

IT Ticket Analysis

BY:LAKSHMIKANTHA S

**Problem Statement**

You are tasked with analyzing the IT support ticket management system to understand the performance of IT agents, the efficiency of ticket resolution, and the satisfaction levels of employees. The objective is to identify high and low performers among IT agents, assess the overall effectiveness of the team, and pinpoint areas for improvement in the ticket resolution process

OBJECTIVE QUESTIONS

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

* TIckets Sheet: This sheet has 11 columns (attributes):
* ID Ticket
* Fecha
* Employee ID
* Agent ID
* Request Category
* Issue Type
* Severity
* Priority
* Resolution Time (Days)
* Satisfaction Rate
* IT Agents Sheet: This sheet has 6 columns
* Agent ID
* Full Name
* Email
* Year of Birth
* Month of Birth
* Day of Birth

**In total, there are 17 unique attributes across both sheets.**

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

Inconsistent or Incorrect Values:

1. Severity Column (from the TIckets sheet):

* Incorrect Value:
* "Mayor" should be corrected to "Major" (count = 4,836).
* "Unclasified" should be corrected to "Unclassified" (count = 356).

1. Priority Column (from the TIckets sheet):

* Incorrect Value:
* "Unassiged" should be corrected to "Unassigned" (count = 29,410).
* "Mid" should be corrected to "Midium" (count = 15,845).

**3.What is the average daily ticket volume over time?**

* Created a Pivot Table where the rows are grouped by Fecha (Date) and the values are the count of Ticket IDs (ticket volume per day).
* Used Excel's AVERAGE function on the column where the ticket counts (daily volumes) are displayed to calculate the average daily ticket volume**.**
* The formula =AVERAGE($K$3:$K$368)/5 computes the average of the daily ticket counts from row 3 to row 368 in column
* average number of tickets handled per day = 53
* location:

Excel file - sheet name : Solution For Objective Question

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

* The tickets are categorized into the following groups with Count of each:
* Hardware (Count = 9733)
* Login Access (Count = 29193)
* System (Count = 39002)
* Software (Count = 19570)

**5.How many tickets has each agent handled?**

To analyze the number of tickets handled by each agent, I created a Pivot Table (located in Excel File – Sheet: Solution For Objective Question,Table Number 5). The steps followed are outlined below:

1. Row Field:
   * The Agent Name was added to the Rows field to list each agent individually.
2. Values Field:
   * The Ticket ID was added to the Values field, and the count of Ticket IDs was calculated, representing the total number of tickets each agent handled.

The table summarizes the ticket handling capacity of each agent, allowing for easy identification of workloads across agents. The grand total of tickets handled by all agents combined is 97,498.

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

To extract the domain name from email addresses in the IT Agents sheet, the following formula was used:

=LEFT(MID(C2,FIND("@",C2)+1,LEN(C2)), FIND(".",MID(C2,FIND("@",C2)+1,LEN(C2)))-1)

located in Excel File – Sheet: IT Agents,Column I (Domain name)

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

To retrieve the full name of an agent based on their **Agent ID**, the **VLOOKUP** function was used. The formula applied is:  
=VLOOKUP($D2,'IT Agents'!$A:$B,2,0)  
This formula is used in **Excel file - Sheet: Tickets, Column E (Agent Name)** to display the full name of the agent corresponding to their Agent ID.

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

|  |  |
| --- | --- |
| **Row Labels** | **Count of ID Ticket** |
| IT Error | 24278 |
| IT Request | 73220 |
| **Grand Total** | **97498** |
|  |  |

**9.What is the daily average resolution time for tickets?**

* Created a Pivot Table where the rows are grouped by Fecha (Date), and the values are the average of Resolution Time for each day.
* Used Excel's AVERAGE function on the column where the daily resolution times are displayed to calculate the average daily resolution time.
* The formula =AVERAGE(U3:U1829) computes the average of the daily resolution times from row 3 to row 1829 in column U.
* Average daily resolution time = 4.5

Location:  
Excel File – Sheet: Solution For Objective Question,Table Number 9

**10.How has the volume of tickets changed over time?**

• Method Used: I created a pivot table where the rows represent the years, and the value field includes the count of ticket IDs. The data shows the volume of tickets over the years from 2016 to 2020. After setting up the pivot table, I visualized the trend using a line chart. This allows us to observe how the volume of tickets has changed over time.

• Data Summary:

|  |  |
| --- | --- |
| **Row Labels** | **Count of ID Ticket** |
| 2016 | 13051 |
| 2017 | 14915 |
| 2018 | 18954 |
| 2019 | 21490 |
| 2020 | 29088 |
| **Grand Total** | **97498** |

* 2016: 13,051 tickets
* 2017: 14,915 tickets
* 2018: 18,954 tickets
* 2019: 21,490 tickets
* 2020: 29,088 tickets
* Grand Total: 97,498 tickets

• Visualization Method Used: Line chart

• Location: Excel File – Sheet: Solution For Objective Question, Table Number 10

**11.What is the average age of the IT agents?**

• Method Used: I calculated the average age of the IT agents by applying the AVERAGE function to the age column in the dataset. Specifically, I used =AVERAGE('IT Agents'!H:H) to determine the average age.

• Result: The average age of the IT agents is obtained from this calculation is 39.08

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

**• Method Used:** I calculated the correlation coefficient between the severity of issues and the resolution time. The result of **-0.04054** indicates the strength and direction of the relationship between these two variables.

**• Interpretation:** The correlation coefficient of -0.04054 suggests a very weak negative correlation between the severity of issues and the resolution time. This means there is almost no relationship between how severe an issue is and the time it takes to resolve it.

**13.How many categorical columns are there in the data?**

* There are 6 categorical columns
* ID Ticket
* Agent Name
* Request Category
* Issue Type
* Severity
* Priority

SUBJECTIVE QUESTIONS

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

To determine the optimal use of investment for improving IT support, we can perform a cost-benefit analysis based on the provided ticket resolution and satisfaction metrics. The analysis will consider the following option:

1. Improving Training Programs

1. Agent Performance

* Average Resolution Time: 4.55 days
* Average Satisfaction Rate: 4.10

Top Performers:

* Best in Resolution Time: Jesus Grajeda (3.60 days)
* Best in Satisfaction Rate: Sandra Lujan (3.60 satisfaction)

Lowest Performers:

* Longest Resolution Time: Sandra Lujan (5.20 days)
* Lowest Satisfaction Rate: Alfonso Barraza (3.04 satisfaction)

Visualization: Line and clustered column charts illustrate variations in resolution times and satisfaction rates among agents.

2. Priority vs. Resolution & Satisfaction

* High Priority Tickets: Faster resolution time (3.49 days) and similar satisfaction (4.09).
* Low Priority Tickets: Slower resolution time (6.01 days) but slightly higher satisfaction (4.13).

Visualization: Column chart displays differences in resolution times and satisfaction based on ticket priority.

3. Issue Type vs. Resolution & Satisfaction

* IT Errors: Quicker resolution (3.11 days) with the same satisfaction (4.10) as IT Requests.
* IT Requests: Longer resolution (5.03 days) with the same satisfaction rate (4.10).

Visualization: Pie chart compares resolution times for different issue types.

Recommendation:

1. Improving Training Programs:
   * Pros: Could improve overall agent performance, especially for those with longer resolution times and lower satisfaction. Enhanced skills can lead to more efficient problem-solving and higher customer satisfaction.
   * Cons: Training programs require time and resources; effectiveness might vary among agents.

**Conclusion:**

Improving Training Programs is likely the most cost-effective strategy given the current data. Although upgrading ticket management software would streamline operations, the variance in agent performance suggests targeted training could significantly improve resolution times and satisfaction rates.  
Location: Excel File – Sheet: 1.cost-benifit analysis

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

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

Based on the performance metrics analyzed, the agents requiring additional training can be identified by their lower satisfaction ratings and longer resolution times. To assess this, a pivot table was created with the agent names in the row field and the resolution time and satisfaction rate added to the values field as averages. The average resolution time is 4.55, and the average satisfaction rate is 4.10.

Steps taken:

1. Resolution Time: A filter was applied to identify agents with a resolution time greater than 4.55.
2. Satisfaction Rate: Another filter was applied to capture agents with satisfaction ratings lower than 4.10.

**Agents Identified for Additional Training:**

* **Aldo Carrillo:** Resolution Time: 4.55 | Satisfaction Rate: 3.78
* **Jesus Pacheco:** Resolution Time: 4.60 | Satisfaction Rate: 3.66
* **Miller Gaviria:** Resolution Time: 4.73 | Satisfaction Rate: 3.99
* **Flores Sierra:** Resolution Time: 4.75 | Satisfaction Rate: 3.99
* **Lopez Moran:** Resolution Time: 4.78 | Satisfaction Rate: 3.64
* **Guadalupe Villanueva:** Resolution Time: 4.80 | Satisfaction Rate: 3.63
* **Parra Luna:** Resolution Time: 4.87 | Satisfaction Rate: 3.85
* **Alfonso Barraza:** Resolution Time: 5.00 | Satisfaction Rate: 3.04
* **Sandra Lujan:** Resolution Time: 5.20 | Satisfaction Rate: 3.60
* **A. Trejo:** Resolution Time: 5.32 | Satisfaction Rate: 3.59
* **Elena Velez:** Resolution Time: 5.38 | Satisfaction Rate: 3.62
* **Nurio Zepeda:** Resolution Time: 5.41 | Satisfaction Rate: 3.61
* **Lorena:** Resolution Time: 5.51 | Satisfaction Rate: 3.63
* **Estuardo Ocaño:** Resolution Time: 5.52 | Satisfaction Rate: 3.98

These agents display higher-than-average resolution times and below-average satisfaction rates, indicating the need for targeted training to improve performance.  
Location:

Excel File – Sheet: 2.agents who need training

**3. Do certain categories of requests have longer resolution times?**

Pivot Table: The pivot table displays the average resolution times for each request category, as shown below:

|  |  |
| --- | --- |
| **Row Labels** | **Average of Resolution Time (Days)** |
| Hardware | 7.63 |
| Login Access | 0.31 |
| Software | 5.24 |
| System | 6.62 |

* Column Chart: A column chart has been used to represent these categories visually, where each bar reflects the average resolution time for each request category. Hardware and System issues show higher resolution times, while Login Access requests have the lowest average.

2. Approach

* Step 1: Data Cleaning  
  I ensured the data was cleaned, removing any outliers or incomplete records that could skew the average resolution time.
* Step 2: Pivot Table Creation  
  Using Excel, I created a pivot table with the following configuration:
  + Row Field: Request Categories (Hardware, Login Access, Software, System)
  + Value Field: Average of Resolution Time (in Days)
* Step 3: Visual Representation  
  To better visualize the data, I used a column chart. Each category is represented as a bar on the x-axis, with the y-axis showing the average resolution time. This helps in quickly identifying which categories have the longest and shortest resolution times.

3. Insights

* Longer Resolution Times for Hardware & System Issues:  
  Hardware issues have the highest average resolution time (7.63 days), followed by System issues (6.62 days). This suggests that these types of issues require more time, possibly due to the complexity of diagnosing hardware failures or system configurations.
* Quick Resolution for Login Access Requests:  
  Login Access requests are resolved the fastest, with an average time of just 0.31 days. These requests likely involve simple password resets or account activations, which can be handled quickly.
* Software Issues Resolution Time:  
  Software issues take an average of 5.24 days, indicating that software-related problems might involve troubleshooting, patching, or upgrades, which adds to the resolution time.
* Overall Average:  
  The grand total average resolution time is 4.55 days, indicating that, across all categories, most requests are resolved within a week.

4. Recommendations

* Streamlining Hardware and System Issue Resolution:  
  The high resolution times for hardware and system requests suggest potential bottlenecks. To address this, it is recommended to:
  + Implement a more structured troubleshooting process for hardware issues, perhaps by investing in additional diagnostic tools.
  + Offer more training for system administrators to reduce the time spent on complex system problems.
  + Explore automated solutions for basic hardware and system diagnostics to free up IT staff for more advanced issues.
* Login Access Efficiency Can Serve as a Model:  
  Since Login Access issues are resolved quickly, the processes used here can serve as a model for other categories. Consider automating certain aspects of the resolution process for other types of requests, particularly software issues, to improve efficiency.
* Focus on Reducing Software Issue Time:  
  Given that software-related problems have a moderate resolution time, this category could benefit from enhanced troubleshooting workflows or proactive software maintenance. Investing in better tools for software deployment and bug detection could help reduce delays.

By taking these actions, the overall resolution times can be reduced, especially in categories like hardware and system issues, while maintaining the efficiency seen in login access requests.

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

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

Method Used:

To evaluate the performance metrics, I created a pivot table with years and quarters in the row field. In the value field, I included the average resolution time (in days) and the average satisfaction rate. This provided a clear view of trends across different periods.

Hypothetical Performance Analysis:

* 2016-2018:
  + The average resolution time fluctuated slightly, ranging between 4.50 to 4.65 days.
  + Satisfaction rates showed a gradual improvement, from 3.95 in Q1 2016 to 4.13 in Q1 2018.
* 2019-2020:
  + The average resolution time remained stable, ranging from 4.50 to 4.62 days.
  + Satisfaction rates improved more significantly, reaching 4.19 in Q2 2020, indicating a positive shift in user satisfaction.

Hypothesis Conclusion:

While the average resolution times have remained fairly stable over the years, the increase in satisfaction rates suggests that any potential software tools or improvements implemented may have positively impacted user satisfaction, even if they did not significantly decrease the resolution time.

Location: **Excel file - Sheet:** **4.Current Software Analysis**

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

Method Used:

To analyze the IT support team's performance over time, I created a pivot table with quarters in the row field and included the average resolution time (days) and the average satisfaction rate in the value field.

Performance Analysis (2016-2020):

* Resolution Time:
  + The average resolution time remained consistent throughout the years, fluctuating between 4.50 to 4.65 days.
  + The highest resolution time was 4.65 days in Q2 2018, while the lowest was 4.50 days in several quarters.
* Satisfaction Rate:
  + Satisfaction rates showed a steady increase, starting from 3.95 in Q1 2016 and rising to 4.19 in Q2 2020.
  + Overall, satisfaction has improved, with the highest being 4.19 in Q2 2020.

While resolution times have remained fairly stable, the steady improvement in satisfaction rates over the years indicates a positive shift in the IT support team's performance, particularly in customer satisfaction.  
we employed line chart for visualization  
Location: **Excel file - Sheet:**  **5.Performance of Agents**

**6.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.**

**Historical Data Overview (2016-2020)**

Investing in better tech can improve ticket resolution times by increasing efficiency and capabilities. It can also boost employee satisfaction by reducing frustration and enhancing job support. Effective implementation and training are crucial to achieving these benefits.

By looking the factsheet we can conclude that higher the satisfaction rate for maximum Tickets.

Resolution Time for IT request Category is more so implementing new Technologies here will help for future growth.

By considering the above chart we can say that issue related to resolution time is less than 7 days for most of the Tickets However, implanting Chat-Bot, AI and ML tools will reduce the burden on Human errors.

Resolution Time for Hardware and System Request is consuming more time so by introducing Hardware Engineering and applying new Technologies will help to reduce this burden.

By looking into the average resolution time by age group we can conclude that all the age group in an average take same time However, The age group 32-36 taking more time than usual this can be taken care of by looking into socio economic factors.

By data the Satisfaction Rate for the Age group 27-31 is higher compared to middle aged groups this can be resolved by Training and introducing AI and ML tools.

Conclusion:

1. Satisfaction Correlation: There is a clear correlation between resolution time and user satisfaction, particularly in the IT request category. The data indicates that most tickets are resolved within 7 days, contributing to a higher satisfaction rate.
2. Technology Integration: Implementing new technologies, such as chatbots, AI, and machine learning tools, can significantly reduce human error and improve resolution efficiency. This will not only enhance user experience but also streamline operations.
3. Challenges in Hardware and System Requests: The resolution times for hardware and system requests are notably higher. Introducing specialized hardware engineering support and advanced technologies can alleviate these challenges, ensuring faster response and resolution rates.
4. Age Group Insights: While the average resolution time remains consistent across age groups, the 32-36 age group experiences longer resolution times. Addressing the socio-economic factors affecting this demographic could improve their experience and satisfaction.
5. Training and Development: The satisfaction rate is notably higher among the 27-31 age group. To bridge the gap with middle-aged groups, targeted training programs and the introduction of AI and ML tools can empower employees and enhance service delivery.

Overall Recommendation:

Technology Integration

1. Streamlined Processes:
   * Investing in modern technologies, such as customer relationship management (CRM) systems and automated ticketing solutions, can streamline operations. These tools can facilitate faster response times and ensure that users receive timely assistance.
   * Integrating AI and machine learning can help predict user needs based on historical data, allowing for proactive support rather than reactive responses.
2. Self-Service Options:
   * Implementing self-service portals with FAQs, tutorials, and chatbots can empower users to find answers to their questions quickly. This not only enhances user experience but also reduces the load on support staff.
   * Providing a mobile-friendly platform can improve accessibility, especially for younger demographics who prefer to access services through their smartphones.

Specialized Support for Complex Requests

1. Dedicated Support Teams:
   * Establishing specialized teams trained to handle complex inquiries can lead to more effective resolutions. This ensures that users with unique needs receive the attention and expertise required for their specific situations.
   * Implementing tiered support levels allows for more efficient routing of requests, ensuring that simpler issues are resolved quickly while more complex ones are escalated appropriately.
2. Knowledge Sharing:
   * Creating a centralized knowledge base that is continuously updated with solutions to complex issues can help support staff access information quickly, leading to faster resolutions for users.
   * Encouraging collaboration and knowledge sharing among team members can enhance expertise and improve overall service quality.

Targeted Training Initiatives

1. Customized Training Programs:
   * Developing training initiatives tailored to different roles within the organization ensures that staff are equipped with the skills necessary to meet user needs effectively. For example, front-line staff might need customer service skills, while technical support might require deeper product knowledge.
   * Regular training sessions that include updates on new technologies, product features, and user feedback can keep staff well-informed and prepared to assist users.
2. Feedback and Continuous Improvement:
   * Implementing a feedback mechanism to evaluate training effectiveness helps identify areas for improvement. This can lead to adjustments in training content and delivery methods, ensuring that they remain relevant and impactful.
   * Encouraging staff to participate in ongoing professional development fosters a culture of learning and adaptability, which can translate to better user experiences.

Enhanced Efficiency and Reduced Resolution Times

* By integrating technology and providing specialized support, organizations can significantly reduce resolution times. Faster service leads to higher user satisfaction, as customers appreciate prompt responses to their inquiries.
* Efficient processes also allow support teams to handle a higher volume of requests without compromising quality, facilitating organizational growth and scalability.

Elevating User Satisfaction Across Demographics

* Addressing the specific needs of various user demographics, including different age groups and tech-savviness, is crucial for enhancing overall satisfaction. Tailored support ensures that all users feel valued and understood.
* As user satisfaction improves, organizations are likely to see increased loyalty, positive word-of-mouth referrals, and ultimately, growth in their customer base.

In conclusion, investing in technology integration, providing specialized support, and focusing on targeted training are essential strategies for fostering growth and enhancing user satisfaction. By prioritizing these areas, organizations can create a more efficient, responsive, and user-centric service environment.

Location: **Excel file - Sheet:** **6.Investment Analysis**

**7.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, satisfaction scores, and number of tickets resolved.**

Key Performance Metrics

1. Average Resolution Time: Measures how quickly agents resolve tickets.
2. Average Satisfaction Rate: Reflects customer satisfaction with the resolution provided.
3. Number of Tickets Handled: Indicates the volume of work an agent handles.

Top Performers:

* Resolution Time:
  + Diana Rojo: 3.64 days
  + Isela Leyva: 3.65 days
* Satisfaction Rate:
  + Diana Rojo: 4.60
  + JesusGrajeda: 4.47

Underperformers:

* Resolution Time:
  + Estuardo Ocaño: 5.52 days
  + Sandra Lujan: 5.20 days
* Satisfaction Rate:
  + Sandra Lujan: 3.60
  + Elena Velez: 3.62

Action Plan:

* Training: Provide additional training for agents with high resolution times and low satisfaction.
* Support: Assess workload and provide necessary support.
* Monitoring: Regularly review performance and implement improvement plans.
* Firing: Consider as a last resort after exploring training and support options.

Location: **Excel file - Sheet:** **7.KPI**

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

**Analysis: Segment analysis using filters and pivot tables.**

Method:

* Data Segmentation: Analyzed data using a pivot table segmented by employee age groups.
* Metrics Evaluated:
  + Average Satisfaction Rate
  + Average Resolution Time (Days)

Key Insights:

1. Ticket Handling:
   * High Ticket Counts: Agents aged 43-44 (13,586 tickets) and 41-42 (11,643 tickets) handle the most tickets.
   * Low Ticket Counts: Agents aged 47-48 (1,897 tickets) and 37-38 (3,883 tickets) handle fewer tickets.
2. Satisfaction Rates:
   * High Satisfaction: Older (47-48: 4.49) and younger agents (51-52: 4.40, 45-46: 4.36) generally have higher satisfaction rates.
   * Low Satisfaction: Middle-aged agents (49-50: 3.82, 41-42: 3.84) show lower satisfaction rates.

Findings:

* Experience and Seniority: Older agents tend to handle more tickets and have higher satisfaction rates, suggesting that experience and seniority positively impact outcomes.
* Burnout/Performance Fluctuations: Middle-aged groups (e.g., 41-42, 49-50) show lower satisfaction, possibly due to burnout or other performance fluctuations.

Recommendation:

* Support and Training: Focus on support and training for middle-aged agents to address lower satisfaction rates. Leverage the experience of older agents to mentor and guide less experienced teams.

Location: **Excel file - Sheet:** **8.Agent Demographics**

**9.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.**

|  |  |  |
| --- | --- | --- |
| **Row Labels** | **Count of ID Ticket** | **Average of Satisfaction Rate** |
| **2016** | **13051** | **3.98** |
| Qtr1 | 3276 | 3.95 |
| Qtr2 | 3265 | 3.97 |
| Qtr3 | 3252 | 3.98 |
| Qtr4 | 3258 | 4.02 |
| **2017** | **14915** | **4.07** |
| Qtr1 | 3559 | 4.07 |
| Qtr2 | 3834 | 4.06 |
| Qtr3 | 3717 | 4.07 |
| Qtr4 | 3805 | 4.08 |
| **2018** | **18954** | **4.09** |
| Qtr1 | 4266 | 4.13 |
| Qtr2 | 4936 | 4.07 |
| Qtr3 | 4927 | 4.09 |
| Qtr4 | 4825 | 4.08 |
| **2019** | **21490** | **4.12** |
| Qtr1 | 5114 | 4.13 |
| Qtr2 | 5152 | 4.14 |
| Qtr3 | 5646 | 4.13 |
| Qtr4 | 5578 | 4.09 |
| **2020** | **29088** | **4.16** |
| Qtr1 | 7156 | 4.14 |
| Qtr2 | 7012 | 4.19 |
| Qtr3 | 7236 | 4.18 |
| Qtr4 | 7684 | 4.13 |

Method:

* Data Segmentation: Utilized pivot tables to segment ticket volumes and satisfaction rates by year and quarter.
* Data Visualization: Created charts to visualize trends in ticket volumes and satisfaction rates over time.

Key Trends:

1. Peak Times:
   * Highest Ticket Volume: Q4 of 2020 with 7,684 tickets.
   * High Satisfaction Rates: Q2 of 2020 with a satisfaction rate of 4.19.
2. Stable Times:
   * Stable Ticket Volume: Q1 of 2016 and Q4 of 2019, with consistent volumes around 3,276 and 5,578 tickets, respectively.
   * Stable Satisfaction Rates: Satisfaction rates remained relatively stable across quarters, averaging around 4.10.

Analysis:

* Increasing Ticket Volume: A steady increase in ticket volume from 2016 (13,051) to 2020 (29,088).
* Improving Satisfaction: Satisfaction rates have generally improved, with a peak in 2020 (4.16).
* Peak Periods: The highest ticket volumes and satisfaction rates were observed in late 2020, suggesting increased activity and improved service during this period.

Recommendation:

* Resource Allocation: Allocate more resources during peak periods (Q4) to maintain high satisfaction and handle increased ticket volumes.
* Monitoring: Continuously monitor trends to anticipate peak times and adjust staffing accordingly.
* Location: **Excel file – Sheet:** **9.Trends**

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

The IT Support Performance Dashboard provides key insights into the performance of the IT support team over a five-year period (2016-2020). The dashboard captures vital metrics such as ticket resolution efficiency, employee satisfaction, and overall workload. These metrics contribute directly to identifying high and low performers within the IT team, assessing team effectiveness, and improving the ticket resolution process. The ultimate goal is to enhance service quality and make informed staffing decisions (hiring, firing, and training) to optimize team performance.

Key Metrics and Their Contribution to the Problem Statement

1. Total Tickets (97,438)

* Explanation: The total number of tickets handled over the period from 2016 to 2020.
* Contribution: This metric provides an overview of the team's workload. Understanding ticket volume allows management to assess if staffing levels are adequate and if certain years (e.g., 2020) saw an increase in demand that could impact team performance. High ticket volumes may indicate the need for additional resources or improved efficiency.

2. Average Resolution Time (4.55 days)

* Explanation: The average time taken to resolve IT support tickets.
* Contribution: This metric directly relates to the efficiency of ticket resolution, which is a core part of the problem statement. Faster resolution times reflect a more effective team. Identifying areas where resolution times are higher can help target specific training needs or process improvements to boost performance.

3. Average Satisfaction Rate (4.10)

* Explanation: The average satisfaction score given by employees based on the resolution of their tickets (out of 5).
* Contribution: Employee satisfaction is a key indicator of IT agent performance. Low satisfaction scores may point to underperforming agents or inefficient processes. This metric helps pinpoint where service quality needs improvement, allowing for targeted interventions such as additional training or process reviews.

4. Highest Tickets in a Year (29,088 in 2020)

* Explanation: The year with the highest number of IT support tickets.
* Contribution: This metric highlights when ticket volumes peaked, allowing management to identify periods of high demand that could strain resources. Knowing the highest volume year aids in resource planning and helps determine whether staffing or training needs to be adjusted to manage future demand surges.

Trends and Performance Insights

5. Ticket Volume Over Time

* Explanation: The bar chart shows how the total number of tickets has changed over the five-year period.
* Contribution: Tracking ticket volume over time helps assess long-term trends in workload. A sharp increase in 2020 may indicate increased strain on the team, helping management understand when to hire more agents or adjust workflows to manage rising demand.

6. Distribution of Employees Based on Satisfaction Score

* Explanation: This chart shows how many employees rated their IT support experience on a scale from 1 to 5.
* Contribution: Understanding the distribution of satisfaction scores allows management to see where the majority of employees fall in terms of satisfaction. Low satisfaction scores may be indicative of poor service quality or unresolved issues and highlight underperforming agents or periods where service may have declined.

7. Ticket by Severity Rate

* Explanation: A pie chart that breaks down tickets by severity level (Unclassified, Minor, Normal, Major, Urgent).
* Contribution: Analyzing tickets by severity helps understand how well the team is handling high-priority issues. A large number of unresolved urgent tickets may signal that the team is struggling to prioritize critical tasks, indicating where improvements in performance or staffing are needed to ensure timely resolution of critical issues.

Agent Performance and Team Effectiveness

8. Age Group by Satisfaction Rate

* Explanation: This bar chart breaks down satisfaction scores by different age groups of employees.
* Contribution: This metric helps analyze whether IT support performance is perceived differently across employee age groups. If a particular age group reports lower satisfaction, it may indicate the need for tailored communication or service strategies to ensure all demographic groups are adequately served by the IT team.

9. Resolution Rate by Count of Ticket

* Explanation: This bar chart categorizes tickets based on the resolution time, showing how many tickets were resolved within different time frames.
* Contribution: This metric provides insight into how quickly tickets are being resolved. A high number of tickets taking longer to resolve may indicate inefficiencies or bottlenecks in the process. This directly informs where additional training or process improvements are needed to enhance team performance.

10. Resolution Time vs. Satisfaction Rate

* Explanation: This line and bar chart compares the resolution time with satisfaction rates over each quarter.
* Contribution: This metric is crucial for understanding the correlation between how quickly tickets are resolved and employee satisfaction. If longer resolution times consistently result in lower satisfaction scores, it may indicate the need to improve resolution speed to maintain high levels of satisfaction. This directly helps in identifying performance thresholds for agents.

11. Issue Type Distribution

* Explanation: This chart categorizes tickets by type (IT Request vs. IT Error), showing how the distribution has changed over time.
* Contribution: Understanding the types of issues the team is handling (requests versus errors) allows management to allocate resources and provide training more effectively. If a significant number of tickets are related to complex IT errors, agents may require advanced training to improve their ability to resolve these issues more efficiently.

Conclusion

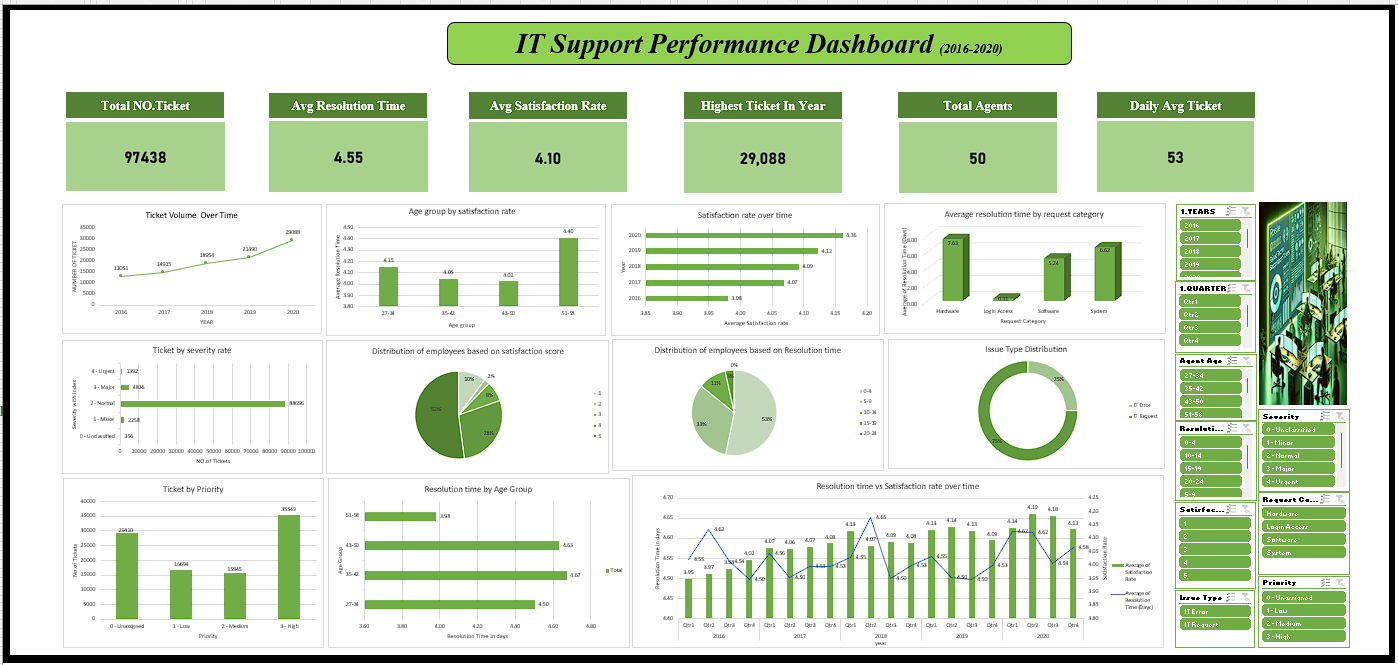
The metrics included in the IT Support Performance Dashboard offer a comprehensive view of the team's performance, focusing on workload, resolution efficiency, and employee satisfaction. Each metric directly contributes to addressing the problem statement by helping identify high and low performers, understanding overall team effectiveness, and pinpointing areas for improvement in the ticket resolution process.

By leveraging these insights:

* High performers can be rewarded or given more responsibilities.
* Low performers can be targeted for additional training or reassignment.
* Team efficiency can be improved by streamlining processes or reallocating resources during peak demand periods.

This analysis supports data-driven decision-making to enhance service quality, optimize team performance, and ultimately improve IT support operations**.**

Location: **Excel file – Sheet:** **Dashboard**

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