

Technical Test Data Analyst

Presented By:

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Task Overview

Complaint ticket data records customer complaints about services or products. This data helps analyze complaint patterns, assess resolution effectiveness, and provide insights to improve service and business strategies.

Analysis Objectives:

- Analyzing Customer Complaint Patterns and Trends
- Identify Factors that Affect Complaints
- Provide Insights and Recommendations for Service Improvement

Data and Methodology



Methodology

- Data Preparation
- EDA
- Visualization
- Analysis to get Insight



Data

Data is retrieved from the database using Python with the following query:

```
query = "SELECT * FROM tb_tech_test;"
df = pd.read_sql(query, conn)
df.to_csv("data_complaint.csv", index=False)
# Tutup koneksi
conn.close()
```

The dataset contains **2224 customer complaint tickets** with various attributes, such as city, submission method, complaint status, and others.

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 2224 entries, 0 to 2223
Data columns (total 10 columns):
```

#	Column	Non-Null Count	Dtype
0	Ticket_Number	2224 non-null	object
1	Customer_Complaint	2224 non-null	object
2	Date_Month_Year	2224 non-null	object
3	Time	2224 non-null	object
4	Received_Via	2224 non-null	object
5	City	2224 non-null	object
6	State	2224 non-null	object
7	Zip_Code	2224 non-null	int64
8	Status	2224 non-null	object
9	Filing_on_Behalf_of_Someone	2224 non-null	object

```
dtypes: int64(1), object(9)
```

```
memory usage: 173.9+ KB
```

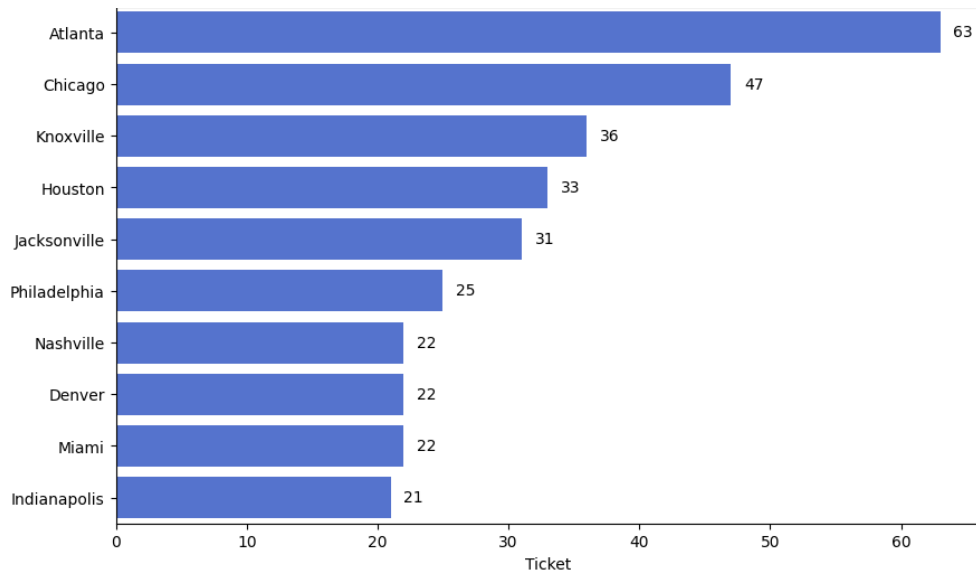
Result Data

Data after cleaning stage

Ticket_Number	Customer_Complaint	Date_Month_Year	Time	Received_Via	City	State	Zip_Code	Status	Filing_on_Behalf_of_Someone
211255	Disney harassment	04-Jan-15	12:18:47 AM	Customer Care Call	Schaumburg	Illinois	60193	Closed	No
211472	Disney cable	04-Jan-15	10:43:20 AM	Customer Care Call	Lockport	Illinois	60441	Closed	No
211478	Disney	04-Jan-15	10:47:35 AM	Internet	North Huntingdon	Pennsylvania	15642	Closed	No
211677	Disney refusal of service	04-Jan-15	12:01:06 PM	Customer Care Call	Wayne	Pennsylvania	19087	Closed	No
211775	Horrible Service	04-Jan-15	12:28:58 PM	Customer Care Call	McKeesport	Pennsylvania	15132	Closed	No
211784	billing	04-Jan-15	12:32:23 PM	Customer Care Call	Stone Mountain	Georgia	30083	Closed	No
211904	Unable to get in touch with anyone that has th...	04-Jan-15	1:06:33 PM	Customer Care Call	Huntsville	Alabama	35801	Closed	No
211976	Fraudulent claims reported to collections agency	04-Jan-15	1:26:53 PM	Customer Care Call	Atlanta	Georgia	30312	Closed	No
212079	No Internet service	04-Jan-15	1:53:22 PM	Internet	Philadelphia	Pennsylvania	19128	Closed	No
212228	Disney Lied About Pricing And Installation	04-Jan-15	2:29:41 PM	Customer Care Call	Newark	California	94560	Closed	No

Complaint Ticket Distribution

10 Cities with the Highest Number of Complaint Tickets

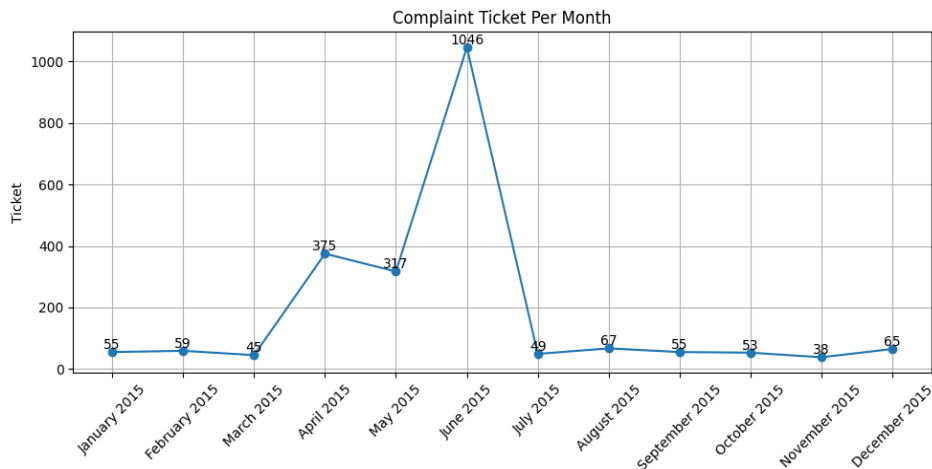


01 Atlanta has the highest number of complaint tickets (**63**), followed by Chicago (47) and Knoxville (36).

02 Cities with a high number of complaints may have a **larger customer base**, resulting in a higher volume of reported issues, while factors such as **service quality, response time, and customer satisfaction** could also contribute to this trend.

Monthly Trends in Complaint Tickets

Complaint Ticket Per Month

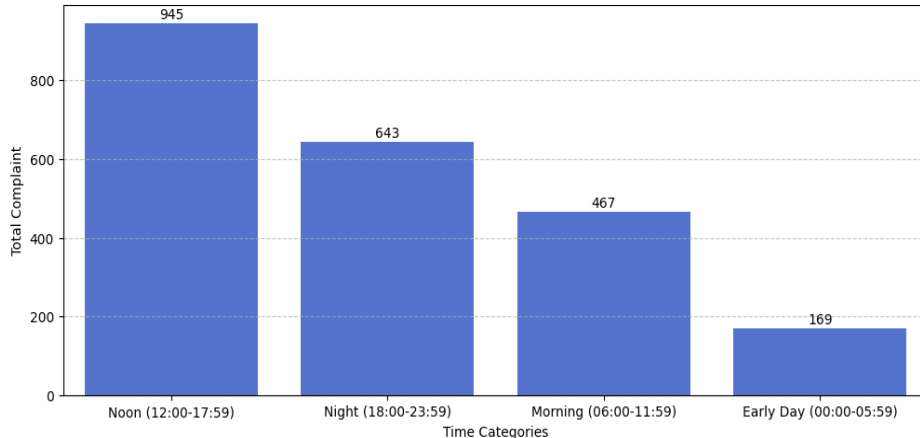


01 Complaint numbers vary across months, peaking in **June 2015 with 1,046 complaints**, followed by **April and May 2015**, indicating possible seasonal trends or recurring service issues.

02 **November 2015 recorded the lowest number of complaints (38)**, which could be attributed to improved service performance, lower customer activity, or other mitigating factors.

Time-Based Analysis of Complaints

Time Distribution of Complaints by Time Range

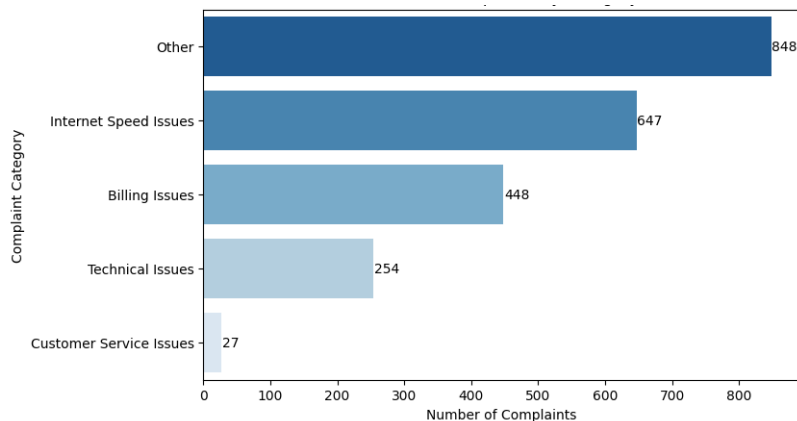


01 The majority of complaints were reported during the afternoon (12:00–17:59), suggesting that customers are more likely to address service issues during regular business hours.

02 The number of complaints decreases in the evening (18:00–23:59) and morning (06:00–11:59), while the fewest complaints occur during the early hours of the day (00:00–05:59), likely due to lower customer activity during these times.

Customer Complaint Category Analysis

Customer Complaints by Category



01 Internet speed issues (647 complaints) were the main concern.

02 Billing issues had 448 complaints reflecting challenges in the payment system.

03 Technical-related complaints (254 complaints) were also significant, while customer service issues (27 complaints) were relatively low.

Customer Complaint Category Analysis

Complaint by Month

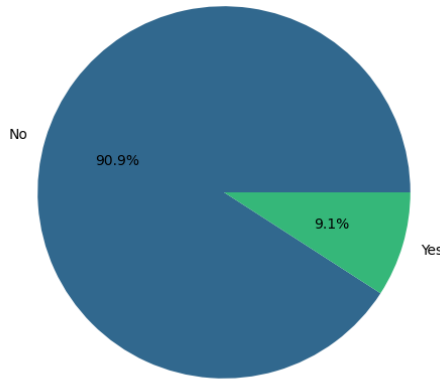
Month	Most Common Complaint
April 2015	Internet Speed Issues
August 2015	Internet Speed Issues
December 2015	Internet Speed Issues
February 2015	Billing Issues
January 2015	Internet Speed Issues
July 2015	Billing Issues
June 2015	Internet Speed Issues
March 2015	Billing Issues
May 2015	Internet Speed Issues
November 2015	Internet Speed Issues
October 2015	Billing Issues
September 2015	Internet Speed Issues

01 Internet speed complaints dominated in 8 out of 12 months (**April, August, December, January, June, May, November, and September**), indicating **customer dissatisfaction with internet services**.

02 Billing issues were the top complaint in 4 months (**February, July, March and October**). This could indicate that there are certain periods where **customers experience confusion or dissatisfaction regarding service charges**.

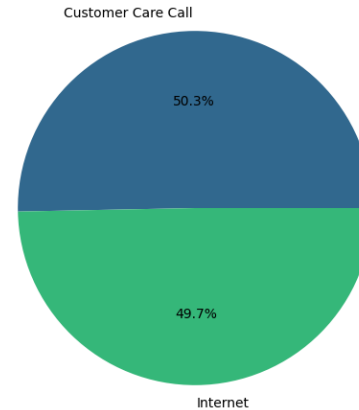
Complaint Submission Methods & Customer Representation

Filing on Behalf of Someone



The majority of complaints (2021 cases) were filed directly by the customers themselves, indicating that most issues were personally experienced rather than reported through referrals or third parties.

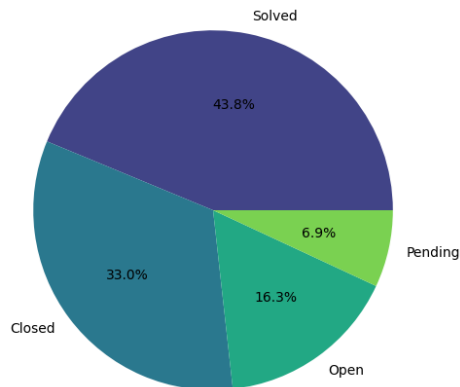
Type of Complaint Received From



The number of complaints received via Customer Care Call (1,119 cases) and Internet (1,105 cases) is **nearly equal, indicating that customers utilize both channels almost equally to report their issues.**

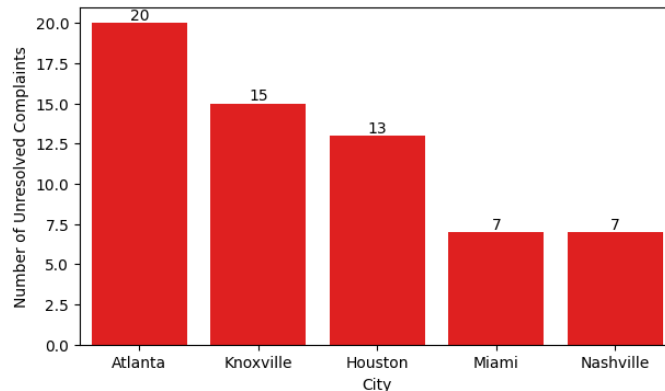
Status of Complaint Tickets

Proportions of Complaint Ticket Status



The majority of complaints have been resolved, with **43.8% tickets marked as "Solved"** and **33% as "Closed."** However, a **significant number of complaints remain unresolved**, with 6.9% still "Open" and 16.3% marked as "Pending," **indicating potential delays in addressing customer issues.**


Top 5 Cities with Unresolved Complaints (Open & Pending)



Atlanta has the highest number of unresolved complaints, indicating **significant challenges in resolving customer issues efficiently.** Knoxville and Houston also show notable numbers, suggesting potential service gaps.

Recommendation

1. Strengthen Service Quality and Customer Experience


- Focused on improving service in Atlanta, Chicago, and Knoxville by identifying the most frequently complained about issues.
 - The majority of complaints came in during working hours (12:00-17:59), indicating that customers are more active in contacting support during productive hours. Increase customer service capacity during the day to accommodate the spike in complaints that occur during these hours.
 - A total of 6.9% of tickets are still “Open” and 16.3% are “Pending”, indicating potential delays in complaint resolution. Rotate the workforce or create flexible shifts so that the availability of the customer service team matches the complaint time trend because Cities with a high number of complaint tickets indicate a potential imbalance between service demand and manpower.
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Recommendation

2. Improve Network Quality & Internet Stability

- Internet speed is the most common complaint. Companies can identify areas with a high frequency of complaints and invest in network capacity upgrades in those regions.

3. Optimization of Billing System

- Billing complaints were the top issue in 4 months (February, July, March, October), indicating a possible critical period in the billing system.
 - If complaints arise due to tariff changes or unclear charges, companies can simplify service packages and prices to make them easier to understand.
 - Send automatic reminders to customers before the due date to avoid confusion.
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- A decorative wavy line in dark blue and orange colors spans the bottom of the slide.



THANK YOU!

Github

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LinkedIn

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