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Restaurant Sales Intelligence Report In Tableau

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Abstract: This analysis examines a restaurant chain sales dataset covering transaction recorded across November and December 2022, spanning five major European cities — London, Lisbon, Madrid, Berlin, and Paris. The dataset capture nine key attributes including Order ID, Date, Product, Price, Quantity, Purchase Type, Payment Method, Manager, and City, forming a structured foundation for evaluating multi-dimensional sales performance. Burger emerge as the highest revenue-generating product, followed by Fries and Chicken Sandwiche, while Sides & Other contributes the least to overall revenue. Geographically, Lisbon leads in both total revenue and quantity sold, closely followed by London, whereas Berlin and Paris record comparatively lower performance. Purchase behavior analysis reveals that Online transaction are the most frequently used channel, followed by Instore and Drive thru. In terms of payment preferences, Credit Card dominates as the most widely adopted method, ahead of Cash and Gift Card usage. These finding highlight key revenue regional performance disparities, and customer purchasing preferences, offering a data-driven foundation for improving inventory planning, targeted marketing strategies, and overall operational decision-making.

Keywords: restaurant sales analysis, revenue performance, European cities, customer purchase behavior, online transactions, payment methods, inventory planning, sales dataset, operational decision-making, revenue generation, targeted marketing, and business analytics.

I. INTRODUCTION:

Sales data analysis is a critical role in understanding customer behavior, evaluating products performance and identifying revenue growth opportunities. This report presents a comprehensive analysis of a sales dataset using Tableau, focusing on uncovering patterns, trends, and performance indicators through interactive visual analytics.

The primary problem addressed in this analysis is the lack of clear visibility into sales performance across different products, cities, and payment methods. Businesses often collect large volumes of transactional data, however, without proper visualization and structured analysis, it becomes difficult to interpret performance metrics or identify actionable insights. Decision-makers require a centralized analytical view that highlights revenue distribution, customer purchasing preferences. Therefore, this project aims to convert raw sales records into an organized analytical dashboard that enables efficient monitoring and comparison of business performance indicators.

The dataset used for this analysis contains transactional information including Order ID, Date, Product category, Price, Quantity, Purchase Type, Payment Method, Manager, and City. These parameters serve as the foundation for evaluating both operational and financial outcomes. Time-based analysis was also incorporated to observe sales distribution over specific dates and identify possible trends or fluctuations.

Several analytics dimensions were considered while designing the Tableau dashboard. Product categories were analyzed to determine top-performing and low-performing item based on revenue contribution. Geographic analysis was conducted to compare sales performance across cities, helping identify high-revenue markets. Purchase Type (Online vs In-store) was examined to understand customer channel preferences, while Payment Method analysis provided insight into customer transaction behavior.

The expected outputs of this analysis include interactive visualization such as sales trend chart, revenue comparison dashboards, product performance rankings, and geographic distribution maps. These outputs enable stakeholders to quickly interpret complex datasets through graphical representation rather than manual data inspection. Tableau filtering and drill-down capabilities further allow users to explore detailed insights.

The result of this analysis are intended to support decision-making by highlighting revenue drivers, identifying profitable product, and reveal operational patterns that influence sales outcomes. By visualizing key performance indicators (KPIs), the analysis helps stakeholders recognize growth opportunities, improve inventory planning, and optimize marketing or sales .

Overall, this project demonstrate how business intelligence tool like Tableau can transform structured dataset into actionable insight, bridg the gap between raw data and strategic business planning. The analytical framework established in this report provides a scalable approach that can be extended to future datasets for continuous performance monitoring and improvement.

II. LITERATURE SURVEY:

Bera, Samiran presented an application-oriented study on using operational analytics to predict restaurant sales revenue [1]. The author integrated machine learning techniques with operational data such as historical sales, customer footfall, and possibly seasonal and promotional variables. The study demonstrates how predictive models can support managerial decision-making by improving revenue forecasting accuracy. It emphasizes the practical value of analytics in optimizing staffing, inventory planning, and demand management within restaurant operations.

Gómez-Talal, Ismael, et al., explored the application of big data and unsupervised learning techniques to restaurant ticket data combined with environmental variables (e.g., weather, calendar effects [2]. By applying clustering and pattern-recognition methods, the authors identify hidden structures in sales behavior. The findings suggest that incorporating contextual variables improves forecasting performance and allows managers to better understand demand variability. The research highlights the strategic role of big data analytics in enhancing sales prediction accuracy.

Roy, Debjit, Eirini Spiliotopoulou, and Jelle de Vries provided a comprehensive overview of restaurant analytics as an emerging field [3]. It synthesizes current industry practices and academic research across areas such as demand forecasting, revenue management, pricing optimization, and customer analytics. The authors identify gaps in the literature and propose future research directions, including integration of real-time data, AI-driven personalization, and cross-functional analytics. The study positions restaurant analytics as a strategic capability essential for competitive advantage.

Bujalance-López, Lourdes, et al examined the evolution of revenue management (RM) practices in the restaurant industry[4]. The authors analyze prior research on pricing strategies, capacity management, demand segmentation, and performance optimization. The study identifies methodological trends, theoretical foundations, and research gaps, particularly regarding dynamic pricing and data-driven decision systems. It concludes by outlining future challenges, including integration of AI, sustainability considerations, and omnichannel service environments.

Alwahedi, Hamda, and Khaled Aljaberi investigated the relationship between restaurant branding strategies and financial performance using data analytics tools[5]. The authors examine financial metrics and brand-related indicators to assess how brand positioning influences profitability. Through quantitative analysis, the study demonstrates that strong branding, when supported by data-driven financial evaluation, contributes positively to revenue growth and market competitiveness. The research underscores the importance of integrating branding analytics with financial decision-making

Imran, H. M., et al provided a broad examination of predictive analytics applications across pricing, marketing, and operations[6]. Although not limited to restaurants, the study offers relevant insights for hospitality businesses. It discusses machine learning models used for price optimization, demand prediction, customer segmentation, and operational efficiency improvements. The authors emphasize the transformative impact of predictive analytics in enhancing profitability and competitive positioning through evidence-based decision-making.

Mitra, Rony, et al focused on quick-service restaurants (QSRs) and proposes hybrid deep learning models for improved sales forecasting[7]. By combining techniques such as recurrent neural networks (RNNs), LSTM models, or other ensemble approaches, the authors enhance predictive accuracy over traditional statistical models. The results demonstrate significant improvements in short-term demand forecasting, enabling better inventory control, workforce scheduling, and waste reduction. The paper highlights the growing role of advanced AI in QSR operational management.

Chae, Bongsug, Chwen Sheu, and Eunhye Park research adopts a dynamic capabilities framework to analyze demand forecasting within a large restaurant chain[8]. The authors argue that forecasting effectiveness depends not only on analytical tools but also on organizational learning, data integration capabilities, and managerial responsiveness. Using empirical evidence, the study shows how firms can build adaptive forecasting systems to respond to environmental uncertainty. It bridges operations management theory and practical forecasting implementation.

Kim, Sung, Jaewook Kim, and Jewoo Kim investigated how spatial factors influence restaurant delivery operations[9]. The authors analyze geographical data, delivery distances, population density, and operational features to understand their impact on delivery performance and sales outcomes. The findings reveal that location significantly affects operational efficiency, service speed, and revenue potential. The research provides strategic guidance for site selection and delivery zone optimization in the growing online food delivery market.

Li, Zhuoxin, and Gang Wang examined the impact of on-demand delivery platforms on restaurant sales performance[10]. Using empirical data, the authors analyze whether joining third-party delivery platforms increases total sales or merely shifts in-house dining revenue to online channels. The study explores platform economics, commission structures, and competitive dynamics.

III. MATERIALS AND METHODS:

The **Sales Data Analysis dataset (2022)** represents a global-level retail sales dataset that captures transactional information from multiple European cities including London, Madrid, Lisbon, Berlin, and Paris. The dataset contains **254** sales record collected between **November 7, 2022 and December 29, 2022**, providing detailed insight into product demand, purchasing patterns across different regions. The primary products included in the dataset are **Burger, Fries, Beverage, Chicken Sandwiches, and Sides & Other**. Each transaction records key attributes such as **Order ID, Date, Product, Price, Quantity, Purchase Type, Payment Method, Manager, and City**. These attributes help in understanding how customers interact with products, how frequently purchases are made, and how sales vary across geographic locations. From a local perspective, the dataset highlights how individual cities contribute to overall sales performance, with **London** showing **the highest frequency of orders**, suggesting stronger consumer demand in that region compared to other cities. Different managers oversee operations in each city, indicating decentralized management across locations, which helps in evaluating regional performance and managerial effectiveness. The dataset also reveals product demand variations, where commonly ordered items such as **Burgers and Beverages** show consistent demand across cities, while **Sides & Other** products display more fluctuating demand, suggesting seasonal, promotional, or customer preference influences. This variation help business understand which products require more focus in terms of inventory, marketing, and pricing strategy. From a global demand perspective, the dataset demonstrates growing customer engagement during the November–December period, likely influenced by holiday season purchasing trends, promotions, and increased consumer spending. This time-based pattern help business identify peak sales period and prepare operational strategy accordingly. Payment methods and purchase types further reflect customer preferences, showing a mix of **online and in-store purchases**. This information is useful for business to improve digital platforms.

From 2021 to 2022. In **Paris**, overall revenue increased from €100 billion in 2021 to €114 billion in 2022, representing a 14% rise[1]. In **London**, tourism spending was approximately £0.756 billion in 2021 and rebounded significantly in 2022, resulting in a very large percentage increase year-on-year[2]. **Berlin** saw tourism revenue grow from about €3.6 billion in 2021 to roughly €6.56 billion in 2022, an increase of approximately 82%[3]. **Madrid** in 2021 are not confirmed in the same format, tourism revenue rose substantially in 2022 as international travel recovered[4]. **Lisbon** experienced growth from around €4.25 billion in 2021 to approximately €5.01 billion in 2022, marking an estimated 18% increase[5].

Tableau is a powerful and widely used business intelligence and data visualization platform designed to help organizations transform raw data into meaningful and interactive visual insight. It is built for both technical and non-technical users, allowing them to explore, analyze, and present data without requiring advanced programming skill. Tableau is available in multiple versions to suit different needs, including Tableau Desktop for local development, It Server and Tableau Online for organizational sharing and collaboration, Tableau

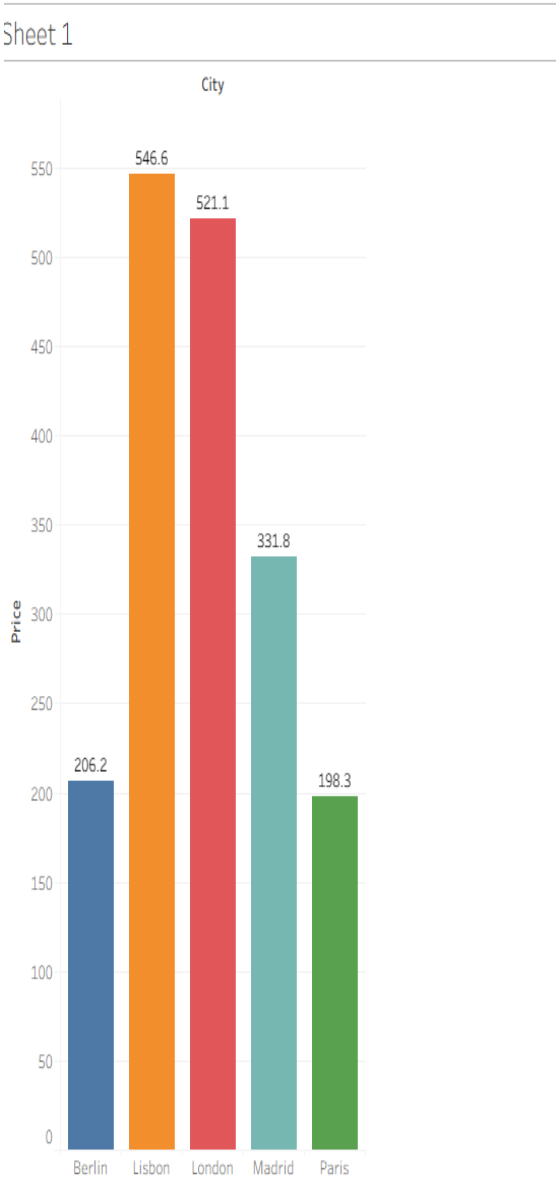
Public for free public visualization, It is for data cleaning and preparation. The tool work by first connecting to a wide variety of data sources such as Excel sheets, CSV files, Text files, etc... Once the data is connected, user can clean and prepare it using features like data type formatting, calculated field, joins, and data blending, etc.. which allows combining multiple data source into a single analysis. Tableau Prep is also available as a dedicated solution for more complex data transformation tasks before the data is brought into the main workspace. One of Tableau most notable features is its intuitive drag-and-drop interface, which allows users to build a wide range of visualizations simply by dragging data fields onto a canvas. Tableau automatically suggests the most suitable chart type based on the selected data, making it easy to create bar charts, line charts, pie charts, scatter plots, heat maps, tree maps, etc... The geographic mapping feature is particularly useful for visualizing regional and spatial data, helping business to identify performance difference across cities and countries. It also support the creation of interactive dashboard, where multiple visualization are combined into a single unified interface. These dashboard can include filters, parameters, and actions that allow user to interact with the data by clicking, hovering, or selecting different option. Dashboard can then be published and shared through Tableau Server, Tableau Online, or Tableau Public, making insights accessible to teams and decision-makers from any device or browser. In terms of advanced features, Tableau offers calculated field and Level of Detail expression. These capabilities make Tableau suitable for a wide range of use cases including sales and revenue analysis, customer behavior tracking, financial reporting, supply chain management, healthcare analytics, and marketing performance monitoring. The key advantages of Tableau include its user-friendly design, ability to handle large datasets efficiently, strong real-time collaboration features. Tableau remains one of the most trusted and widely adopted analytics platforms in the industry, valued for its ability to make data analysis accessible, efficient, and visually compelling for business of all size.

IV. DATA ANALYTICS AND VISUALIZATION:

(1)Bar Graphs:

1

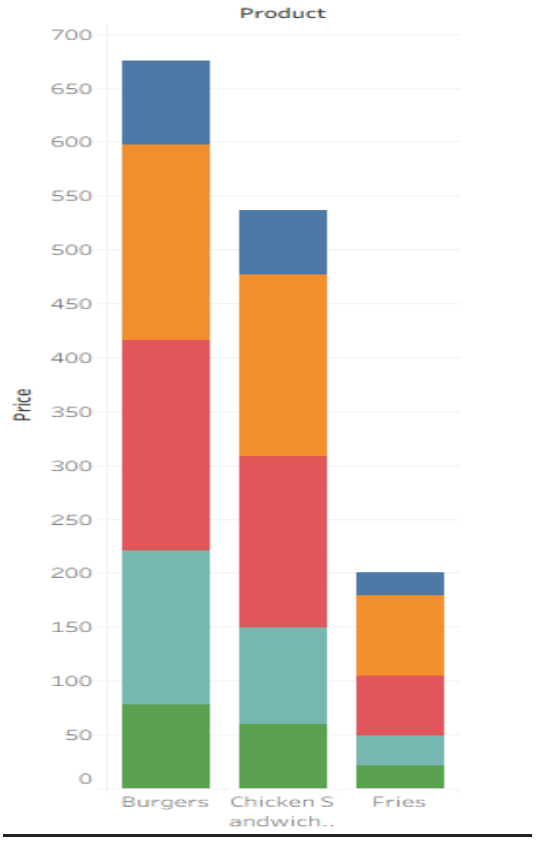
→CITY and PRICE:



The graph shows about that Lisbon have the highest price, followed by London , Madrid , Berlin while Paris have the lowest price across all cities. Among the cities, London and Lisbon contribute the most to overall prices. Lisbon is the most popular and profitable city in the restaurant sales data.

2

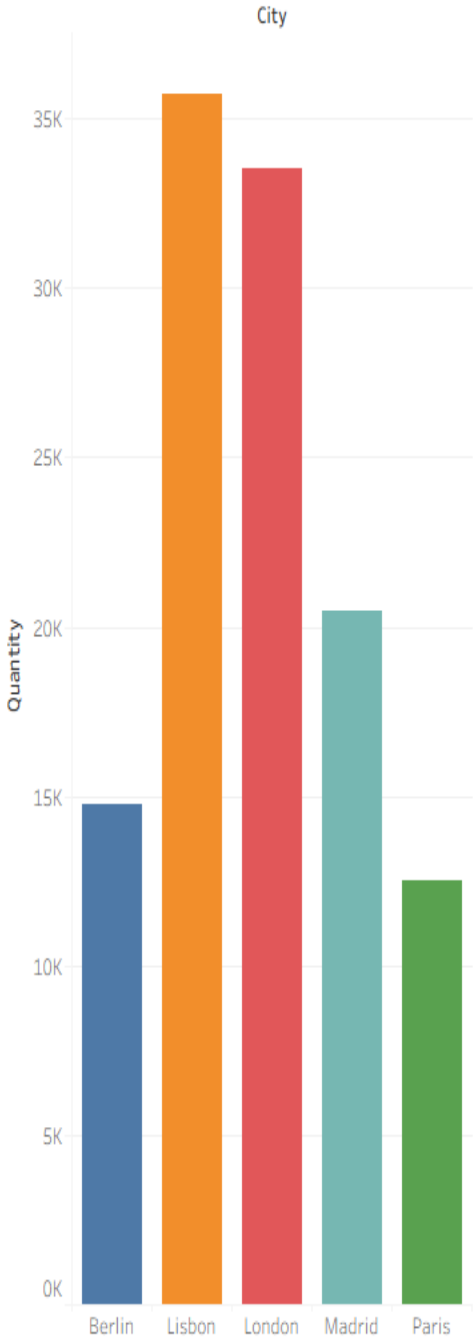
→ PRODUCT and PRICE:



The graph shows about that Burgers have the highest sales, followed by Chicken Sandwich while Fires have the lowest sales across all cities. Among the cities, London and Lisbon contribute the most to overall sales. Burgers are the most popular and profitable product in the restaurant sales data.

3

→CITY and QUANTITY(maximum,At most):



This graph shows about that Lisbon have the highest quantity, followed by London , Madrid, Berlin while Paris have the lowest quantity across all cities. Among the cities, London and Lisbon contribute the most to overall qualities. Lisbon is the most popular and profitable city in the restaurant sales data.

(2)Text Tables:

→PAYMENT METHOD vs PRICE:
→PRODUCT vs PRICE:
→CITY vs PRICE:

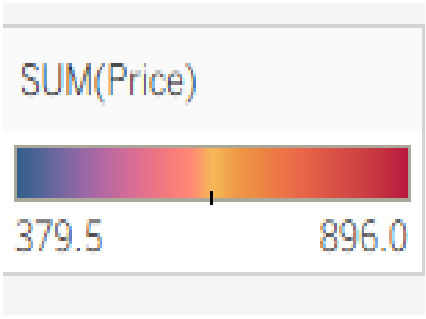
Payment M..	
Cash	528.5
Credit Card	896.0
Gift Card	379.5

product vs price

Product	
Beverages	147.5
Burgers	675.5
Chicken Sandwiches	536.5
Fries	200.0
Sides & Other	244.5

city vs price

City	
Berlin	206.2
Lisbon	546.6
London	521.1
Madrid	331.8
Paris	198.3



This graph shows about the difference values of price according to the payment method , product and cities. In this graph the lowest price is shown in the colour of blue and the average colour is shown as orange and the highest price is shown in the colour red.

(3)HIGHLIGHT TABLE:

City vs Product:

<City vs Product>

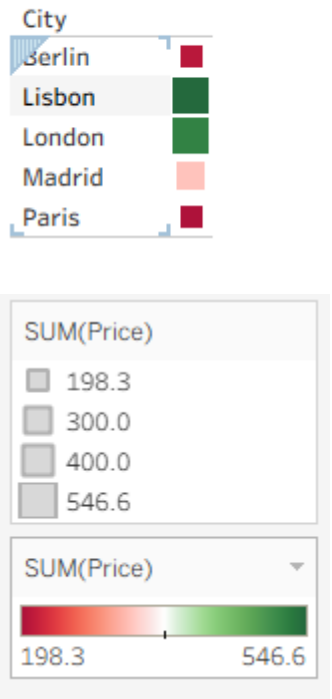
Product	City				
	Berlin	Lisbon	London	Madrid	Paris
Beverages	17.7	47.2	41.3	26.6	14.8
Burgers	77.9	181.9	194.9	142.9	77.9
Chicken Sandwiches	59.7	168.4	159.2	89.6	59.7
Fries	20.9	74.4	55.8	27.9	20.9
Sides & Other	29.9	74.9	69.9	44.9	25.0

This is the Highlight table which displays the products how much is sold in the cities. Burgers are sold highest as per the other products. Beverages are sold lowest as per the other products.

(4)HEAT MAP:

City vs Price:

<City vs price>

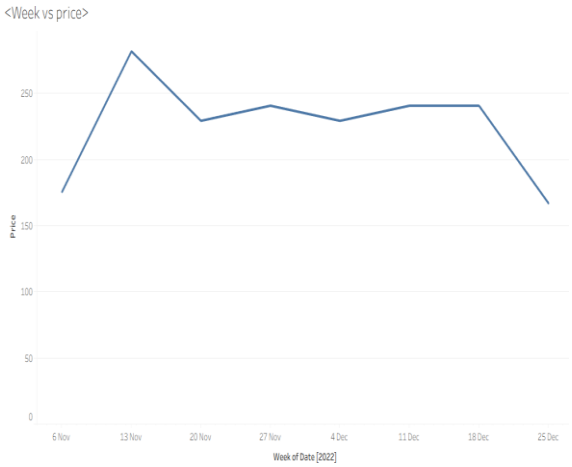


This is the Heat Map which shows about the difference between city and prices according to the size and colour. The red colour is the lowest priced city and the light pink and light green colours are the average priced city and the dark green colour is the highest priced city.

(5)Line Charts:

1

→ Price vs Weekdays(Date)

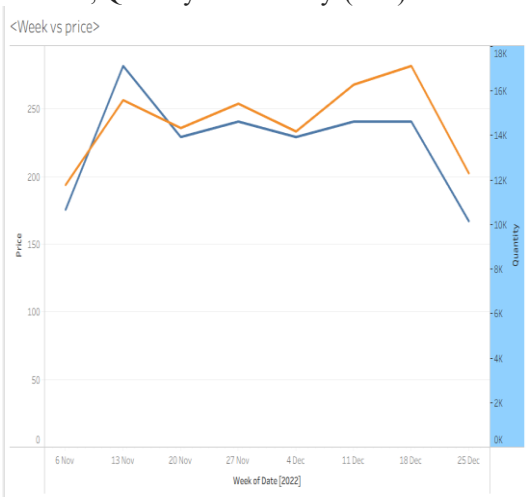


This graph is about the range of the price according to the weeks from the first day to the last day of the data (from 6-nov 2022 to 25-nov 2022).

2

– Dual Axis Line Chart

→ Price, Quantity vs Weekdays(date):



This graph shows about the dual axis range of Price and Quantity according to the weeks from 6-nov 2022 to 25-nov 2022.

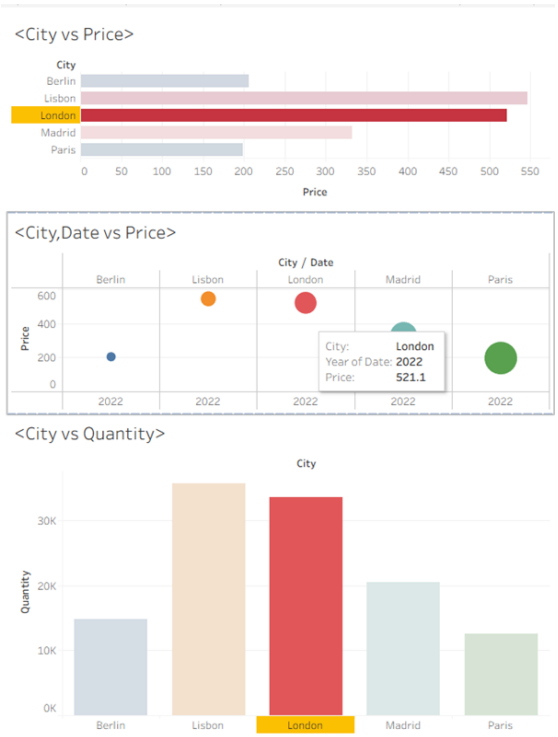
(6)DashBoard:

1

→City vs Price

→City vs Quantity

→City/Date vs Price



This Dashboard shows the three different graphs in one dashboard which are linked by one attribute(City). If we want to select any one value(Lisbon) from three different graphs to know the values then this method is used.

2

→ City vs Price

→ City vs Quantity

→ City vs Product(Highlight Table)

→ City, OrderID vs Price

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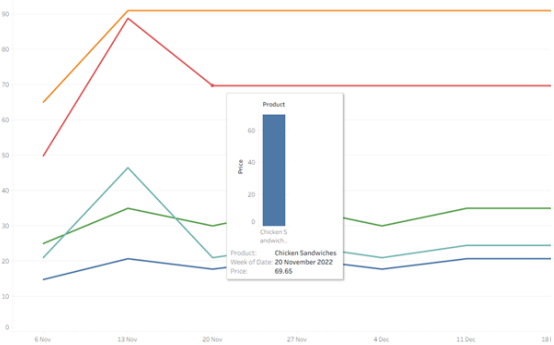
This Dashboard shows the four different graphs in one dashboard which are linked by one attribute(City). If we want to select any one value(Madrid) from three different graphs to know the values then this method is used.

(7)<u>Tooltip</u>:

1

→Product vs Price

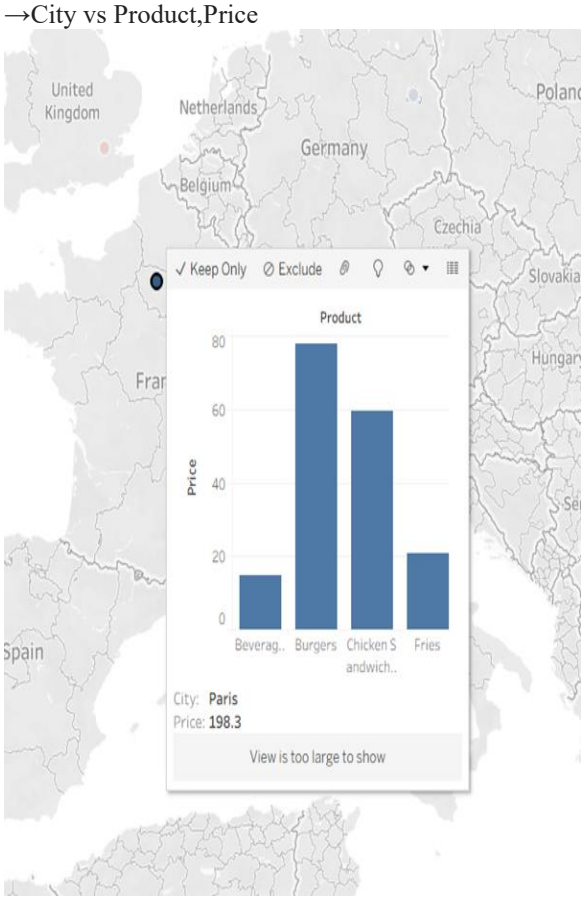
→Date



This method is called as ToolTip, in this one sheet is connected to the other sheet with the tooltip. After connected, we can see the two different data like Price and Product and also the Date.

2

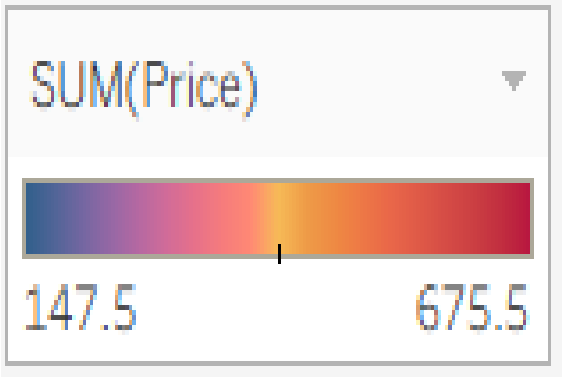
→City vs Product,Price

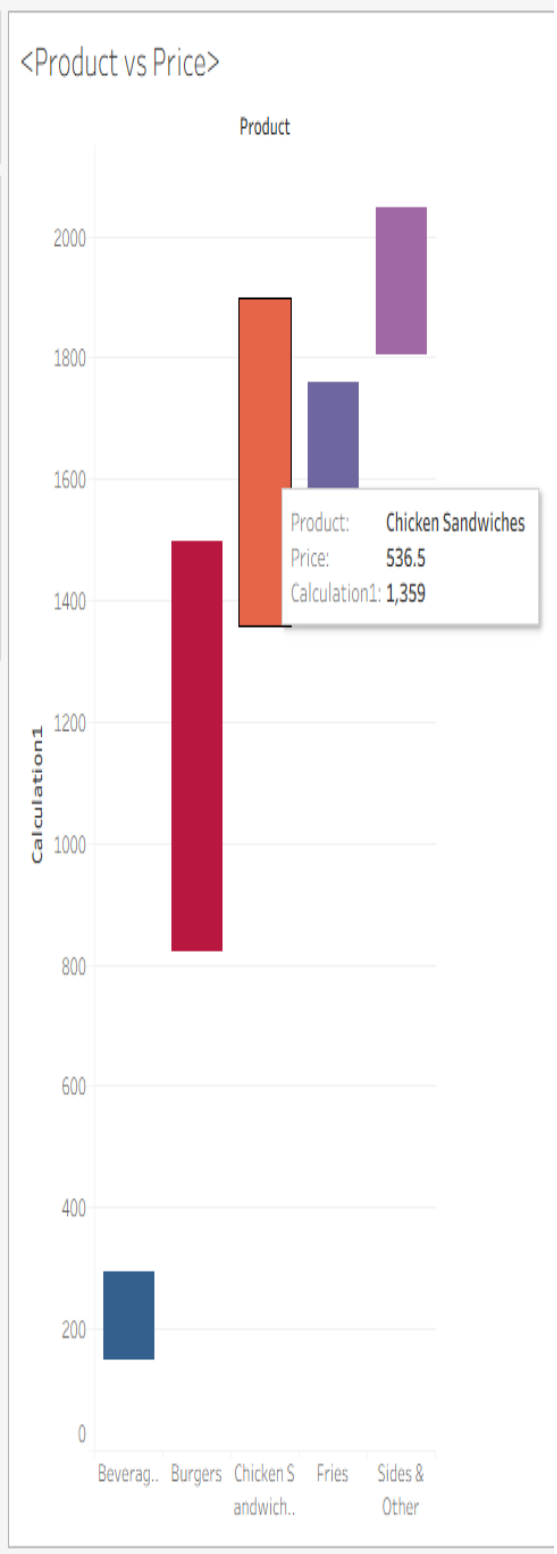


This method is called as ToolTip, in this one sheet is connected to the other sheet with the tooltip. After connected, we can see the two different data like Price and Product according to the city.

(8)<u>Water Fall</u>:

→Product vs Price

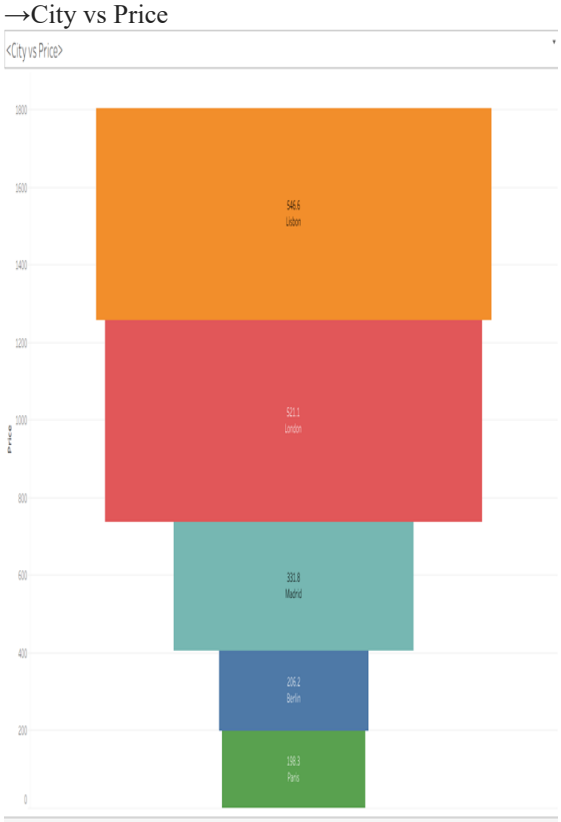


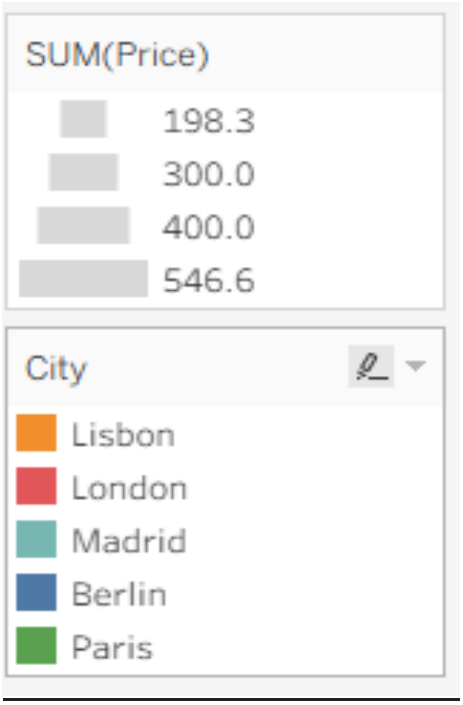


This is the graphical chat that is represented by the Product and Price, It represent the calculated value with the selection of the feature of Running Tools and make Gantt Bar from automatic in the marks .

(9)Funnel:

→City vs Price





This method is Funnel , this is Shows the values and names according to itself and in the order. It make easy to view the values.

V. DISCUSSIONS:

The restaurant sales data provide valuable insights into customer purchasing behavior, product performance, and regional sales trend across different cities. Using Tableau visualization, the dataset was analyzed based on city, product category, quantity, payment methods, and purchase type to identify major business patterns.

The analysis reveal that Lisbon generated the highest sales revenue and quantity among all cities, followed by London and Madrid, while Paris recorded the lowest sales performance. This indicates that customer demand and purchasing activity were significantly stronger in Lisbon and London during the observed period. Geographic analysis therefore highlight the importance of regional market difference in influencing restaurant revenue.

Product-wise analysis shows that Burgers were the highest selling and most profitable product category across all cities. Chicken Sandwiches also contributed strongly to overall sales, whereas Fries and Sides & Other generated comparatively lower revenue. These suggest that customers prefer main meal products over additional side items. Such insights can help business improve menu planning and inventory management.

The analysis of payment methods indicates that Credit Card transactions contributed the highest revenue, showing a strong preference for digital payment systems among customers. In terms of purchase type, Online orders generated higher sales compared to In-store and Drive-thru purchases, emphasizing the growing importance of online food ordering platforms and digital service in the restaurant industry.

Time-based analysis using line chart and dual-axis chart showed fluctuations in sales and quantity during November and December 2022, likely influenced by holiday-season demand and increased consumer spending. The interactive dashboards, heat map, highlight table, and tooltip created in Tableau improved data interpretation and enabled efficient comparison of sale performance across different dimensions. Overall, the analysis demonstrate how business intelligence tools can transform raw sales data into meaningful insight that support better business decision making and operational planning.

VI. CONCLUSION

This project successfully demonstrates the application of Tableau in analyzing restaurant sales data and converting raw transactional records into meaningful business insight. Through various visualization techniques such as bar graph, line chart, heat map, highlight table, dashboard, tooltip, funnel chart, and waterfall chart, the analysis identified important patterns related to sales performance, customer preference, and regional business trend.

The study reveal that Lisbon and London were the highest performing cities in terms of revenue and sales quantity, while Burgers emerged as the most profitable and frequently purchased product category. The analysis also showed that customers preferred Credit Card payments and Online purchasing method, reflecting the growing importance of digital transactions and online food ordering system in the restaurant industry.
Time-based sales analysis highlighted fluctuations in demand during November and December 2022, indicating the impact of seasonal purchasing behavior and holiday spending trend. These finding can help business improve inventory management, marketing strategies, pricing decision, and operational planning.

This document is highly useful for restaurants because it provides a clear understanding of customer behavior, sales trends, and product performance through visual analytics. Restaurant manager can use these insights to identify high-demand products, improve menu planning, optimize stock management, and develop better promotional strategies. The analysis also helps businesses understand customer purchasing preferences, preferred payment methods, and the effectiveness of online sales channel. By using these insights, restaurants can improve operational efficiency, increase customer satisfaction, and maximize overall profitability.

Overall, the project proves that data analytics and business intelligence tool like Tableau play a significant role in supporting data driven decision making. The visual dashboard and interactive report make complex sales data easier to understand and allow stakeholders to quickly identify business

opportunities and performance issues. The analytical framework developed in this study can be further expanded with larger datasets and predictive analytics techniques to improve future forecasting and strategic planning in the restaurant industry.

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