**IT Ticket Analysis**

**Objective Questions**

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

**Answer:**

**The raw dataset consists of two sheets:**

1. **Tickets:**
   * **97,499 rows and 10 columns of data.**
2. **IT Agents:**
   * **51 rows and 6 columns of data.**

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

**Answer:**

**Data Cleanup Summary: Resolving Inconsistencies in Columns**

**Priority Column:**

1. **Error: *Unassiged* ➡ Corrected: *Unassigned***
   * **Occurrences Fixed: 29,410**
2. **Error: *Mid* ➡ Corrected: *Medium***
   * **Occurrences Fixed: 15,845**

**Severity Column:**

1. **Error: *Unclasified* ➡ Corrected: *Unclassified***
   * **Occurrences Fixed: 356**
2. **Error: *Mayor* ➡ Corrected: *Major***
   * **Occurrences Fixed: 4,836**

**Column Name Update:**

* **"Fecha" ➡ Renamed to: *"Date"***

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

**Answer: 53.36507937**

**As observed daily ticket volume over the years Is Increasing.**

|  |  |  |
| --- | --- | --- |
| **Date** | **Count of ID Ticket** | **average of count of ticket** |
| **2016** | **13051** | **35.65846995** |
| **2017** | **14915** | **40.8630137** |
| **2018** | **18954** | **51.92876712** |
| **2019** | **21490** | **58.87671233** |
| **2020** | **29088** | **79.47540984** |
| **Grand Total** | **97498** | **53.36507937** |

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

**Answer:**

**Tickets are distributed as per ticket category as:**

**System Login Access Software Hardware**

|  |  |
| --- | --- |
| **Row Labels** | **Count of ID Ticket** |
| Hardware | 9733 |
| Login Access | 29193 |
| Software | 19570 |
| System | 39002 |

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

**Answer: Here is the list of tickets by per agent.**

|  |  |
| --- | --- |
| **Row Labels** | **Count of ID Ticket** |
| alberto barraza | 1988 |
| alberto casillas | 1974 |
| alberto gastelum | 1889 |
| alberto trejo | 1949 |
| aldo carrillo | 1966 |
| alfonso barraza | 1984 |
| alfredo barreras | 1920 |
| armando sierra | 1890 |
| aurelio tanori | 2027 |
| barbara grijalva | 2003 |
| carlos orci | 1926 |
| darwin echeverry | 1945 |
| diana rojo | 1927 |
| eduardo luna | 1920 |
| elena velez | 2021 |
| enrique montiel | 1938 |
| estuardo ocaño | 1935 |
| estuardo torres | 1942 |
| eva cardenas | 1943 |
| flores sierra | 1963 |
| griselda galindo | 1856 |
| guadalupe galindo | 1991 |
| guadalupe hernandez | 1915 |
| guadalupe torrico | 1987 |
| guadalupe villanueva | 1958 |
| isela leyva | 1968 |
| javier davila | 1897 |
| jesus contreras | 2026 |
| jesus grajeda | 1968 |
| jesus pacheco | 1931 |
| jose velasquez | 1949 |
| lopez moran | 1956 |
| lorena leon | 1966 |
| lourdes leon | 1961 |
| lucero mata | 1969 |
| luis arguello | 1929 |
| luis torres | 1913 |
| marisol piedrahita | 1960 |
| melinda barcelo | 2007 |
| miller gaviria | 1892 |
| nurio zepeda | 1946 |
| parra luna | 1963 |
| ramon macias | 1949 |
| reyna santacruz | 1897 |
| rosa olguin | 1950 |
| sandra lujan | 1906 |
| segura garcia | 1931 |
| silvia morales | 1974 |
| willyberto gonzales | 2000 |
| yomaira agudelo | 1933 |
| **Grand Total** | **97498** |

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

**Answer:**

**We can extract domain name from email ids of agents by following method-**

**We can use the below formula to extract domain name from mail Ids of Agents.**

**=LEFT(RIGHT([@Email],LEN([@Email])-FIND("@",[@Email])),FIND(".",RIGHT([@Email],LEN([@Email])-FIND("@",[@Email])))-1)**

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

**Answer:**

** Create a New Column:**

* **In the Tickets sheet, add a new column named "Agent Name" next to the "Agent ID" column.**

** Use XLOOKUP to Fetch Agent Names:**

* **Apply the XLOOKUP function to retrieve the agent names based on the Agent ID in the Tickets sheet.**
* **Formula is =XLOOKUP([@[Agent ID]],IT\_Agents!$A:$A,IT\_Agents!$G:$G,"Agent Not Found")**
* **This Gives agent not found if agent is not prsesnt for that agent id.**

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

**Answer:**

**Count of Issue type can be found using pivot table.**

|  |  |
| --- | --- |
| **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?**

**Answer:**

**We can find using pivot table:**

**Average resolution time as per request category is:**

|  |  |
| --- | --- |
| **Row Labels** | **Average of Resolution Time (Days)** |
| Hardware | 7.62539813 |
| Login Access | 0.313808105 |
| Software | 5.238732754 |
| System | 6.615609456 |
| **Grand Total** | **4.553149808** |

**Daily average resolution time over the years is:**

|  |  |
| --- | --- |
| **Row Labels** | **Average of Resolution Time (Days)** |
| **2016** | **4.551758486** |
| **2017** | **4.530070399** |
| **2018** | **4.558668355** |
| **2019** | **4.520800372** |
| **2020** | **4.585911716** |
| **Grand Total** | **4.553149808** |

**Conclusion:**

**Observations on Resolution Time**

* **Hardware Issues:  
  These have the maximum resolution time, indicating they may require more complex troubleshooting or external dependencies.**
* **Login Issues:  
  These have the minimum resolution time, likely due to their straightforward nature or predefined solutions.**
* **Agent Performance:  
  The average resolution time for agents across the years is 4.5 days, reflecting overall efficiency in addressing tickets.**

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

**Answer:**

**Volume of tickets is Increasing over time from year 2016-2020 as per data.**

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

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

**Answer: The age of IT agents can be calculated using Excel's DATEDIF function. To do this, you'll first need to concatenate the year, month, and day into a proper date format.**

**=DATEDIF([@DOB],TODAY(),"Y")**

**Then after calculating age of agents average is calculated using average formula.**

**=AVERAGE (J2:J51) Which comes out to be 39 Years.**

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

**Answer:**

**The correlation between the "Severity Key" and "Resolution Time" was calculated using the formula:**

**=CORREL(Tickets1!G:G, Tickets1!K:K)**

**The resulting value is -0.04054.**

**This negative correlation suggests an inverse relationship between the two variables: as the severity of cases increases, the resolution time tends to decrease. However, since the correlation value is close to zero, it indicates that the relationship is weak and not strongly correlated.**

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

**Answer:**

**Observed Categorical Columns in the Dataset**

1. **Request Category**:  
   This column contains different **categories of requests**, such as *software issues*, *hardware issues*, and more.
2. **Issue Type**:  
   Represents the **type of issue**, distinguishing between *IT Errors* and *IT Requests*.
3. **Severity**:  
   Defines the **severity levels** of issues, including categories like *Normal*, *Major*, *Minor*, etc.
4. **Priority**:  
   Indicates the **priority level** of the request, such as *Low*, *Medium*, and *High*.
5. **Satisfaction Rate**:  
   A numerical rating system (from *1* to *5*) that represents **customer satisfaction**, where each number corresponds to a qualitative value (e.g., *1* for Poor, *5* for Excellent).
6. **Agent Name**:  
   Serves as a unique identifier for **agents**, categorizing them by their names.

These categorical columns help categorize and group data, enabling deeper insights into trends and patterns across various factors.

**IT Ticket Analysis**

**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?**

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

**Answer:**

**We can consider following criteria to analyze performance of Agents as per given Data:**

**1.Custumer satisfaction score of agents. (CSAT)**

**2.Average resolution time of agents. (ART)**

**1. CSAT (Customer Satisfaction)**

**CSAT is a key metric for evaluating customer satisfaction with a product, service, or interaction. It is usually gathered through surveys where customers rate their experience after resolving a support ticket.**

**Rating Scale:**

**1 = Very Unsatisfied**

**2 = Unsatisfied**

**3 = Neutral**

**4 = Satisfied**

**5 = Very Satisfied**

**CSAT Score Calculation:**

**The CSAT Score (%) represents the percentage of positive responses out of the total number of responses:**

**CSAT Score (%)=(Number of Positive Responses/Total Number of Responses)×100**

**\*\*\*Treating 4,5 as positive response.**

**2. Average Resolution Time (ART)**

**ART measures the average time it takes to resolve a customer support ticket or issue. It helps assess the efficiency of a support team in managing customer inquiries.**

**ART Calculation:**

**The ART (%) is calculated based on the total resolution time for an agent divided by the number of tickets resolved:**

**ART (=(Total Resolution Time of Agent/Number of Tickets Resolved)**

**Both of these metrics—CSAT and ART—are crucial for evaluating both the quality of customer service and the operational efficiency of support teams.**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Agent name** | **Positive** | **Total Response** | **Total Resolution Time** | **CSAT(%)** | **tickets no** | **ART** |
| **alberto barraza** | **1661** | **1988** | **10425.00** | **83.55** | **1988** | **5** |
| **alberto casillas** | **1716** | **1974** | **8485.00** | **86.93** | **1974** | **4** |
| **alberto gastelum** | **1601** | **1889** | **7000.00** | **84.75** | **1889** | **4** |
| **alberto trejo** | **1362** | **1949** | **10370.00** | **69.88** | **1949** | **5** |
| **aldo carrillo** | **1421** | **1966** | **8955.00** | **72.28** | **1966** | **5** |
| **alfonso barraza** | **1081** | **1984** | **9919.00** | **54.49** | **1984** | **5** |
| **alfredo barreras** | **1330** | **1920** | **8231.00** | **69.27** | **1920** | **4** |
| **armando sierra** | **1672** | **1890** | **10100.00** | **88.47** | **1890** | **5** |
| **aurelio tanori** | **1785** | **2027** | **9151.00** | **88.06** | **2027** | **5** |
| **barbara grijalva** | **1760** | **2003** | **8467.00** | **87.87** | **2003** | **4** |
| **carlos orci** | **1343** | **1926** | **8316.00** | **69.73** | **1926** | **4** |
| **darwin echeverry** | **1661** | **1945** | **7893.00** | **85.40** | **1945** | **4** |
| **diana rojo** | **1703** | **1927** | **7007.00** | **88.38** | **1927** | **4** |
| **eduardo luna** | **1571** | **1920** | **8463.00** | **81.82** | **1920** | **4** |
| **elena velez** | **1418** | **2021** | **10877.00** | **70.16** | **2021** | **5** |
| **enrique montiel** | **1725** | **1938** | **8999.00** | **89.01** | **1938** | **5** |
| **estuardo ocaño** | **1547** | **1935** | **10689.00** | **79.95** | **1935** | **6** |
| **estuardo torres** | **1569** | **1942** | **9518.00** | **80.79** | **1942** | **5** |
| **eva cardenas** | **1712** | **1943** | **9171.00** | **88.11** | **1943** | **5** |
| **flores sierra** | **1532** | **1963** | **9333.00** | **78.04** | **1963** | **5** |
| **griselda galindo** | **1638** | **1856** | **9878.00** | **88.25** | **1856** | **5** |
| **guadalupe galindo** | **1732** | **1991** | **7279.00** | **86.99** | **1991** | **4** |
| **guadalupe hernandez** | **1683** | **1915** | **8728.00** | **87.89** | **1915** | **5** |
| **guadalupe torrico** | **1673** | **1987** | **7291.00** | **84.20** | **1987** | **4** |
| **guadalupe villanueva** | **1339** | **1958** | **9407.00** | **68.39** | **1958** | **5** |
| **isela leyva** | **1590** | **1968** | **7186.00** | **80.79** | **1968** | **4** |
| **javier davila** | **1703** | **1897** | **7695.00** | **89.77** | **1897** | **4** |
| **jesus contreras** | **1809** | **2026** | **11254.00** | **89.29** | **2026** | **6** |
| **jesus grajeda** | **1718** | **1968** | **7078.00** | **87.30** | **1968** | **4** |
| **jesus pacheco** | **1332** | **1931** | **8873.00** | **68.98** | **1931** | **5** |
| **jose velasquez** | **1375** | **1949** | **8816.00** | **70.55** | **1949** | **5** |
| **lopez moran** | **1366** | **1956** | **9346.00** | **69.84** | **1956** | **5** |
| **lorena leon** | **1401** | **1966** | **10835.00** | **71.26** | **1966** | **6** |
| **lourdes leon** | **1643** | **1961** | **7266.00** | **83.78** | **1961** | **4** |
| **lucero mata** | **1742** | **1969** | **10723.00** | **88.47** | **1969** | **5** |
| **luis arguello** | **1334** | **1929** | **7138.00** | **69.16** | **1929** | **4** |
| **luis torres** | **1560** | **1913** | **7496.00** | **81.55** | **1913** | **4** |
| **marisol piedrahita** | **1711** | **1960** | **7515.00** | **87.30** | **1960** | **4** |
| **melinda barcelo** | **1755** | **2007** | **8769.00** | **87.44** | **2007** | **4** |
| **miller gaviria** | **1455** | **1892** | **8952.00** | **76.90** | **1892** | **5** |
| **nurio zepeda** | **1379** | **1946** | **10527.00** | **70.86** | **1946** | **5** |
| **parra luna** | **1457** | **1963** | **9554.00** | **74.22** | **1963** | **5** |
| **ramon macias** | **1676** | **1949** | **10625.00** | **85.99** | **1949** | **5** |
| **reyna santacruz** | **1388** | **1897** | **7296.00** | **73.17** | **1897** | **4** |
| **rosa olguin** | **1731** | **1950** | **10373.00** | **88.77** | **1950** | **5** |
| **sandra lujan** | **1348** | **1906** | **9920.00** | **70.72** | **1906** | **5** |
| **segura garcia** | **1702** | **1931** | **7177.00** | **88.14** | **1931** | **4** |
| **silvia morales** | **1612** | **1974** | **9646.00** | **81.66** | **1974** | **5** |
| **willyberto gonzales** | **1741** | **2000** | **8518.00** | **87.05** | **2000** | **4** |
| **yomaira agudelo** | **1569** | **1933** | **7393.00** | **81.17** | **1933** | **4** |

**It is observed that there are agents Who have both, Above Average ART and Below Average CSAT**

**To optimize resource allocation between hiring more IT agents, improving training programs, or upgrading ticket management software, the following insights were derived from a detailed analysis of satisfaction and resolution time metrics.**

**Key Insights**

1. **Correlation Between Satisfaction and Resolution Time**
   * **Agents with faster resolution times tend to achieve higher satisfaction rates. For instance, Diana Rojo (3.64 days, 4.60 rating) and Javier Davila (4.06 days, 4.49 rating) are prime examples of this trend.**
   * **Conversely, low-performing agents like Alfonso Barraza (5.00 days, 3.04 rating) highlight areas requiring improvement.**
2. **Targeted Interventions Needed**
   * **Low satisfaction scores from agents such as Sandra Lujan (3.60 rating) and Guadalupe Villanueva (3.63 rating) suggest a need for targeted training to elevate their performance and overall team efficiency.**

**Recommendations**

1. **Prioritize Training Programs**
   * **Action: Focus on targeted training for lower-performing agents, addressing customer service, problem-solving, and effective tool usage.**
   * **Benefit: This directly enhances resolution times and satisfaction metrics without the overhead of new hires.**
   * **Implementation: Pair low-performing agents with high performers for mentorship, fostering skill-sharing and best practices.**
2. **Assess the Ticket Management Software**
   * **Action: Evaluate the current system for inefficiencies and consider upgrading to software with advanced analytics, automation, and reporting features.**
   * **Benefit: Streamlined processes can improve resolution times, supporting the team’s overall performance.**
3. **Monitor Staffing Needs**
   * **Action: Reassess the need for additional IT agents after training and software upgrades.**
   * **Benefit: Avoid unnecessary costs while ensuring existing staff can handle the workload effectively.**
4. **Leverage High Performers**
   * **Action: Involve top-performing agents in training programs to mentor peers.**
   * **Benefit: Encourages knowledge-sharing and strengthens team cohesion.**

**Conclusion**

**Investing in training programs offers the most immediate and cost-effective impact, addressing performance gaps directly. Following the results of training, upgrading the ticket management software can amplify efficiency. Hiring additional IT agents should be a tertiary strategy, contingent on observed outcomes post-implementation.**

**This phased approach ensures resource efficiency while driving meaningful improvements in team performance and customer satisfaction.**

**So, below cost benefit analysis table can be considered for an Action:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Option** | **Costs** | **Expected Improvement in ART** | **Expected Improvement in CSAT** | **ROI Consideration** |
| **Hire More IT Agents** | **High (Salaries, Onboarding)** | **Medium** | **Medium** | **Short-term improvement, scalable** |
| **Improve Training Programs** | **Moderate (Training Costs)** | **Medium** | **High** | **Long-term skills improvement** |
| **Upgrade Ticket Management Software** | **High (Software, Implementation)** | **High** | **High** | **Long-term efficiency and scalability** |

**2.Which agents need additional training based on their performance metrics? Analysis: Identify agents with the lowest satisfaction ratings and longest resolution times**.

**Answer:**

**By identifying agents with both low satisfaction ratings and long resolution times, we can target those who might benefit most from additional training and support, ultimately improving overall performance and customer satisfaction.**

**Upon Sorting and Filtering on CSAT Score sheet, to find those agents who have Low satisfaction score and High-resolution time.**

**Below list consists of names of agents who have below average CSAT score and above average ART.**



**Impact of Low CSAT and Long ART on Performance**

1. **Customer Experience:  
   Low CSAT scores signal dissatisfaction, which can significantly affect employee satisfaction and loyalty. Employees who face extended wait times and inadequate service are more likely to feel disengaged, leading to reduced motivation and performance.**
2. **Operational Efficiency:  
   Extended resolution times (ART) can hinder the overall efficiency of the support team. Inefficiencies may stem from issues such as inadequate processes, insufficient training, or outdated tools, all of which negatively affect both agent productivity and customer experience.**

**Actions to Improve Performance**

**1. Additional Training**

* **Skill Development:  
  Focus training efforts on areas where agents need improvement, such as communication, problem-solving, or deepening their understanding of specific products and services.**
* **Customer Service Techniques:  
  Provide training to enhance agents' abilities to handle difficult customer situations, manage expectations, and maintain a positive, professional demeanor under pressure.**

**2. Performance Assessment**

* **Evaluation:  
  Conduct a comprehensive evaluation to identify the root causes of underperformance. Factors such as lack of engagement, knowledge gaps, or personal challenges could be contributing to subpar performance.**
* **Fit for Role:  
  Assess whether the agent’s skills align with the demands of the role. If there is a mismatch between the agent’s capabilities and the job requirements, it may be necessary to consider role reassignment or adjustments.**

**Interpretation**

**Agents with both low CSAT scores and long resolution times often require targeted training, additional support, or upgraded tools to boost their performance. If specific agents consistently underperform despite support, it may be necessary to re-evaluate their fit for the role and consider potential reassignment or a change in responsibilities to align their strengths with the needs of the team.**

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

**Analysis: Analyze the resolution times by request category.**

**Answer:**

**After analyzing pivot table based on request category and average time of resolution, we have the following Insights,**

**1.Hardware issues and system issues have the longest resolution time.**

**2.Software issues have resolution time as per ART of agents.**

**3.Login access requests have lowest resolution time.**

|  |  |
| --- | --- |
| **Row Labels** | **Average of Resolution Time (Days)** |
| Hardware | 7.62539813 |
| Login Access | 0.313808105 |
| Software | 5.238732754 |
| System | 6.615609456 |

**Suggestions for Improvement**

**1. Dedicated Support Teams**

**Consider forming specialized support teams or designating agents with specific expertise in hardware and system issues. This approach can streamline problem-solving, leading to faster resolution times and more efficient service delivery.**

**2. Enhance Tools and Resources**

**Ensure that agents have access to advanced diagnostic tools and other resources that can accelerate the resolution process for hardware and system-related issues. Equipped with the right tools, agents can resolve complex problems more efficiently.**

**3. Leverage Automation**

**Implement automation for routine tasks related to hardware and system issues. By automating repetitive and time-consuming processes, agents will have more bandwidth to focus on handling more complex, high-priority cases.**

**4. Performance Benchmarking**

**Review and adjust ART targets for software-related issues to ensure they are realistic and achievable. If current targets are being consistently met, consider setting more challenging goals to push for further improvements in performance and resolution efficiency.**

**These strategies will help enhance the overall efficiency of support operations, improve customer satisfaction, and ensure that agents are equipped to handle issues effectively.**

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

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

**Answer:**

**First we need to analyze current data by Priority and Severity to measure the performance of current software tools in tickets management**

**Number of Tickets by priority type**

**Number of Tickets by Severity**

**To evaluate the effectiveness of the current software tools in managing IT tickets based on the provided image, we need to focus on two key performance metrics: Resolution Time (in days) and Satisfaction Score over the course of the year.**

**Insights from the Chart:**

1. **Resolution Time: The blue line, representing the average time to resolve tickets, fluctuates throughout the year. This inconsistency indicates that the current software tools are not consistently improving or stabilizing performance. Resolution times rise significantly in some months (like July) and drop in others, indicating potential inefficiencies or challenges that the software isn't managing effectively. Ideally, after implementing new tools, we should see a steady reduction in resolution time as processes become more streamlined and the team adapts to the software.**
2. **Satisfaction Score: The orange line shows that customer satisfaction has remained relatively stable throughout the year, even though resolution times vary. This suggests that while customers may not be overly dissatisfied with the service, there is no significant improvement in satisfaction either. The slight decline toward the second half of the year could be an early indicator of rising frustrations as resolution times fluctuate.**

**Performance Evaluation:**

* **Before and After Tool Implementation: If the chart reflects post-implementation data, the current software tools have managed to maintain stable customer satisfaction but have not consistently reduced resolution times. The lack of a clear downward trend in the blue line suggests the tools aren't fully optimizing ticket resolution processes. The fluctuations in resolution time imply that the tools may not be addressing underlying operational inefficiencies or peak workloads effectively.**

**Recommendations:**

1. **Optimize Ticket Prioritization and Automation:  
   To reduce the inconsistency in resolution times, the software tools should be configured to prioritize tickets based on urgency or complexity. Automating the handling of simpler, routine tickets will free up resources for more complex issues. Additionally, using the software’s analytics to detect trends can help identify months where resolution time spikes and allow the team to respond proactively.**
2. **Enhance Communication with Users:  
   Customer satisfaction has remained stable despite fluctuating resolution times, suggesting that other factors—such as communication—are helping maintain user satisfaction. Strengthen this by using the software to automate regular updates to customers, keeping them informed on their ticket status, especially when resolutions are delayed. Clear and proactive communication can prevent dissatisfaction from growing when response times increase.**
3. **Improve Resource Allocation:  
   Peaks in resolution times during certain months may indicate an imbalance in staffing or resource availability. The software tools should be used to better predict periods of high ticket volume, allowing the team to plan for increased resources or staff availability during these times. Implementing load-balancing features or assigning specialized teams during peak months could help reduce resolution times.**
4. **Leverage Predictive Analytics:  
   Using predictive analytics within the software tools can help forecast potential problem areas, such as ticket spikes or common issues. This allows for better planning and quicker responses to anticipated challenges, ensuring resolution times remain stable and satisfaction scores don’t decline.**

**Conclusion:**

**The current software tools are moderately effective in managing IT tickets. While they help maintain stable customer satisfaction, they are not consistently reducing resolution times. To increase the effectiveness of these tools, the organization should focus on automating processes, improving communication, and optimizing resource allocation, especially during peak periods. By doing so, resolution times can be stabilized and customer satisfaction can be maintained or improved.**

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

**Analysis: Trend analysis using time series charts.**

**Answer:**

**To analyse the performance of IT support team we can plot time series chart**

**Between years Vs Average of satisfaction rate and resolution time of IT tickets.**

**Analysis:**

**Satisfaction Rate:**

**There is a consistent increase in the average satisfaction rate from 3.98 in 2016 to 4.16 in 2020.**

**This steady growth suggests gradual improvements in service quality or the tools used to resolve tickets over time.**

**Resolution Time:**

**The average resolution time remains relatively stable, fluctuating slightly between 4.52 and 4.59 days across the five years.**

**Despite the minor fluctuations, the resolution time has not significantly decreased or improved over the years, suggesting that while customer satisfaction has risen, the time taken to resolve issues hasn't drastically changed.**

**Insights:**

**Rising Satisfaction: Despite a mostly unchanged resolution time, the increase in satisfaction could be attributed to factors other than speed, such as better communication, higher service quality, or improved tools.**

**Stable Resolution Times: The relatively steady resolution times suggest there may be room for improvement in speeding up ticket handling processes, which could further boost satisfaction rates.**

**Recommendations:**

**Focus on Reducing Resolution Time: Since satisfaction is improving, prioritizing strategies to reduce resolution time while maintaining service quality could yield even higher satisfaction levels.**

**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.**

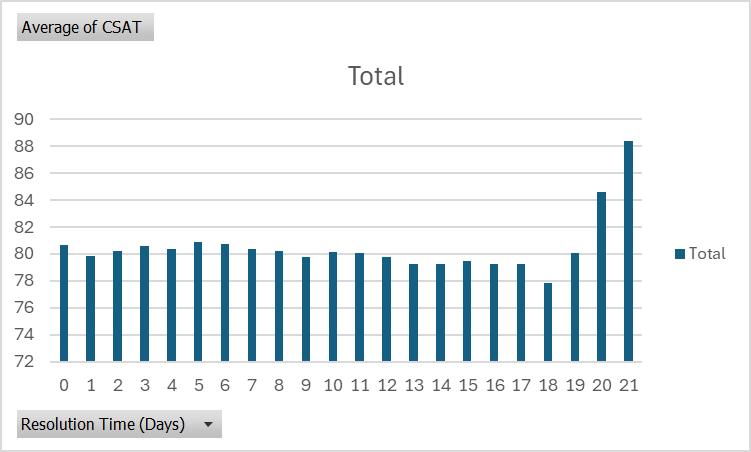
**Answer:**

**Investing in technology, such as upgrading hardware, software, or implementing more efficient tools, can significantly impact both ticket resolution times and employee satisfaction.**

**As we can see certain type of Issues are increasing over the years, so we can say Investing in tech can be an important and good move.**

**Now let’s find out how the CSAT score of IT employees related to the resolution time:**

**We know ticket resolution time and satisfaction are dependent on each other.**

**By reducing the resolution time we can improve satisfaction score and to reduce the resolution time new hardware and software tools have an important role to play.**

|  |  |
| --- | --- |
| **Row Labels** | **Average of CSAT** |
| **0** | 80.62874571 |
| **1** | 79.85952435 |
| **2** | 80.19906384 |
| **3** | 80.59481771 |
| **4** | 80.39535172 |
| **5** | 80.89102514 |
| **6** | 80.74928413 |
| **7** | 80.3842218 |
| **8** | 80.19040509 |
| **9** | 79.74933967 |
| **10** | 80.17190688 |
| **11** | 80.10154469 |
| **12** | 79.76641356 |
| **13** | 79.21496296 |
| **14** | 79.25398887 |
| **15** | 79.48425192 |
| **16** | 79.27583936 |
| **17** | 79.2816345 |
| **18** | 77.83472498 |
| **19** | 80.03212602 |
| **20** | 84.61878015 |
| **21** | 88.35995941 |

**Insights:**

**The 3–4-day window is optimal for high CSAT scores and should be the target for resolving tickets.**

**4-5 days causes the largest drop in satisfaction, signaling the need for swift resolution efforts during this period.**

**If resolution takes longer than 5 days, focusing on communication and quality service can help mitigate the negative impact on customer satisfaction.**

**Impact of Investing in Hardware and Software tools on Ticket Resolution Times:**

**Improved Efficiency:**

**Upgrading to faster and more reliable hardware can reduce system lag and downtime, it will also reduce the volume of tickets generating on daily basis, increase in productivity of employees which will ultimately lead to quicker ticket resolution.**

**Implementing better software tools can automate repetitive tasks, streamline workflows, and enhance issue diagnosis, reducing the time agents spend on each ticket.** **Modern diagnostic tools can help agents quickly identify and resolve issues. For instance, advanced monitoring software can detect problems before they escalate, enabling faster resolutions.**

**Impact on Employee Satisfaction:**

**Reduced Frustration:**

**Employees with access to efficient, reliable tools are likely to experience less frustration and stress, leading to higher job satisfaction. Reliable hardware and software reduce downtime and technical issues, contributing to a smoother work experience.**

**Enhanced Job Performance:**

**Access to cutting-edge technology can enhance employee’s ability to perform their jobs effectively, leading to a sense of accomplishment and satisfaction.**

**Conclusion:**

**We can say that upgrading technology will reduce average resolution times.**

**Enhanced tools would likely lead to less frustration and more efficient workflows, boosting employee morale and satisfaction**.

**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 analyse metrics such as average handling time, satisfaction scores, and number of tickets resolved.**

**Answer:**

**In order to assess the performance of IT agents, several key performance indicators (KPIs) can be analyzed as per data. These KPIs provide insights into efficiency, quality of service, and overall impact on customer and employee satisfaction**.

**Main objective of developing KPI’S are-**

**Identify Top Performers: Agents with high ticket resolution rates, low handling time, and high CSAT scores are your top performers. Reward and encourage these agents to continue their good work.**

**Identify Struggling Agents: Agents with high handling time, low CSAT scores should be the focus of performance improvement plans.**

**Training: Provide targeted training for agents struggling with complex issues or customer service skills.**

**Tools and Resources: Invest in better hardware, software, and knowledge management systems to help agents resolve issues faster.**

**Workload Management: Reassign tickets to balance the workload among all agents, ensuring no one is overloaded.**

**Employee Engagement: Boost morale through recognition programs, gamification of performance metrics, and regular feedback sessions**.

**Important KPI’s to be considered to evaluate agent and process performance:**

**CSAT:** **A measure of how satisfied users are with the service they received from an agent, typically collected through post-resolution surveys.**

**ART: The average time an agent spends resolving a support ticket, from the moment they start working on it until the ticket is resolved**.

**Number of Tickets Resolved:** **The total number of tickets an agent resolves within a given time period (daily, weekly, monthly).**

**Do We Need to Fire Any Agents?**

**Before making a decision about firing any agents, follow these steps:**

**Conduct Performance Reviews: For agents consistently underperforming across multiple metrics (e.g., high ART, low CSAT, low ticket resolution), conduct detailed performance reviews to understand the root causes (e.g., lack of skills, motivation, or workload issues).**

**Provide Improvement Plans: Offer struggling agents personalized performance improvement plans, which include:**

**Clear performance goals.**

**Additional training and coaching.**

**Regular progress reviews over a defined period.**

**Firing as a Last Resort: If, after multiple improvement efforts, an agent continues to underperform and negatively impacts the team, firing might be necessary. This decision should be based on data-backed evidence, such as:**

**-Continuous failure to meet performance targets.**

**-Persistent customer complaints and low satisfaction scores.**

**-Lack of improvement despite support and training.**

**Agent’s performances are summarized in the below table-**



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

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

**Answer:**

**In agent data, minimum age of agent is 27 and maximum age is 52, Filtering agents on the basis of their age group we have the following outcome:**

|  |  |  |
| --- | --- | --- |
| **Row Labels** | **Average of CSAT(%)** | **Average of ART** |
| 25-34 | 81.2688913 | 4.503601276 |
| 35-44 | 78.47558329 | 4.742397646 |
| 45-55 | 83.12286419 | 4.203236544 |

**Segment Analysis:**

**For Age Group 25-34:**

**Agents in this group perform reasonably well in terms of CSAT scores, but their resolution time is slightly above average compared to the 45-55 age group. They might benefit from more time-saving tools or process improvements.**

**Age Group 35-44:**

**This group has the lowest CSAT score and the longest resolution time. These agents may require targeted training to improve their efficiency and customer satisfaction, or perhaps some support with workflow management or technology tools to reduce resolution times.**

**Age Group 45-55:**

**This group has the highest CSAT score and the fastest resolution time. They are performing the best overall, suggesting they might be the most experienced or efficient group. Their performance could serve as a benchmark for the other groups.**

**Conclusion:**

**The 45-55 age group excels in both customer satisfaction and resolution time, providing a strong benchmark.**

**The 35-44 age group needs targeted support to improve both their CSAT and resolution time.**

**The 25-34 age group has solid CSAT but could benefit from efficiency improvements.**

**By focusing on improving the performance of the 25-34 and 35-44 groups, overall satisfaction and resolution time can be enhanced, leading to better customer experiences and operational efficiency.**

**We can also analyze age and ticket handled by each age groups.**

|  |  |
| --- | --- |
| **Row Labels** | **Count of ID Ticket** |
| **25-34** | **30.05%** |
| **35-44** | **47.81%** |
| **45-55** | **22.14%** |
| **Grand Total** | **100.00%** |

**Key Observations:**

**The 35-44 age group is handling a disproportionate share of tickets (nearly half), yet they have the lowest performance in both CSAT and resolution time. This indicates a potential workload imbalance that is affecting their performance.**

**The 25-34 age group is performing fairly well but has room for improvement in resolution time. Their workload is moderate (30.05% of tickets).**

**The 45-54 age group is the most efficient and has the highest customer satisfaction, but they are handling the fewest tickets (22.14%).**

**Suggestions:**

**Redistribute Workload: We should consider redistributing tickets more evenly across the age groups. The 45-54 group could take on more tickets since they handle them quickly and with high satisfaction, while the 35-44 group could benefit from a reduced load to improve their performance.**

**Support for 35-44 Group: We can provide additional training, tools, or process improvements for the 35-44 group to help them manage their high workload more effectively.**

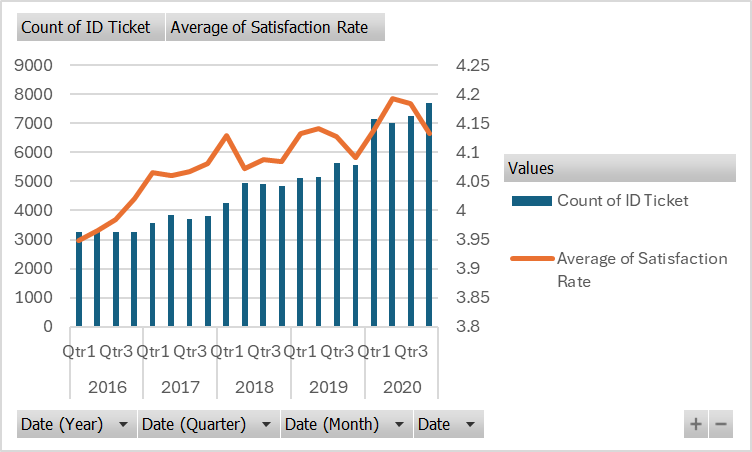
**9.Identify the trends for IT support operations based on ticket volumes and satisfaction, and mention the peak and stable times?**

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

**Answer:**

**We can analyze trends based on ticket volumes and satisfaction with the help of below pivot table and line chart.**

|  |  |  |
| --- | --- | --- |
| **Row Labels** | **Count of ID Ticket** | **Average of Satisfaction Rate** |
| **2016** |  |  |
| **Qtr1** | **3276** | **3.948412698** |
| **Qtr2** | **3265** | **3.966003063** |
| **Qtr3** | **3252** | **3.984624846** |
| **Qtr4** | **3258** | **4.01995089** |
| **2017** |  |  |
| **Qtr1** | **3559** | **4.06518685** |
| **Qtr2** | **3834** | **4.060511215** |
| **Qtr3** | **3717** | **4.066182405** |
| **Qtr4** | **3805** | **4.080420499** |
| **2018** |  |  |
| **Qtr1** | **4266** | **4.12822316** |
| **Qtr2** | **4936** | **4.072528363** |
| **Qtr3** | **4927** | **4.08768013** |
| **Qtr4** | **4825** | **4.08373057** |
| **2019** |  |  |
| **Qtr1** | **5114** | **4.131795072** |
| **Qtr2** | **5152** | **4.141692547** |
| **Qtr3** | **5646** | **4.126638328** |
| **Qtr4** | **5578** | **4.091609896** |
| **2020** |  |  |
| **Qtr1** | **7156** | **4.137926216** |
| **Qtr2** | **7012** | **4.191956646** |
| **Qtr3** | **7236** | **4.184632394** |
| **Qtr4** | **7684** | **4.133003644** |

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**Insights:**

**Ticket Volume Trends:**

**From 2016 to 2020, there has been a consistent increase in the Volume of Tickets.**

**The ticket volume grows steadily, with a noticeable jump in 2019 and a significant spike in 2020, particularly in the third quarter.**

**The ticket volume reached its peak in Q3 of 2020, with the number of tickets exceeding 7,500. This could be due to external factors such as organizational growth, increased reliance on IT, or possibly the transition to remote work due to the pandemic. This suggests that the IT department faced a significant workload increase during this period.**

**Satisfaction Rate Trends:**

**The chart does not directly provide details on the Average Satisfaction Rate values. Satisfaction Rates might show a slight decline as the ticket volume increases, especially in 2020, where the workload is highest.**

**If the satisfaction rate remained relatively stable despite the increasing ticket volume, it would be a sign of good team performance under pressure. However, if the satisfaction rate dropped, it would indicate the need for more support or resources.**

**Recommendations:**

**Improve Resource Allocation: To maintain high satisfaction despite growing volumes, invest in automation tools, better ticketing systems, or additional staff to ensure that the IT team can handle the demand efficiently.**

**Monitor Satisfaction Rates: If satisfaction rates are declining with the rise in ticket volume, it is important to address potential bottlenecks and ensure IT agents have the tools and resources to work effectively.**

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

**Answer:**

**We can include following matrices on our dashboard:**

**1. Operational Metrics:**

**Total Number of Tickets: Number of tickets created (daily, monthly, quarterly).**

**Ticket Volume by Category: Breakdown of tickets by issue type or request category (e.g., software issues, hardware failures), ticket volume by severity and priority.**

**Average Resolution Time (ART): Time spent resolving a ticket. Helps measure efficiency.**

**Tickets by priority and severity type.**

**2. Customer Experience Metrics:**

**Customer Satisfaction (CSAT) Score: Average satisfaction score based on post-ticket surveys.**

**Average Time to Resolution: The average time taken to resolve tickets, categorized by issue type.**

**3. Employee Performance Metrics:**

**Average Tickets Handled per Agent: A productivity measure showing the number of tickets each agent resolves.**

**Agent Efficiency: A combined metric that considers handle time, resolution time.**

**6. Trend Analysis:**

**Ticket Volume & Performance Trends: Monthly or quarterly trends in ticket volume, average resolution time, and satisfaction scores.**

**Agent Performance Trends: Track changes in agent productivity and efficiency over time.**

**Satisfaction Trends: How satisfaction scores change over time, especially after changes or improvements are implemented.**

**Dashboard Visualization Suggestions:**

**Trend Line Charts: For ticket volume, resolution times, and customer satisfaction trends.**

**Bar Charts: To visualize agent performance, ticket categories, and customer satisfaction scores.**

**Pie Charts: For category-wise ticket distribution or resource utilization.**