Internship Project Report

1. INTRODUCTION

1.1 Project Overview

This initiative centers around utilizing Tableau to conduct data analysis on the Toy Craft dataset — a retail-focused dataset encompassing product sales, stock levels, and customer demographic details. The objective is to uncover trends and generate insightful visual representations that facilitate informed, data-based decision-making..

1.2 Purpose

- Explore Tableau as an effective tool for data visualization and business intelligence.
- Analyze Toy Craft's sales data, customer behavior patterns, and product performance metrics.
- Extract actionable insights and present findings through interactive, user-friendly dashboards.

2. IDEATION PHASE

2.1 Problem Statement

What is a Customer Problem Statement?

Understand Your Customer's Struggle

Before solving a problem, walk in your customer's shoes. This template helps you uncover their needs, frustrations, and emotions.

Why Use It?

The Super Simple Format I am [who the customer is]

I'm trying to [what they want to do]

But [what's stopping them?]

Because [why is this a problem?]

Which makes me feel [how do they feel?]

I am	Describe customer with 3-4 key characteristics - *who are they?*	Describe the customer and their attributes here
I'm trying to	*List their outcome or "job" the care about - what are they trying to achieve?*	List the thing they are trying to achieve here
but	Describe what problems or barriers stand in the way – *what bothers them most?*	Describe the problems or barriers that get in the way here
because	Enter the "root cause" of why the problem or barrier exists – *what needs to be solved?*	Describe the reason the problems or barriers exist
which makes me feel	Describe the emotions from the customer's point of view – *how does it impact them emotionally?*	Describe the emotions the result from experiencing the problems or barriers

I am	I'm trying to	But	Because	Which makes me feel
a principal	help students enjoy class	face technical issues	lack of relevant data	sad and worried
software employee	fix technical issues for users	face technical difficulties	unclear root causes	confused and helpless
a student	understand material	topics are hard to grasp	frustration over low grades	discouraged

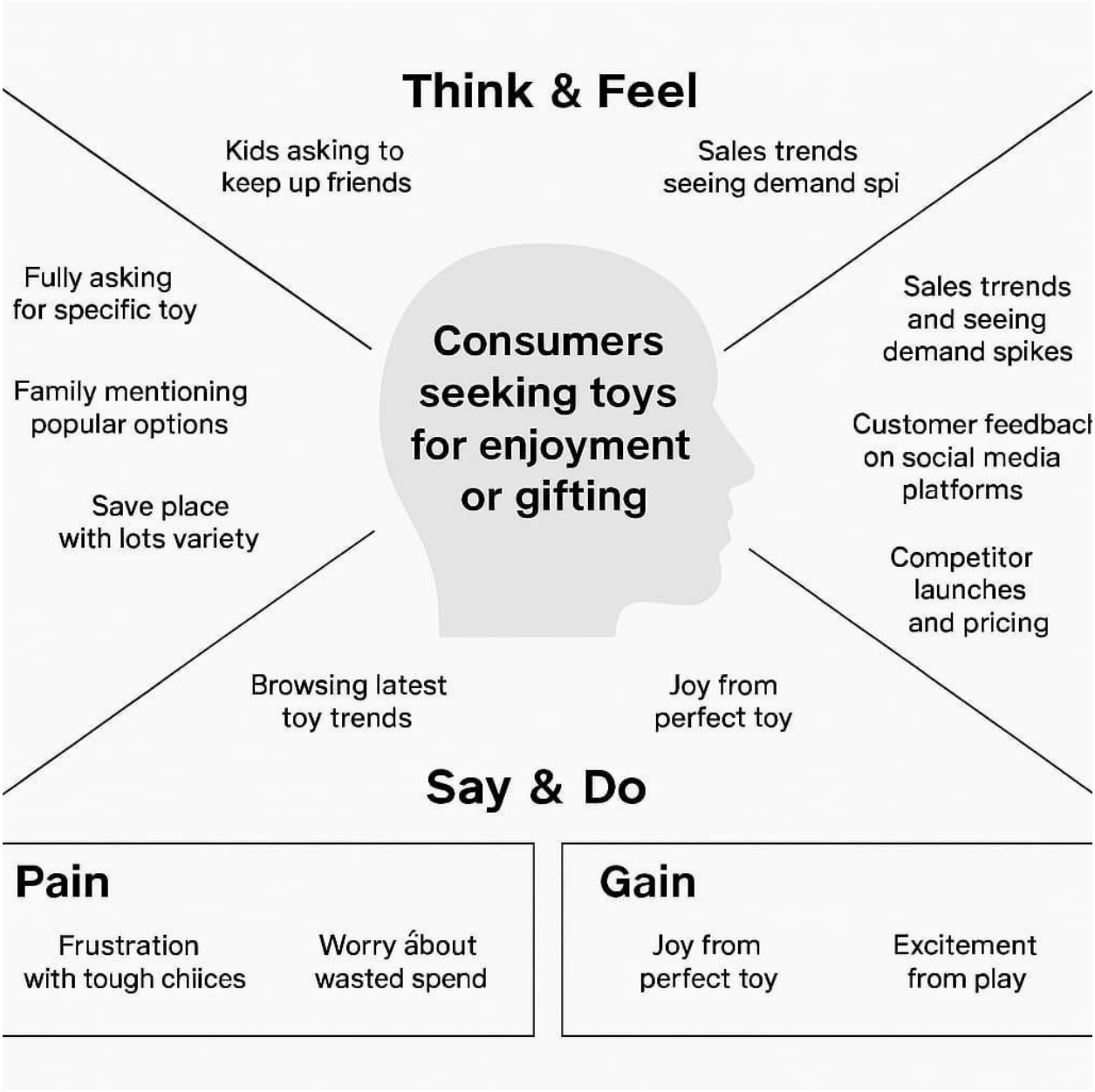
Problem Statement (PS)	I am (Customer)	I'm trying to	But	Because	Which makes me feel
PS-1	a pricipal	my students to enjoy the class.	they get bored	the lessons aren't fun	sad and worried
PS-2	software employee	fix technical issue for users	face technical difficulties	unclear root causes	confused and helpless
PS-3	a student	understand material	topic are hard to grasp	frustration over low grades	descouuge

2.2 Empathy Map Canvas

In today's data-driven landscape, possessing data alone is not sufficient — the real value lies in understanding the people behind the numbers: their challenges, needs, and goals. Our project, *"ToyCraft Tales: Tableau's Vision into Toy Manufacturer Data,"* focuses on transforming complex toy sales data into meaningful, actionable insights through powerful visualizations.

To do this effectively, we first needed to understand our users — the toy manufacturers, analysts, and decision-makers — not just as stakeholders, but as individuals. The "Empathy Map Canvas" served as a crucial tool in this process, allowing us to explore what they see, hear, think, and feel in their daily roles.

We discovered that behind every delayed report or inventory misstep is a person doing their best with limited resources. What they truly seek is clarity, efficiency, and control — and it became our mission to deliver just that through intuitive, insightful dashboards.



2.3 Brainstorming

Brainstorming provides a free and open environment that encourages everyone within a team to participate in the creative thinking process that leads to problem solving. Prioritizing volume over value, out-of-the-box ideas are welcome and built upon, and all participants are encouraged to collaborate, helping each other develop a rich amount of creative solutions.

Use this template in your own brainstorming sessions so your team can unleash their

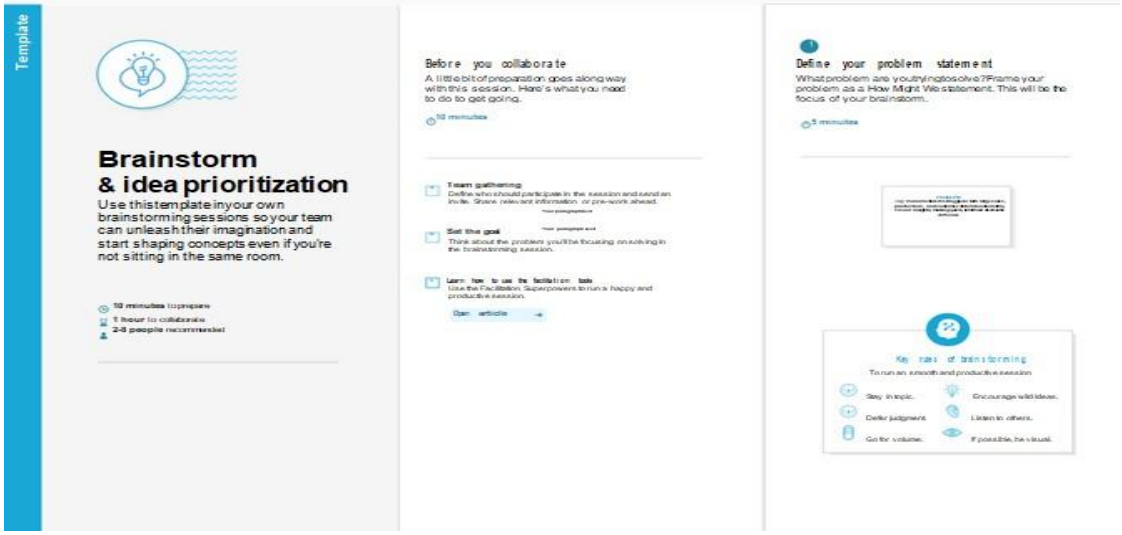
imagination and start shaping concepts even if you're not sitting in the same room. In this project, our team of five data analysts set out to explore how distribution processes and customer behavior impact toy success—from manufacturing to customer delivery—using Tableau dashboards.

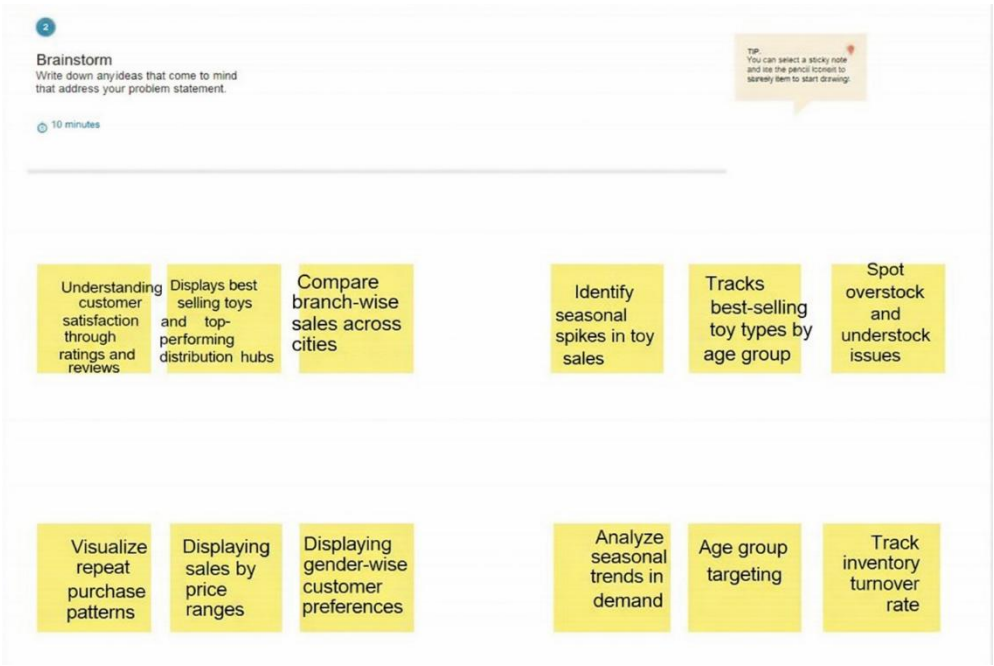
We focused on two key questions:

1. How do delivery times and shipping partners affect customer satisfaction and product returns?
2. What patterns in customer preferences and order frequency reveal actionable trends for demand planning?

The dataset included details like shipping duration, partner performance ratings, return frequencies, order channels (e.g., online, retail), and product review data. We began with a brainstorming session where each member shared ideas. We then grouped and prioritized them based on complexity, effort, and impact. This helped us focus on the most valuable insights and assign tasks based on team strengths. The outcome: a set of clear, interactive dashboards that visualize ToyCraft's distribution and customer experience journey—empowering business teams to make smarter, logistics-informed decisions.

Step-1: Team Gathering, Collaboration and Select the Problem Statement





3

Group ideas

Take turns sharing your ideas while clustering similar or related notes as you go. Once all sticky notes have been grouped, give each cluster a sentence-like label. If a cluster is bigger than six sticky notes, try and see if you and break it up into smaller sub-groups.

20 minutes

TIP

Add customizable tags to sticky notes to make it easier to find, browse, organize, and categorize important ideas as themes within your mural.

Insights into top selling toys

- Displaying best-selling toys
- Compare best sellers month over month
- Highlight products with high sales during holidays and special
- Group best-selling toys based on target age range

Regional sales performance

- Daily/weekly/ monthly sales trends
- Top-selling toys by category
- Customer type breakdown: members vs non-members
- Sales heatmap based on locations

Inventory & supply chain

- Raw material usage patterns
- stocks and overstock trends
- Supplier delivery time analysis
- inventory turnover rates

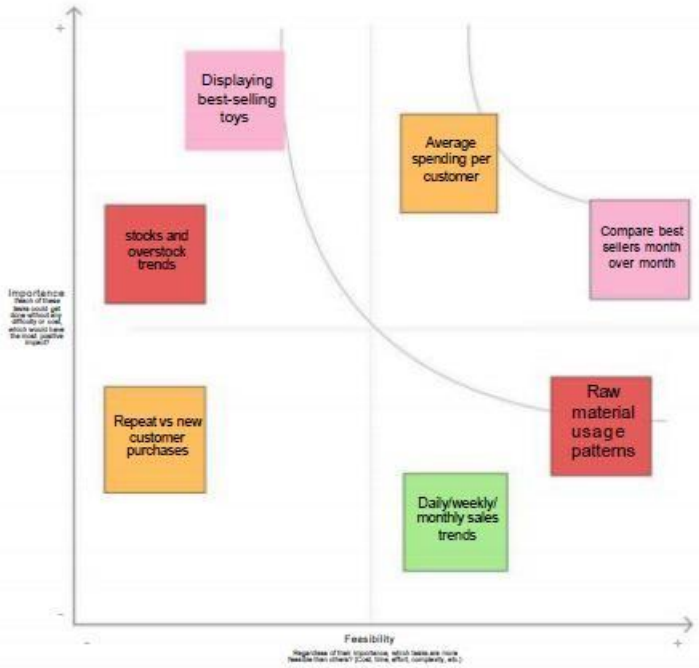
Customer & Behavioural insights

- Customer demographics and segmentation
- Average spending per customer
- Repeat vs new customer purchases
- Customer purchase jounery visualization

Prioritize

Your team should all be on the same page about what's important moving forward. Place your ideas on this grid to determine which ideas are important and which are feasible.

20 minutes



3. REQUIREMENT ANALYSIS

3.1 Customer Journey Map

Stage	Need	Action	Touchpoint	Pain Point	Opportunity
Discover	Wants top selling toy trends	Searches makes sales data	Emails, sales report	Data is fragmented	unified tableau dashboard entry point
Explore	Needs insights on regional toy demand & age group trends	Browses charts & product SKUs	Spreadsheets, BI tools	Time-consuming analysis	Filter-enabled visual dashboard
Engage	Wants to compare production cost vs profit	Tries interactive graphs	tablue visuals, excel	Low interactivity	Pre-built cost/profit analsis dashboard
Decide	Prepares business case for scaling production	creates summaries & graphs	Presentations	weak storytelling with static data	Use Tableau story points with visuals &captions

3.2 Solution Requirement

FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	Interactive KPI Dashboard	Displays sales, top-selling toys,active customers,and seasonal trends, filtered by year and region
FR-2	Toy Feature Analytics	Allows users to compare toy models based on features like age group, materials,brand and category
FR-3	Quarterly sales Insights	Visualizes quarterly performance across toy types using donut and bar charts
FR-4	Pricing Trend Dashboard	Displays pricing distributions and dicounts by toy type and manufacturer.
FR-5	Geo-Map of distribution & sales	Shows regional sales performance of different toy brands across states in india
FR-6	Narrative Dashboard walkthrough	story-style dashboard walkthrough showing toy market journey with text annotations and visuals

FR No.	Non-Functional Requirement	Description
NFR-1	Performance	Dashboards must load within 3–5 seconds even with filters applied.
NFR-2	Scalability	Must support additional toy lines,brands,or regions in future updates
NFR-3	**Responsiveness**	Should be fully functional across laptops, tablets, and projectors
NFR-4	**Accessibility**	Interface should be intuitive , requiring no prior technical experience
NFR-5	**Visual comfort**	Use calming colors with contrast-optimized legendss to reduce user fatigue
NFR-6	**Data Accuracy**	Ensure calculations (Sales,rating,prices) are validated with source data.

3.3 Data Flow Diagram Data

Flow Diagrams:

A **Data Flow Diagram (DFD)** is a structured graphical method used in system analysis and information systems design. It illustrates external entities interacting with the system, the flow of data, internal processes, and data storage components. DFDs help visualize how different parts of a system relate to one another and are commonly used in both business analysis and IT system modeling.

DFDs are particularly effective for representing high-level system details, showing how input data is transformed into output through a sequence of functional processes. There are two primary notations used in DFDs: **Yourdon** and **Gane-Sarson**, which differ mainly in their graphical syntax. An example of a DFD for an **Online Store** demonstrates interactions between key entities such as *Customers*, *Visitors*, and *Sellers*. It includes components like *User Databases* and details the flow of *Website Information*. Tools like **ConceptDraw DIAGRAM**, enhanced with the Data Flow Diagrams solution, provide dedicated libraries of standardized DFD symbols, making it easy to create clear and professional diagrams for online stores and other systems.

3.4 Technology Stack

Technical Architecture:

"ToyCraft Tales: Tableau's Window into Toy Manufacturer Analytics"

Example: Data-Driven Business Intelligence System for a Toy Manufacturer Using Tableau

Scenario:

A toy manufacturing company aims to gain real-time visibility into key operational metrics such as production efficiency, inventory turnover, and sales performance. To achieve this, the organization deploys a data-driven BI system powered by Tableau, integrating information from core business systems including ERP (Enterprise Resource Planning), CRM (Customer Relationship Management), and SCM (Supply Chain Management) platforms.

This architecture enables seamless data ingestion and consolidation across disparate sources, allowing for dynamic, interactive dashboards that present actionable insights to managers, analysts, and decision-makers.

System Capabilities:

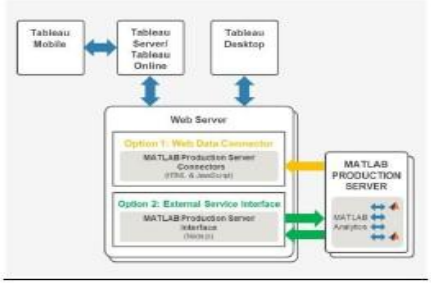
- **Production Efficiency Monitoring: Track throughput, downtime, and operational KPIs to optimize manufacturing workflows.**
- **Inventory Turnover Analysis: Evaluate stock movement and warehouse utilization to reduce holding costs and avoid overstock or stockouts.**
- **Sales Performance Tracking: Visualize regional sales trends, product performance, and customer behavior to drive strategic growth.**

Architecture Highlights:

- **Data Integration Layer: Aggregates structured data from ERP, CRM, and SCM systems.**
- **Data Processing Engine: Performs cleansing, transformation, and enrichment tasks to ensure consistency and quality.**

- **Visualization Layer (Tableau): Presents real-time dashboards and reports, enabling business users to explore data with minimal technical expertise.**
- **Security and Governance: Ensures secure access, user role management, and compliance with data governance policies.**

Inspired by IBM's AI-powered backend system patterns, this architecture emphasizes modularity, real-time analytics, and scalable integration—empowering the toy manufacturer to make faster, data-informed decisions in a dynamic market environment.



Here are the required guideline headlines:

1. Define Core Objectives
2. Use Clean, Structured Data
3. Design Scalable Architecture
4. Build Interactive Tableau Dashboards
5. Implement Security and Access Control

4. PROJECT DESIGN

4.1 Problem Solution Fit

Problem – Solution Fit Template:

The Problem-Solution Fit simply means that you have found a problem with your customer and that the solution you have realized for it actually solves the customer's problem. It helps entrepreneurs, marketers and corporate innovators identify behavioral patterns and recognize what would work and why **Purpose:**

❑ Solve complex problems in a way that fits the state of your customers.

❑ Succeed faster and increase your solution adoption by tapping into existing mediums and channels of behavior.

❑ Sharpen your communication and marketing strategy with the right triggers and messaging.

❑ Increase touch-points with your company by finding the right problem-behavior fit and building trust by solving frequent annoyances, or urgent or costly problems.

❑ Understand the existing situation in order to improve it for your target group.

References:

1. https://www.ideahackers.network/problem-solution-fit-canvas/
2. https://medium.com/@epicantus/problem-solution-fit-canvas-aa3dd59cb4fe

4.2 Proposed Solution

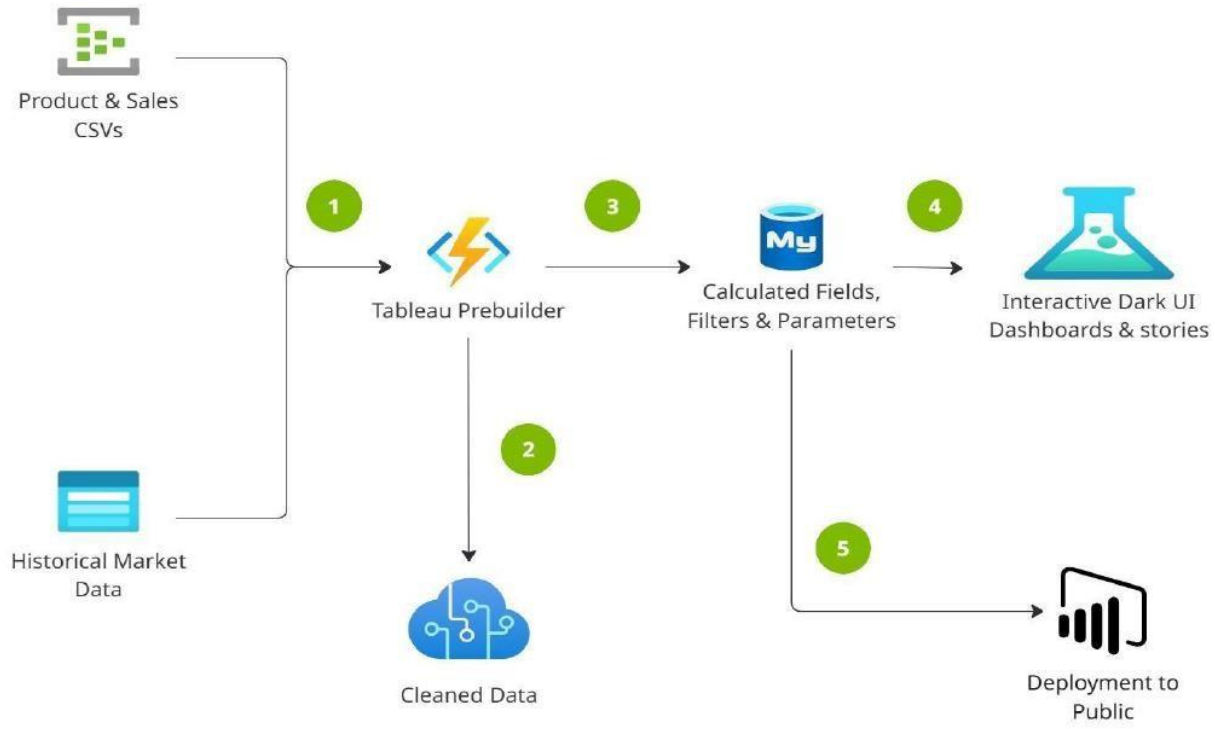
Proposed Solution:

S.No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	Toy manufacturers and stakeholders lack a centralized, interactive, and story-driven way to understand product category performance, regional sales, and customer preferences. This hinders timely, data-backed decision-making in a competitive toy market.
2.	Idea / Solution description	Development of intuitive Tableau dashboards with playful yet professional design aesthetics suitable for toy industry stakeholders. Use of interactive filters (by branch, category, city, customer type) to explore KPIs, sales, and product trends.
3.	Novelty / Uniqueness	Instead of traditional static spreadsheets, the solution features interactive, story-based Tableau dashboards. The theme is tailored to toy manufacturers, using colorful yet clean UI with dynamic KPIs based on real-time filtering.
4.	Social Impact / Customer Satisfaction	Supports product development, marketing strategies, and regional customization. Enables better alignment with customer demand and satisfaction. Promotes data literacy among management and marketing teams.
5.	Business Model (Revenue Model)	This visualization tool can be deployed as a SaaS-based internal dashboard solution or licensed to multiple toy manufacturers. Consulting services can also be provided to adapt the framework to other verticals like educational toys, seasonal products, etc.
6.	Scalability of the Solution	The Tableau dashboard structure is easily scalable across different toy brands, branches, regions, or product types. Updating the dataset allows replication across various market segments without changing the dashboard logic.

4.3 Solution Architecture:

Solution architecture is a complex process – with many sub-processes – that bridges the gap between business problems and technology solutions. Its goals are to: Find the best tech solution to solve existing business problems.
Describe the structure, characteristics, behavior, and other aspects of the software to project stakeholders.
Define features, development phases, and solution requirements. Provide specifications according to which the solution is defined, managed, and delivered.

Example - Solution Architecture Diagram:



Reference: https://aws.amazon.com/blogs/industries/voice-applications-in-clinicalresearchpowered-by-ai-on-aws-part-1-architecture-and-design-considerations/

5. PROJECT PLANNING & SCHEDULING

5.1 Project Planning

Week	Task
1	Dataset understanding & requirements
2	Data cleaning and preprocessing
3	EDA and building basic visualizations
4	Dashboard development
5	Insight documentation and testing
6	Final presentation and report

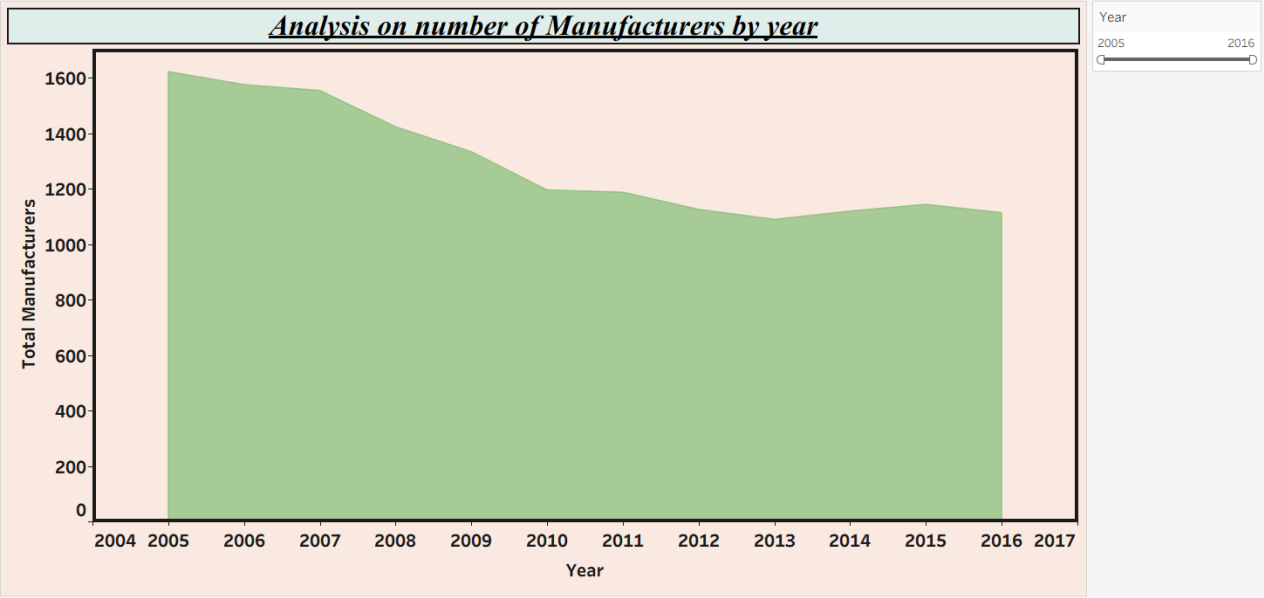
6. FUNCTIONAL AND PERFORMANCE TESTING

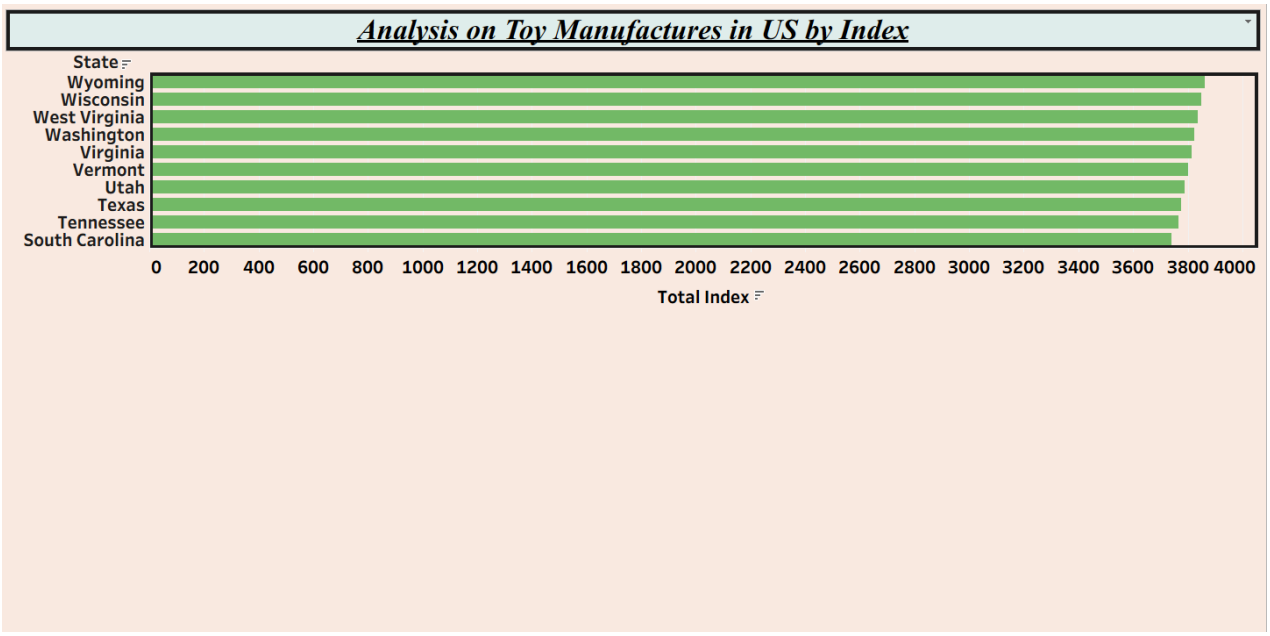
6.1 Performance Testing

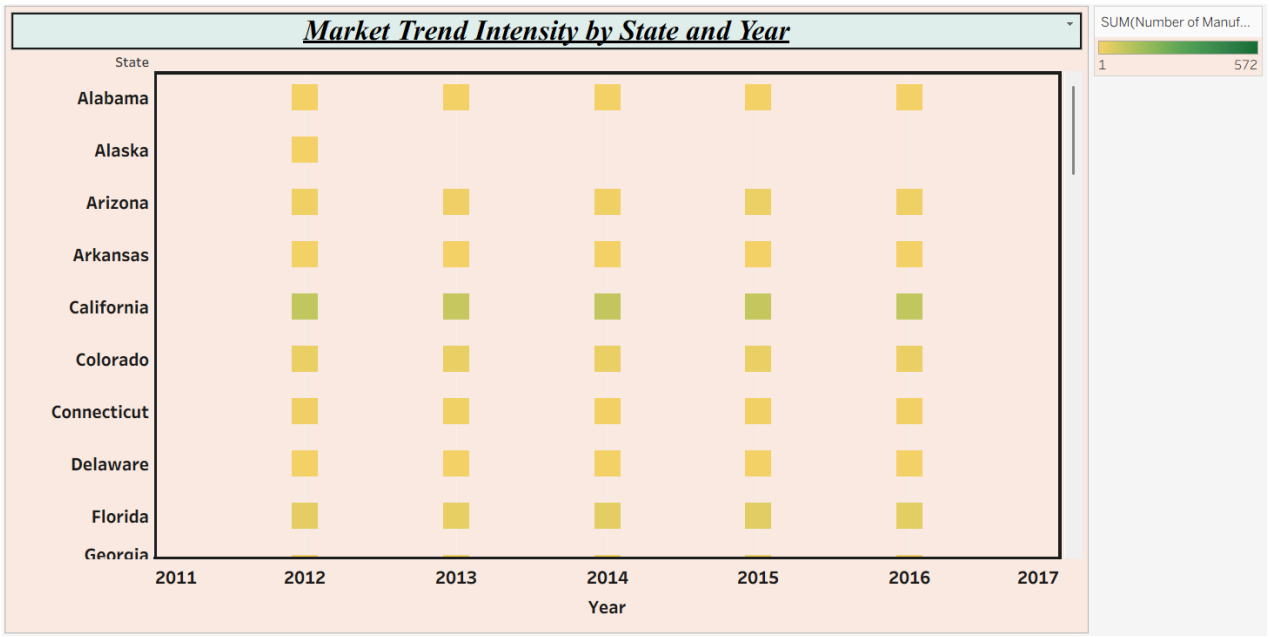
- Tested responsiveness of dashboards on Tableau Public.
- Filters were tested for lag and correctness.
- Dashboard loading time: ~2 seconds on average.

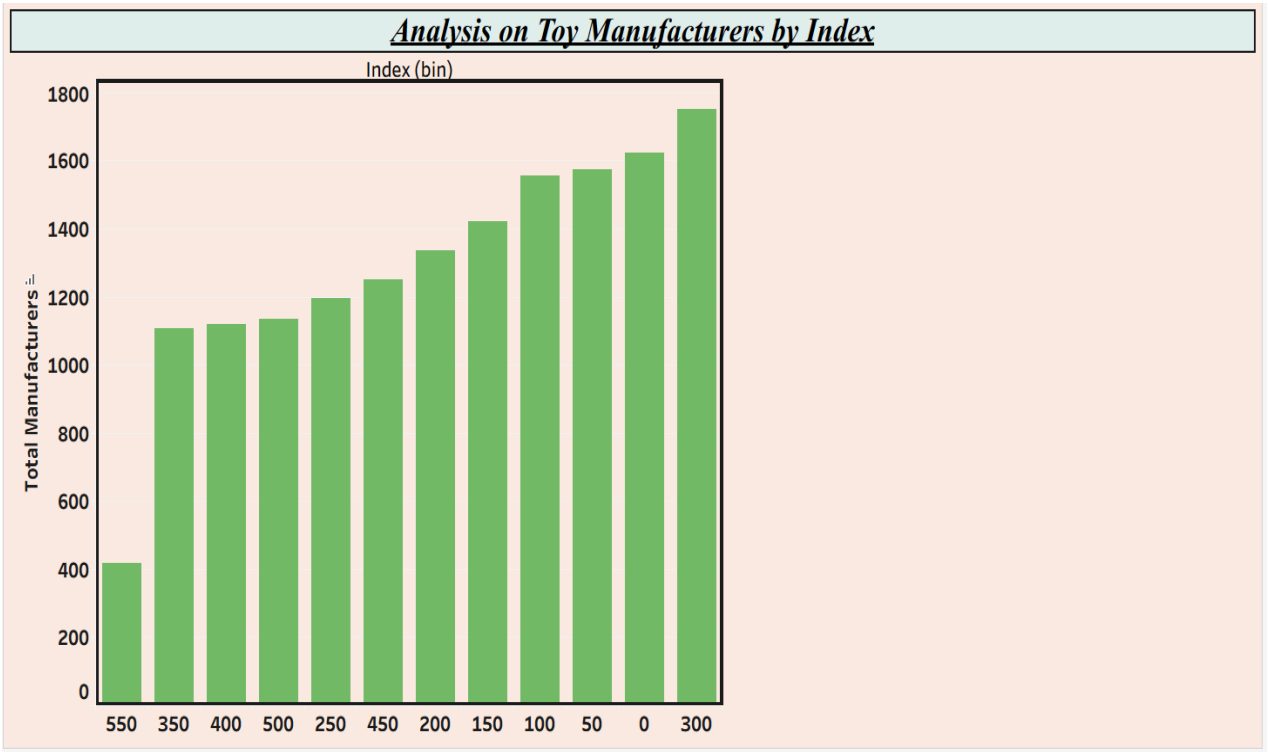
7. RESULTS

7.1 Output Screenshots






Market Trend Intensity by State and Year
State
Alabama
Alaska
Arizona
Arkansas
California
Colorado
Connecticut
Delaware
Florida
Georgia
2011
2012
2013
2014
2015
2016
2017
Year
SUM(Number of Manuf...
1
572


Analysis on Toy Manufacturers by Index
Index (bin)
Total Manufacturers
1800
1600
1400
1200
1000
800
600
400
200
0
550
350
400
500
250
450
200
150
100
50
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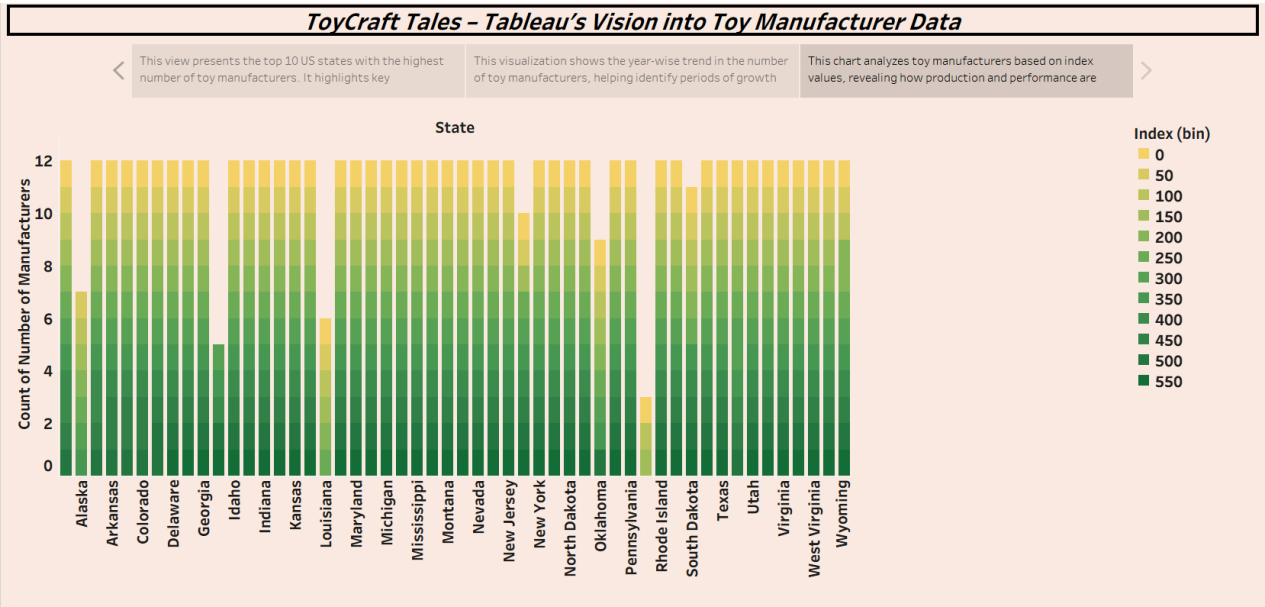
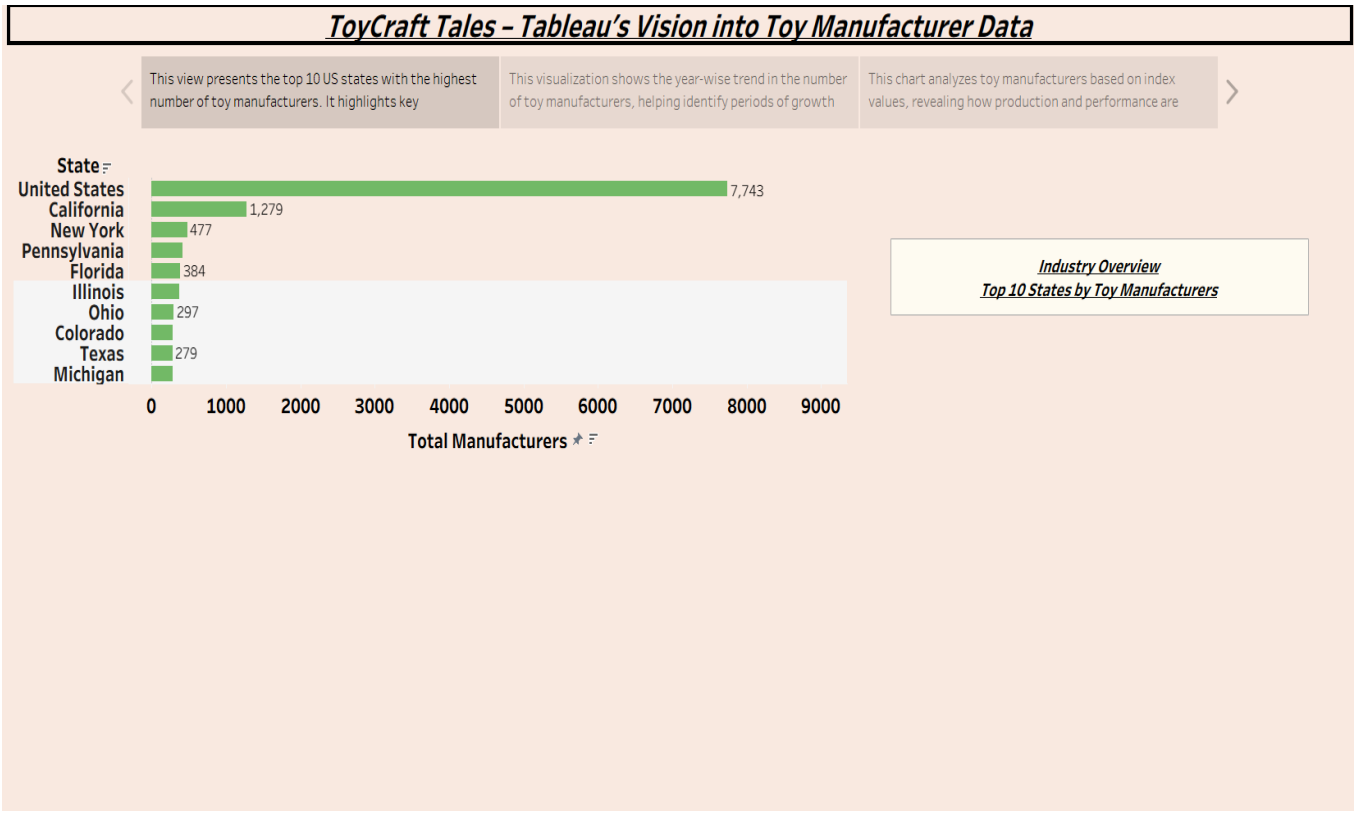
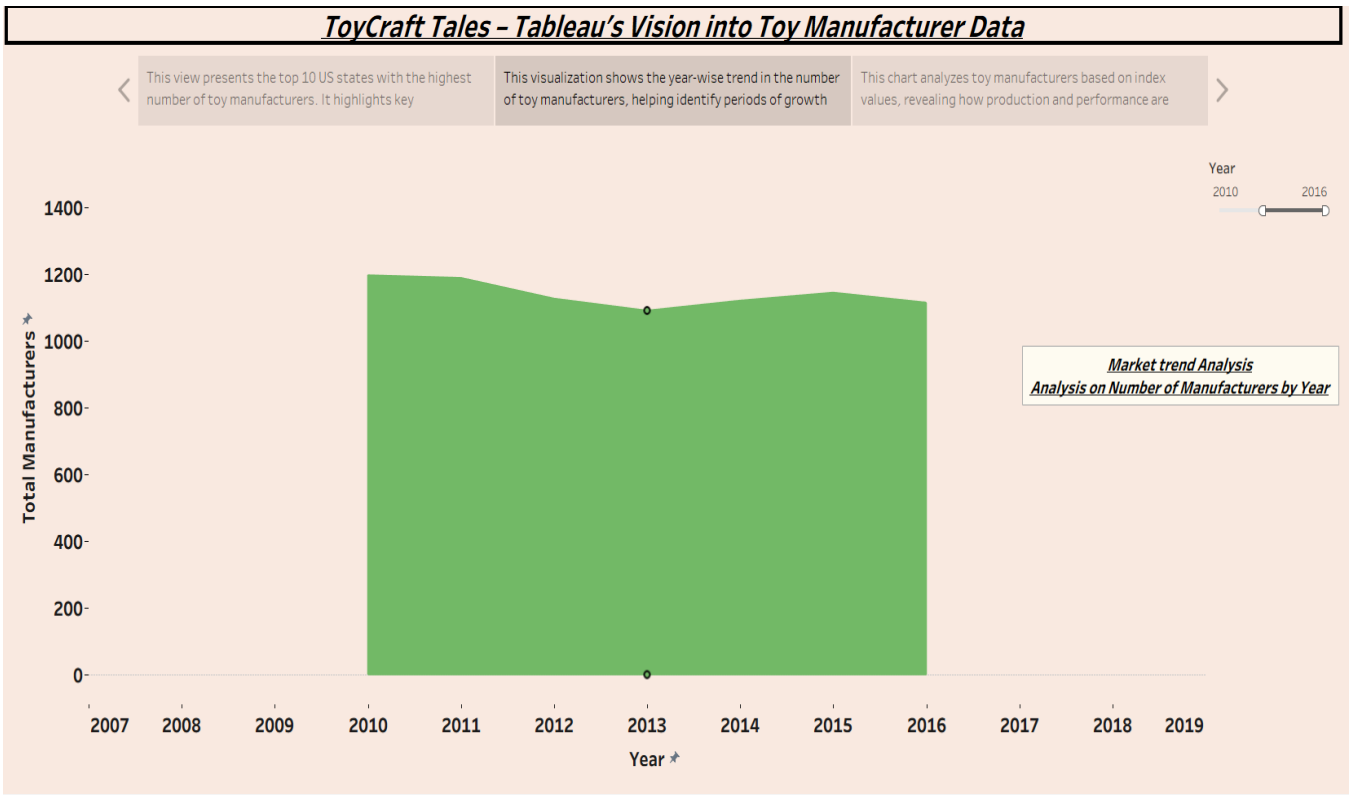
300

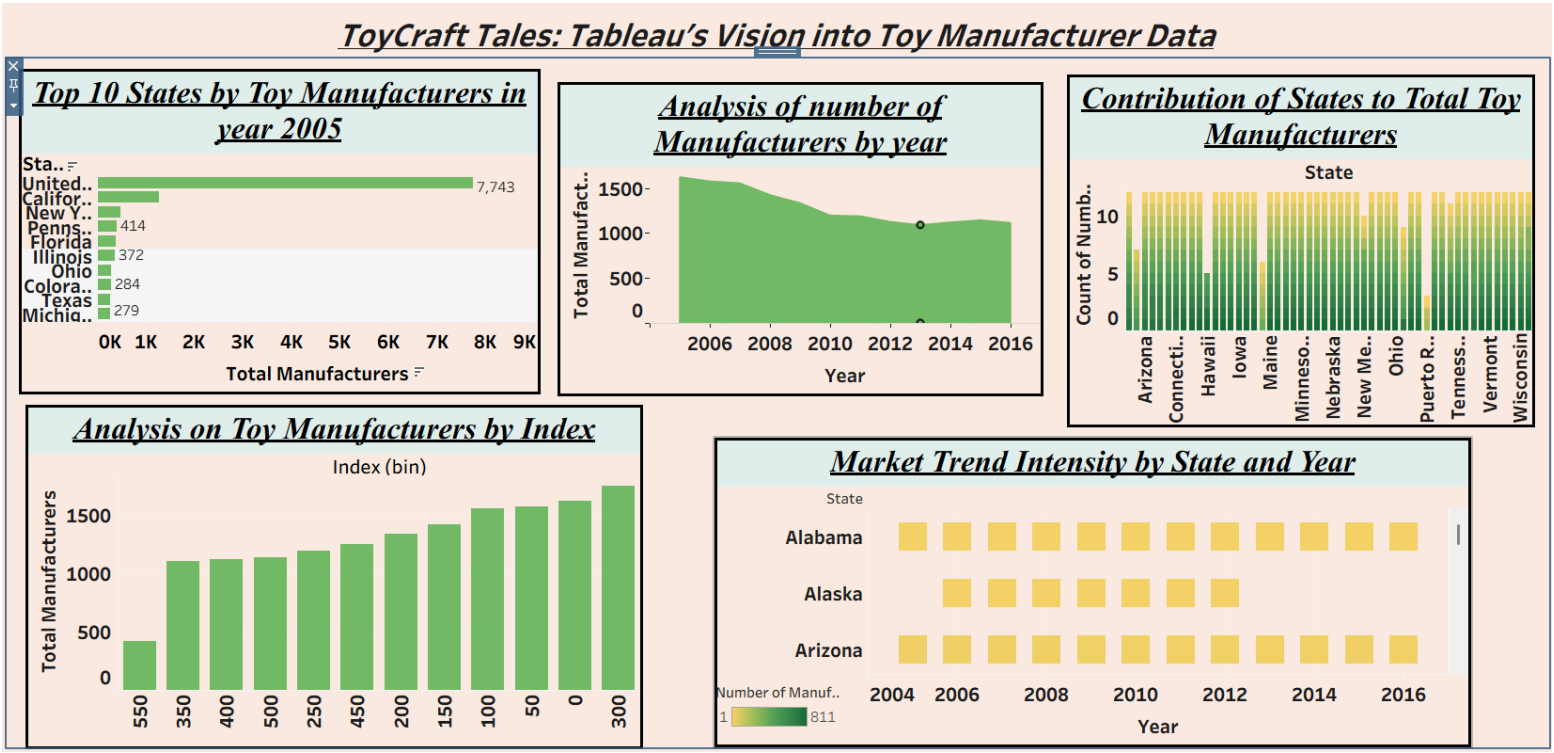


STORY AND DASHBOARD:





8. ADVANTAGES & DISADVANTAGES



Advantages

- **Interactive Dashboards:** Empower users to explore data at their own level of detail through filters, drill-downs, and dynamic visual elements.
- **Intuitive Visualizations:** Graphical representations make complex data easier to understand and interpret compared to traditional spreadsheets.
- **Accelerated Decision-Making:** Real-time visual KPIs support quicker, data-driven decisions by highlighting trends and anomalies at a glance. **Disadvantages**
- **Limited Storage on Tableau Public:** Free versions of Tableau (e.g., Tableau Public) offer restricted data storage and lack advanced enterprise features.
- **Internet Dependency:** Publishing and sharing dashboards online require a stable and fast internet connection, especially for real-time updates.
- **Performance Constraints with Large Datasets:** Without proper data modeling and optimization, Tableau may struggle with very large or complex datasets.

9. CONCLUSION

This project provided an opportunity to apply theoretical concepts in a practical, realworld scenario. By analyzing the ToyCraft dataset using Tableau, we successfully designed and implemented interactive dashboards that deliver meaningful business insights. Through this process, we strengthened key competencies in **data analytics**, **data visualization**, and the **effective communication of analytical findings**. Overall, the project demonstrated how business intelligence tools like Tableau can transform raw data into actionable strategies for operational improvement.

10. FUTURE SCOPE

- Add customer feedback
- Integrate farecasting models
- Develop real-time dashboards for live decision-making
- Expand dataset for broader industry coverage

11. APPENDIX

Dataset Link:

https://www.kaggle.com/datasets/thedevastator/toy-manufacturers-in-us-states?select=Week+39+-+US+Toy+Manufacturers+-+2005+to+2016.hyper

GitHub & Project Demo Link:

Github

Demo Video