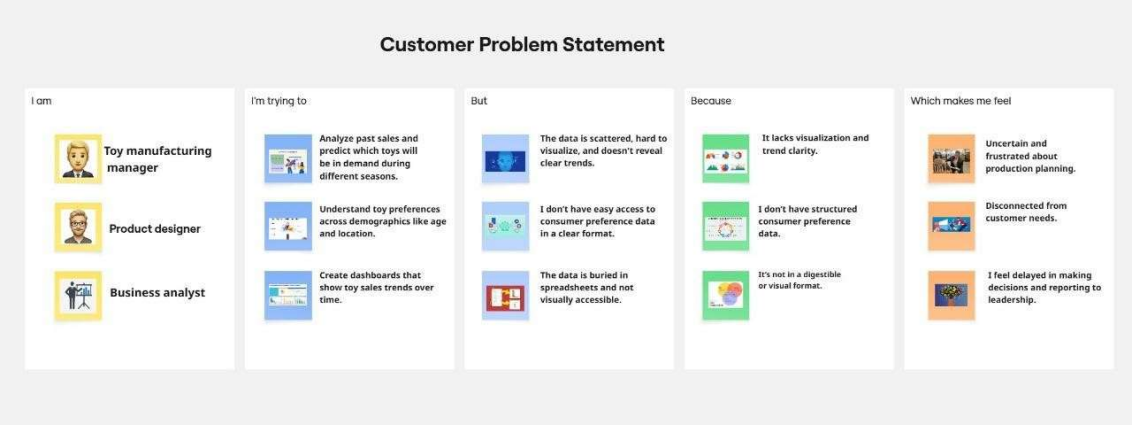
4. Enable Interactive Exploration

Develop dynamic Tableau dashboards that allow users to filter, compare, and interact with the data. This makes analysis more user-friendly and decision-focused.

2. IDEATION PHASE

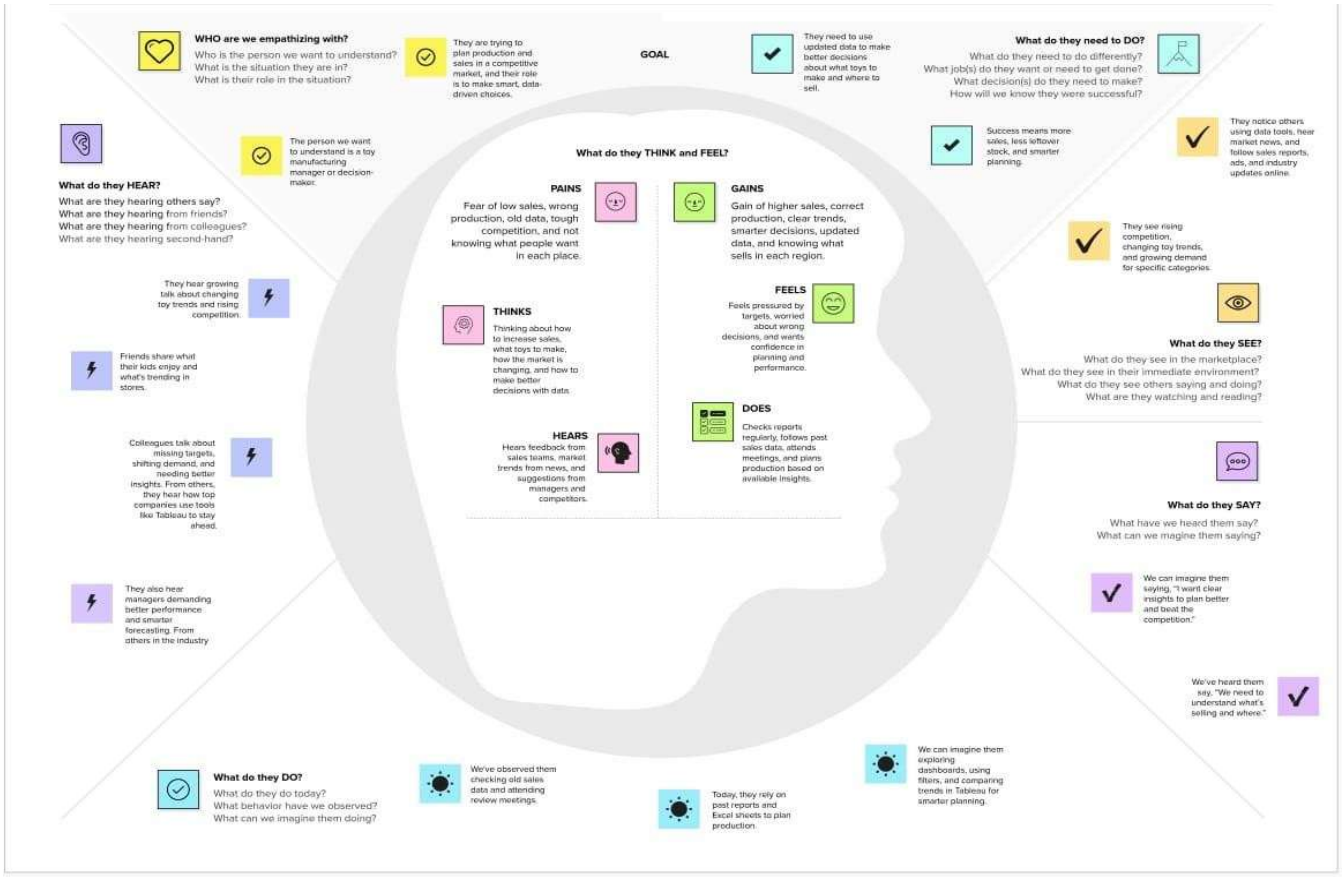
2.1 Problem Statement :

The toy manufacturing industry faces challenges in adapting to dynamic market trends, evolving consumer preferences, and regional demand variations. Despite having access to extensive data, many manufacturers lack actionable insights to make informed strategic decisions. There is a pressing need for a data-driven approach that can reveal production patterns, seasonal sales fluctuations, and demographic-based consumer behavior.

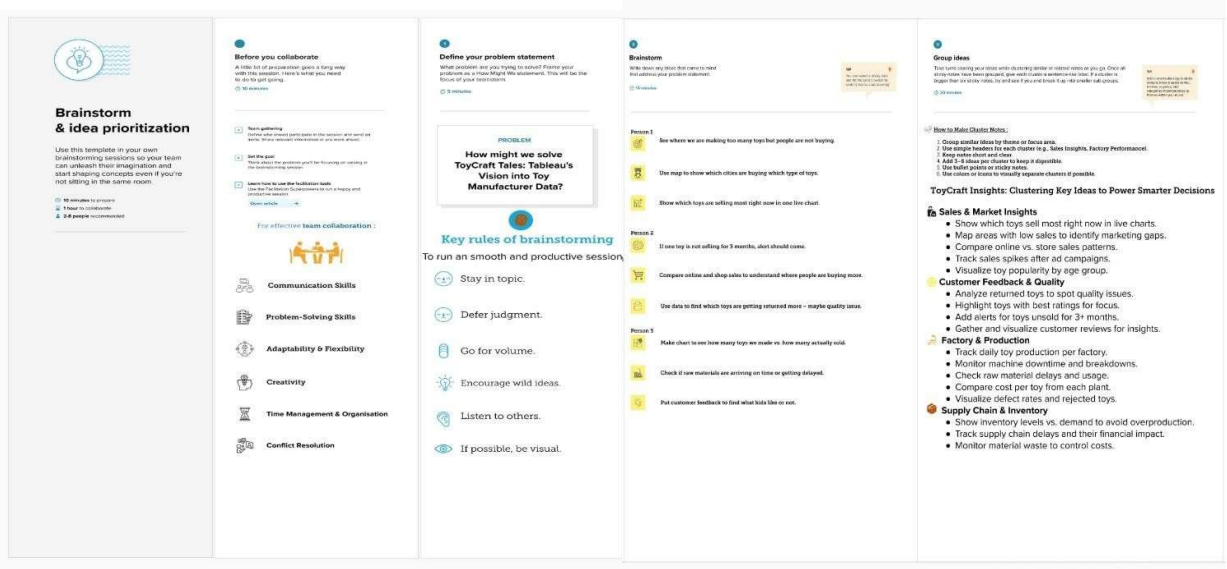


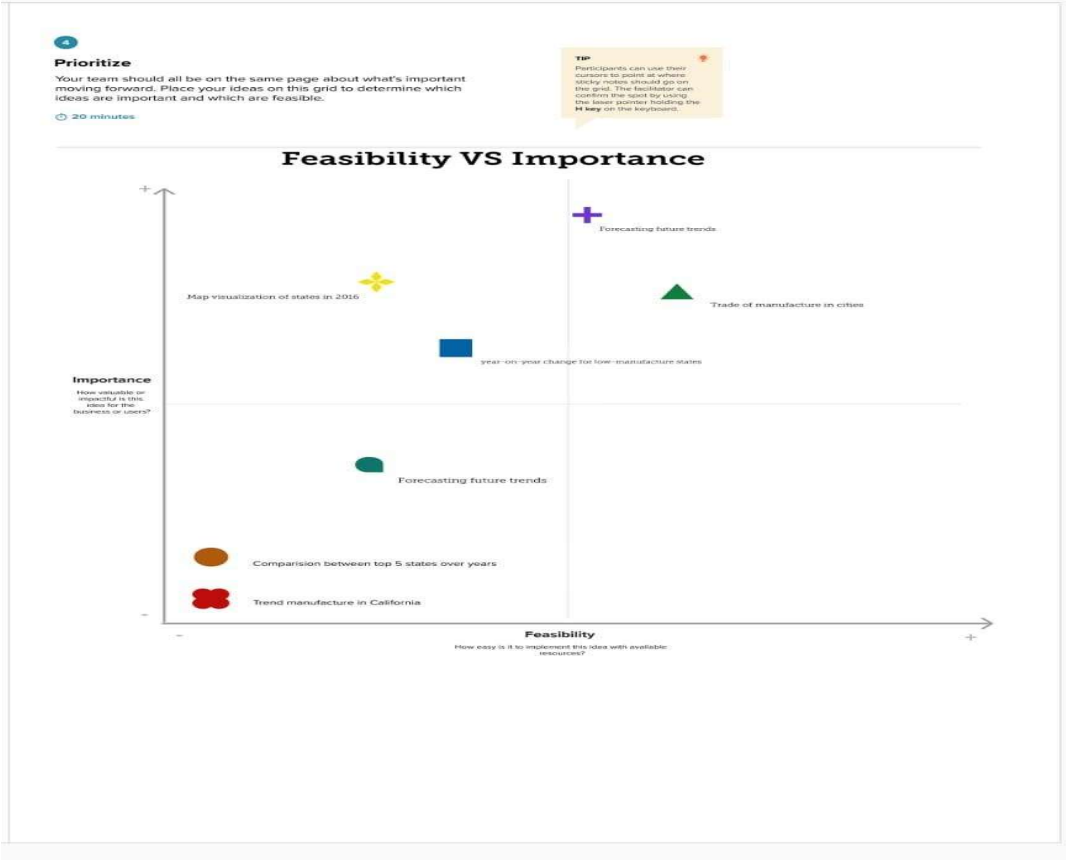
This project addresses the problem by leveraging Tableau to analyze and visualize multi-dimensional toy industry data. It aims to uncover hidden trends, highlight regional and seasonal sales performance, and provide manufacturers with interactive tools to explore consumer preferences. Through insightful visual storytelling, the project empowers stakeholders to optimize production planning, tailor marketing strategies, and enhance competitiveness in a highly seasonal and consumer-driven market.

2.2 Empathy Map Canvas:



2.3 Brainstorming:



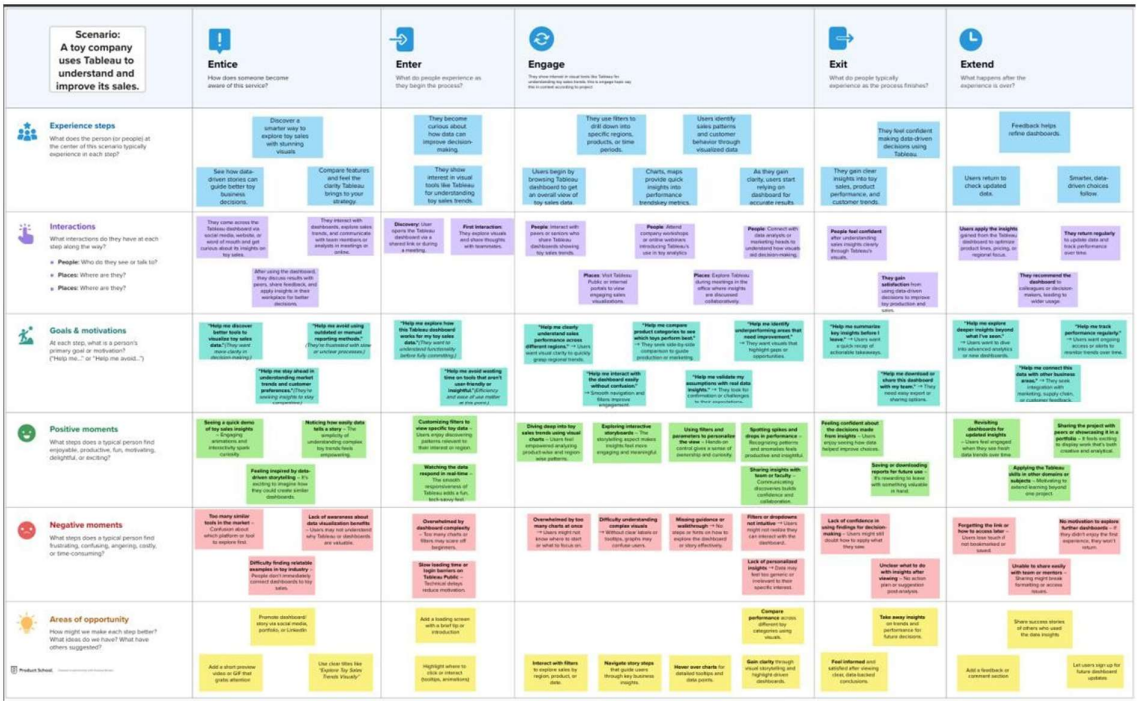


3. REQUIREMENT ANALYSIS

The primary objective of this project is to help a toy manufacturing company gain valuable insights into its sales, product performance, and regional distribution through data visualization using Tableau. The stakeholders include business analysts, sales and marketing teams, manufacturing managers, and decision-makers who require clear, interactive, and insightful dashboards to support strategic decisions. The project must handle clean and structured sales data, provide filtering options (e.g., by product, region, or time), and present key metrics in a visually compelling format. Tableau dashboards and stories should load quickly, be responsive, and ensure data security. Data sources include Excel or CSV files containing detailed records of transactions, products, and customer segments. The solution aims to simplify complex data into actionable insights, making data exploration intuitive for all user levels.

3.1 Customer Journey map:

1. **Entice** – People discover the dashboard through social media, websites, or word of mouth.
2. **Enter** – They visit the link and check out the visuals for the first time.
3. **Engage** – Users explore filters, charts, and stories to understand toy sales.
4. **Exit** – After finding insights, they leave or save/download what they need.
5. **Extend** – They return later, share it with others, or use it in team decisions.



3.2 Solution Requirement:

1. User-Friendly Dashboard
    - Clear visuals and filters to analyze toy sales data.
2. Interactive Storytelling
    - Story feature to guide users through key insights.
3. Responsive Design

- Accessible on desktops, tablets, and mobile devices.

1. Live Data Connectivity (Optional)
    - Option to link real-time or regularly updated datasets.
2. Data Security & Privacy
    - Ensure shared dashboards protect sensitive info.
3. Performance & Speed
    - Fast loading and smooth filtering experience.

3.3 Data Flow Diagram:

- Users interact with the ToyCraft Dashboard through a web browser.
- The Dashboard pulls data from a Sales Database that includes product, region, and time-based sales.
- Admin/Analysts upload or update data to the Cloud Data Storage using ETL tools.
- External APIs (e.g., weather or location) may be used to enrich the data before analysis.
- The data flows through Tableau, which processes and presents it visually in dashboards and stories.
- Processed data can also be exported to other tools for reports or shared with management.

3.4 Technology Stack:

1. **Frontend**

- **HTML/CSS/JavaScript** – For building the interactive landing page and embedding Tableau visualizations.
- **Tableau Public Embed** – To visually present the dashboard and story within the website.

2. **Data Visualization**

- **Tableau Public** – Main tool used to create dashboards and storyboards for toy sales analysis across products, regions, and time.

3. **Backend / Data Handling**

- **CSV/Excel Files** – Used for importing cleaned toy sales data into Tableau.
- **ETL (Extract-Transform-Load)** – Performed manually or through Tableau Prep for preprocessing data.

4. **Cloud / Hosting**

- **Tableau Public Cloud** – Hosts the dashboard and story online for public access.
- **GitHub or Netlify (optional)** – For hosting the static website where Tableau is embedded.

5. **External Tools (Optional)**

- **Miro/Mural** – For customer journey mapping and planning architecture.
- **Canva** – For banner or UI design.

4. PROJECT DESIGN

4.1 Problem Solution Fit:

Problem:

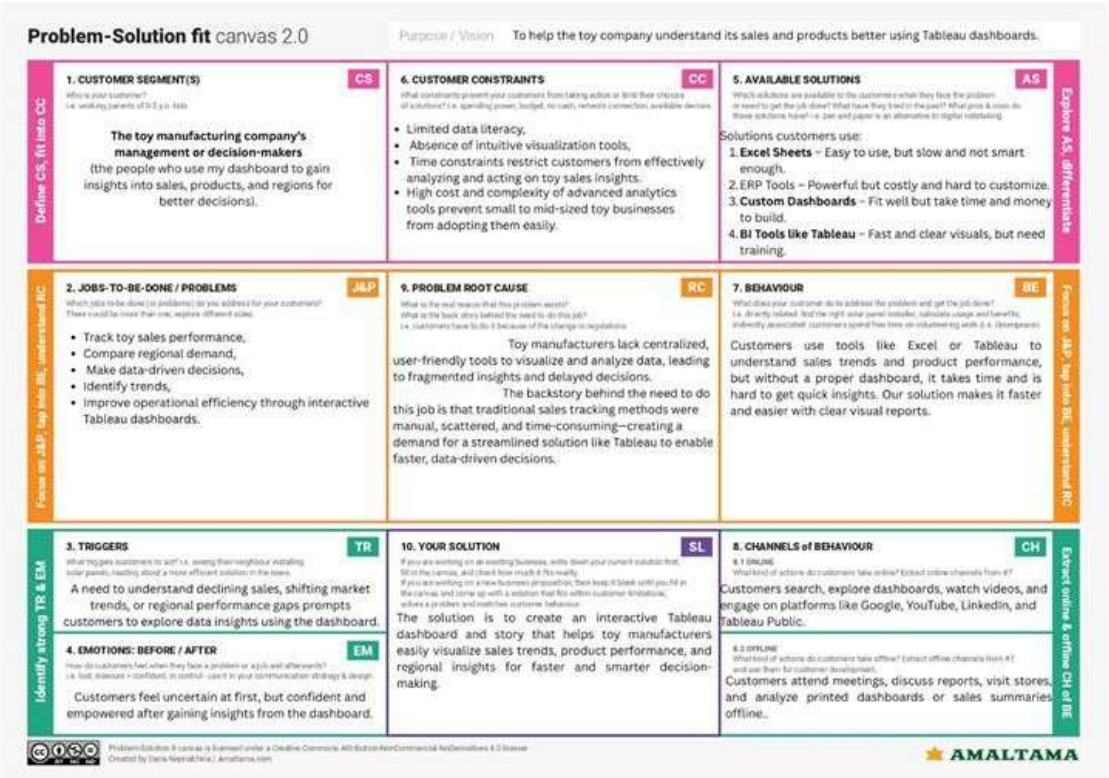
Toy manufacturing companies often struggle to understand complex sales patterns, regional demand, and product performance due to scattered or unvisualized data.

Solution:

The Tableau dashboard and story provide a centralized, interactive, and visual way to explore toy sales data—helping decision-makers quickly identify trends, compare regions, and make informed business decisions.

Fit:

The solution directly addresses the need for clarity, speed, and accuracy in analyzing sales data. It transforms raw numbers into meaningful insights, enabling better planning and strategy.



4.2 Proposed Solution:

We propose implementing an interactive **Tableau Dashboard and Story** that visually represents toy sales data across various regions and products. This solution enables:

- **Real-time insights** into sales performance, top-selling products, and low-performing regions.
- **User-friendly visualizations** for stakeholders to explore trends without deep technical knowledge.
- **Data-driven decisions** through filters, graphs, and KPIs that highlight key metrics.
- **Scalability** to add more data like customer demographics or seasonal trends in future updates.

By using Tableau, the company can convert raw sales data into actionable insights for better planning, marketing, and product decisions.

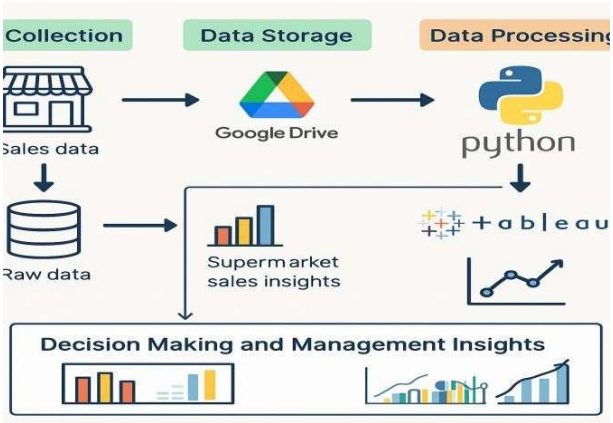
4.3 Solution Architecture:

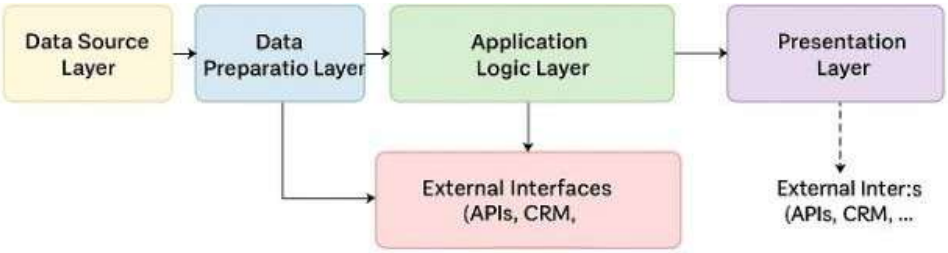
The solution architecture for *ToyCraft Tales* integrates data processing, visualization, and user interaction in a streamlined flow:

1. **Data Source Layer**
    - Sales data is collected from spreadsheets, databases, or ERP systems used by the toy manufacturer.
2. **Data Preparation Layer**
    - Data is cleaned, transformed, and formatted using tools like Microsoft Excel or Tableau Prep.
3. **Visualization Layer**
    - Tableau Public is used to build interactive dashboards and stories that visualize sales trends, product performance, and regional analysis.
4. **User Interface Layer**

- Users access the visualizations via embedded Tableau dashboards in a responsive web page (HTML/CSS/JS).

5. **Hosting Layer**





5. PROJECT PLANNING & SCHEDULING

5.1 Project Planning

1. **Objective:**
To build an interactive Tableau dashboard and story that helps toy manufacturers analyze sales data across products, regions, and time.

2. **Phases & Timeline:**

Phase	Description	Duration
1. Requirement Analysis	Understand data needs, audience, and business goals	2 days
2. Data Collection	Gather and clean sales data	2–3 days
3. Data Visualization	Build dashboard and story using Tableau	4–5 days
4. Web Integration	Embed visualizations into a responsive webpage	2 days
5. Testing & Feedback	Test functionality and gather user feedback	1–2 days
6. Final Presentation	Document, present, and deploy final solution	1 day

3. **Tools & Technologies:**
   - Tableau Public
   - Excel or CSV data files
   - HTML, CSS, JavaScript
   - Canva/Miro for diagrams (optional)

6. FUNCTIONAL AND PERFORMANCE TESTING

6.1 Performance Testing:

1. Data Rendered Annual number of toy manufacturers from 2005 to 2016, categorized by U.S. states, including a national total for “United States.

2. Data Preprocessing Removed ”index” column, ensured correct data types (“Year” as “int”, “Number of Manufactures” as” int”), checked for and handled missing values.

3. Utilization of Filters Filters for “State”, “Year” (range: 2005 2016), and “Number of Manufactures”, used for interactive selection in visualizations.

4. Calculation fields Used Year-over-Year change, % contribution of each state to the national total, cumulative state trends, and national aggregates.

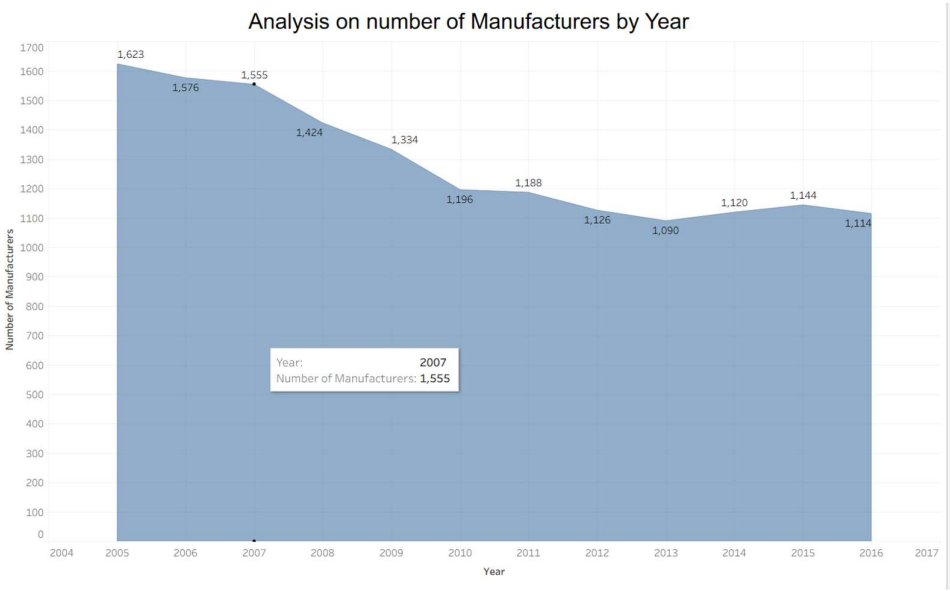
5. Dashboard design No of Visualizations / Graphs – 6

6 Story Design No of Visualizations / Graphs – 7

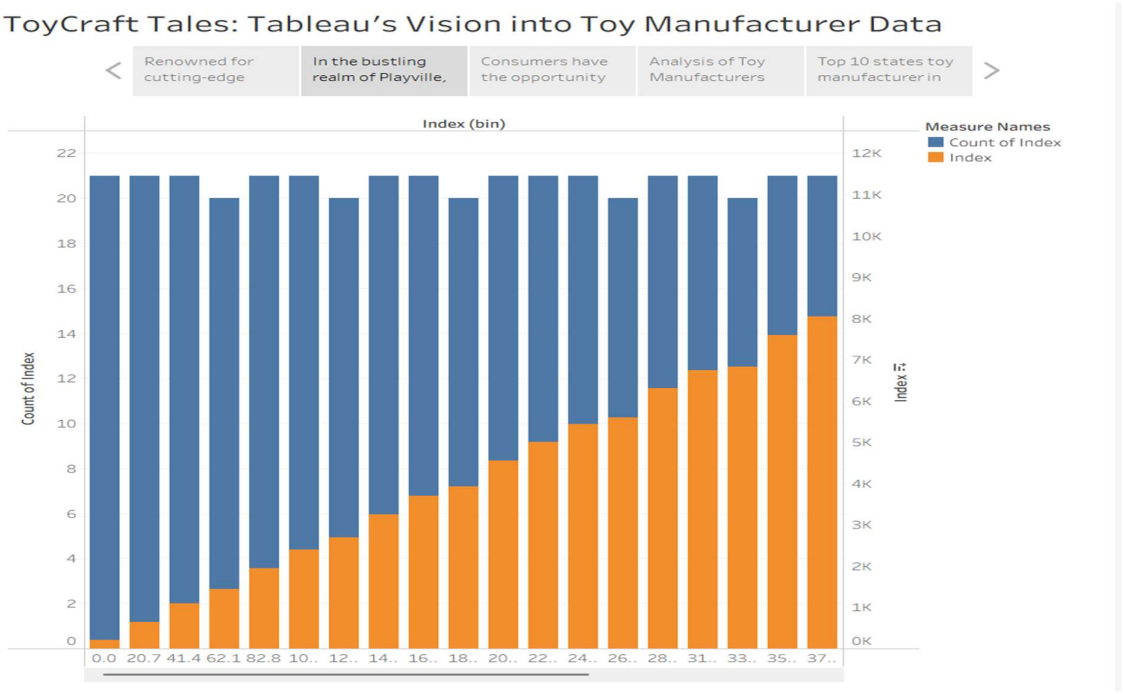
7. RESULTS

7.1 Output Screenshots

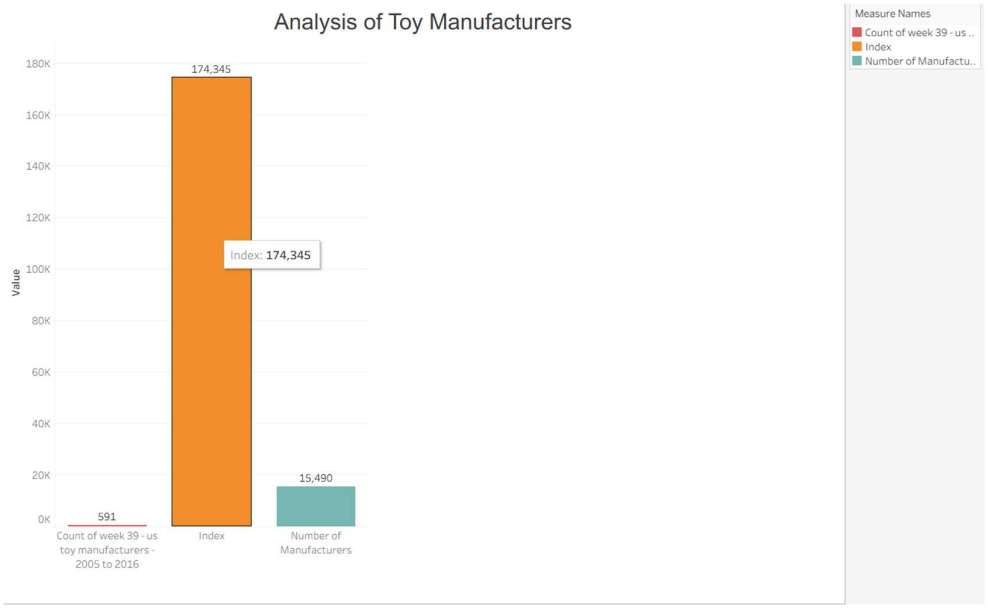
1. AREA CHART showing number of manufacturers by year:



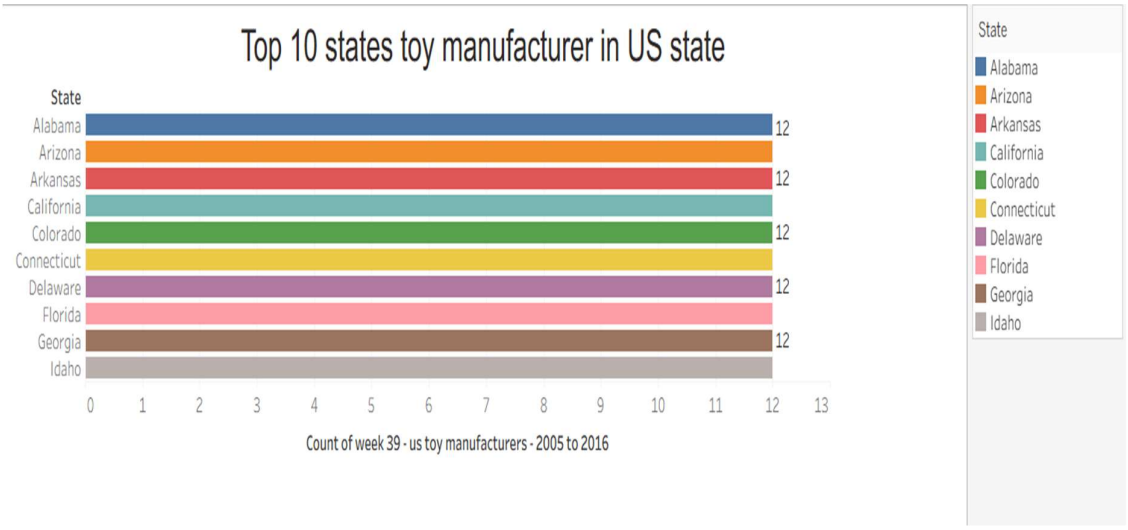
2.BAR CHART showing analysis on Toy manufacturers by



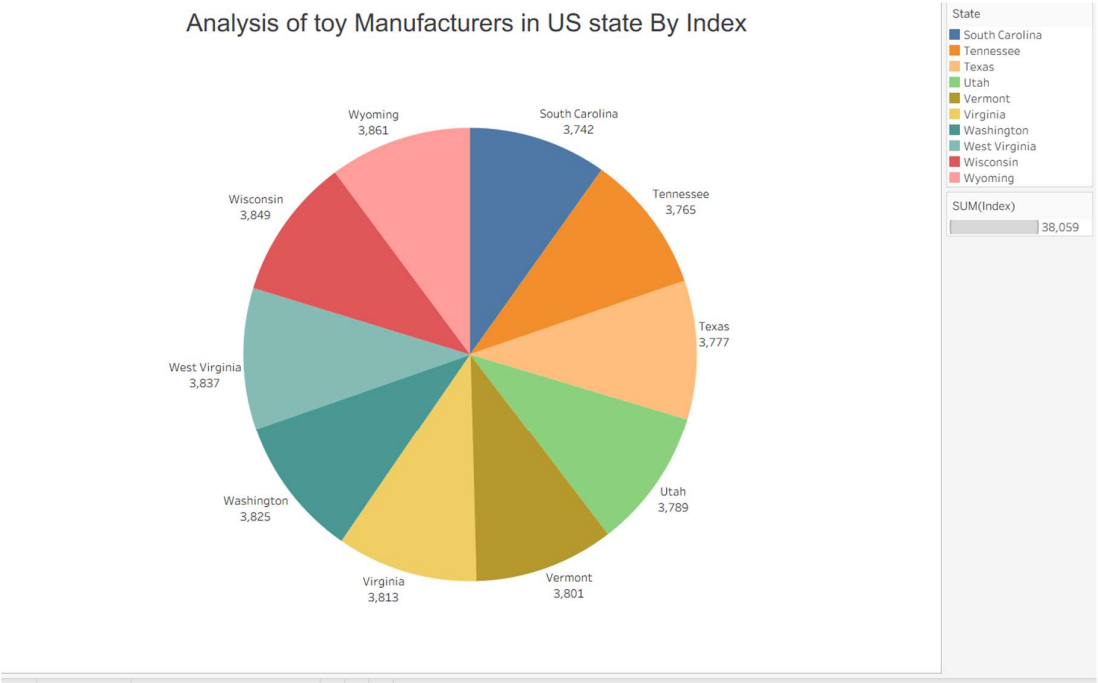
3.BAR CHART showing no.of indexes:



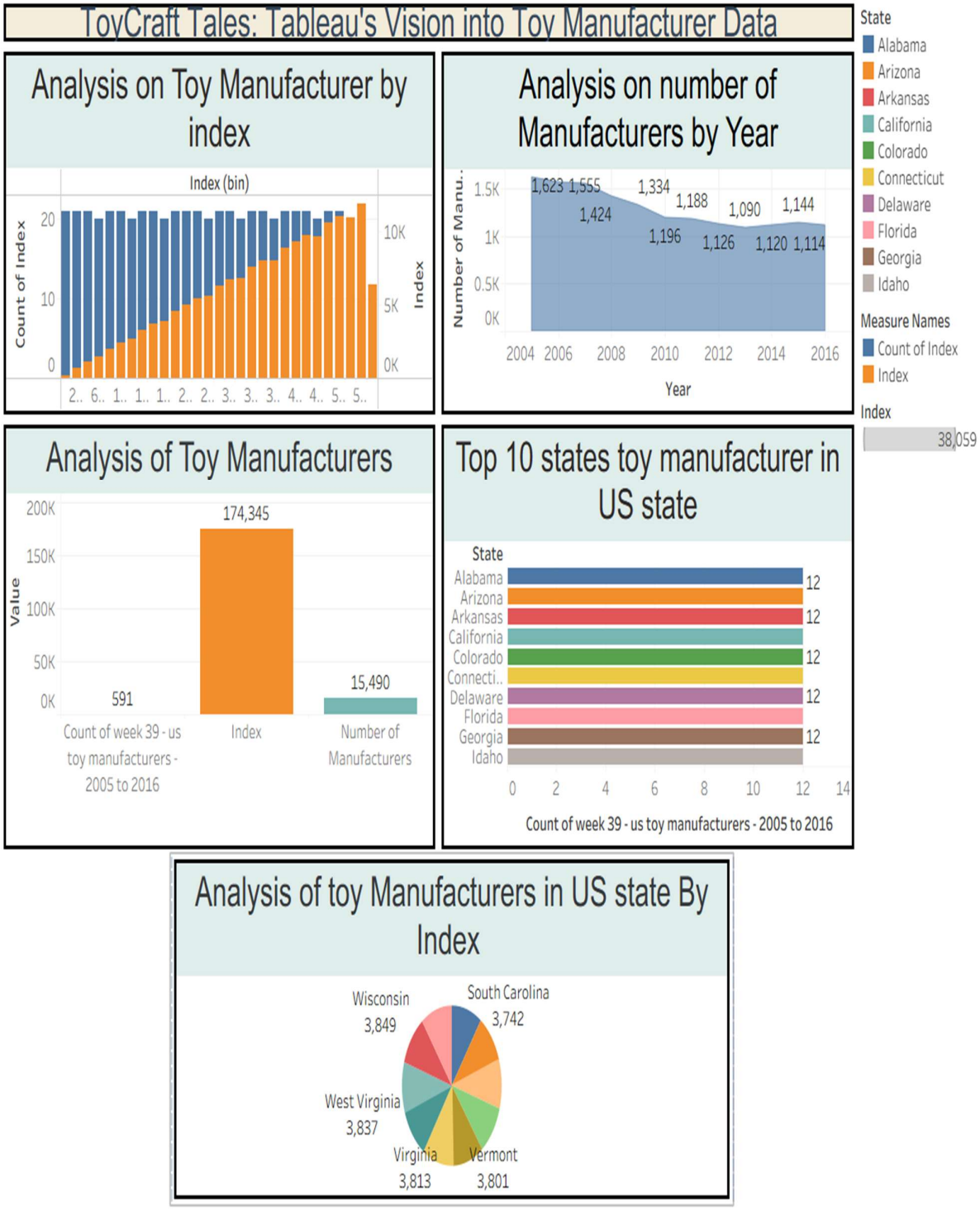
4.Chart showing top 10 toy manufacturers in US



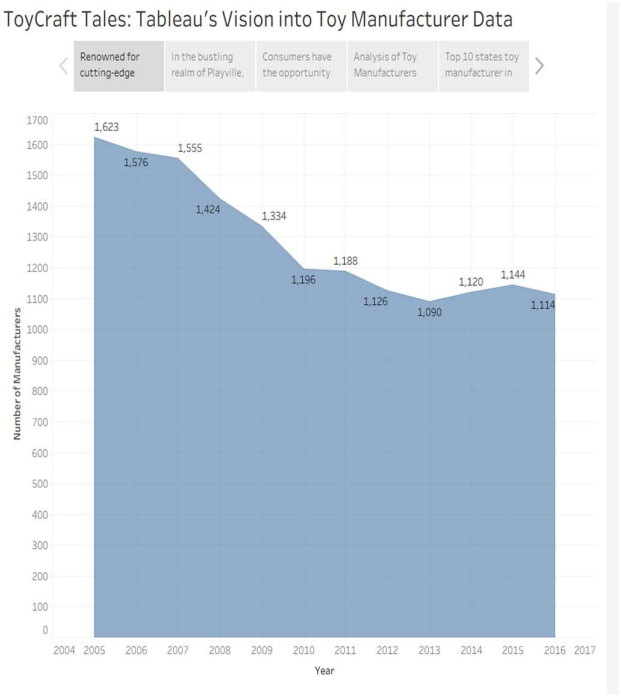
5.PIE CHART showing analysis on toy manufacturers by index:



DASHBOARD


ToyCraft Tales: Tableau's Vision into Toy Manufacturer Data
Analysis on Toy Manufacturer by index
Index (bin)
Count of Index
Index
Analysis on number of Manufacturers by Year
Number of Manu..
1,623 1,555 1,424 1,334 1,196 1,188 1,126 1,090 1,120 1,144 1,114
Year
Analysis of Toy Manufacturers
Value
591
174,345
15,490
Count of week 39 - us toy manufacturers - 2005 to 2016
Index
Number of Manufacturers
Top 10 states toy manufacturer in US state
State
Alabama
Arizona
Arkansas
California
Colorado
Connecti..
Delaware
Florida
Georgia
Idaho
Count of week 39 - us toy manufacturers - 2005 to 2016
Analysis of toy Manufacturers in US state By Index
Wisconsin 3,849
South Carolina 3,742
West Virginia 3,837
Virginia 3,813
Vermont 3,801
State
Alabama
Arizona
Arkansas
California
Colorado
Connecticut
Delaware
Florida
Georgia
Idaho
Measure Names
Count of Index
Index
Index
38,059

STORY


ToyCraft Tales: Tableau's Vision into Toy Manufacturer Data
Renowned for cutting-edge
In the bustling realm of Playville,
Consumers have the opportunity
Analysis of Toy Manufacturers
Top 10 states toy manufacturer in
Number of Manufacturers
Year
1,623
1,576
1,555
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1,334
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1,188
1,126
1,090
1,120
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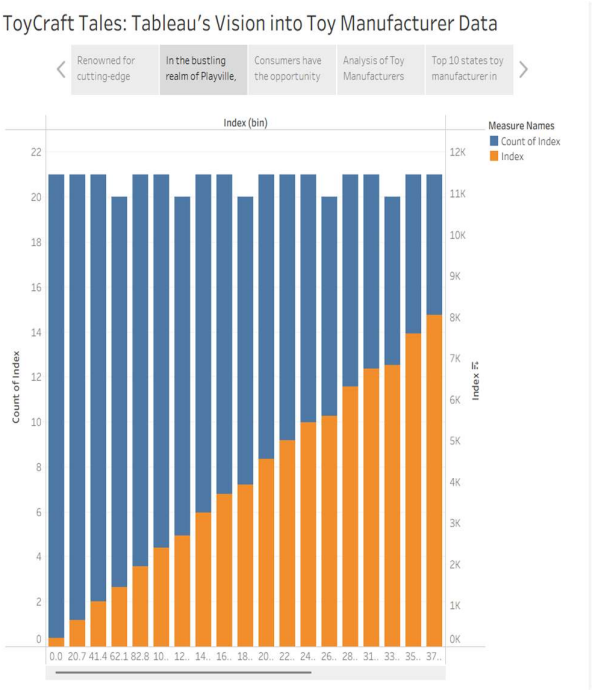
1,114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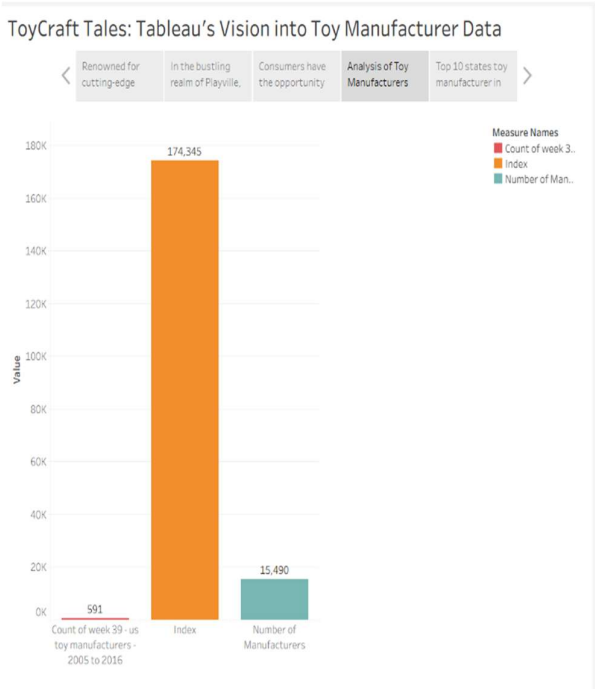
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Top 10 states toy manufacturer in
Measure Names
Count of week 3..
Index
Number of Man..
Value
174,345
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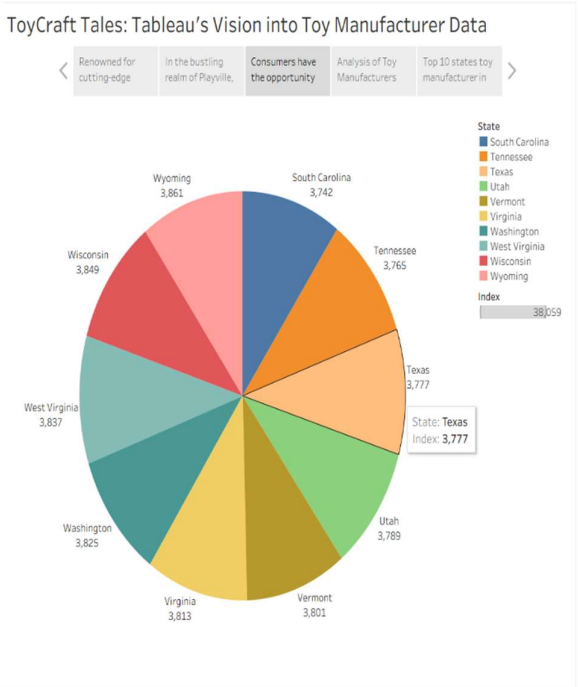
591
Count of week 39 - us toy manufacturers - 2005 to 2016
Index
Number of Manufacturers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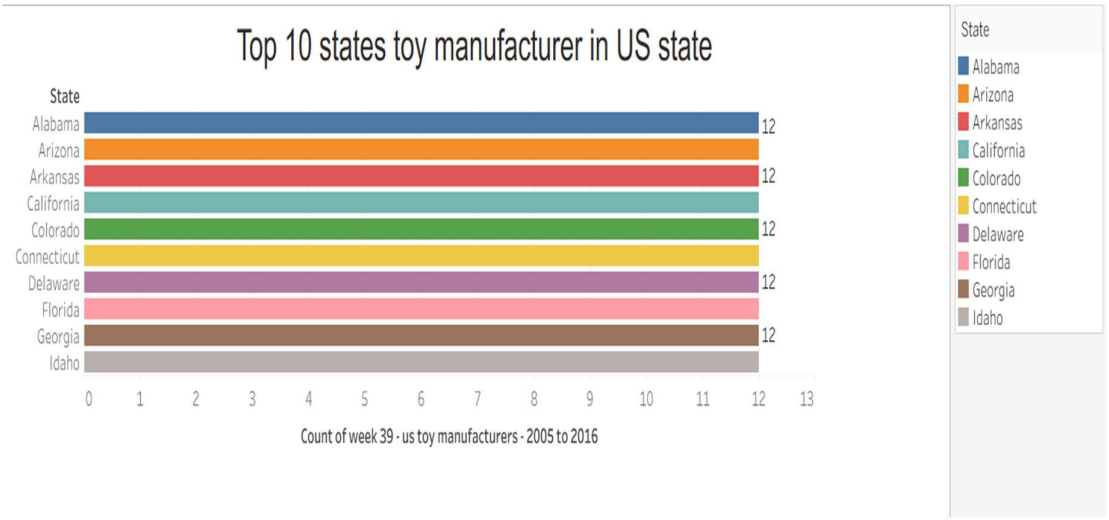
Top 10 states toy manufacturer in
State
South Carolina
Tennessee
Texas
Utah
Vermont
Virginia
Washington
West Virginia
Wisconsin
Wyoming
Index
38,059
Wyoming 3,861
South Carolina 3,742
Wisconsin 3,849
Tennessee 3,765
Texas 3,777
West Virginia 3,837
State: Texas
Index: 3,777
Utah 3,789
Washington 3,825
Virginia 3,813
Vermont 3,801



8. ADVANTAGES & DISADVANTAGES

Advantages:

1. **Improved Decision-Making**
   Helps toy manufacturers make data-driven decisions using interactive visuals.
2. **Visual Insights**
   Tableau dashboards and stories make complex data easy to understand.
3. **User-Friendly Interface**
   Clean, responsive web integration makes the dashboard accessible on any device.
4. **Time-Saving**
   Reduces manual reporting efforts with real-time visual updates.
5. **Scalable Solution**
   Can be extended with more datasets like inventory, feedback, or seasonal trends.

Disadvantages:

1. **Limited to Public Tableau**
   Free Tableau Public has restrictions (e.g., no data privacy, limited customization).

2. **Static Data (if not automated)**
   If data isn't updated regularly, the dashboard becomes outdated.
3. **Internet Dependency**
   Requires stable internet to view online dashboards.
4. **Learning Curve**
   Some users may need time to understand and interact with Tableau visuals effectively.
5. **Not a Full BI Tool**
   This project provides insights but doesn't support advanced forecasting or real-time alerts without additional tools.

9. CONCLUSION

The **ToyCraft Tales** project successfully demonstrates how data visualization tools like **Tableau** can transform raw sales data into meaningful insights for better decision-making in the toy manufacturing industry. By integrating interactive dashboards and stories, this project enhances data accessibility, uncovers key trends across products and regions, and empowers stakeholders with a clear view of performance. It provides a solid foundation for building data-driven strategies and highlights the importance of visual analytics in modern business environments.

10. FUTURE SCOPE:

Future Scope

1. **Real-time Data Integration**: Incorporate live data feeds for dynamic dashboards and up-to-the-minute insights.
2. **Advanced Analytics**: Apply predictive analytics and forecasting models using machine learning for demand prediction.
3. **Mobile Accessibility**: Optimize dashboards for mobile and tablet viewing to enhance usability for on-the-go decision-makers.
4. **User Customization**: Enable role-based dashboards tailored to departments like sales, marketing, or inventory.

5. **Scalability**: Extend the solution to include more regions, product lines, and multi-source data integration for broader insights.

11. APPENDIX

Source Code(if any):

ToyCraft Tales project is based on **Tableau**, there usually isn't "source code" for this project in the traditional sense (like Python, Java, etc.)

Dataset Link:

ToyCraft _Tales : Tableau's Vision into Toy Manufacturer Data

https://www.kaggle.com/datasets/thedevastator/toy-manufacturers-in-us-states

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GitHub & Project Demo Link

Github repository:

https://github.com/Venkatesh9143/ToyCraft-Tales-Tableau-s-Vision-into-Toy-Manufacturer-Data

project demo link:

https://drive.google.com/file/d/1epBvtg2rjXZlit-yytVlGNwi5socludF/view?usp=sharing