An

INTERNSHIP REPORT

on

DATA ANALYTICS
Submitted in partial fulfillment of the requirements for the award of the degree of

BACHELOR OF TECHNOLOGY
in
ARTIFICIAL INTELLIGENCE & DATA SCIENCE
by

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(Roll No. 22AK1A3023)

under the Mentorship of
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DEPARTMENT OF ARTIFICIAL INTELLIGENCE & DATA SCIENCE

ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES, TIRUPATI
(AUTONOMOUS)

2025-26

ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES, TIRUPATI (AUTONOMOUS)
DEPARTMENT OF ARTIFICIAL INTELLIGENCE & DATA SCIENCE

CERTIFICATE

This is to certify that MS. KUPPAM DIVYA SREE **(22AK1A3023)** has carried out Virtual Internship on "DATA ANALYTICS" and submitted to the Department of **ARTIFICIAL INTELLIGENCE & DATA SCIENCE** of Annamacharya Institute of Technology and Sciences, in partial fulfilment of the requirements for the award of the Degree of **Bachelor of Technology** in Artificial Intelligence & Data Science is meeting the Academic Regulations.

Signature of Internship Mentor   **Signature of HOD**

DECLARATION

I am KUPPAM DIVYA SREE **(22AK1A3023),** Studying Final year B. Tech in Artificial Intelligence & Data Science of Annamacharya Institute of Technology and Sciences, hereby declare that this Internship report titled **"DATA ANALYTICS"** has been done by me. The Internship work carried out is original and has not been submitted to any other University or Institution for the award of any credits. I promise to meet all the mandatory requirements as specified by the Academic regulations

PLACE:

DATE :

SIGNATURE

ACKNOWLEDGEMENT

The needs and deeds of a particular person are only satisfied with the support and endurance of many.

I would like to express my deepest appreciation for **All India Council for Technical Education, AICTE New Delhi** for their commitment to the betterment of technical education and the opportunities they have made available to our students. I look forward to the continued collaboration between **EXCELR and APSCHE** to provide more student Internships to gain hands-on experience and become better-prepared professionals.

I would like to extend my heartfelt thanks to Principal **Dr.C. Nadhamuni Reddy** for his constant encouragement and support during the Internship period.

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Finally, I would like to express my sincere thanks to faculty members of AI Department, Lab Technicians, Internship company trainers and friends, one and all that have helped me to complete the Internship successfully.

KUPPAM DIVYA SREE

Roll No 22AK1A3023

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Registered Hall ticket no. **22AK1A3023** under **Annamacharya Institute Of Technology And Sciences(A)**,

Tirupati of **JNTUA** has successfully completed Short-Term Internship of 2 months on **Data Analytics**

with Tableau Organized by **SmartBridge Educational Services Pvt. Ltd.** in collaboration with **Andhra**

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Certificate ID: **EXT-APSCHE_DA-54429**

Date: 21-Jul-2025

Place: Virtual

Amarendar Katkam
Founder & CEO

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(PLAN-14F2691E3A32)

According to the Your Learning Builder - Plans system of record

Completion date: 28 May 2025 (GMT)

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(MDL-510)

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Completion date: 24 May 2025 (GMT)

Learning hours: 1 hr

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(PLAN-2EC3A305F2C3)

According to the Your Learning Builder - Plans system of record

Completion date: 02 Jun 2025 (GMT)

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ABSTRACT

Data analytics with Tableau is an essential practice in today's data-driven world. It involves the systematic examination and visualization of data to uncover meaningful insights and support informed decision-making. Tableau, a leading data visualization and business intelligence tool, empowers analysts and organizations to transform complex datasets into clear, interactive, and visually engaging dashboards. Its primary goal is to simplify data interpretation, enabling businesses to recognize trends, patterns, and hidden opportunities that drive growth and efficiency. Tableau emphasizes accuracy, clarity, and accessibility, making analytics more approachable for both technical experts and non-technical stakeholders.

Using Tableau, data analysts can connect to various data sources, clean and process information, and create real-time reports with ease. The platform provides a wide range of visualization options—such as bar charts, heat maps, scatter plots, and geographic maps—that allow users to explore data dynamically. Collaboration is a key feature, as Tableau dashboards can be shared across teams and organizations, ensuring transparency and collective decisionmaking. Beyond technical expertise, effective use of Tableau requires analytical thinking, creativity, and strong problem-solving skills to present data stories that are both accurate and impactful.

In an era where organizations are inundated with massive amounts of data, continuous learning and adaptability are vital in data analytics. Tableau regularly evolves with new features to address emerging business needs, making it a powerful tool for staying competitive. By enabling clear communication of insights, Tableau plays a crucial role in safeguarding business strategies, optimizing resources, and fostering innovation. It is a proactive and indispensable approach to harnessing the power of data in our digitally interconnected world.

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CHAPTER-1

INTRODUCTION

Introduction

The pursuit of knowledge and hands-on experience is a journey that takes aspiring professionals from the realm of theoretical learning into the dynamic world of practical application. My journey into the realm of web development was significantly enriched by my 8-week internship with Preqinsta Virtual Internship, HMI Foundation a forward-thinking company registered under the AICTE. This internship report offers a comprehensive account of my transformative experience during this period, highlighting the amalgamation of knowledge, skills, and creativity in the ever-evolving domain of web development.

The Importance of Academia-Industry Synergy

During this 8-week internship, I delved into a spectrum of roles and responsibilities, harnessing skills and insights in areas such as Networking, Ports, Cyber tools , and more. Additionally, I familiarized myself with industry-standard tools, practices, and emerging trends, ensuring that my contributions remained at the cutting edge of web development. I shall also discuss how these activities aligned with Preqinsta Virtual Internship's commitment to driving innovation and sustainable growth in the digital space.

The subsequent sections of this report will reflect the nuanced facets of my internship, including specific roles, tasks, and learning experiences that have shaped my journey. It is my aspiration that this report not only encapsulates the knowledge and skills acquired during the 8-week tenure but also underscores the profound impact of my internship on my career aspirations and the value it has added to my academic voyage. The association with Preqinsta Virtual Internship marks a symbiotic learning experience, where I, as an intern, have grown and contributed, and the organization, in return, has enriched my understanding of web development in the context of the Indian startup ecosystem.

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WEEKLY OVERVIEW

Week 1	Introduction to Data Analytics Getting Started with Tableau (Installation, Interface, and Basics)
Week 2	Connecting to Data Sources Data Preparation and Cleaning in Tableau
Week 3	Basic Charts and Visualizations (Bar, Line, Pie, Maps) Working with Filters and Sorting
Week 4	Advanced Charts (Heat Maps, Scatter Plots, Tree Maps) Calculated Fields and Parameters
Week 5	Dashboards and Stories Interactive Features (Actions, Tooltips, Drill-Downs)
Week 6	Data Blending and Joins Connecting Tableau with Excel, SQL, and Cloud Data
Week 7-8	Project – Build an Interactive Business Dashboard using Tableau

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MODULES

Introduction to Data Analytics with Tableau Data Analytics with Tableau is the process of exploring, analyzing, and visualizing data using Tableau, a powerful business intelligence (BI) and data visualization tool. Tableau allows individuals and organizations to transform raw data into meaningful insights through interactive dashboards and visual reports. Unlike traditional reporting, Tableau emphasizes simplicity, interactivity, and storytelling with data, making insights accessible to both technical and non-technical users.

The primary goal of using Tableau is to help organizations make data-driven decisions by recognizing patterns, identifying trends, and understanding hidden relationships within datasets. Tableau is widely used in industries such as finance, healthcare, marketing, retail, and technology.

Tableau operates with a user-friendly drag-and-drop interface, making it possible to connect to multiple data sources, clean and transform data, and build dashboards without complex coding. It promotes **clarity, accuracy, and collaboration**, enabling teams to stay ahead in today's data-driven world.

Week 1 – Introduction to Tableau and Data Connections

Getting Started with Tableau

- Tableau installation and workspace overview.

- Understanding Tableau Desktop, Tableau Public, and Tableau Server.

- Introduction to the drag-and-drop interface.

Connecting to Data Sources

- Tableau supports multiple data sources such as Excel, CSV, SQL databases, Google Sheets, and cloud platforms.

- Users can connect to **live connections** (real-time data updates) or **extracts** (saved snapshots of data).

➢ **Techniques**

- Direct connection to files (Excel, CSV).

- Database connection (SQL, Oracle, MySQL).

- Cloud connection (Google BigQuery, AWS, Azure).

➤ **Countermeasures (Best Practices)**

- Ensure data source permissions are secure.

- Use extracts to reduce load on live databases.

- Regularly validate source connections.

Week 2 – Data Preparation and Cleaning

Data Preparation

Raw data often contains missing values, duplicates, or inconsistencies. Tableau offers tools to clean and transform data before visualization.

Techniques

- **Data Interpreter** – automatically cleans and organizes Excel sheets.

- **Pivoting Data** – reshaping data for analysis.

- **Joining and Blending** – combining multiple tables or sources.

- **Data Filtering** – removing irrelevant records.

Tools

- Tableau Prep (for advanced cleaning and shaping).

- Built-in Tableau features (calculated fields, groups, sets).

Countermeasures (Challenges)

- Always verify data accuracy.

- Document applied transformations.

- Avoid unnecessary joins that slow down dashboards.

Week 3 – Basic Visualizations

Introduction to Charts in Tableau

Visualizations turn raw data into meaningful patterns. Tableau provides simple drag-and-drop chart creation.

➢ **Common Visualizations**

- **Bar Charts** – compare categories.

- **Line Charts** – show trends over time.

- **Pie Charts** – show proportions.

- **Maps** – display geographical data.

Methods

- Apply filters to highlight relevant data.

- Use sorting and grouping to organize charts.

- Combine multiple visualizations in one worksheet.

➢ **Tools**

- Show Me panel (suggests suitable charts).

- Marks card (control color, size, labels).

Week 4 – Advanced Visualizations and Calculations

Advanced Charts

- **Heat Maps** – show intensity of data values.

- **Scatter Plots** – show relationships between two measures.

- **Tree Maps** – represent hierarchical data.

- **Dual-Axis Charts** – combine two graphs in one.

Calculated Fields and Parameters

- Create new fields using formulas (e.g., Profit = Sales – Cost).

- Parameters allow user input for interactive dashboards.

➤ **Countermeasures (Best Practices)**

- Avoid unnecessary calculations in live dashboards.

- Test formulas for accuracy.

- Keep visualizations simple to avoid confusion.

Week 5 – Dashboards and Stories

Dashboards

Dashboards combine multiple worksheets to present data insights in one view.

- Add interactivity with **filters, actions, and highlights**.

- Optimize dashboard layout for desktop and mobile.

Stories

Stories are a sequence of dashboards used for data storytelling.

➤ **Techniques**

- Use consistent colors and chart types.

- Apply interactive filters for exploration.

- Add text and images for context.

➤ **Countermeasures**

- Avoid clutter by using too many charts.

- Keep dashboards responsive and optimized for speed.

Week 6 – Working with Multiple Data Sources

Data Blending vs Joins

- **Joins** – combine tables from the same source.

- **Blending** – merge data from different sources.

Examples

- Combine sales data from Excel with customer info from SQL.

- Blend marketing campaign data with social media statistics.

➢ **Best Practices**

- Use extracts to improve performance.

- Define relationships carefully to avoid duplication.

Week 7 – Advanced Analytics in Tableau

Analytical Features

- **Trend Lines** – analyze patterns over time.

- **Forecasting** – predict future values using built-in algorithms.

- **Clustering** – group similar data points automatically.

Methods

- Apply forecasting to sales data.

- Use clustering to segment customers.

- Add reference lines for benchmarks.

➢ **Countermeasures**

- Validate predictions against real data.

- Avoid over-reliance on automatic models.

Week 8 – Project Work

Project Example: Build an Interactive Business Dashboard ·

Connect to real-world data (e.g., sales, finance, healthcare).

- Clean and transform the dataset.

- Create multiple visualizations.

- Combine into a dashboard with filters and interactivity.

- Present findings as a story to decision-makers.

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PROJECT

Data Analytics with Tableau

Overview of the Project

- Develop a **data analytics project using Tableau** to connect, clean, analyze, and visualize data.
- Objectives include creating a **user-friendly dashboard**, implementing **interactive filters**, and providing **insights for decision-making**.
- Components consist of **data connection**, **data cleaning and transformation**, **visualizations (charts, maps, KPIs)**, **dashboards and stories**, and **publishing/sharing**.
- Ethical considerations require **data privacy, avoiding misleading visuals, and ensuring transparency** in analysis.
- Rigorous testing of dashboards for accuracy, performance, and usability is vital.
- The project aims to strike a balance between **useful insights and responsible data handling**, ensuring analytics is done fairly and ethically.

End Users

- Tableau dashboards and reports are widely used by:
  - **Business Analysts** – to track performance and KPIs. o **Managers and Executives** – to make data-driven business decisions. o **Data Scientists** – to explore patterns before applying advanced models.
  - **Teachers/Researchers** – to present findings in a visual format.
  - **Government and NGOs** – to analyze policies, public data, and trends.

  However, if misused (e.g., hiding data, manipulating visuals), analytics can lead to **wrong decisions**.

Always deploy Tableau responsibly with **accurate, transparent data** to protect trust and reliability.

Solutions and Their Propositions

- Develop Tableau dashboards only with **trusted, accurate data sources**.

- Use analytics for **legitimate purposes** like performance monitoring, forecasting, and reporting.
- Ensure **data privacy and compliance** with legal frameworks (like GDPR).
- For educational projects, focus on **learning Tableau's features and visualization best practices**.
- Adopt a **white-hat approach**:
  - Gain permission before analyzing sensitive datasets.
  - Prioritize user privacy and confidentiality.
- Consider making the project **open-source or shareable** so others can inspect, learn, and improve.
- Remember: **Misleading or manipulated analytics is unethical**; always consult experts when analyzing sensitive data.

Modeling the Project

- The project aims to develop an **interactive Tableau dashboard** capable of analyzing and visualizing datasets (e.g., sales, healthcare, finance, or education).
- By implementing this tool, it will track and display **trends, KPIs, and comparisons**, providing valuable insights for decision-making.
- The Tableau dashboard will operate in a **simple drag-and-drop interface**, working in real-time with connected data sources.
- The project will prioritize **accuracy, usability, and data privacy**, adhering to ethical considerations.
- Comprehensive **testing and validation** will be conducted to ensure the dashboards are **functional, reliable, and compatible** across devices (desktop, web, and mobile).

Project Steps (instead of Source Code)

Since Tableau is not a coding tool, the project is built through **steps**:

1. **Connect to Data Source** o Example: Excel file with Sales Data (sales.xlsx). o Alternatively: SQL database or Google Sheets.
2. **Prepare and Clean Data** o Remove duplicates. o Handle missing values.
   - Rename fields for clarity.

3. **Build Visualizations** ○ Bar Chart → Sales by Category. ○ Line Chart → Monthly Revenue Trends.

   ○ Map → Sales by Region.

   ○ KPI Cards → Profit, Revenue, Quantity.

4. **Create Dashboard** ○ Combine multiple charts. ○ Add **interactive filters** (Region, Year, Product).

   ○ Add **tooltips** for more details.

5. **Publish/Share** ○ Export as PDF, image, or interactive Tableau Public link.

   ○ Share with team/organization.

Output (Example)

When the dashboard is ready, the **output will look like this**:

- **Bar Chart:** "Technology category has the highest sales compared to Furniture and Office Supplies."

- **Line Chart:** "Revenue shows an upward trend from January to December."

- **Map Visualization:** "Western region contributes the most to total revenue."

- **KPI Cards:** "Total Sales = $500,000 | Total Profit = $80,000 | Total Orders = 5,000."

- **Interactive Dashboard:** Users can filter by *Year, Region, or Product Category* and see instant changes in charts.

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Results and Conclusions Result

- The project on **Data Analytics with Tableau** aimed to design and implement an interactive dashboard that could visualize, analyze, and present insights from raw datasets.

- Through continuous testing and refinement, the team successfully developed **clear and user-friendly dashboards** capable of displaying trends, KPIs, and comparisons.

- The outcomes of the project include **better decision-making support, simplified data interpretation, and improved communication of insights** across users.

- Additionally, the project highlighted the importance of **data cleaning, ethical data handling, and accurate reporting**, ensuring that the analytics process contributes positively to organizational goals.

Conclusions Conclusion of Preqinsta Virtual Internship

The Preqinsta internship has been an **enriching and rewarding journey**, offering valuable exposure to real-world projects and industry practices. During this period, I had the opportunity to **work on Tableau-based analytics tasks, explore visualization techniques, and contribute to meaningful projects** that enhanced both my technical and professional skills.

Skill Development

The internship at Preqinsta allowed me to strengthen my expertise in:

- **Data analytics** using Tableau.

- **Data cleaning and preparation** for visualization.

- **Designing dashboards** with charts, maps, KPIs, and filters.

- **Storytelling with data** to   make insights   clear   and   actionable. The **hands-on practice** has been an invaluable step in bridging the gap between academic knowledge and professional applications.

Teamwork and Collaboration

Working within the Preqinsta team gave me insights into how collaborative projects succeed. I learned the importance of:

- Sharing ideas openly.

- Accepting feedback constructively.

- Supporting   team   members   with   complementary   skills.

This collaboration emphasized that **data analytics is most effective when combined with teamwork and collective decision-making**.

Adaptability and Innovation

The dynamic nature of the projects encouraged me to be flexible and creative. I adapted to:

- Different datasets and domains (sales, finance, social, etc.).
- Changing requirements for dashboard features.
- Finding **innovative ways to visualize data** that best communicate insights. This adaptability improved my problem-solving skills and prepared me to handle **realworld analytics challenges**.

Professional Growth

The Tableau analytics project gave me a clear view of the **expectations and standards of the industry**. I gained:

- Confidence in working with real-world data.
- A deeper understanding of professional work ethics.
- A clearer vision of pursuing a career in **data analytics and business intelligence**.

Networking and Mentorship

The guidance from mentors and collaboration with colleagues at Preqinsta was invaluable. Their support and expertise:

- Enhanced my learning experience.
- Helped me apply best practices in analytics.
- Shaped my career goals with clarity and confidence.

Final Thoughts

In conclusion, the Preqinsta internship has been a **transformative experience**. It not only strengthened my technical skills in **Tableau and data analytics** but also contributed to my **personal and professional growth**. I am thankful for the opportunity to learn, contribute, and grow within such a supportive environment.

This internship has given me the confidence to pursue a career in data analytics, and I am excited to apply these lessons to future challenges. I extend my sincere gratitude to the entire Preqinsta team for their mentorship, trust, and support.

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VERIFIABLE CREDENTIALS

Verifiable Link for Certificate

https://apsche.smartinternz.com/certificate/student/bdc8c4f925fc4fc2c307322d57aa43b4

GitHub Repository Link

https://github.com/DivyaSree2416/Electricity--Consumption--Patterns--Using-

-Tableau-