PROJECT REPORT

Team ID: : LTVIP2025TMID49452

1. INTRODUCTION

Project Overview (IREVOLUTION: A Data-Driven)

. The **iRevolution** project is a data-centric analysis and exploration of **Apple's iPhone ecosystem**, aiming to uncover trends, performance metrics, user adoption, and the innovation trajectory of one of the most influential technology products of the 21st century. Through the lens of **data science and analytics**, this project dissects the iPhone's journey from its launch in 2007 to the present, exploring its impact on the tech industry, consumer behavior, and Apple's business strategy

1.1 Purpose

The purpose of the **iRevolution** project is to leverage data-driven methodologies to explore and understand the evolution, impact, and strategic decisions behind Apple's iPhone product line. By analyzing diverse datasets, this project aims to uncover:.

Ideation Phase Define the Problem Statements

Customer Problem Statement Template:

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.

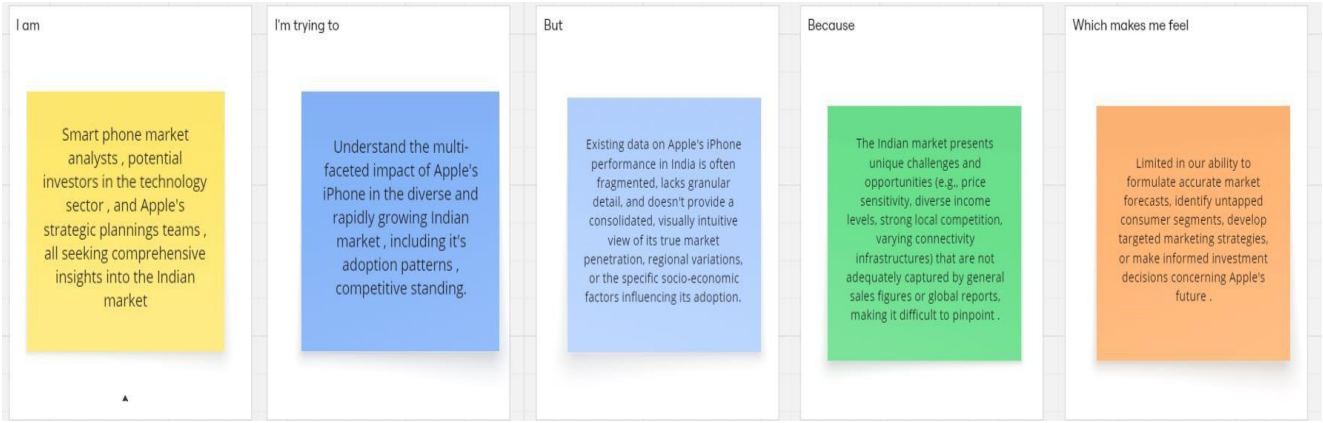
A well-articulated customer problem statement allows you and your team to find the ideal solution for the challenges your customers face. Throughout the process, you'll also be able to empathize with your customers, which helps you better understand how they perceive your product or service.

Problem Statement:

The project, "Revolution: A Data-driven Exploration of Apple's iPhone Impact in India using Tableau," aims to analyze the profound influence of the iPhone on the Indian market, leveraging data visualization techniques in Tableau to reveal trends and patterns in consumer behaviour, market penetration, and brand perception. The core problem statement focuses on understanding how the iPhone, initially perceived as a niche luxury item, has transformed into a mainstream device and impacted various facets of the Indian mobile phone landscape**.**

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

Example:



Problem Statement (PS)	I am (Customer)	I'm trying to	But	Because	Which makes me feel

PS-1	Smart phone market analysts, potential investors in the technology sector, and Apple's strategic plannings teams, all seeking comprehen sive insights into the Indian market	Understand the multifaceted impact of Apple's iPhone in the diverse and rapidly growing Indian market, including it's adoption, patterns, competitive standing.	Existing data on Apple's iPhone performa nce in India is often fragment ed, lacks granular detail, and doesn't provide a consolida ted, visually intuitive view of its true market penetrati on,	The Indian market presents unique challenges and opportunitie s (e.g., price sensitivity, diverse income levels, strong local competition, varying connectivity infrastructur es) that are not adequately captured by general sales figures or global	Limited in our ability to formulate accurate market forecasts, identify untapped consumer segments, develop targeted marketing strategies, or make informed investment decisions concerning Apple's future .
			regional variations , or the specific socioeconomic factors influencin g its adoption.	reports, making it difficult to pinpoint .	

PS-2	Indian consumers interested in smartphone technology, market analysts, and potential investors in the Indian tech market.	Understand the specific impact and evolving dynamics of Apple's iPhone in the Indian market, beyond general sales figures, including user adoption patterns, competitive landscape, and key growth drivers or inhibitors.	There is a lack of consolida ted, datadriven insights specificall y focusing on the nuanced impact of the iPhone in India, making it difficult to fully grasp its true influence, challenge s, and opportuni ties within this unique and diverse market.	Existing data often provides high-level sales numbers but rarely delves into granular user behaviour, regional variations, price sensitivity, brand perception shifts	Uninformed and limited in our ability to make strategic decisions regarding product development, marketing efforts, investment opportunities, or competitive positioning within the Indian smartphone ecosystem, potentially leading to missed opportunities or misaligned strategies.

Ideation Phase Empathize & Discover

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 helps 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.

An **empathy map** is a widely used visualization tool within the field of user experience design and human–computer interaction practice. In relation to empathetic design, the primary purpose of an empathy map is to bridge the understanding of the end user. Within context of

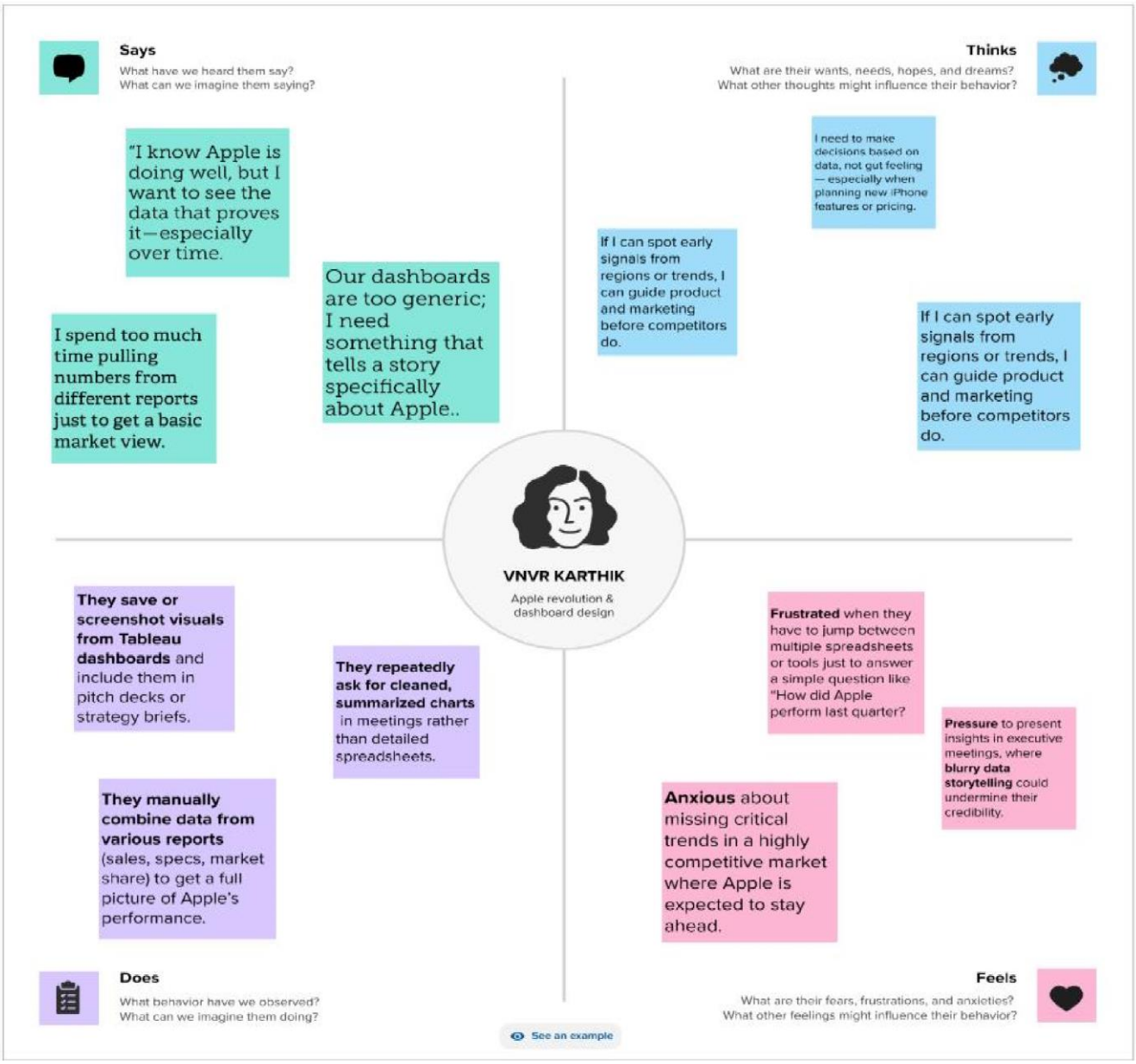
its application, this tool is used to build a shared understanding of the user's needs and provide context to a user-centered solution

Structure

The traditional empathy map begins with four categories: says, thinks, does, and feels. At the center of the map, a user or persona is displayed to remind practitioners and stakeholders what type of individual this research is centered around. Each category of the empathy map represents a snapshot of the user's thoughts and feelings without any chronological order.

- **Says** category contains what the user says out loud during research or testing. Ideally, each point is written down as close to the user's original words as possible.
- **Thinks** category contains what the user is thinking. While content may overlap with the *Says* category, *Thinks* category exists to capture thoughts users may not want to share willing due to social factors, such as self-consciousness or politeness.
- **Does** category contains the user's action and behaviours. This contains what the user is physically doing and captures what actions users are taking.
- **Feels** category contains the user's emotional state in context with their experience. This typically contains information or phrases as to how they feel about the experience

Example:


Says
What have we heard them say?
What can we imagine them saying?
"I know Apple is doing well, but I want to see the data that proves it—especially over time.
Our dashboards are too generic; I need something that tells a story specifically about Apple..
I spend too much time pulling numbers from different reports just to get a basic market view.
Thinks
What are their wants, needs, hopes, and dreams?
What other thoughts might influence their behavior?
I need to make decisions based on data, not gut feeling — especially when planning new iPhone features or pricing.
If I can spot early signals from regions or trends, I can guide product and marketing before competitors do.
If I can spot early signals from regions or trends, I can guide product and marketing before competitors do.
VNVR KARTHIK
Apple revolution & dashboard design
They save or screenshot visuals from Tableau dashboards and include them in pitch decks or strategy briefs.
They repeatedly ask for cleaned, summarized charts in meetings rather than detailed spreadsheets.
They manually combine data from various reports (sales, specs, market share) to get a full picture of Apple's performance.
Frustrated when they have to jump between multiple spreadsheets or tools just to answer a simple question like "How did Apple perform last quarter?
Pressure to present insights in executive meetings, where blurry data storytelling could undermine their credibility.
Anxious about missing critical trends in a highly competitive market where Apple is expected to stay ahead.
Does
What behavior have we observed?
What can we imagine them doing?
Feels
What are their fears, frustrations, and anxieties?
What other feelings might influence their behavior?
See an example

Ideation Phase

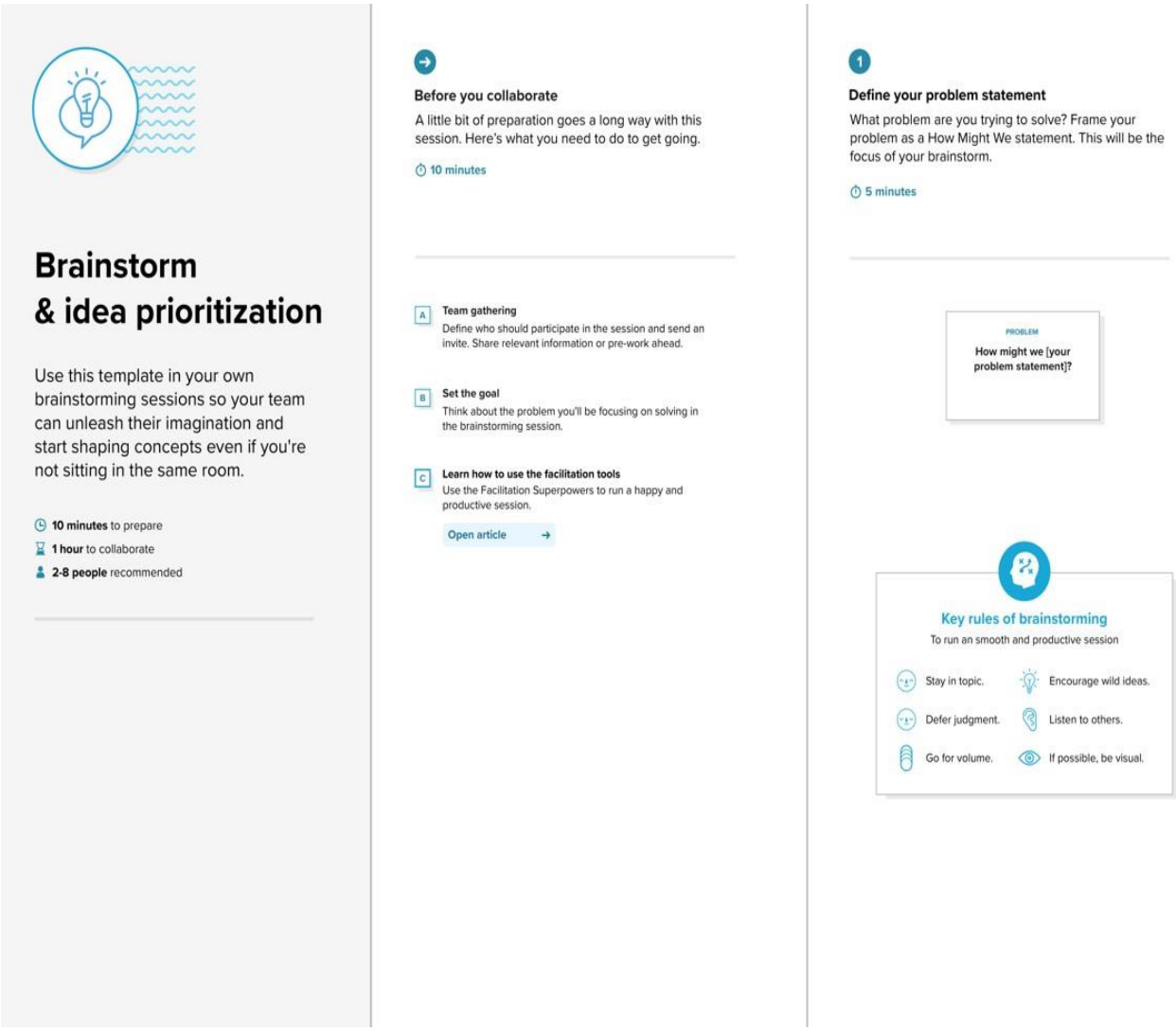
Brainstorm & Idea Prioritization Template

Brainstorm & Idea Prioritization Template:

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.

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



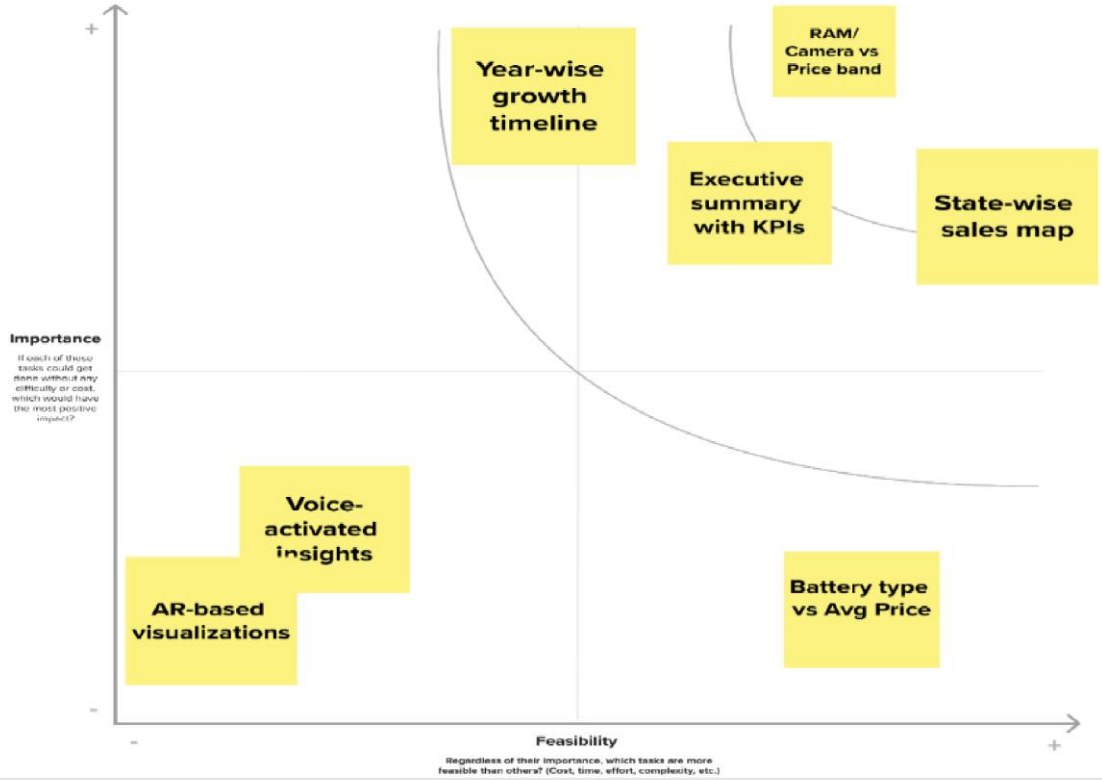
Step-3: Idea Prioritization

4

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



1. Customer Journey Map

This map represents how a product strategist or analyst interacts with the iRevolution dashboard from need to insight.

Stage	Need	Action	Touchpoint	Pain Point	Opportunity
Discover	Wants iPhone market trends	Searches Excel/market data	Emails, Files	Data is scattered	Single dashboard entry point
Explore	Needs regional & feature insights	Browses charts manually	Spreadsheets, BI tools	Time-consuming	Filter-enabled Tableau dashboard
Engage	Wants to compare specs vs pricing	Tries custom visualizations	Excel formulas	Lacks interactivity	Pre-built price/spec dashboard
Decide	Prepares pitch for leadership	Screenshots graphs	Presentations	Dry data storytelling	Use Tableau story points with captions

Project Design Phase-II
Solution Requirements (Functional & Non-functional)

Date	28 June 2025
Team ID	LTVIP2025TMID49452
Project Name	iRevolution: A Data -driven Exploration of Apple's iPhone Impact in India using Tableau
Maximum Marks	4 Marks

Functional Requirements:

Following are the functional requirements of the proposed solution.

FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	Interactive KPI Dashboard	Display revenue, units sold, active users, and discount percentage filtered by year and region.

FR-2	Model & Spec Analysis	Allows users to compare iPhone models based on features like display size, battery type, RAM, and camera.
FR-3	Quarterly Market Share Visualization	Displays brand-wise share in India across four quarters using donut and bar charts.
FR-4	Pricing Pattern Insights	Visualizes average price distribution and discount trends by feature and battery type.
FR-5	Geo-Map Representation	Shows Apple's regional performance across Indian states.
FR-6	Story-Based Dashboard Navigation	Sequential story view explaining Apple's performance journey with narrative captions.

Non-functional Requirements:

Following are the non-functional requirements of the proposed solution.

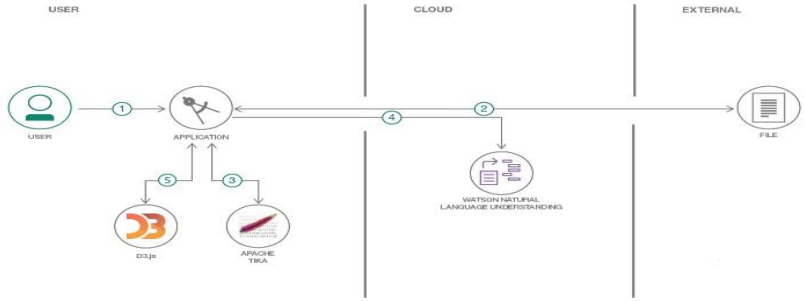
FR No.	Non-Functional Requirement	Description
NFR-1	**Usability**	Use a dark theme with eye-comfort colours and clear legends to reduce user-fatigue.
NFR-2	**Security**	Ensure calculations (KPIs, averages, comparisons) are correctly validated against source files.
NFR-3	**Responsiveness**	Dashboard layout should be usable on laptops and projectors during presentations.
NFR-4	**Performance**	The interface must be simple, readable, and require no technical background to explore.
NFR-5	**Availability**	Dashboards must load within 3-5 seconds even with filters applied.
NFR-6	**Scalability**	The framework should future data addition.

Project Design Phase-II Data Flow Diagram & User Stories

Data Flow Diagrams:

A Data Flow Diagram (DFD) is a traditional visual representation of the information flows within a system. A neat and clear DFD can depict the right amount of the system requirement graphically. It shows how data enters and leaves the system, what changes the information, and where data is stored.

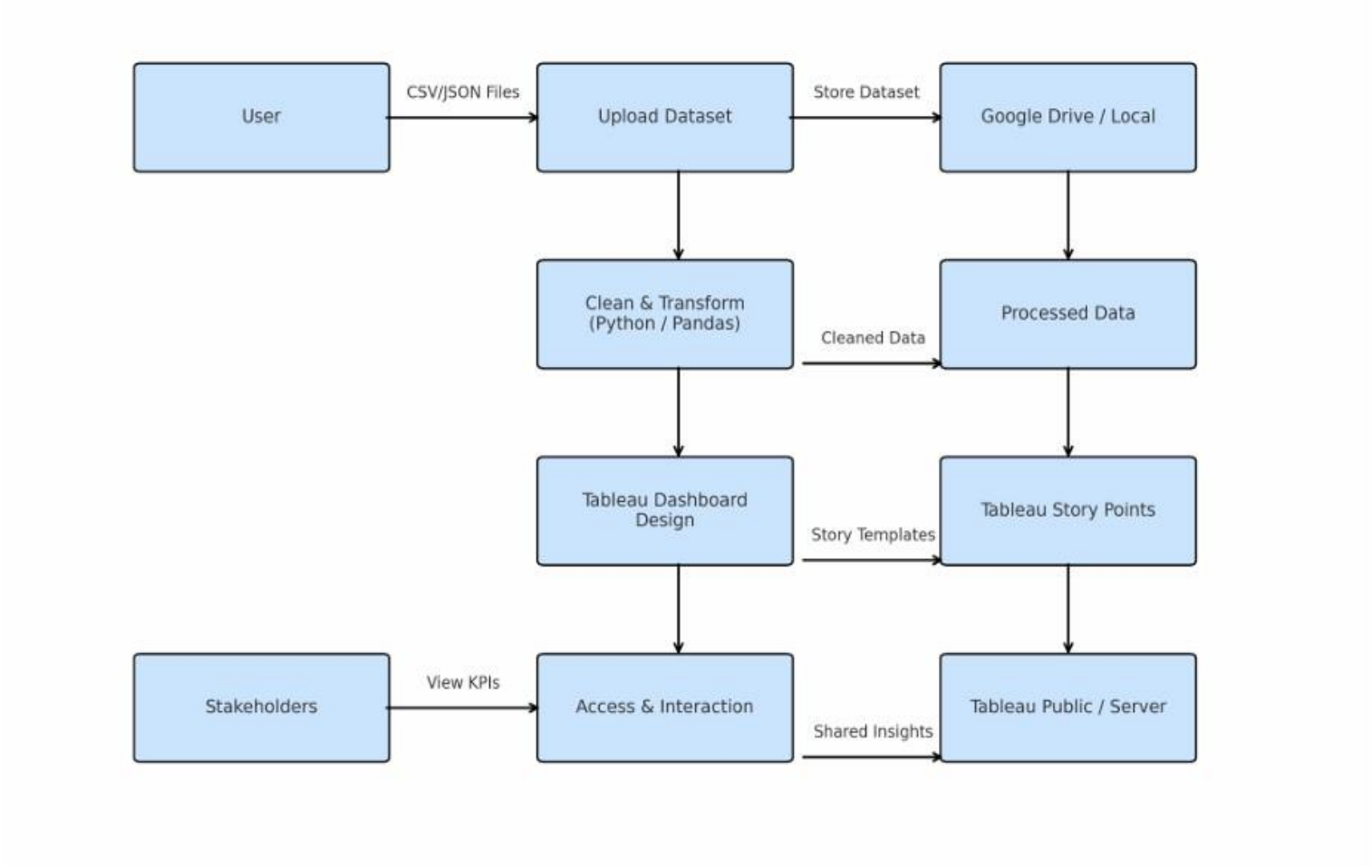
Flow



1. User configures credentials for the Watson Natural Language Understanding service and starts the app.
2. User selects data file to process and load.
3. Apache Tika extracts text from the data file.
4. Extracted text is passed to Watson NLU for enrichment.
5. Enriched data is visualized in the UI using the D3.js library.

Example:

DATA FLOW DIAGRAM



Project Design Phase-II Technology Stack (Architecture & Stack)

Technology Architecture:

The Deliverable shall include the architectural diagram as below and the information as per the table1 & table 2

Technology Stack :

Below is the technology stack used in the iRevolution Tableau Project

Component	Tool/Technology	Purpose
Data Source	CSV, JSON files	Raw smartphone sales and specs data
Visualization	Tableau Desktop	Creating interactive dashboards and stories
Storage	Google Drive / Local	Storing raw and processed datasets
Collaboration	Google Docs, Slack	Team communication and report writing

Table 1 : Components and Technology

S.No	Component	Description	Technology
1.	User Interface	How user interacts with application e.g. Web UI, Mobile App, Chatbot etc.	HTML, CSS, JavaScript / Angular Js / React Js etc.
2.	Application Logic-1	Logic for a process in the application	Java / Python
3.	Application Logic-2	Logic for a process in the application	IBM Watson STT service
4.	Application Logic-3	Logic for a process in the application	IBM Watson Assistant
5.	Database	Data Type, Configurations etc.	MySQL, NoSQL, etc.
6.	Cloud Database	Database Service on Cloud	IBM DB2, IBM Cloudant etc.
7.	File Storage	File storage requirements	IBM Block Storage or Other Storage Service or Local Filesystem
8.	External API-1	Purpose of External API used in the application	IBM Weather API, etc.
9.	External API-2	Purpose of External API used in the application	Aadhar API, etc.
10.	Machine Learning Model	Purpose of Machine Learning Model	Object Recognition Model, etc.
11.	Infrastructure (Server / Cloud)	Application Deployment on Local System / Cloud Local Server Configuration: Cloud Server Configuration :	Local, Cloud Foundry, Kubernetes, etc.

Table-2: Application Characteristics:

S.No	Characteristics	Description	Technology
1.	Open-Source Frameworks	List the open-source frameworks used	Technology of Opensource framework
2.	Security Implementations	List all the security / access controls implemented, use of firewalls etc.	e.g. SHA-256, Encryptions, IAM Controls, OWASP etc.
3.	Scalable Architecture	Justify the scalability of architecture (3 – tier, Micro-services)	Technology used
4.	Availability	Justify the availability of application (e.g. use of load balancers, distributed servers etc.)	Technology used
S.No	**Characteristics**	**Description**	**Technology**

5.	Performance	Design consideration for the performance of the application (number of requests per sec, use of Cache, use of CDN's) etc.	Technology used

Project Design Phase

Problem – Solution Fit Template

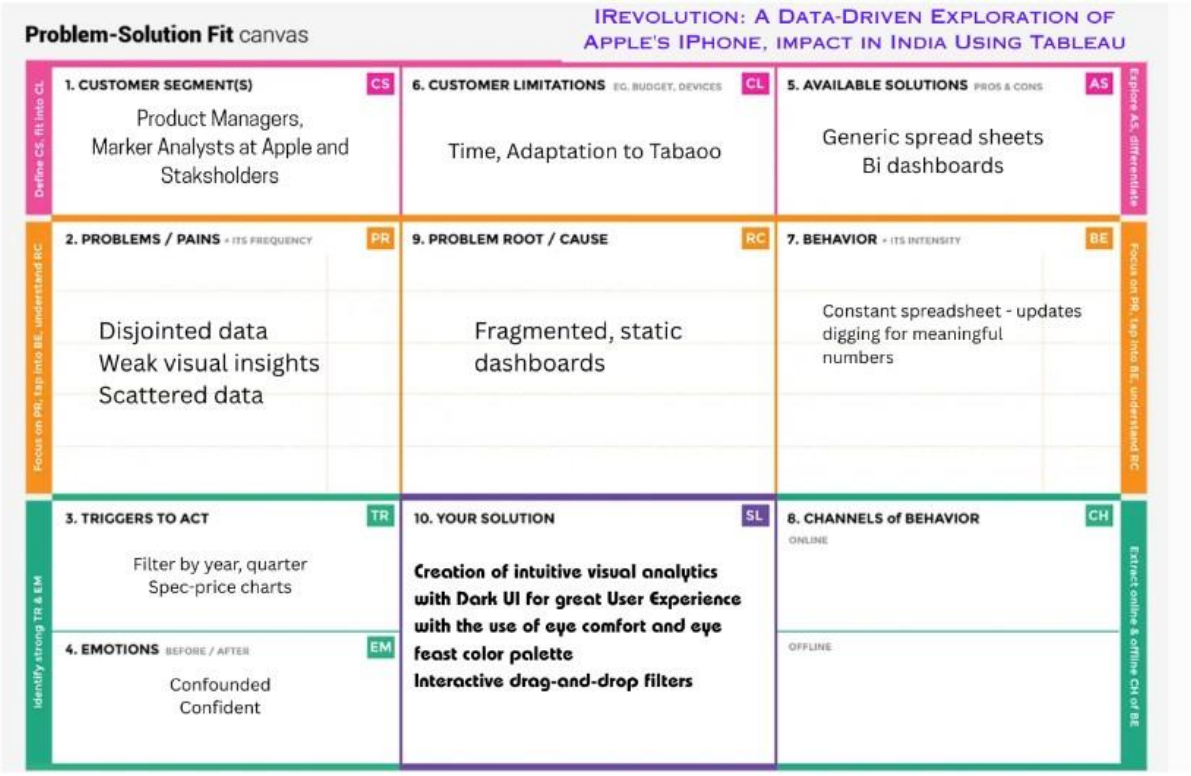
Problem – Solution Fit Template:

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.**

Template:



Project Design Phase

Proposed Solution Template

Proposed Solution Template:

Project team shall fill the following information in the proposed solution template.

S.No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	Apple and its stakeholder lack a centralized, interactive, and story-driven way to understand iPhone's feature-wise, region-wise, and pricewise impact in India.
2.	Idea / Solution description	Creation of intuitive visual analytics with Dark UI for great User experience with the use of eye comfort and eye feast colour palette.
3.	Novelty / Uniqueness	Instead of traditional static reports, this solution uses story-driven dashboard with realtime interactivity. The dark UI is thoughtfully chosen reduce eye strain and improve focus.
4.	Social Impact / Customer Satisfaction	Helps product and marketing teams make better decisions that align with consumer needs, especially in varied Indian markets.
5.	Business Model (Revenue Model)	This solution can be packaged as a subscriptionbased internal tool or consultancy model where other OEMS or market agencies can adopt the dashboard framework tailored to their brand data.
6.	Scalability of the Solution	The dashboard framework is scalable to other countries, brands, or product categories. Only the dataset and labels need to be updated-the core logic and layout remain reusable across contexts.

Project Design Phase

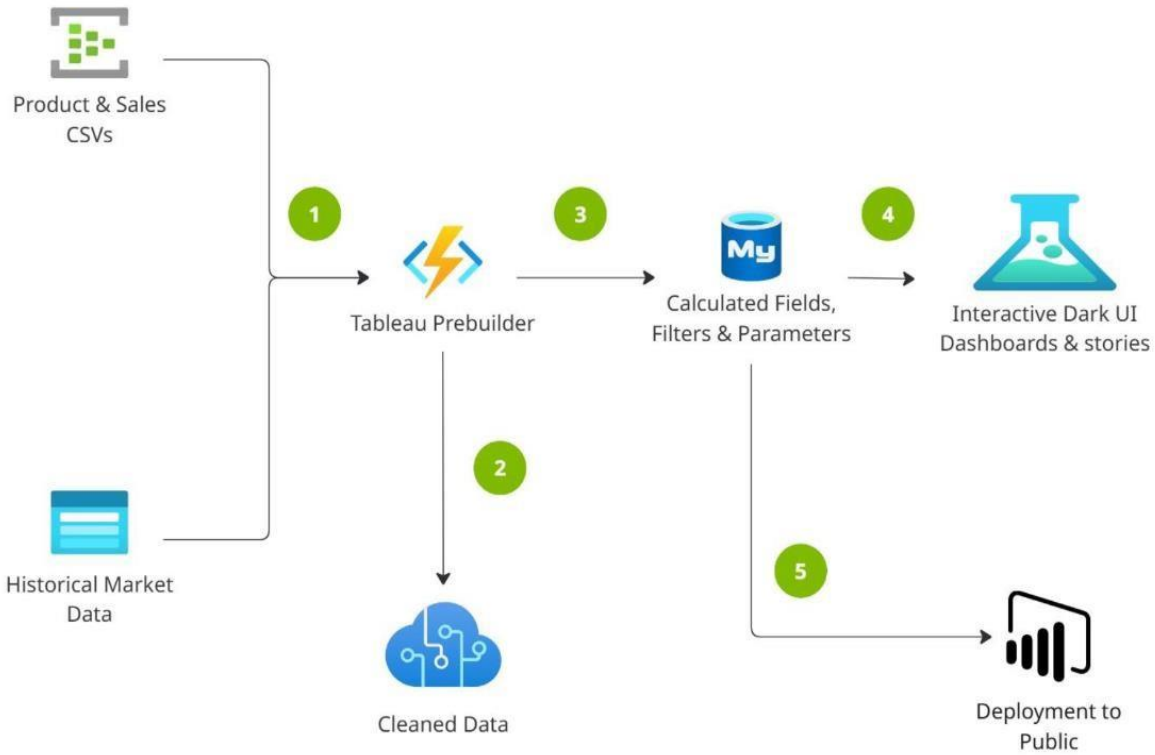
Solution Architecture

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, behaviour, 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:



Project Planning Phase

Project Planning Template (Product Backlog, Sprint Planning, Stories, Story points)

Product Backlog, Sprint Schedule, and Estimation (4 Marks)

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 Collection	USN-2	As a user, I can load data into preprocessing 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 variable appropriately	2	Medium	All
Sprint-3	Making Graphics/Visualization	USN-5	As a user, I can build the initial model based on processed data	5	High	All
Sprint-4	Dashboards& stories	USN-6	Dark UI eye feasted colour palette	6	High	All
Sprint-5	Report &documentation	USN-7	The step by step guide documentation	7	Medium	All

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

Sprint	Total Story Points	Duration	Sprint Start Date	Sprint End Date (Planned)	Story Points Completed (as on Planned End Date)	Sprint Release Date (Actual)

Sprint-1	20	1 Day	21 June 2025	21 June 2025	20	21 June 2025
Sprint-2	20	1 Day	22 June 2025	22 June 2025	20	22 June 2025
Sprint-3	20	1 Day	23 June 2025	23 June 2025	20	23 June 2025
Sprint-4	20	1 Day	24 June 2025	24 June 2025	20	24 June 2025
Sprint-5	20	1 Day	25 June 2025	25 June 2025	20	25June 2025

Project Development Phase Model Performance Test

Model Performance Testing:

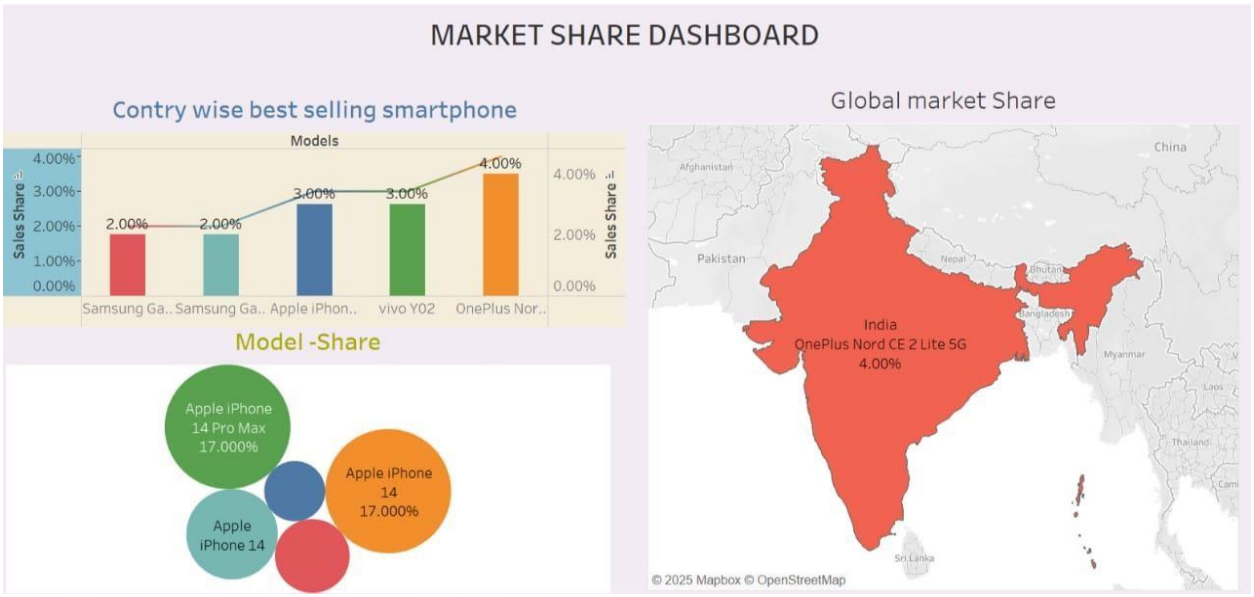
Project team shall fill the following information in model performance testing template.

S.No.	Parameter	Screenshot / Values
1.	Data Rendered	Rendered from cleaned CSV files with Apple iPhone specs, regional sales, quarterly performance, etc. Loaded 1,000+ rows
2.	Data Preprocessing	Null values handled, feature mapping applied for battery type, display size, model grouping, and quarter classification
3.	Utilization of Filters	Applied Tableau filters for brand, region, year, battery type, display size, RAM, and Quarter, Response under 3 seconds
4.	Calculation fields Used	-Average Price by Spec -Discount Percentage -Revenue Trends by Year -Brand-wise Quarterly Share -KPI Metrics
5.	Dashboard design	No of Visualizations / Graphs -4 Dashboards
6	Story Design	No of Visualizations / Graphs -2 Stories with 4 story points each

RESULTS:

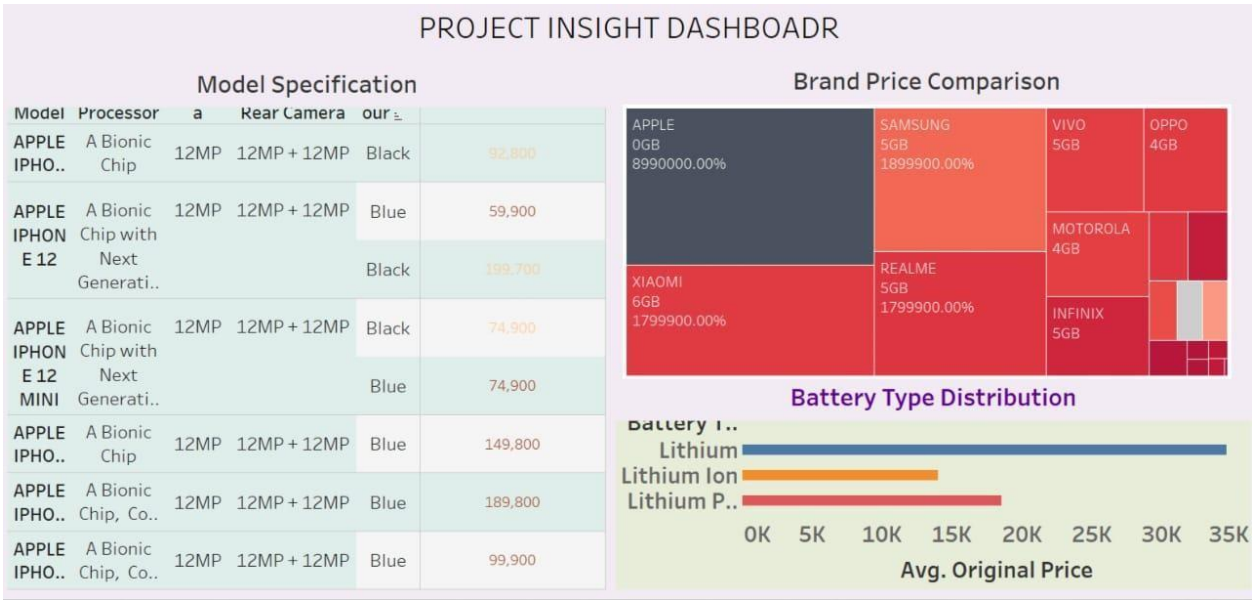
Outputs Screenshots DASHBOARDS:

DASHBOARD 1



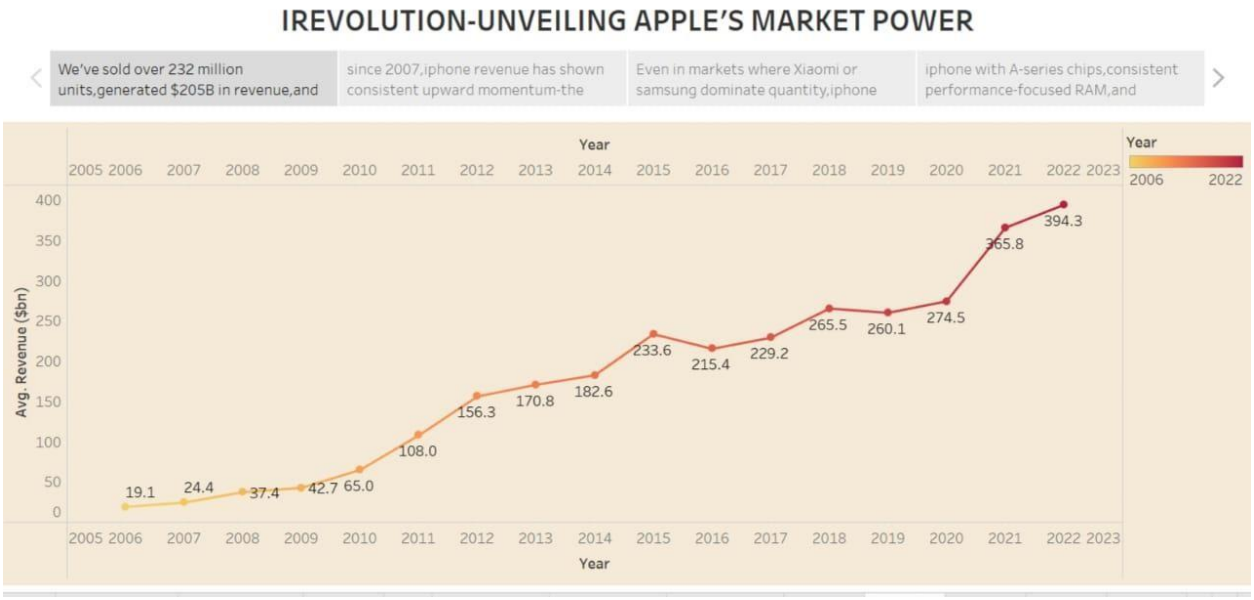
DASHBOARDS 2:

DASHBOARD 3:

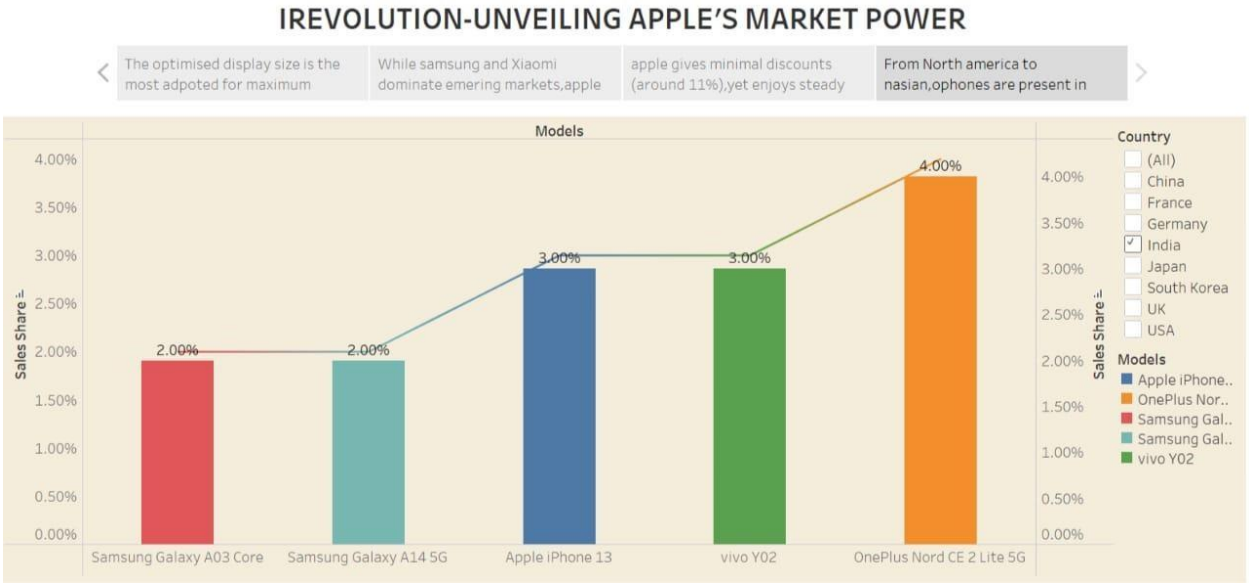

PROJECT INSIGHT DASHBOADR
Model Specification
Model
Processor
a
Rear Camera
our
APPLE IPHO..
A Bionic Chip
12MP
12MP + 12MP
Black
92,800
APPLE IPHON E 12
A Bionic Chip with Next Generati..
12MP
12MP + 12MP
Blue
59,900
Black
199,700
APPLE IPHON E 12 MINI
A Bionic Chip with Next Generati..
12MP
12MP + 12MP
Black
74,900
Blue
74,900
APPLE IPHO..
A Bionic Chip
12MP
12MP + 12MP
Blue
149,800
APPLE IPHO..
A Bionic Chip, Co..
12MP
12MP + 12MP
Blue
189,800
APPLE IPHO..
A Bionic Chip, Co..
12MP
12MP + 12MP
Blue
99,900
Brand Price Comparison
APPLE
0GB
8990000.00%
SAMSUNG
5GB
1899900.00%
VIVO
5GB
OPPO
4GB
MOTOROLA
4GB
XIAOMI
6GB
1799900.00%
REALME
5GB
1799900.00%
INFINIX
5GB
Battery Type Distribution
Lithium
Lithium Ion
Lithium P..
0K
5K
10K
15K
20K
25K
30K
35K
Avg. Original Price

STORY OUTPUTS:

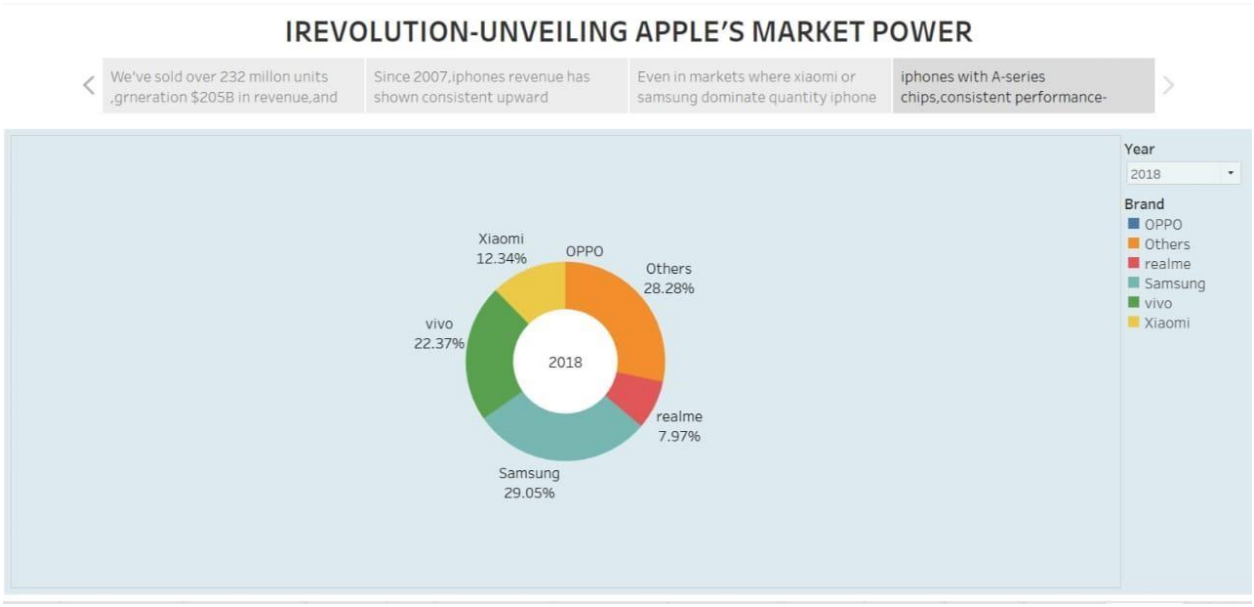
STORY 1



STORY 2:


IREVOLUTION-UNVEILING APPLE'S MARKET POWER
The optimised display size is the most adpoted for maximum
While samsung and Xiaomi dominate emering markets,apple
apple gives minimal discounts (around 11%),yet enjoys steady
From North america to nasian,ophones are present in
Models
Sales Share
4.00%
3.50%
3.00%
2.50%
2.00%
1.50%
1.00%
0.50%
0.00%
2.00%
2.00%
3.00%
3.00%
4.00%
Samsung Galaxy A03 Core
Samsung Galaxy A14 5G
Apple iPhone 13
vivo Y02
OnePlus Nord CE 2 Lite 5G
Country
(All)
China
France
Germany
India
Japan
South Korea
UK
USA
Models
Apple iPhone..
OnePlus Nor..
Samsung Gal..
Samsung Gal..
vivo Y02

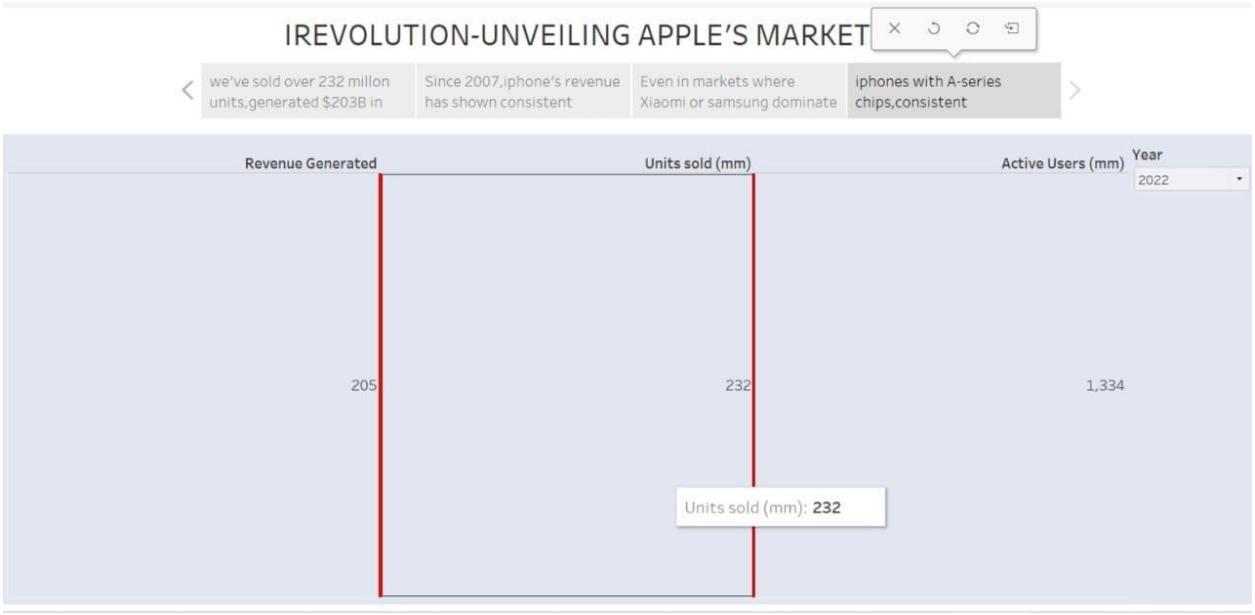
STORY 3:


IREVOLUTION-UNVEILING APPLE'S MARKET POWER
We've sold over 232 millon units ,grneration $205B in revenue,and
Since 2007,iphones revenue has shown consistent upward
Even in markets where xiaomi or samsung dominate quantity iphone
iphones with A-series chips,consistent performance-
Year
2018
Brand
OPPO
Others
realme
Samsung
vivo
Xiaomi
Xiaomi 12.34%
OPPO
Others 28.28%
vivo 22.37%
2018
realme 7.97%
Samsung 29.05%

STORY 4:


IREVOLUTION-UNVLING APPLE"S MARKET POWER
The optimised display size is the most adopted for maximum
While samsung and xiaomi dominate emerging markets,apple commands
Apple gives minimal discounts(around 11%),yet enjoys
From north american to aisan ,iphone are present in nearly every
China
Iraq
Iran
Afghanistan
Pakistan
Nepal
Bhutan
Bangladesh
Saudi Arabia
United Arab Emirates
Oman
Yemen
Myanmar
Viet Nam
Laos
Thailand
Cambodia
Taiwan
Philippines
Sri Lanka
India
OnePlus Nord CE 2 Lite 5G
4.00%
© 2025 Mapbox © OpenStreetMap
Country
India
Country
India

STORY 5:


IREVOLUTION-UNVEILING APPLE'S MARKET
we've sold over 232 millon units,generated $203B in
Since 2007,iphone's revenue has shown consistent
Even in markets where Xiaomi or samsung dominate
iphones with A-series chips,consistent
Revenue Generated
Units sold (mm)
Active Users (mm)
Year
2022
205
232
1,334
Units sold (mm): 232

PROJECT REPORT

Team ID: : LTVIP2025TMID49452

7. ADVANTAGES & DISADVANTAGES

- **ADVANTAGES**:

- **Data-Backed Decision Making**
  Provides reliable, quantitative insights into iPhone trends, helping businesses and analysts make informed decisions based on real-world data rather than assumptions.

- **Trend Identification**
  Detects patterns in product launches, feature evolution, pricing, and consumer response—revealing how Apple's strategies have changed over time.

- **Innovation Mapping**
  Highlights key innovations (e.g., Face ID, Retina Display, 5G) and their measurable impact on sales, user satisfaction, and market share.

- **Consumer Insight**
  Analyzes user reviews and social media sentiment to better understand consumer needs, pain points, and preferences across different iPhone generations.

- **Global Market Understanding**
  Breaks down regional sales and adoption rates, showing how the iPhone performs in different markets (e.g., North America vs. Asia).

- **Competitive Benchmarking**
  Compares iPhone data with competitors to reveal Apple's market positioning and how it maintains its brand dominance.

- **DISADVANTAGES**:

- **Limited Data Availability**
  Access to proprietary Apple data (e.g., internal metrics, detailed customer analytics) is restricted, which may limit the depth of analysis.
- **Data Reliability Issues**
  Publicly sourced data (e.g., from third-party websites, user reviews, or social media) may be incomplete, outdated, or biased.
- **Complexity of Data Integration**
  Combining diverse datasets (sales, specs, sentiment, innovation timelines) from different formats and sources can be time-consuming and error-prone.
- **Sentiment Analysis Limitations**
  Natural Language Processing (NLP) tools may misinterpret sarcasm, slang, or multilingual reviews, leading to inaccurate sentiment classification.

PROJECT REPORT

8. CONCLUSION

The **iRevolution** project presents a comprehensive, data-driven narrative of Apple's iPhone journey—one of the most transformative product stories in modern technology. By integrating data analytics, visualization, and sentiment analysis, the project reveals how Apple strategically shaped the smartphone industry through continuous innovation, targeted marketing, and a deep understanding of user behavior.

Through exploring sales trends, feature evolution, consumer sentiment, and market dynamics, the project not only highlights Apple's success story but also showcases the power of **data science as a storytelling and decision-making tool**. Despite certain limitations in data access and sentiment interpretation, the findings offer valuable insights for **business strategists, technologists, educators, and researchers**.

9. FUTURE SCOPE

- Expansion to Other Apple Products
- Predictive Analytics & Forecasting.