FINAL PROJECT REPORT

On Data Analysis using Excel

Submitted by

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BONAFIDE CERTIFICATE

This is to certify that the project titled " Data Analysis using Excel" is a bonafide work of Kirti 22BCA10576 student of Bachelor of Computer Applications, University Institute of Computing, Chandigarh University, who carried out the project work under the guidance of Mr Arvinder sir, Professor at Chandigarh University.

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Submitted for the project viva-voce examination held on

INTERNAL EXAMINER EXTERNAL **EXAMINER**

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this endeavor.

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Lastly, I would like to thank everyone .

Comprehensive Report on Data Analysis using Excel

Introduction to Data Analysis

Data analysis is the systematic application of statistical and logical techniques to describe, summarize, and compare data. It plays a crucial role in decision-making and strategic planning.

By analyzing data, organizations can uncover trends, measure performance, and predict future outcomes. Modern businesses rely heavily on data analysis to remain competitive, improve customer satisfaction, and drive innovation.

Data analysis involves several key steps:

1. **Data Collection**: Gathering relevant data from various sources, including databases, surveys, and logs.
2. **Data Cleaning**: Removing inconsistencies, errors, and duplicates to ensure data accuracy and reliability.
3. **Data Exploration**: Understanding the structure, patterns, and key metrics within the data using descriptive statistics and exploratory visualization.
4. **Data Transformation**: Converting raw data into a structured format suitable for analysis.
5. **Data Visualization**: Using charts, graphs, and dashboards to represent data visually for easier interpretation.

6. **Insight Generation**: Drawing actionable conclusions and recommendations based on the analysis.
7. **Communication of Results**: Presenting findings through comprehensive reports, visualizations, or presentations to stakeholders.

With the advent of big data and advanced analytics, data analysis has become even more critical, enabling businesses to gain deeper insights and maintain a competitive edge.

The Role of Excel in Data Analysis

Microsoft Excel is a versatile and widely-used tool for data management and analysis. Its user-friendly interface and robust features make it accessible to users with varying levels of expertise. Key advantages of Excel in data analysis include:

1. **Data Organization**: Excel's tabular format allows users to neatly organize and structure data for analysis, with features like sorting and filtering.
2. **Formulae and Functions**: Built-in functions such as SUM, AVERAGE, VLOOKUP, INDEX-MATCH, and logical functions enable efficient data manipulation and calculation.
3. **Conditional Formatting**: Highlighting important trends, outliers, or anomalies directly within the dataset.
4. **Data Validation**: Ensuring the accuracy and consistency of data entries through validation rules.

5. **Data Visualization**: Creating a variety of charts, graphs, and dashboards to communicate insights effectively.
6. **Pivot Tables and Charts**: Allowing users to summarize, sort, and analyze large datasets interactively, offering flexibility and depth in analysis.
7. **Macros and Automation**: Automating repetitive tasks to save time and reduce errors.
8. **Integration**: Seamlessly integrating with other tools and platforms like Power BI, SQL, and external APIs for advanced analysis.

Excel's flexibility and wide array of features make it a cornerstone of data analysis for businesses and individuals alike, suitable for tasks ranging from basic calculations to complex analytics.

Understanding Pivot Tables and Charts

Pivot Tables and Charts are powerful tools within Excel that help transform raw data into meaningful summaries and visualizations. They provide a dynamic way to interact with data, making it easier to uncover insights. Key features and benefits include:

- **Summarization**: Quickly aggregate data based on categories such as region, product, or time period, enabling high-level overviews.

- **Reorganization**: Rearrange data dynamically by dragging and dropping fields within the Pivot Table interface.
- **Filtering**: Apply filters and slicers to focus on specific aspects of the dataset, facilitating in-depth exploration.
- **Visualization**: Combine with Pivot Charts to present data in a clear, interactive, and impactful manner.
- **Automation**: Automatically updates when the underlying data changes, ensuring up-to-date insights.

Raw Data:

index	Order ID	Cust ID	Gender	Age	Age Group	Date	Month	Status	Channel	SKU
1	171-1029312-3038738	1029312	Women	44	Adult	04-12-2022	Dec	Delivered	Myntra	JNE1233-BLUE-KR-031-XXL
2	405-2183842-2225946	2183842	Women	29	Teenager	04-12-2022	Dec	Delivered	Ajio	SET414-KR-NP-L
3	171-1641533-8921966	1641533	Women	67	Senior	04-12-2022	Dec	Delivered	Myntra	SET261-KR-PP-S
4	404-7490807-6300351	7490807	Women	20	Teenager	04-12-2022	Dec	Delivered	Amazon	SET110-KR-PP-M
5	403-9293516-4577154	9293516	Women	62	Senior	04-12-2022	Dec	Delivered	Myntra	JNE2294-KR-A-XXL
6	407-1298130-0368305	1298130	Men	49	Adult	04-12-2022	Dec	Delivered	Flipkart	JNE3797-KR-XXL
7	407-1298130-0368305	1298130	Women	23	Teenager	04-12-2022	Dec	Delivered	Meesho	JNE3801-KR-XXL
8	171-5561216-3398711	5561216	Women	70	Senior	04-12-2022	Dec	Delivered	Others	JNE3405-KR-M
9	408-2935263-2935550	2935263	Women	75	Senior	04-12-2022	Dec	Delivered	Amazon	JNE3474-KR-E-XL
10	404-2648970-9042715	2648970	Women	43	Adult	04-12-2022	Dec	Delivered	Myntra	JNE3466-KR-L
11	404-2648970-9042715	2648970	Women	76	Senior	04-12-2022	Dec	Delivered	Amazon	JNE3795-KR-S
12	404-2648970-9042715	2648970	Women	45	Adult	04-12-2022	Dec	Delivered	Myntra	J0181-TP-M
13	408-0265357-4939534	265357	Women	18	Teenager	04-12-2022	Dec	Delivered	Amazon	SET217-KR-PP-XL
14	403-9268874-7296313	9268874	Men	44	Adult	04-12-2022	Dec	Delivered	Myntra	SET185-KR-NP-M
15	407-0442660-2736366	442660	Women	52	Senior	04-12-2022	Dec	Delivered	Amazon	SET333-KR-DPT-M
16	406-7482261-1657136	7482261	Women	18	Teenager	04-12-2022	Dec	Delivered	Nalli	J0124-TP-L
17	407-7039962-7080347	7039962	Men	30	Adult	04-12-2022	Dec	Delivered	Meesho	SET304-KR-DPT-XL
18	407-3422488-7373923	3422488	Women	48	Adult	04-12-2022	Dec	Delivered	Others	SET184-KR-PP-XS

Steps to create a Pivot Table in Excel:

1. Select the dataset you want to analyze, ensuring it is well-structured with no blank rows or columns.
2. Go to the "Insert" tab and click on "PivotTable."
3. Choose the location for the Pivot Table (new or existing worksheet).
4. Drag fields into Rows, Columns, Values, and Filters sections as needed.

Using Slicers in Excel

Slicers enhance the interactivity of Pivot Tables and Charts by allowing users to filter data with a simple click. They provide a visual interface for filtering, making it easier to explore large datasets.

Steps to add a slicer:

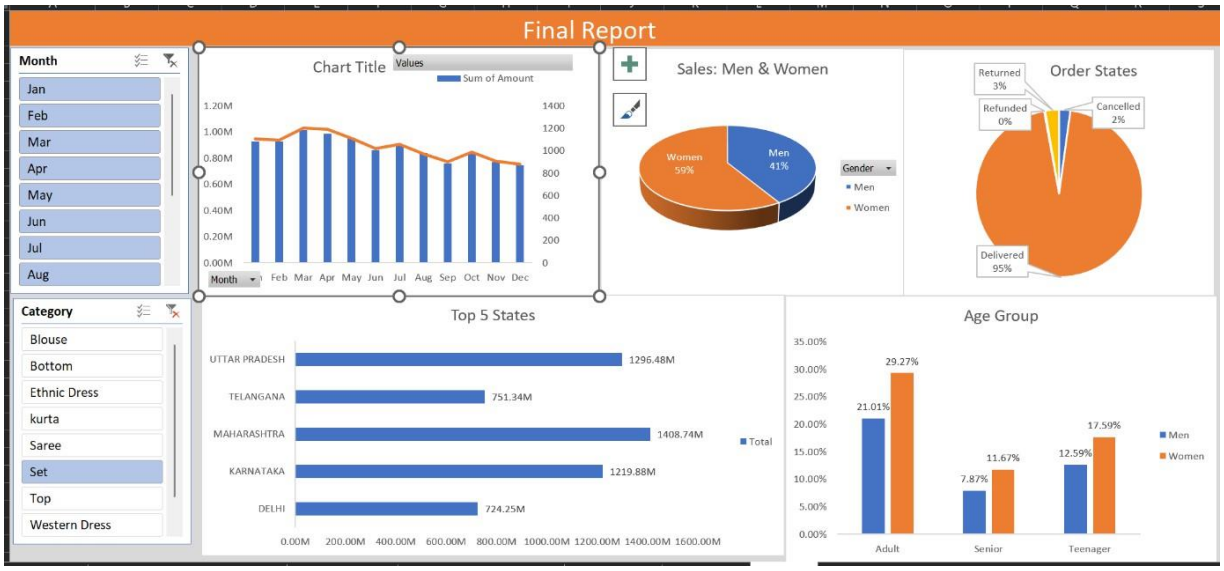
1. Select the Pivot Table or Chart.
2. Go to the "Insert" tab and click on "Slicer."
3. Choose the fields for filtering from the available options.
4. Arrange and format the slicers as needed, adjusting their size and position for better visibility.

Key benefits of using slicers include:

- Easy and intuitive filtering without requiring advanced Excel skills.
- Ability to connect multiple Pivot Tables and Charts to a single slicer for synchronized filtering.

- Improved user experience in dashboards and reports by offering an interactive exploration tool.
- Customization options for better aesthetics, such as color schemes and styles.

Slicers are particularly useful in dynamic dashboards where multiple dimensions of data need to be analyzed simultaneously.



Section 1: Sales and Orders Analysis

Overview

This section examines the trends between sales and order volumes, identifying peak periods and underlying factors contributing to performance variations. Understanding these trends can help

businesses optimize inventory, forecast demand, and plan marketing strategies.

Methodology

Using Pivot Tables and Charts, the "Sales Vs Orders" sheet was analyzed to:

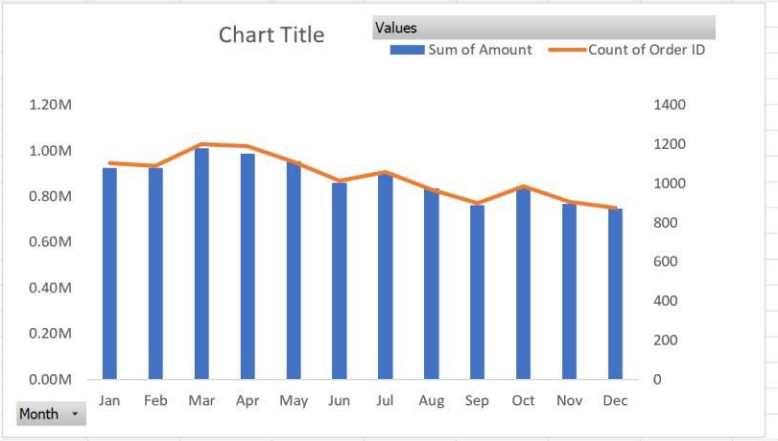
- Aggregate monthly sales and order data.
- Compare sales across different channels and order statuses.
- Visualize trends over time using line and bar charts.
- Filter results dynamically using slicers by channel and status.

Insights

- Monthly sales peaked in December, likely due to holiday shopping and end-of-year promotions.
- Orders from online channels like Amazon and Myntra dominated sales figures, indicating the growing importance of e-commerce.
- Canceled and returned orders were minimal, suggesting strong customer satisfaction and effective logistics.

To deepen the analysis, additional metrics like customer retention rates, average delivery times, and product-specific performance can be incorporated, offering a more comprehensive understanding of the sales ecosystem.

Row Labels	Sum of Amount	Count of Order ID
Jan	923687	1103
Feb	925459	1090
Mar	1010754	1200
Apr	985973	1189
May	952557	1109
Jun	859430	1014
Jul	897639	1056
Aug	835564	966
Sep	759911	897
Oct	843407	985
Nov	766844	906
Dec	746321	876



Section 2: Gender-Based Sales Analysis

Overview

We analyzed sales data segmented by gender to understand purchasing behavior differences. Gender-based analysis provides valuable insights for targeted marketing and product development.

Methodology

- Gender-wise segmentation using Pivot Tables to calculate total sales and average order value.
- Representation through Pivot Charts such as pie charts and bar graphs.
- Slicer-enabled filtering by age group, region, and category to explore trends further.

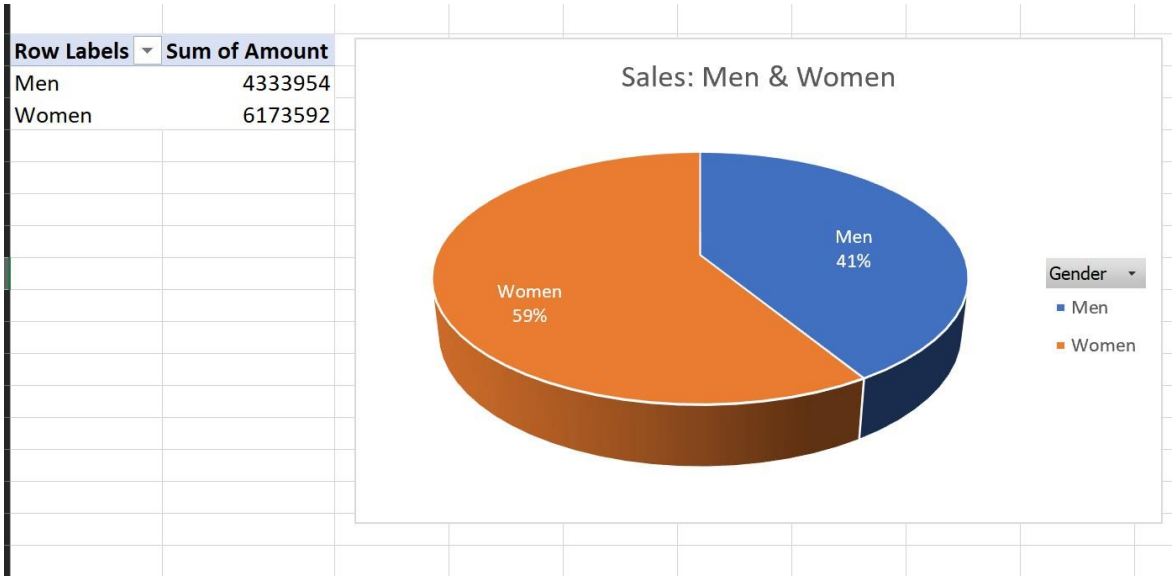
Insights

- Women accounted for a higher sales volume than men, suggesting a stronger purchasing tendency in this demographic.
-

- Age groups such as Adults (30-50 years) had the most significant contribution, with a preference for apparel and accessories.
- Men's purchases were focused on gadgets and formal wear, reflecting different priorities and shopping behaviors.

Insights from this analysis can guide businesses in tailoring product offerings and marketing campaigns to suit the preferences of different demographics, enhancing customer engagement and loyalty.

Sales: Men vs. Women



Section 3: Regional Performance

Overview

The "Order States" sheet was utilized to identify state-level sales performance. Understanding regional trends is crucial for supply chain optimization and market expansion.

Methodology

- Summarized sales by state using Pivot Tables to rank states based on revenue and order volume.
- Highlighted top states using a Pivot Chart with a dynamic slicer for category filtering.
- Analyzed urban vs. rural performance by segmenting sales data based on city tiers.

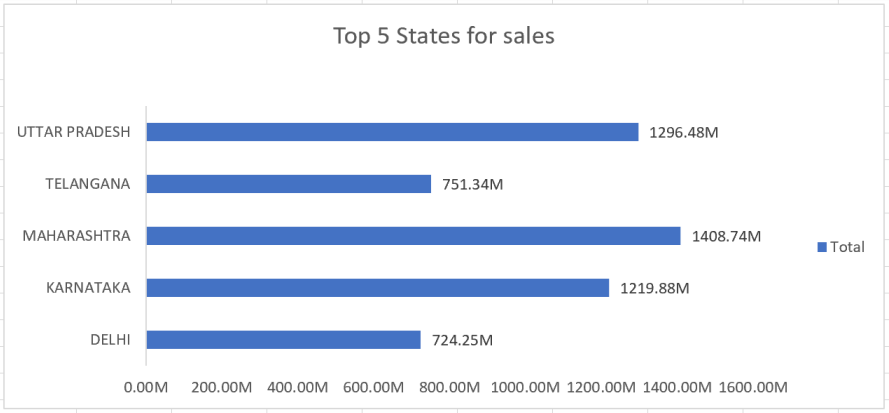
Insights

- Haryana and Punjab emerged as top-performing states, driven by afluent urban centers like Gurugram and Chandigarh.
- Urban areas contributed a larger share of sales, emphasizing the importance of targeting metropolitan markets.
- Categories such as traditional wear and accessories were particularly popular in northern states.

This analysis can inform regional marketing strategies, helping businesses allocate resources efficiently and tap into high-potential markets.

Top 5 States of Sales:

Row Labels	Sum of Amount
DELHI	724245
KARNATAKA	1219884
MAHARASHTRA	1408735
TELANGANA	751341
UTTAR PRADESH	1296475
Grand Total	**5400680**

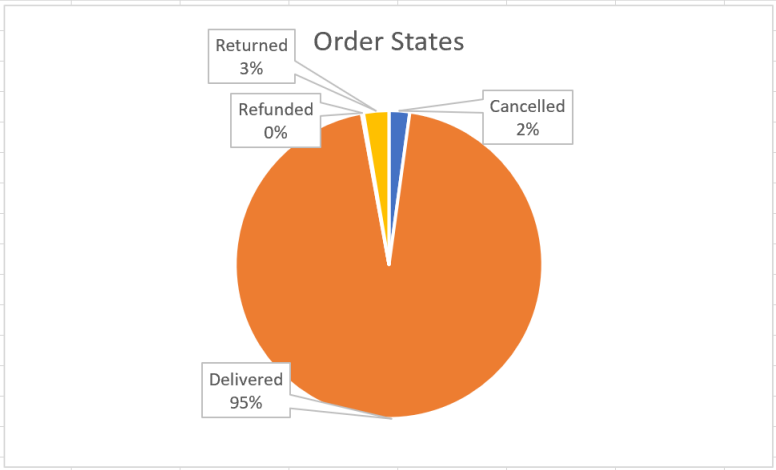


Section 4: Analysis of Order States

Overview

The "Order States" sheet provides valuable insights into the distribution and performance of orders across various states. This analysis highlights patterns and trends that can guide logistics, marketing, and inventory decisions.

Row Labels	Count of Order ID
Cancelled	269
Delivered	11766
Refunded	26
Returned	330



Methodology

- Created Pivot Tables to aggregate data by order states, identifying total orders and revenue contributions.
- Used slicers to filter data by time periods, categories, and delivery statuses for a granular view.
- Visualized the data through heat maps and bar charts to compare states.

Insights

- States such as Maharashtra and Karnataka showed consistently high order volumes, reflecting their robust consumer bases and market maturity.
- Rural regions in states like Uttar Pradesh contributed to steady growth, indicating opportunities for e-commerce expansion.
- Seasonal trends showed spikes in orders from southern states during festival periods, aligning with cultural shopping behaviors.

- Logistic challenges were noted in certain remote areas, leading to delays in delivery, which presents an opportunity for improving last-mile connectivity.

Analyzing the "Order States" data can support better allocation of resources, more targeted marketing efforts, and enhanced customer satisfaction through optimized operations.

Section 5: Age Group-Based Sales Analysis

Overview

This section explores the distribution of sales across various age groups to identify patterns and preferences. Understanding the age-related trends in consumer behavior is critical for tailoring marketing strategies and product development.

Methodology

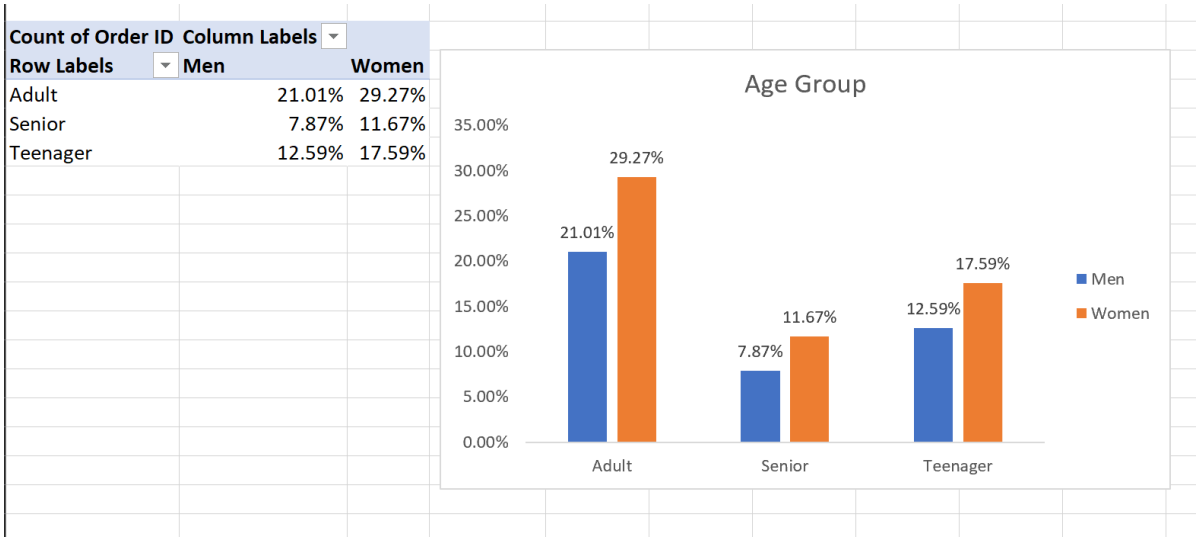
- Data segmentation by age groups using Pivot Tables to calculate total sales, average order value, and product preferences.
- Age groups categorized as Teenagers (18-29), Adults (30-50), and Seniors (50+).
- Represented insights through bar charts and pie charts for better visualization.
- Added slicers to filter data by region, gender, and product category.

Insights

- **Teenagers**: Contributed significantly to sales in categories like gaming and casual wear. Their preferences align with trends in youth-centric products and brands.

- **Adults (30-50)**: Dominated sales figures with purchases across diverse categories such as home appliances, formal wear, and family-oriented products.
- **Seniors (50+)**: Preferred wellness products, books, and traditional wear, indicating a focus on comfort and personal interests.

This analysis highlights the importance of tailoring marketing messages to different age groups and aligning product offerings with their preferences. Targeted campaigns can drive engagement and improve overall sales performance.



Count of Order ID	Column Labels	
Row Labels	Men	Women
Adult	21.01%	29.27%
Senior	7.87%	11.67%
Teenager	12.59%	17.59%

Conclusion

The comprehensive analysis provided valuable insights into various aspects of the data, such as sales trends, demographic preferences, regional performance, and age-based consumer behavior .

By leveraging tools like Excel's Pivot Tables, Charts, and Slicers, the data was transformed into actionable information that can support strategic decision-making. Key takeaways include:

- The importance of targeting high-performing regions and demographics to maximize sales and customer engagement.
- Understanding seasonal and cultural trends to plan marketing and inventory strategies effectively.
- Utilizing advanced Excel features for dynamic and interactive data exploration.

The findings from this report can guide businesses in optimizing operations, enhancing customer satisfaction, and driving growth.

By continually analyzing data and adapting to emerging trends, organizations can maintain a competitive edge in a rapidly evolving market.

Appendix

Appendix A: Pivot Table Configuration

A detailed guide on how to set up Pivot Tables for the analyses performed in this report, including field mappings and filters used.

Appendix B: Chart Types and Styles

An overview of the charts created for the report, specifying their type (bar chart, pie chart, line graph) and formatting settings.

Appendix C: Raw Data Fields

A list of all the fields from the dataset utilized in the analysis, including their descriptions and data types.

Appendix D: Glossary of Terms

Definitions and explanations of key terms such as Pivot Tables, Slicers, and Data Transformation used throughout the report.

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