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4th Year
(7th Semester)

Information Technology

1. Project Title

“ Healthcare Performance & Patient Insights Dashboard ”

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2. Introduction To The Project

This project focuses on analyzing healthcare performance through a data – driven dashboard titled **“ Healthcare Performance & Patient Insights Dashboard ”**. The dashboard visualizes key metrics such as total patients, revenue, profit, treatment cost, departmental performance, regional distribution & payment method usage.

Data Analytics plays a critical role in transforming raw healthcare data into meaningful visual insights. By aggregating & analyzing patient volumes, treatment profits, average costs & regional trends.

The project contributes to the United Nations Sustainable Development Goal (SDG) 3 : Good Health & Well – Being by :

- Promoting efficient & equitable healthcare management.
- Enhancing the quality of care through informed decision – making
- Supporting universal health coverage by optimizing cost and access across regions.

Tableau Public was used to create interactive visualization, allowing stakeholders to explore trends, detect inefficiencies & support data – driven planning.

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3. Problem Statement

The healthcare industry generates vast amounts of data, but much of if remains underutilized. Hospitals often face challenges such as :

- Lack of visibility into department – wise performance.
- Unclear understanding of cost – effectiveness of treatment types.
- Difficulty in identifying regional disparities in patient load or profit.
- Poor insight into monthly patient trends & payment method preferences.

The gap leads to inefficient resource allocation, rising costs & missed opportunities for improving patient care and operational effectiveness.

Efficient healthcare delivery requires :

- Understanding which departments drive the most revenue & patient traffic.
- Identifying treatments with the highest profit margins and average costs.
- Recording regional and seasonal trends to manage resources.
- Making informed financial & administrative decisions.

Without clear insights, hospitals risk overspending, under serving certain areas & delivering uneven care quality.

Data Analytics bridges the gap by :

- Turning raw healthcare data into actionable insights through visualizations.
- Highlighting underperforming areas or high cost treatments.
- Revealing patient behaviour patterns across time, region and treatments type.
- Supporting evidence – based decisions that improve financial & clinical outcomes .

Through this analysis, hospital administrators can make data informed decisions that lead to better patient outcomes and more sustainable healthcare systems.

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4. Objective of The Project

Here's a clear & focused list of project objectives tailored to your healthcare dashboard project.

- Analyze total patients, revenue, profit & expenses across departments.
- Identify top – performing department based on revenue generation.
- Compare treatment types by profit and average cost.
- Visualize regional disparities in patient count & departmental reach.
- Track monthly trends in patient visits to identify peak & low periods.

- Understand patient payment preferences (Online Payment, Cash, Insurance).
- Provide data – driven insights for hospital management and policy planning.
- Support cost optimization and efficient resource allocation.

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5. Hypothesis

- Hospitals can improve overall profitability & patient satisfaction by identifying high – performing departments & optimizing treatment costs based on regional & seasonal patient trends.
- Treatment types with higher average costs do not always correlate with higher profits, indicating a need for cost – efficiency improvements.
- Departments receiving higher patient volumes in certain regions contribute disproportionately to overall hospital revenue & should be prioritized for resource allocation.

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6. Analysis & Visualization (Tableau Dashboard Summary)

The **" Healthcare Performance & Patient Insights Dashboard "** presents an interactive visual analysis of hospital operations using a variety of filters & visualizations to reveal key trends & comparisons.

Filters & Parameters Used :

- **Region :** To explore patient volume & departmental performance by geographic location.
- **Department :** To focus on specific medical units like Cardiology, Orthopedics, etc.
- **Year / Month :** To analyze trends over time (seasonality or monthly fluctuations).
- **Treatment Type :** To compare costs & profits among different services.
- **Payment Method :** To assess patient preferences & financial behavior.

Type of Visualizations :

- **Bar Charts :** Showing revenue, profit & expenses by department & region.

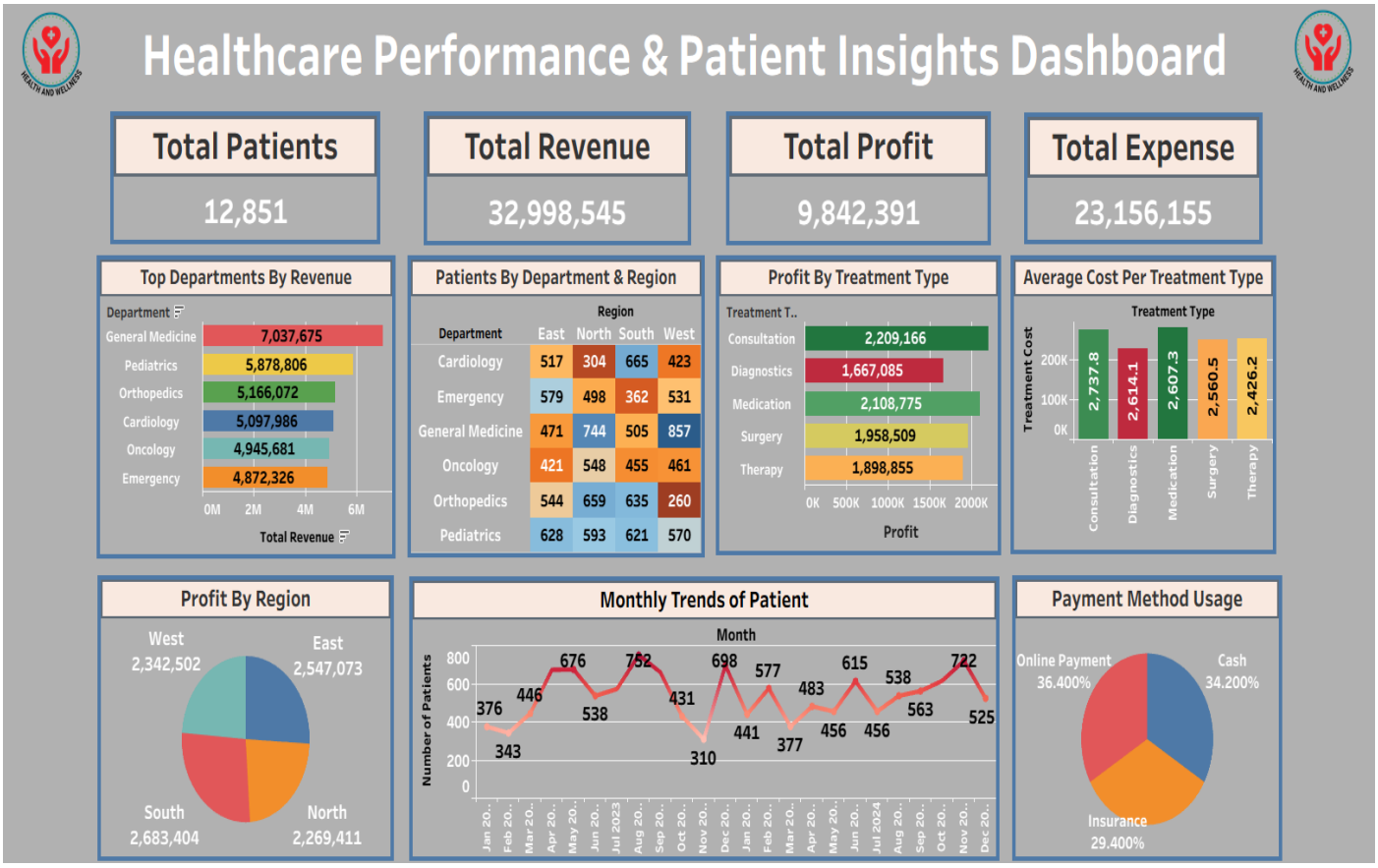
- **Pie Chart :** Depicting distribution of payment methods.
- **Trend Line :** Illustrating monthly patient visit patterns.
- **Heatmap :** Highlighting regional variations in patient count & performance.
- **KPI Cards :** Displaying total revenue, total patients & overall profit at a glance.

Interactivity & User Navigation :

- Users can interact with filters to dynamically update charts.
- Hover features reveal specific values (tooltips) for deeper insights.
- Clickable visual allows drilling down into departments or time periods.
- The layout is designed for intuitive navigation between insights.

Patterns & Comparisons Enabled :

- Compare department-wise performance across regions.
- Identify the most and least profitable treatment types.
- Observe seasonal trends in patient inflow.
- Understand regional disparities in healthcare service delivery.
- Analyze how payment methods influence financial outcomes.



7. Key Insights & Findings

1. High patient volume doesn't always mean high profit : Some departments treat more patients but earns less profit.
2. Regional gaps exist : Certain areas have fewer patients and lower revenue, showing unequal access.
3. Low – cost treatments can be more profitable : Not all expensive treatments bring high returns.
4. Patient visits vary by season : Monthly trends help plan staffing and resources better.
5. Online payments are rising : More patients prefer digital modes over cash.

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8. Proposed Solutions & Recommendations

- Allocate more staff, equipment & budget to departments with high profit & patient demand to maximize impact & efficiency.
- Deploy mobile clinic or targeted awareness campaigns in regions with low patient counts to improve healthcare access & service utilization.
- Invest in digital payment infrastructure & educate patients on using online methods to streamline billing & improve financial tracking.

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9. Probable Outcomes & SDG Contribution

- This project supports SDG 3 : Good Health & Well – Being by identifying gaps in healthcare access, optimizing treatment costs & improving departmental efficiency.
- It can help hospitals allocate resource better, reach underserved regions & enhance patient care. Promoting digital payments also supports faster, transparent healthcare services.

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10. Tools & Technologies Used

I used Microsoft Excel for data cleaning, processing and organization. After that used Tableau Public Edition for creating interactive dashboards & visualizations and also

used for publishing the dashboards on Tableau Public. And used Microsoft Word for making reports.

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11. References

I used Google Search for understanding chart types in deep, aggregation formulas & Tableau Public functionalities.