Tasks

**Objective Questions:**

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

Attributes are the columns or features of a dataset that describe its characteristics (e.g., Ticket ID, Issue Type, Agent Name).

The dataset consists of two sheets:

* + Tickets sheet: 10 attributes
  + IT Agents sheet: 6 attributes

# 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

# What is the average daily ticket volume over time?

|  |  |
| --- | --- |
| **Row Labels** | **Count of ID Ticket** |
| 01-01-2016 | 28 |
| 02-01-2016 | 43 |
| 03-01-2016 | 37 |
| 04-01-2016 | 36 |
| 05-01-2016 | 44 |
| 06-01-2016 | 33 |
| 07-01-2016 | 44 |
| 08-01-2016 | 39 |
| 09-01-2016 | 39 |
| 10-01-2016 | 30 |
| 11-01-2016 | 39 |
| 12-01-2016 | 40 |
| 13-01-2016 | 35 |
| 14-01-2016 | 29 |
| 15-01-2016 | 42 |
| 16-01-2016 | 38 |
| 17-01-2016 | 36 |
| 18-01-2016 | 34 |

* + A Pivot Table was created with Date in rows and Count of Ticket IDs in values to calculate daily ticket counts.
  + Applying the formula:

=Average() on the column of daily ticket volume

* + Answer= 53.365

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

A Pivot Table was created with Request Category in rows and Count of Ticket IDs in values.

|  |  |  |
| --- | --- | --- |
| **Row Labels** | **Count of ID Ticket** | **Count of ID Ticket2** |
| Hardware | 9733 | 9.98% |
| Login Access | 29193 | 29.94% |
| Software | 19570 | 20.07% |
| System | 39002 | 40.00% |
| **Grand Total** | **97498** | **100.00%** |

* + System tickets form the largest share (40%).
  + Login Access is second largest (~30%) → frequent recurring issue.
  + Software requests are moderate (20%).
  + Hardware has the lowest share (~10%).

# How many tickets has each agent handled?

* + Pivot table created to get the no. of tickets handled by each agent

|  |  |
| --- | --- |
| **Row Labels** | **Count of ID Ticket** |
| 1 | 1969 |
| 2 | 1968 |
| 3 | 2021 |
| 4 | 1988 |
| 5 | 2000 |
| 6 | 1949 |
| 7 | 1935 |
| 8 | 1960 |
| 9 | 1949 |
| 10 | 1974 |
| 11 | 1956 |
| 12 | 1897 |
| 13 | 1856 |
| 14 | 1942 |
| 15 | 1991 |
| 16 | 1926 |
| 17 | 1961 |
| 18 | 1892 |
| 19 | 1984 |
| 20 | 1920 |
| 21 | 1889 |
| 22 | 1966 |
| 23 | 1915 |
| 24 | 2003 |
| 25 | 1906 |
| 26 | 1963 |
| 27 | 1968 |
| 28 | 1946 |
| 29 | 1931 |
| 30 | 1963 |
| 31 | 1987 |
| 32 | 1974 |
| 33 | 1958 |
| 34 | 1927 |
| 35 | 2007 |
| 36 | 1913 |
| 37 | 1931 |
| 38 | 1938 |
| 39 | 2026 |
| 40 | 1920 |
| 41 | 1966 |
| 42 | 1945 |
| 43 | 1897 |
| 44 | 1943 |
| 45 | 1929 |
| 46 | 1950 |
| 47 | 1933 |
| 48 | 2027 |
| 49 | 1890 |
| 50 | 1949 |
| **Grand Total** | **97498** |

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

Formula used : =RIGHT(C2,len(C2)- FIND("@",C2)

|  |
| --- |
| fp20analytics.com |
| fp20analytics.com |
| fp20analytics.com |
| fp20analytics.com |
| fp20analytics.com |
| fp20analytics.com |
| fp20analytics.com |
| fp20analytics.com |
| fp20analytics.com |
| fp20analytics.com |
| fp20analytics.com |
| fp20analytics.com |
| fp20analytics.com |
| fp20analytics.com |
| fp20analytics.com |
| fp20analytics.com |
| fp20analytics.com |
| fp20analytics.com |

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

This can be done using Xlookup. Formula used :

=XLOOKUP(K29,'IT Agents'!$A$2:$A$51,'IT Agents'!$B$2:$B$51)

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

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

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

We take the average of the column named “Resolution Time(Days)”

Formula used : =AVERAGE(Tickets!K:K) Avg= 4.553 days

# How has the volume of tickets changed over time?

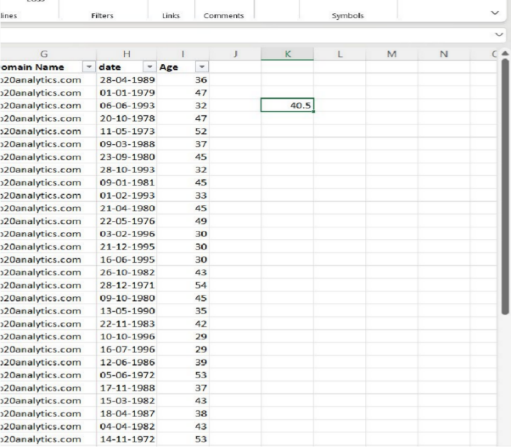
* Overall growth: Ticket volume nearly doubled from 2016 to 2020.
* Steady year-over-year increase: Suggests consistent demand for IT support.

# What is the average age of the IT agents?

1. Full DOB was formed from the year, month, and day using the

=DATE(year,month,date) function.

1. The age of each agent was calculated using the =DATEDIF() function.



Average was calculated using =AVERAGE() formula which came out to be -> 40.5

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

|  |  |
| --- | --- |
| **Row Labels** | **Count of ID Ticket** |
| 0 - Unclasified | 356 |
| 1 - Minor | 2258 |
| 2 - Normal | 88656 |
| 3 - Mayor | 4836 |
| 4 - Urgent | 1392 |
| **Grand Total** | **97498** |

Observation:

* + Normal issues take the longest time to resolve (4.66 days).
  + Urgent issues are resolved the fastest (2.0 days), reflecting prioritization.
  + Minor and Major issues fall in between.

Conclusion: There is a clear correlation — higher urgency generally leads to faster resolution, while normal/non-urgent issues tend to take longer.

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

Categorical data represents labels or identifiers, even if they are stored as numbers. Continuous data represents measurable numeric or time-based values.

From the Tickets sheet, the categorical columns are: Ticket ID (identifier)

Employee Email (text category) Agent ID (numeric identifier) Request Category (category) Issue Type (category)

Severity (category) Priority (category)

Total categorical columns in Tickets sheet = **7**

From the Tickets sheet, the continuous columns are: Date (time variable)

Resolution Time (measurable numeric value) Satisfaction Rating (numeric scale)

Total continuous columns in Tickets sheet = **3**

From the IT Agents sheet, the categorical columns are: Agent ID (numeric identifier)

Full Name (text category) Email (text category)

Total categorical columns in IT Agents sheet = **3**

From the IT Agents sheet, the continuous columns are: Year of Birth

Month of Birth Day of Birth

Total continuous columns in IT Agents sheet = **3**

Therefore, total categorical columns in the dataset = **10**

Therefore, total continuous columns in the dataset = **6**

**Subjective Questions:**

# 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. 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

|  |  |
| --- | --- |
| **Average of Resolution Time**  **Agent Name (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**

|  |  |
| --- | --- |
| **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**

Ticket Vol1u2m-14e 1v5s-1A7 vg. Resolution Time

5%

3%

18-21

0%

9-11

10%

0-2

42%

6-8

20%

0-2

3-5

6-8

9-11

12-14

15-17

18-21

3-5

20%

# 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.

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

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.

|  |  |
| --- | --- |
| **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 |

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

|  |  |
| --- | --- |
| 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**

|  |  |
| --- | --- |
| **Average of Satisfaction**  **Agent Name 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 |

**Sort the Pivot Table so that the agent with Less Average**

|  |  |
| --- | --- |
| 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**

6

5

4

3

2

1

Average of Resolution Time

(Days)

Average of Satisfaction Rate

0

Total

6

5

4

3

2

1

0

Total

Total

5

4.5

4

3.5

3

2.5

2

1.5

1

0.5

0

Total

A. Trejo

Alberto Gastelum

Alfonso Barraza

Armando Sierra

Barbara Grijalva

Darwin E.

Eduardo Luna

Enrique Montiel

EstuardoTorres

Flores Sierra

Griselda Galindo

Guadalupe Torrico

Isela Leyva

Jesus Contreras

JesusGrajeda

Lopez Moran.

Luis Arguello

Marisol Piedrahita

Melinda

Nurio Zepeda

Parra Luna

Reyna Santacruz

Sandra Lujan

Silvia Morales

Jesus Contreras

Lorena

Mata Lucero

Elena Velez

Griselda Galindo

Rosa Olguin

Sandra Lujan

EstuardoTorres

Parra Luna

Lopez Moran.

Miller Gaviria

Enrique Montiel

Guadalupe Hernandez

Velasquez Jose

Eduardo Luna

Orci Carlos

Alfredo Barreras

Barbara Grijalva

Javier D.

Reyna Santacruz

Yomaira Agudelo

Alberto Gastelum

Luis Arguello

Galindo Guadalupe

Diana Rojo

Willyberto Gonzales

Alfonso Barraza

Sandra Lujan

Elena Velez

Guadalupe Villanueva

Jesus Pacheco

Alfredo Barreras

Aldo Carrillo

Parra Luna

Estuardo Ocaño

Miller Gaviria

Silvia Morales

Yomaira Agudelo

Luis Torres

Isela Leyva

Rosa Olguin

Leon Lourdes

Armando Sierra

Guadalupe Torrico

Guadalupe Hernandez

Alberto Gastelum

Eva Cardenas

Marisol Piedrahita

Enrique Montiel

Galindo Guadalupe

Javier D.

|  |  |  |
| --- | --- | --- |
| **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.

# 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.

**Average of Resolution Time**

**Request Category (Days)**

Hardware 7.62539813

Login Access 0.313808105

Software 5.238732754

System 6.615609456

Hardware Login Access Software System

Total

9

8

7

6

5

4

3

2

1

0

Total

**4.553149808**

**Grand Total**

**Request Category Count of ID Ticket**

Hardware 9733

Login Access 29193

Software 19570

System 39002

**Grand Total**

**97498**

Total

45000

40000

35000

30000

25000

20000

15000

10000

5000

0

Total

Hardware Login Access Software System

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | | | | | | |  |  |
|  | | | | | | |  |
|  | | |  |  | | |  |
|  | | |  | | |  |
|  | | |  |  |  |  |
|  | | |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |

# 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.

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

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

**Criteria Used:**

* + **Average Resolution Time (days) — efficiency metric.**
  + **Average Satisfaction Rating — user experience metric.**
  + **Ticket Count per Year — workload handled. Constraints:**
  + Ticket severity categories are **Major, Minor, Normal, Unclassified, Urgent**.
  + Priority categories are High, Mid, Low, Unassigned.
  + Tools should ideally enforce automated routing of Urgent & Major severity cases to High Priority queues.
  + ​

# Criteria Explanation Why it Matters

**Ticket Volume by Year** Number of tickets handled by agents over time

Helps assess scalability of tools as workload increases

**Average Resolution Time** Time taken to close tickets Indicates efficiency of ticket

handling workflows

**Customer Satisfaction Rate** User feedback after ticket

closure

Whether high-severity issues

Reflects quality of support experience

Ensures critical problems are

# Priority vs Severity Alignment

**Priority-Based Resolution Performance**

are mapped to high priority

and resolved quickly Comparison of resolution speed and satisfaction across priority levels

addressed first

Shows if tool helps in correct workload management

|  |  |
| --- | --- |
| Count of ID  **Row Labels** Ticket | |
| 2016 | 13051 |
| 2017 | 14915 |
| 2018 | 18954 |
| 2019 | 21490 |

2020 29088

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Grand Total** |  | **97498** |  | | |
|  |  | **Ticket Volume Over Time** | |  |  |
| **35000** |  |  | |  |  |
| **30000** |  |  | |  |  |
| **25000** |  |  | |  |  |
| **20000** |  |  | |  |  |
| **15000** |  |  | |  |  |
| **10000** |  |  | |  |  |
| **5000** |  |  | |  |  |
| **0** |  |  | |  |  |
|  | 2016 | 2017 2018 | | 2019 | 2020 |

|  |  |
| --- | --- |
| **Average of Resolution Time** | **Average of Satisfaction** |
| **Row Labels (Days)** | **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** |
| **Resolution Time and Satisfaction Rate Over Time**  **4.7**  **4.6**  **4.5**  **4.4**  **4.3** Average of Resolution  **4.2** Time (Days)  Average of Satisfaction  **4.1** Rate  **4**  **3.9**  **3.8**  **3.7**  **3.6**  **2016 2017 2018 2019 2020** | |

|  |  |
| --- | --- |
| **Row Labels Count of ID Ticket** | |
| 0-  Unassigned | 29410 |
| 1 - Low | 16694 |
| 2 - Mid | 15845 |

3 - High 35549

**Grand**

**Total**

**97498**

Total

1. - Unassigned
2. - Low
3. - Mid
4. - High

**Priority**

**Average of Satisfaction Rate**

**Average of Resolution**

**Time (Days)**

High 4.094433036 3.491828181

Low 4.128968492 6.01054271

Mid 4.101167561 4.002082676

Unassiged 4.091805508 5.305644339

7

6

5

4

3

2

1

0

Average of Satisfaction Rate

Average of Resolution Time (Days)

High Low Mid Unassiged

**4.553149808**

**4.100648218**

**Grand Total**

**Priority**

**Average of Satisfaction Rate**

**Average of Resolution**

**Time (Days)**

Major 4.11827957 3.907981803

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Minor |  |  |  |  |  |  | 4.072187777 |  |  | 3.43534101 |  |
| Normal |  |  |  |  |  |  | 4.099846598 |  |  | 4.663609908 |  |
| Unclasified |  |  |  |  |  |  | 4.168539326 |  |  | 2.876404494 |  |
| Urgent |  |  |  |  |  |  | 4.119252874 |  |  | 2.001436782 |  |
| **Grand Total** |  |  |  |  |  |  | **4.100648218** |  |  | **4.553149808** |  |
| 5  4.5  4  3.5  3  2.5 Average of Satisfaction  2 Average of Resolution Tim  1.5  1  0.5  0  Major Minor Normal Unclasified Urgent | | | | | | | | | | | Rate  e (Days) |

**Count of ID**

**Ticket**

**Column Labels**

Major

Minor

Normal

Unclasified

Urgent

**Priority**

**Count of ID**

**Ticket**

Major 4836

Minor 2258

Normal 88656

Unclasified 356

Urgent 1392

1392

356

2258

4836

88656

100000

90000

80000

70000

60000

50000

40000

30000

20000

10000

0

Total

**97498**

**Grand Total**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Priority** | **High** | **Low** | **Mid** | **Unassiged** |  |
| Major |  | 2075 | 614 | 713 | 14 |
| Minor |  | 676 | 549 | 407 | 6 |
| Normal |  | 32080 | 15282 | 14468 | 268 |
| Unclasified |  | 106 | 80 | 55 | 1 |
| Urgent |  | 612 | 169 | 202 | 4 |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Grand Total** | | **35549** | **16694** | **15845** |  | **294** |
| 35000 |  |  | Diagram Title  32080  26826  1521842468  106 80 55 115  Normal Unclasified |  |  |  |
| 30000 |  |  |  |  |
| 25000 |  |  |  | High |
| 20000  15000 |  |  |  | Low  Mid Unassiged |
| 10000 |  |  |  |  |
| 5000  0 | 20756147131434 | 676549407626 | 612169202409 |  |
|  | Major | Minor | Urgent |  |

# Insights Based on It

* Ticket volume has grown by **~123% from 2016 to 2020**, indicating increased dependency on the IT support function and suggesting that the tools have successfully scaled to handle higher workloads.
* Despite higher ticket volumes in later years, Satisfaction Rate has improved steadily, implying better ticket handling processes, resolution clarity, and possibly improved agent training.
* Resolution time trend remains nearly stable, suggesting that the tools prevent backlog accumulation even under rising ticket load — an important sign of process maturity.
* High Priority tickets are being resolved faster (**3.49 days**) than the overall average (**4.55 days**), indicating the system successfully enforces quicker response for urgent issues.
* However, Low Priority and Unassigned tickets reflect longer resolution times (**6.01 days** and **5.31 days** respectively). This suggests that the tool does not auto-assign or escalate unattended tickets — manual intervention or routing improvements are needed.
* Severity vs Priority mapping is not fully consistent:
* *Example****:* ~1,434 Major** severity tickets are incorrectly placed in **Unassigned** priority.
* This reveals workflow leakage where high-impact issues may not get timely attention.
* Urgent severity tickets still exist in Low and Unassigned categories, which can pose business risk, signalling the need for automated routing rules.
* Normal severity tickets make up **~91%** of overall volume, meaning most of the operational load is routine, and workflow automation or bulk resolution templates can greatly reduce effort.
* Higher satisfaction scores correspond to faster resolution categories, showing a clear relationship between timely handling and user experience — reinforcing the need to reduce low-priority queue delays.
* Slight variations in Satisfaction Rate across years suggest incremental improvements in agent training, ticket documentation quality, and communication clarity.

**Key Issue Identified:**

**The presence of 29,410 Unassigned tickets and 356 Unclassified severity tickets indicates workflow configuration gaps in the tool.**

**Recommendations Accordingly**

**Recommendation Expected Impact Implement automated severity-to-priority**

**mapping** (e.g., Urgent → High, Major → High by default)

**Introduce Auto-Assignment Rules** to reduce Unassigned ticket count

**Set SLA timers with alerts** for tickets crossing priority-based resolution thresholds

**Periodic audit dashboard** to track mismatched Priority vs Severity cases

# Training for agents to reclassify severity correctly

Ensures critical issues are not delayed

Prevents resolution delays caused by ownership gaps

Improves responsiveness on critical cases

Helps maintain routing discipline among agents

Reduces classification errors leading to misprioritization

# 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.

# Approach:

To evaluate how the IT support performance changed over time:

Time-Series Trend Analysis was performed using monthly and quarterly data. Key metrics analyzed:

* Average Resolution Time (Days)
* Average Customer Satisfaction Score
* Ticket Volume (Count of Tickets)

Category-wise comparison was done for:

* Hardware, Software, Login Access & System tickets.
* Year-wise comparison was used to identify workload growth.
* Focus was on detecting:
* Performance improvements or declines
* Workload spikes and operational pressure points
* Relationship between resolution time and satisfaction rate

**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** |

**Ticket Volume Trend**

8600

8400

8200

8000

7800

7600

7400

7200

7000

6800

6600

Total

**Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec**

|  |  |  |
| --- | --- | --- |
| **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** |

**Month vs. Avg Resolution Time and Avg Satisfaction Rate**

**4.7**

**4.6**

**4.5**

**4.4**

**4.3**

**4.2**

**4.1**

**4**

**3.9**

**3.8**

**3.7**

Average of Resolution Time

(Days)

Average of Satisfaction Rate

**Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec**

|  |  |
| --- | --- |
| **Count of ID**  **Quarter/Month Ticket** | |
| 2016 | 13051 |
| 2017 | 14915 |
| 2018 | 18954 |
| 2019 | 21490 |

2020 29088

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Grand Total** | | **97498** |  | |
|  |  | **Ticket volume over Years** | |  |
| **35000** |  |  | |  |
| **30000** |  |  | |  |
| **25000** |  |  | |  |
| **20000** |  |  | |  |
| **15000** |  |  | |  |
| **10000** |  |  | |  |
| **5000** |  |  | |  |
| **0** |  |  | |  |
|  | **2016** | **2017 2018 2019** | | **2020** |

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

Hardware

Login Access Software System

Total

**97498**

**Grand Total**

# 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.

**Workload increased significantly over the years**, rising from 13K tickets in 2016 to 29K in 2020 (**+123% growth**). The largest jump occurred in **2020 (+35%)**, likely indicating new systems or remote work transitions.

**System (40%) and Login Access (30%) tickets make up 70% of overall workload**, suggesting strong dependency on internal systems and frequent access-related issues.

**Resolution time remained stable (~4.55 days) despite higher ticket volume**, indicating good operational consistency and capacity scalability.

**Satisfaction score also remained stable (~4.10)** and did not drop even when workload increased, showing **service quality was maintained**.

# 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.

# 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
  + Evaluated current performance by comparing resolution time and satisfaction levels across request categories (Hardware, Software, Login Access, System).
  + Assessed year-wise trends to see whether performance improved over time naturally (process maturity effect).
  + Projected a 25% reduction in resolution time assuming investment in better tools (faster hardware replacements, automation, better monitoring systems).

# Constraints:

* + No explicit system upgrade event noted, so improvement trends are inferred from performance patterns over time.
  + Satisfaction Rate is already high (~4.1), so improvements will be noticeable mainly in resolution speed, not necessarily satisfaction score jumps

# Steps in Excel:

Created a pivot with:

* + Rows → Request Category
  + Values → Average of Resolution Time, Average of Satisfaction Rate
  + Rows → Year
  + 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

|  |  |
| --- | --- |
| **Average of Resolution Time**  **Request Category (Days)** | |
| Hardware | 7.62539813 |
| Login Access | 0.313808105 |
| Software | 5.238732754 |

System 6.615609456

System

Software

Login Access

Hardware

**9**

**8**

**7**

**6**

**5**

**4**

**3**

**2**

**1**

**0**

**Request Category vs Avg Resolution Time**

**4.553149808**

**Grand Total**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **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 vs Avg Satisfaction Rate**  **4.108**  **4.106**  **4.104**  **4.102**  **4.1**  **4.098**  **4.096**  **4.094**  **4.092**  **4.09**  **4.088**  **Hardware Login Access Software System** | | | | |  |

**Request**

**Count of ID**

**Category Ticket**

Hardware 9733

Login Access 29193

Software 19570

System 39002



Ticket Volume by Request Category

**39002**

**29193**

**19570**

**9733**

**Hardware**

**Login Access**

**Software**

**System**

**Grand Total** **97498**

**Year**

**Average of**

**Resolution Time (Days)**

2016 4.551758486

2017 4.530070399

2018 4.558668355

2019 4.520800372

2020 4.585911716

|  |  |  |
| --- | --- | --- |
| **Grand Total** **4.553149808** | |  |
|  | Resolution Time Over Year | |
| 4.6 |  | |
| 4.58 |  | |
| 4.56 |  | |
| 4.54 |  | |
| 4.52 |  | |
| 4.5 |  | |
| 4.48 |  | |
|  | 2016 2017 2018 2019 2020 | |

**Year Average of Satisfaction Rate**

|  |  |
| --- | --- |
| 2016 | 3.979695043 |
| 2017 | 4.068119343 |
| 2018 | 4.091853962 |
| 2019 | 4.122382503 |

2020 4.161269252

Total

4.2

4.15

4.1

4.05

Total

4

3.95

3.9

3.85

2016

2017

2018

2019

2020

**Grand Total** **4.100648218**

**Year**

**Count of ID**

**Ticket**

2016 13051

2017 14915

2018 18954

2019 21490

2020 29088

Total

35000

30000

25000

20000

Total

15000

10000

5000

0

2016

2017

2018

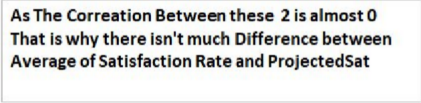
2019

2020

**97498**

**Grand Total**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Request Category | Average of Resolution Time (Days) | ProjectedRT\_25  % | Average of Satisfaction Rate | ProjectedSat |
| Hardware | 7.62539813 | 5.719048598 | 4.10099660  9 | 4.100996609 |
| Login Access | 0.313808105 | 0.235356079 | 4.09450895  8 | 4.094508958 |
| Software | 5.238732754 | 3.929049566 | 4.10633622  9 | 4.106336229 |
| System | 6.615609456 | 4.961707092 | 4.10230244  6 | 4.102302446 |
| Grand Total | 4.553149808 | 3.414862356 | 4.10064821  8 | 4.100648218 |



9

8

7

6

5

4

Sum of Average of Resolution

Time (Days)

Sum of ProjectedRT\_25%

3

2

1

0

rand Total Hardware

Login

Access

Software

System

# 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.

# Category Current RT Projected RT (–25%)

**Expected Impact**

Major

|  |  |  |  |
| --- | --- | --- | --- |
| Hardware | 7.63 days | **5.72 days** | improvement in  downtime |
|  |  |  | reduction |
|  |  |  | Reduced rework |
| Software | 5.24 days | **3.93 days** | and faster |
|  |  |  | deployments |
|  |  |  | Faster incident |
| System | 6.62 days | **4.96 days** | resolution, fewer |
|  |  |  | escalations |
|  |  |  | Already |
| Login Access | 0.31 days | **0.23 days** | optimized, |
|  |  |  | minimal gain |

Overall Resolution Time improves from **4.55 → ~3.41 days** (≈ 1.1 days faster on average).

# Recommendations Accordingly

* Increase investment in hardware procurement & replacement workflows
  + Reduce dependency on vendor lead time.
  + Maintain buffer stock of critical components.
* Automate System & Software troubleshooting
  + Auto-restart scripts, automated patch push, auto-ticket diagnosis.
* Expand the automation model used in Login Access workflows
  + Apply to password resets, app provisioning, and VPN/access issues.
* Implement SLA-based routing
  + Ensure *high severity* tickets never fall into *Low or Unassigned* queues.
* Track performance monthly instead of yearly
  + Allows faster corrective action and reduces operational lag.

# 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)

**Average Satisfaction Rate Constraints:**

Time taken to resolve each ticket Lower = Better efficiency

User feedback score (1–5 scale) Higher = Better service

quality

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** |
| 6 |  |  | |
| 5 |  |  | |
| 4 |  |  | |
| 3 |  |  | |
| 2 |  | Average of Resolution Time | |
|  |  | (Days) | |
| 1 |  | Average of Satisfaction Rate | |
| 0 |  |  | |

A. Trejo

Alberto Gastelum

Alfonso Barraza

Armando Sierra

Barbara Grijalva

Darwin E.

Eduardo Luna

Enrique Montiel

EstuardoTorres

Flores Sierra

Griselda Galindo

Guadalupe Torrico

Isela Leyva

Jesus Contreras

JesusGrajeda

Lopez Moran.

Luis Arguello

Marisol Piedrahita

Melinda

Nurio Zepeda

Parra Luna

Reyna Santacruz

Sandra Lujan

Silvia Morales

Willyberto Gonzales

|  |  |  |
| --- | --- | --- |
| **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.

**Not recommended.** All agents perform

Peer-learning and consistent quality

Cost-efficient retention

# Firing Decision

within a manageable deviation from

average; gaps are fixable through training.

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

# 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** |

**25000**

**Ticket Volume by Age**

**20000**

**15000**

**10000**

**5000**

**0**

**29-32**

**33-36**

**37-40**

**41-44**

**45-48**

**49-53**

|  |  |
| --- | --- |
| **Average of Resolution Time**  **Agent Name (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

**Average Resolution Time by Age**

**6**

**5**

**4**

**3**

**2**

**1**

**0**

**29-32**

**33-36**

**37-40**

**41-44**

**45-48**

**49-53**

**4.553149808**

**Grand Total**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  | | |
|  |  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |

|  |  |
| --- | --- |
| **Average of Satisfaction**  **Agent Name 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**



**Average Satisfaction rate by Age**

**4.3**

**4.2**

**4.1**

**4**

**3.9**

**3.8**

**3.7**

29-32

33-36

37-40

41-44

45-48

49-53

# 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.

# 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:

* + *Used* ***monthly and quarterly ticket volume data*** *to identify* ***peak and stable demand periods****.*
  + *Analyzed* ***average satisfaction rate trends across years*** *to understand service experience stability.*
  + *Included* ***year-wise average resolution time comparison*** *to determine whether performance improved or slowed down with higher ticket volume.*

# 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**, Create pivot tables to analyze:
  + Ticket Volume (Count of ID Ticket) by Month. and **Year**
  + Average Satisfaction Rate by Month.,Ticket Count ,and Year

|  |  |  |
| --- | --- | --- |
| **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

Total

8600

8400

8200

8000

7800

7600

7400

7200

7000

6800

6600

Total

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec

**97498**

**Grand Total**

**Agent Name**

**Average of Satisfaction Rate**

**Average of Resolution**

**Time (Days)**

|  |  |  |
| --- | --- | --- |
| **Qtr1** |  | |
| Jan | 4.151615576 | 4.575807788 |
| Feb | 4.071763068 | 4.586254904 |
| Mar | 4.073650948 | 4.557243559 |
| **Qtr2** |  |  |
| Apr | 4.113770946 | 4.562429129 |
| May | 4.110700653 | 4.561384066 |
| Jun | 4.09249478 | 4.619579904 |
| **Qtr3** |  |  |
| Jul | 4.124039653 | 4.554522924 |
| Aug | 4.098598186 | 4.502886088 |
| Sep | 4.102323884 | 4.502129213 |

# Qtr4

Oct 4.081341966 4.562919364

Nov 4.093409256 4.505330749

Dec 4.100702297 4.553862635

4.7

4.6

4.5

4.4

4.3

Average of Satisfaction Rate

4.2

4.1

Average of Resolution Time

(Days)

4

3.9

3.8

3.7

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec

**4.553149808**

**4.100648218**

**Grand Total**

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

Total

35000

30000

25000

20000

15000

10000

5000

0

Total

2016 2017 2018 2019 2020

**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**

4.7

4.6

4.5

4.4

4.3

4.2

4.1

4

3.9

3.8

3.7

3.6

2016

**4.553149808**

**4.100648218**

Average of Resolution Time

(Days)

Average of Satisfaction Rate

2017

2018

2019

2020

# Insights Based on the Analysis

1. **Monthly & Quarterly Ticket Volume Trends**
   * Ticket volume gradually increases from **Jan → Mar** (Q1), then **peaks in Q3 & Q4**.
   * **August, October, and December** show the **highest ticket loads** annually.
   * **Q1 is the most stable period**, with balanced workload and smoother resolution patterns.

# Satisfaction vs Resolution Time Across Months

* + Satisfaction remains **consistently around 4.05 – 4.15**, indicating steady user experience.
  + **Resolution time fluctuates only slightly (~4.50–4.62 days)** showing that workload changes did not significantly impact performance.
  + **August and September show slightly better resolution times (~4.50 days)**, suggesting effective handling during high volume.

# Year-wise Ticket Growth & Performance

YearTicketsAvg Res TimeAvg Satisfaction201613,0514.55 days3.98202029,0884.59 days4.16

* + Ticket volume **increased by ~123%** from 2016 → 2020.
  + Despite this increase, **resolution time remained stable (~4.5 days)**.
  + Satisfaction **improved YOY**, showing:
    - Better support processes,
    - Improved agent efficiency,
    - or stronger self-service/automation maturity.

1. **Peak and Stable Operational Periods**
   * **Peak Support Demand: July–December (Q3 & Q4)**
   * **Stable / Lower Load Period: January–March (Q1)**
   * System performance (resolution time & satisfaction) **remains stable even during peak**, indicating **team resilience**.

# Recommendations

* + **Scale staffing during Q3 & Q4** (Jul–Dec) to avoid agent overload and maintain response SLAs.
  + **Implement proactive task automation** for repetitive login/system requests to further reduce resolution time.
  + Use **Q1 (stable period)** for:
    - Agent refresher training
    - Knowledge base updates
    - System maintenance and upgrade planning.
  + **Monitor resolution time monthly**, not yearly, to quickly detect performance dip and adjust capacity.

Analyze workload distribution and consider **redistributing tickets** more evenly across agents to maintain consistency

# 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.