# **Tasks**

**Learners have to develop a dashboard to support the answers to the following questions.**

**Objective Questions**:

1. What is the total no. of attributes present in the data?

Total, No. of attributes present in the data is 17.

1. Which columns have inconsistent or missing values, and what is the count of such values?

Zero columns have inconsistent or missing values. The count is Zero.

1. What is the average daily ticket volume over time?

The Average Daily Ticket Volume Over Time is 53.36507937

1. What is the distribution of ticket categories (e.g., Login Access, System, Software)?

A screen shot of a pie chart

Description automatically generated

System – 40%

Login Access – 30%

Software – 20%

Hardware – 10%

1. How many tickets has each agent handled?

|  |  |
| --- | --- |
| **Row Labels** | **Count of ID Ticket** |
| A. Trejo | 1949 |
| Alberto Casillas | 1974 |
| Alberto Gastelum | 1889 |
| Aldo Carrillo | 1966 |
| Alfonso Barraza | 1984 |
| Alfredo Barreras | 1920 |
| Armando Sierra | 1890 |
| Aurelio Tanori | 2027 |
| Barbara Grijalva | 2003 |
| Barraza Alberto | 1988 |
| Darwin E. | 1945 |
| Diana Rojo | 1927 |
| Eduardo Luna | 1920 |
| Elena Velez | 2021 |
| Enrique Montiel | 1938 |
| Estuardo Ocaño | 1935 |
| EstuardoTorres | 1942 |
| Eva Cardenas | 1943 |
| Flores Sierra | 1963 |
| Galindo Guadalupe | 1991 |
| Griselda Galindo | 1856 |
| Guadalupe Hernandez | 1915 |
| Guadalupe Torrico | 1987 |
| Guadalupe Villanueva | 1958 |
| Isela Leyva | 1968 |
| Javier D. | 1897 |
| Jesus Contreras | 2026 |
| Jesus Pacheco | 1931 |
| JesusGrajeda | 1968 |
| Leon Lourdes | 1961 |
| Lopez Moran. | 1956 |
| Lorena | 1966 |
| Luis Arguello | 1929 |
| Luis Torres | 1913 |
| Marisol Piedrahita | 1960 |
| Mata Lucero | 1969 |
| Melinda | 2007 |
| Miller Gaviria | 1892 |
| Nurio Zepeda | 1946 |
| Orci Carlos | 1926 |
| Parra Luna | 1963 |
| Ramon Macias | 1949 |
| Reyna Santacruz | 1897 |
| Rosa Olguin | 1950 |
| Sandra Lujan | 1906 |
| Segura Garcia | 1931 |
| Silvia Morales | 1974 |
| Velasquez Jose | 1949 |
| Willyberto Gonzales | 2000 |
| Yomaira Agudelo | 1933 |
| **Grand Total** | **97498** |

1. How can you extract the domain from the email addresses in the IT Agents sheet?

**MID([@Email],FIND("@",C2)+1,13)**This is the formula I used to extract the domain. The Domain is at the right end, so I used the right function. The length function returns the length of the mail. The find function finds the index of the “@” from the mail. I subtracted to get the domain name.

1. How can you find the full name of an agent given their Agent ID?

**VLOOKUP(D2,'IT Agents'!$A$1:$F$51,MATCH(N$1,'IT Agents'!$A$1:$F$1,0),0)**

I used the above VLOOKUP function to extract the full name from the agent sheet with the help of the agent ID.

1. What is the count of each issue type (e.g., IT Error, IT Request)?

I used the Countif function to get the IT ERROR and IT Request count.

For IT Error - Countif(Tickets!G2:G97499,”IT Error”)

For IT Request - Countif(Tickets!G2:G97499”,IT Request”)

|  |  |
| --- | --- |
| IT Error | 24278 |
| IT Request | 73220 |

1. What is the daily average resolution time for tickets?

The Daily Average Resolution Time for tickets is 4.553149808. (Used AVG fun)

1. How has the volume of tickets changed over time?

A graph showing the number of tickets

Description automatically generated

**Observation:**  As the Year increases the volume of the Tickets are also increasing.

1. What is the average age of the IT agents?

The Average Age of the IT Agents is 39.34. (Used Average function)

1. Is there a correlation between the severity of issues and the resolution time?

The Correlation Value is **-0.040536349 (Negative).**

Whenever the Correlation is Negative then both metrics inversely

Proportional to each other.

**Observation:**  Whenever the Severity of Issues increases, then the Satisfaction of the Resolution Time Decreases.

1. How many categorical columns are there in the data? [Search about categorical and continuous data, and try to answer this question]

There are 6 Categorical Columns are there in the data. Categorical Columns are the columns of the data that can be categorised.

**Subjective Question:**

1. If there is an investment, should it be used to hire more IT agents, improve training programs, or upgrade ticket management software?

Analysis: Perform a cost-benefit analysis using ticket resolution and satisfaction metrics.

A graph with blue and orange lines

Description automatically generated

**Insight:**  The volume of tickets is increasing over the time.

**Recommendation:** Due to the increasing of tickets over time. We need to Hire more agents for the coming years.

**Correlation between Ticket Resolution and Satisfaction Metrics:**

The Correlation Value is -0.003623335 (Negative).

Whenever the Correlation is Negative then both metrics is inversely

Proportional.

**Insight:**  Whenever the Ticket Resolution Time increases then the Satisfaction of the Customer Decreases.

**Recommendation:** Need to decrease the resolution time of the tickets.

By providing Training programs to the Agents who are lacking.

**Insight:**  The values of the Average of Resolution Time (Days) and Average Satisfaction Rate have not increased or decreased over time. There is no major change in the performance of the metrics.

**Recommendation:** Need to Improve the Software Management tool for better results.

1. Which agents need additional training based on their performance metrics?

Analysis: Identify agents with the lowest satisfaction ratings and longest resolution times.

|  |  |
| --- | --- |
| **Row Labels** | Training Required |
| A. Trejo | Yes |
| Alberto Casillas | NO |
| Alberto Gastelum | NO |
| Aldo Carrillo | Yes |
| Alfonso Barraza | Yes |
| Alfredo Barreras | NO |
| Armando Sierra | NO |
| Aurelio Tanori | NO |
| Barbara Grijalva | NO |
| Barraza Alberto | NO |
| Darwin E. | NO |
| Diana Rojo | NO |
| Eduardo Luna | NO |
| Elena Velez | Yes |
| Enrique Montiel | NO |
| Estuardo Ocaño | Yes |
| EstuardoTorres | Yes |
| Eva Cardenas | NO |
| Flores Sierra | Yes |
| Galindo Guadalupe | NO |
| Griselda Galindo | NO |
| Guadalupe Hernandez | NO |
| Guadalupe Torrico | NO |
| Guadalupe Villanueva | Yes |
| Isela Leyva | NO |
| Javier D. | NO |
| Jesus Contreras | NO |
| Jesus Pacheco | Yes |
| JesusGrajeda | NO |
| Leon Lourdes | NO |
| Lopez Moran. | Yes |
| Lorena | Yes |
| Luis Arguello | NO |
| Luis Torres | NO |
| Marisol Piedrahita | NO |
| Mata Lucero | NO |
| Melinda | NO |
| Miller Gaviria | Yes |
| Nurio Zepeda | Yes |
| Orci Carlos | NO |
| Parra Luna | Yes |
| Ramon Macias | NO |
| Reyna Santacruz | NO |
| Rosa Olguin | NO |
| Sandra Lujan | Yes |
| Segura Garcia | NO |
| Silvia Morales | NO |
| Velasquez Jose | NO |
| Willyberto Gonzales | NO |
| Yomaira Agudelo | NO |

**Insight:** Calculated the Average Resolution Time (4.55314) and Average Satisfaction (4.10064). For those with Above Average Resolution Time and Below Average Satisfaction Requires Training. Based on this condition, I marked the agents who require Training (Yes/NO).

**Recommendation:** In the above list I marked the agents who require Training as (Yes). By Training them we can improve Satisfaction and decrease the Resolution Time.

1. Do certain categories of requests have longer resolution times?

Analysis: Analyze the resolution times by request category.

**Insight:** Based on the above graph. The Ticket Categories consist of Hardware and System taking Highest Resolution Time.

**Recommendation:** We need to concentrate on Hardware and System Tickets more to reduce the Average Resolution Time. By Reducing Resolution Time, we can increase the Customer satisfaction.

1. How effective are the current software tools in managing IT tickets?

Analysis: Evaluate performance metrics before and after the implementation of new tools.

**Insight :** There is no major change on the performance metrics of Resolution Time and Satisfaction Rate.

**Recommendation:** Need to better upgrade of the software.

1. How has the performance of the IT support team changed over time (e.g., monthly or quarterly)?

Analysis: Trend analysis using time series charts.

**Insight:**

**1.** The average satisfaction is increasing Year by Year, which is good for customers.

**2.** The graph of Resolution Time and Year shows that resolution Time is increasing and decreasing year after year.

**3.** The count of tickets is increasing year by year.

**Recommendation:**

**1.** We need to maintain the average customer satisfaction rate. It should increase exponentially.

**2.**  The Average Resolution Time is inconsistent we need to make it consistent by providing better software and improving the Agents' skills.

**3.** The Count of Tickets are growing rapidly so for the upcoming years we need to Hire more Agents. So, customer satisfaction remains the same.

1. If we invest more on tech (Hardware, software, etc), do you think it will improve the ticket resolution times and employee satisfaction?

Analysis: Use historical data to project potential improvements.

**Insight:** The Ticket categories related to Hardware, Software and System have the Highest Average Resolution Time compared to others.

**Recommendation:** We need to invest more in Hardware, Software and System Tech. It Reduces the Average Resolution Time. Lower the Resolution Time Higher the Customer Satisfaction.

1. What are the key performance metrics for IT agents, and how can they be improved, do we need to fire any agents?

Analysis: Define and analyze metrics such as average handling time,

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Agent Name** | **Count of Tickets** | **AVG. Satisfaction** | **AVG. Resolution** | **Training Required** |
| A. Trejo | 1949 | 3.592611596 | 5.32067727 | Yes |
| Alberto Casillas | 1974 | 4.415906788 | 4.298378926 | NO |
| Alberto Gastelum | 1889 | 4.401270513 | 3.705664373 | NO |
| Aldo Carrillo | 1966 | 3.783316378 | 4.554933876 | Yes |
| Alfonso Barraza | 1984 | 3.04233871 | 4.999495968 | Yes |
| Alfredo Barreras | 1920 | 3.667708333 | 4.286979167 | NO |
| Armando Sierra | 1890 | 4.355026455 | 5.343915344 | NO |
| Aurelio Tanori | 2027 | 4.407992107 | 4.514553527 | NO |
| Barbara Grijalva | 2003 | 4.441337993 | 4.227159261 | NO |
| Barraza Alberto | 1988 | 4.187625755 | 5.243963783 | NO |
| Darwin E. | 1945 | 4.361953728 | 4.058097686 | NO |
| Diana Rojo | 1927 | 4.596782564 | 3.636222107 | NO |
| Eduardo Luna | 1920 | 4.147916667 | 4.4078125 | NO |
| Elena Velez | 2021 | 3.615042058 | 5.381989114 | Yes |
| Enrique Montiel | 1938 | 4.444272446 | 4.643446852 | NO |
| Estuardo Ocaño | 1935 | 3.97622739 | 5.524031008 | Yes |
| EstuardoTorres | 1942 | 4.085478888 | 4.901132853 | Yes |
| Eva Cardenas | 1943 | 4.411219763 | 4.720020587 | NO |
| Flores Sierra | 1963 | 3.990830362 | 4.754457463 | Yes |
| Galindo Guadalupe | 1991 | 4.4716223 | 3.655951783 | NO |
| Griselda Galindo | 1856 | 4.282327586 | 5.322198276 | NO |
| Guadalupe Hernandez | 1915 | 4.377545692 | 4.55770235 | NO |
| Guadalupe Torrico | 1987 | 4.364368395 | 3.66935078 | NO |
| Guadalupe Villanueva | 1958 | 3.631256384 | 4.804392237 | Yes |
| Isela Leyva | 1968 | 4.222052846 | 3.651422764 | NO |
| Javier D. | 1897 | 4.489720611 | 4.05640485 | NO |
| Jesus Contreras | 2026 | 4.344521224 | 5.554787759 | NO |
| Jesus Pacheco | 1931 | 3.660797514 | 4.595028483 | Yes |
| JesusGrajeda | 1968 | 4.473577236 | 3.596544715 | NO |
| Leon Lourdes | 1961 | 4.341662417 | 3.705252422 | NO |
| Lopez Moran. | 1956 | 3.63803681 | 4.778118609 | Yes |
| Lorena | 1966 | 3.628179044 | 5.511190234 | Yes |
| Luis Arguello | 1929 | 3.821150855 | 3.700362882 | NO |
| Luis Torres | 1913 | 4.198118139 | 3.918452692 | NO |
| Marisol Piedrahita | 1960 | 4.436734694 | 3.834183673 | NO |
| Mata Lucero | 1969 | 4.340274251 | 5.44591163 | NO |
| Melinda | 2007 | 4.399103139 | 4.369207773 | NO |
| Miller Gaviria | 1892 | 3.991014799 | 4.731501057 | Yes |
| Nurio Zepeda | 1946 | 3.612024666 | 5.409558068 | Yes |
| Orci Carlos | 1926 | 3.665109034 | 4.317757009 | NO |
| Parra Luna | 1963 | 3.847682119 | 4.867040245 | Yes |
| Ramon Macias | 1949 | 4.204720369 | 5.451513597 | NO |
| Reyna Santacruz | 1897 | 3.913020559 | 3.846072746 | NO |
| Rosa Olguin | 1950 | 4.320512821 | 5.319487179 | NO |
| Sandra Lujan | 1906 | 3.601259182 | 5.204616999 | Yes |
| Segura Garcia | 1931 | 4.461418954 | 3.716727084 | NO |
| Silvia Morales | 1974 | 4.123100304 | 4.886524823 | NO |
| Velasquez Jose | 1949 | 3.690097486 | 4.523345305 | NO |
| Willyberto Gonzales | 2000 | 4.376 | 4.259 | NO |
| Yomaira Agudelo | 1933 | 4.170201759 | 3.824624935 | NO |

**Insight:** Calculated the Average Resolution Time, Average Satisfaction Rate and Count of Tickets. Based on this I marked them for Training or not.

* **Recommendation:** Will provide the training for them who marked Yes agents in the area where they are lacking. We can only consider firing agents who show no improvement after training and support.

1. How do employee demographics (e.g., department, seniority) impact satisfaction and ticket outcomes?

Analysis: Segment analysis using filters and pivot tables.

**Insight :**

1. Agents aged 34, 36, 42, 43, and 50 have satisfaction rates below 4.0.

2. Agents aged **35**, **36**, and **41** exhibit resolution times above 5.2 days, indicating inefficiencies.

3. Agents aged **34**, **38**, and **43** resolved fewer than 2,000 tickets, indicating either lighter workloads or potential inefficiencies.

**Recommendation:**

To improve satisfaction rates and reduce resolution times, focus on agents aged 34, 36, 42, and 43.

Tickets should be redistributed among the agents to balance the workload for those handling tickets over 11,000(agents aged **28**, **42**, and **44).**

1. Identify the trends for IT support operations based on ticket volumes and satisfaction, and mention the peak and stable times?

Analysis: Use pivot tables and charts to identify peak and off-peak hours.

**Insight:**  From the above Sum of Tickets of Months of Every Year vs count of tickets graph, we can observe that the mentioned months (Jan, Feb, April, Jul) have low ticket volumes compared to other months. Every Year the Count of Tickets increases over the period.

**Recommendations:** Except this Jan, Feb, April, and Jul remaining months the volume of tickets is high. We need more agents, and a better distribution of tickets should be done to increase customer satisfaction.

1. What metrics should be included in the final dashboard to provide a comprehensive view of call centre performance and guide investment decisions?

A screenshot of a diagram

Description automatically generated

I have included metrics such as Daily Average Ticket volume, Average Resolution Time, Average Satisfaction Rate, Average age of Agents, Count of IT error Tickets and Request Tickets.

Visualised the Distribution of Ticket Categories, Distribution of Tickets based on Satisfaction and Resolution Time in a pie chart.

Visualised the Count of Tickets vs Year, Average Satisfaction Rate vs Time(year), and Age vs Satisfaction Rate in Line Graphs.

Visualised the Ticket Category vs Average Resolution Time, Count of Ticket by severity and Count of Tickets by Priority in Column and Bar graphs.

I Added slicers of Category, Quarters and Year linked into respective graphs.

**\*\*\*I calculated the Averages and counts of all metrics in the TASKS sheet, and from there, I extracted data into the Dashboard. I had hidden the sheet.**

**Ensure that you put the slicers for choosing the priority wise and year in order to observe the dashboard since the management will be having a long discussion which can go for weeks.**

**Note: The dashboard would be more interactive and user-friendly, allowing management to explore data in detail and make informed decisions.**