ToyCraft Tales: Tableau's Vision into Toy Manufacturer Data

1. INTRODUCTION

Project Overview:

The project titled "ToyCraft Tales: Tableau’s Vision into Toy Manufacturer Data" explores the historical patterns and evolving dynamics of the U.S. toy manufacturing industry between 2005 and 2016. Using Tableau as the primary visualization and analytical tool, this project transforms raw CSV data into interactive dashboards, unveiling insights into state-wise manufacturer distribution, declining industry trends, and potential regional market opportunities. The visual narratives are structured to empower stakeholders—such as analysts, strategists, and policymakers—with the ability to detect actionable insights, simulate demand patterns, and build resilient growth strategies in a data-driven manner.

Purpose

The core purpose of this project is to highlight the steady decline in U.S. toy manufacturers over a 12-year period and to help decision-makers visualize the industry’s historical trends and regional shifts. By developing and showcasing interactive Tableau dashboards, the project aims to:

- Enable stakeholders to identify top-performing and underrepresented states in toy production
- Simulate seasonal or demographic market behaviors using calculated visual patterns
- Provide a tool for strategic planning, regional investments, and product-line development
- Illustrate the power of Tableau as a medium for transforming complex data into intuitive visual storytelling

2. IDEATION PHASE

Problem Statement:

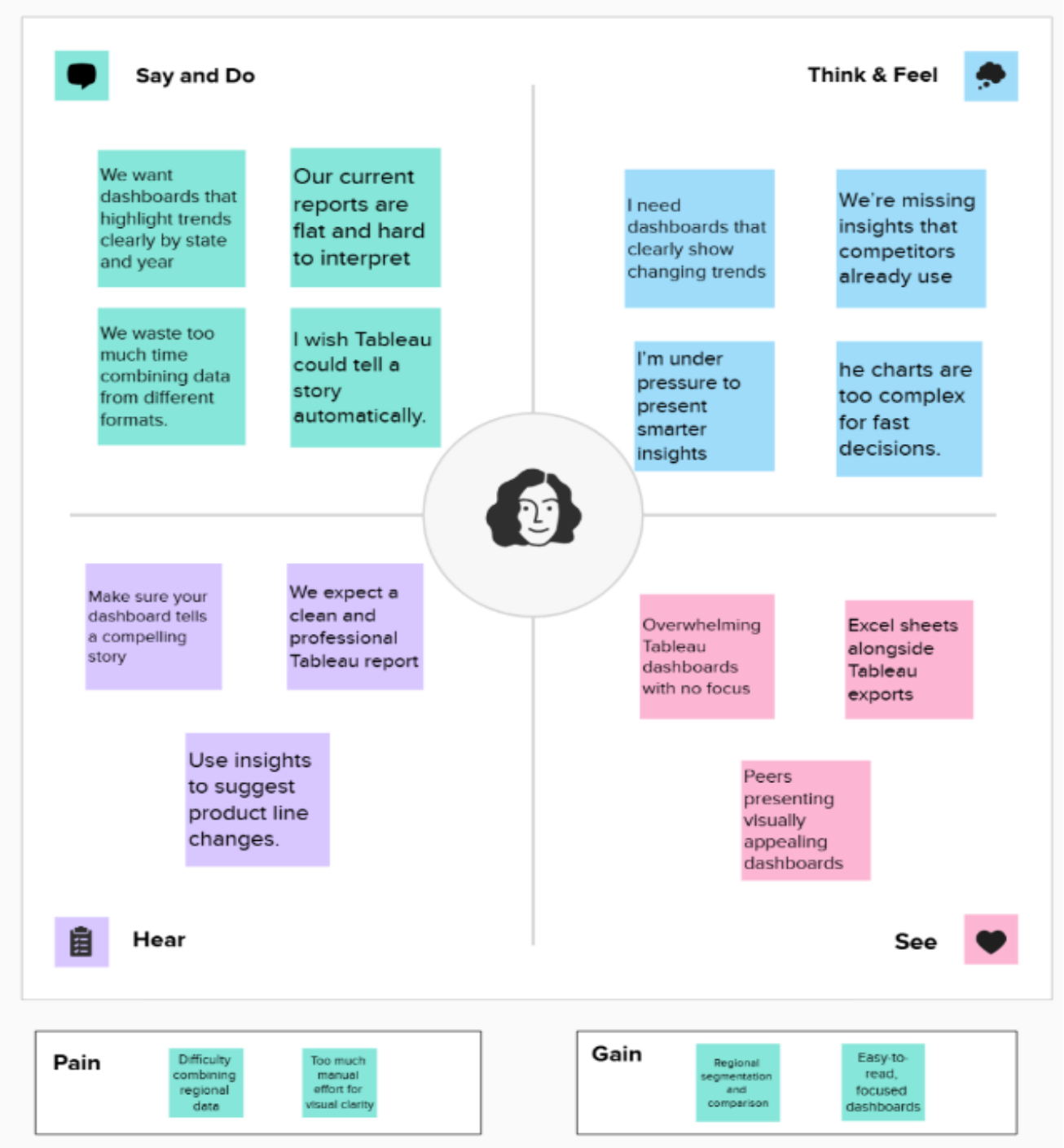
The U.S. toy manufacturing industry experienced a consistent decline in the number of manufacturers between 2005 and 2016. Despite the availability of historical data, stakeholders—including analysts, strategists, and policymakers—face significant challenges in identifying patterns, regional disparities, and the underlying causes behind this decline. Traditional static reports fail to provide the interactive exploration needed to derive actionable insights. There is a clear need for a dynamic, visually-driven solution that transforms raw data into meaningful narratives to support strategic decision-making, detect untapped opportunities, and stimulate informed investment in the toy sector.

Prompt	Guiding Question	Customized Response
I am	Describe the customer with 3–4 key characteristics – who are they?	A data-driven business analyst or strategist in the U.S. toy industry, seeking to uncover regional trends and historical performance of manufacturers.
I'm trying to	List their outcome or "job" they care about – what are they trying to achieve?	Make informed, strategic decisions by visualizing historical manufacturing data and predicting growth opportunities using Tableau dashboards.
but	Describe what problems or barriers stand in the way – what bothers them most?	Raw data is complex and lacks immediate insights; no easy visibility into trends, state-wise comparisons, or seasonal variations.
because	Enter the "root cause" of why the problem or barrier exists – what needs to be solved?	Traditional reports are static and fragmented, and there's limited tooling to translate complex data into intuitive, interactive insights.
which makes me feel	Describe the emotions from the customer's point of view – how does it impact them emotionally?	Frustrated, uncertain, and under pressure to deliver decisions quickly without enough clarity or confidence from the data alone.

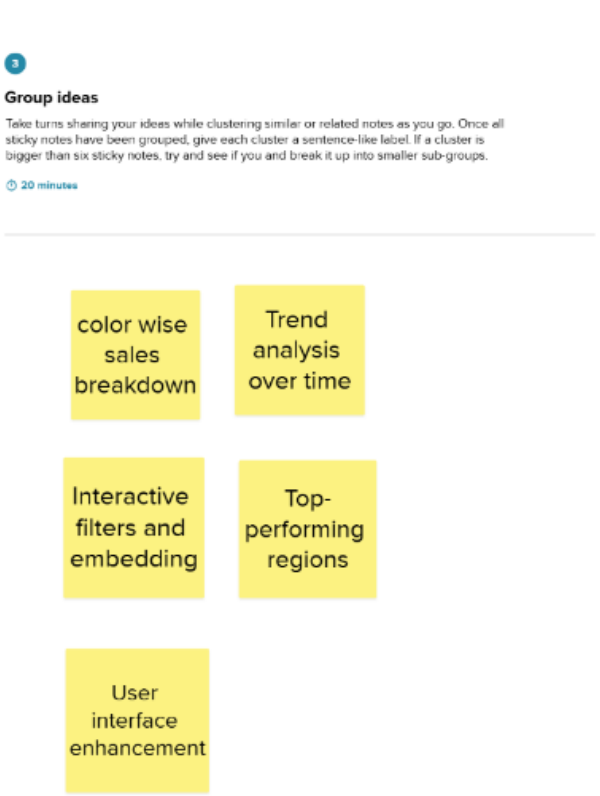
Example:

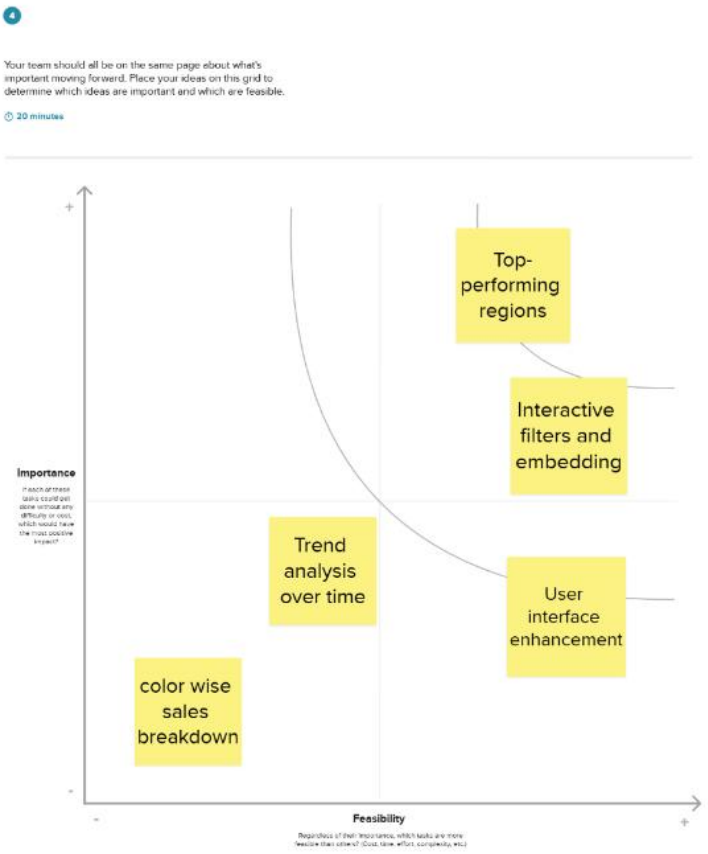
Problem Statement (PS)	I am (Customer)	I'm trying to	But	Because	Which makes me feel
PS-1: U.S. toy manufacturing has been declining steadily from 2005 to 2016, and businesses lack clarity on trends.	A toy industry strategist, data analyst, or planner in the U.S.	Make informed decisions about where and how to invest or scale manufacturing.	The available data is raw, fragmented, and lacks interactive insights.	Traditional reports don't help simulate scenarios or visualize regional shifts effectively.	Frustrated, under pressure, and limited by poor visibility into market behavior.
PS-2: There's a need for interactive tools that reveal regional manufacturing trends and market seasonality shifts.	A policymaker, consultant, or stakeholder reviewing industrial performance and economic development.	Develop strategies that support local manufacturing and understand toy industry behavior across states.	Current tools lack the granularity, storytelling, and simulation needed to identify insights.	There's no unified dashboard that combines spatial, time-series, and category-level analysis.	Confused, hesitant to invest, and in need of intuitive data guidance.

Empathy map:


Say and Do
We want dashboards that highlight trends clearly by state and year
Our current reports are flat and hard to interpret
We waste too much time combining data from different formats.
I wish Tableau could tell a story automatically.
Think & Feel
I need dashboards that clearly show changing trends
We're missing insights that competitors already use
I'm under pressure to present smarter insights
he charts are too complex for fast decisions.
Make sure your dashboard tells a compelling story
We expect a clean and professional Tableau report
Use insights to suggest product line changes.
Overwhelming Tableau dashboards with no focus
Excel sheets alongside Tableau exports
Peers presenting visually appealing dashboards
Hear
See
Pain
Difficulty combining regional data
Too much manual effort for visual clarity
Gain
Regional segmentation and comparison
Easy-to-read, focused dashboards

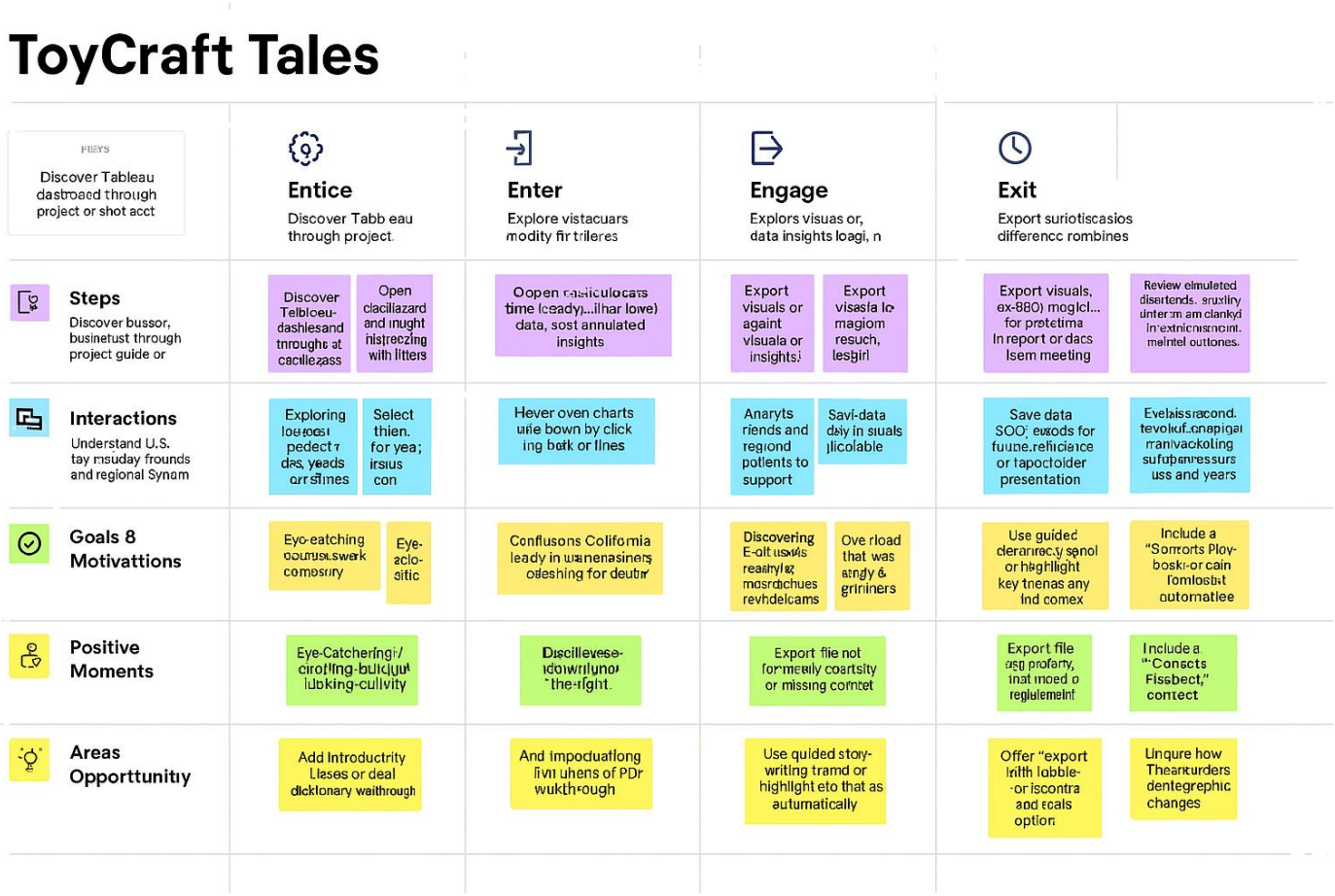
Brainstorming:





3. REQUIREMENT ANALYSIS

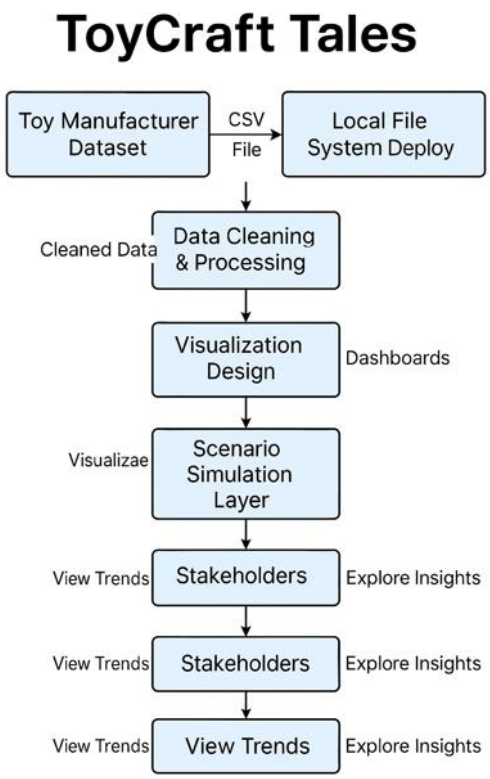
Customer Journey map



Solution Requirement

FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	User Registration	Registration through Form Registration through Gmail Registration through LinkedIN
FR-2	User Confirmation	Confirmation via Email Confirmation via OTP
FR-3	Data Exploration & Filtering	- Filter manufacturers by Year, State, and Index; simulate category filters like product typ
FR-4	Dashboard Interactivity	- View dynamic charts (e.g., Manufacturers by Year, Top States); use drill-down by State or Year
FR-5	Scenario-Based Storytelling	- Include seasonal demand simulation; regional insights; animated change across time with storytelling
FR-6	User Feedback & Export Options	Export dashboard as image/PDF for reports; capture user suggestions via embedded notes or comments

Data Flow Diagram:



Technology Stack:

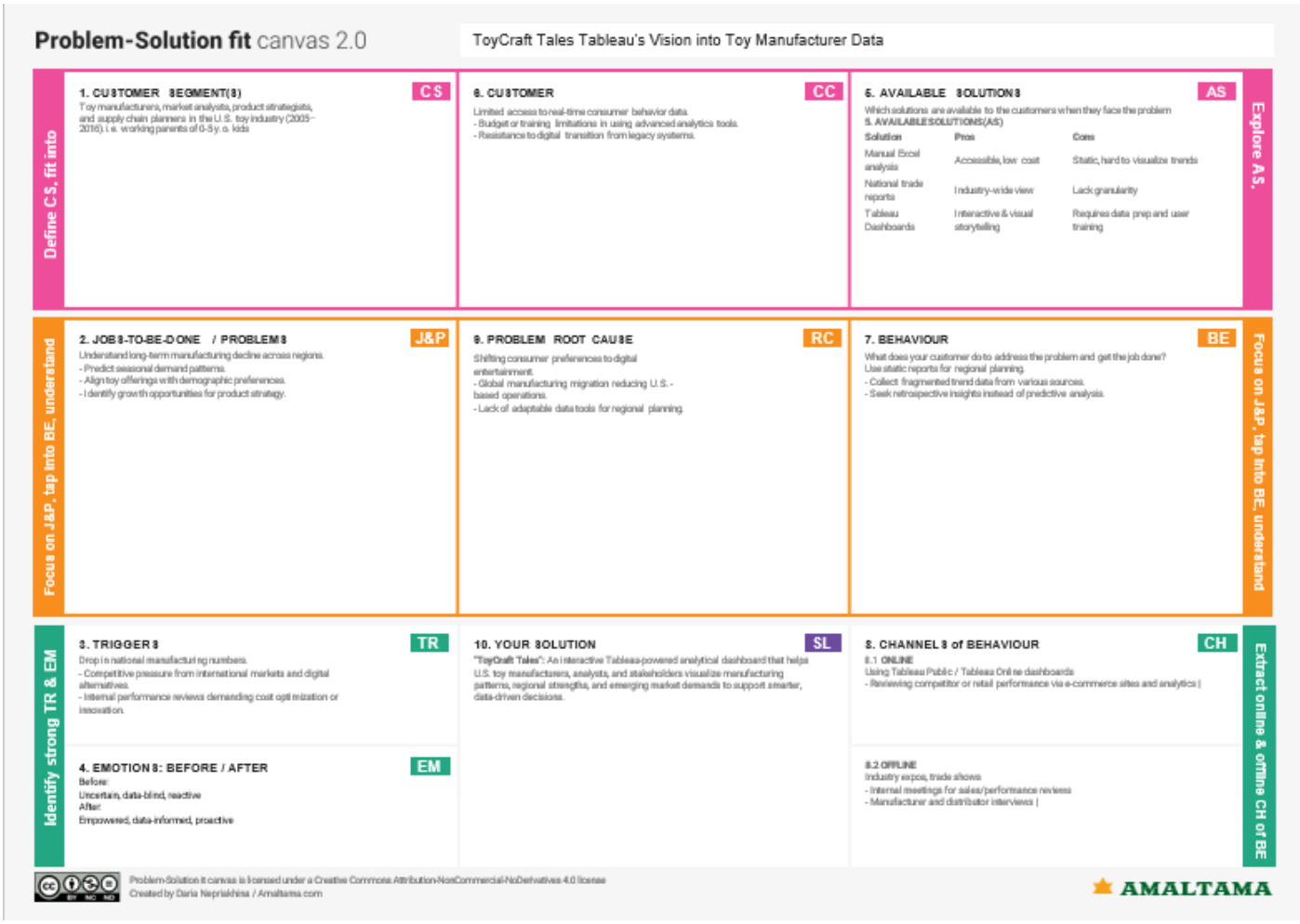
Component	Tool / Technology	Purpose
Data Source Layer	food_coded.csv	Raw dataset containing students' dietary behaviors, preferences, and lifestyle indicators
Data Storage	SQL Workbench / CSV File	Centralized storage for cleaned and filtered datasets
Data Processing	Python (pandas, NumPy)	Cleaning, filtering, recoding variables, and transforming data for analysis
Data Filtering	SQL Queries	Custom filters based on GPA, calorie intake, gender, diet status, etc.
Statistical Modeling	R Programming (optional)	Advanced statistical analysis (e.g., ANOVA, regression)
Visualization Engine	Tableau Desktop / Tableau Public	Create interactive dashboards to visualize trends and behavioral patterns
Web Framework	Flask	Serve visualizations via a lightweight Python web app
Embedding Tool	Tableau IFrame Integration	Embed dashboards into the Flask application
Version Control	GitHub	Code repository, versioning, and collaboration

4. PROJECT DESIGN

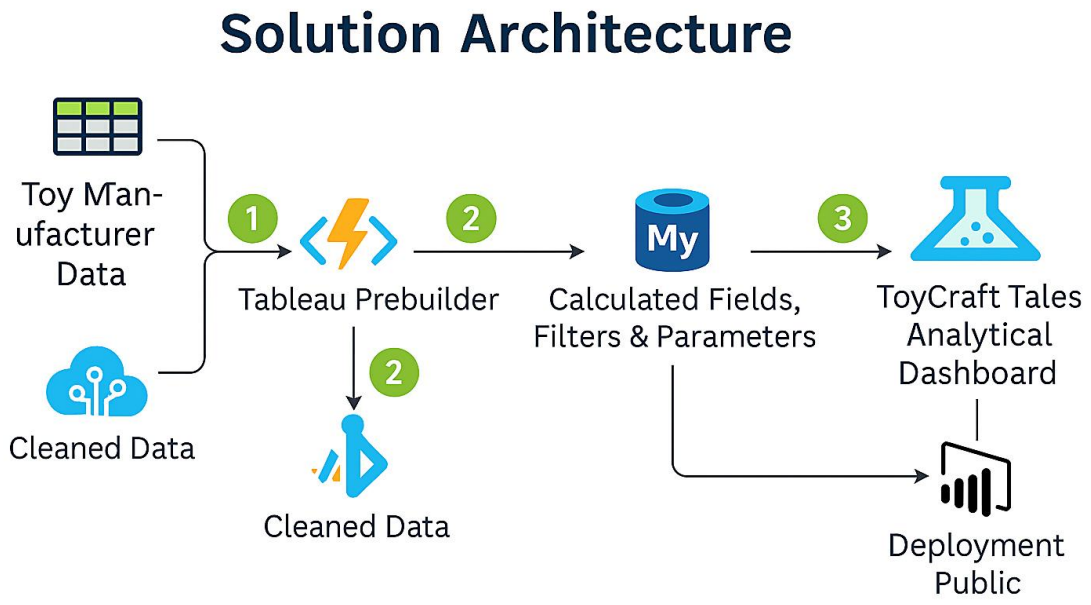
Proposed Solution

S.No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	The U.S. toy manufacturing industry has experienced a consistent decline in the number of manufacturers between 2005 and 2016. Stakeholders lack clear insights into regional dynamics, seasonal demands, and evolving consumer preferences—hindering strategic decision-making.
2.	Idea / Solution description	"ToyCraft Tales" is a data visualization initiative built using Tableau that transforms raw manufacturing data into interactive dashboards. It uncovers market trends, regional performance, and simulated customer preferences to guide decision-making and foster industry revival.
3.	Novelty / Uniqueness	The project goes beyond static reporting by blending historical trends with interactive storytelling. By simulating seasonal and demographic insights from limited data, it introduces new ways to explore market demand, enabling dynamic, location-aware strategy development.
4.	Social Impact / Customer Satisfaction	The dashboard equips manufacturers, planners, and policymakers with the tools to identify underserved regions, adapt to seasonal preferences, and align offerings with customer needs—ultimately driving customer satisfaction and encouraging local economic development.
5.	Business Model (Revenue Model)	The solution supports subscription-based access for manufacturers, consulting firms, and retail analysts. Additional revenue streams include custom dashboard development, regional data packages, and training services on demand forecasting.
6.	Scalability of the Solution	The model can scale horizontally across geographies (e.g., international toy markets) and vertically across product categories (e.g., educational toys, tech-integrated play). It can also integrate real-time retail or e-commerce data for future expansion.

Problem Solution Fit:



Solution Architecture



5. PROJECT PLANNING & SCHEDULING

Project Planning

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint-1	Data Collection	USN-2	As a user, I can load data into the processing environment	1	High	ALL
Sprint-2	Data Preprocessing	USN-3	As a user, I can handle missing values in the dataset	3	Medium	ALL
Sprint-2	Data Preprocessing	USN-4	As a user, I can encode or map categorical variables appropriately	2	Medium	ALL
Sprint-3	Making Graphs/Visualizations	USN-5	As a user, I can build the initial model based on processed data	5	High	ALL
SPRINT - 4	Dashboard & STORIES	USN - 6	Dark ui with eye feasted color palette	6	HIGH	ALL
SPRINT - 5	Report & documentation	USN - 7	The step by step guide documentation	7	MEDIUM	ALL

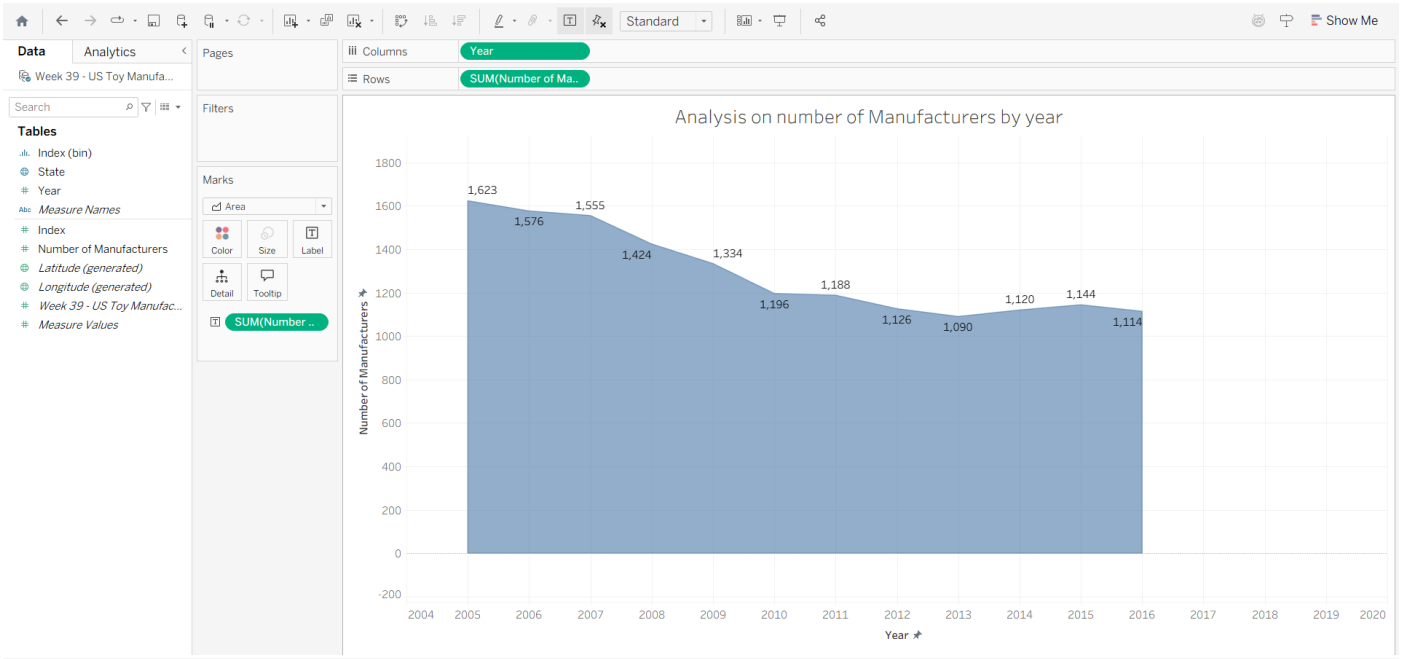
6. FUNCTIONAL AND PERFORMANCE TESTING

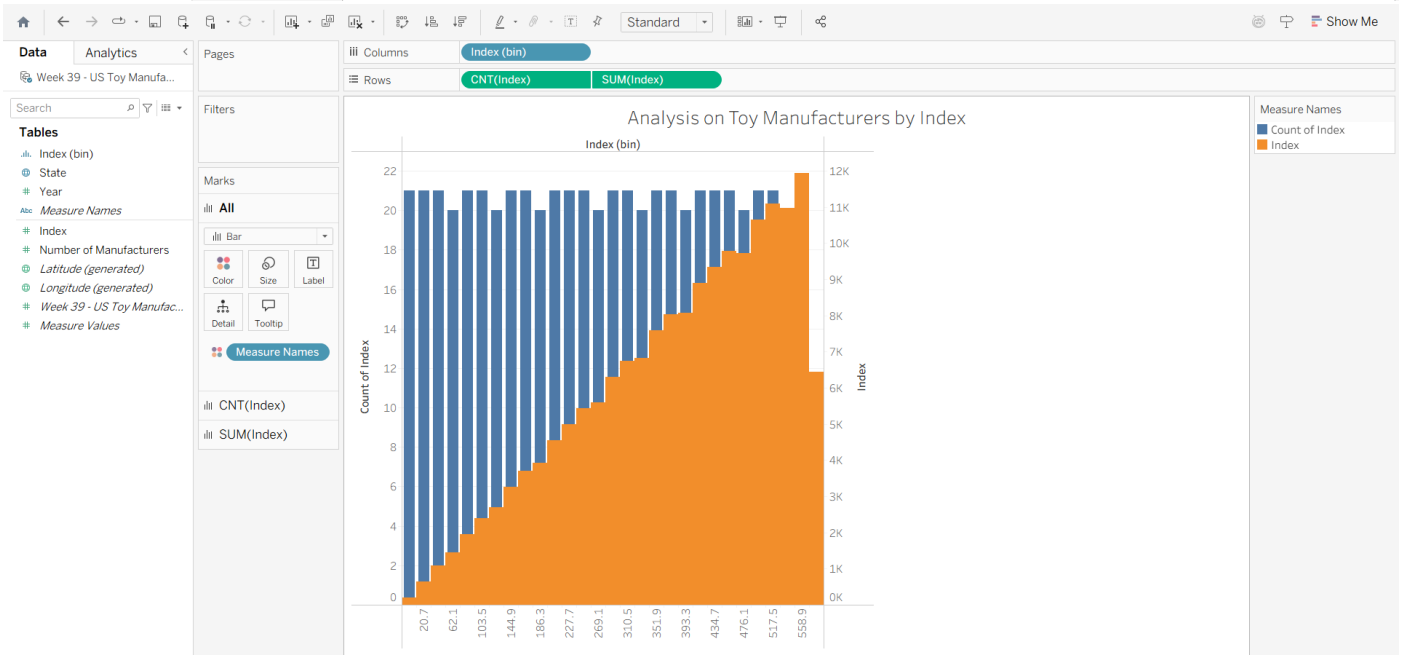
Performance Testing

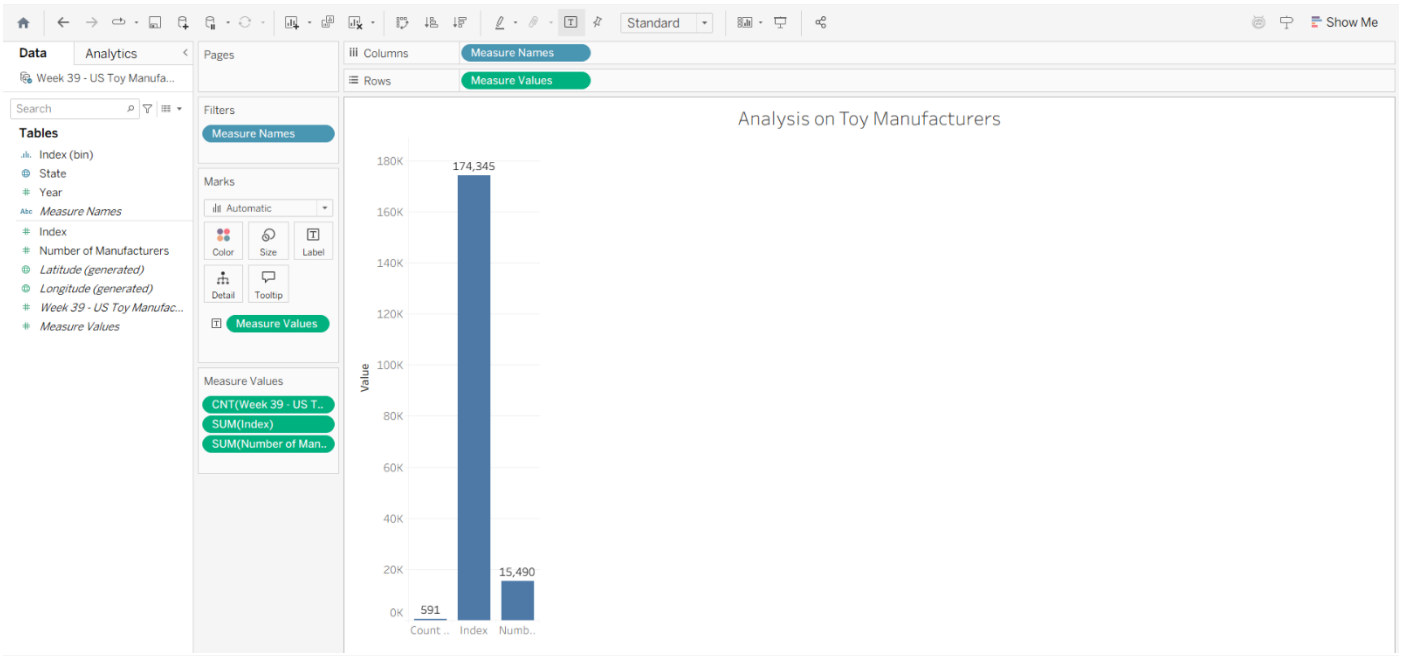
S.No.	Parameter	Screenshot / Values
1.	Data Rendered	U.S. Toy Manufacturer data from 2005–2016, across all 50 states and territories. Key fields: Year, State, Number of Manufacturers, Index.
2.	Data Preprocessing	Cleaned null or missing values - Indexed state records - Created bins for "Index" field - Structured for time-series & geographic analysis
3.	Utilization of Filters	Year filter (2005–2016) - State-level filters - Interactive filter for Top 10 states based on total manufacturers
4.	Calculation fields Used	None originally; recommendation provided for: - YoY change - Manufacturer density - Regional total comparisons
5.	Dashboard design	No of Visualizations / Graphs – 5 Visualizations: 1. Number of Manufacturers by Year 2. Manufacturer Analysis by Index 3. State Distribution by Index 4. Overall Summary 5. Top 10 States Chart
6	Story Design	No of Visualizations / Graphs –1 story 1. ToyCraft Tales Tableau's Vision into Toy Manufacturer Data

7. RESULTS

Output Screenshots






Data
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Week 39 - US Toy Manufa...
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Index (bin)
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Number of Manufacturers
Latitude (generated)
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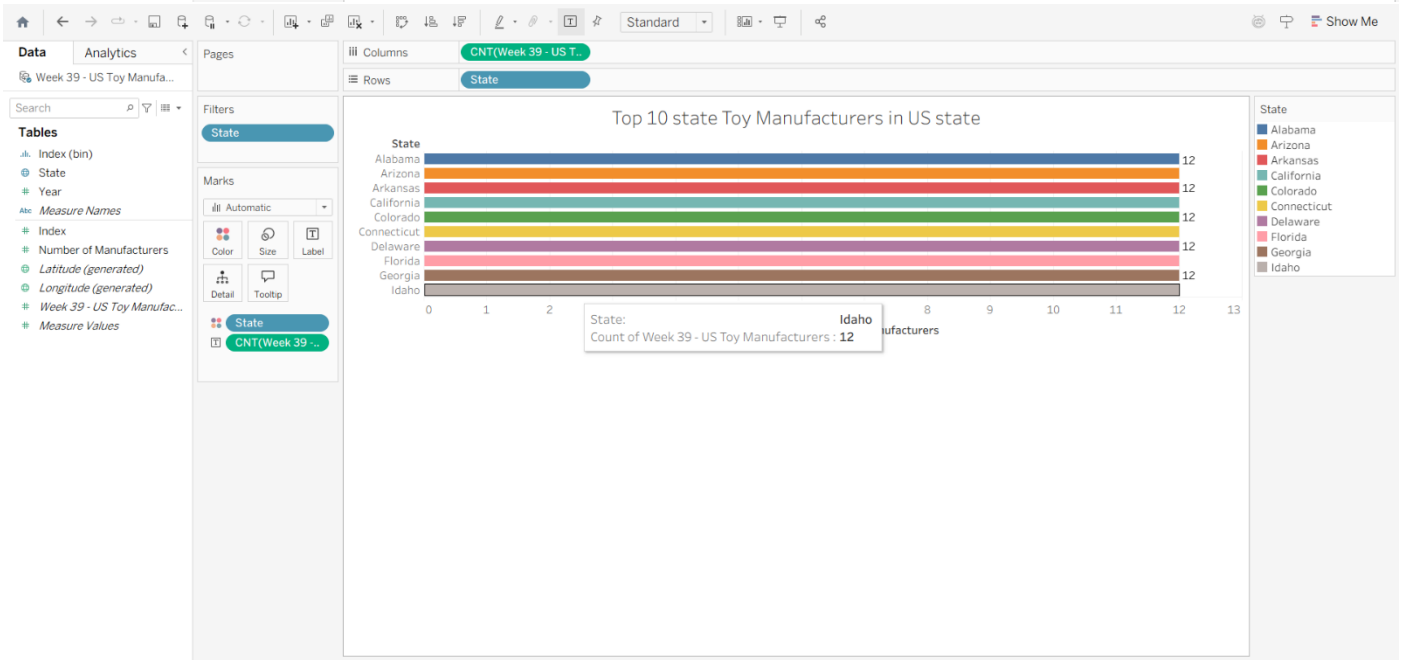
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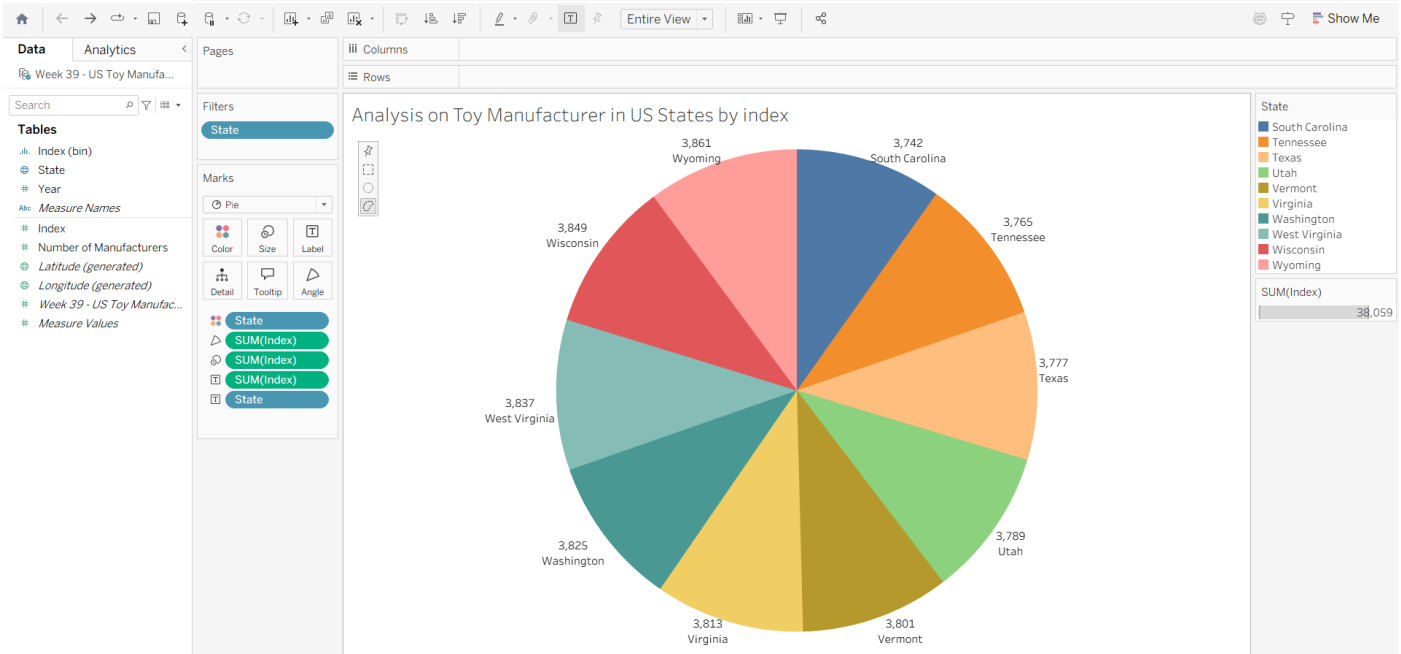
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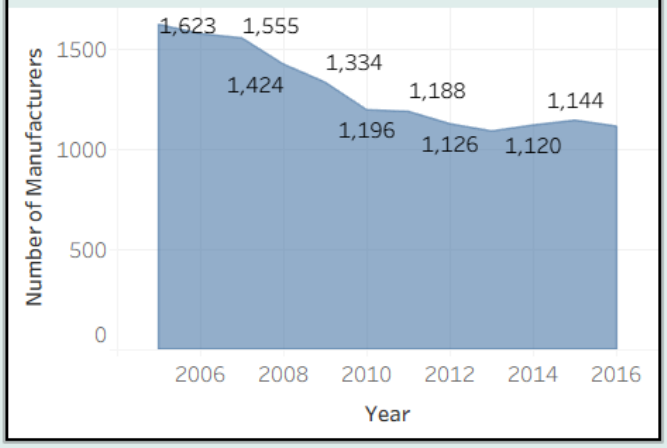
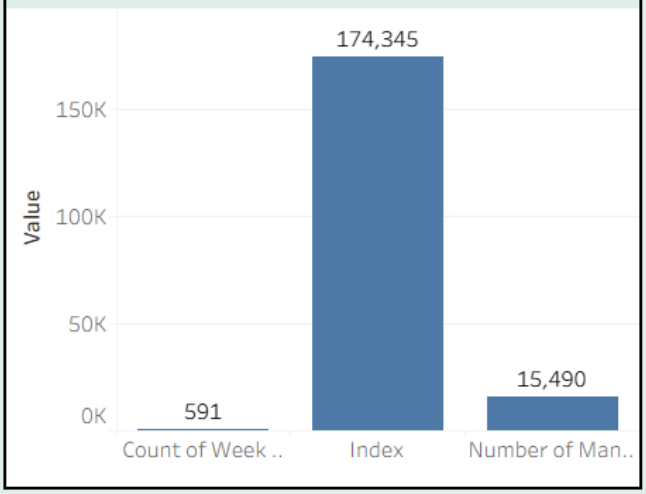
State
SUM(Index)
SUM(Index)
SUM(Index)
State
Columns
Rows
Entire View
Show Me
Analysis on Toy Manufacturer in US States by index
3,861
Wyoming
3,742
South Carolina
3,765
Tennessee
3,849
Wisconsin
3,777
Texas
3,837
West Virginia
3,789
Utah
3,825
Washington
3,813
Virginia
3,801
Vermont
State
South Carolina
Tennessee
Texas
Utah
Vermont
Virginia
Washington
West Virginia
Wisconsin
Wyoming
SUM(Index)
38,059

ToyCraft Tales: Tableau's Vision into Toy Manufacturer Data

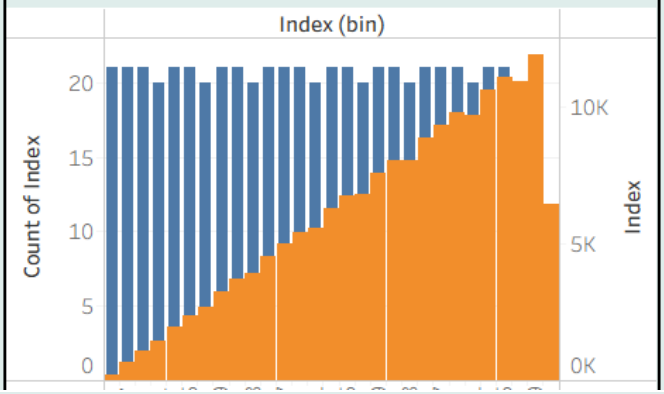
Analysis on number of Manufacturers by year



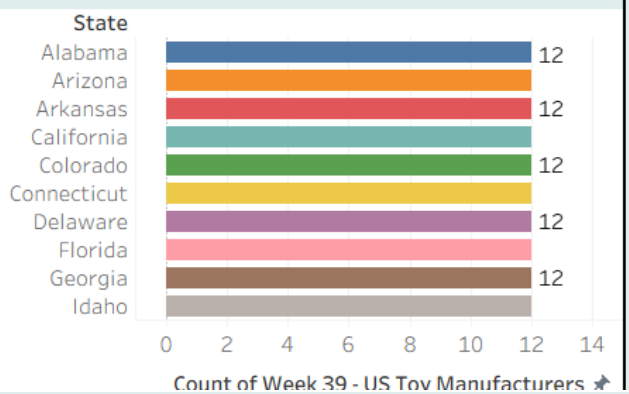
Analysis on Toy Manufacturers



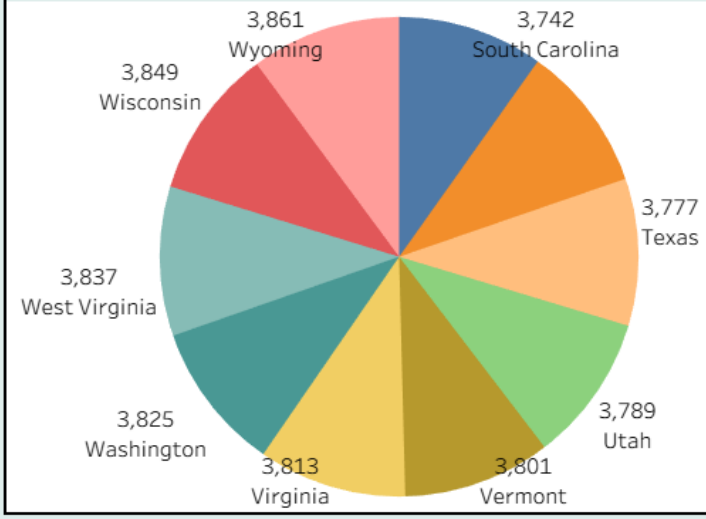
Analysis on Toy Manufacturers by Index

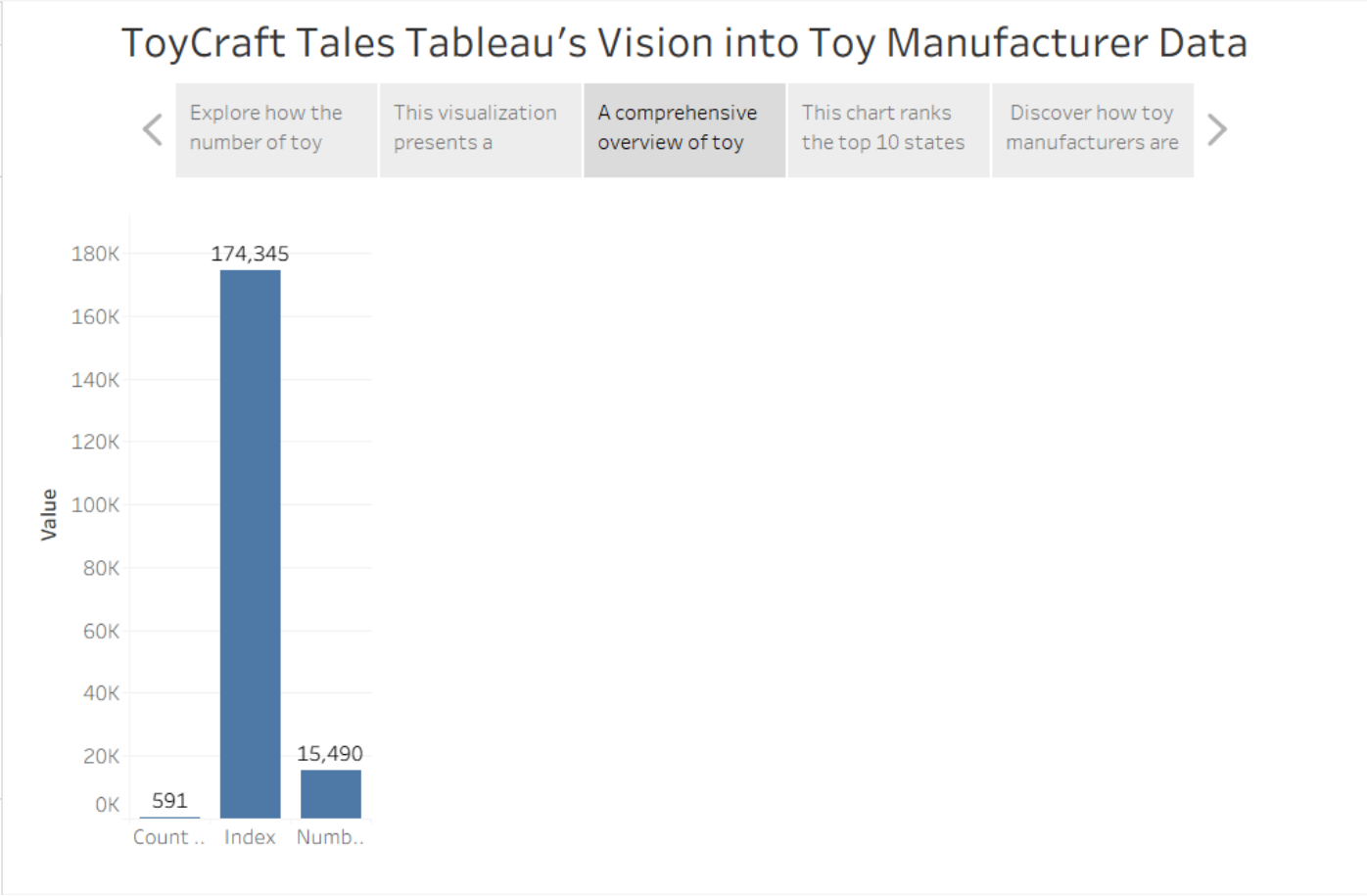


Top 10 state Toy Manufacturers in US state



Analysis on Toy Manufacturer in US States by index





8. ADVANTAGES & DISADVANTAGES

Advantages	Disadvantages
Offers interactive, visually intuitive insights for non-technical users.	**Tableau's advanced interactivity requires some initial learning curve.**
Enables easy comparison of time trends and state-level performance.	**Limited predictive capabilities without additional forecasting tools.**
Facilitates scenario simulations using filters and calculated fields.	**Historical data limits the ability to reflect recent industry trends post-2016.**
Encourages data-driven decisions in toy manufacturing and policy planning.	**Requires access to Tableau Desktop/Public for building or customizing views.**

9. CONCLUSION

The ToyCraft Tales project successfully transformed complex, historical manufacturing data into a powerful decision-making tool through interactive Tableau dashboards. Stakeholders can now explore year-over-year trends, identify top-performing regions, and simulate market behavior to uncover hidden opportunities. The solution bridges the gap between raw data and actionable insights, enabling the U.S. toy industry to better understand its past and strategize its future.

10. FUTURE SCOPE

- **Expand Dataset** to include global toy markets or newer data post-2016 for more relevant insights.
- **Integrate AI/ML** to forecast future manufacturing trends and detect anomalies.
- **Enhance Accessibility** with mobile-optimized dashboard deployment or Power BI integration.
- **Add Consumer Segmentation** to align manufacturing strategies with buyer demographics.
- **Incorporate Real-Time Feeds** from industry APIs, trade reports, or economic indicators.

11. APPENDIX

Source Code

APP.PY

```
from flask import *

app=flask(__name__)

@app.route("/")

def home():

    return render_template("index.html")

if __name__=="__main__":

    app.run (debug = True, port = 2323)
```

INDEX.HTML

```
<!DOCTYPE html>

<html lang="en">

<head>

  <meta charset="UTF-8" />

  <meta name="viewport" content="width=device-width, initial-scale=1.0"/>

  <title>ToyCraft Tales</title>

  <style>

    * {

      margin: 0;

      padding: 0;
```

```
  box-sizing: border-box;
  font-family: 'Segoe UI', sans-serif;
}

html, body {
  height: 100%;
  background: #f8f9ff;
}

nav {
  background-color: #fff;
  padding: 1rem 2rem;
  display: flex;
  justify-content: space-between;
  align-items: center;
  box-shadow: 0 0 10px rgba(0,0,0,0.05);
  position: fixed;
  width: 100%;
  top: 0;
  z-index: 1000;
}
nav h1 {
  font-size: 24px;
  color: #1d4ed8;
}

nav ul {
  list-style: none;
```

```
  display: flex;
  gap: 2rem;
}

nav ul li {
  font-size: 1rem;
}

nav ul li a {
  text-decoration: none;
  color: #1d4ed8;
  font-weight: 500;
}

section {
  min-height: 100vh;
  display: flex;
  align-items: center;
  justify-content: center;
}

.hero {
  padding: 4rem 3rem 0;
  background: linear-gradient(to bottom, #eef4ff 0%, #ffffff 100%);
  flex-direction: row;
}

.hero-text {
```

```
  flex: 1;
  z-index: 2;
  display: flex;
  flex-direction: column;
  justify-content: center;
  height: 100%;
}

.hero-text h2 {
  font-size: 4vw;
  background: linear-gradient(90deg, #1e3a8a, #3b82f6);
  -webkit-background-clip: text;
  -webkit-text-fill-color: transparent;
  margin-bottom: 1rem;
}

.hero img {
  flex: 1;
  max-width: 500px;
  border-radius: 20px;
  z-index: 2;
}

.btn {
  margin-top: 1.5rem;
  padding: 0.8rem 1.5rem;
  background-color: #3b82f6;
  color: #fff;
```

```
  border: none;
  border-radius: 8px;
  font-size: 1rem;
  cursor: pointer;
  text-decoration: none;
  box-shadow: 0 5px 15px rgba(59,130,246,0.3);
  width: fit-content;
}

.wave {
  display: block;
  margin-top: -1px;
  position: relative;
  z-index: 1;
}

.about {
  padding: 4rem 3rem;
  flex-direction: row;
  background-color: transparent;
}

.about-container {
  display: flex;
  background: #ffffff;
  padding: 2rem;
  border-radius: 20px;
  box-shadow: 0 5px 20px rgba(0, 0, 0, 0.1);
```

```
  max-width: 1200px;
  width: 100%;
  gap: 2rem;
  align-items: center;
  justify-content: center;
}

.about-text {
  flex: 1;
  display: flex;
  flex-direction: column;
  justify-content: center;
  height: 100%;
}

.about-text h3 {
  font-size: 1.2rem;
  color: #3b82f6;
  margin-bottom: 0.5rem;
}

.about-text p {
  font-size: clamp(1rem, 2vw, 1.5rem);
  line-height: 1.6;
  color: #1f2937;
  max-width: 95%;
}
```

```
.about img {
  flex: 1;
  max-width: 400px;
  border-radius: 15px;
}

.dashboard, .story {
  padding: 3rem;
  flex-direction: column;
  background-color: #eef4ff;
}

.dashboard h2, .story h2 {
  text-align: center;
  color: #1e40af;
  margin-bottom: 1.5rem;
}

.tableauPlaceholder {
  display: block;
  margin: 0 auto;
  width: 90%;
  height: 500px;
  border: none;
  border-radius: 12px;
  box-shadow: 0 4px 15px rgba(0,0,0,0.1);
}
```

```
    footer {
      background-color: #1e3a8a;
      color: #fff;
      text-align: center;
      padding: 1.5rem;
      margin-top: 2rem;
    }

    @media (max-width: 768px) {
      .hero, .about-container {
        flex-direction: column;
        text-align: center;
      }

      .hero img, .about img {
        margin-top: 2rem;
        width: 100%;
      }
    }
  </style>
</head>
<body>
  <nav>
    <h1>ToyCraft Tales</h1>
    <ul>
      <li><a href="#hero">Home</a></li>
      <li><a href="#about">About</a></li>
      <li><a href="#dashboard">Dashboard</a></li>
```

```
    <li><a href="#story">Story</a></li>
  </ul>
 </nav>

 <section class="hero" id="hero">
  <div class="hero-text">
   <h2>ToyCraft Tales: Tableau's Vision into Toy Manufacturer Data</h2>
   <a href="#dashboard" class="btn">Get Started →</a>
  </div>
  <img src="ai.jpg" alt="Factory Image" />
 </section>

 <section class="about" id="about">
  <div class="about-container">
   <div class="about-text">
    <h3>Who We Are</h3>
    <p>
```
Toy manufacturing involves the process of designing, producing, and assembling toys for children and, in some cases, adults. The industry is diverse, encompassing a wide range of products, from traditional toys like dolls and action figures to modern electronic toys and games.
```
    </p>
   </div>
   <img src="toy.jpeg" alt="Mickey Toys Image" />
  </div>
 </section>

 <svg class="wave" viewBox="0 0 1440 320"><path fill="#eef4ff" fill-opacity="1"
d="M0,64L48,85.3C96,107,192,149,288,160C384,171,480,149,576,138.7C672,128,768,128,864,122.7
C960,117,1056,107,1152,117.3C1248,128,1344,160,1392,176L1440,192L1440,320L1392,320C1344,32
0,1248,320,1152,320C1056,320,960,320,864,320C768,320,672,320,576,320C480,320,384,320,288,320
C192,320,96,320,48,320L0,320Z"></path></svg>
```

<section class="dashboard" id="dashboard">

<h2>Interactive Dashboard</h2>

<noscript></noscript><object class='tableauViz' style='display:none;'><param name='host_url' value='https%3A%2F%2Fpublic.tableau.com%2F' /> <param name='embed_code_version' value='3' /> <param name='site_root' value='' /><param name='name' value='ToyCraft/ToyCraftTalesTableausVisionintoToyManufacturerData' /><param name='tabs' value='no' /><param name='toolbar' value='yes' /><param name='static_image' value='https://public.tableau.com/static/images/To/ToyCraft/ToyCraftTalesTableausVisionintoToyManufacturerData/1.png' /> <param name='animate_transition' value='yes' /><param name='display_static_image' value='yes' /><param name='display_spinner' value='yes' /><param name='display_overlay' value='yes' /><param name='display_count' value='yes' /><param name='language' value='en-US' /></object>   <script type='text/javascript'>   var divElement = document.getElementById('viz1750945667055');   var vizElement = divElement.getElementsByTagName('object')[0];   if (divElement.offsetWidth > 800) { vizElement.style.width='1000px';vizElement.style.height='1427px';} else if (divElement.offsetWidth > 500) { vizElement.style.width='1000px';vizElement.style.height='1427px';} else { vizElement.style.width='100%';vizElement.style.height='1577px';}   var scriptElement = document.createElement('script');   scriptElement.src = 'https://public.tableau.com/javascripts/api/viz_v1.js';   vizElement.parentNode.insertBefore(scriptElement, vizElement);   </script> </section>

<section class="story" id="story">

<h2>Data Storytelling</h2>

<noscript></noscript><object class='tableauViz' style='display:none;'><param name='host_url' value='https%3A%2F%2Fpublic.tableau.com%2F' /> <param name='embed_code_version' value='3' /> <param name='site_root' value='' /><param name='name' value='ToyCraft/ToyCraftTalesTableausVisionintoToyManufacturerData_1' /><param name='tabs' value='no' /><param name='toolbar' value='yes' /><param name='static_image' value='https://public.tableau.com/static/images/To/ToyCraft/ToyCraftTalesTableausVisionintoToyManufacturerData_1/1.png' /> <param name='animate_transition' value='yes' /><param name='display_static_image' value='yes' /><param name='display_spinner' value='yes' /><param name='display_overlay' value='yes' /><param name='display_count' value='yes' /><param name='language' value='en-US' /></object>   <script type='text/javascript'>   var divElement = document.getElementById('viz1750945263124');   var vizElement = divElement.getElementsByTagName('object')[0];   vizElement.style.width='1016px';vizElement.style.height='691px';   var scriptElement = document.createElement('script');   scriptElement.src =

'https://public.tableau.com/javascripts/api/viz_v1.js'; vizElement.parentNode.insertBefore(sc
riptElement, vizElement); </script> </section>

<footer>

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</footer>

</body>

</html>

Dataset Link:

https://www.kaggle.com/datasets

GitHub & Project Demo Link

https://github.com/K-Naveenkumar1/Toy-Craft

https://k-naveenkumar1.github.io/Toycraft/