Appendix-A

A REPORT ON

Developing Data-Driven Dashboards: From Concept to KPI Execution

BY

NAME	ID NUMBER
Suyash Mangla	2023A7PS0593P

AT

INK IN CAPS (IIC) INTERACTIVE LABS PRIVATE LIMITED,
MUMBAI

A Practice School–I Station of

BIRLA INSTITUTE OF TECHNOLOGY AND SCIENCE, PILANI
July, 2025

Appendix-B

A REPORT ON

Developing Data-Driven Dashboards: From Concept to KPI Execution

BY

NAME	ID NUMBER	DISCIPLINE
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Prepared in partial fulfilment
of the Practice School-I Course Nos.
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MUMBAI

BIRLA INSTITUTE OF TECHNOLOGY AND SCIENCE, PILANI
July, 2025

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I am also grateful to Ms. Divya Jain, our project mentor at IIC Interactive Labs Whose insights and mentorship were instrumental in shaping the direction and execution of my project.

I would also like to acknowledge the entire team at IIC Interactive Labs for their indirect yet valuable contributions to the success of this work.

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This project would not have been possible without the collective guidance and support of the individuals mentioned above.

Appendix-C

BIRLA INSTITUTE OF TECHNOLOGY & SCIENCE
PILANI (RAJASTHAN)
Practice School Division

Station: Ink In Caps (IIC) Interactive Labs Private Limited
Centre: Mumbai
Duration: 2 months
Date of Start: 26th May, 2025 **Date of Submission:** 17th July, 2025

Title of the Project: Developing Data-Driven Dashboards: From Concept to KPI Execution

Name: Suyash Mangla **ID No:** 2023A7PS0593P
Discipline: B.E.Computer Science

Name and Designation of the Expert: Divya Jain, Software Developer at IIC
Name of the PS Faculty: Prof. Jitender Kumar .
Project Areas: Data Analytics & Modeling

Abstract:
During my Practice School-I internship at IIC Interactive Labs Private Limited, Mumbai, I worked on a project titled **"Developing Data-Driven Dashboards: From Concept to KPI Execution."** The objective of this project was to gain hands-on experience in building dynamic, interactive dashboards that convert raw marketing and performance data into actionable business insights. The work involved connecting diverse data sources to Power BI, performing data cleaning and transformation using Power Query, designing robust data models, and developing visually impactful dashboards tailored to business needs. As the project progressed, I transitioned to Looker Studio to leverage enhanced interactivity and layout flexibility. This experience provided me with end-to-end exposure to modern Business Intelligence workflows—from data integration and modeling to visualization and insight generation. Overall, the project significantly strengthened my technical skills in Power BI and Looker Studio, while deepening my understanding of how well-structured analytics can inform strategic decision-making in a professional environment.

Signature of Student
Date 17 July 2025

Signature of PS Faculty
Date 17 July 2025

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INTRODUCTION

IIC Interactive Labs, based in Mumbai, is a cutting-edge MarTech and experiential design agency founded in 2021. As a full-service firm, it blends immersive technologies—like AR/VR, projection mapping, gesture recognition and spatial computing—with interactive installations, CGI, motion capture, and IoT solutions to craft engaging brand experiences.They also offer traditional digital services such as website and app development, AI-based systems, as well as 2D/3D animation and motion graphics .Their collaboration portfolio is impressive, featuring projects for industry giants including Jio, BMW, Amazon, Netflix, Star Sports, Google, Maruti, Royal Enfield, and Disney+, where they've delivered immersive showrooms, virtual events, metaverse experiences, gesture-based activations, and projection-mapped campaigns.

During my internship at **IIC Interactive Labs**, I focused on gaining practical experience in data modeling, transformation, and visualization by building interactive dashboards using **Power BI** and **Looker Studio**. Initially, I developed three dashboards using the Power BI web version, where I applied techniques such as data cleaning, DAX functions, and structured data modeling to extract meaningful business insights. To strengthen my foundation, I also completed a certified course on Power BI that enhanced my understanding of end-to-end BI workflows. However, due to the limitations of Power BI on macOS—particularly in terms of interactivity and layout flexibility—I transitioned to **Looker Studio** for the final two dashboards. This shift allowed me to explore more advanced design capabilities and implement best practices in visual hierarchy, layout, and user-centric design. Across all five dashboards, I worked with diverse datasets to analyze campaign performance, regional engagement, and audience behavior. The final dashboard was a complete redesign of the marketing insights dashboard, incorporating industry-standard design principles for improved clarity, storytelling, and decision enablement. This comprehensive dashboard now enables marketing leadership to quickly interpret key metrics and identify areas for strategic improvement.Finally, we worked with a dummy BMW performance dataset to build the "BMW Marketing & Performance Dashboard" using Looker Studio, applying everything we learned to create a clear, executive-level view of business performance.

Comprehensive Overview of Dashboards & Business Insights

During my time at IIC Interactive Labs, I aimed to gain hands-on experience in data modeling and visualization by developing interactive dashboards using Power BI. As part of this initiative, I successfully built three dashboards using two raw datasets, applying key Power BI functionalities such as data transformation, relationship modeling, DAX calculations, and dynamic visual design to extract meaningful business insights.To begin with, we completed a certified Power BI course, which provided a strong foundation in data integration, transformation, modeling, and dashboard design. This equipped us with the essential skills required to effectively apply Power BI throughout the project.

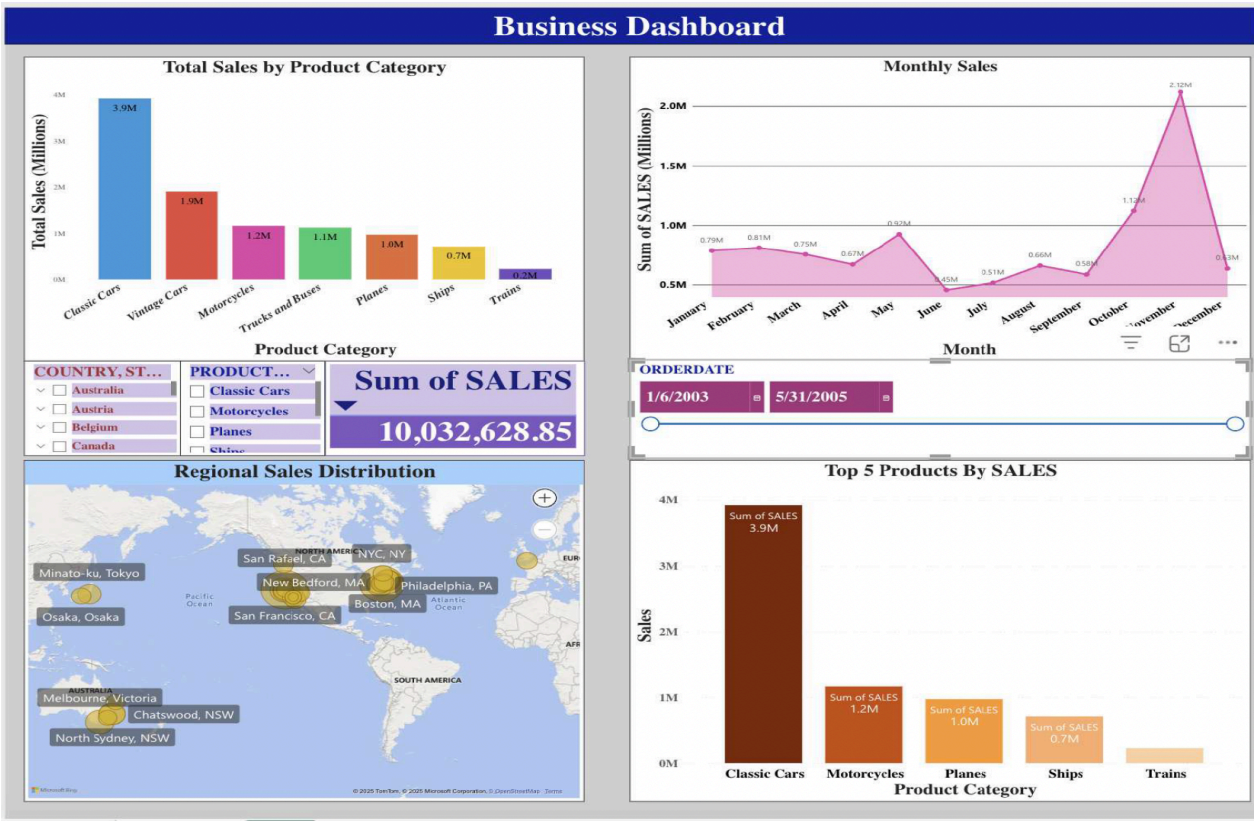
Regarding POWER BI Learnings :

As recommended by our mentor, I completed the “Power BI Basics” course offered by Simplilearn (hosted via SkillUp). This beginner-friendly, self-paced program spans approximately 6 hours of video lessons and provides 90 days of free access, culminating in a completion certificate.

The curriculum covered all core aspects of Power BI—including its main components, Power Query for data transformation, DAX functions, data modeling, and dashboard creation—offering a solid foundational knowledge that directly enhanced my ability to build interactive dashboards in my project. In addition to the certified Power BI course.I also watched several introductory video tutorials recommended by our mentor to build a solid understanding of key Business Intelligence concepts and Power BI fundamentals before starting the hands-on project work.

Business dashboard 1:

As part of my Practice School-I project at IIC Interactive Labs, I developed an interactive Business Dashboard for a fictional retail store using Power BI. The objective was to apply concepts learned from a certified course and mentor-led tutorials to analyze and visualize sales performance data.



The dashboard provides a holistic view of key metrics, including **total sales of ₹10,032,628.85**, **top-performing product categories (with Classic Cars leading at ₹3.9M)**, and monthly trends highlighting a **significant sales spike in**

November—indicating possible seasonal factors or promotions. It also maps regional sales distribution, showing strong performance in cities like San Francisco, Philadelphia, Tokyo, and Sydney.

The **Regional Sales Distribution** map makes it easy to understand geographic performance visually.This project enhanced my skills in data transformation, DAX, and storytelling through visual analytics.The slicers for Region, Product Category, and Date Range are strategically placed at the center of the dashboard for easy accessibility.Top 5 Product Categories by Sales chart uses varying shades of the same color — from dark to light — to visually represent sales volume, with darker shades indicating higher sales.Slicers and filters for dynamic interactivity are implemented . Tools used include mainly Power BI web versions.

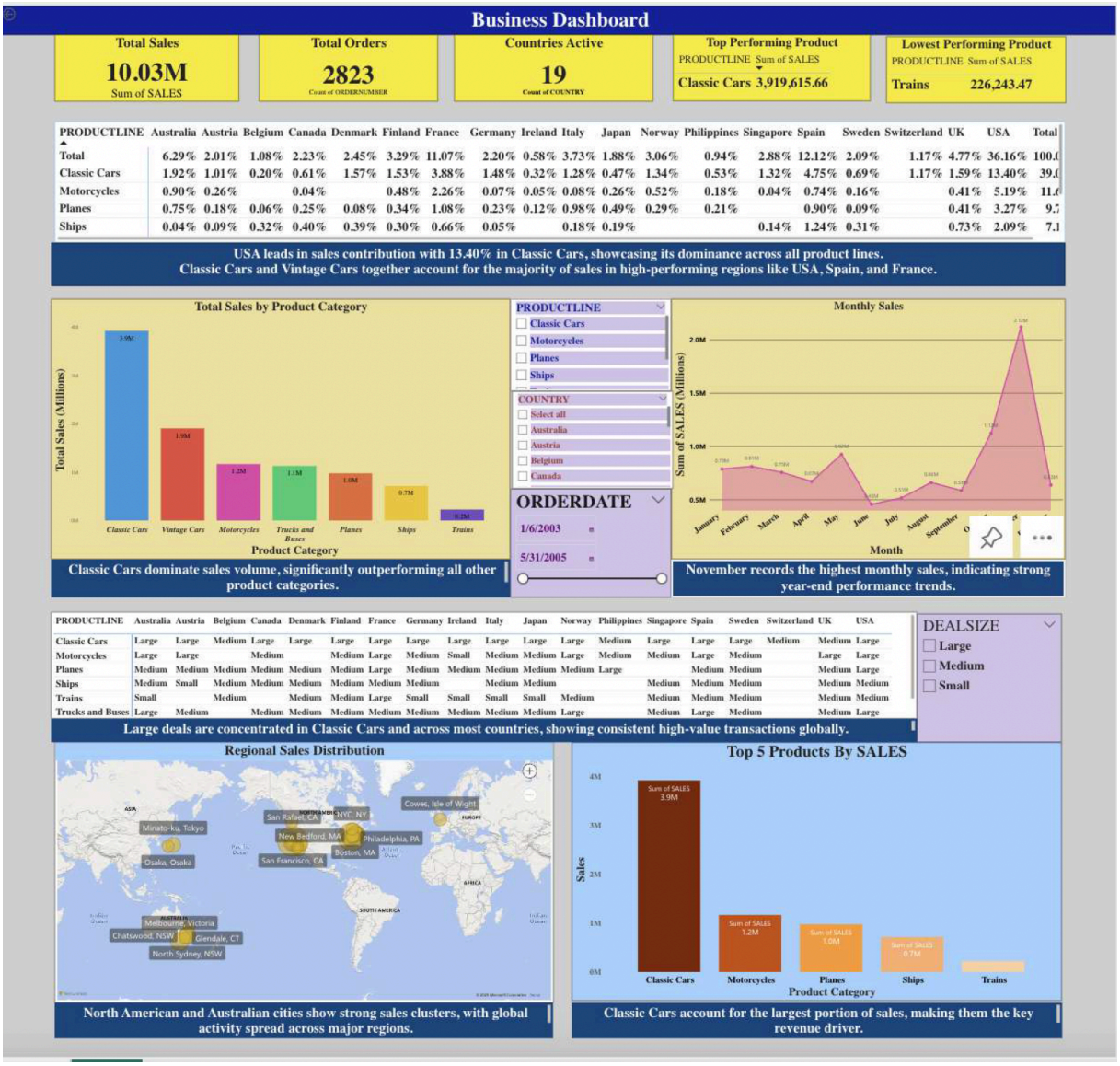
Business dashboard 2:

Based on our mentor's feedback, we restructured the dashboard to ensure that the first view offers a clear, high-level summary of the business data. The updated layout begins with a dedicated top row showcasing key performance indicators such as **Total Sales (₹10.03M), Total Orders (2,823), Countries Active (19), along with the Top Performing Product (Classic Cars - ₹3.91M) and Lowest Performing Product (Trains - ₹226K)**. This redesign aligns with the best practices of business intelligence reporting by giving users an immediate snapshot of overall performance. Additionally, we reorganized visual elements to highlight regional sales distribution, product category trends, monthly performance spikes (notably in November), and the scale of deals across geographies. These enhancements not only improve the visual hierarchy of the report but also support better storytelling and faster decision-making for stakeholders.

Following further guidance from our mentor, we refined the dashboard structure to move beyond surface-level insights and deliver deeper, decision-oriented analysis. The next-level enhancement focused on showcasing product performance across specific regions—such as countries and territories—to help identify which products perform well in which markets. This regional-product mapping empowers stakeholders to make geography-based business decisions.

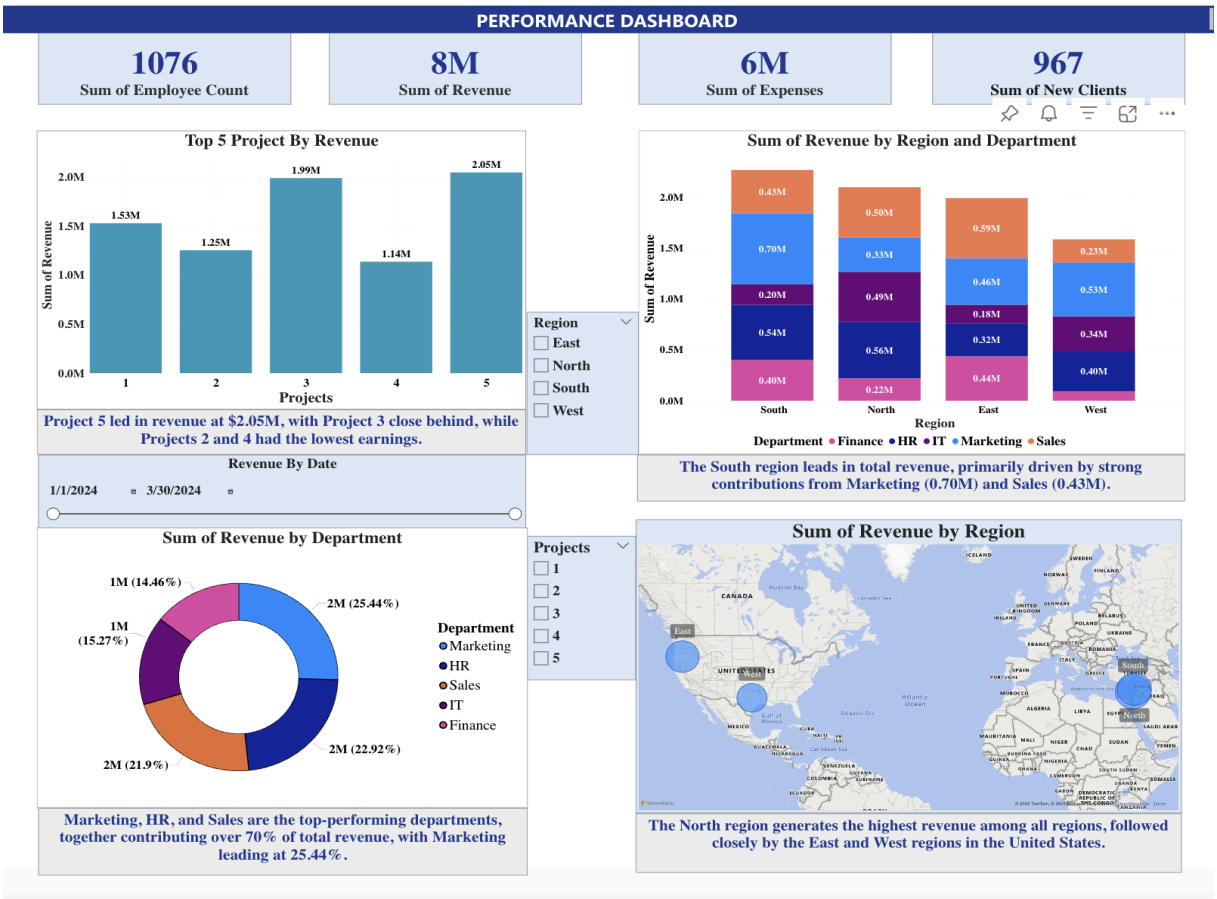
Building on this, we included targeted graphs comparing product categories

with sales and then drilled down by region for layered insights. Another critical improvement involved analyzing deal size distribution to understand which products generate more high-value ("Large") deals and in which locations—an insight crucial for strategic targeting. We also optimized the use of filters by creating context-aware slicers: for example, the order date filter now applies across the entire report, ensuring consistent temporal comparisons across all visuals. Finally, to strengthen clarity and interpretation, we introduced concise, one-line conclusions beneath each graph, summarizing its core takeaway. These narrative cues guide the viewer's attention and align the dashboard with business storytelling best practices.



Business dashboard 3:

The performance dashboard provides a comprehensive overview of the company's operational metrics across projects, departments, and regions. Among the top-performing projects, **Project 5 leads in revenue with $2.05M**, closely followed by **Project 3 with $1.99M**, while Projects 2 and 4 contribute the least—suggesting potential areas for strategic reassessment. From a departmental perspective, **Marketing** emerges as the highest contributor, accounting for **25.71%** of total revenue, followed by **HR (23.17%) and Sales (22.14%)**. Together, these three departments generate over 70% of overall revenue. Regionally, the North region performs best, with East and South not far behind, whereas the West lags and may require targeted interventions. A deeper look into regional-departmental impact shows that in the **South**, **Marketing and Sales dominate with $0.70M and $0.43M respectively**, while in the **East**, **Sales alone contributes $0.59M**, making it the key revenue driver for that area. These insights enable data-driven decisions regarding resource allocation, regional focus, and departmental performance optimization.



Based on our mentor's guidance, we also implemented a professional color-coding scheme to enhance the visual clarity and consistency of the dashboard. The chosen palette was designed to maintain a balance between aesthetics and readability—using cool tones like blues and greys for neutral metrics, green for positive trends, and red or orange to highlight areas of concern or underperformance. This helped differentiate key insights at a glance, such as identifying top-performing projects and departments versus those needing attention. The application of a uniform visual language not only improved the dashboard's professional appearance but also made it easier for stakeholders to interpret data quickly and accurately.

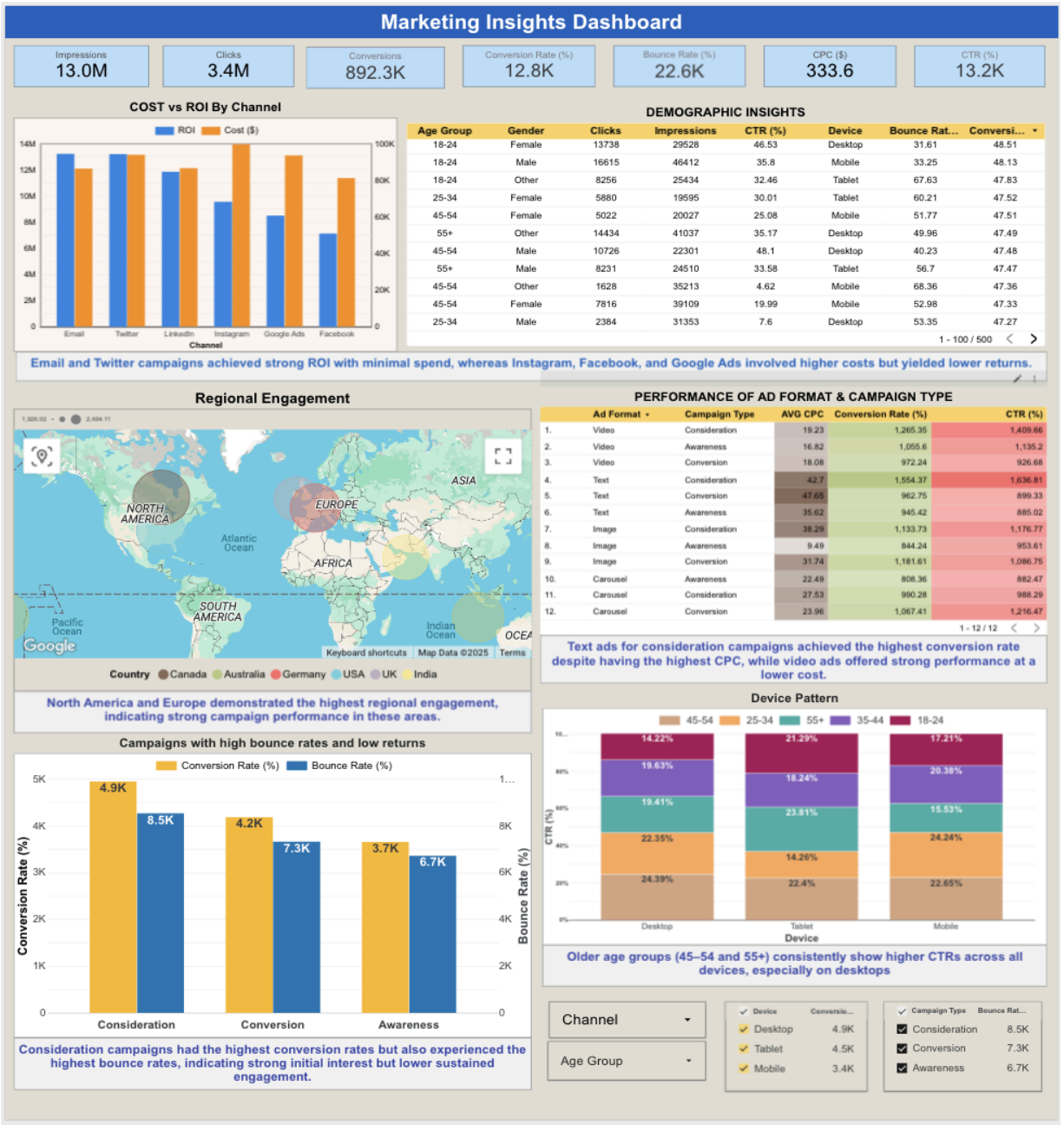
Regarding Looker Studio Learnings :

Over the course of exploring Looker Studio, I developed a strong foundation in designing interactive and insightful dashboards tailored for business users. I learned how to connect multiple data sources—including Google Analytics, Google Search Console, and third-party platforms like Facebook Ads using connectors such as Supermetrics—and visualize them effectively within a single interface. I understood the core concepts of **dimensions and metrics**, which are essential for structuring any report. I practiced applying advanced features like **data blending**, **custom fields**, and **conditional formatting**, enabling me to merge insights across platforms and highlight key business metrics dynamically. I also created **drill-down reports**, added **interactive filters**, and used **community visualizations** to extend dashboard capabilities beyond native charts. Through this, I gained practical knowledge in building multi-page, client-ready dashboards with interactive navigation menus, user-focused layout, and clean visual hierarchy. Finally, I recognized the importance of keeping dashboards visually simple yet informative to ensure clarity and usability for decision-makers.

Multi-Dimensional Marketing Insights Dashboard :

To support strategic decision-making, we built a **Multi-Dimensional Marketing Insights Dashboard** that helps marketing leadership at IIC Interactive Labs assess campaign performance and uncover opportunities for optimization. The

dashboard was designed to be both comprehensive and user-friendly, consolidating a wide range of performance indicators—ROI, engagement rates, conversion efficiency, device usage, and demographic behavior—into a single visual interface.At the core, we introduced a calculated **ROI metric** (based on an assumed value of $500 per conversion), allowing leadership to gauge cost-efficiency across platforms. This helped reveal critical insights, such as **Email and Twitter** emerging as the most ROI-effective channels, and **Instagram, Facebook, and Google Ads** showing high spend but low return. These insights were immediately visible through top-level KPIs placed prominently at the top of the dashboard.



The dashboard adopted a modular design layout:

- **Channel performance** was visualized using bar and comparison charts to distinguish between ROI leaders and underperformers.
- **Audience segments** were analyzed through age, gender, and device breakdowns—highlighting that the **18–24 age group** had the highest CTR and **females** showed stronger engagement across platforms.
- **Regional engagement** was shown using geo-maps, identifying **North America and Europe** as the most responsive regions.
- **Device analysis** revealed that **older users on desktops** showed significantly higher CTRs, especially in high-performing campaign combinations.
- A deep dive into **ad format and campaign type performance** showed that **Text + Consideration campaigns** had the best conversion and engagement metrics, while **Image ads**, despite their low CPC, consistently underperformed.

Initially, the dashboard was developed using **Power BI (web version)**, but limitations on macOS—especially in advanced data modeling—led to a shift to **Looker Studio** for the final dashboards. This transition allowed smoother browser-based interactivity and easier integration with Google Sheets, though with trade-offs in deep customization. The last two dashboards were developed entirely in Looker Studio, applying best practices in layout, visual hierarchy, and user-centric design.

Overall, this dashboard serves as a decision-enablement tool that distills complex multi-channel performance data into a clear narrative, helping marketing leaders quickly identify what's working, where to optimize, and how to align future strategies with real-time data.

Regarding Dashboard Designing Learnings :

As part of our learning process, we focused on understanding and applying best practices in dashboard layout, visual hierarchy, and user-centric design. The objective was to go beyond simply visualizing data—to structure dashboards in a way that tells a clear, actionable story. By redesigning our earlier dashboards,

we aimed to improve not only visual clarity but also the decision-enablement aspect for stakeholders. We explored design principles such as grouping related metrics, placing high-level KPIs at the top, using consistent color schemes, and maintaining logical flow across charts and pages. Drawing inspiration from real-world KPI dashboard examples and industry templates, we refined the structure, layout, and readability of our marketing dashboards. The redesigned versions provide cleaner navigation, better segmentation insights, and more focused visuals aligned with stakeholder needs and analytical goals.

Redesigned Version of the Marketing Dashboard:

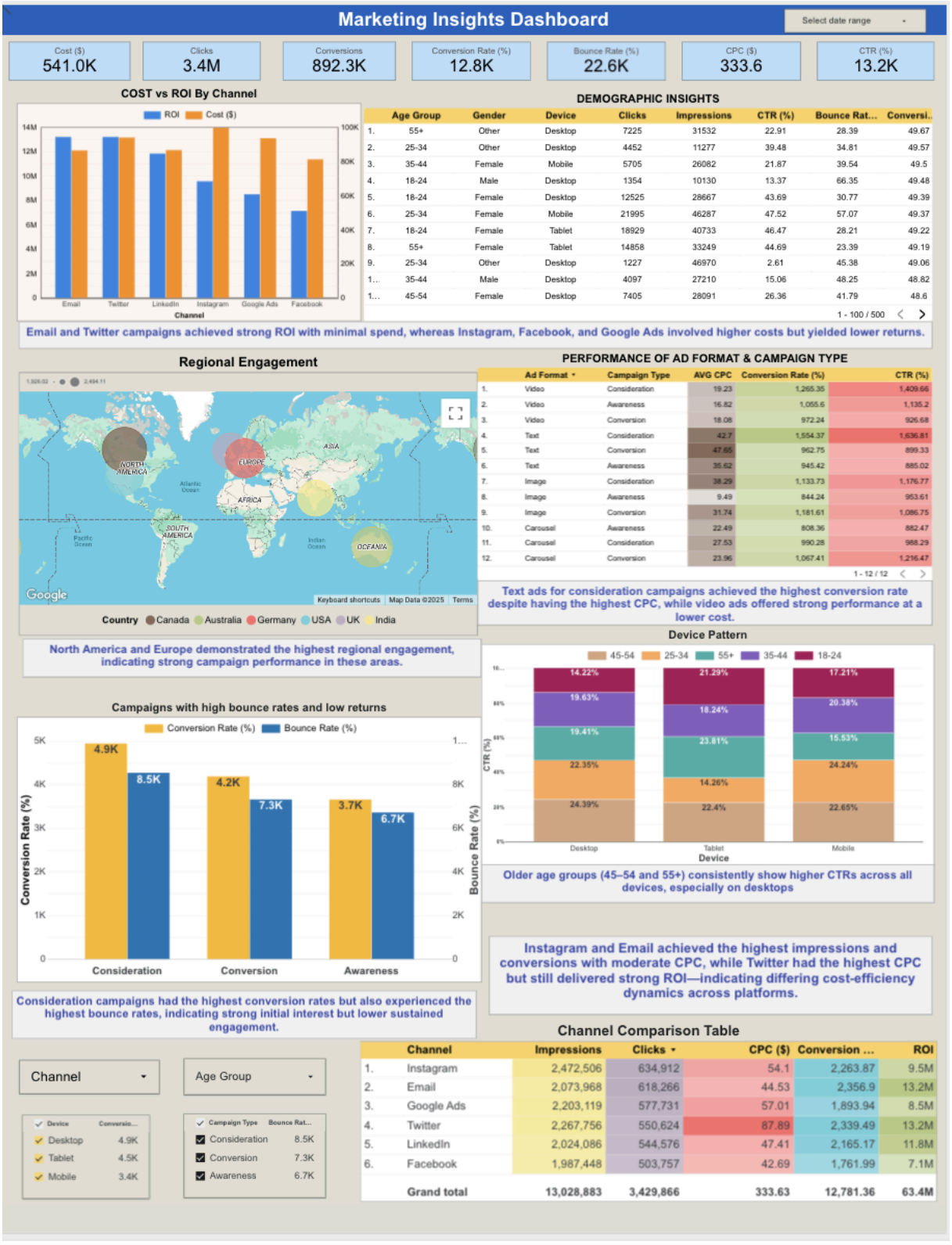
To enhance usability, clarity, and decision-making impact, we developed a redesigned version of the Marketing Insights Dashboard by applying key dashboard design principles learned during our project. This version focuses on visual hierarchy, user-centric layout, and storytelling through data, ensuring that marketing leadership can quickly interpret campaign performance and identify areas for strategic improvement.

Insights Highlighted in Design:

- **Best ROI Platforms**: Twitter and Email.
- **Underperformers**: Instagram, Facebook, and Google Ads due to high cost but low return.
- **Top Engagement Segments**: 18–24-year-olds and female users.
- **Highest CTR Devices**: Desktop, especially for older age groups (45–54 and 55+).
- **Top Ad Format Combo**: Text + Consideration campaigns with peak performance.
- **Cost-effective Format**: Video ads delivering solid engagement at lower cost.

Strategic Layout & Visual Hierarchy

The dashboard begins with a **top row of scorecards** showing critical KPIs like total cost, clicks, conversions, CPC, and ROI—delivering an instant performance snapshot. These are styled in a clean, color-consistent layout (blue for performance, yellow for cost) for maximum legibility.



Challenges Encountered:

Due to the **absence of timestamp data** in the dataset, we could not extract **hourly trends or peak posting times** across platforms. Additionally, **weekly comparisons** of performance failed to render despite extensive attempts at

reformatting the date field—highlighting a limitation in the source data, not the dashboard logic.

BMW Marketing & Performance Dashboard:

The **BMW Performance Dataset**, structured to mirror production data, provides a unified view of user engagement and model-level interest across digital touchpoints. In the **BMW Marketing & Performance Dashboard (Looker Studio)**, visualizations capture essential KPIs such as total users, average time spent, regional distribution, model preference (iX1, iX, i7), and platform usage (iOS vs Android). To enhance decision-making, **two new KPIs** have been introduced:

1. **User Retention Rate** – This KPI tracks the percentage of returning users over a selected time range, helping assess long-term user engagement and the effectiveness of campaigns in building loyalty.

2. **Conversion Potential Index** – A composite metric derived from time spent, region activity, and model interactions, this KPI identifies high-intent user segments likely to convert, assisting sales and targeting strategies.

Following best practices in dashboard design, these KPIs are integrated using intuitive filters (e.g., model, time range, region), ensuring clarity without overcrowding. The layout emphasizes **storytelling** through a logical flow — from **user demographics** to **behavioral trends** and finally to **business impact** — supporting both high-level strategic insights and granular drill-downs. Each KPI is paired with contextual tooltips and trend indicators to enhance interpretability and align with stakeholder goals.

CONCLUSION

Over the course of my Practice School-I internship at IIC Interactive Labs, I successfully completed a certified course on Power BI Basics offered by Simplilearn, which laid a strong foundation in data modeling, transformation, and visualization. Building on this, I developed three interactive dashboards using Power BI Web, working with raw datasets to analyze sales performance, regional trends, product-level insights, and deal size distributions. Each dashboard was designed to extract actionable insights and support strategic decisions. Through iterative improvements and mentor feedback, I implemented features such as conditional filters, graph-specific slicers, and a professional color scheme that enhanced clarity and storytelling.

Due to macOS limitations in Power BI Web, I transitioned to Looker Studio for the final two dashboards, which offered better interactivity, integration with Google-based data, and design flexibility. One of these involved a complete redesign of the marketing insights dashboard using layout, visual hierarchy, and user-centric storytelling best practices. The final version delivered a multi-dimensional view of campaign performance, demographic behavior, ROI trends, and device usage—providing leadership with a clear, data-driven tool.

In the final phase, I built the BMW Marketing & Performance Dashboard using a dummy dataset modeled after production data. It consolidated KPIs such as total users, average time spent, regional engagement, platform usage (iOS vs Android), and model interest (iX1, iX, i7). I also introduced two advanced KPIs: **User Retention Rate**, tracking returning users, and a custom **Conversion Potential Index**, identifying high-intent segments. Filters like model, region, and time range ensured clarity without clutter. The dashboard design followed a logical narrative flow—from user demographics to behavior and business impact—enabling both executive and detailed views.

This internship significantly strengthened my technical and analytical skills in Power BI and Looker Studio, while offering practical exposure to using BI tools for marketing insights and data-driven decision-making.

REFERENCES

1. https://www.simplilearn.com/learn-power-bi-basics-free-course-skillup
2. https://app.powerbi.com/home?experience=power-bi
3. Power BI Office Hour 29: Power BI for Mac Users (Power BI Online)
4. Power BI Office Hour 29: Power BI for Mac Users (Power BI Online)
5. First data set: https://www.kaggle.com/datasets/kyanyoga/sample-sales-data?resource=download
6. Final Business Dashboard of first data set: https://app.powerbi.com/links/1snBlA2ugw?ctid=b9abe56c-43a7-4e67-a17b-32cfa05c95c8&pbi_source=linkShare
7. Second Data set: https://docs.google.com/spreadsheets/d/199e0216UIDKJ3Rypxilk1zSBZ74hTvSxKWk8-wWXkvA/edit?gid=110288708#gid=110288708
8. Performance dashboard of second data set: https://app.powerbi.com/links/W196jaRXOv?ctid=b9abe56c-43a7-4e67-a17b-32cfa05c95c8&pbi_source=linkShare
9. Learn full Looker Studio Course in 2.5 Hours in Hindi | Looker studi…
10. Multi-Dimensional Marketing Insights Dashboard first phase: https://lookerstudio.google.com/reporting/75fe1078-d7b7-49bb-93e5-03aee302e41f
11. 12 Dashboard design tips for better data visualization
12. Stop Sharing Data—Start Telling Stories
13. 5 KPI Dashboard Examples (from Real Businesses)
14. Multi-Dimensional Marketing Insights Dashboard final phase: https://lookerstudio.google.com/reporting/75fe1078-d7b7-49bb-93e5-03aee302e41f
15. BMW Dashboard Design.mov
16. BMW Dashboard Design.pdf

GLOSSARY

S.NO.	TERM	DEFINITION
1	**Power BI**	A Business Intelligence (BI) tool by Microsoft used to visualize and analyze data.
2	**Looker Studio**	A free tool from Google that allows users to create interactive dashboards and reports from various data sources.
3	**Dashboard**	A collection of visuals like charts, KPIs, and maps displayed on one page for analysis.
4	**Dataset**	A collection of data loaded into Power BI for modeling and visualization.
5	**DAX(Data Analysis Expression)**	A formula language used in Power BI to create custom calculations and measures.
6	**Slicers**	A visual filter that allows users to interactively refine report data.
7	**Power Query**	The ETL (Extract, Transform, Load) tool in Power BI for shaping and cleaning data.
8	**KPI**	Key Performance Indicator – a visual that tracks progress toward a measurable goal.
9	**Filters**	A tool used to restrict the data shown in a visual, page, or entire report.