

# Hospital Supply Chain Analytics Project Report .

## 1] Project Overview :

This project focuses on analyzing hospital supply chain and operations data using Excel, SQL, and Power BI. The objective is to optimize inventory management, monitor financial performance, analyze patient flow, and evaluate staff utilization for better operational efficiency.

## 2] Dataset Description :

The dataset consists of multiple tables stored in an Excel workbook:

- Financial Data: Date, Amount, Expenses\_category, and Description.  
Rows = 500 , Columns = 4

- Inventory Data: Date, Item\_ID, Item\_Type, Item\_Name, Current\_Stock, Minimum\_Required, Max\_Capacity, Unit\_Cost, Avg\_usege\_per\_day, Restock\_Lead\_Time, Vendor\_ID.  
Rows = 500 , Columns = 9

- Patient Data: Patient\_Id, Admission\_Date, Discharge\_Date, Primery\_Diagnosis, Procedures\_Perform, Room\_Type, Bed\_days, Supplies\_used, Equipement\_Used, Staff\_Needed.  
Rows =500 , Columns = 10

- Staff Data: Staff\_Id, Staff\_Type, Shift\_Date, Shift\_Start\_Time, Shift\_End\_Time, Current\_Assignment, Hours\_Worked, Overtime\_Houres, Patients\_Assignment .  
Rows = 500 , Columns = 9

- Vendor Data: Vendor\_ID Vendor\_Name, Iteam\_Suppled, Avg\_Lead\_Time, Cost\_Per\_Item, Last\_Order\_Date, Next\_Delivery\_Date .  
Rows = 3 , Columns = 7

## 3] SQL Analysis :

“Since MySQL doesn’t support multi-sheet Excel, I normalized the dataset by exporting each sheet as a CSV and importing them as separate tables.”

## 1] Top 5 High cost inventory items :

```
40 •   select
41     Item_Name,
42     Current_Stock,
43     Unit_Cost
44   from inventory
45   order by Unit_Cost desc
46   limit 5;
```

	Item_Name	Current_Stock	Unit_Cost
▶	IV Drip	601	19984.16
	Gloves	3801	19913.41
	X-ray Machine	2692	19844.87
	IV Drip	1278	19782.43
	IV Drip	1024	19648.94

## 2] Expense Breakdown by Category :

```
76 •   SELECT
77     Expense_Category,
78     round(SUM(Amount),2) AS Total_Amount
79   FROM finantial
80   GROUP BY Expense_Category
81   ORDER BY Total_Amount DESC;
82
```

	Expense_Category	Total_Amount
▶	Supplies	4906190.82
	Staffing	3842108.81
	Equipment	3611946.10

## 3] Top 5 Critical items by stock gap :

```
103 •   SELECT
104         Item_Name,
105             (Min_Required - Current_Stock) AS Stock_Gap
106     FROM inventory
107    WHERE Current_Stock < Min_Required
108    ORDER BY Stock_Gap DESC
109    LIMIT 5;
```

	Item_Name	Stock_Gap
▶	IV Drip	654
	Surgical Mask	570
	X-ray Machine	525
	Ventilator	515
	IV Drip	435

#### 4] Average bed days by room type :

```
122 •   select Room_Type, Avg(Bed_Days) as avg_bed_days
123     from patient
124     group by Room_Type
125     Order by avg_bed_days desc
```

	Room_Type	avg_bed_days
▶	ICU	7.4286
	General Ward	7.2946

#### 5] Average hours of work by staff :

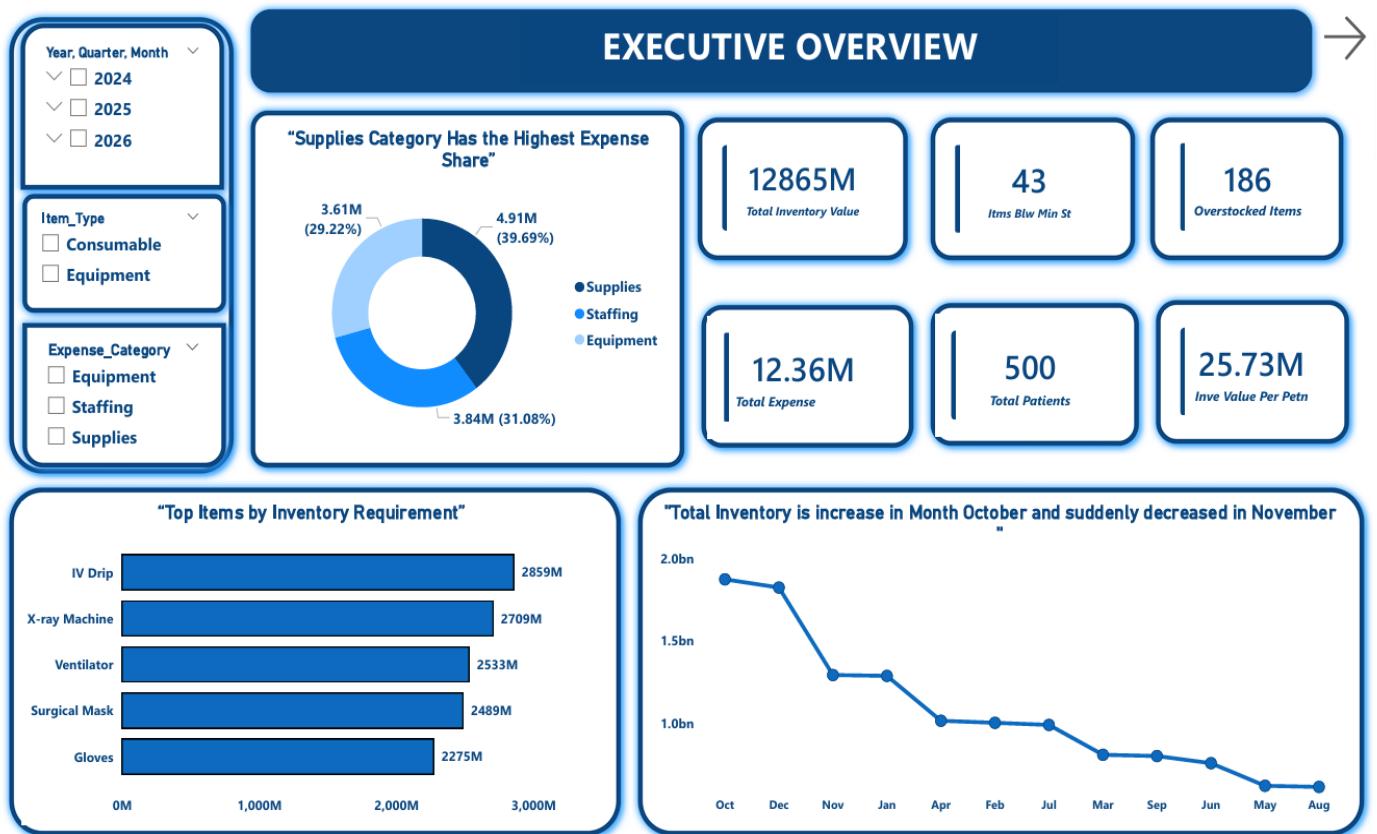
```
128 •   select Staff_Type , Avg(Hours_Worked) as Total_Work_Hours
129     from staff
130     group by Staff_Type
131     Order by Total_Work_Hours Desc;
132
```

	Staff_Type	Total_Work_Hours
▶	Nurse	9.5780
	Technician	9.5515
	Surgeon	9.5123

## 4] Analysis & Dashboards :

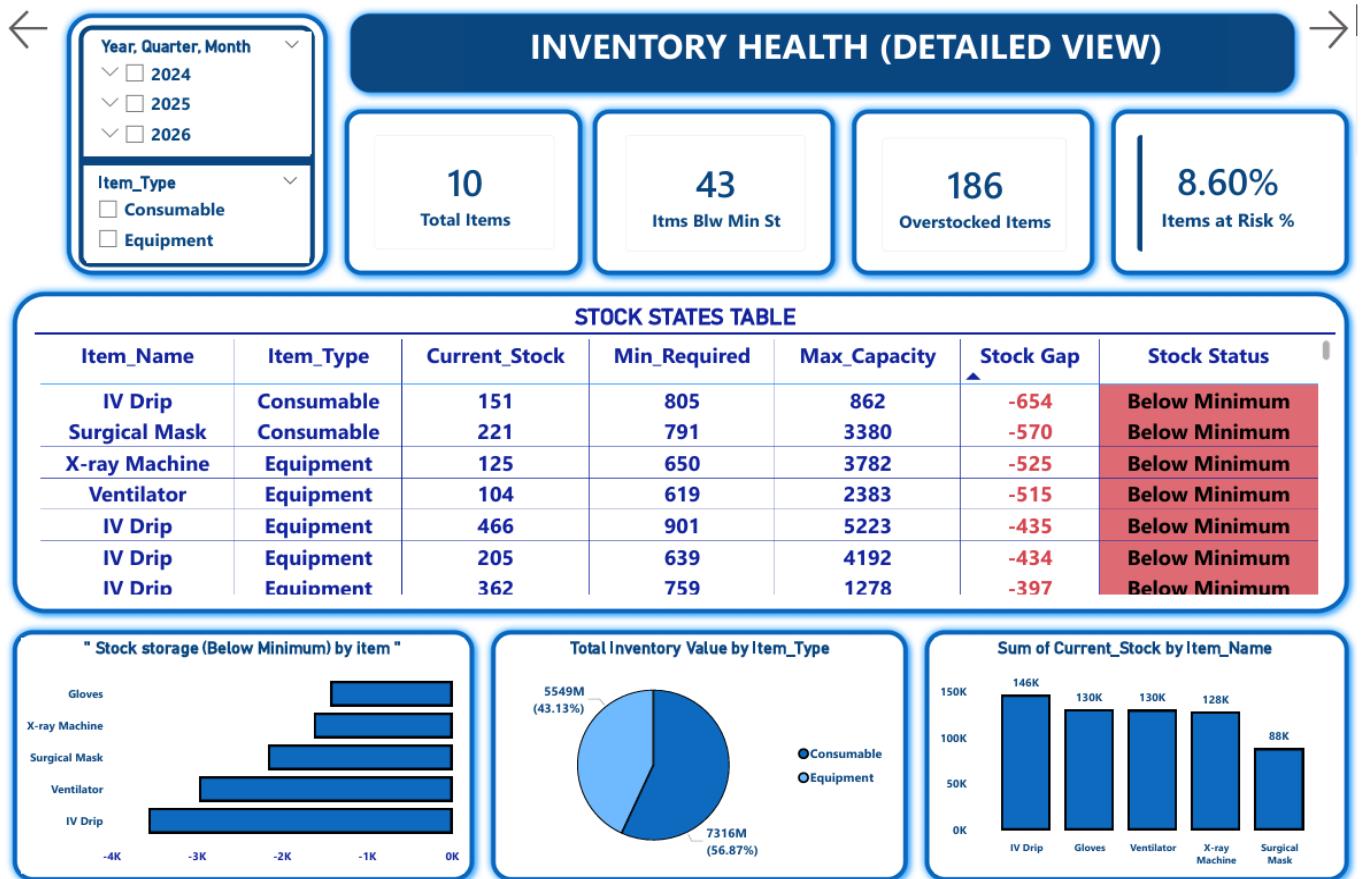
### Page 1 – Overview:

"Page 1 provides an executive overview of hospital supply chain health, covering inventory value, stock risk, vendor-independent demand drivers like patient volume, and monthly spending trends to support quick decision-making."



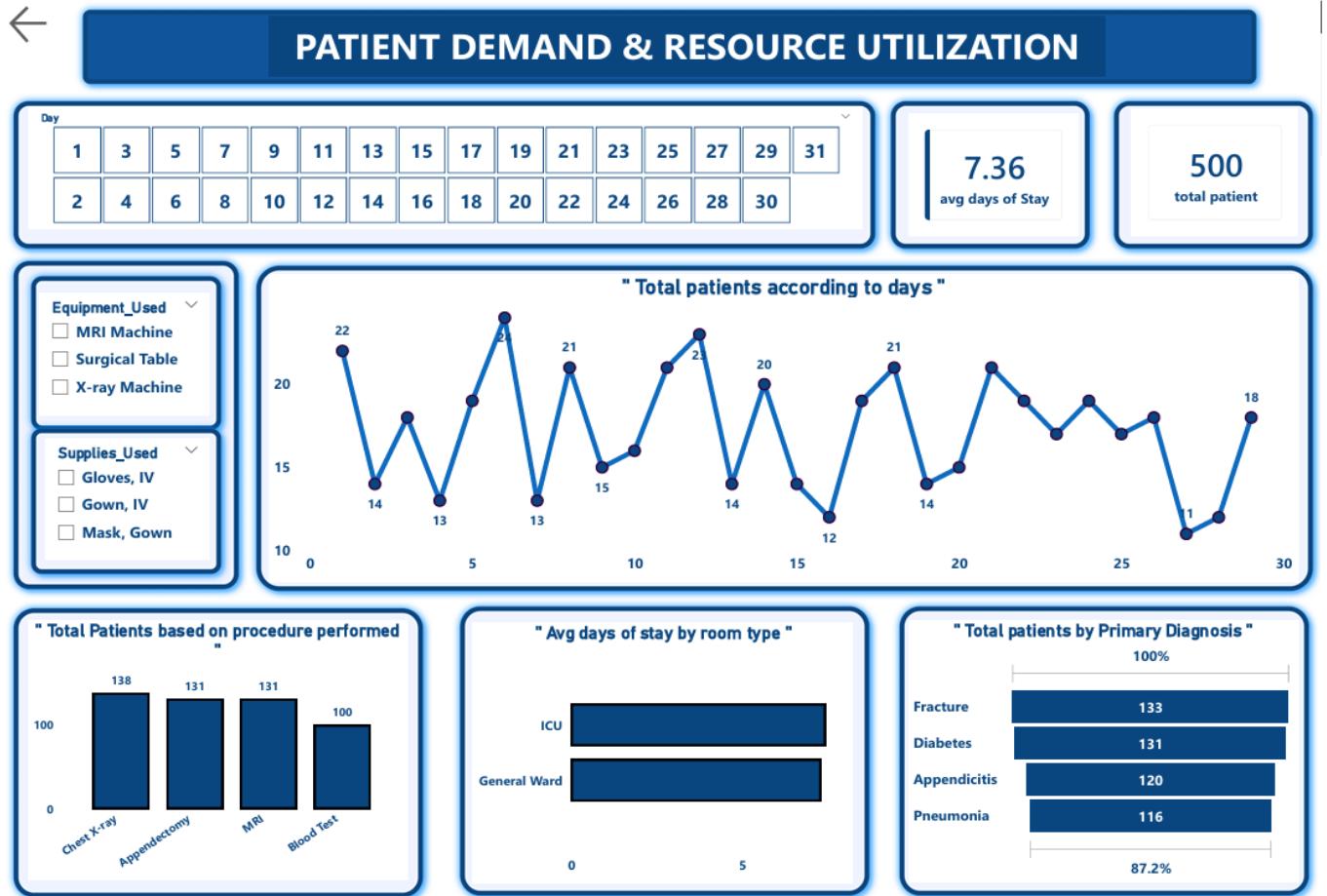
## Page 2 – Inventory Health:

**“Page 2 focuses on inventory health, highlighting stock gaps, minimum threshold violations, and overstocking risks, enabling proactive replenishment decisions.”**



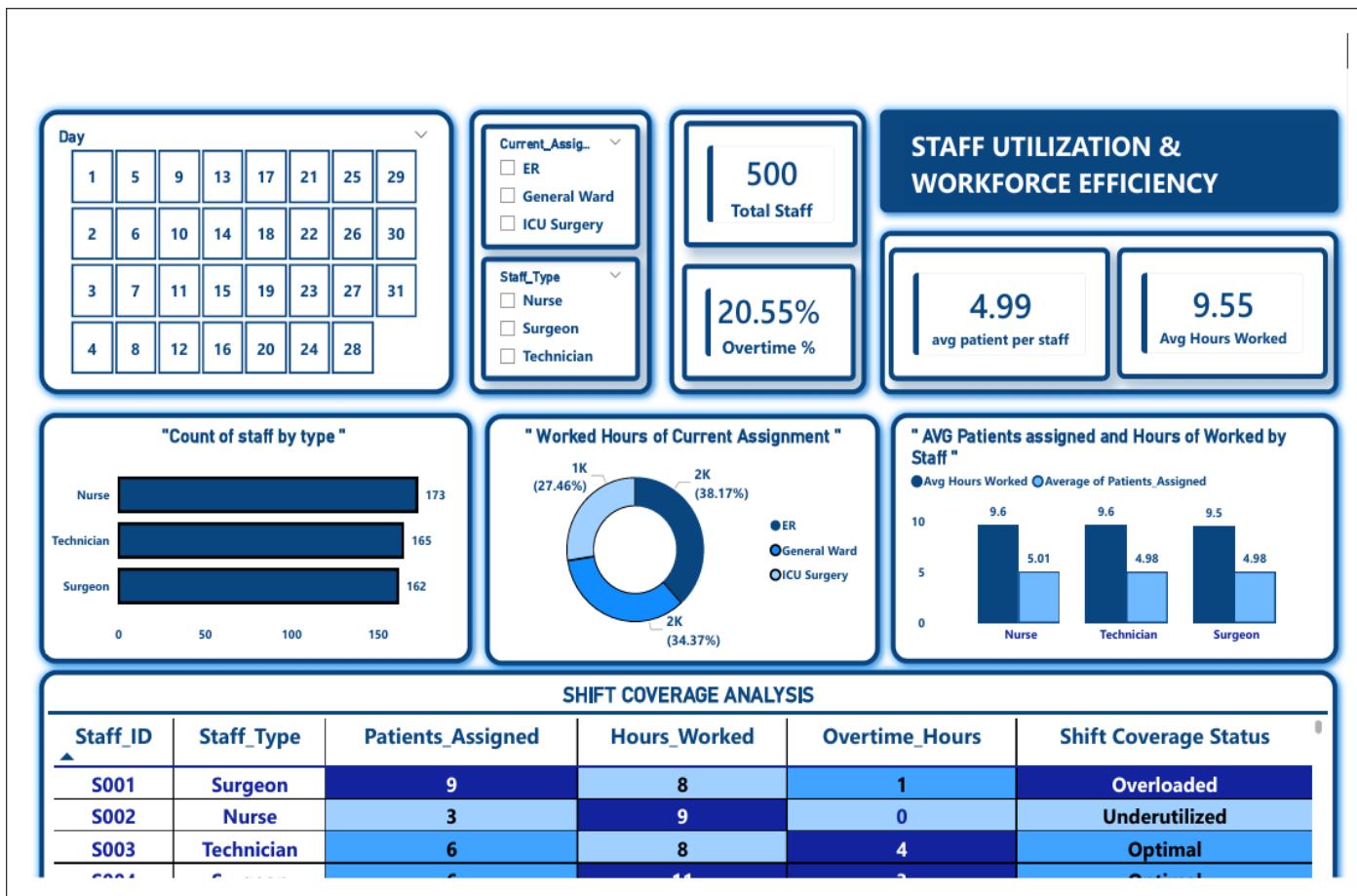
## Page 3 – Patient Analysis:

“Page 3 links patient demand with resource utilization, helping understand how diagnoses, procedures, and length of stay impact inventory and staffing needs.”



## Page 4 – Staff Utilization:

“This page 4 analyzes staff utilization by evaluating shift coverage, patient load, overtime, and working hours to identify workforce inefficiencies and burnout risks.”



## 5] Key Insights :

- The Technician show high overtime% as 21.38% , indicating staff overload.
- Inventory shortages identified for critical supplies.
- Patient load varies significantly across staff types and shifts- Better staff allocation can reduce overtime costs.

## 6] Business Recommendations :

- Improve demand forecasting for inventory replenishment.
- Optimize staff shift scheduling to balance workload.
- Monitor KPIs regularly using Power BI dashboards- Reduce operational costs by minimizing overtime.