GOVERNMENT OF TAMILNADU

Naan Muthalvan - Project-Based Experiential Learning

iRevolution: A Data-Driven Exploration of Apple's iPhone Impact in India

Submitted by

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Under the guidance of

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Guest Lecturer

PG and Research Department of Mathematics

M.V.MUTHIAH GOVERNMENT ARTS COLLEGE FOR WOMEN

(Affiliated To Mother Teresa Women's University, Kodaikanal)
Reaccredited with "A" Grade by NAAC
DINDIGUL-624001.

NOVEMBER - 2023

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PG & RESEARCH DEPARTMENT OF MATHEMATICS

BONAFIDE CERTIFICATE

This is to certify that this is a bonafide record of the project entitled, **"iREVOLUTION : A DATA DRIVE EXPLORATION APPLE IPHONE IMPACT IN INDIA** " done **by Ms. D. MARIA MEDONA- (21321ER049) , Mrs. S. LINO- (21321ER046), Ms. P. LOGALAKSHMI - (21321ER047) and Ms. R. MATHUMITHA - (21321ER048)**. This is submitted in partial fulfillment for the award of the degree of **Bachelor of Science in Mathematics in M.V.MUTHIAH GOVERNMENT ARTS COLLEGE FOR WOMEN,DINDIGUL** during the period of June 2023 to November 2023.

Project Mentor(s) **Head of the Department**

CONTENT

1.INTRODUCTION

The world has changed as a consequence of the increasing use of smartphones, which have improved communication, connected people, and revolutionized many different businesses. With its main product, the iPhone, capturing markets around the world, Apple Inc. has emerged as a prominent player among the top smartphone makers. India, one of the economies with the greatest economic growth, has seen a tremendous increase in smartphone usage, making it an interesting market to study the effects of Apple's iPhone.

In order to shed light on important factors like market penetration, customer preferences, economic ramifications, and societal changes, this research report will perform a datadriven investigation of the impact of the iPhone in India. This study will offer invaluable insights into the transformative impact of the iPhone on India's technological landscape and the lives of its consumers by using advanced data analytics techniques and analyzing large datasets.

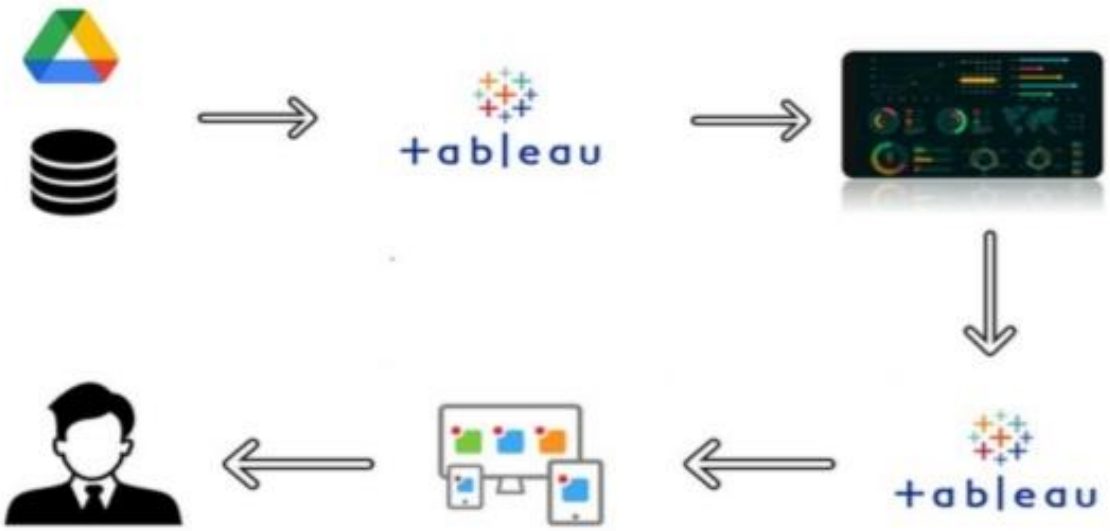
Apple has a special chance to increase its market share and develop a significant presence in India thanks to the country's large population and rising smartphone adoption. Each new iPhone model unveiling generates excitement and anticipation among Indian buyers. By utilizing the plethora of information Already accessible, this research aims to go beyond conjecture and anecdotal evidence in order to develop a thorough knowledge of the effects of the iPhone.

2.TECHNICAL ARCHITECTURE:

The technical architecture involves leveraging the data analytics capabilities of Tableau for visualizations and analysis. The architecture comprises several components to ensure efficient data processing and visualization.

At the core of the architecture is the data infrastructure, which includes data sources such as market reports, economic indicators, and surveys conducted among iPhone users in India. These data sources are collected and stored in a structured format for further analysis. Tableau is used as the primary data visualization tool. It connects to the data sources and allows for data

extraction, transformation, and loading (ETL) processes. Tableau's intuitive interface enables users to create interactive and visually appealing visualizations, charts, and dashboards based On the analyzed data



3. PROJECT FLOW

To accomplish this, we have to complete all the activities listed below

1.Define Problem / Problem Understanding

- Specify the business problem
- Business requirements
- Literature Survey

2. Data Collection & Extraction

- ❖ Collect the dataset
- ❖ Connect Dataset with Tableau

3. Data Preparation

- ❖ Prepare the Data for Visualization

4. Data Visualizations

- ❖ No of Unique Visualizations

5. Dashboard

- ❖ Responsive and Design of Dashboard

6. Story

- ❖ No of Scenes of Story

7. Performance Testing

- ❖ Utilization of Data Filters
- ❖ No of Calculation Fields
- ❖ No of Visualizations/ Graphs

8. Publishing

- ❖ Publishing Dashboard and Story to Tableau Public

9. Project Demonstration & Documentation

- ❖ Record explanation Video for project end to end solution
- ❖ Project Documentation-Step by step project development procedure

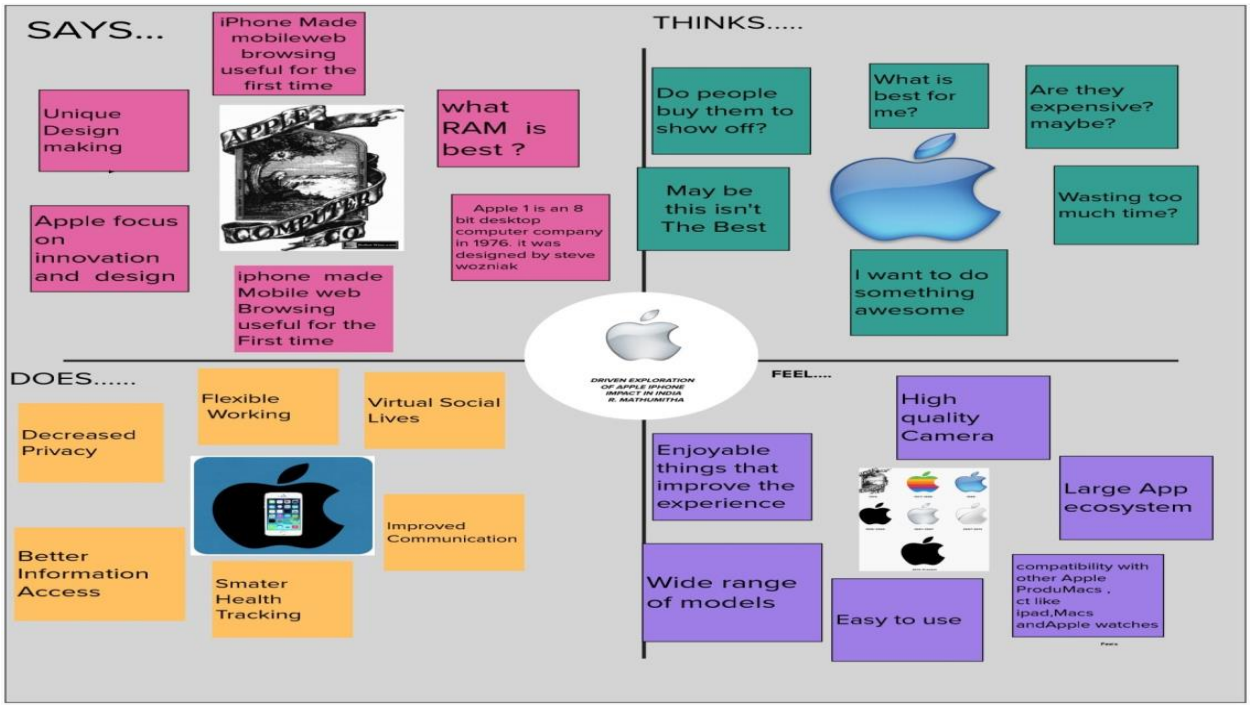
4. DEFINE PROBLEM PROBLEM UNDERSTANDING

Activity 1: Specify the Business Problem

The objective of this study is to obtain a thorough understanding of how Apple's iPhone would affect the Indian market. In particular, we want to investigate the market penetration of iPhones in India, comprehend consumer preferences and decision-making processes, and assess the social and economic effects of iPhone adoption. We aim to offer insights that can direct strategic decisions for Apple and other stakeholders active in the Indian smartphone industry by leveraging data analytics and visualization using Tableau.

Activity 1.1: Empathy Map

An empathy map is tool used in design thinking to build an emotional representation of a user or the customer.

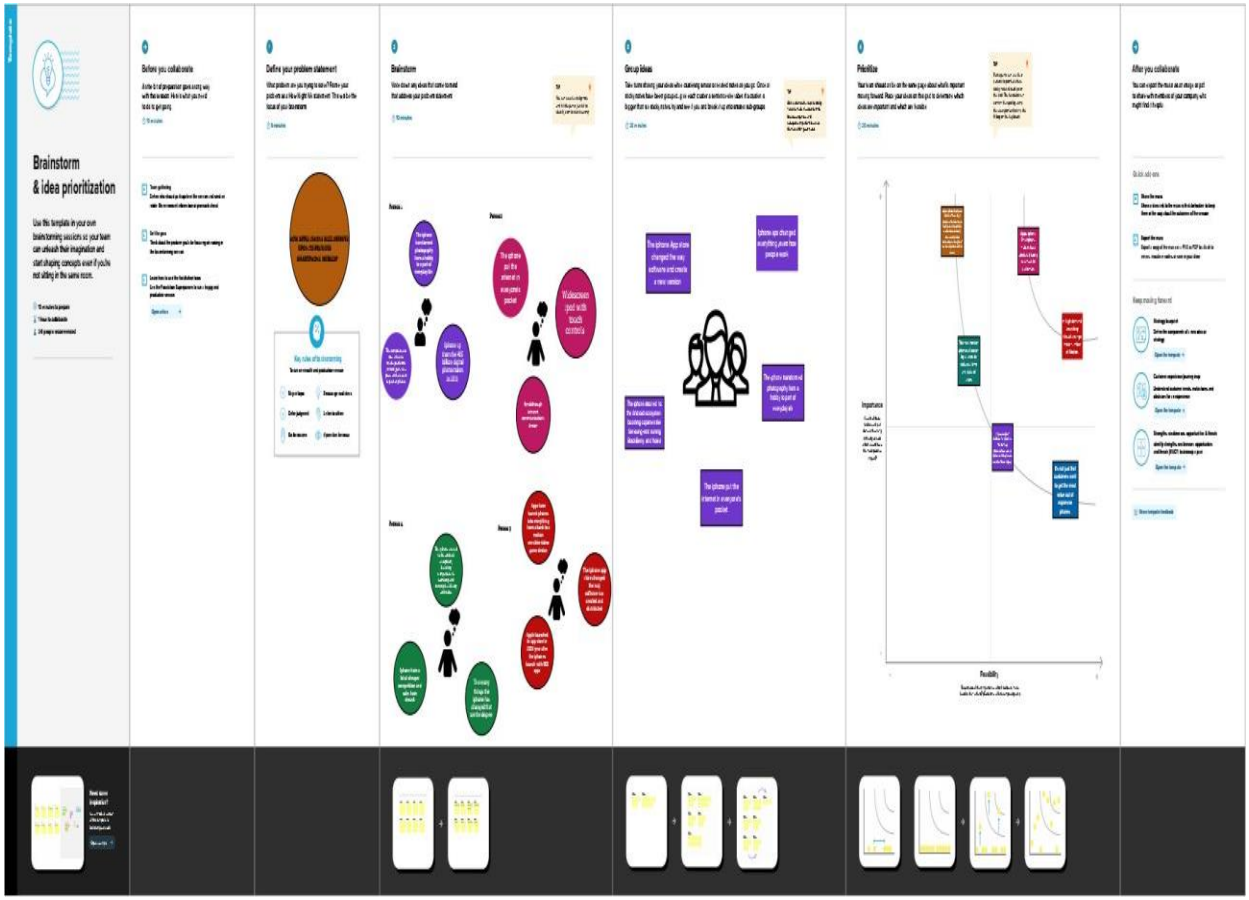


Activity 1.2 : Brain storming

- People able to think more freely and move into new areasof thoughtand create new numerous ideas and solutions.
- Brain storming is a group problem solving method that involves the spontaneous contribution of creative ideas and solutions.
- Brain storming is a group activity where each participant shares their ideas as soon as they come to mind

TYPES OF BRAINSTORMING

- Individual brainstorming
- Group brainstorming



Activity 2: Business Requirements

The project's business needs call for data analysis and visualization in order to understand how Apple's iPhone has affected India. This entails looking at customer choices, market penetration, sociological developments, and economic effects. Tableau visualizations should be interactive, understandable, and educational so that stakeholders can make data-driven decisions and comprehend the impact of the iPhone on the Indian market.

Activity 3: Literature Survey

A literature survey would involve a search for relevant publications, articles, and academic papers on the topic, as well as an analysis of the various techniques, models, and algorithms used in previous research. The literature survey would also involve identifying gaps in existing research and potential areas for further exploration and improvement.

Activity 4: Social or Business Impact.

Social Impact:

An important component of this study is the societal impact of Apple's iPhone in India. We intend to investigate how the iPhone has altered communication, information access, and social relationships in Indian society through data analytics and Tableau visualizations. Studying the impact of iPhones on social media use, online content consumption, and the broader digital divide are all included in this. Policymakers and organizations can better manage the benefits and difficulties brought on by the expanding smartphone adoption by understanding the social impact.

Business Impact:

Research must focus on how Apple's iPhone has affected business in India. We seek to examine the economic effects of iPhone uptake in the Indian market using data analytics and Tableau visualizations. Examining iPhone sales data, market share, revenue creation, and its

effects on different industries like e-commerce, app development, and digital payments are all part of this. Organizations can find possibilities for growth and innovation by understanding the business impact and using it to help them position themselves in their markets and make strategic decisions.

5. DATA COLLECTION & PREPARATION

Data collection is the process of gathering and measuring information on variables of interest, in an established systematic fashion that enables one to answer stated research questions, test hypotheses, and evaluate outcomes and generate insights from the data.

Activity 1: Collect the dataset

Please use the link to download the dataset:

https://docs.google.com/spreadsheets/d/1p1ZWaYcEuFl5UNFcmNvpkXi3JnoHamut/edit?usp=sharing&ouid=113247709954189786236&rtpof=true&sd=true

Activity 1.1: Understand the data

Data contains all the meta information regarding the columns described in the CSV files. We have provided the XLSX file:

Column Description for BigML_Dataset.csv:

The file apple_products.xlsx contains a total of 7 sheets. Each sheet corresponds to a different parameter related to iPhones/Smartphones.

You can access sheet commands on the right-click menu in the worksheet, sheet sorter or the film strip view.

The sheets are:

- apple_products.csv
- Flipcart_Smartphone
- Annual revenue
- Market penetration (iPhone)
- Country wise share
- Quarterly-share
- Model-wise share

Activity 2: Connect Datasets with Tableau

Tableau for students:

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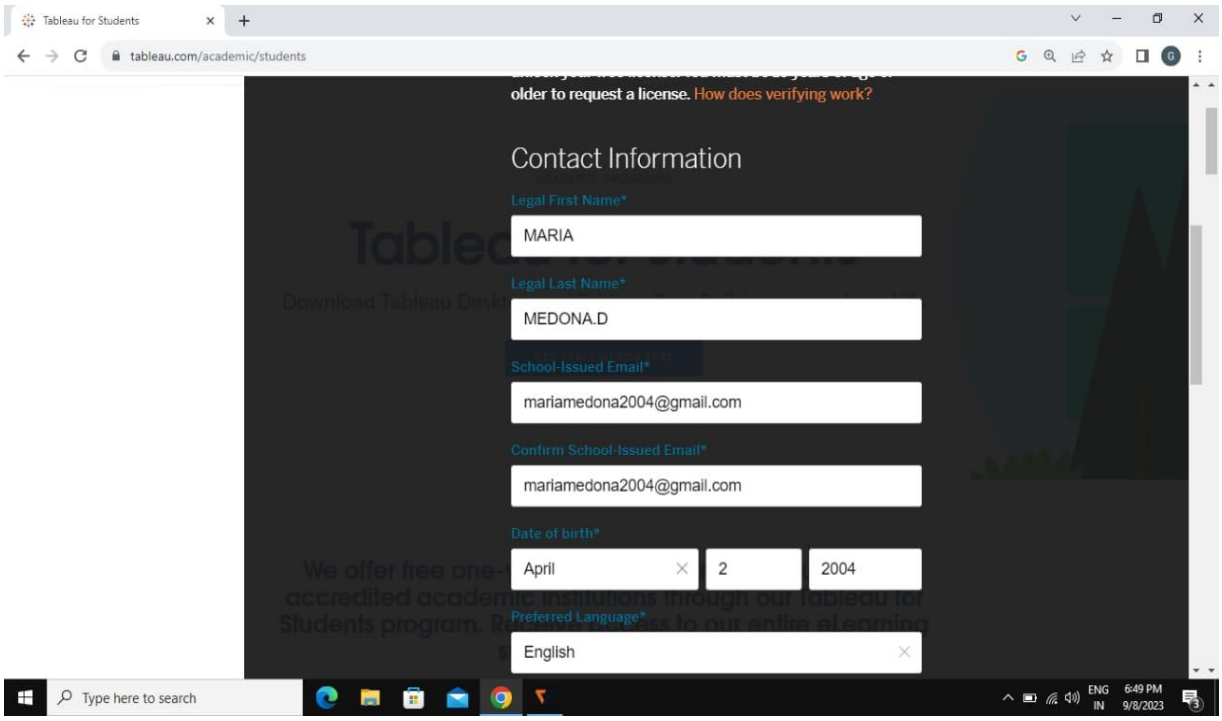
Step 2: Goto products.

Step 3: In products Goto tableau Desktop.

Step 4: Click on start a free trail.

Step 5: Goto tableau.

Step 6: Activate with product key.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Confirm School-Issued Email*
mariamedona2004@gmail.com
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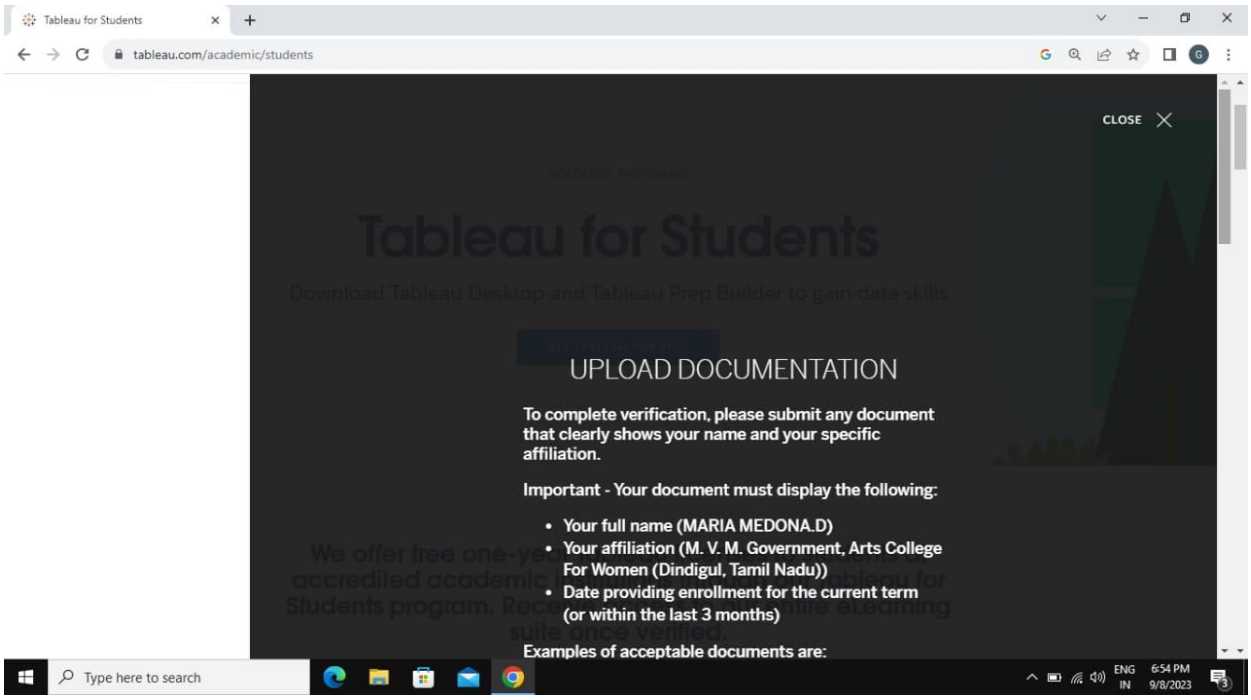
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UPLOAD DOCUMENTATION
To complete verification, please submit any document that clearly shows your name and your specific affiliation.
Important - Your document must display the following:
Your full name (MARIA MEDONA.D)
Your affiliation (M. V. M. Government, Arts College For Women (Dindigul, Tamil Nadu))
Date providing enrollment for the current term (or within the last 3 months)
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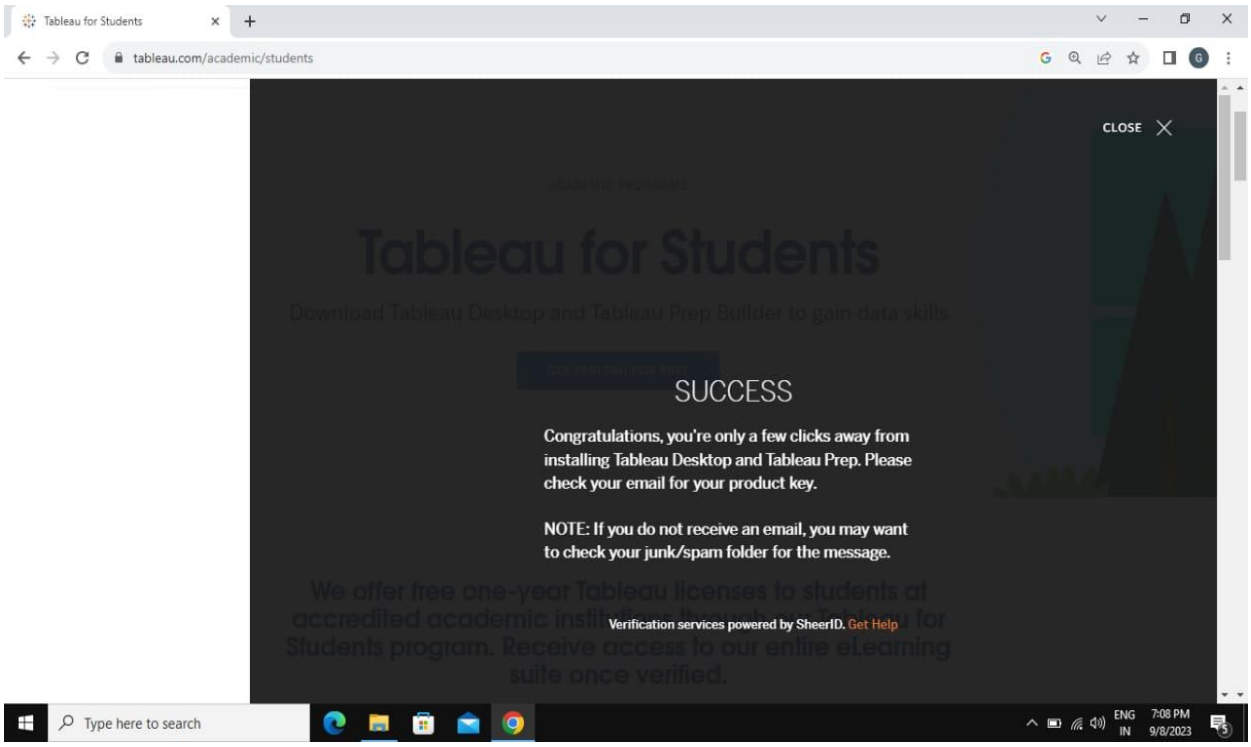
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NOTE: If you do not receive an email, you may want to check your junk/spam folder for the message.
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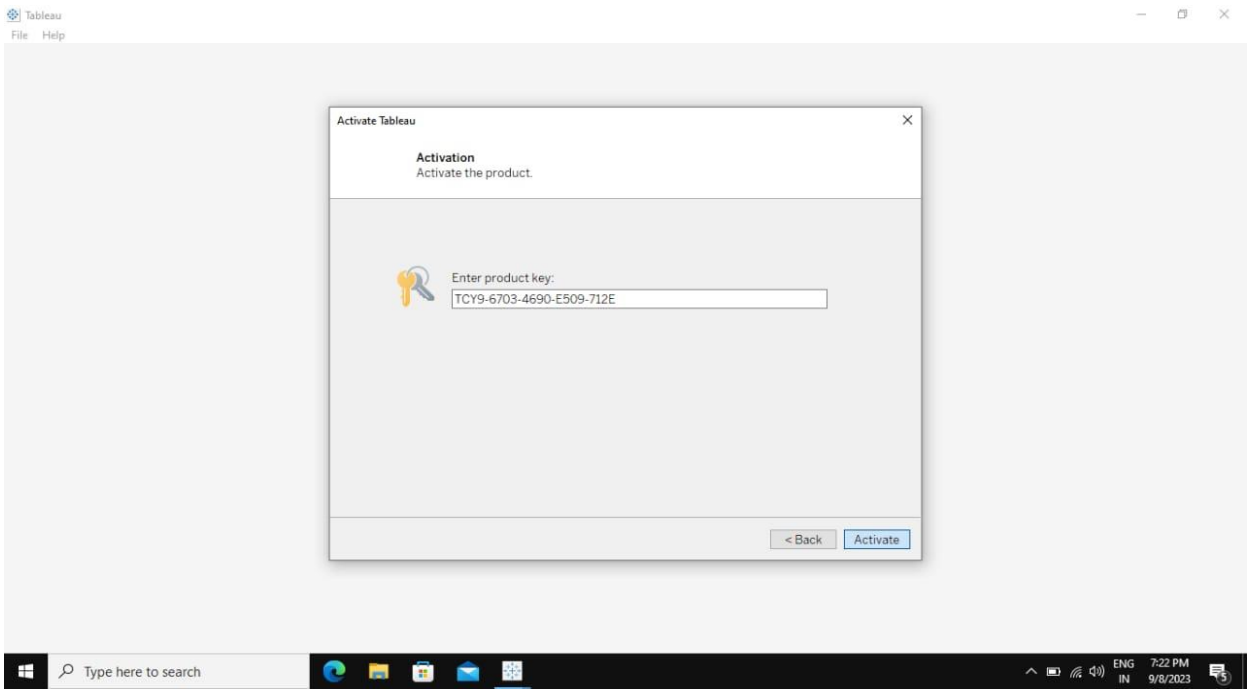
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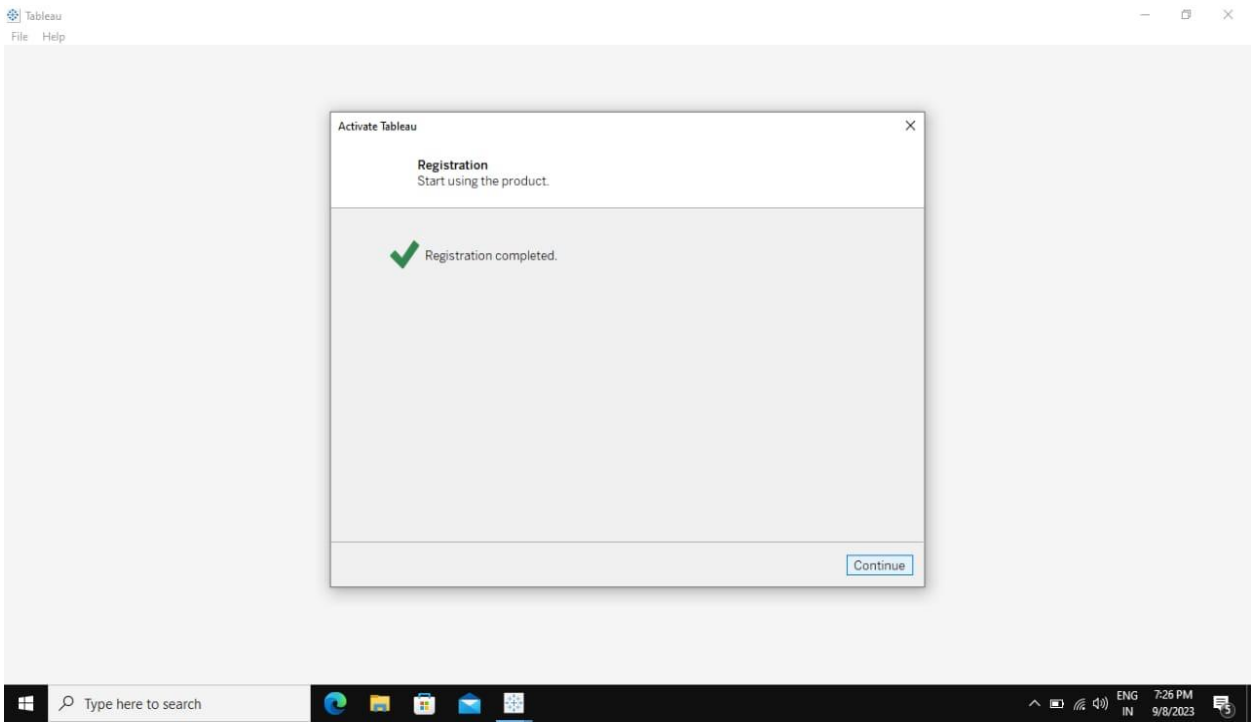
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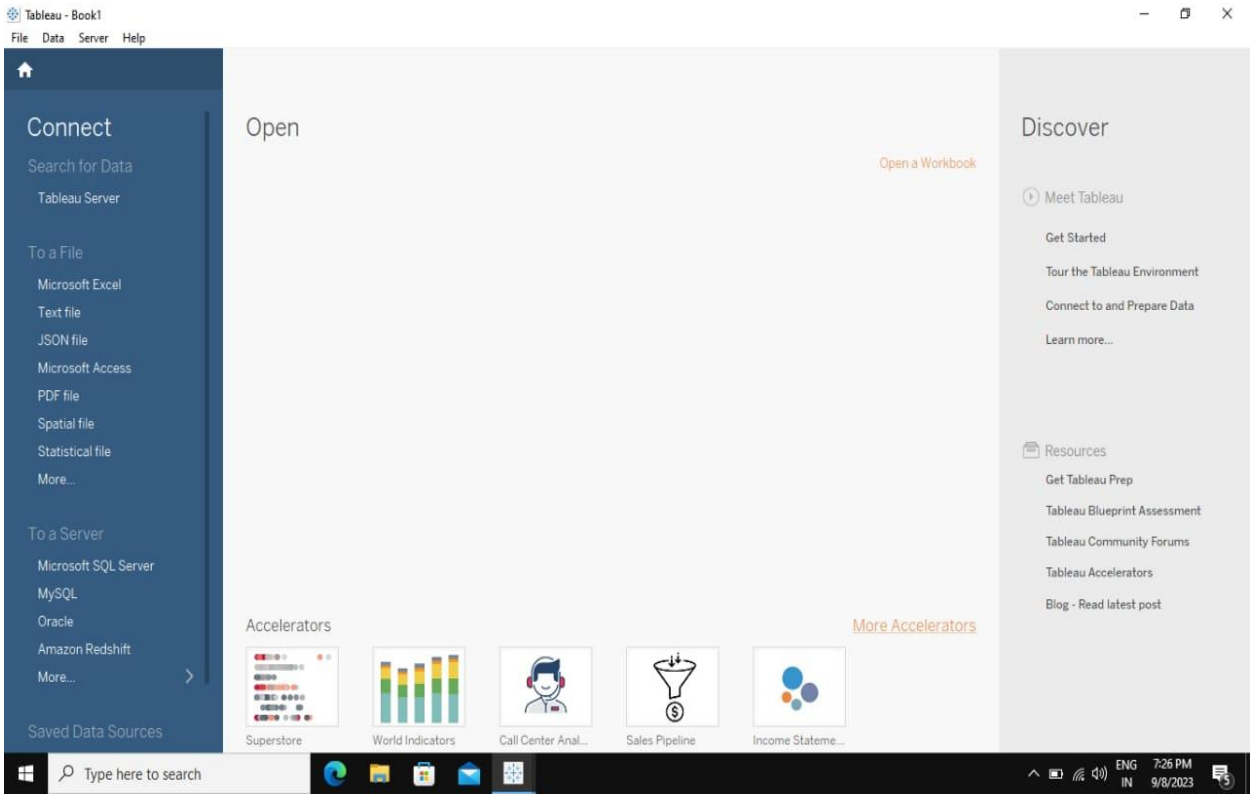
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File Data Server Help
Connect
Search for Data
Tableau Server
To a File
Microsoft Excel
Text file
JSON file
Microsoft Access
PDF file
Spatial file
Statistical file
More...
To a Server
Microsoft SQL Server
MySQL
Oracle
Amazon Redshift
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Saved Data Sources
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Accelerators
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Discover
Meet Tableau
Get Started
Tour the Tableau Environment
Connect to and Prepare Data
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Tableau Blueprint Assessment
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6. DATA PREPARATION

Activity 1: Prepare the Data for Visualization

Data modules are containers that describe data and rules for combining and shaping data to prepare it for analysis and visualization in Tableau. Data module sources. Data modules can be based on data servers, packages, uploaded files, data sets, and other data modules.

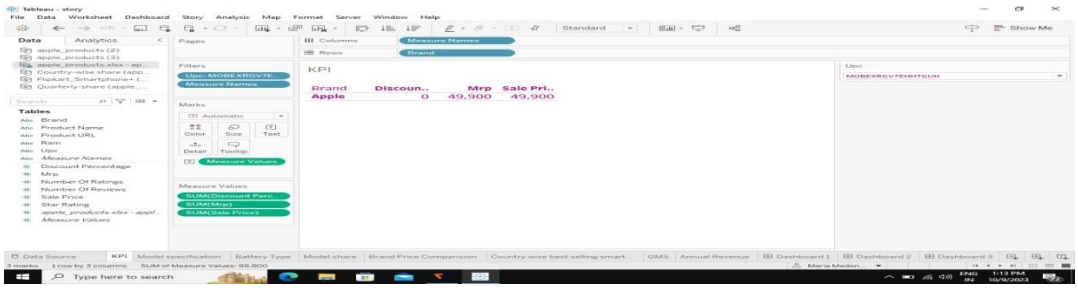
7. DATA VISUALZATION

Data visualization is the process of creating graphical representations of data in order to help people understand and explore the information. The goal of data visualization is to make complex data sets more accessible, intuitive, and easier to interpret. By using visual elements such as charts, graphs, and maps, data visualizations can help people quickly identify patterns, trends, and outliers in the data.

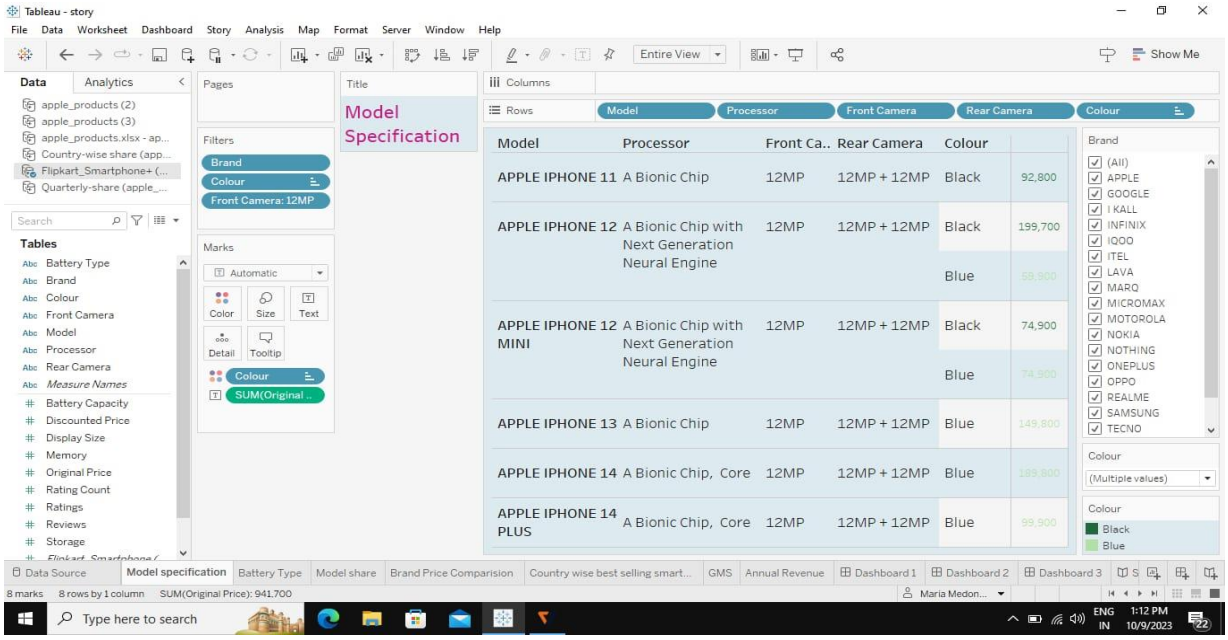
Activity 1: No of Unique Visualizations

The number of unique visualizations that can be created with a given dataset. Some common types of visualizations that can be used to analyze the performance and efficiency of a project include bar charts, line charts, heat maps, scatter plots, pie charts, Maps, etc. These visualizations can be used to compare performance, track changes over time, and show distribution, and relationships between variables.

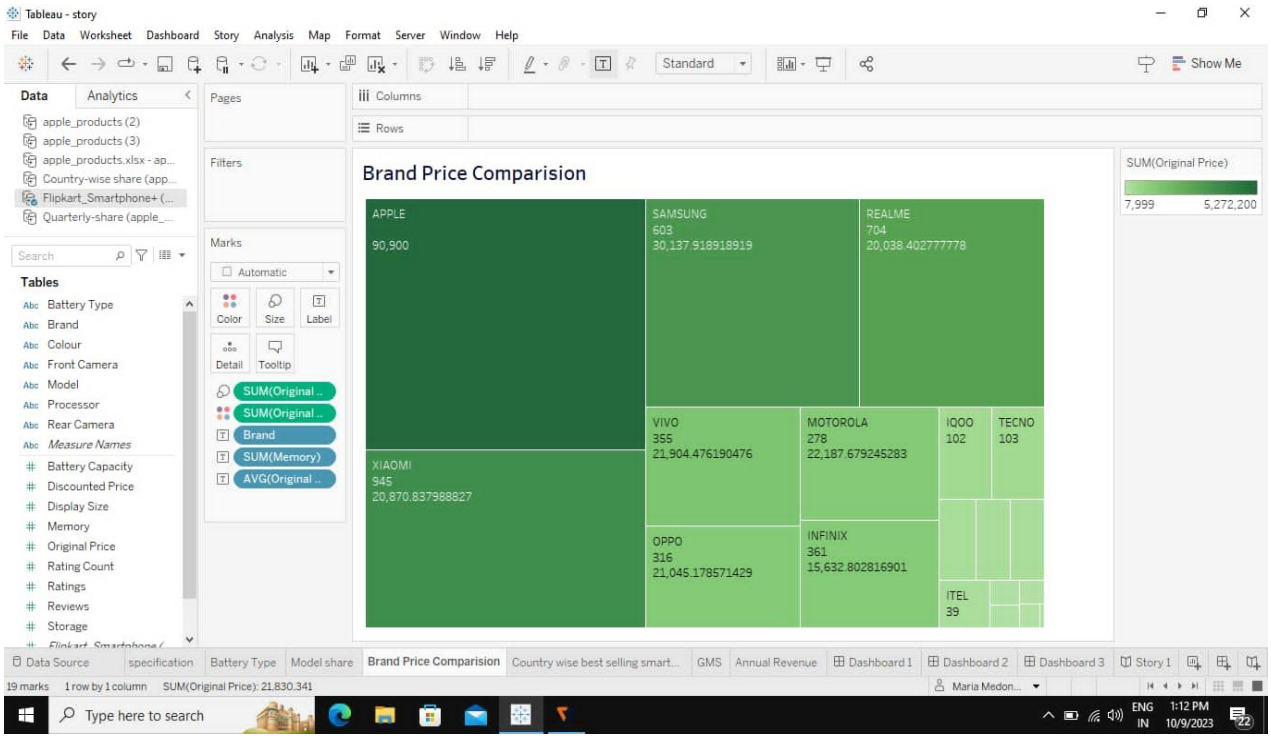
Activity 1.1 : KPI



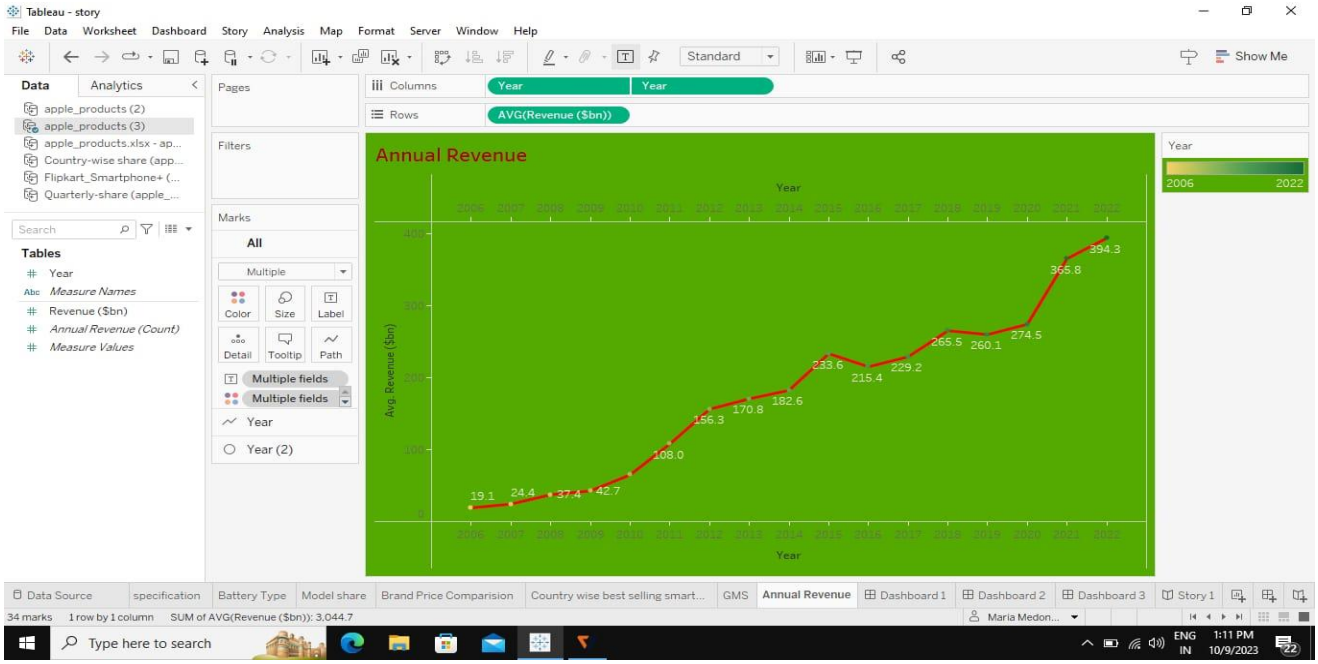
Activity 1.2: MODEL SPECIFICATION



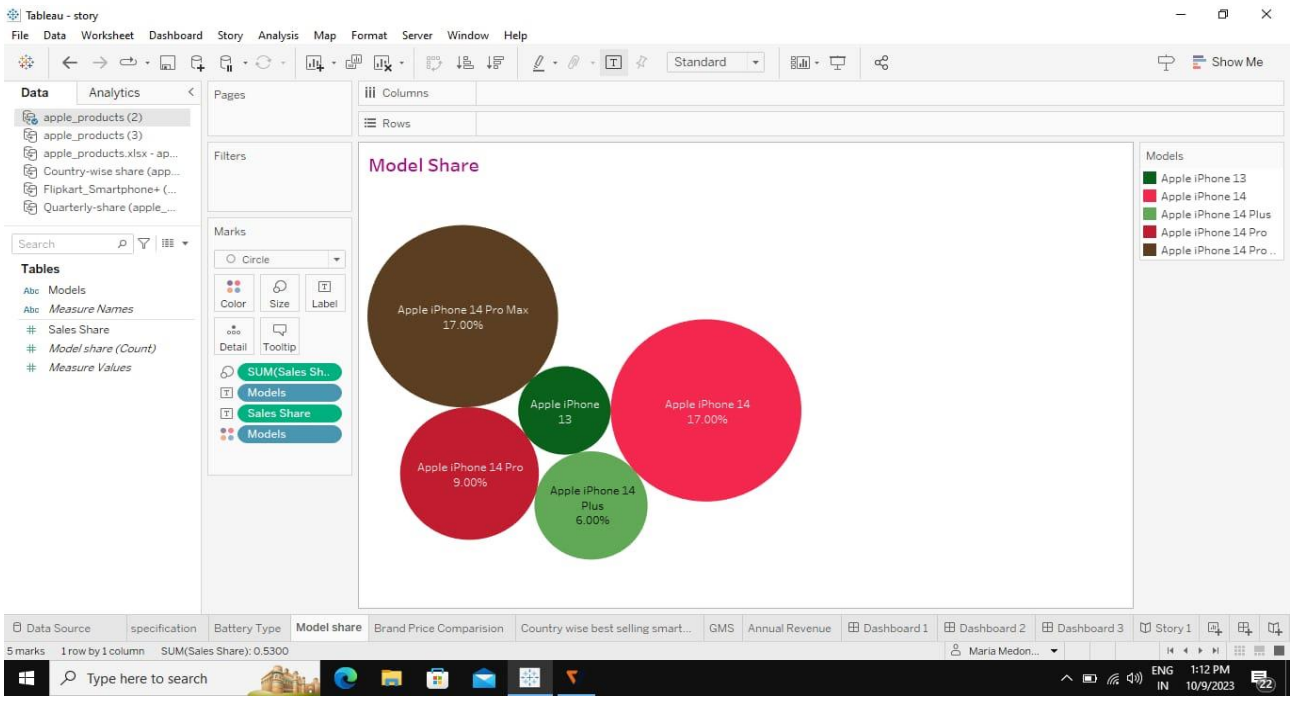
Activity 1.3: BRAND PRICE COMPARISION



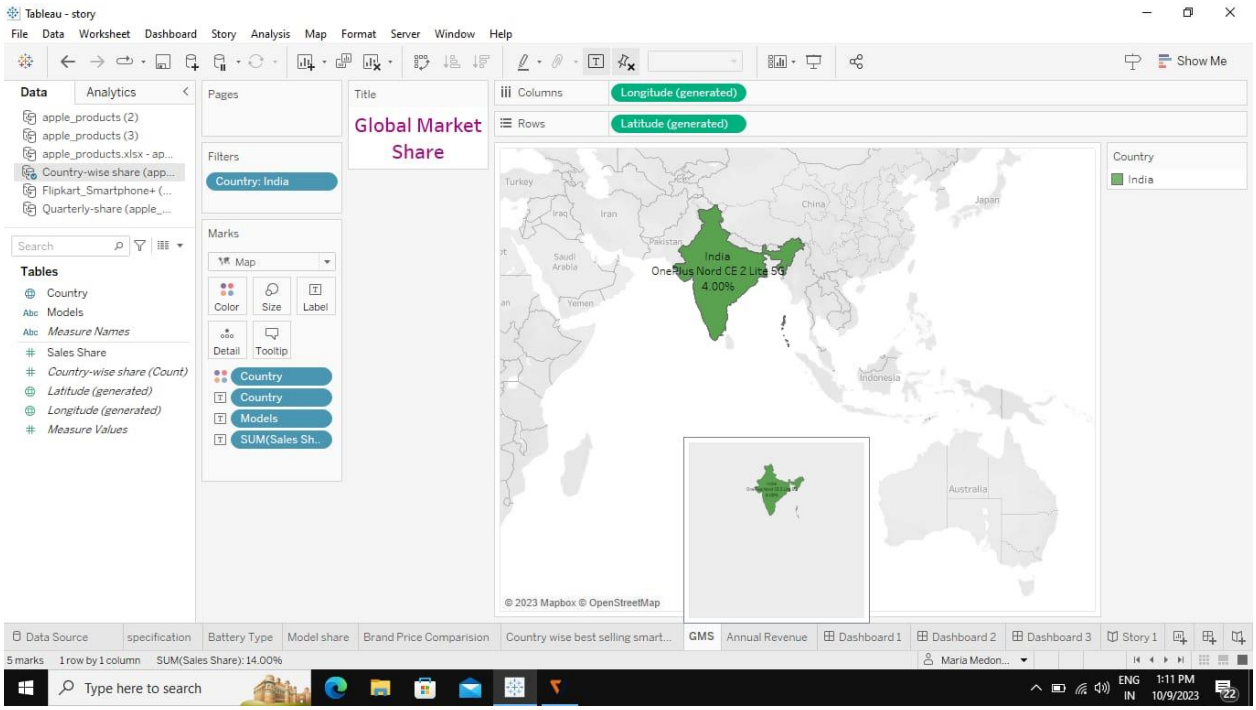
Activity 1.4: ANNUAL REVENUE



Activity 1.5: MODEL SHARE

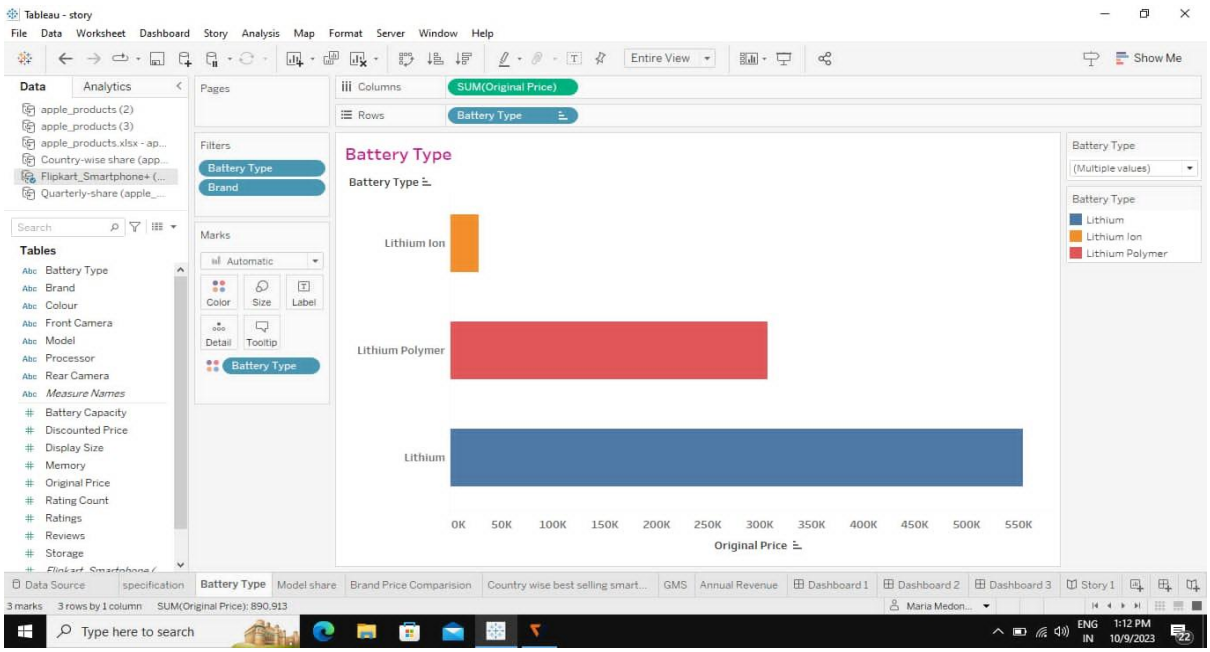


Activity 1.6: GLOBAL MARKET SHARE



Activity 1.7: COUNTRY WISE BEST SELLING SMARTPHONE

Activity 1.8: BATTERY TYPE



8. DASHBOARD

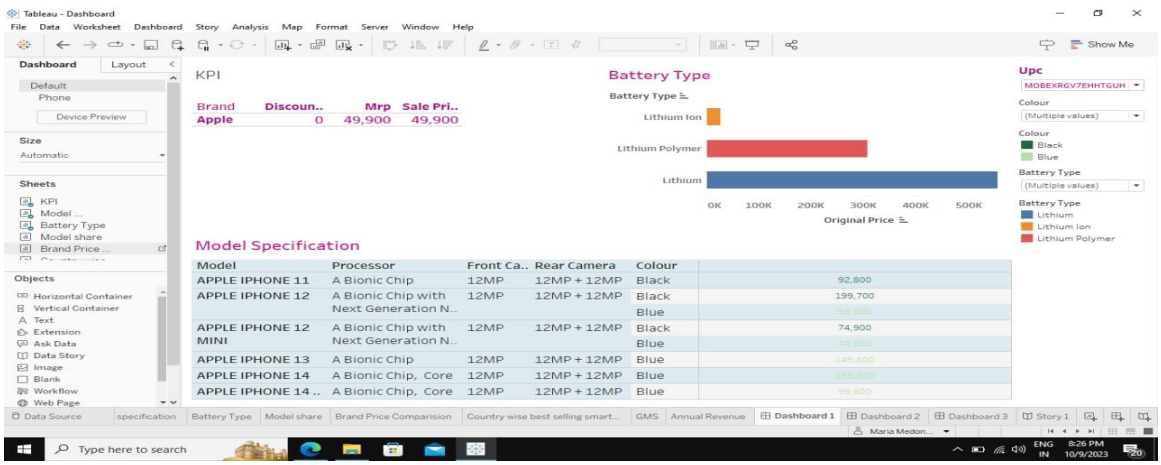
A dashboard is a graphical user interface (GUI) that displays information and data in an organized, easy-to-read format. Dashboards are often used to provide real-time monitoring and analysis of data, and are typically designed for a specific purpose or use case. Dashboards can be used in a variety of settings, such as business, finance, manufacturing, healthcare, and many other industries. They can be used to track key performance indicators (KPIs), monitor performance metrics, and display data in the form of charts, graphs, and tables.

Activity: 1- Responsive and Design of Dashboard

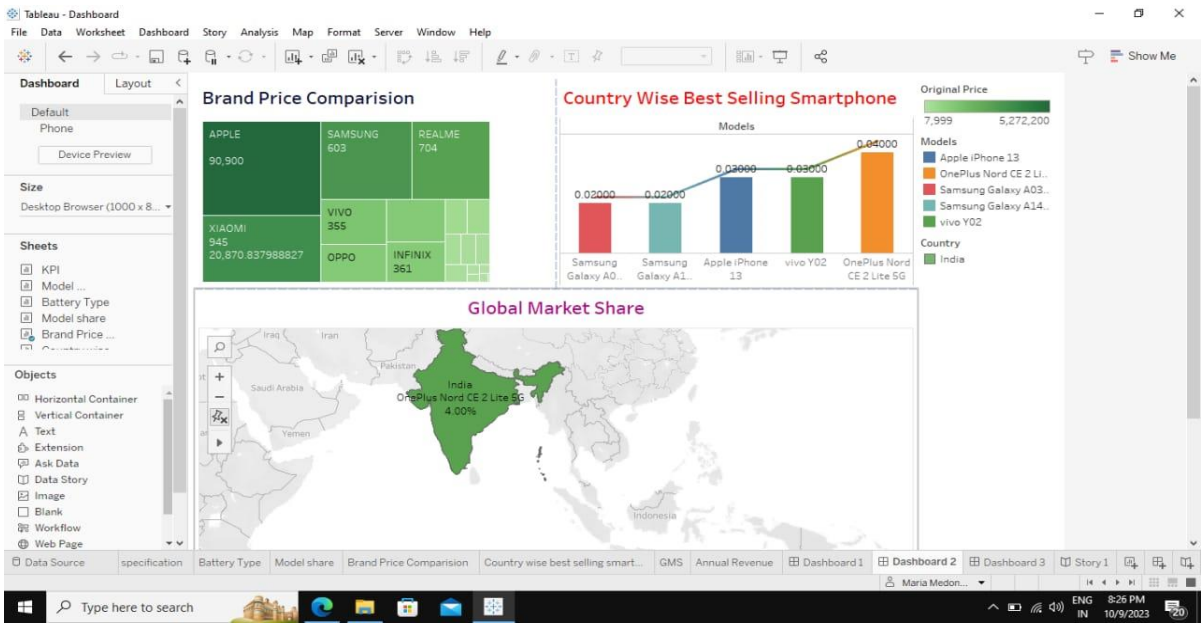
The responsiveness and design of a dashboard for Data-Driven insights on iRevolution: A Data-driven Exploration of Apple's iPhone Impact in India is crucial to ensure that the information is easily understandable and actionable. Key considerations for designing a responsive and effective dashboard include user-centered design, clear and concise information,

interactivity, a data-driven approach, accessibility, customization, and security. The goal is to create a dashboard that is user-friendly, interactive, and data-driven, providing actionable insights.

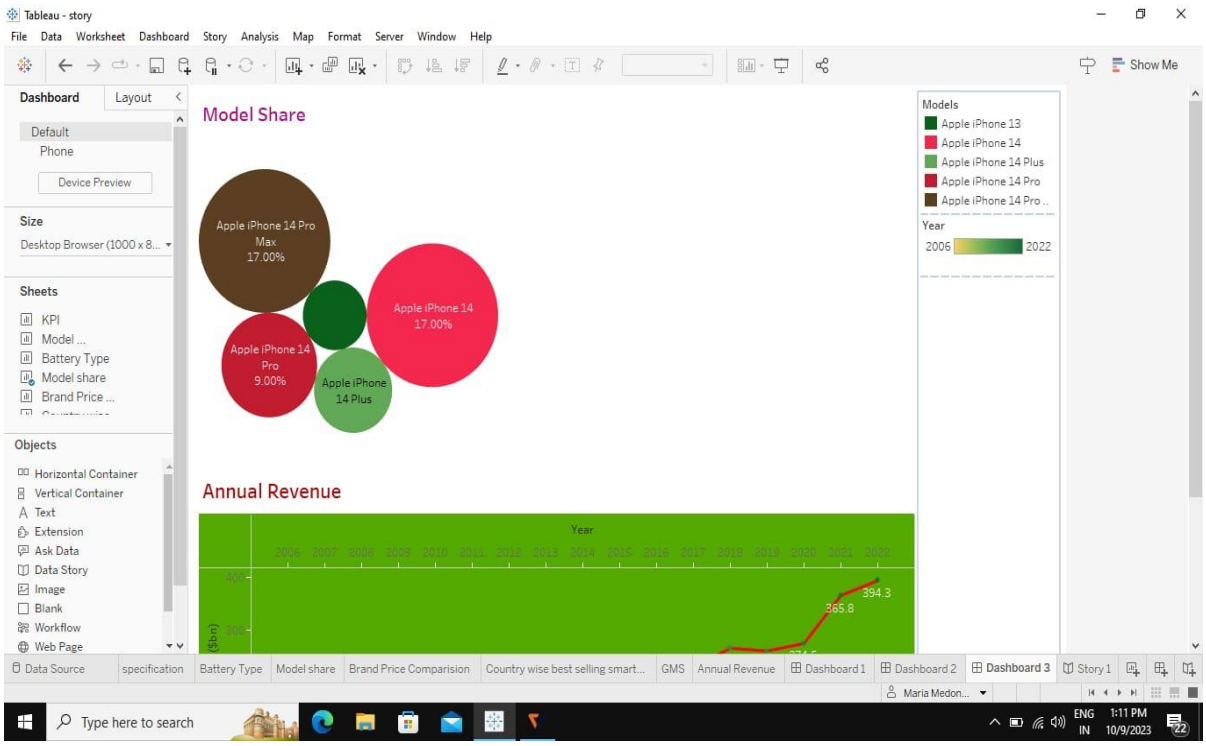
Activity 1.1:



Activity 1.2:



Activity 1.3:



9. STORY

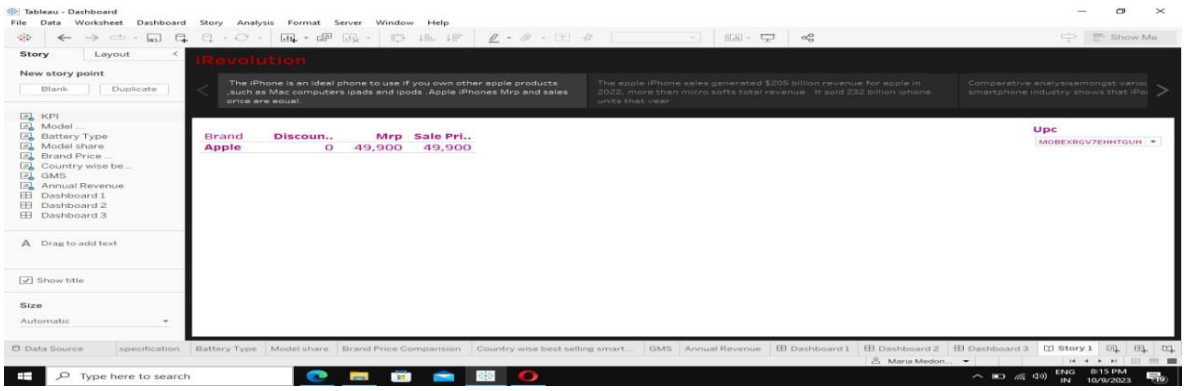
A data story is a way of presenting data and analysis in a narrative format, with the goal of making the information more engaging and easier to understand. A data story typically includes a clear introduction that sets the stage and explains the context for the data, a body that presents the data and analysis in a logical and systematic way, and a conclusion that summarizes the key findings and highlights their implications.

Data stories can be told using a variety of mediums, such as reports, presentations, interactive visualizations, and videos.

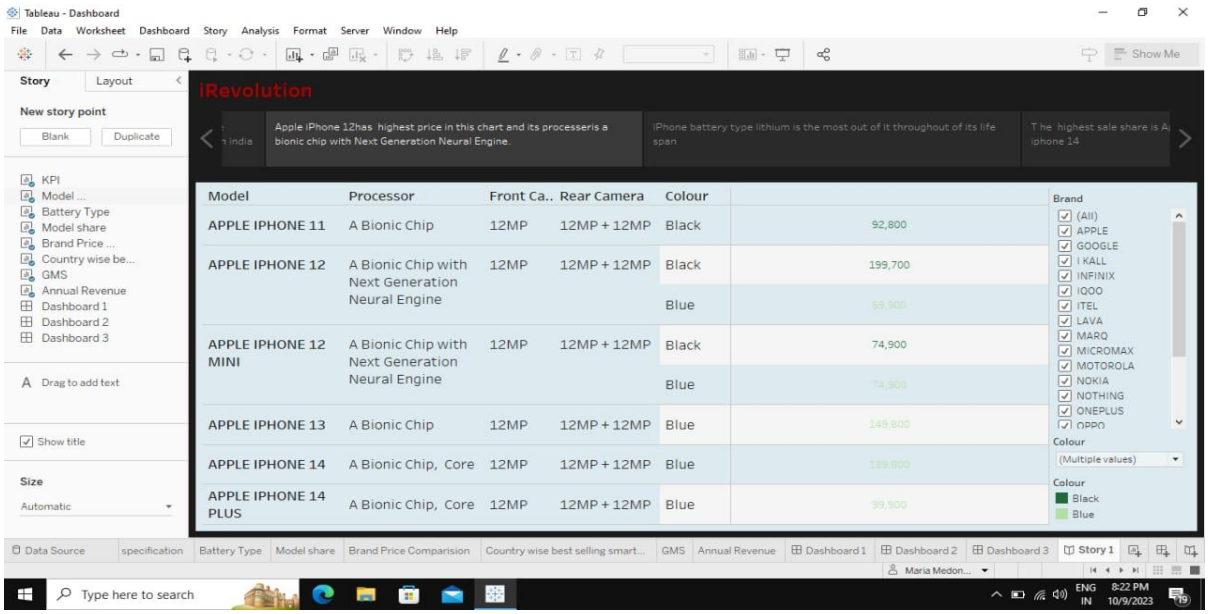
Activity: 1- No of Scenes of Story

The number of scenes in a storyboard for iRevolution will depend on the complexity of the analysis and the specific insights that are trying to be conveyed. A storyboard is a visual representation of the data analysis process and it breaks down the analysis into a series of steps or scenes.

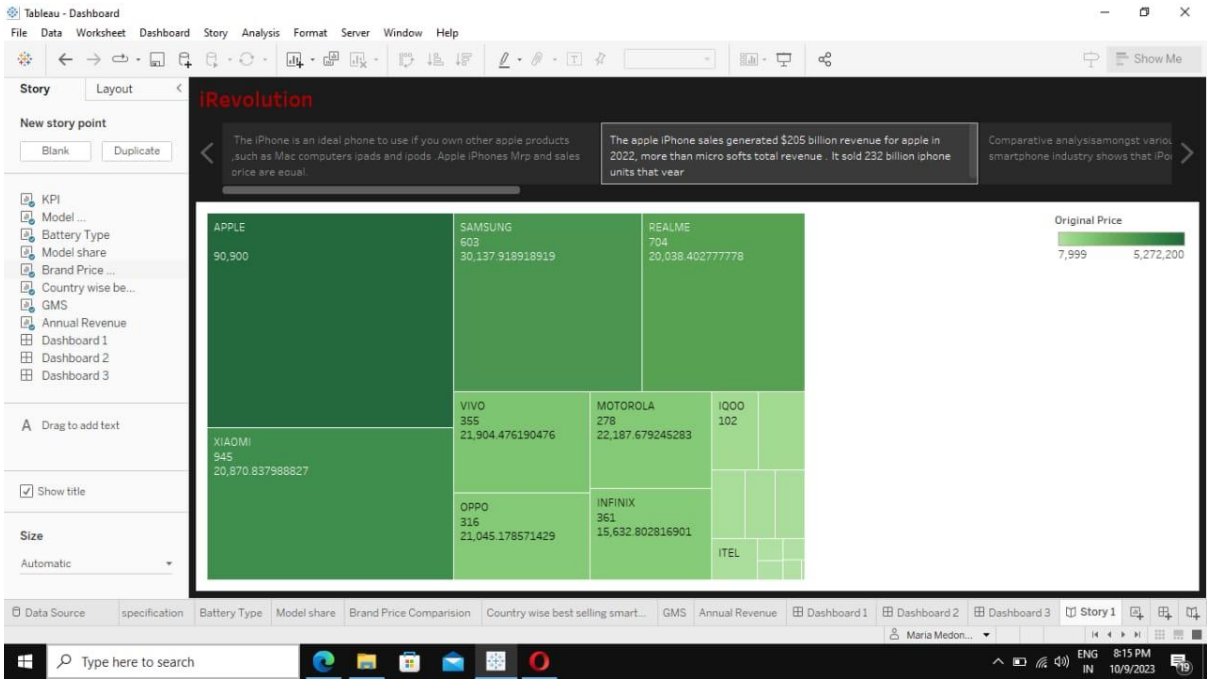
Activity 1.1: KPI



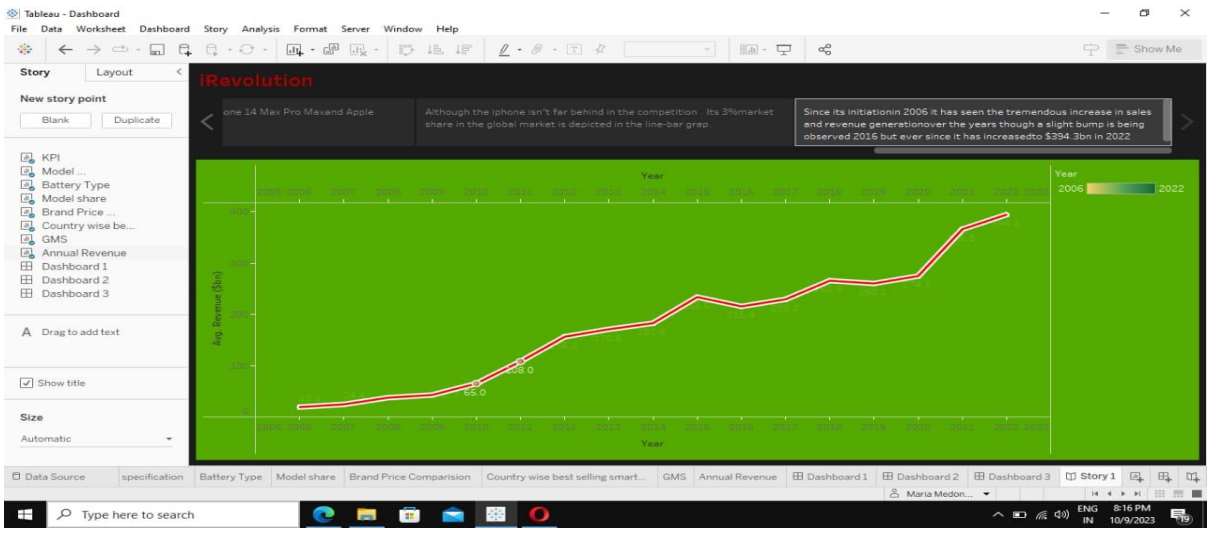
Activity 1.2: MODEL SPECIFICATION



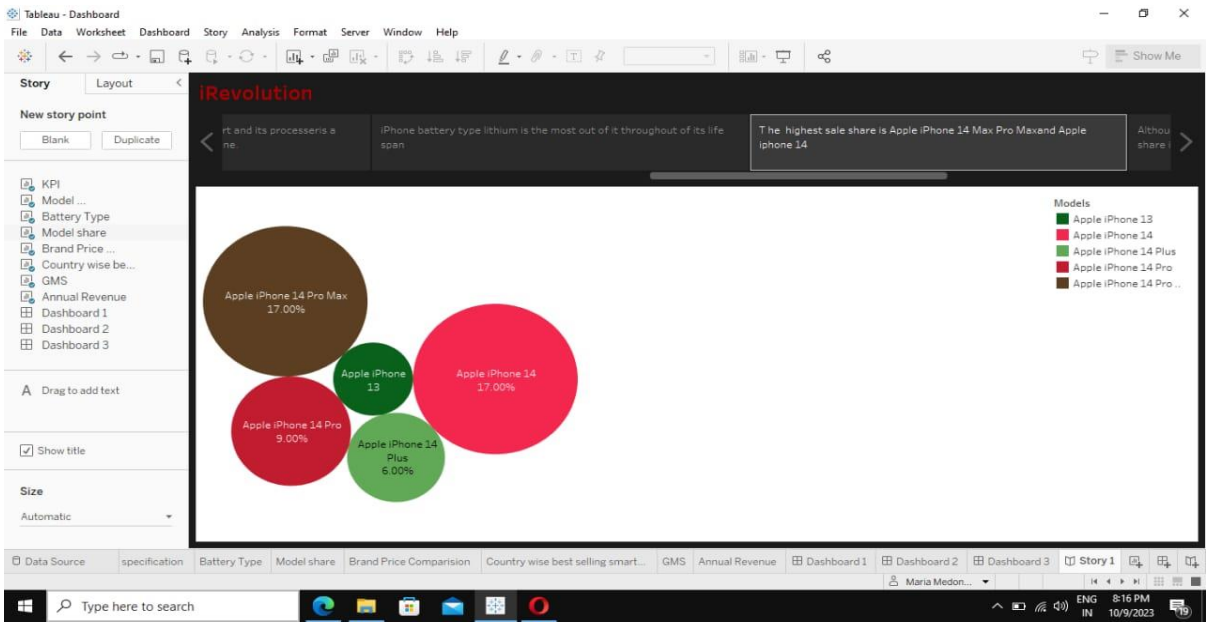
Activity 1.3: BRAND PRICE COMPARISION



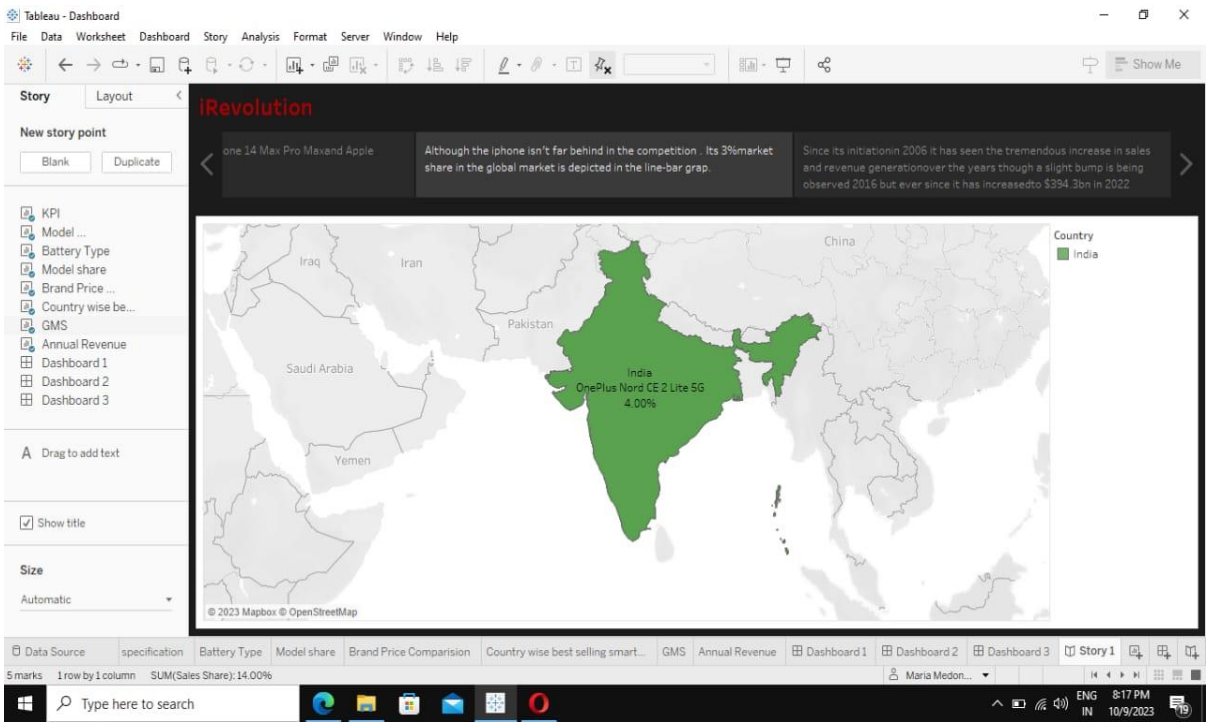
Activity 1.4: ANNUAL REVENUE



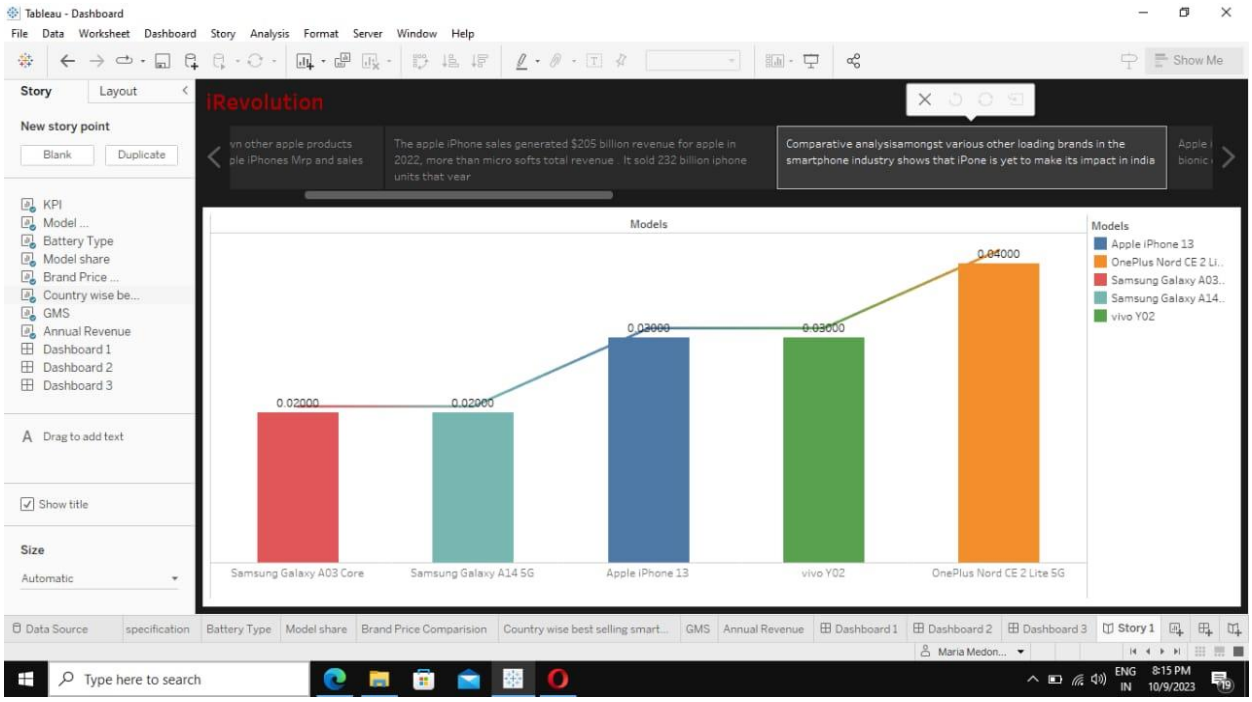
Activity 1.5: MODEL SHARE:



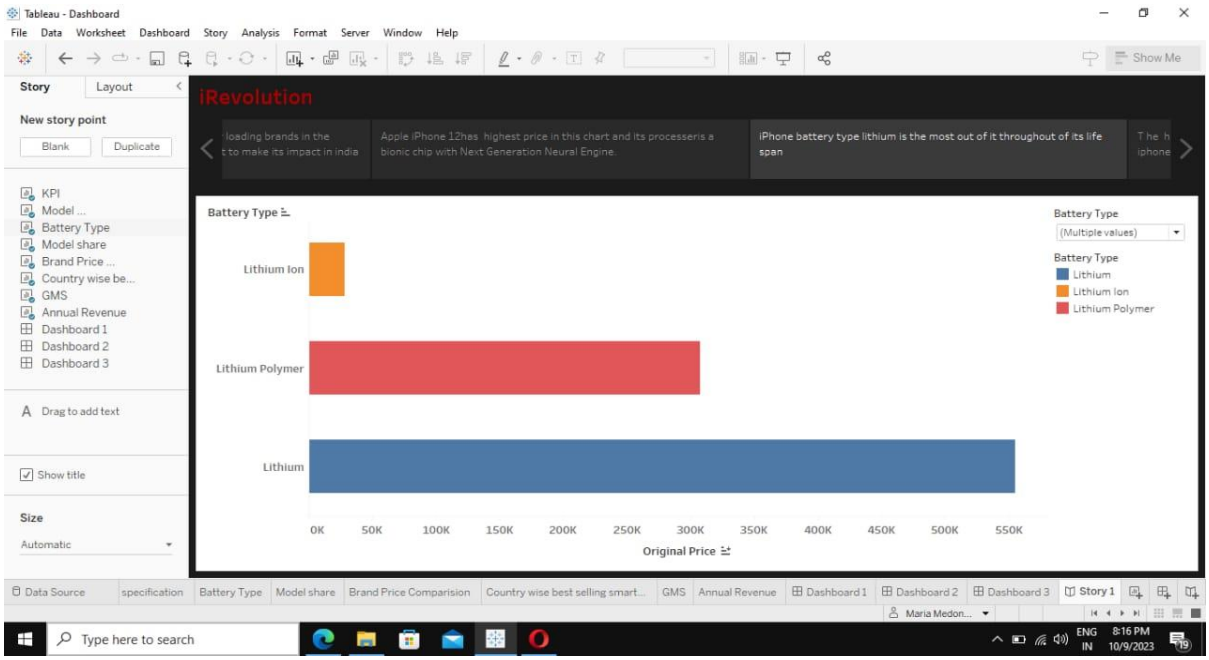
Activity 1.6: GLOBAL MARKET SHARE



Activity 1.7: COUNTRY WISE BEST SELLING SMART PHONE



Activity 1.8: BATTERY TYPE



10. PERFORMANCE TESTING

Activity 1: Utilization of Filters

Tableau filters are based on a condition that can be used to limit the number of records in database

Tableau filters support both simple cases based on field values and advanced calculations or context based filters

Tableau filters help in minimizing the size of the data for efficiency purposes, cleaning up underlying data, removing irrelevant dimension members, and setting measure.

Date ranges for what you want to analyze.

Filtering is a useful way to see only the data you want to see.

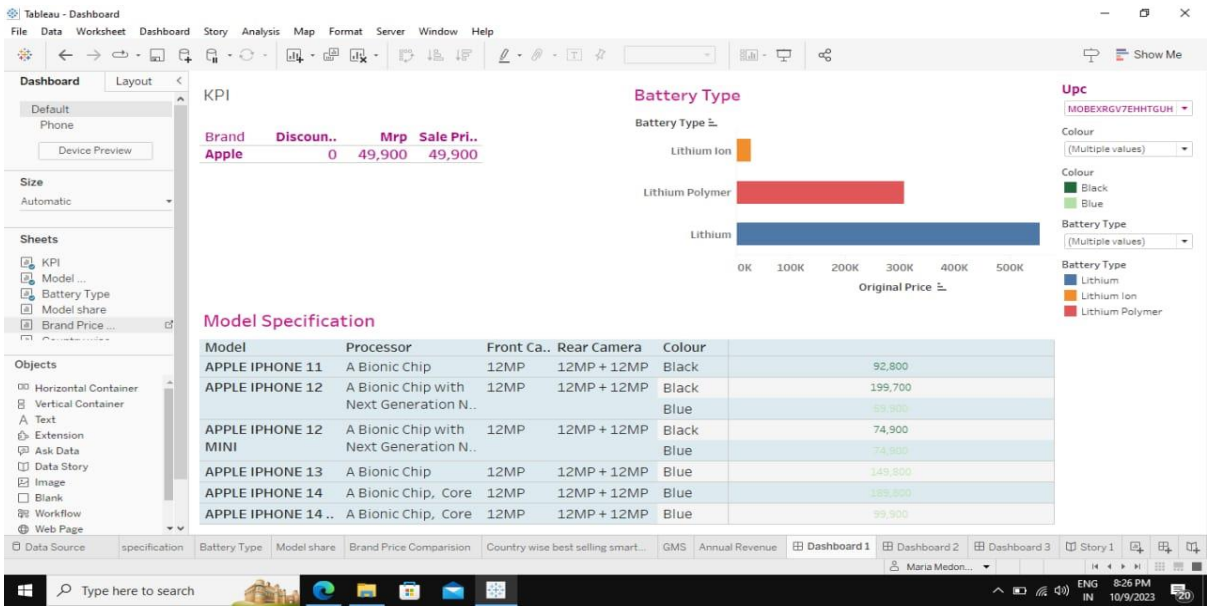


Tableau - Dashboard
KPI
Brand Discoun.. Mrp Sale Pri..
Apple 0 49,900 49,900
Battery Type
Lithium Ion
Lithium Polymer
Lithium
0K 100K 200K 300K 400K 500K
Original Price
Upc
Colour
Black
Blue
Battery Type
Lithium
Lithium Ion
Lithium Polymer
Model Specification
Model Processor Front Ca.. Rear Camera Colour
APPLE IPHONE 11 A Bionic Chip 12MP 12MP + 12MP Black 92,800
APPLE IPHONE 12 A Bionic Chip with Next Generation N.. 12MP 12MP + 12MP Black 199,700
Blue
APPLE IPHONE 12 MINI A Bionic Chip with Next Generation N.. 12MP 12MP + 12MP Black 74,900
Blue
APPLE IPHONE 13 A Bionic Chip 12MP 12MP + 12MP Blue
APPLE IPHONE 14 A Bionic Chip, Core 12MP 12MP + 12MP Blue
APPLE IPHONE 14 .. A Bionic Chip, Core 12MP 12MP + 12MP Blue

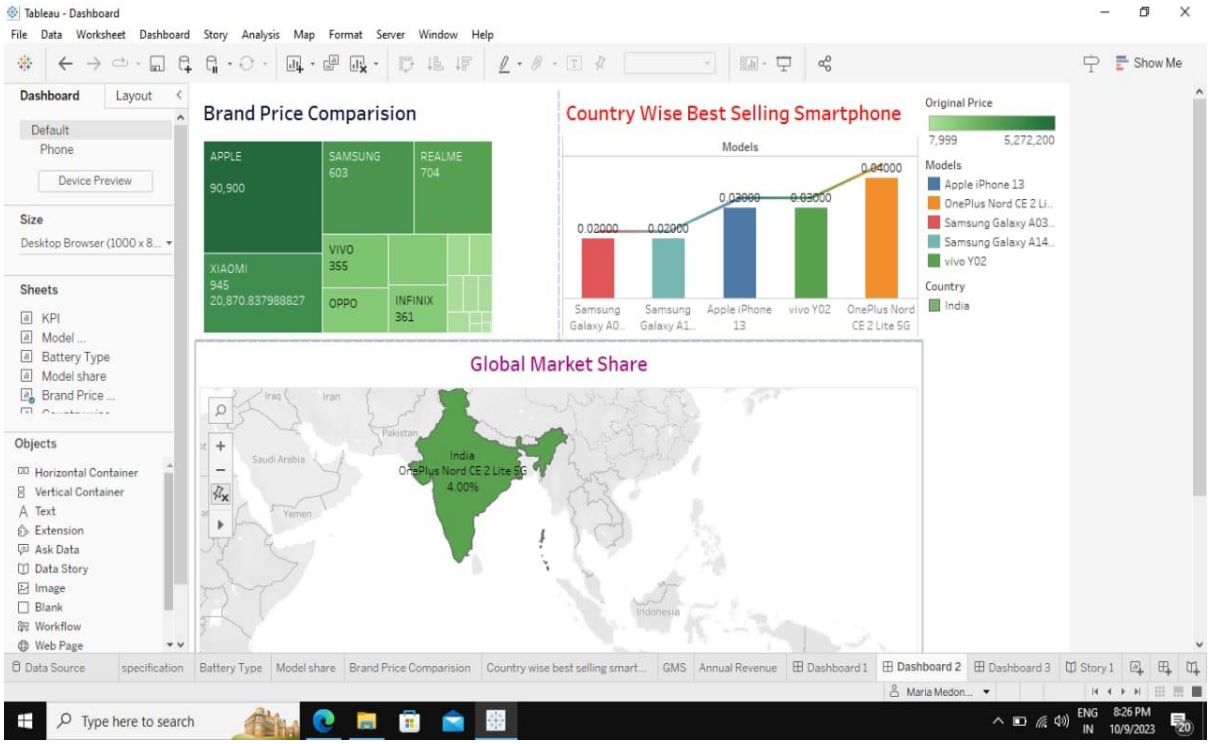
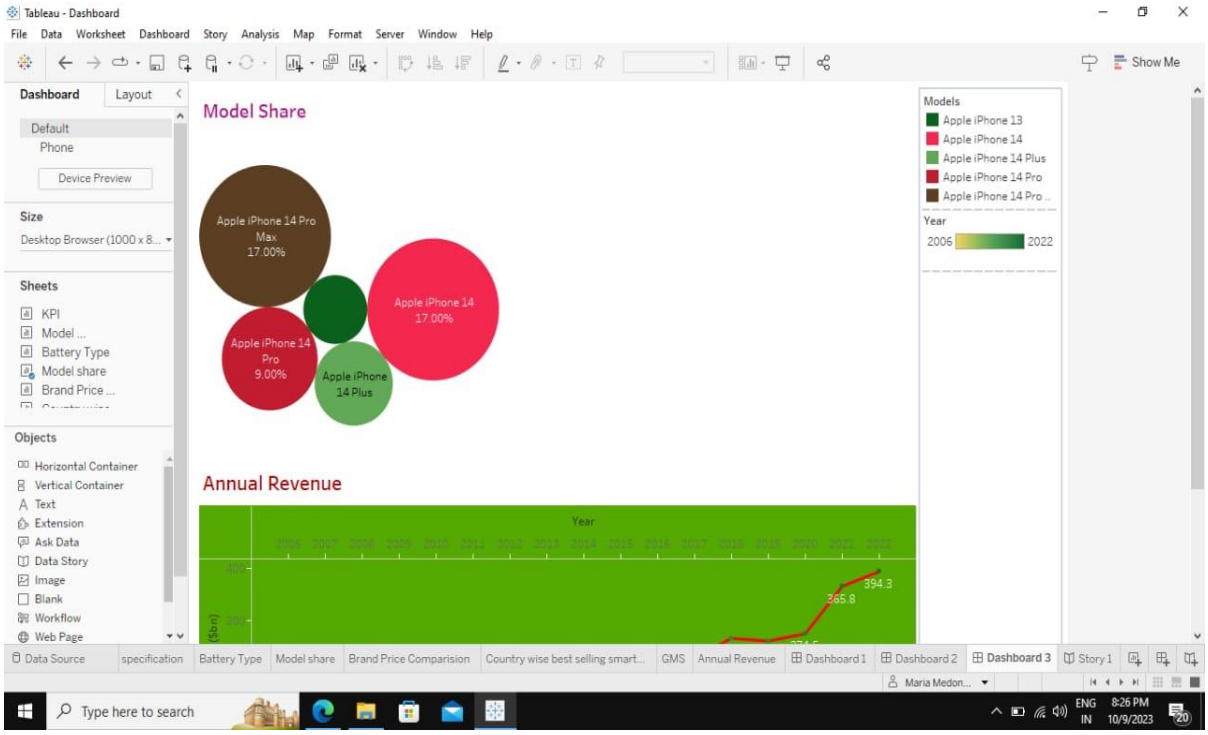


Tableau - Dashboard
Brand Price Comparision
APPLE 90,900
SAMSUNG 603
REALME 704
VIVO 355
XIAOMI 945 20,870.837988827
OPPO
INFINIX 361
Country Wise Best Selling Smartphone
Models
0.02000
0.02000
0.03000
0.03000
0.04000
Samsung Galaxy A0..
Samsung Galaxy A1..
Apple iPhone 13
vivo Y02
OnePlus Nord CE 2 Lite 5G
Original Price
7,999 5,272,200
Models
Apple iPhone 13
OnePlus Nord CE 2 Li..
Samsung Galaxy A03..
Samsung Galaxy A14..
vivo Y02
Country
India
Global Market Share
India
OnePlus Nord CE 2 Lite 5G
4.00%



Activity 2: No of Calculation Fields

Picture 1:

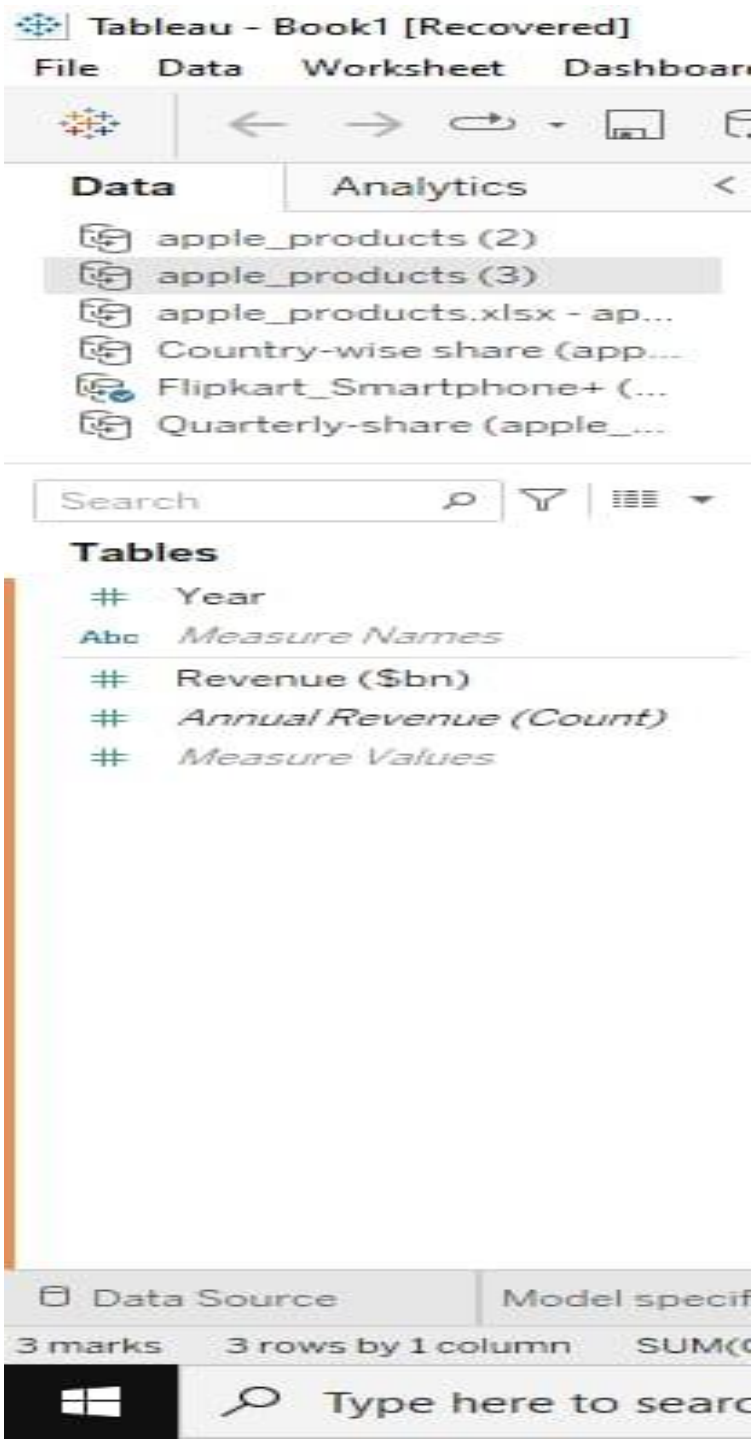


Tableau – Book1 [Recovered]
File
Data
Worksheet
Dashboar
Data
Analytics
apple_products (2)
apple_products (3)
apple_products.xlsx - ap...
Country-wise share (app...
Flipkart_Smartphone+ (...
Quarterly-share (apple_...
Search
Tables
Year
Measure Names
Revenue ($bn)
Annual Revenue (Count)
Measure Values
Data Source
Model specif
3 marks
3 rows by 1 column
SUM(
Type here to searc

Picture 2:

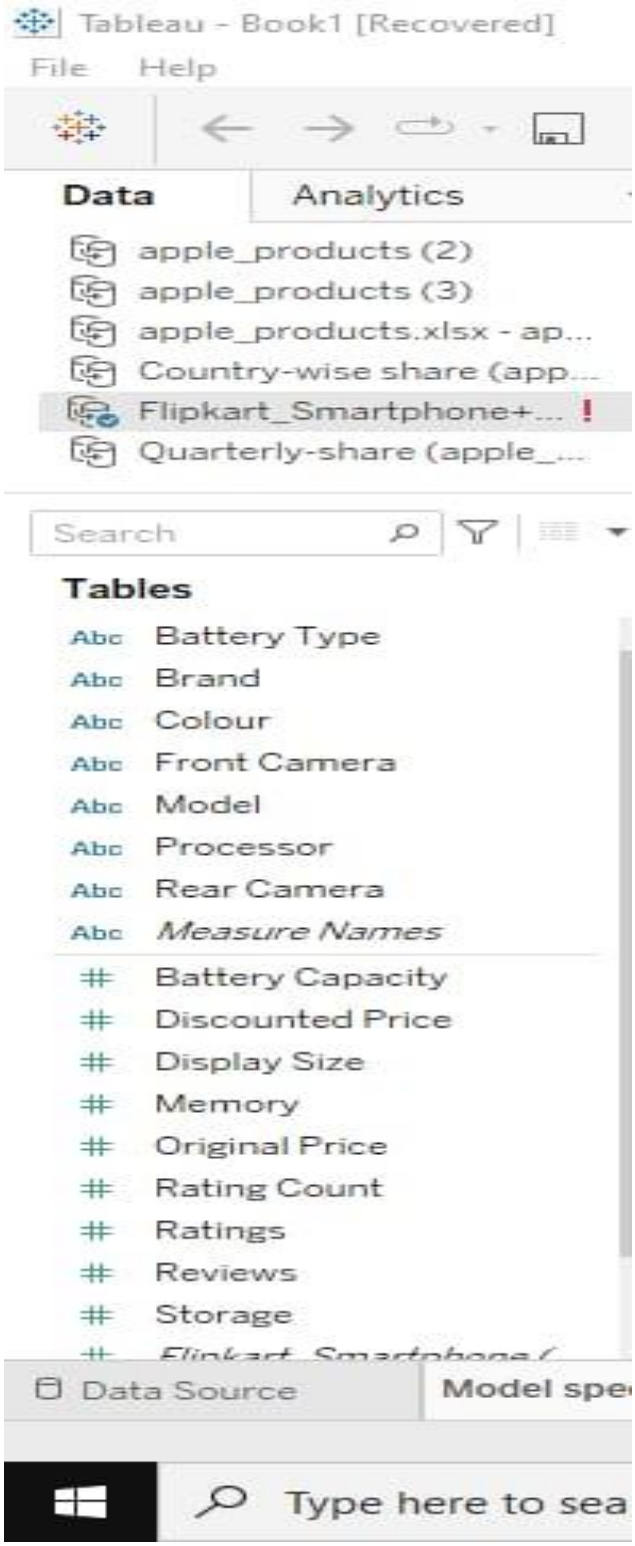


Tableau - Book1 [Recovered]
File Help
Data
Analytics
apple_products (2)
apple_products (3)
apple_products.xlsx - ap...
Country-wise share (app...
Flipkart_Smartphone+...
Quarterly-share (apple_...
Search
Tables
Abc Battery Type
Abc Brand
Abc Colour
Abc Front Camera
Abc Model
Abc Processor
Abc Rear Camera
Abc Measure Names
Battery Capacity
Discounted Price
Display Size
Memory
Original Price
Rating Count
Ratings
Reviews
Storage
Data Source
Model spe
Type here to sea

Activity 3: No of Visualizations/ Graphs

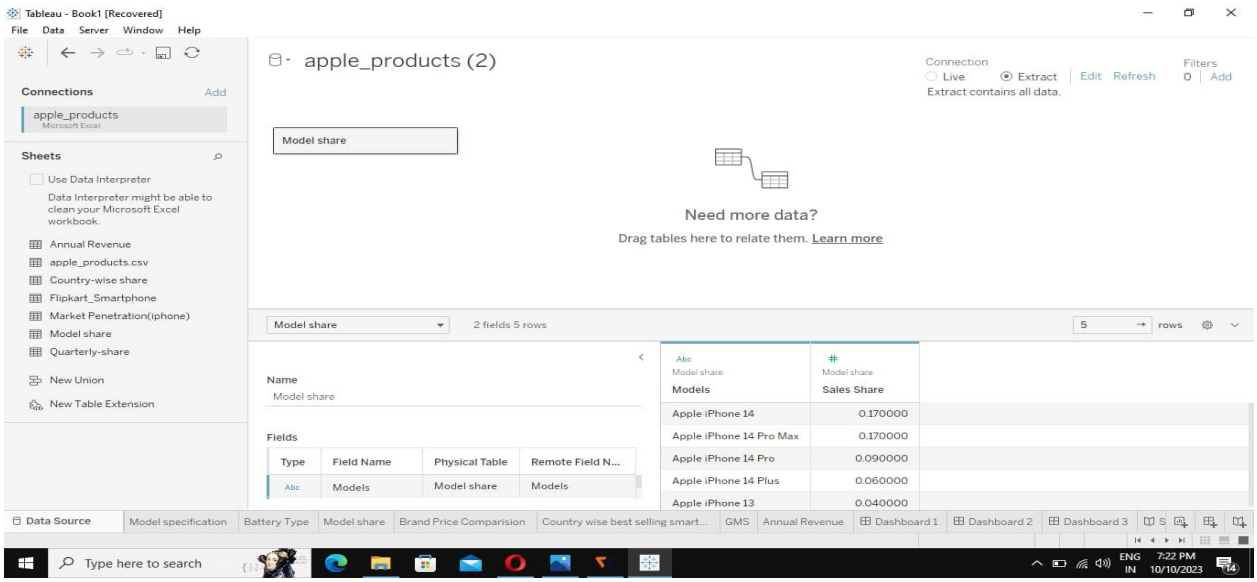
- ✓ KPI
- ✓ Model Specification
- ✓ Model- Wise share
- ✓ Battery-Type distribution
- ✓ Brand- Price Comparison
- ✓ Country-Wise Best-Selling Smartphone
- ✓ Annual Revenue Year-Wise
- ✓ Global Market Share

11. PUBLISHING

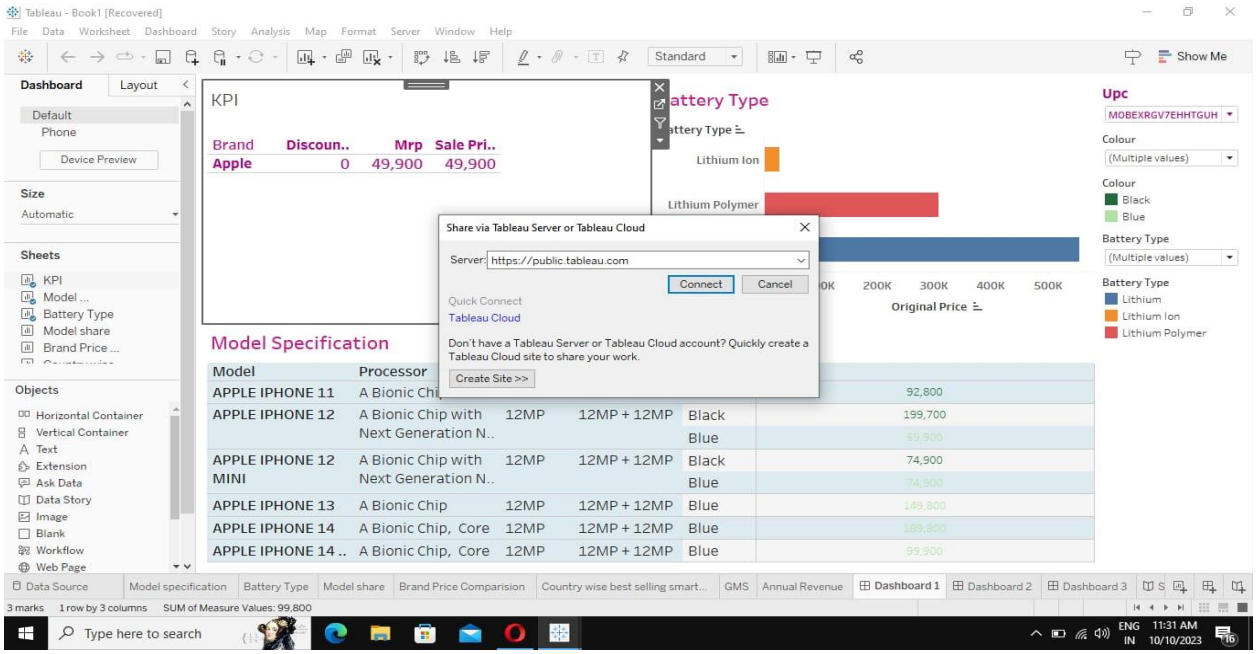
Publishing helps us to track and monitor key performance metrics, to communicate results and progress. help a publisher stay informed, make better decisions, and communicate their performance to others.

Publishing dashboard and reports to tableau public

Step 1 Go to data Source and Select Extract so that .hyper extension files are created and save it at your desktop.(please wait for pop up of file to save)



Step 2: Go to Dashboard/story, click on share button on the top ribbon..

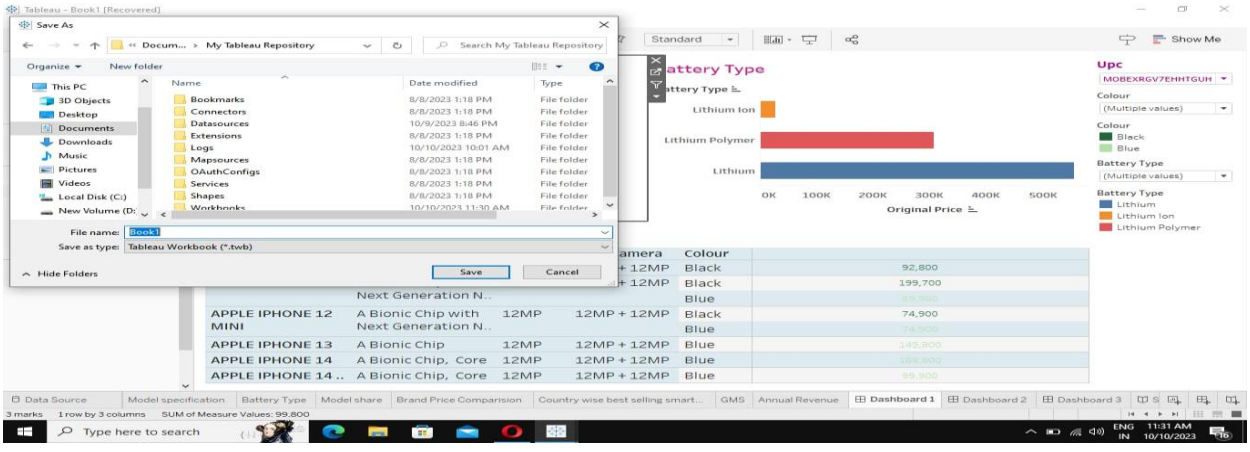


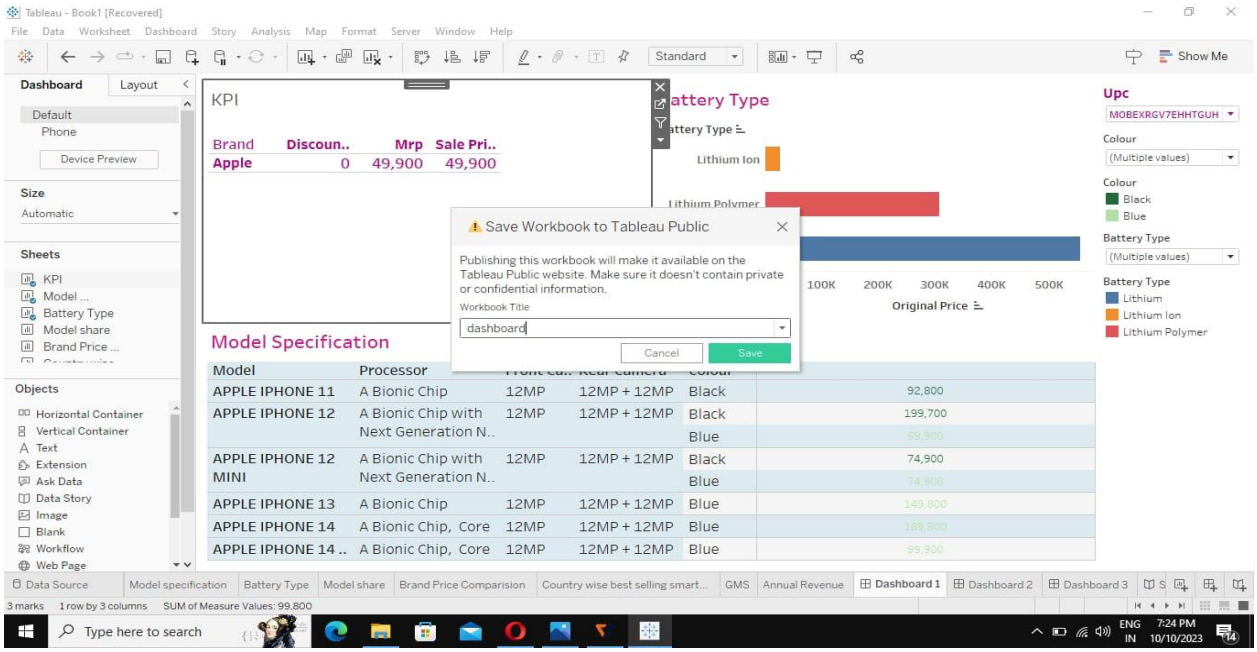
Step 3: Give the server address of your tableau public account and click on connected.

Sign in to your Tableau Public account or create a new account if you don't have one. You can visit the Tableau Public website (public.tableau.com) and click on the "Sign In" or "Join" button.

In the "Tableau Public Sign In" window, enter your Tableau Public account credentials and click "Sign In."

Next, you'll need to provide a title and description for your workbook. Fill in the appropriate details in the provided field of workbook Title





Click on the "Save" button to start the publishing process. Tableau Desktop will upload your workbook to Tableau Public.

Once the upload is complete, a browser window will automatically open, displaying your published workbook on Tableau Public. Review the workbook to ensure that everything appears as expected.

So in Similar way we can also publish Story to tableau public.

12.PROJECT DEMOSTRATIONS & DOCUMENTATION

Below mentioned deliverables to be submitted along with other deliverables.

Activity 1: Record explanation Video for project end to end solution

Activity 1.1

Video demonstr

https://drive.google.com/file/d/1efUH_g0apHaTHSDvHHZBRB8MxDFGbJw6/view?usp=drivesdk

Activity 2: Project Documentation-Step by step project development procedure Create a document as per the template provided.

13. ADVANTAGES:

- Compared to android products, IPhones, IPads and other apple products hold better value.
- Not only apple offers its products at a high price, but three products also have a good resale value.
- Apple IPhone have the some of the best camera.
- IPhone batteries are Lithium ion technology.
- Lithium-ion batteries charge faster.
- Giving more battery life in a lights package.

14. DISADVANTAGES:

- Compared to apple IPhone selling percentage of other android phones are high.
- The IPhone battery are non renewable which means that users can't replace.
- Brand price comparison of IPhone with other androids are high expensive.
- Global market share of IPhone in Indian is very low compared to other countries.

15.APPLICATIONS:

- The IPhone utilizing features face ID and fingerprint recognition for device securities.

- The IPhone providing various accessibility features for individuals with disabilities.
- A software application that runs under ions, which is the operating system that process Apple's mobile devices.

16. CONCLUSION:

It is irrefutable to say that Apple Inc. is one of the most well-known companies to date. With a huge brand name and consumer base. Apple has been able to satisfy the need for a portable, yet powerful device, that allows the user to access information quickly and efficiently. First, an environment scan helped us see some upcoming opportunities and threads for apple Inc such as developing countries growth. Second, by define apple's main consumer behavior in terms of psychological and social-cultural influences, we can that apple products give consumers an idealized view of themselves and a sense of luxury. Third, by identifying apple's target market for the IPhone and using a market product grid and perceptual map, we can determine apple's ideal market is towards men between the ages 35-44 and secondary market to ages 18-34. Along with apple's brand name, its successful influence on its target market has led them to become the technology giant they are today.