**Let’s Start with a Story.**

Meet Suzan,

A cartoon of a child

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Clipboard Health’s newest intern in sales. Fresh out of training, she’s eager and ready to make her mark in the competitive marketplace.  
Being at a data centric company Clipboard Health, Suzan Knows we have a dedicated sales analyst by her side – someone who can turn numbers into narratives.

Being part of a staffing firm, it's crucial for Suzan to understand the demographics and flow of the industry.   
**But where to begin?** With a mixture of curiosity and determination, Suzan approached Hemanth (that’s me!) to help navigate the waters of her new sales journey.

**Hemanth, the Data Warrior**

Armed with Power BI and relentless energy that would make even the bravest of warriors pause, I explored the depths  of what might initially seem like the worst data imaginable.

**My mission?** To extract gold from the mud.

**Focusing on Key Areas**

Here are the topics I decided to tackle, with an eye for uncovering hidden gems:

**1.Demographics of Data**

* **Objective**: To map the geographical distribution of providers and staffed hours, analyzing staffing needs across regions.
* **Visual Tools Used**: Some KPI’s to understand Data. Crafted line charts to illustrate the number of new providers per year and average ratings of providers relative to their year of establishment.
* **Findings and Recommendations**: States like OH, FL, PA, IL, CA, NY, IN, MO, MI, and NC are the top ten with the highest number of providers. New York stands out with more staff than any other, providing growth opportunities for others. Particularly, the 10M hour staffing gap between Ohio and New York sparks Ohio as a prime candidate for expansion. We should channel more resources here and followed by other states.
* The number of providers has been on a steady decline since 2002. It’s important to focus on states witnessing growth and less declines.
* Although there is a decrease in providers, the overall ratings of new providers are greater than the older one. We should tie up with the new service provider, which not only builds long-term business, and we also can able to improve their service levels.
* Meanwhile, we can also focus on old providers, whose ratings are going down. We can use our staff to improve their services.
* When the overall ratings of service providers ate just 2.83, further analyzing I understood avg staff rating with 2.75 hurts the overall rating. This means the performance of the existing staff is not up to the mark. Our well-educated and trained can replace them easily.

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**2.Full time Employee Vs Contract Employee.**

* **objective** : To identify gaps and opportunities within the industry for positioning our staff in both contract and full-time roles.
* **Visual Tools Used**: Visual representations such as pie charts for general distribution and bar charts for comparing data across states.
* **Findings and Recommendations:** About 92% of total staff hrs. are Full time employees, driving opportunity for long term. We should hire and train accordingly to place staff for long-term relationships.
* CNA’s represent about 55% of both full-time and contract hours, with LPN’s accounting for 20% in full-time roles and 27% in contract roles. RNs are more prevalent in contract positions than full-time.
* Admin and directorial roles are predominantly full-time, while practitioner roles are evenly distributed across full-time and contract positions.
* We should prioritize hiring, training, and placing LPNs, CNAs, and RNs, who collectively represent 80% of staffing needs.
* When preferred for full time, NY, FL, CA, Oh are most preferable and in contract NY, PA, Nj, Il are preferred highlighting demographics interests

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**3. Week Wise Analysis**

* **Objective**: To find the staffing trends and predict future demands.
* **Visual Tools Used**: Time Series Analysis, Week Wise Analysis with Full time and CTR Employees
* **Findings And Recommendations: There** is a clear down trend in the weekends, stating people are less interested to work on weekends.
* Overall People in All positions are trend to work less on Weekends , providing opportunity at all levels
* Interestingly, more than 20% total Full Time Employees work force doesn’t work on Weekends, In Numbers it is a short of 10M Hours for each Quarter. But Contract Worker Numbers are same
* This is the right opportunity to fill the Gaps of shortage, we should focus more on filling the market gaps on weekends.

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**4. Staffing Adequacy**

* **Objective:** Determine where there may be gaps in staffing that Clipboard Health can fill.
* **Visual Tools Used**: Measures to calculate ratios, Tables and bar charts to Demonstrate gaps at state level
* **Findings and Recommendations:** At some facilities, each resident receives up to 12 hours of staff time, while others receive less than 10 minutes, with a national average of 2.98 hours.
* New York, despite having a high average number of residents per provider, generally maintains an adequate staff-to-resident ratio, though some locations are under-resourced.
* Likewise, there are several locations whose residents will get less than 3 hours of Staff time , causing reduced ratings, Staff gaps , This Locations are in huge need of staffing and are potential clients for us to place our staff.

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**5.Staff Turnover**

* **Objective:** To find the correlation of Staff turnover with long-term and short-term QM Ratings to make necessary Actions.
* **Visual Tools Used**: Scatter Plot to plot against the Turnover rates with Ratings, with Few QM Ratings KPI
* **Findings And Recommendations:** The overall provider rating currently stands at a concerning 2.85, indicating suboptimal performance across the board. This is primarily due to low health inspection ratings, averaging 2.78, and inadequate staffing ratings at 2.75. However, Quality Measure (QM) ratings offer a slightly better, holding a more respectable average of 3.34.
* Analysis from the scatter plot clearly indicates that employee turnover significantly burdens the industry, adversely affecting overall ratings.
* There is a positive correlation between both long-term and short-term QM ratings and employee turnover, highlighting how changes in staff consistency impact service quality.
* To Build relationships with Service Providers, it is important to have trusted and reliable Staffing, at it not only adversely affects the clients rotation but also keep our reputation at stake.

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**Suzan Voice:** After a deep dive into the data with Hemanth, I am more than ready to tackle the competitive healthcare staffing market. Our teamwork has equipped me with invaluable insights and a solid grasp of the data-driven strategies needed to navigate these waters successfully. Feeling empowered and confident, I’m eager to apply what I learned. I’m enthusiastic about the opportunity to make a meaningful impact at Clipboard Health, using my new knowledge to improve service delivery and help business growth. As I step into my role with a clear vision and a vibrant determination to transform insights into action.

Data Sets Used : [Payroll Based Journal Daily Nurse Staffing](https://data.cms.gov/quality-of-care/payroll-based-journal-daily-nurse-staffing/data), [Provider Information](https://data.cms.gov/provider-data/dataset/4pq5-n9py)

Link to Power BI file[: https://drive.google.com/file/d/1iLafdjW1nBpW8zd0BAJsPBkU02Uih-tU/view?usp=drive\_link](file:///C:\Users\heman\OneDrive\Desktop\Documents\%20https\drive.google.com\file\d\1iLafdjW1nBpW8zd0BAJsPBkU02Uih-tU\view%3fusp=drive_link)

**Part 2: SQL Test**

**Instructions:** Please write SQL queries for each of the following questions. You may assume that all tables follow typical database conventions unless otherwise specified.

**Tables:**

Assume you have the following tables in your database:

1. **Sales**
   * sales\_id (INT)
   * customer\_id (INT)
   * product\_id (INT)
   * sale\_date (DATE)
   * quantity (INT)
   * total\_amount (DECIMAL)
2. **Customers**
   * customer\_id (INT)
   * customer\_name (VARCHAR)
   * sales\_region (VARCHAR)
   * sign\_up\_date (DATE)
3. **Products**
   * product\_id (INT)
   * product\_name (VARCHAR)
   * category (VARCHAR)
   * price (DECIMAL)

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**Questions:**

1. Write a query to return the customer\_name, product\_name, and total\_amount for each sale in the last 30 days.

SELECT C.CUSTOMER\_NAME, P.PRODUCT\_NAME, S.TOTAL\_AMOUNT

FROM SALES S

JOIN CUSTOMERS C ON S.CUSTOMER\_ID = C.CUSTOMER\_ID

JOIN PRODUCTS P ON S.PRODUCT\_ID = P.PRODUCT\_ID

WHERE S.SALE\_DATE >= CURRENT\_DATE - INTERVAL 30 DAY;

2.Write a query to find the total revenue generated by each product category in the last year. The output should include the product category and the total revenue for that category.

SELECT P.CATEGORY, SUM(S.TOTAL\_AMOUNT) AS TOTAL\_REVENUE

FROM SALES S

JOIN PRODUCTS P ON S.PRODUCT\_ID = P.PRODUCT\_ID

WHERE S.SALE\_DATE >= CURRENT\_DATE - INTERVAL 1 YEAR

GROUP BY P.CATEGORY

3.Write a query to return all customers who made purchases in 2023 and are located in the "West" region.

SELECT DISTINCT C.CUSTOMER\_ID, C.CUSTOMER\_NAME

FROM CUSTOMERS C

JOIN SALES S ON C.CUSTOMER\_ID = S.CUSTOMER\_ID

WHERE C.SALES\_REGION = 'WEST' AND YEAR(S.SALE\_DATE) = 2023

4.Write a query to display the total number of sales, total quantity sold, and total revenue for each customer. The result should include the customer\_name, total sales, total quantity, and total revenue.

SELECT C.CUSTOMER\_NAME, COUNT(S.SALES\_ID) AS TOTAL\_SALES, SUM(S.QUANTITY) AS TOTAL\_QUANTITY,SUM(S.TOTAL\_AMOUNT) AS TOTAL\_REVENUE

FROM CUSTOMERS C

JOIN SALES S ON C.CUSTOMER\_ID = S.CUSTOMER\_ID

GROUP BY C.CUSTOMER\_ID, C.CUSTOMER\_NAME;

5.Write a query to find the top 3 customers (by total revenue) in the year 2023.

SELECT C.CUSTOMER\_NAME, SUM(S.TOTAL\_AMOUNT) AS TOTAL\_REVENUE

FROM CUSTOMERS C

JOIN SALES S ON C.CUSTOMER\_ID = S.CUSTOMER\_ID

WHERE YEAR(S.SALE\_DATE) = 2023

GROUP BY C.CUSTOMER\_NAME

ORDER BY TOTAL\_REVENUE DESC LIMIT 3;

6.Write a query to rank products by their total sales quantity in 2023. The result should include the product\_name, total quantity sold, and rank.

SELECT P.PRODUCT\_NAME,SUM(S.QUANTITY) AS TOTAL\_QUANTITY\_SOLD,

RANK() OVER (ORDER BY SUM(S.QUANTITY) DESC) AS RANK

FROM PRODUCTS P

JOIN SALES S ON P.PRODUCT\_ID = S.PRODUCT\_ID

WHERE YEAR(S.SALE\_DATE) = 2023

GROUP BY P.PRODUCT\_ID, P.PRODUCT\_NAME

ORDER BY TOTAL\_QUANTITY\_SOLD DESC;

7.Write a query that categorizes customers into "New" (if they signed up in the last 6 months) or "Existing" based on their sign\_up\_date. Include the customer\_name, region, and category in the result.

SELECT CUSTOMER\_NAME, SALES\_REGION AS REGION,

CASE

WHEN SIGN\_UP\_DATE >= CURRENT\_DATE - INTERVAL 6 MONTH THEN 'NEW'

ELSE 'EXISTING'

END AS CATEGORY

FROM CUSTOMERS

ORDER BY CATEGORY, CUSTOMER\_NAME;

8.Write a query to return the month and year along with the total sales for each month for the last 12 months.

SELECT YEAR(SALE\_DATE) AS YEAR, MONTH(SALE\_DATE) AS MONTH,

SUM(TOTAL\_AMOUNT) AS TOTAL\_SALES

FROM SALES

WHERE SALE\_DATE >= CURRENT\_DATE - INTERVAL 12 MONTH

GROUP BY YEAR(SALE\_DATE), MONTH(SALE\_DATE)

ORDER BY YEAR DESC, MONTH DESC;

9.Write a query to return the product categories that generated more than $50,000 in revenue during the last 6 months.

SELECT P.CATEGORY,SUM(S.TOTAL\_AMOUNT) AS TOTAL\_REVENUE

FROM PRODUCTS P

JOIN SALES S ON P.PRODUCT\_ID = S.PRODUCT\_ID

WHERE S.SALE\_DATE >= CURRENT\_DATE - INTERVAL 6 MONTH

GROUP BY P.CATEGORY

HAVING SUM(S.TOTAL\_AMOUNT) > 50000

ORDER BY TOTAL\_REVENUE DESC;

10.Write a query to check for any sales where the total\_amount doesn’t match the expected value (i.e., quantity \* price).

SELECT S.SALES\_ID, S.QUANTITY, P.PRICE, S.TOTAL\_AMOUNT, (S.QUANTITY \* P.PRICE) AS EXPECTED\_AMOUNT

FROM SALES S

JOIN PRODUCTS P ON S.PRODUCT\_ID = P.PRODUCT\_ID

WHERE S.TOTAL\_AMOUNT <> (S.QUANTITY \* P.PRICE);