

# **Project Final Report**

Team Id= LTVIP2025TMID47570

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## INTRODUCTION

### 1.1 Project Overview

**ToyCraft** is a creative and user-centric platform designed to revolutionize the way toys are discovered, designed, and experienced. In today's fast-paced digital world, choosing the right toy for a child often becomes overwhelming due to the vast number of options and lack of personalization. This project aims to address that gap by offering an intelligent and interactive environment where users—primarily parents, children, and educators—can explore a curated selection of toys based on age, learning outcomes, interests, and developmental benefits.

The platform not only recommends toys based on user needs but also introduces an element of creativity by allowing users to virtually design or customize their own toys. It combines educational and recreational values, ensuring that the toys chosen or created serve both fun and developmental purposes. The system uses data-driven insights, empathy mapping, and design thinking to guide the user through a structured yet playful journey.

### 1.2 Purpose

The main purpose of the ToyCraft project is to simplify and enhance the toy selection process while promoting creativity and education. It aims to address common challenges such as decision fatigue, lack of personalization, and poor understanding of a toy's learning impact. By applying user research and empathy-based design, the project ensures that the end users' needs, motivations, and frustrations are well understood and reflected in the final solution.

Additionally, the platform serves as a medium to foster bonding between children and adults through collaborative toy crafting and selection. It encourages imaginative thinking and skill-building by integrating DIY elements or providing guidance for physical creation. From a broader perspective, ToyCraft envisions supporting sustainable toy consumption by helping users make conscious and informed choices rather than purchasing impulsively or based on trends alone.

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## **IDEATION PHASE**

## **2.1 Customer Problem Statement:**

Create a problem statement to understand your customer's point of view. The Customer Problem Statement template helps you focus on what matters to create experiences people will love.

A well-articulated customer problem statement allows you and your team to find the ideal solution for the challenges your customers face. Throughout the process, you'll also be able to empathize with your customers, which helps you better understand how they perceive your product or service.

<b>I am</b>	Describe customer with 3-4 key characteristics - who are they?	Describe the customer and their attributes here
<b>I'm trying to</b>	List their outcome or "job" they care about - what are they trying to achieve?	List the thing they are trying to achieve here
<b>but</b>	Describe what problems or barriers stand in the way - what bothers them most?	Describe the problems or barriers that get in the way here
<b>because</b>	Enter the "root cause" of why the problem or barrier exists - what needs to be solved?	Describe the reason the problems or barriers exist
<b>which makes me feel</b>	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

## **Customer Problem Statement Template**

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Problem Statement (PS)	I am (Customer)	I'm trying to	But	Because	Which makes me feel
PS-1	A busy parent juggling work and kids	Find toys that are both fun and educational	Too many irrelevant suggestions online	Platforms focus on sales, not child engagement	Worried about my child's safety and happiness
PS-2	A toy store owner trying to restock trending items	Purchase trending toys before they go out of stock	In-store options are outdated	Too many sellers flood the market with low-quality toy	Disappointed when toys don't meet expectations

## 2.2 Empathy Map Canvas:

An empathy map is a simple, easy-to-digest visual that captures knowledge about a user's behaviours and attitudes.

It is a useful tool to help teams better understand their users. Creating an effective solution requires understanding the true problem and the person who is experiencing it. The exercise of creating the map helps participants consider things from the user's perspective along with his or her goals and challenges.

To build a solution that genuinely addresses the needs and experiences of the users, we developed an Empathy Map Canvas focusing on our primary user: parents and guardians looking to choose or craft toys for their children. The Empathy Map is a collaborative visualization tool used to articulate what we know about the user. It helps us synthesize observations and draw out insights about user behavior and mindset.

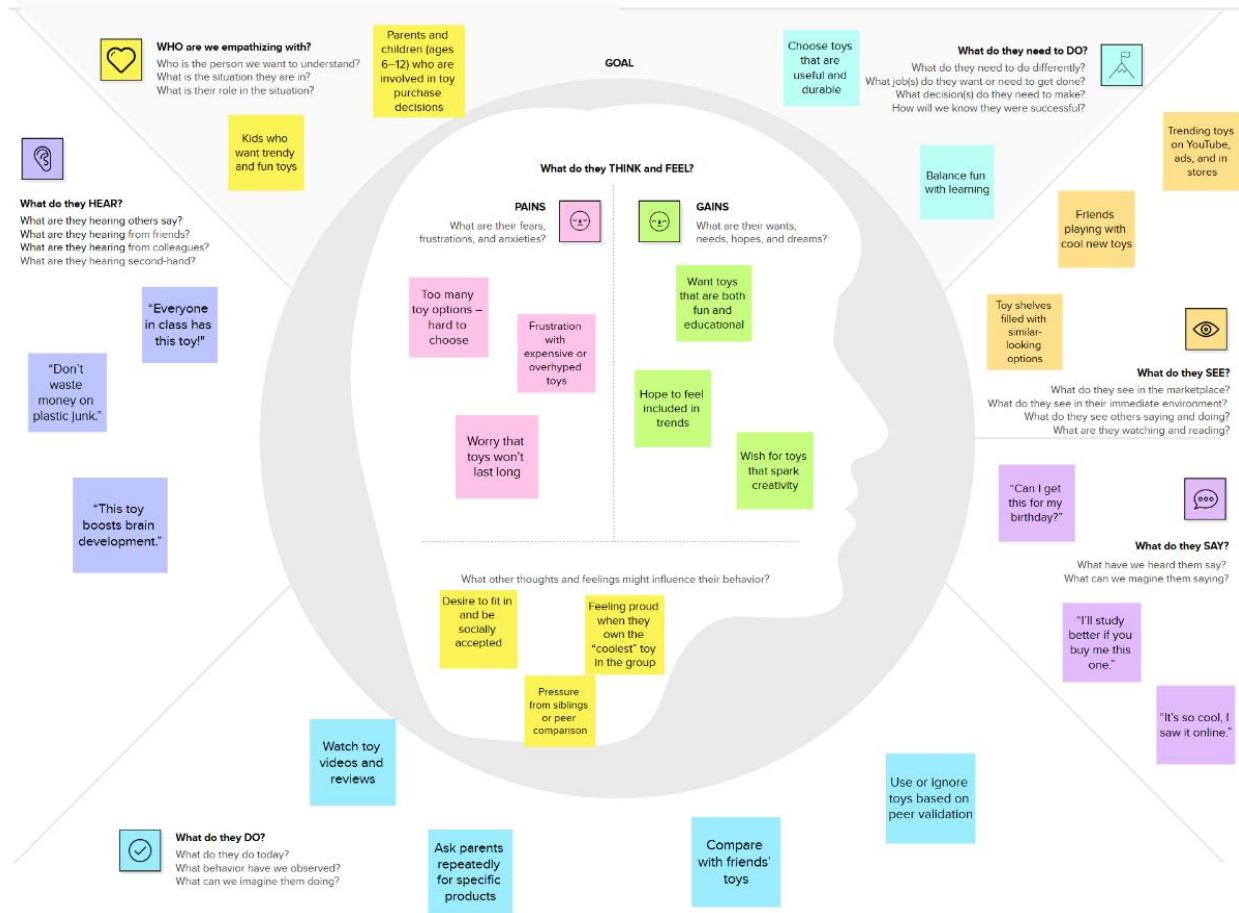
The canvas is divided into six key quadrants—Says, Thinks, Does, Feels, Pains, and Gains—to explore the user's perspective in depth:

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## Develop shared understanding and empathy

We gathered insights from children (ages 6–12) and their parents, the key users impacted by toy products. Kids are drawn to trendy and fun toys they see online or with friends. Parents focus on safety, price, and educational value. These findings help us prioritize features like durability, interactive learning, and affordability—ensuring the product meets both user desires and decision-maker concerns.



## 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.

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## Before you collaborate

A little bit of preparation goes a long way with this session. Here's what you need to do to get going.

⌚ 10 minutes

### A Team gathering

Define who should participate in the session and send an invite. Share relevant information or pre-work ahead.

### B Set the goal

Think about the problem you'll be focusing on solving in the brainstorming session.

### C Learn how to use the facilitation tools

Use the Facilitation Superpowers to run a happy and productive session.

[Open article](#) →

2

## Define your problem statement

What problem are you trying to solve? Frame your problem as a How Might We statement. This will be the focus of your brainstorm.

⌚ 5 minutes

### PROBLEM

Parents and kids struggle to find toys that are fun, safe, educational, and personalized—leading to poor purchase decisions, short-lived engagement, and wasted money.



### Key rules of brainstorming

To run a smooth and productive session

- Stay in topic.
- Encourage wild ideas.
- Defer judgment.
- Listen to others.
- Go for volume.
- If possible, be visual.

2

## Brainstorm

Write down any ideas that come to mind that address your problem statement.

⌚ 10 minutes

TIP  
You can select a sticky note and hit the pencil [switch to sketch] icon to start drawing!

Person 1

A toy recommendation app with a mood scanner

Person 3

"Build Your Own Toy" kits for kids

Person 2

Voice-activated toys that teach languages

Person 4

AI chatbot for parents to filter toys by age/needs

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 can break it up into smaller sub-groups.

⌚ 20 minutes

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

Toy recycling exchange between families

Smart shelf that tracks which toys are used most

Subscription box with surprise toys based on interest

Augmented reality (AR) toy trials before buying

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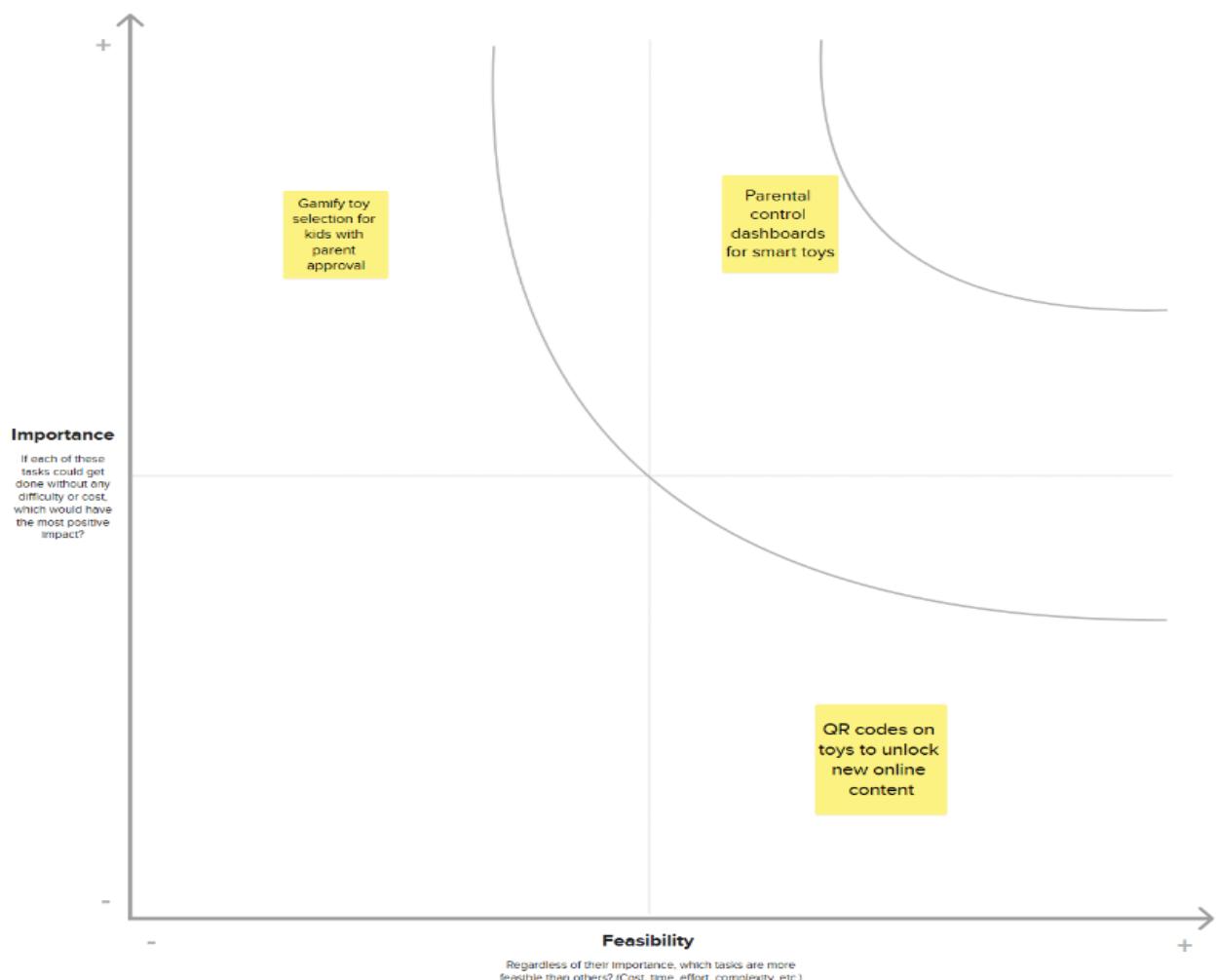
## Prioritize

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

### TIP

Participants can use their cursors to point at where sticky notes should go on the grid. The facilitator can confirm the spot by using the laser pointer holding the **H key** on the keyboard.



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## 3. REQUIREMENT ANALYSIS

### 3.1 Customer Journey map:

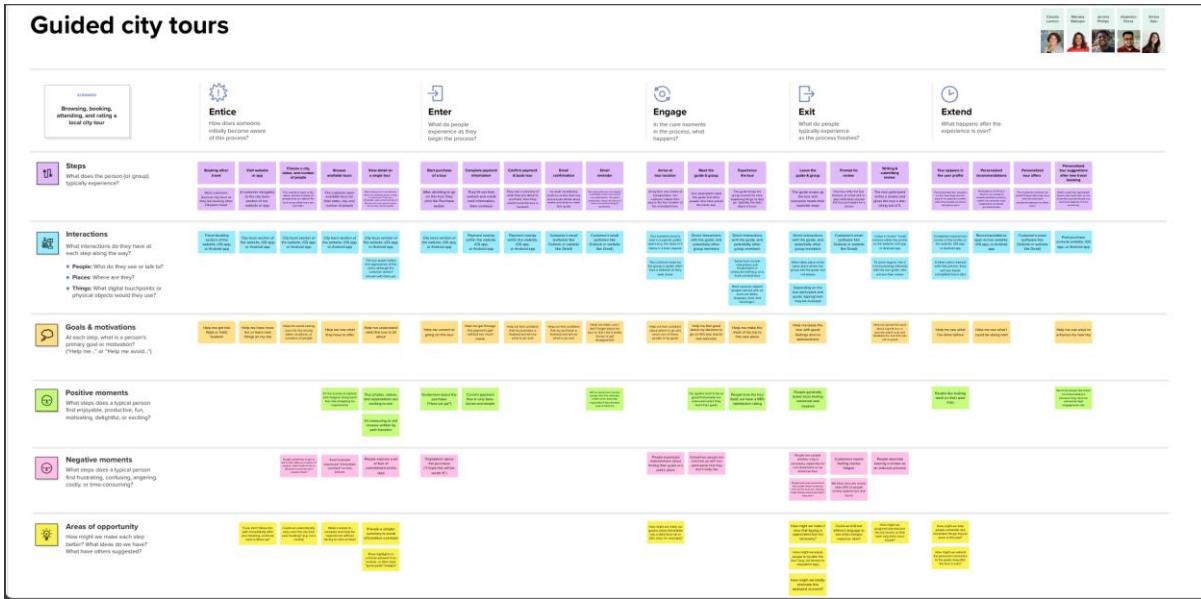
The Customer Journey Map was created to visualize the experience of a parent or guardian as they interact with the ToyCraft platform. This journey highlights key touchpoints, emotions, and decision-making stages, enabling us to identify friction areas and opportunities for improvement.

#### Stages:

1. **Awareness:** The user becomes aware of the platform through social media, word-of-mouth, or a recommendation from an educator.
2. **Exploration:** They visit the platform and browse available toys, craft ideas, or the customization section.
3. **Evaluation:** The user filters toys by age, skill focus (e.g., creativity, logic), and preferences. They may use the recommendation assistant or read reviews.
4. **Decision:** After shortlisting, they select a toy or generate a custom toy design with the help of the system.
5. **Action:** They proceed to purchase, download a DIY guide, or initiate a custom craft order.
6. **Post-Experience:** They receive the toy or build it using the provided guide. Feedback and satisfaction are shared on the platform.

This map helped us identify moments of confusion and delight and align the platform features with user needs at each step.

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## 3.2 Solution Requirement:

Based on the insights gained from brainstorming and the empathy map, the following functional and non-functional requirements were identified:

### Functional Requirements:

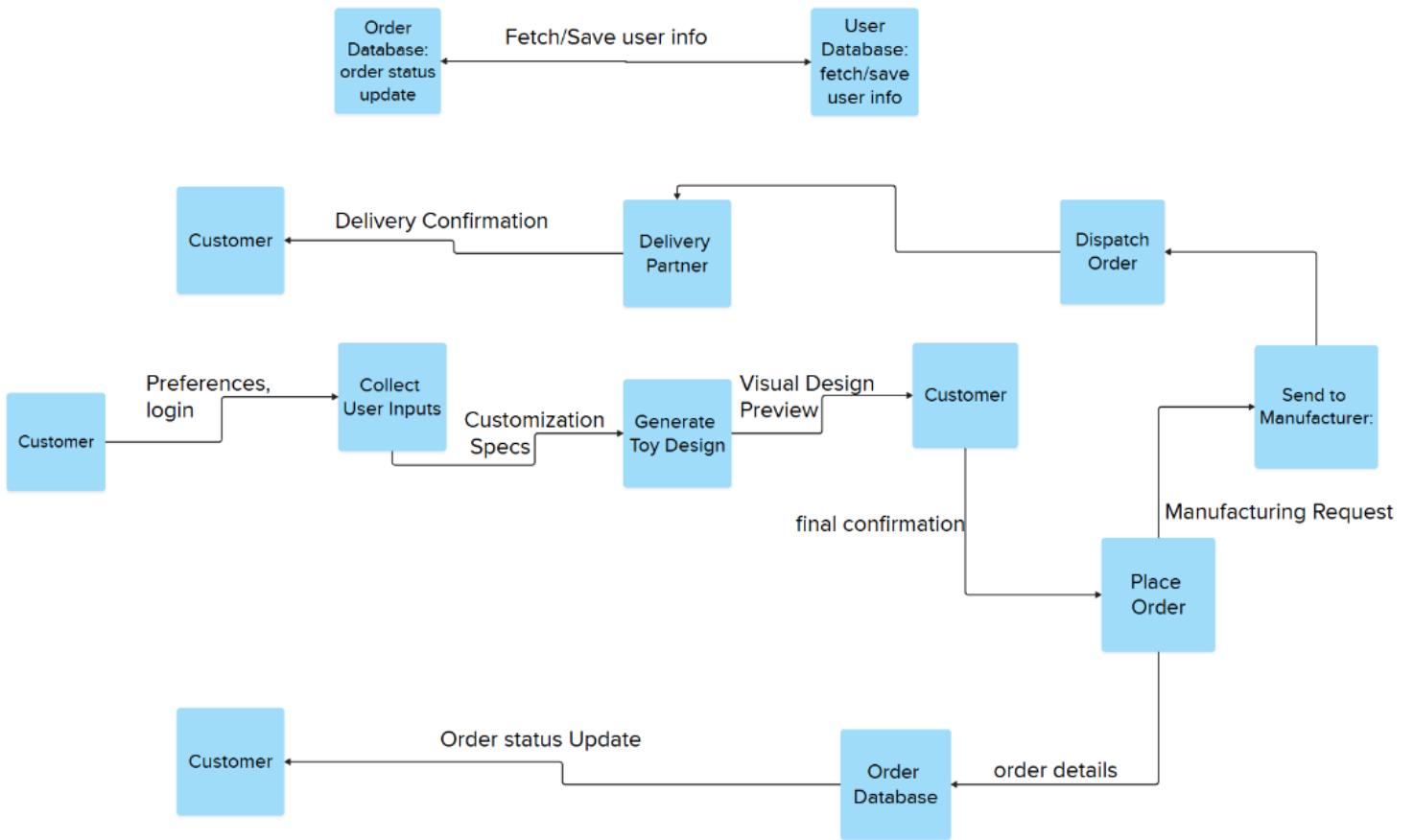
- User registration and login
- Toy search with filters (age, category, learning goal, etc.)
- Toy recommendation engine based on user input
- Custom toy crafting interface
- Downloadable DIY craft guides
- Ratings and review section
- Admin dashboard to manage inventory and user feedback

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## Non-Functional Requirements:

- Intuitive and child-friendly UI/UX
- Mobile and desktop responsiveness
- Fast load time and search performance
- Secure user data storage and safe payment processing
- Scalable architecture for increasing user base
- Integration with third-party APIs (e.g., payment gateway, image generation tools)

## 3.3 Data Flow Diagram:



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A Level 1 Data Flow Diagram (DFD) was created to represent the flow of data between different modules of the system. The core components include:

- User: Initiates interactions by registering, searching, and crafting.
- Toy Database: Stores all toy information including descriptions, categories, and user reviews.
- Recommendation Engine: Uses user input to suggest suitable toys.
- Customization Module: Allows users to build their own toy from templates or scratch.
- Admin Panel: Handles data management, analytics, and inventory.

The diagram ensures a clear understanding of how data moves within the system, aiding in both design and implementation planning.

## 3.4 Technology Stack:

S.No	Component	Description	Technology / Tool
1	User Interface	Interface to view dashboard and interact with visuals	Tableau Public / Tableau Desktop
2	Application Logic-1	Data preprocessing and transformation	Python (Pandas), Tableau prep tools
3	Application Logic-2	Creating calculated fields and data filters	Tableau Calculated Fields
4	Application Logic-3	Visualization logic and chart rendering	Tableau Visualization Engine
5	Database	Local storage of CSV dataset	Flat File (.CSV)
6	Cloud Database	(Optional) Hosting dataset on cloud for Tableau Cloud usage	Google Sheets / Tableau Cloud
7	File Storage	Where source dataset is stored before uploading to Tableau	Local Filesystem / Google Drive
8	External API-1	Not used (N/A for this dashboard)	N/A
9	External API-2	Not used	N/A
10	Machine Learning Model	Not used in current scope	N/A
11	Infrastructure	System used for dashboard design and publishing	Local (Windows/MacOS) / Tableau Public

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## **4. PROJECT DESIGN**

### **4.1 Problem Solution Fit:**

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.

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<p><b>1. CUSTOMER SEGMENT(S)</b></p> <p>The key customers are toy manufacturers, especially small to mid-scale companies. Within these firms, product managers, toy designers, and market research teams are the main users. They rely on insights to create products that meet market demand and reduce waste.</p>	<p><b>6. CUSTOMER LIMITATIONS</b> EG. BUDGET, DEVICES</p> <p>Manufacturers often lack technical expertise and big budgets. They prefer simple, web-based tools that are easy to use without extra training. Time and device compatibility are also key limitations.</p>	<p><b>5. AVAILABLE SOLUTIONS</b> PROS &amp; CONS</p> <p>Current tools include surveys, sales dashboards, and consultants. Surveys are slow, dashboards are too basic, and consultants are expensive. These methods offer limited insights and are not tailored to the toy industry.</p>
<p><b>2. PROBLEMS / PAINS + ITS FREQUENCY</b></p> <p>Manufacturers often produce toys that don't match customer needs due to a lack of real-time feedback. They rely on outdated reports or general trends, leading to high unsold inventory and weak product-market fit. There's also a gap in understanding age-specific and regional preferences.</p>	<p><b>9. PROBLEM ROOT / CAUSE</b></p> <p>The core issue is the lack of a single tool that combines customer preferences, trends, and production data. Without this, manufacturers can't predict demand or build toys that connect with users.</p>	<p><b>7. BEHAVIOR + ITS INTENSITY</b></p> <p>Most manufacturers rely on gut feelings and old sales records. They don't use analytics tools often, but they're open to adopting new ones if they're easy and helpful. The need for change is rising.</p>
<p><b>3. TRIGGERS TO ACT</b></p> <p>Events like leftover unsold toys, festive seasons with unclear demand, and competitor success push them to act. There's also pressure to optimize manufacturing and create smarter, data-backed product lines.</p>	<p><b>10. YOUR SOLUTION</b></p> <p>Toycraft is a simple Tableau-powered dashboard built for toy manufacturers. It turns data into visuals that help companies see what kids like, track trends, and design better toys. It's easy to use and made for this specific industry.</p>	<p><b>8. CHANNELS of BEHAVIOR</b></p> <p><b>ONLINE</b> Online, they use email, dashboards, Excel sheets, and chat tools like Slack or Teams.</p> <p><b>OFFLINE</b> Offline, they use printed reports in meetings or get customer opinions during retail visits or expos.</p>
<p><b>4. EMOTIONS BEFORE / AFTER</b></p> <p>Before using a solution, users feel confused, stressed, and uncertain about their decisions. After implementing a data-driven system, they feel confident, relieved, and satisfied with more accurate, informed actions.</p>		

## 4.2 Proposed Solution:

S.No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	Toy manufacturers often lack detailed insights into customer preferences and evolving toy trends. This leads to overproduction, underperformance, or irrelevant designs.
2.	Idea / Solution description	<i>Toycraft</i> is a data-driven solution using Tableau dashboards to visualize customer insights, production patterns, and trend analytics. It helps manufacturers understand what toys are in demand, which designs are

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		underperforming, and how to optimize their inventory and customization options based on real-time market and user data.
3.	Novelty / Uniqueness	Combines interactive Tableau dashboards with toy customization feedback loops. Unlike standard BI tools, it's tailored specifically for toy manufacturers and integrates with customer reviews, seasonal trends, and regional preferences.
4.	Social Impact / Customer Satisfaction	Enables toy makers to build better, more meaningful toys aligned with developmental goals. Children get toys they love; parents feel confident in purchases; manufacturers reduce waste and boost satisfaction.
5.	Business Model (Revenue Model)	SaaS-based licensing model for toy manufacturers to access the dashboard. Additional revenue via premium analytics modules, consultancy, and toy trend forecasting reports.
6.	Scalability of the Solution	Easily extendable to various geographies, toy categories, or even different industries. Modular dashboard components allow addition of more data sources and deeper AI-driven insights over time.

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## 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.

## Goals of the Architecture

1. Find the best tech solution to visualize how product position, price, promotions, and

customer demographics affect sales volume.

2. Define the system's structure and behavior using Tableau Public for dashboards and

Python/Tableau for preprocessing.

3. Outline features, components, and development phases clearly for visualization and

interaction.

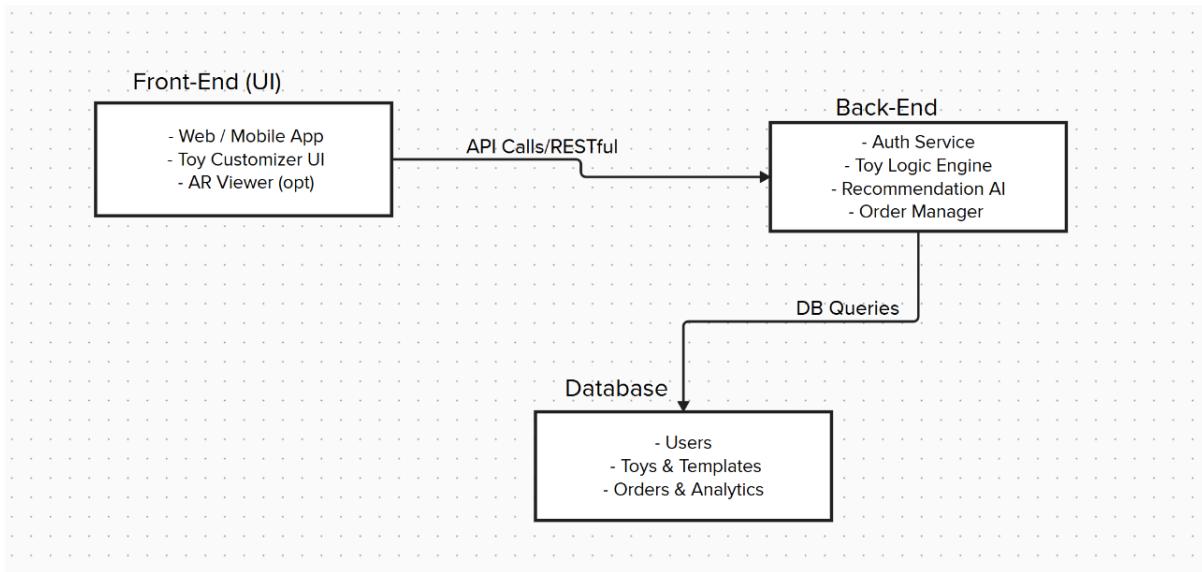
4. Provide technical specifications for implementation and scaling.

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## Architecture Components

Layer	Component Description
Data Layer	Source: Product Positioning.csv file with fields like Sales Volume, Foot Traffic, Demographics, Promotion, etc.
Processing Layer	Data cleaning, formatting, and calculated fields in Tableau or via Python (optional).
Application Layer	Tableau logic engine for filters, calculations, and chart rendering.
Presentation Layer	Final dashboard built in Tableau with interactive visuals: bar, funnel, donut, waterfall, etc.
Users	Retail managers, marketing executives, analysts – accessing via Tableau Public or PDF reports.

## Solution Architecture Diagram:



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## 5. PROJECT PLANNING & SCHEDULING

### 5.1 Project Planning:

Use the below template to create product backlog and sprint schedule

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint -1	Data Preparation	USN-1	As an analyst, I want to clean and inspect the dataset for nulls or anomalies.	2	High	A1
Sprint -1	Data Preparation	USN-2	As an analyst, I want to rename columns for easy access and remove index column.	1	Medium	A2
Sprint -2	Trend Analysis	USN-3	As a user, I want to see a line chart showing yearly changes in total manufacturers.	3	High	A1

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Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint -2	State-Level Comparison	USN-4	As a user, I want a bar chart showing top 10 states by average manufacturer s.	3	High	A2
Sprint -3	Interactive Dashboard	USN-5	As a user, I want to filter manufacturer data by year and state interactively.	4	High	A3
Sprint -3	Visual Summary	USN-6	As a user, I want to view a heatmap showing state-wise performance over years.	3	Medium	A1
Sprint -4	Insights and Story	USN-7	As a presenter, I want a slide-based story showing key findings and conclusions.	4	High	A2

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Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint -4	Project Delivery & Documentation	USN-8	As a team, we want to prepare a final report with visualizations and insights.	4	High	A3

## Project Tracker, Velocity & Burndown Chart: (4 Marks)

Sprint	Total Story Points	Duration	Start Date	End Date	Points Completed	Release Date
Sprint-1	3	6 Days	10 Jul 2025	15 Jul 2025	3	15 Jul 2025
Sprint-2	6	6 Days	16 Jul 2025	21 Jul 2025	6	21 Jul 2025
Sprint-3	7	6 Days	22 Jul 2025	27 Jul 2025	7	27 Jul 2025
Sprint-4	8	6 Days	28 Jul 2025	2 Aug 2025	8	2 Aug 2025

### Velocity:

Imagine we have a 10-day sprint duration, and the velocity of the team is 20 (points per sprint). Let's calculate the team's average velocity (AV) per iteration unit (story points per day)

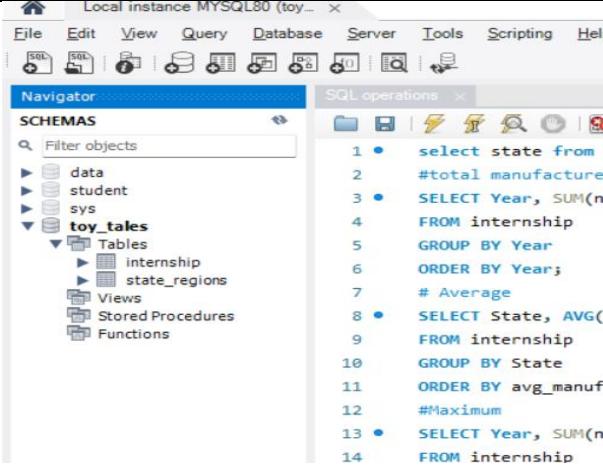
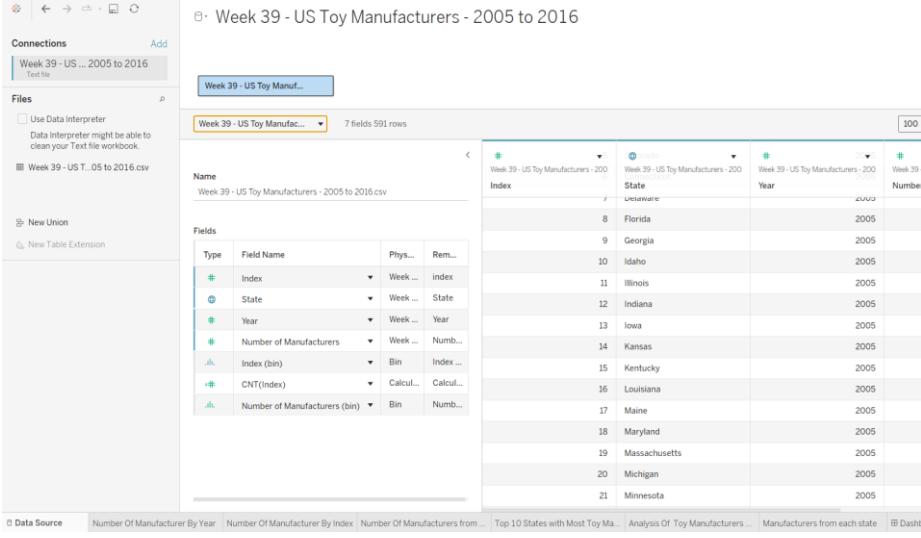
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**Velocity** = Total Story Points Completed / Number of Sprints  
=  $(3 + 6 + 7 + 8) / 4$   
= **6.0 story points per sprint**

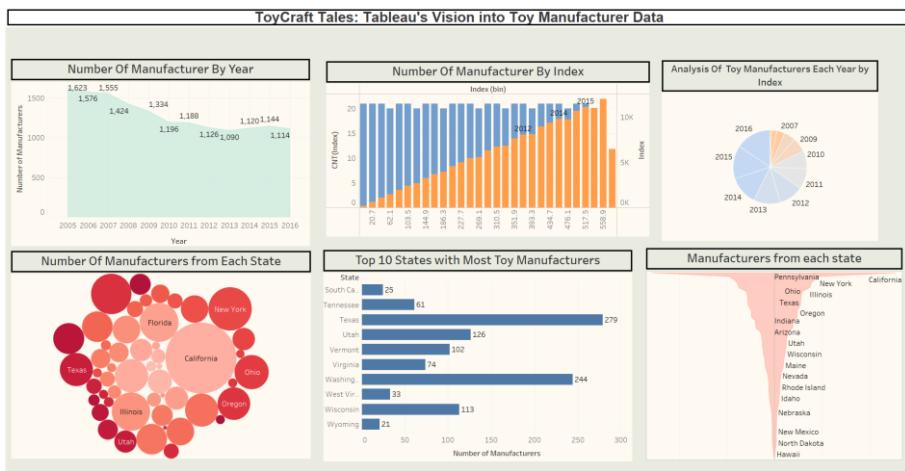
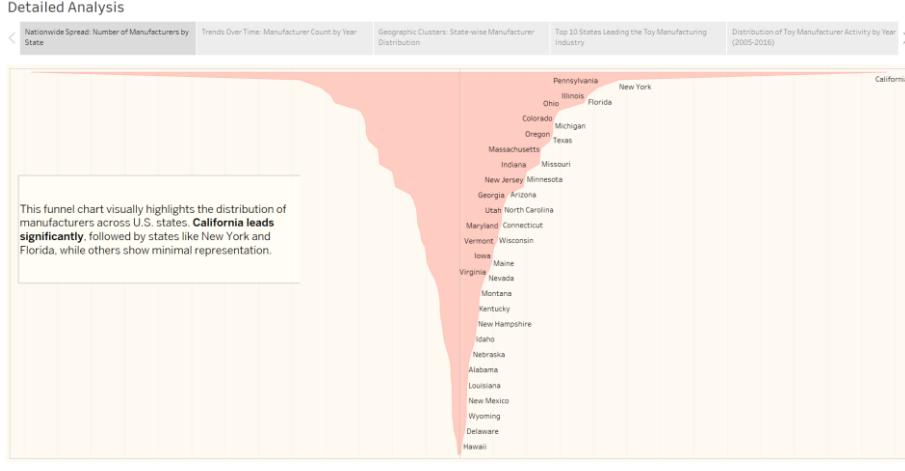
## 6.FUNCTIONAL AND PERFORMANCE TESTING

### 6.1 Model Performance Testing:

Project team shall fill the following information in model performance testing template.

S. No .	Parameter	Screenshot / Values																																																												
1	Data Rendered																																																													
2.	Data Preprocessing	 <table border="1"><thead><tr><th>Index</th><th>State</th><th>Year</th><th>Number</th></tr></thead><tbody><tr><td>8</td><td>Florida</td><td>2005</td><td></td></tr><tr><td>9</td><td>Georgia</td><td>2005</td><td></td></tr><tr><td>10</td><td>Idaho</td><td>2005</td><td></td></tr><tr><td>11</td><td>Illinois</td><td>2005</td><td></td></tr><tr><td>12</td><td>Indiana</td><td>2005</td><td></td></tr><tr><td>13</td><td>Iowa</td><td>2005</td><td></td></tr><tr><td>14</td><td>Kansas</td><td>2005</td><td></td></tr><tr><td>15</td><td>Kentucky</td><td>2005</td><td></td></tr><tr><td>16</td><td>Louisiana</td><td>2005</td><td></td></tr><tr><td>17</td><td>Maine</td><td>2005</td><td></td></tr><tr><td>18</td><td>Maryland</td><td>2005</td><td></td></tr><tr><td>19</td><td>Massachusetts</td><td>2005</td><td></td></tr><tr><td>20</td><td>Michigan</td><td>2005</td><td></td></tr><tr><td>21</td><td>Minnesota</td><td>2005</td><td></td></tr></tbody></table>	Index	State	Year	Number	8	Florida	2005		9	Georgia	2005		10	Idaho	2005		11	Illinois	2005		12	Indiana	2005		13	Iowa	2005		14	Kansas	2005		15	Kentucky	2005		16	Louisiana	2005		17	Maine	2005		18	Maryland	2005		19	Massachusetts	2005		20	Michigan	2005		21	Minnesota	2005	
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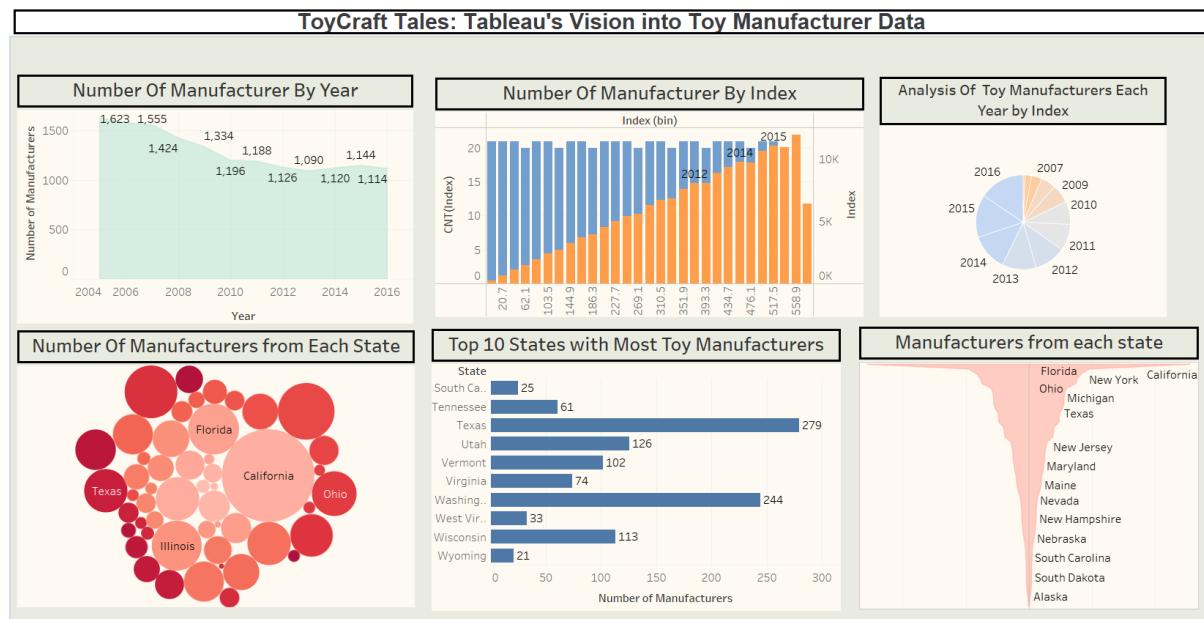
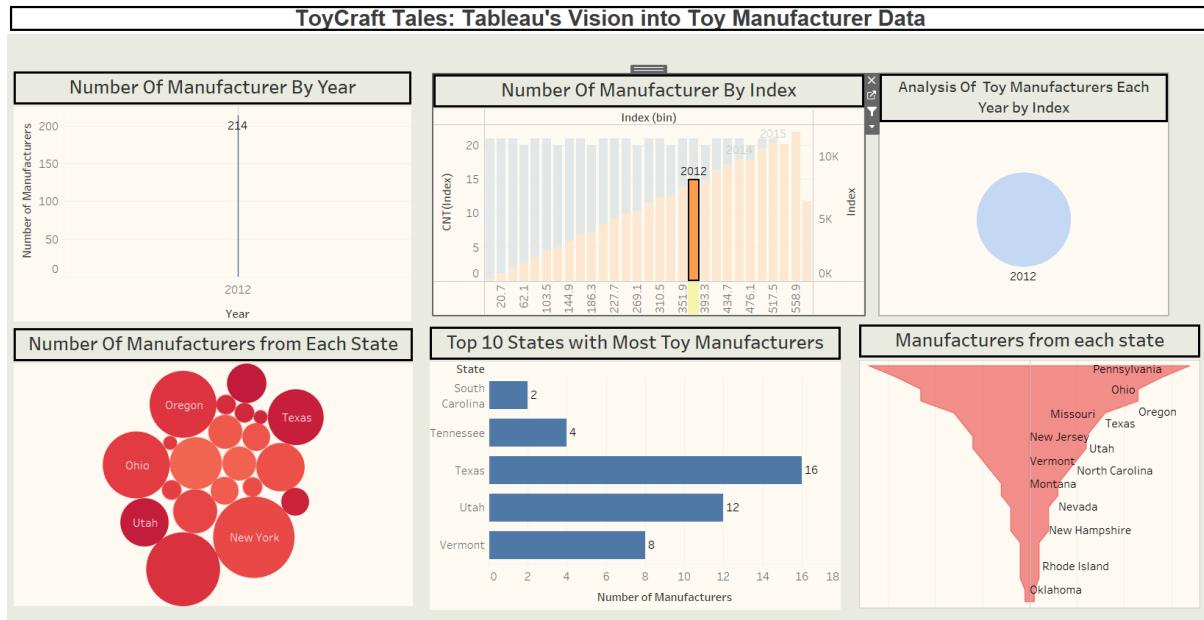
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3.	Utilization of Filters	The fields Year and State are majorly used as Filters.
4.	Calculation fields Used	Index(BIN), CNT(Index) are the calculation fields used for analysis.
5.	Dashboard design	No of Visualizations / Graphs – 6 
6	Story Design	No of Visualizations / Graphs – 5 

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## 7.RESULTS

### 7.1 OUTPUT SCREENSHOTS:

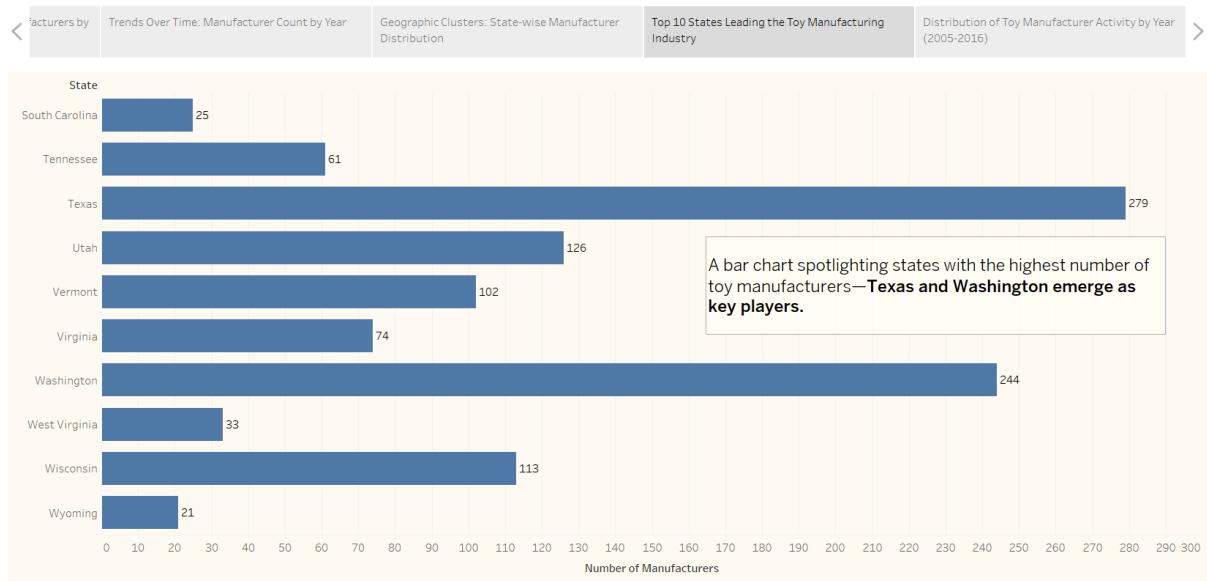


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## Detailed Analysis



## Detailed Analysis



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## 8. ADVANTAGES & DISADVANTAGES

### Advantages

- **User-Centered Design:** The entire platform is built around real user needs identified through empathy mapping and journey mapping, ensuring high relevance and usability.
- **Personalization:** ToyCraft offers personalized toy recommendations based on age, interest, and developmental goals, making the selection process more meaningful.
- **Creative Engagement:** The customization and DIY features encourage creativity, allowing users to craft unique toys and engage in hands-on learning.
- **Educational Value:** By focusing on skill-based toy categorization (STEM, logic, art, etc.), ToyCraft ensures that playtime also supports cognitive development.
- **Scalability:** The architecture is designed to support feature expansion, third-party integration, and a growing user base without major changes.
- **Time-Saving:** Smart filtering and recommendations help users quickly find toys that suit their needs, reducing decision fatigue.

### Disadvantages

- **No Advanced AI Yet:** The current recommendation system is basic and does not include AI or machine learning for adaptive personalization.
- **Web-Only Platform:** As of now, ToyCraft is only available on web browsers. Users looking for mobile accessibility may find this limiting.
- **DIY Accessibility:** Some DIY toy guides may require materials or tools that are not easily available to all users, especially in rural areas.
- **Limited Real-Time Interaction:** There is no collaborative feature for multiple users (like a parent and child) to customize toys together in real time.

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- **Initial Inventory Management:** Curating and maintaining a diverse, high-quality toy database (especially for user-generated designs) can be resource-intensive during early phases.

## 9. CONCLUSION

ToyCraft is a user-centered solution built on empathy, creativity, and innovation. By addressing key challenges faced by parents and children in the toy selection process, the platform introduces a seamless and interactive way to discover, personalize, and craft toys that matter.

From brainstorming and empathy mapping to designing the architecture and defining features, every step of the project has been aligned with real user needs. While there are limitations in its current form, the foundation laid by this project opens doors for future improvements and real-world applications.

In conclusion, ToyCraft aims to redefine how toys are experienced — not just as products, but as tools of connection, learning, and imagination.

## 10. FUTURE SCOPE

The future of ToyCraft holds significant potential for technological enhancement, user engagement, and market expansion. Below are some possible areas of growth:

- **AI-Powered Recommendations:** Implementing advanced AI and behavioral analytics to understand user preferences and improve toy suggestions over time.
- **Mobile App Development:** Launching a fully optimized mobile app for Android and iOS to make the platform accessible on-the-go.

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- **3D Toy Visualization:** Allowing users to see 3D previews of custom-designed toys for better visualization before downloading or purchasing.
- **Real-Time Collaboration Features:** Introducing live co-creation sessions where parents and children can customize toys together remotely.
- **Gamification:** Adding achievement systems, badges, and creative challenges to encourage regular use and creativity.
- **Marketplace Integration:** Partnering with toy makers or allowing small-scale creators to sell their custom-designed toys through the platform.

These enhancements will make ToyCraft not just a toy discovery tool, but a **complete ecosystem** for creative, educational, and engaging toy interactions.

## 11. APPENDIX

Dataset Link: <https://docs.google.com/spreadsheets/d/1UjCzqXYFdENnL-NDPYPgfh6E0Hap1VeMwPdDB5e79A8/edit?usp=sharing>

GitHub Link: <https://github.com/Ash-rith/ToyCraft-Tales>

Project Demo Link:

[https://drive.google.com/file/d/1pqyPkil9JrvJ9at6V\\_EPH4ozz1fpRBOX/view?usp=sharing](https://drive.google.com/file/d/1pqyPkil9JrvJ9at6V_EPH4ozz1fpRBOX/view?usp=sharing)