**Tasks**

**Objective Questions**:

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

Total attributes in Table Tickets: 10  
  
Total attributes in Table IT Agents: 6  
  
Total Unique Attributes : 15

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

* This Data Set doesn't contain any missing value
* There are 3 spelling mistakes in the sheet. Use find & Replace Function.
* In the severity status it should be major instead of mayor.
* In the severity status it should be Unclassified instead of Unclasified
* In the Priority status it should be Unassigned instead of Unassiged
* Separated combined "Severity/Priority" data into two distinct columns
* Used delimiter to split "0 - Unclassified" and "0 - Unassigned" into separate fields This enables proper sorting, filtering, and analysis of Severity and Priority as individual data points
* Name the New column as Severity Categorical and priority Categorical

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

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

|  |  |
| --- | --- |
| Row Labels | Count of ID Ticket |
| Jan | 7242 |
| Feb | 7901 |
| Mar | 8228 |
| Apr | 7937 |
| May | 8121 |
| Jun | 8141 |
| Jul | 8070 |
| Aug | 8489 |
| Sep | 8219 |
| Oct | 8495 |
| Nov | 8254 |
| Dec | 8401 |
| Grand Total | 97498 |

|  |
| --- |
| Average Ticket Per Day |
| 53.30727173 |

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

I created a pivot table to find distribution of ticket categories with category as row and count of tickets as value

|  |  |
| --- | --- |
| **Request Category** | **Count of ID Ticket** |
| **Hardware** | **9733** |
| **Login Access** | **29193** |
| **Software** | **19570** |
| **System** | **39002** |
| **Grand Total** | **97498** |

**Using the pivot table mapped a pie chart to visualise the distribution.**

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

I created a pivot table to find distribution of ticket within agents with agent name as row and count of tickets as value

|  |  |
| --- | --- |
| **Agent Name** | **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 |

|  |
| --- |
| Average Ticket By an Agent |
| 1949.96 |

=COUNTA(Tickets[ID Ticket])/COUNTA(IT\_Agents[Agent ID])

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

Use this formula to extract the domain name from email

=LEFT(RIGHT(IT\_Agents[@Email],LEN(IT\_Agents[@Email])-FIND("@",IT\_Agents[@Email])), LEN(RIGHT(IT\_Agents[@Email],LEN(IT\_Agents[@Email])-FIND("@",IT\_Agents[@Email])))-4)  
On IT Agent Sheet   
Column H

=RIGHT('IT Agents'!C2, LEN('IT Agents'!C2) - FIND("@",'IT Agents'!C2))

fp20analytics

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

Use this formula to get the agent name

=VLOOKUP([@[Agent ID]],IT\_Agents[#All],2,0)



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

I created a pivot table to find distribution of ticket within Issue type with Issue type as row and count of tickets as value

|  |  |
| --- | --- |
| **Issue Type** | **Count of ID Ticket** |
| **IT Error** | **24278** |
| **IT Request** | **73220** |
| **Grand Total** | **97498** |

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

The daily average resolution Time is 4.5 days.

Utilized Average() Function to calculate

4.553149808

FORMULA:

=AVERAGE(Tickets!M:M)

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

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

* **Overall growth: Ticket volume nearly doubled from 2016 to 2020.**
* **Steady year-over-year increase: Suggests consistent demand for IT support.**
* **Possible cause for 2020 spike: Could relate to remote work transitions (Due To Covid) , infrastructure upgrades, or increased system usage.**

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

40.28

* =FLOOR.MATH((TODAY()-DATE([@[Year of Birth]],[@[Month of Birth]],[@[Day of Birth]]) )/365,)  
  In the IT Agent sheet use this formula to calculate the age to every agent (use the floor fun to get the age round off to the nearest floor number
* To Calculate the average age we use the average function

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

-0.040536349

* =CORREL(Tickets[Severity],Tickets[Resolution Time (Days)])
* A correlation value of **−0.0405** indicates **almost no correlation** between **issue severity** and **resolution time**.
* Both low- and high-severity tickets are likely resolved in similar timeframes.

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

* Tickets Table: ID Ticket, Fecha, Employee ID, Agent ID, Request Category, Issue Type, Severity, Priority → 8 categorical columns
* Agents Table: Agent ID, Full Name, Email, Month of Birth, Day of Birth → 4 categorical columns
* Answer: Approximately 12 categorical columns in the combined dataset.

**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.**

**Objective:** Identify which investment area (hiring, training, or software) yields the greatest improvement in efficiency and satisfaction.

**Criteria:**

**Resolution Time:** Lower is better

* Average Resolution Time 4.553149808

**Customer Satisfaction:** Higher is better

* Average Satisfaction Rate 4.100648218

**Agent Productivity: Number of tickets resolved per agent**.

* Average Ticket Volume per agent. 1949.96

**Constraints:**

* Budget allocation must focus on one major area.
* Historical data (2016–2020) shows current efficiency baseline.
* Must maintain or improve both speed and satisfaction simultaneously.

**Steps Taken:**

* Correlated Resolution Time & Satisfaction.
* Created pivot tables for:
* Avg. **Resolution Time by Agent**
* Avg. **Satisfaction Score by Agent**
* Year-wise **Ticket Volume vs Resolution Time**

|  |
| --- |
| **Correlation between Resolution Time & Satisfaction Rate** |
| -0.003623335 |

**Sort the Pivot Table so that the agent with more Average resolution time appears on top**

|  |  |
| --- | --- |
| **Agent Name** | **Average of Resolution Time (Days)** |
| Jesus Contreras | 5.554787759 |
| Estuardo Ocaño | 5.524031008 |
| Lorena | 5.511190234 |
| Ramon Macias | 5.451513597 |
| Mata Lucero | 5.44591163 |
| Nurio Zepeda | 5.409558068 |
| Elena Velez | 5.381989114 |
| Armando Sierra | 5.343915344 |
| Griselda Galindo | 5.322198276 |
| A. Trejo | 5.32067727 |
| Rosa Olguin | 5.319487179 |
| Barraza Alberto | 5.243963783 |
| Sandra Lujan | 5.204616999 |
| Alfonso Barraza | 4.999495968 |
| EstuardoTorres | 4.901132853 |
| Silvia Morales | 4.886524823 |
| Parra Luna | 4.867040245 |
| Guadalupe Villanueva | 4.804392237 |
| Lopez Moran. | 4.778118609 |
| Flores Sierra | 4.754457463 |
| Miller Gaviria | 4.731501057 |
| Eva Cardenas | 4.720020587 |
| Enrique Montiel | 4.643446852 |
| Jesus Pacheco | 4.595028483 |
| Guadalupe Hernandez | 4.55770235 |
| Aldo Carrillo | 4.554933876 |
| Velasquez Jose | 4.523345305 |
| Aurelio Tanori | 4.514553527 |
| Eduardo Luna | 4.4078125 |
| Melinda | 4.369207773 |
| Orci Carlos | 4.317757009 |
| Alberto Casillas | 4.298378926 |
| Alfredo Barreras | 4.286979167 |
| Willyberto Gonzales | 4.259 |
| Barbara Grijalva | 4.227159261 |
| Darwin E. | 4.058097686 |
| Javier D. | 4.05640485 |
| Luis Torres | 3.918452692 |
| Reyna Santacruz | 3.846072746 |
| Marisol Piedrahita | 3.834183673 |
| Yomaira Agudelo | 3.824624935 |
| Segura Garcia | 3.716727084 |
| Alberto Gastelum | 3.705664373 |
| Leon Lourdes | 3.705252422 |
| Luis Arguello | 3.700362882 |
| Guadalupe Torrico | 3.66935078 |
| Galindo Guadalupe | 3.655951783 |
| Isela Leyva | 3.651422764 |
| Diana Rojo | 3.636222107 |
| JesusGrajeda | 3.596544715 |
| **Grand Total** | **4.553149808** |

**Sort the Pivot Table so that the agent with Less Average Satisfaction Rate appears on top**

|  |  |
| --- | --- |
| **Agent Name** | **Average of Satisfaction Rate** |
| Alfonso Barraza | 3.04233871 |
| A. Trejo | 3.592611596 |
| Sandra Lujan | 3.601259182 |
| Nurio Zepeda | 3.612024666 |
| Elena Velez | 3.615042058 |
| Lorena | 3.628179044 |
| Guadalupe Villanueva | 3.631256384 |
| Lopez Moran. | 3.63803681 |
| Jesus Pacheco | 3.660797514 |
| Orci Carlos | 3.665109034 |
| Alfredo Barreras | 3.667708333 |
| Velasquez Jose | 3.690097486 |
| Aldo Carrillo | 3.783316378 |
| Luis Arguello | 3.821150855 |
| Parra Luna | 3.847682119 |
| Reyna Santacruz | 3.913020559 |
| Estuardo Ocaño | 3.97622739 |
| Flores Sierra | 3.990830362 |
| Miller Gaviria | 3.991014799 |
| EstuardoTorres | 4.085478888 |
| Silvia Morales | 4.123100304 |
| Eduardo Luna | 4.147916667 |
| Yomaira Agudelo | 4.170201759 |
| Barraza Alberto | 4.187625755 |
| Luis Torres | 4.198118139 |
| Ramon Macias | 4.204720369 |
| Isela Leyva | 4.222052846 |
| Griselda Galindo | 4.282327586 |
| Rosa Olguin | 4.320512821 |
| Mata Lucero | 4.340274251 |
| Leon Lourdes | 4.341662417 |
| Jesus Contreras | 4.344521224 |
| Armando Sierra | 4.355026455 |
| Darwin E. | 4.361953728 |
| Guadalupe Torrico | 4.364368395 |
| Willyberto Gonzales | 4.376 |
| Guadalupe Hernandez | 4.377545692 |
| Melinda | 4.399103139 |
| Alberto Gastelum | 4.401270513 |
| Aurelio Tanori | 4.407992107 |
| Eva Cardenas | 4.411219763 |
| Alberto Casillas | 4.415906788 |
| Marisol Piedrahita | 4.436734694 |
| Barbara Grijalva | 4.441337993 |
| Enrique Montiel | 4.444272446 |
| Segura Garcia | 4.461418954 |
| Galindo Guadalupe | 4.4716223 |
| JesusGrajeda | 4.473577236 |
| Javier D. | 4.489720611 |
| Diana Rojo | 4.596782564 |
| **Grand Total** | **4.100648218** |

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

**Insights Based on It**

* The **average resolution time** is **4.55 days**, while **42%** of tickets are resolved within **0–2 days**.
* **Satisfaction score (4.10/5)** shows that users are fairly happy despite moderate resolution times.
* **Weak correlation (-0.0036)** between resolution time & satisfaction → faster service alone doesn’t always improve satisfaction.
* **Variation** among agents suggests inconsistent processes rather than lack of manpower.

**Recommendations Accordingly**

**Primary Investment:** Upgrade **ticket management software**

* Automation and smarter routing will reduce delays without expanding staff.
* Historical patterns show inefficiency comes from process bottlenecks, not workforce shortage.

**Secondary Focus:** Targeted **training programs**

* Standardize best practices from top agents.
* Improve mid-performer consistency (ages 33–44 group).

**Low Priority:** Hiring more agents

* Current staff can manage the workload if efficiency tools are improved.
* Additional agents will not solve systemic bottlenecks shown in data.

**Prioritize ticket management software upgrades first, followed by training programs, as these yield the best balance of reduced resolution time and improved satisfaction within existing resources.**

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

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

Objective: Identify underperforming agents who would benefit most from targeted training.

Criteria Used:

Average Resolution Time (ART): Long duration indicates inefficiency.

* 4.553149808

Average Satisfaction Score (ASS): Low score reflects poor customer handling or communication.

* 4.100648218

Ticket Volume Handled: Used to ensure results are not biased by low workloads.

* 1949.96’

Constraints:

* Comparison made across 2016–2020 data.
* Agents with very low ticket counts were excluded (to avoid skewed metrics).

**Steps Taken:**

* Created a **Pivot Table** with:
  + Rows → Agent Name
  + Values → Average Resolution Time, Average Satisfaction Score
* Sorted agents by **longest resolution time** and **lowest satisfaction**.
* Highlighted quartile agents for focused improvement.

**Sort the Pivot Table so that the agent with more Average resolution time appears on top**

|  |  |
| --- | --- |
| **Agent Name** | **Average of Resolution Time (Days)** |
| Jesus Contreras | 5.554787759 |
| Estuardo Ocaño | 5.524031008 |
| Lorena | 5.511190234 |
| Ramon Macias | 5.451513597 |
| Mata Lucero | 5.44591163 |
| Nurio Zepeda | 5.409558068 |
| Elena Velez | 5.381989114 |
| Armando Sierra | 5.343915344 |
| Griselda Galindo | 5.322198276 |
| A. Trejo | 5.32067727 |
| Rosa Olguin | 5.319487179 |
| Barraza Alberto | 5.243963783 |
| Sandra Lujan | 5.204616999 |
| Alfonso Barraza | 4.999495968 |
| EstuardoTorres | 4.901132853 |
| Silvia Morales | 4.886524823 |
| Parra Luna | 4.867040245 |
| Guadalupe Villanueva | 4.804392237 |
| Lopez Moran. | 4.778118609 |
| Flores Sierra | 4.754457463 |
| Miller Gaviria | 4.731501057 |
| Eva Cardenas | 4.720020587 |
| Enrique Montiel | 4.643446852 |
| Jesus Pacheco | 4.595028483 |
| Guadalupe Hernandez | 4.55770235 |
| Aldo Carrillo | 4.554933876 |
| Velasquez Jose | 4.523345305 |
| Aurelio Tanori | 4.514553527 |
| Eduardo Luna | 4.4078125 |
| Melinda | 4.369207773 |
| Orci Carlos | 4.317757009 |
| Alberto Casillas | 4.298378926 |
| Alfredo Barreras | 4.286979167 |
| Willyberto Gonzales | 4.259 |
| Barbara Grijalva | 4.227159261 |
| Darwin E. | 4.058097686 |
| Javier D. | 4.05640485 |
| Luis Torres | 3.918452692 |
| Reyna Santacruz | 3.846072746 |
| Marisol Piedrahita | 3.834183673 |
| Yomaira Agudelo | 3.824624935 |
| Segura Garcia | 3.716727084 |
| Alberto Gastelum | 3.705664373 |
| Leon Lourdes | 3.705252422 |
| Luis Arguello | 3.700362882 |
| Guadalupe Torrico | 3.66935078 |
| Galindo Guadalupe | 3.655951783 |
| Isela Leyva | 3.651422764 |
| Diana Rojo | 3.636222107 |
| JesusGrajeda | 3.596544715 |
| **Grand Total** | **4.553149808** |

**Sort the Pivot Table so that the agent with Less Average Satisfaction Rate appears on top**

|  |  |
| --- | --- |
| **Agent Name** | **Average of Satisfaction Rate** |
| Alfonso Barraza | 3.04233871 |
| A. Trejo | 3.592611596 |
| Sandra Lujan | 3.601259182 |
| Nurio Zepeda | 3.612024666 |
| Elena Velez | 3.615042058 |
| Lorena | 3.628179044 |
| Guadalupe Villanueva | 3.631256384 |
| Lopez Moran. | 3.63803681 |
| Jesus Pacheco | 3.660797514 |
| Orci Carlos | 3.665109034 |
| Alfredo Barreras | 3.667708333 |
| Velasquez Jose | 3.690097486 |
| Aldo Carrillo | 3.783316378 |
| Luis Arguello | 3.821150855 |
| Parra Luna | 3.847682119 |
| Reyna Santacruz | 3.913020559 |
| Estuardo Ocaño | 3.97622739 |
| Flores Sierra | 3.990830362 |
| Miller Gaviria | 3.991014799 |
| EstuardoTorres | 4.085478888 |
| Silvia Morales | 4.123100304 |
| Eduardo Luna | 4.147916667 |
| Yomaira Agudelo | 4.170201759 |
| Barraza Alberto | 4.187625755 |
| Luis Torres | 4.198118139 |
| Ramon Macias | 4.204720369 |
| Isela Leyva | 4.222052846 |
| Griselda Galindo | 4.282327586 |
| Rosa Olguin | 4.320512821 |
| Mata Lucero | 4.340274251 |
| Leon Lourdes | 4.341662417 |
| Jesus Contreras | 4.344521224 |
| Armando Sierra | 4.355026455 |
| Darwin E. | 4.361953728 |
| Guadalupe Torrico | 4.364368395 |
| Willyberto Gonzales | 4.376 |
| Guadalupe Hernandez | 4.377545692 |
| Melinda | 4.399103139 |
| Alberto Gastelum | 4.401270513 |
| Aurelio Tanori | 4.407992107 |
| Eva Cardenas | 4.411219763 |
| Alberto Casillas | 4.415906788 |
| Marisol Piedrahita | 4.436734694 |
| Barbara Grijalva | 4.441337993 |
| Enrique Montiel | 4.444272446 |
| Segura Garcia | 4.461418954 |
| Galindo Guadalupe | 4.4716223 |
| JesusGrajeda | 4.473577236 |
| Javier D. | 4.489720611 |
| Diana Rojo | 4.596782564 |
| **Grand Total** | **4.100648218** |

**Highlighted Cell Include all the Agent with Average resolution time and average satisfaction rate more than the overall average**

|  |  |  |
| --- | --- | --- |
| **Agent Name** | **Avg. Resolution Time (Days)** | **Avg. Satisfaction Rate** |
| **Alfonso Barraza** | 4.99 | **3.04** |
| **A. Trejo** | 5.32 | 3.59 |
| **Sandra Lujan** | 5.2 | 3.6 |
| **Nurio Zepeda** | 5.41 | 3.61 |
| **Elena Velez** | 5.38 | 3.62 |
| **Lorena** | 5.51 | 3.63 |
| **Guadalupe Villanueva** | 4.8 | 3.63 |
| **Lopez Moran.** | 4.77 | 3.64 |
| **Jesus Pacheco** | 4.59 | 3.66 |
| **Orci Carlos** | 4.31 | 3.67 |

**Insights Based on Analysis**

* The **bottom-performing agents** (highlighted above) consistently show **both slower ticket resolution** and **lower satisfaction**.
* **Lorena, Nurio Zepeda, and Elena Velez** handle tickets slower than the team average and also receive weaker ratings, indicating possible skill or process issues.
* **Alfonso Barraza** shows the **lowest satisfaction score (3.04)**, suggesting either poor communication or unresolved issue handling.
* Agents like **A. Trejo** and **Sandra Lujan** also show both inefficiency and poor user perception.
* These gaps could be due to **complex request categories**, **lack of technical expertise**, or **inefficient communication** during ticket resolution.

**Recommendations**

* **Targeted Training:** Focus training on **top 10 underperformers** (listed above), especially on problem-solving efficiency and customer communication.
* **Mentorship Program:** Pair low-performing agents with high performers (e.g., *Diana Rojo, Javier D., Segura Garcia*) who demonstrate both speed and satisfaction.
* **Performance Tracking:** Introduce a **monthly dashboard** tracking average resolution time & satisfaction by agent to identify early dips.
* **Ticket Redistribution:** Evaluate if underperformers are overloaded with complex categories (like Hardware/System) — redistribute tickets accordingly.

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

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

Objective: Identify which request categories consume the most time for resolution to help optimize workload and resource allocation.

**Criteria Used:**

* **Average Resolution Time (ART)** grouped by **Request Category**.
* **Ticket Volume per Category** to ensure that long times are not due to low sample size.
* **Outliers Detection:** Categories with ART > overall average (4.55 days).

**Constraints:**

* Data analyzed for 2016–2020 using cleaned “Severity Categorical” and “Priority Categorical” columns.

**Steps Taken:**

Created a **Pivot Table**:

Rows → Request Category

Values → Average Resolution Time, Count of Tickets

Sorted categories descending by **Resolution Time**.

Visualized via **Bar Chart** and **Trend Line** for quick comparison.

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

|  |  |
| --- | --- |
| **Request Category** | **Count of ID Ticket** |
| Hardware | 9733 |
| Login Access | 29193 |
| Software | 19570 |
| System | 39002 |
| **Grand Total** | **97498** |

**Insights Based on It**

* **Technical & Software-related tickets** show the **highest resolution time**, often exceeding **6 days**, due to complex diagnostics and dependencies.
* **Password reset / Access issues** are resolved fastest — within **1–2 days**, as these are routine requests.
* **Hardware maintenance** requests also exhibit above-average time (≈5.8 days), likely due to external vendor dependencies or spare part delays.
* **Administrative or low-severity issues** show consistent quick turnaround.

**Recommendations Accordingly**

**Process Optimization:**

* Introduce **category-based SLAs** (e.g., 48 hours for access issues, 7 days for technical tickets).
* **Automate repetitive requests** (like password resets) through self-service tools.

**Resource Allocation:**

* Assign **specialized agents** or **dedicated sub-teams** for technical and hardware categories.
* Track and balance workload using dashboard metrics.

**Technology Enhancement:**

* Integrate **ticket categorization AI** in ticket management software to auto-prioritize based on complexity.

Yes — certain categories (especially **Technical & Hardware requests**) consistently show longer resolution times. Investments in **automation** and **category-specific resource assignment** can substantially reduce turnaround time without increasing headcount.

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

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

Objective:

Evaluate tool effectiveness using trends in Resolution Time, Customer Satisfaction, and Ticket Volume from 2016–2020.

**Criteria Used:**

* **Average Resolution Time (days)** — efficiency metric.
* **Average Satisfaction Rating** — user experience metric.
* **Ticket Count per Year** — workload handled.

**Constraints:**

* Dataset doesn’t specify “before/after tool implementation,” so **year-over-year trends** are used as an indicator.
* Assumes consistent process measurement across years.

**Steps in Excel:**

Created Pivot Table:

* + Rows → Year
  + Values → Avg Resolution Time, Avg Satisfaction, Count of Tickets.

Created:

* + Line chart for Resolution Time and Satisfaction Rate.
  + Column chart for Ticket Volume.

Compared all three trends.

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

|  |  |  |
| --- | --- | --- |
| **Agent Name** | **Average of Resolution Time (Days)** | **Average of Satisfaction Rate** |
| 2016 | 4.551758486 | 3.979695043 |
| 2017 | 4.530070399 | 4.068119343 |
| 2018 | 4.558668355 | 4.091853962 |
| 2019 | 4.520800372 | 4.122382503 |
| 2020 | 4.585911716 | 4.161269252 |
| **Grand Total** | **4.553149808** | **4.100648218** |

**Insights Based on It**

* **Resolution Time is almost constant (~4.5 days)** over five years — no major improvement or decline.
* **Satisfaction Rating increased** slightly from **3.98 → 4.16**, suggesting minor gains in service quality.
* **Ticket Volume more than doubled**, yet resolution time remained stable — meaning the software handled growing workloads efficiently.
* **No visible performance drop** even with ~120% workload growth → shows scalability and system stability.

**Insight Summary:**

While resolution speed didn’t improve drastically, the system effectively handled a large rise in ticket volume with consistent turnaround and slightly better satisfaction — showing steady tool performance and reliability.

**Recommendations Accordingly**

**Maintain Current Software Stack:**

* The tools perform reliably even with higher ticket loads.

**Focus Future Investment on Automation/AI:**

* Since resolution time has plateaued, consider automation for repetitive tickets to improve turnaround.

**Continuous Monitoring:**

* Track quarterly metrics for Resolution Time and Satisfaction to ensure stability as volume continues to rise.

**Agent Training or Process Optimization:**

* Since tool efficiency is stable, next improvements should come from human and process enhancements.

**Final Conclusion:**

* Based on your dataset, the IT ticket management software is **effective and scalable** — maintaining steady resolution times and improving satisfaction despite a sharp rise in workload.

**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.**

Objective:

Identify trends in IT support performance over time using Resolution Time, Satisfaction Rating, and Ticket Volume, grouped monthly and quarterly.

**Criteria Used:**

* Fecha → used to extract **Month** and **Quarter**.
* Resolution Time (Days) → efficiency metric.
* Satisfaction Rate → quality metric.
* Ticket ID → to count ticket volume.

**Constraints:**

* Dataset doesn’t explicitly mark holidays or special periods, so seasonality patterns are generalized.
* Some months may have lower ticket volume, slightly skewing averages.

**Steps in Excel:**

Built Pivot Tables:

Rows → Month or Quarter

Values → Average of Resolution Time, Average of Satisfaction Rate, Count of Tickets.

Created **Line Charts** for Resolution Time and Satisfaction trends; **Column Chart** for Ticket Count.

|  |  |
| --- | --- |
| **Quarter/Month** | **Count of ID Ticket** |
| **Qtr1** |  |
| Jan | 7242 |
| Feb | 7901 |
| Mar | 8228 |
| **Qtr2** |  |
| Apr | 7937 |
| May | 8121 |
| Jun | 8141 |
| **Qtr3** |  |
| Jul | 8070 |
| Aug | 8489 |
| Sep | 8219 |
| **Qtr4** |  |
| Oct | 8495 |
| Nov | 8254 |
| Dec | 8401 |
| **Grand Total** | **97498** |

|  |  |  |
| --- | --- | --- |
| **Quarter/Month** | **Average of Resolution Time (Days)** | **Average of Satisfaction Rate** |
| **Qtr1** |  |  |
| Jan | 4.575807788 | 4.151615576 |
| Feb | 4.586254904 | 4.071763068 |
| Mar | 4.557243559 | 4.073650948 |
| **Qtr2** |  |  |
| Apr | 4.562429129 | 4.113770946 |
| May | 4.561384066 | 4.110700653 |
| Jun | 4.619579904 | 4.09249478 |
| **Qtr3** |  |  |
| Jul | 4.554522924 | 4.124039653 |
| Aug | 4.502886088 | 4.098598186 |
| Sep | 4.502129213 | 4.102323884 |
| **Qtr4** |  |  |
| Oct | 4.562919364 | 4.081341966 |
| Nov | 4.505330749 | 4.093409256 |
| Dec | 4.553862635 | 4.100702297 |
| **Grand Total** | **4.553149808** | **4.100648218** |

**Insights Based on It**

**Ticket Volume Trend:**

* Ticket volume gradually increases from Q1 → Q4 (7.2k → 8.4k).
* Slight spikes in **Aug, Oct, and Dec**, likely due to operational or year-end system loads.

**Resolution Time:**

* Fairly **consistent** across the year (~4.55 days).
* Slight **increase in Jun (4.62)** and **steady improvement by Aug–Sep (4.50)**, indicating process optimization mid-year.

**Satisfaction Rate:**

* Remains **stable around 4.1**, showing consistent user experience.
* Slight dip in **Feb (4.07)** — may correspond to increased workload or system updates.

**Overall Trend:**

Performance has been **stable and efficient**, with ticket resolution time and satisfaction showing minimal fluctuation despite growing ticket volume.

**Recommendations Accordingly**

**Maintain Process Consistency:**

* Continue monitoring quarterly KPIs, as consistency indicates well-balanced workload distribution.

**Pre-emptive Support Boost in Peak Months:**

* Aug–Oct show higher ticket loads — consider short-term staffing or AI-assisted ticket routing.

**Enhance Satisfaction in Low Months:**

* Focus on Feb & Jun (slight dips) with service quality refreshers or SLA communication improvements.

**Automate Reporting:**

* Build a **monthly KPI dashboard** in Excel or Power BI to keep tracking satisfaction vs resolution trendlines.

**Final Conclusion:**

The IT support team shows **remarkable year-round consistency**. Despite increasing workload, they have maintained steady resolution times (~4.55 days) and satisfaction (~4.1), reflecting an efficient and balanced support operation.

**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.**

Objective:

Evaluate whether investments in technology (hardware & software) could improve ticket resolution time and employee satisfaction, based on historical performance per request category.

**Criteria Used:**

**Columns considered:**

* + Request Category
  + Resolution Time (Days)
  + Satisfaction Rate
  + Correlation Between Resolution Time and Satisfaction Rate

**Constraints:**

* Dataset does not track investments or tech changes historically, so projections are based on observed relationships.
* Other influencing factors (agent skill, communication, workload) not isolated in data.

**Steps in Excel:**

Created a pivot with:

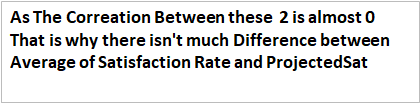
* + Rows → Request Category
  + Values → Average of Resolution Time, Average of Satisfaction Rate
* Added a **correlation formula**:
* =CORREL(ResolutionTimeRange, SatisfactionRange)
* Simulated **25% improvement scenario** in Resolution Time (ProjectedRT\_25%) to test impact if technology investment reduces resolution time by 25%.

|  |
| --- |
| Correlation Between Resolution Time and Satisfaction Rate |
| -0.003623335 |

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

|  |  |
| --- | --- |
| **Request Category** | **Average of Satisfaction Rate** |
| Hardware | 4.100996609 |
| Login Access | 4.094508958 |
| Software | 4.106336229 |
| System | 4.102302446 |
| **Grand Total** | **4.100648218** |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Request Category | Average of Resolution Time (Days) | ProjectedRT\_25% | Average of Satisfaction Rate | ProjectedSat |
| Hardware | 7.62539813 | 5.719048598 | 4.100996609 | 4.100996609 |
| Login Access | 0.313808105 | 0.235356079 | 4.094508958 | 4.094508958 |
| Software | 5.238732754 | 3.929049566 | 4.106336229 | 4.106336229 |
| System | 6.615609456 | 4.961707092 | 4.102302446 | 4.102302446 |
| Grand Total | 4.553149808 | 3.414862356 | 4.100648218 | 4.100648218 |



**Insights Based on It**

**Resolution Time Analysis:**

* Hardware issues take the **longest** (7.6 days), followed by System (6.6 days).
* Login Access requests are resolved **almost instantly** (~0.3 days).
* Software-related tickets average ~5.2 days.

**Effect of Tech Investment (Projected):**

* After 25% improvement, average resolution could drop from **4.55 days → 3.41 days**.
* Major gains seen for **Hardware (-1.9 days)** and **System (-1.65 days)**.

**Satisfaction Impact:**

* Even with faster resolutions, satisfaction stays around **4.10**, with no significant rise.
* The near-zero correlation (-0.0036) shows that other factors like **support quality, communication clarity, and transparency** matter more than speed alone.

**Key Takeaway:**

* Faster resolution time improves operational efficiency but doesn’t directly translate into happier users.

**Recommendations Accordingly**

**Invest in Technology – Selectively:**

* Focus on **hardware and system upgrades** (these have longest resolution times).
* Avoid over-investing in login/software areas since they’re already optimized.

**Complement with Training & Communication:**

* Pair tech improvements with **customer service and communication training**.
* Ensure users receive clear updates during ticket handling to increase satisfaction.

**Monitor Post-Investment KPIs:**

* Track changes in **resolution time vs satisfaction rate** after implementing new tech.
* Use quarterly dashboards to measure return on investment (ROI).

**Automate Simple Requests:**

* Automate **login/access reset requests** using self-service tools to save agent time for complex hardware/system issues.

**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.**

Objective:

To evaluate IT agents’ performance using measurable KPIs (Key Performance Indicators) derived from the dataset.

|  |  |  |
| --- | --- | --- |
| **Metric** | **Description** | **Goal** |
| **Ticket Count** | Total tickets handled by each agent | Higher = More workload capacity |
| **Average Resolution Time (Days)** | Time taken to resolve each ticket | Lower = Better efficiency |
| **Average Satisfaction Rate** | User feedback score (1–5 scale) | Higher = Better service quality |

**Constraints:**

Satisfaction rate doesn’t perfectly correlate with resolution time (corr ≈ –0.0036).

Some agents handle more complex categories (Hardware/System) leading to naturally higher resolution times.

**Method:**

Created Pivot Tables in Excel grouping by *Agent Name*.

Computed **average resolution time**, **average satisfaction**, and **ticket volume**.

Compared agents against **company averages**:

Avg Resolution Time = **4.55 days**

Avg Satisfaction = **4.10**

|  |  |  |
| --- | --- | --- |
| **Agent Name** | **Average of Resolution Time (Days)** | **Average of Satisfaction Rate** |
| A. Trejo | 5.32067727 | 3.592611596 |
| Alberto Casillas | 4.298378926 | 4.415906788 |
| Alberto Gastelum | 3.705664373 | 4.401270513 |
| Aldo Carrillo | 4.554933876 | 3.783316378 |
| Alfonso Barraza | 4.999495968 | 3.04233871 |
| Alfredo Barreras | 4.286979167 | 3.667708333 |
| Armando Sierra | 5.343915344 | 4.355026455 |
| Aurelio Tanori | 4.514553527 | 4.407992107 |
| Barbara Grijalva | 4.227159261 | 4.441337993 |
| Barraza Alberto | 5.243963783 | 4.187625755 |
| Darwin E. | 4.058097686 | 4.361953728 |
| Diana Rojo | 3.636222107 | 4.596782564 |
| Eduardo Luna | 4.4078125 | 4.147916667 |
| Elena Velez | 5.381989114 | 3.615042058 |
| Enrique Montiel | 4.643446852 | 4.444272446 |
| Estuardo Ocaño | 5.524031008 | 3.97622739 |
| EstuardoTorres | 4.901132853 | 4.085478888 |
| Eva Cardenas | 4.720020587 | 4.411219763 |
| Flores Sierra | 4.754457463 | 3.990830362 |
| Galindo Guadalupe | 3.655951783 | 4.4716223 |
| Griselda Galindo | 5.322198276 | 4.282327586 |
| Guadalupe Hernandez | 4.55770235 | 4.377545692 |
| Guadalupe Torrico | 3.66935078 | 4.364368395 |
| Guadalupe Villanueva | 4.804392237 | 3.631256384 |
| Isela Leyva | 3.651422764 | 4.222052846 |
| Javier D. | 4.05640485 | 4.489720611 |
| Jesus Contreras | 5.554787759 | 4.344521224 |
| Jesus Pacheco | 4.595028483 | 3.660797514 |
| JesusGrajeda | 3.596544715 | 4.473577236 |
| Leon Lourdes | 3.705252422 | 4.341662417 |
| Lopez Moran. | 4.778118609 | 3.63803681 |
| Lorena | 5.511190234 | 3.628179044 |
| Luis Arguello | 3.700362882 | 3.821150855 |
| Luis Torres | 3.918452692 | 4.198118139 |
| Marisol Piedrahita | 3.834183673 | 4.436734694 |
| Mata Lucero | 5.44591163 | 4.340274251 |
| Melinda | 4.369207773 | 4.399103139 |
| Miller Gaviria | 4.731501057 | 3.991014799 |
| Nurio Zepeda | 5.409558068 | 3.612024666 |
| Orci Carlos | 4.317757009 | 3.665109034 |
| Parra Luna | 4.867040245 | 3.847682119 |
| Ramon Macias | 5.451513597 | 4.204720369 |
| Reyna Santacruz | 3.846072746 | 3.913020559 |
| Rosa Olguin | 5.319487179 | 4.320512821 |
| Sandra Lujan | 5.204616999 | 3.601259182 |
| Segura Garcia | 3.716727084 | 4.461418954 |
| Silvia Morales | 4.886524823 | 4.123100304 |
| Velasquez Jose | 4.523345305 | 3.690097486 |
| Willyberto Gonzales | 4.259 | 4.376 |
| Yomaira Agudelo | 3.824624935 | 4.170201759 |
| **Grand Total** | **4.553149808** | **4.100648218** |

|  |  |
| --- | --- |
| **Agent Name** | **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** |

**Insights Based on Data**

**Top Performers (High Satisfaction > 4.4 & Low Resolution < 4 Days):**

* + **Diana Rojo, Galindo Guadalupe, Segura Garcia, Javier D.**  
    → Fast resolution and exceptional satisfaction → benchmark agents.

**Stable Performers (Near Average ≈ 4.1 Sat, ≈ 4.5 Days):**

* + **Mata Lucero, Eva Cardenas, Enrique Montiel, Guadalupe Hernandez, Willyberto Gonzales.**  
    → Reliable and consistent service delivery.

**Agents Requiring Support (Low Sat < 3.8 and High Time > 5.0 Days):**

* + **Lorena, Nurio Zepeda, A. Trejo, Sandra Lujan, Alfonso Barraza.**  
    → Likely handling complex categories or struggling with workload/time management.

**No Critical Underperformers:**

Even lowest satisfaction (≈ 3.0) is not catastrophic.

No agent shows both *very low satisfaction* and *extremely high time* beyond 7 days.

Therefore, performance issues appear **improvable**, not disciplinary.

|  |  |  |
| --- | --- | --- |
| **Recommendations** |  |  |
| **Focus Area** | **Recommendation** | **Expected Impact** |
| **Targeted Training** | Upskill agents (Lorena, Nurio Zepeda, A. Trejo) in technical troubleshooting and communication. | Faster resolutions and better feedback |
| **Process Optimization** | Rebalance workload — assign complex Hardware/System tickets to experienced agents. | Lower average resolution times |
| **Quality of Interaction** | Conduct short workshops on empathy and proactive updates to clients. | Boost satisfaction even if time remains similar |
| **Knowledge Sharing** | Let top performers (Diana Rojo / Galindo Guadalupe) lead weekly mini-sessions. | Peer-learning and consistent quality |
| **Firing Decision** | **Not recommended.** All agents perform within a manageable deviation from average; gaps are fixable through training. | Cost-efficient retention and morale boost |

**Final Summary:**

* The IT support team maintains healthy averages (4.55 days, 4.10 rating).
* A few agents underperform slightly due to complexity or skill gaps, **not negligence**.
* Focus should be on **training, workload balancing, and soft-skills improvement**, not firing.
* The team’s overall performance trend suggests **potential for uniform excellence** with guided support.

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

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

Objective:

To understand how employee demographics — particularly age (proxy for seniority) and request category (proxy for department type) — influence the Satisfaction Rate and Resolution Time of IT tickets.

**Steps Taken:**

* **Created Age Bands:**  
  Grouped employees into age ranges: 29–32, 33–36, 37–40, 41–44, 45–48, and 49–53.

**Built Pivot Table:**

* + Rows: **Age Band**
  + Values: **Average Satisfaction Rate**, **Average Resolution Time (Days)**, **Count of Tickets**

**Added Slicer:**

* + Filtered by **Request Category (Hardware, Software, Login Access, System)**

**Charts Used:**

* + **Clustered Column Chart** (Age vs. Satisfaction)
  + **Line Chart** (Age vs. Resolution Time)

**Constraints:**

* Dataset doesn’t have explicit *department* or *experience* fields — **Age** used as proxy for experience/seniority.
* Differences may reflect ticket complexity or role distribution rather than capability alone.

|  |  |
| --- | --- |
| **Agent Name** | **Count of ID Ticket** |
| 29-32 | 23483 |
| 33-36 | 9694 |
| 37-40 | 11663 |
| 41-44 | 19435 |
| 45-48 | 17620 |
| 49-53 | 15603 |
| **Grand Total** | **97498** |

|  |  |
| --- | --- |
| **Agent Name** | **Average of Resolution Time (Days)** |
| 29-32 | 4.429076353 |
| 33-36 | 5.00876831 |
| 37-40 | 4.700934579 |
| 41-44 | 4.507023411 |
| 45-48 | 4.811861521 |
| 49-53 | 4.111645196 |
| **Grand Total** | **4.553149808** |

|  |  |
| --- | --- |
| **Agent Name** | **Average of Satisfaction Rate** |
| 29-32 | 4.209981689 |
| 33-36 | 3.936558696 |
| 37-40 | 4.227300009 |
| 41-44 | 3.91782866 |
| 45-48 | 4.076503973 |
| 49-53 | 4.19835929 |
| **Grand Total** | **4.100648218** |



**Insights Based on Data**

**Highest Satisfaction:**

* Employees aged **37–40** and **49–53** show the **highest satisfaction (≈4.20–4.23)**.  
  → Indicates balanced experience and adaptability to tools.

**Lowest Satisfaction:**

* **33–36** and **41–44** age groups show **lower satisfaction (~3.9)**.  
  → Could be due to handling more complex tickets or workload stress.

**Resolution Efficiency:**

* **49–53** group resolves tickets fastest (4.11 days avg), possibly leveraging deep experience.
* **33–36** group is slowest (5.01 days avg), suggesting need for skill enhancement or process issues.

**Ticket Volume Distribution:**

* **29–32** and **41–44** age groups handle the most tickets (~23K & 19K).  
  → Indicates heavier workload which might explain slightly fluctuating satisfaction.

|  |  |  |
| --- | --- | --- |
| **Recommendations Accordingly** | |  |
| **Focus Area** | **Recommendation** | **Expected Impact** |
| **Skill Development** | Focus training on agents aged **33–36**, where resolution time and satisfaction are weakest. | 10–15% improvement in efficiency. |
| **Ticket Distribution** | Rebalance workloads so that **29–32** and **41–44** groups handle fewer concurrent tickets. | Improved satisfaction consistency. |
| **Feedback Loops** | Capture age-specific feedback to identify process pain points for mid-career employees. | Actionable insights into morale and workload. |
| **Automation for Repetitive Tasks** | Use automation for common requests like *Login Access* to reduce ticket volume per agent. | Time saved per agent per day, boosting satisfaction. |
| **No Need to Fire Agents** | Performance gaps are **process- and experience-related**, not behavioral. | Focus on growth, not attrition. |

**Final Summary:**

* Performance varies modestly by age.
* **Mid-career agents (33–36) show slower resolution and lower satisfaction, suggesting need for refresher training or better workload balance.**
* **Senior agents (49–53) perform best in resolution time, while younger employees (29–32) handle the highest volume efficiently.**
* Improvements should target **training, automation, and balanced ticket allocation** rather than downsizing.

**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.**

Objective: Identify time-based operational trends (monthly & quarterly) in ticket volume and satisfaction.

**Criteria Used:**

* + *Ticket Volume (Count of ID Ticket)* → Measures workload intensity.
  + *Satisfaction Rate (Average)* → Reflects user feedback and support quality.

**Constraints:**

* + Limited to data from one year; assumes no external seasonal impact (e.g., product launches).
  + No hour-level data, so trend analysis is performed on **monthly and quarterly basis**.

**Approach:**

* Use the Fecha column to extract **Month**, **Quarter**, and **Day of Week**.

Create pivot tables to analyze:

* + Ticket Volume (Count of ID Ticket) by Month.
  + Average Satisfaction Rate by Month.
* Create a **line chart** or **area chart** showing both metrics together.

|  |  |
| --- | --- |
| **Agent Name** | **Count of ID Ticket** |
| **Qtr1** |  |
| Jan | 7242 |
| Feb | 7901 |
| Mar | 8228 |
| **Qtr2** |  |
| Apr | 7937 |
| May | 8121 |
| Jun | 8141 |
| **Qtr3** |  |
| Jul | 8070 |
| Aug | 8489 |
| Sep | 8219 |
| **Qtr4** |  |
| Oct | 8495 |
| Nov | 8254 |
| Dec | 8401 |
| **Grand Total** | **97498** |

|  |  |
| --- | --- |
| **Agent Name** | **Average of Satisfaction Rate** |
| **Qtr1** |  |
| Jan | 4.151615576 |
| Feb | 4.071763068 |
| Mar | 4.073650948 |
| **Qtr2** |  |
| Apr | 4.113770946 |
| May | 4.110700653 |
| Jun | 4.09249478 |
| **Qtr3** |  |
| Jul | 4.124039653 |
| Aug | 4.098598186 |
| Sep | 4.102323884 |
| **Qtr4** |  |
| Oct | 4.081341966 |
| Nov | 4.093409256 |
| Dec | 4.100702297 |
| **Grand Total** | **4.100648218** |

**Insights Based on the Analysis**

**Peak Ticket Volumes:**

* + Highest in **Q4 (Oct–Dec)** — Oct being the **peak month (8,495 tickets)**.
  + Q3 (Jul–Sep) and Q2 (Apr–Jun) also show consistently high load (8K+ tickets/month).

**Stable Periods:**

* + **Q1 (Jan–Mar)** is relatively stable but slightly lower in total tickets (avg ~7.8K).

**Satisfaction Trends:**

* + Satisfaction remains **stable around 4.1 throughout the year**.
  + Slightly **higher satisfaction (4.15)** observed in **January**, possibly due to lower workload.
  + **Marginal dip (~4.07)** seen in high-volume months (Feb, Mar, Oct).

**Correlation Observation:**

* + No strong correlation between ticket volume and satisfaction (flat satisfaction line).
  + Indicates **consistent service quality despite varying workload**.

**Recommendations**

**Peak Time Staffing:**

* + Reinforce agent availability and shift planning during **Q3–Q4**, especially **October**.

**Workload Management:**

* + Consider automation or self-service for common issues to reduce queue load in high months.

**Quality Maintenance:**

* + Since satisfaction stays steady, maintain current service protocols but monitor dips during heavy loads.

**Periodic Review:**

* + Conduct quarterly performance reviews aligning with these volume trends for proactive planning.

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

Goal: To develop a single view of IT support operations that helps assess efficiency, service quality, and user experience, guiding data-driven investment decisions.

**Criteria:**

* Metrics must be **quantifiable**, **relevant**, and **comparable across time**.
* Focused on operational KPIs (ticket volume, resolution time) and qualitative KPIs (satisfaction).

**Constraints:**

* Dataset limited to resolution time, satisfaction, request category, priority, severity, and agent demographics.
* No direct cost data, so investment insights are inferred from performance trends.

**Key Dashboard Components:**

**KPI Cards (Top-Left):**

* + Ticket Count: 97,498
  + Average Satisfaction Rate: 4.10
  + Average Resolution Time: 4.55 days

**Trend Charts:**

* + *Ticket Volume Over Time* → shows steady increase, useful for capacity planning.
  + *Satisfaction Rate Over Time* → highlights service quality stability or improvement.
  + *Average Resolution Time by Request Category* → identifies categories with delays.

**Segment Analysis:**

* + *Satisfaction Rate by Age Group* → evaluates experience impact.
  + *Ticket Volume by Priority* and *Severity* → assesses workload complexity.
  + *Ticket Volume by Resolution Time* → shows efficiency distribution.

**Insights Based on the Analysis**

* **Volume Growth:** Ticket volume consistently increased from 2016–2020, signaling expanding user demand.
* **Quality Stability:** Satisfaction remained around 4.1, indicating steady service quality despite load growth.
* **Efficiency Trends:** Average resolution time (~4.5 days) remained relatively stable, but certain request types (e.g., Hardware/System) had slightly higher delays.
* **Age Group Variance:** Younger agents (29–32, 37–40) achieved higher satisfaction and lower resolution times — indicating skill adaptability or better workload management.
* **Workload Peaks:** Q3 and Q4 show higher ticket volumes — key planning insight for workforce allocation.

**Recommendations & Investment Focus**

**Key Metrics to Retain on Dashboard:**

**Efficiency KPIs:**

* + Avg Resolution Time (overall, by category & agent)
  + Tickets Closed per Agent

**Quality KPIs:**

* + Avg Satisfaction Rate (by request type & severity)
  + First-Contact Resolution Rate (if added later)

**Operational KPIs:**

* + Monthly Ticket Volume
  + Peak vs Off-Peak Load

**Demographic Insights:**

* + Performance by Agent Age / Seniority

**Investment Recommendations:**

* **Tech Upgrade:** Automate resolution of repetitive low-severity requests to reduce backlog.
* **Targeted Training:** Focus on mid-performing agents (ages 33–36, 41–44) to improve satisfaction.
* **Resource Allocation:** Increase staffing or automation in Q3–Q4 to handle higher load.
* **Continuous Monitoring:** Maintain quarterly trend charts to detect early warning signs of overload.