BUSINESS INSIGHTS FROM TELCO CUSTOMER TICKETS

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SYNOPSIS:

Project is based on telco customer complaint public dataset of complaints raised [i.e SR Raised].

This project is completely based on customer feedback of telco service and giving suggestion to telco provider to become more of customer centric apart from giving service's and leading them to higher market potential w.r.t competitor.

This dataset corresponds to SR ID, SR Type, Technology Type, SR raised Date, Resolution date, SLA Time, SR Source Type, Customer Account type, Customer details like Name, Address, Customer Type, Area, Geo Lat & Long etc.

Using this data, we intend to analyze SR trends over a given Time period, Average SR raised & time spends for resolutions, delivery performance patterns, Source of SR along with Customer type and Geo location and impact on Business and customer.

The goal behind is to 'put it all together' by developing a Coherent, Concise, and Realistic analysis in the form of a report and give business insights from customer tickets and further scope for improvement in that domain with strong suggestion and recommendations.
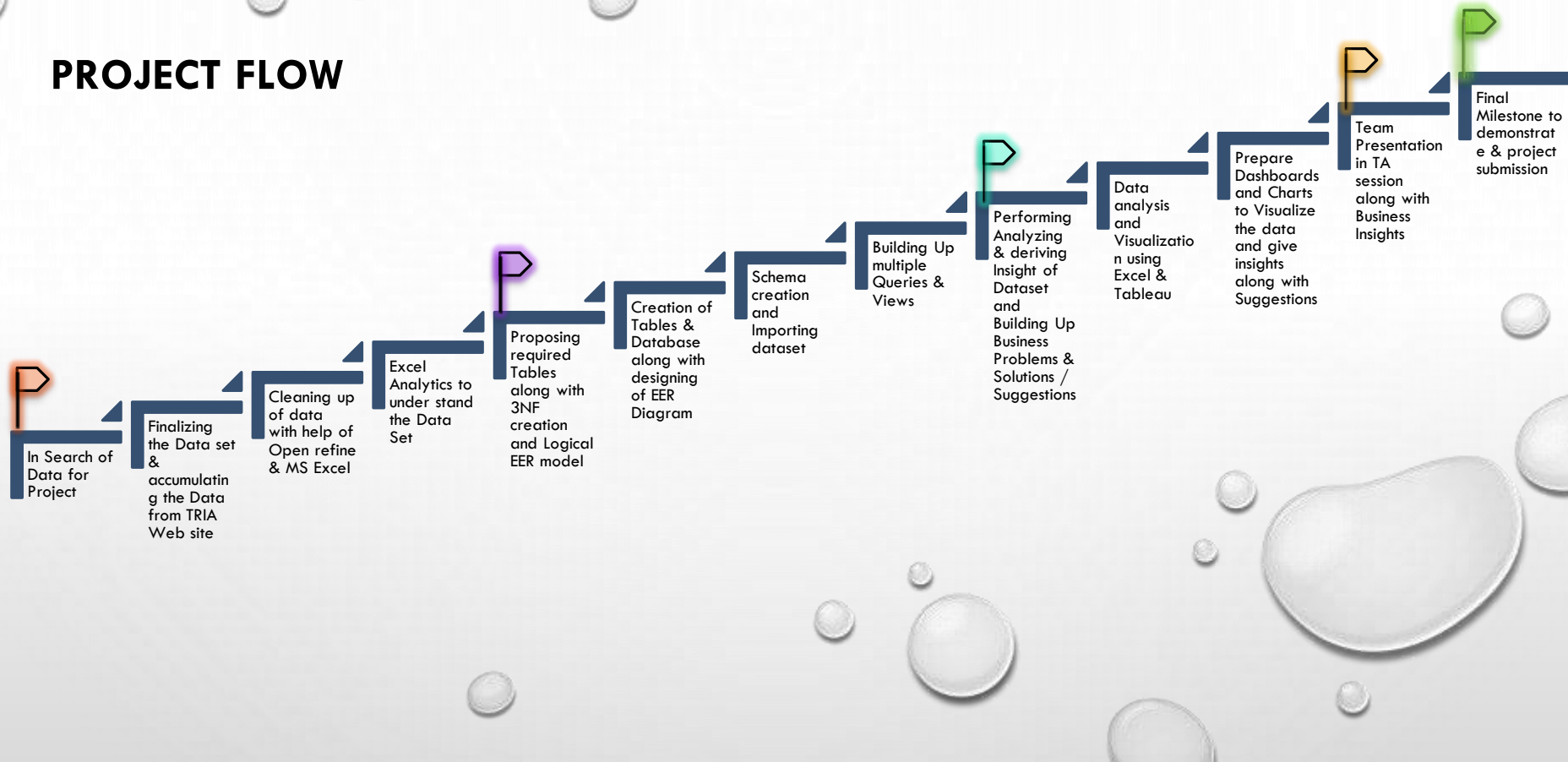
GOAL : Prime goal is to analyze Service Request [SR's] data and come up with actionable insights based on the data, to improve service quality, customer satisfaction which overall enhance business

METHODOLOGY AND TOOLS USED

Service Request data is available on **https://data.gov.in – TRIA web site** in form of CSV files containing various customer's raised complaints along with necessity information, Complaint type and technology, Customer class (Gold, silver, corporate etc.), SLA and other dimensions
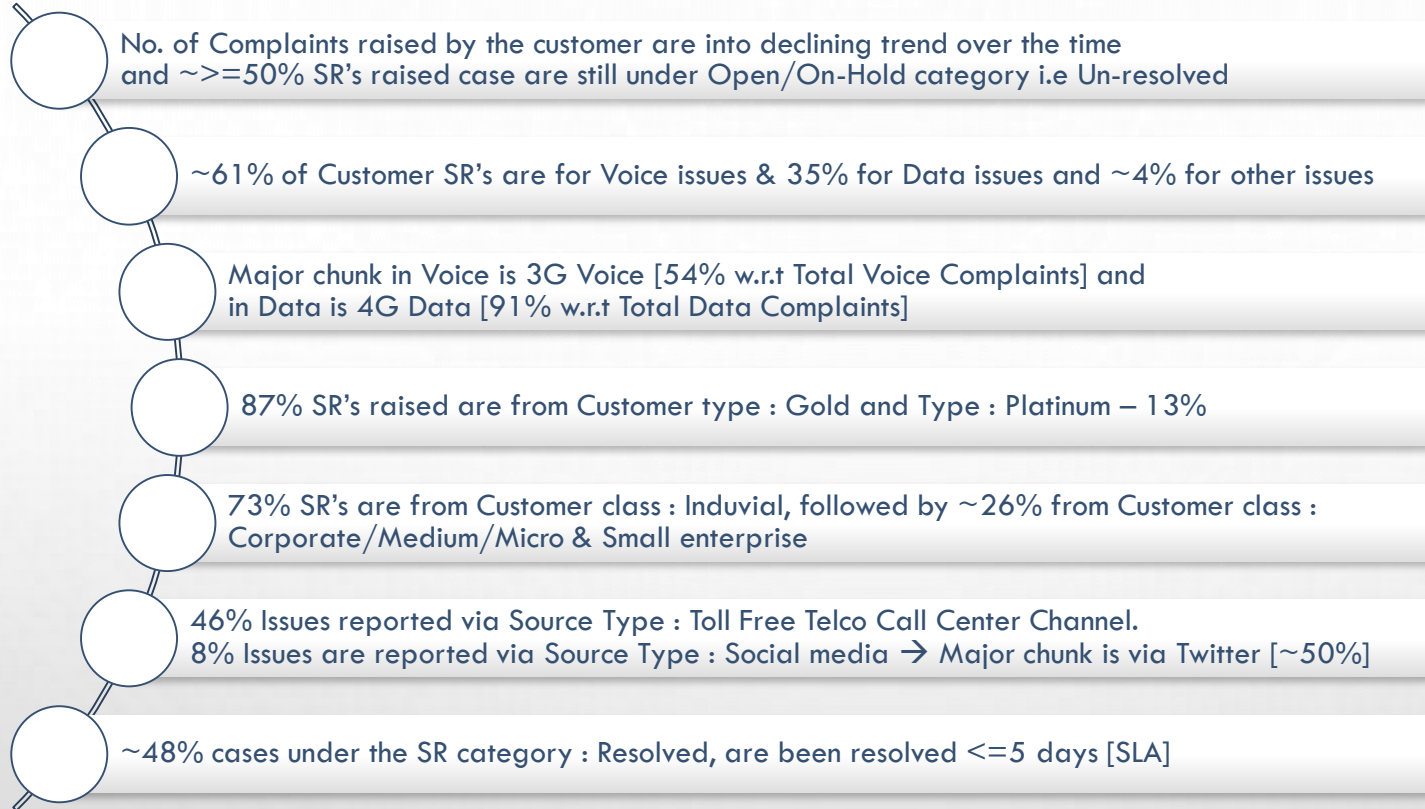
Work Task	Tools Used
Cleanup the CSV data (Remove unwanted & Blank fields, sanitize/format some of them such as Zip codes, Address, Names, Lat-Long)	MS Excel
	Open Refine
Design EER diagrams and various analysis dimensions (such as Customer & source Type, Technology, SLA and SR Status along with Geo Lat-Long)	My SQL Workbench
Create database and Tables based on the ER diagram	My SQL Workbench
Create Schema and Import the Telco Data inside the tables via Insert Command	My SQL Workbench & MS Excel
Commanding Queries and Views to gather insights from the Telco data, Analyze the data and conclude for Business Problems and Way forward	My SQL Workbench
Prepare Dashboards and Charts to Visualize the data and give and share insights	Tableau
	MS Office

PROJECT FLOW

In Search of Data for Project

Finalizing the Data set & accumulating the Data from TRIA Web site

Cleaning up of data with help of Open refine & MS Excel

Excel Analytics to under stand the Data Set

Proposing required Tables along with 3NF creation and Logical EER model

Creation of Tables & Database along with designing of EER Diagram

Schema creation and Importing dataset

Building Up multiple Queries & Views

Performing Analyzing & deriving Insight of Dataset and Building Up Business Problems & Solutions / Suggestions

Data analysis and Visualization using Excel & Tableau

Prepare Dashboards and Charts to Visualize the data and give insights along with Suggestions

Team Presentation in TA session along with Business Insights

Final Milestone to demonstrate & project submission

EXECUTIVE SUMMARY :: OBSERVATIONS
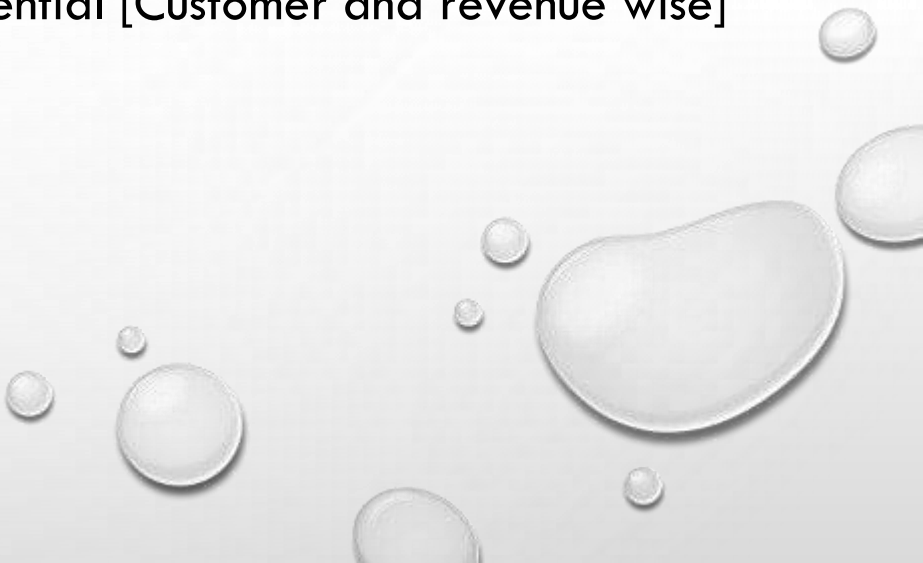
Based on Data Analysis done for Telco Service Requests:

- No. of Complaints raised by the customer are into declining trend over the time and ~>=50% SR's raised case are still under Open/On-Hold category i.e Un-resolved

- ~61% of Customer SR's are for Voice issues & 35% for Data issues and ~4% for other issues

- Major chunk in Voice is 3G Voice [54% w.r.t Total Voice Complaints] and in Data is 4G Data [91% w.r.t Total Data Complaints]

- 87% SR's raised are from Customer type : Gold and Type : Platinum – 13%

- 73% SR's are from Customer class : Induvial, followed by ~26% from Customer class : Corporate/Medium/Micro & Small enterprise

- 46% Issues reported via Source Type : Toll Free Telco Call Center Channel. 8% Issues are reported via Source Type : Social media → Major chunk is via Twitter [~50%]

- ~48% cases under the SR category : Resolved, are been resolved <=5 days [SLA]

OBJECTIVE : UNDERSTANDING THE BUSINESS PROBLEM :

Deep dive on SR's and suggesting reduction opportunity along with insights, so that company has opportunity to have higher customer satisfaction index which helps in leading them for higher market potential [Customer and revenue wise] w.r.t other competitor.

1. No. of SR's vs Technologies vs Issue Type.
2. No. of SR's vs Source Type and Sub-Category
3. No. of SR's vs Customer Type and class
4. No. of SR's vs Locations vs SR's status
5. No. of SR's vs SR's status vs SLA days

MY SQL BASED ANALYSIS

Logical EER Diagram

issue_type
- issue_id SMALLINT(15)
- issue_desc VARCHAR(45)
- Indexes

resolution_category
- resolution_id SMALLINT(15)
- resolution_desc VARCHAR(45)
- Indexes

technology
- technology_id SMALLINT(15)
- technology_desc VARCHAR(45)
- Indexes

sr_details
- sr_id INT(45)
- sr_status VARCHAR(45)
- customer_id INT(15)
- sr_date DATE
- sr_month VARCHAR(50)
- resolution_date DATE
- estimated_resolution_date DATE
- source_id SMALLINT(15)
- resolution_id SMALLINT(15)
- technology_id SMALLINT(15)
- issue_id SMALLINT(15)
- sr_loc_id SMALLINT(15)
- sla_days SMALLINT(4)
- actual_sla_days SMALLINT(15)
- on_holddate DATE
- Indexes

sr_location
- sr_loc_id SMALLINT(15)
- sr_location VARCHAR(100)
- Indexes

sr_source
- source_id SMALLINT(15)
- source_desc VARCHAR(100)
- Indexes

sr_subsource
- subsource_id SMALLINT(15)
- sub_source VARCHAR(100)
- source_id SMALLINT(15)
- Indexes

customer
- customer_id INT(15)
- customer_name VARCHAR(250)
- customer_type_id SMALLINT(15)
- cust_class_id SMALLINT(15)
- last_update DATE
- Indexes

customer_type
- customer_type_id SMALLINT(15)
- customer_type VARCHAR(45)
- sla_days SMALLINT(15)
- Indexes

customer_class
- cust_class_id SMALLINT(15)
- cust_class_desc VARCHAR(100)
- Indexes

How Schema & Tables Created and Data was Inserted

Schema creation

Insert the data base

```
15
16  •   INSERT customer_class values
17      (1,'Corporate'),
18      (2,'Gold'),
19      (3,'Individual'),
20      (4,'Key'),
21      (5,'Medium Enterprise'),
22      (6,'Micro'),
23      (7,'Small Enterprise'),
24      (8,'Test Card'),
25      (9,'Platinum'),
26      (10,'Solitaire');
27
28  •   INSERT sr_location values
29      (1,'Colaba, Nariman Point'),
30      (2,'Marine Lines'),
31      (3,'Grant Road, Mumbai Central, Tardeo'),
32      (4,'Bhyculla, Dockward'),
33      (5,'Lower Parel, Worli'),
34      (6,'Wadala, Dadar, Sewri, Matunga'),
35      (7,'Bandra, Khar'),
36      (8,'Dharavi, Sion'),
37      (9,'Santacruz'),
38      (10,'Kurla, Chunnabhatti'),
39      (11,'Juhu, Vile Parle, Andheri East'),
40      (12,'Jogeshwari, Andheri MIDC, Saki Naka'),
41      (13,'Goregaon East &  West'),
42      (14,'Malad East & West').
```

Use of Joints and View for Queries and linking data with Tableau

Use of Joints & Views


```sql
FROM
    (SELECT
        concat(t.technology_desc,"-" ,it.issue_desc) as Issue_type,
            COUNT(sd.sr_id) AS total_sr
    FROM
        sr_details sd
    LEFT JOIN technology t ON sd.technology_id = t.technology_id
    LEFT JOIN issue_type it ON sd.issue_id = it.issue_id
    GROUP BY t.technology_desc , it.issue_desc) AS a,
    (SELECT
        COUNT(*) AS total
    FROM
        sr_details) AS b
ORDER BY total_sr desc
;
```
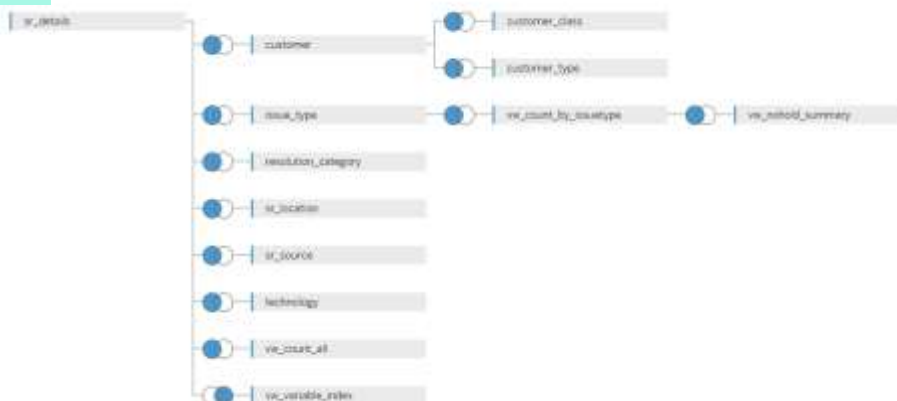


```sql
create or replace view vw_count_all as
select 0 as issue_id, sr_month,
count(sr_id) as Total_Srs,
sum(case when sr_status = "Resolved" then 1 else 0 end) as Resolved_Srs,
sum(case when sr_status = "Resolved" then 1 else 0 end)/count(sr_id) *100 as Resolved_srs_percent,
sum(case when sr_status = "Resolved" and on_holddate > 0 then 1 else 0 end) as Resolved_with_hold_Srs,
sum(case when sr_status = "Resolved" and on_holddate > 0 then 1 else 0 end)/count(sr_id) *100
                                            as Resolved_with_hold_Srs_percent,
(sum(case when sr_status = "Resolved" then 1 else 0 end))
- (sum(case when sr_status = "Resolved" and on_holddate > 0 then 1 else 0 end)) as Resolved_with_no_hold_Srs,
((sum(case when sr_status = "Resolved" then 1 else 0 end))
- (sum(case when sr_status = "Resolved" and on_holddate > 0 then 1 else 0 end)))/count(sr_id) *100
                                            as Resolved_with_no_hold_Srs_percent

from sr_details
group by sr_month
order by sr_month;

select * from vw_count_all;
```

Example 1 - SQL Queries along with Output

Query : Technology - Issue type bifurcation w.r.t total SR's

```sql
SELECT
    a.*, 100 * a.total_sr / b.total AS percent_sr
FROM
    (SELECT
        concat(t.technology_desc,"-" ,it.issue_desc) as Issue_type,
            COUNT(sd.sr_id) AS total_sr
    FROM
        sr_details sd
    LEFT JOIN technology t ON sd.technology_id = t.technology_id
    LEFT JOIN issue_type it ON sd.issue_id = it.issue_id
    GROUP BY t.technology_desc , it.issue_desc) AS a,
    (SELECT
        COUNT(*) AS total
    FROM
        sr_details) AS b
ORDER BY total_sr desc
;
```

Query : Matrix between Technology and Issue type

```sql
SELECT t.technology_desc,
    sum(case when  it.issue_desc like "Vo%" then 1 else 0 end) as Voice_issue,
    sum(case when  it.issue_desc = "Data_Issues" then 1 else 0 end) as Data_Issues,
    sum(case when  it.issue_desc
    in("Roaming_issues", "Other_issues") then 1 else 0 end) as Other_Issues,
    COUNT(sd.sr_id) AS total_sr
    FROM
        sr_details sd
    LEFT JOIN technology t ON sd.technology_id = t.technology_id
    LEFT JOIN issue_type it ON sd.issue_id = it.issue_id
    GROUP BY t.technology_desc

ORDER BY total_sr  desc;
```

Output

Issue_type	total_sr	percent_sr
3G-Voice_issue	27427	32.6279
4G-Data_Issues	27070	32.2032
4G-VoLTE_issue	13956	16.6024
2G-Voice_issue	9587	11.4049
Roaming_issues-Roaming_issues	3012	3.5832
3G-Data_Issues	2523	3.0014
Other_issues-Other_issues	485	0.5770

Output

technology_desc	Voice_issue	Data_Issues	Other_Issues	total_sr
4G	13956	27070	0	41026
3G	27427	2523	0	29950
2G	9587	0	0	9587
Roaming_issues	0	0	3012	3012
Other_issues	0	0	485	485

Example 2 - SQL Queries along with Output

Query : Source Type vs No. of SR

```sql
SELECT
    source_desc, COUNT(source_id)
FROM
    sr_details
        LEFT JOIN
    sr_source USING (source_id)
GROUP BY source_id
ORDER BY source_id desc;
```

Query : Customer Class vs No. of SR's

```sql
SELECT
    a.*, (100 * a.total_sr / b.total) AS percent_sr
FROM
    (SELECT c2.cust_class_desc, COUNT(sr_id) AS total_sr
    FROM sr_details sd
    LEFT JOIN (SELECT c.customer_id,c.last_update,cc.cust_class_desc,c.cust_class_id
                FROM customer c
                LEFT JOIN customer_class cc ON c.cust_class_id = cc.cust_class_id) AS c2
    ON sd.Customer_id = c2.customer_id AND sd.sr_date = c2.last_update
    GROUP BY c2.cust_class_desc) a,
    (SELECT COUNT(*) AS total FROM sr_details) AS b
ORDER BY total_sr desc;
```

Output

source_desc	COUNT(source_id)
VIP_escalation	1153
Port_Out_Threat-retention_desk	16205
Social_Media	6542
3rd_Party_Retail_Stores	9228
Telco_Stores	6525
Corporate_Account_issue	2978
Telco_Toll_Free_Call_Center	38536
Telco_Road_Survey	2893

Output

cust_class_desc	total_sr	percent_sr
Individual	61561	73.2346
Corporate	13025	15.4949
Micro	3374	4.0138
Small Enterprise	2990	3.5570
Medium Enterprise	2525	3.0038
Key	338	0.4021
Gold	201	0.2391
Platinum	26	0.0309
Test Card	19	0.0226
Solitaire	1	0.0012

Example 3 – SQL Queries along with Output

Query : Month on Month SR's vs SR Status distribution

```sql
create or replace view vw_count_all as
select 0 as issue_id, sr_month,
count(sr_id) as Total_Srs,
sum(case when sr_status = "Resolved" then 1 else 0 end) as Resolved_Srs,
sum(case when sr_status = "Resolved" then 1 else 0 end)/count(sr_id) *100 as Resolved_srs_percent,
sum(case when sr_status = "Resolved" and on_holddate > 0 then 1 else 0 end) as Resolved_with_hold_Srs,
sum(case when sr_status = "Resolved" and on_holddate > 0 then 1 else 0 end)/count(sr_id) *100
                                          as Resolved_with_hold_Srs_percent,

(sum(case when sr_status = "Resolved" then 1 else 0 end))
- (sum(case when sr_status = "Resolved" and on_holddate > 0 then 1 else 0 end)) as Resolved_with_no_hold_Srs,
((sum(case when sr_status = "Resolved" then 1 else 0 end))
- (sum(case when sr_status = "Resolved" and on_holddate > 0 then 1 else 0 end)))/count(sr_id) *100
                                          as Resolved_with_no_hold_Srs_percent

from sr_details
group by sr_month
order by sr_month;

select * from vw_count_all;
```

Query : Month on Month SR's vs SR's Location

```sql
SELECT a1.sr_loc_id,a2.sr_location,
sum(case when year(sr_date)*100+month(sr_date) = 201804 then 1 else 0 end) as  Apr2018,
sum(case when year(sr_date)*100+month(sr_date) = 201805 then 1 else 0 end) as  May2018,
sum(case when year(sr_date)*100+month(sr_date) = 201806 then 1 else 0 end) as  Jun2018,
sum(case when year(sr_date)*100+month(sr_date) = 201807 then 1 else 0 end) as  Jul2018,
sum(case when year(sr_date)*100+month(sr_date) = 201808 then 1 else 0 end) as  Aug2018,
sum(case when year(sr_date)*100+month(sr_date) = 201809 then 1 else 0 end) as  Sep2018,
sum(case when year(sr_date)*100+month(sr_date) = 201810 then 1 else 0 end) as  Oct2018,
count(sr_id) as Total
from sr_details as a1 left join sr_location as a2 using (sr_loc_id)
where sr_status in ("Resolved") and year(sr_date)*100+month(sr_date) <= 201810
group by a1.sr_loc_id,a2.sr_location
order by Total desc;
```
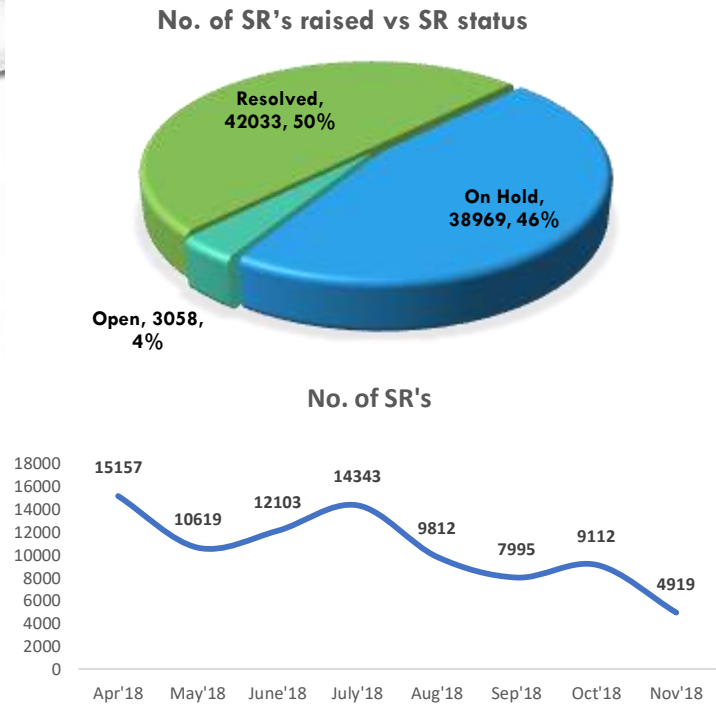
Output

sr_month	Total_Srs	Resolved_Srs	Resolved_srs_percent	Resolved_with_hold_Srs	Resolved_with_hold_Srs_percent	Resolved_with_no_hold_Srs	Resolved_with_no_hold_Srs_percent
201804	15157	10989	72.5012	6507	42.9307	4482	29.5705
201805	10619	7225	68.0384	4388	41.3222	2837	26.7163
201806	12103	6850	56.5975	3354	27.7121	3496	28.8854
201807	14343	7129	49.7037	2779	19.3753	4350	30.3284
201808	9812	4506	45.9234	1754	17.8761	2752	28.0473
201809	7995	2572	32.1701	555	6.9418	2017	25.2283
201810	9112	2119	23.2550	39	0.4280	2080	22.8270
201811	4919	643	13.0718	0	0.0000	643	13.0718

Output

sr_loc_id	sr_location	Apr2018	May2018	Jun2018	Jul2018	Aug2018	Sep2018	Oct2018	Total
12	Jogeshwari, Andheri MIDC, Saki Naka	671	493	419	426	282	165	144	2600
15	Kandivli East & West	612	382	433	388	258	135	111	2319
13	Goregaon East & West	562	387	398	370	275	136	122	2250
23	Gansoli, Airoli, Koparkhairane	540	363	343	419	222	112	114	2113
22	Mumbai, Diva, Dombivli	491	369	337	402	203	96	80	1978
24	Vashi, Turbe, Sanpada, Nerul	545	317	303	315	220	143	91	1934
5	Lower Parel, Worli	439	343	282	277	185	98	126	1750
28	Dahisar, Borivali	517	275	279	289	187	108	84	1739
26	Thakurli, Kalyan, Titwala	442	265	338	306	166	86	135	1738
16	Mira Road, Bhayander	458	295	259	266	174	115	81	1648

EXCEL ANALYSIS TO UNDERSTAND SQL OUTPUT DATA AND BUILD UP STORIES

1. Excel Analytics and Data Insight

No. of SR's raised vs SR status

Resolved, 42033, 50%

On Hold, 38969, 46%

Open, 3058, 4%

No. of SR's

	Apr'18	May'18	June'18	July'18	Aug'18	Sep'18	Oct'18	Nov'18
Value	15157	10619	12103	14343	9812	7995	9112	4919

No. of SR's raised vs Geo Location

Location Name	Location ID
Jogeshwari, Andheri MIDC, Saki Naka	12
Kandivli East & West	15
Goregaon East & West	13
Mumbar, Diva, Dombivli	22
Vashi, Turbe, Sanpada, Nerul	24
Gansoli, Airoli, Koparkhairane	23
Dahisar, Borivali	28
Thane, Kalwa	21
Belapur, Uran, Panvel	25
Thakurli, Kalyan, Titwala	26
Lower Parel, Worli	5
Mira Road, Bhayander	16
Ghatkopar, Vikroli, Vidhyavihar	29
Malad East & West	14
Juhu, Vile Parle, Andheri East	11
Chembur, Mankhur, Trombay	17
Bhandup, Mulund	19
Santacruz	9
Turbe, Kalamboli	27
Kurla, Chunnabhatti	10
Thane / Ghodbandar	20
Wadala, Dadar, Sewri, Matunga	6
Bandra, Khar	7
Dharavi, Sion	8
Powai, Chandivali	18
Colaba, Nariman Point	1
Bhyculla, Dockward	4
Marine Lines	2
Grant Road, Mumbai Central, Tardeo	3

Highs :
- No. of SR's Month on Month is into **decreasing trend.**
- 50% SR's raised by customer has status is Resolved
Lows :
46% SR's are attended but still not resolved [On-Hold], rest **4%** still Open
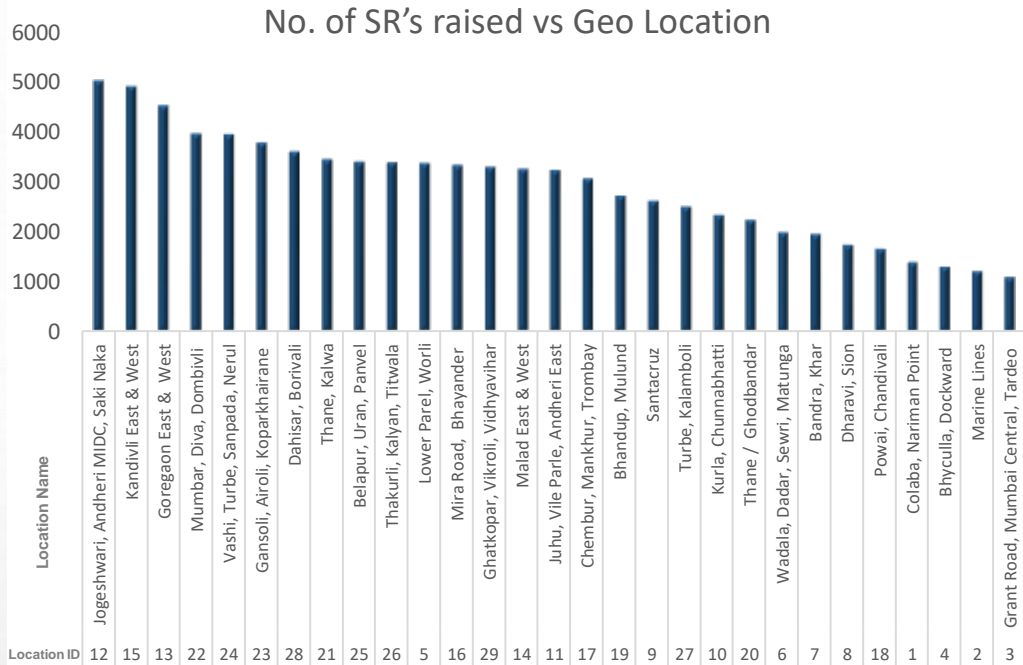
Highs : Location ID 1 to 4 :: Lowest SR's :: High Customer Satisfaction Index
Lows : Location ID 12, 13 & 15 :: Highest SR's :: Low Customer Satisfaction Index

2. Excel Analytics and Data Insight
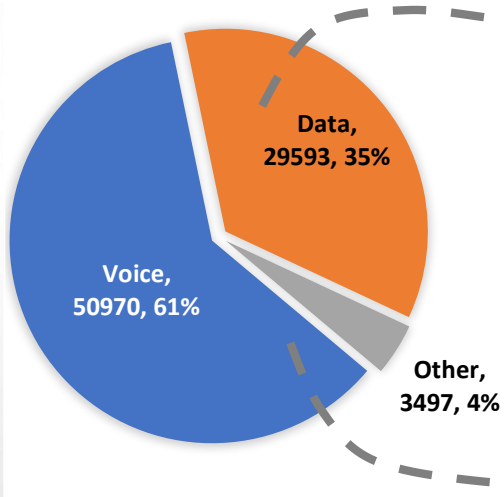
ISSUE TYPE VS TECHNOLOGY [DATA] VS NO OF SR'S

- 4G, 27070, 91%
- 3G, 2523, 9%
- Other, 0, 0%
- 2G, 0, 0%

ISSUE TYPE VS NO. OF SR'S

- Voice, 50970, 61%
- Data, 29593, 35%
- Other, 3497, 4%
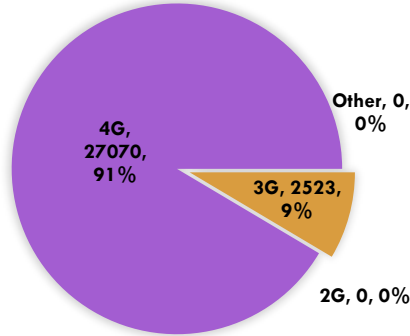
ISSUE TYPE VS TECHNOLOGY [VOICE] VS NO OF SR'S

- 3G, 27427, 54%
- 4G, 13956, 27%
- 2G, 9587, 19%
- Other, 0, 0%

ISSUE TYPE/TECHNOLOGY VS NO. OF SR'S

- 4G-VoLTE issue, 13956, 17%
- 2G-Voice issue, 9587, 11%
- Roaming issues, 3012, 4%
- 3G-Data Issues, 2523, 3%
- Other issues, 485, 0%
- 3G-Voice issue, 27427, 33%
- 4G-Data Issues, 27070, 32%
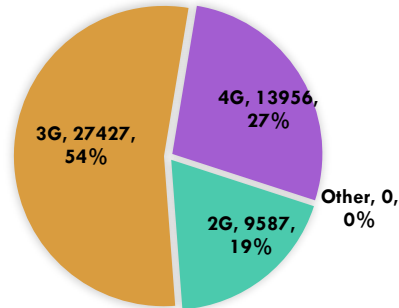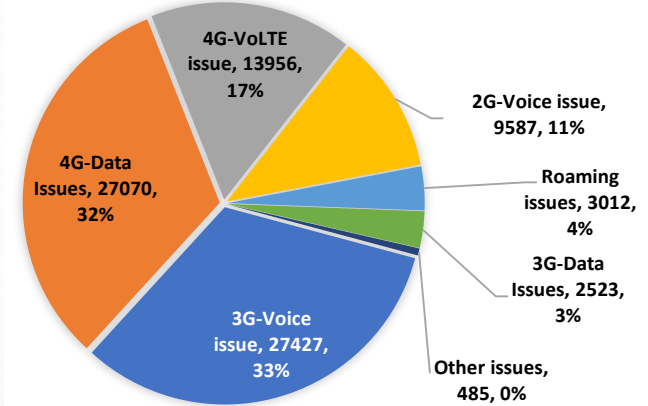
Lows [Technology & Issues] :
3G – Voice [33%] & 4G – Voice [17%] & 4G – Data [32%] is Major Chuck for Voice & Data related issues respectively.

Highs :
- 2G Voice has very less contribution, which say that majority of customers are using smart phone.
- Roaming issue is very rarely reported, hence there is no intra-inter roaming issues.

3. Excel Analytics and Data Insight

TYPE OF SR SOURCE VS NO OF SR'S RAISED

- Port Out Threat-retention desk 19%
- 3rd Party Retail Stores 11%
- Social Media 8%
- Telco Stores 8%
- Telco Toll Free Call Center 46%
- Corporate Account issue 4%
- Telco Road Survey 3%
- VIP escalation 1%
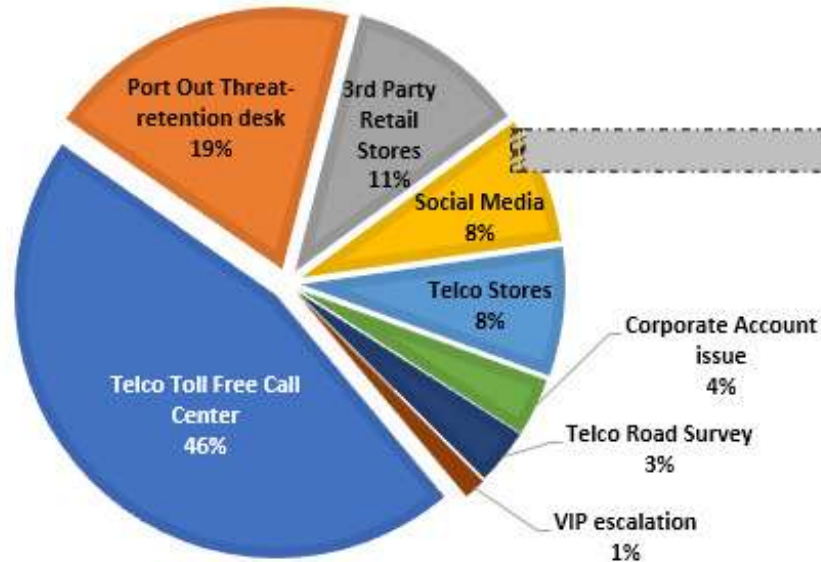
TYPE OF SR SOURCE [SOCIAL MEDIA] VS NO OF SR'S RAISED

- Consumer Complaint Forum, 257, 4%
- Telco App, 782, 12%
- Nodal email / SMS / Call, 240, 4%
- Facebook, 230, 3%
- Telco Blog, 183, 3%
- Twitter, 4574, 70%
- Appellate Email / Call, 151, 2%
- Other Social Media, 125, 2%
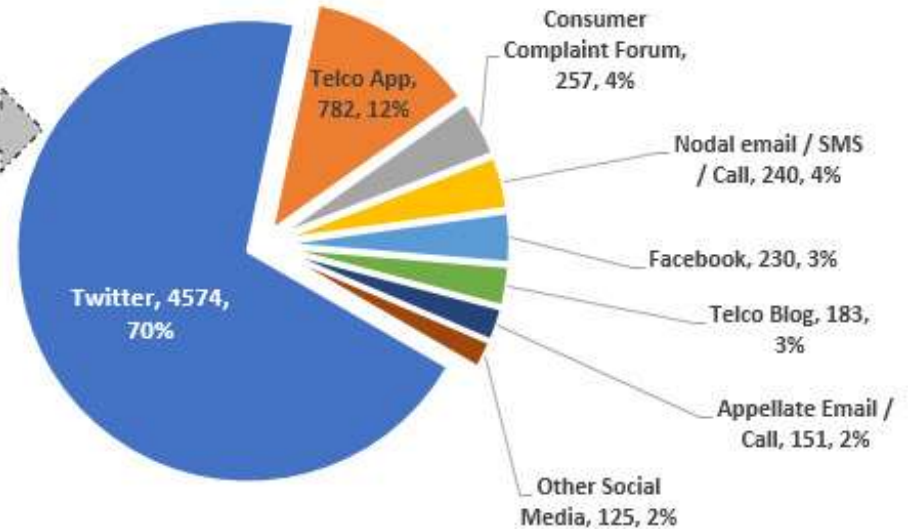
Highs :
 - **~1%** SR's are obtain via Source Mode : VIP escalation
Lows :
 - **19%** SR's are reported :: Source :: **Port Out Threat desk,** need special attention to avoid churn out to competitor & loss of revenue
 - **8%** SR's are reported :: Source :: Social Media, Major chunk from Twitter [**70%**]

4. Excel Analytics and Data Insight

CUTOMER CLASS VS NO. OF SR'S

- Individual, 61561, 73%
- Corporate, 13025, 16%
- Micro, 3372, 4%
- Small Enterprise, 2990, 4%
- Medium Enterprise, 2527, 3%
- Key, 338, 0%
- Gold, 201, 0%
- Solitaire, 1, 0%
- Test Card, 19, 0%
- Platinum, 26, 0%

CUSTOMER CLASS [CORPORATE] VS NO. OF SR'S - SUMMARY FOR TOP CONTRIBUTOR IN CORPORATE CATERGORY

- ICICI Bank & Life insurance, 372, 50%
- Reliance Insurance / Energy / Capital, 126, 17%
- IRCTC railway employee, 57, 8%
- Kotak Mahindra Bank / Life insurance, 51, 7%
- Future Retail Limited, 34, 4%
- Oil And Natural Gas Corp Ltd, 30, 4%
- Santosh Tiwari Pvt Ltd, 27, 4%
- Oil And Natural Gas Corporation Ltd, 23, 3%
- DSTE - Divisional Accounts, 22, 3%
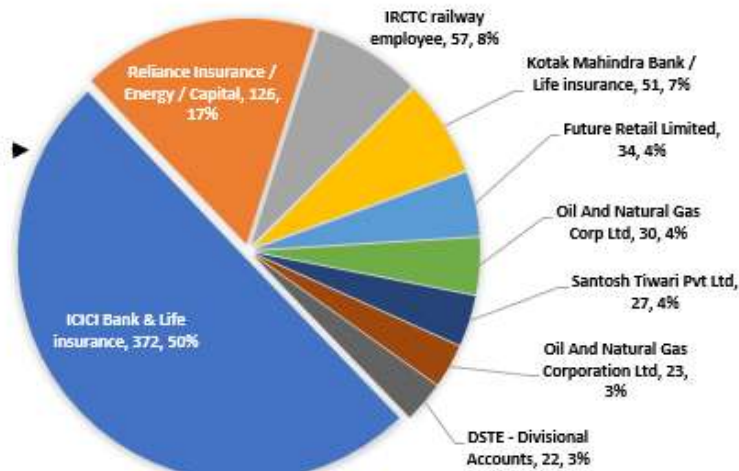
CUSTOMER CLASS [MICRO] VS NO. OF SR'S - SUMMARY FOR TOP CONTRIBUTOR IN CORPORATE CATERGORY

- Pragati Educational Trust, 17, 22%
- Tangent Communications, 14, 18%
- Riya Communication, 12, 16%
- Aecom Asia Company Ltd, 24, 31%
- Samarth Softech Solutions Pvt Ltd, 10, 13%
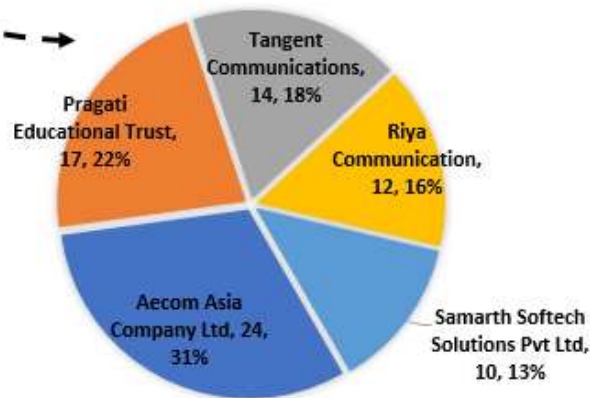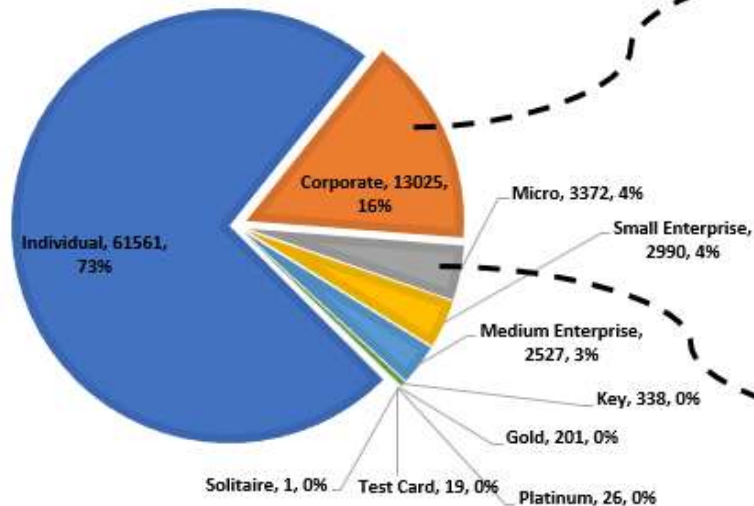
Highs :
 - <1% SR's are raised by Solitaire / Platinum customer's.
Lows :
 - 73% SR's are raised by individual's
 - 27% SR's are raised by Corporate's / Small Enterprise or sectors, need special attention to avoid churn out to competitor.

5. Excel Analytics and Data Insight

SLA Days vs No. of SR Resolved
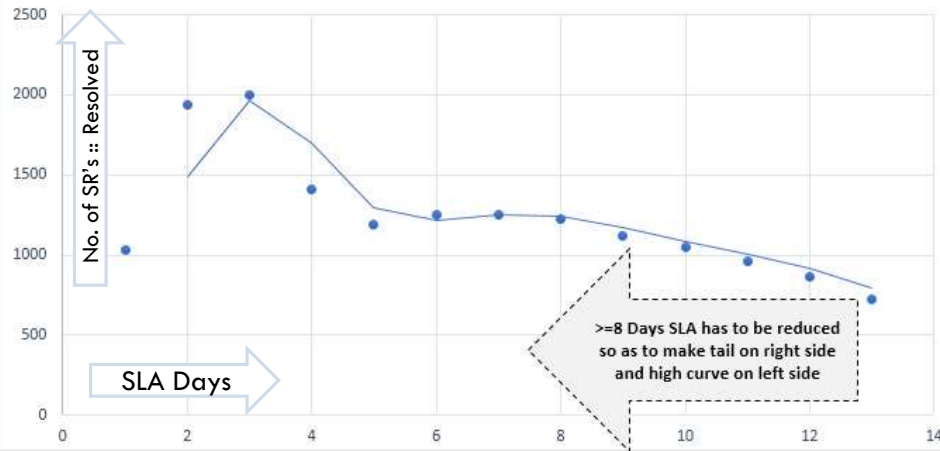
No. of SR's :: Resolved

SLA Days

>=8 Days SLA has to be reduced so as to make tail on right side and high curve on left side

No's of SR's [On-Hold :: SR Category]

No. of SR's :: On-Hold

Month No

4168
3392
5253
7214
5306
5423
6993
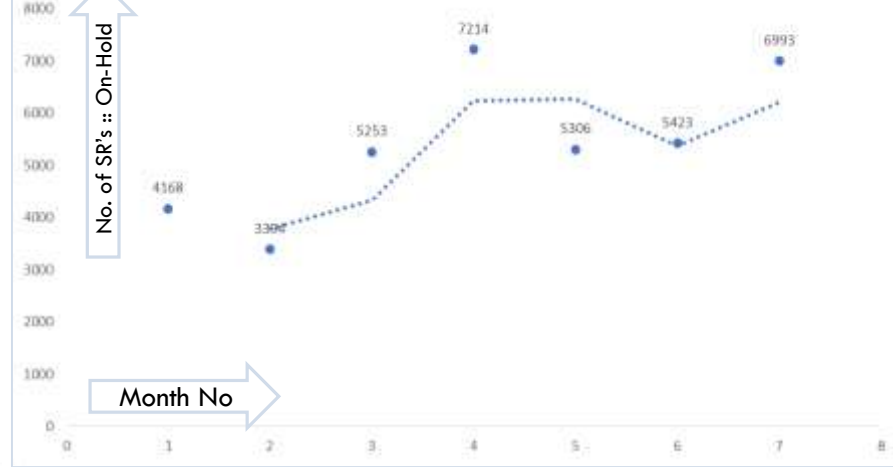
Highs :
 - **48%** SR's under **Resolved** category have <=5 days SLA days.
 - **2 to 4 Days** is the average SLA days.

Lows :
 - **Minimize SLA days,** should target >=8 days SLA days [**39%**].
 - Month on Month - **Increasing Trend -** No. of SR's under SR Status :: On-Hold.

DATA ANALYSIS, VISUALIZATION AND STORY MAKING USING TABLEAU

Note : In these section we tried to compare & make Charts/Story as similar to that of SQL output and Excel charts

1. Business Problem : To acknowledge which service's across technology is doing well & the most frequent issue type faced by the customer which needs attention.

Issue Type vs No. of SR's
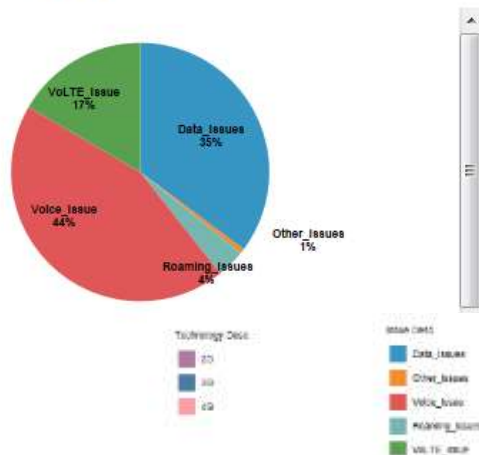
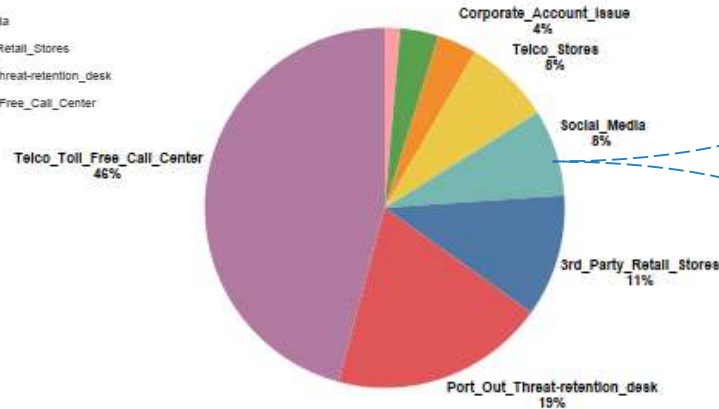Technology - Data issues vs No. of SR's

Technology - Voice issues vs No. of SR's
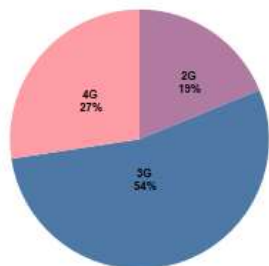
Issue Type/Technology vs No. of SR's
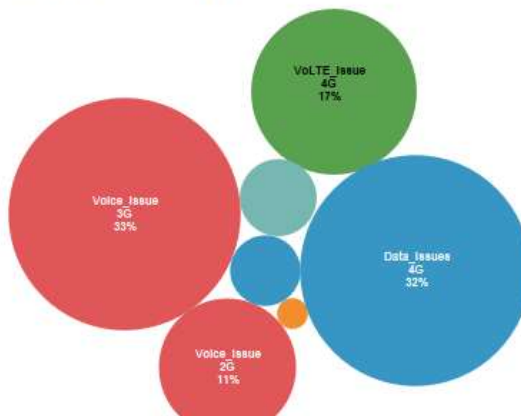
Observation :

Highs :
- 2G Voice has very less contribution, which say that majority of customers are using smart phone.
- Roaming issue is very rarely reported, hence there is no intra-inter roaming issues.

Lows :
3G – Voice [33%] & 4G – Voice [17%] & 4G – Data [32%] is Major Chuck for Voice & Data related issues respectively.

1. Business Problem : To acknowledge which service's across technology is doing well & the most frequent issue type faced by the customer which needs attention. [Continue………………….]
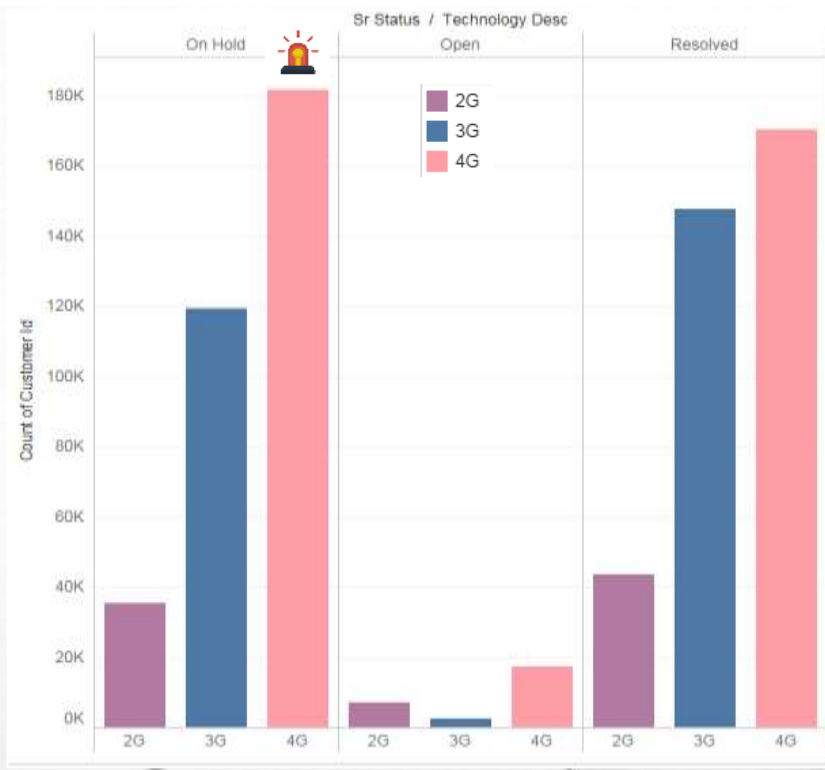
Solution / Suggestion :

- More Focus on resolving 3G Voice issues & 4G Data Issues.
- Insist to push customer's to use VoLTE service which has higher performance metric.
- Identified areas were Coverage & Capacity Augmentation is required for 3G Voice & 4G Data issues [No coverage / Congestion/Buffering/Low speed etc]
- No. of SR's raised for 4G Data are addressed but still un-resolved [i.e On-Hold], special focus has to be given for faster closer.

2. Business Problem : To acknowledge which is the most used source for reporting issues & the most frequent used sub-source type by the customer which needs attention and lower SLA.
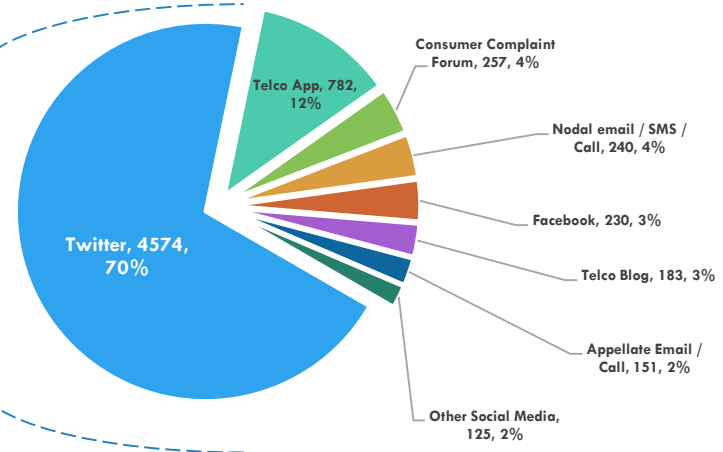
Highs :
   - ~1% SR's are obtain via Source Mode : VIP escalation
   **-** Social Media has the lowest SLA days w.r.t other source type.
Lows :
- 19% SR's are reported :: Source :: **Port Out Threat desk,** need special attention to avoid churn out to competitor & loss of revenue
- 8% SR's are reported :: Source :: Social Media, Major chunk from Twitter [**70%**]
- Corporate Account has the highest SLA days w.r.t other source type.

2. Business Problem : To acknowledge which is the most used source for reporting issues & the most frequent used sub-source type by the customer which needs attention and lower SLA. [Continue…………………..]

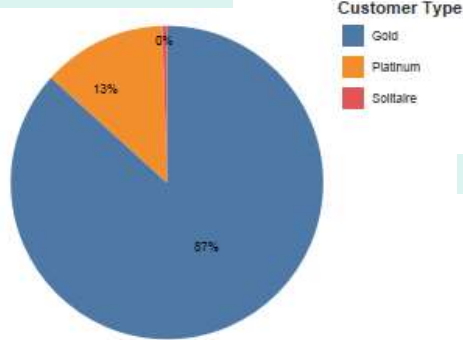SR Source vs SR status

SR Source vs SLA days
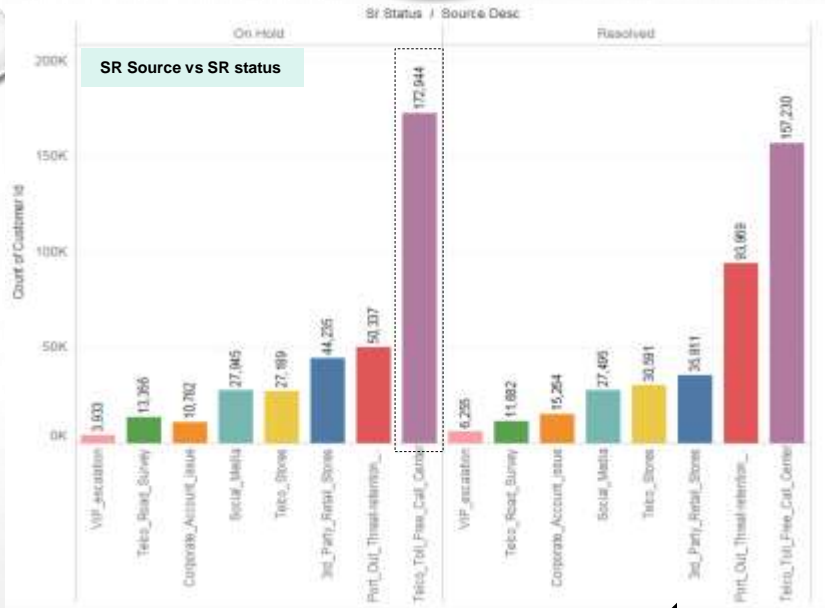
Solution / Suggestion :
- More Focus on resolving Telco Call center cases.
- Guide and train customer care faculty to understand customer's VOC and try to resolve the issues at that moment is remotely possible, these will help to reduce in-flow of SR's.
- Avg. SLA has to minimize [Currently Avg. SLA >=10 Days].
- Focus required for Corporate Account ["high SLA days"]
- Special benchmarks to be made to reduce SLA days for Corporate Accounts , VIP escalations and Social media cases as they directly links companies performance and reputation.
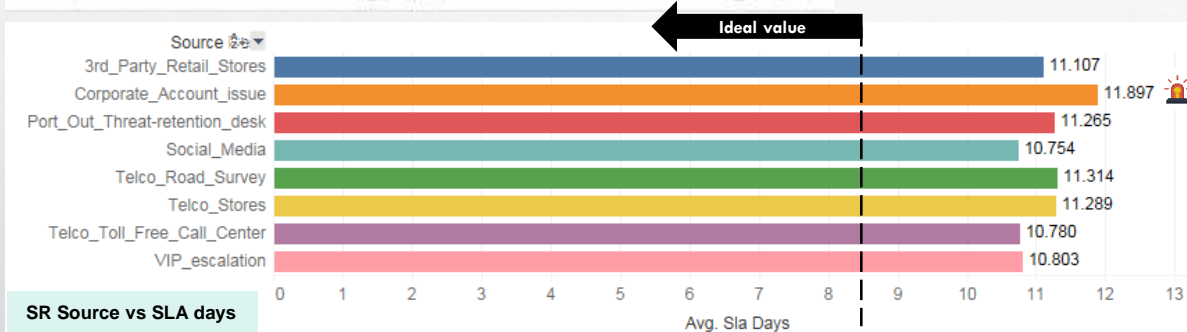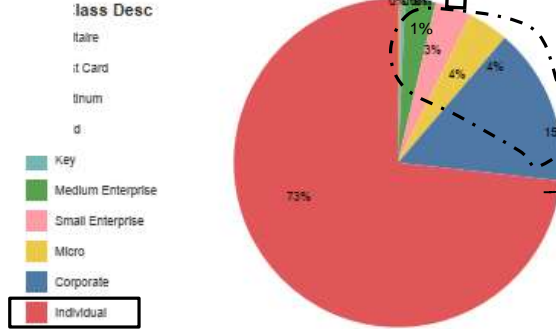
3. Business Problem : To acknowledge & convey which customer's or class have reported frequent issue and which customer's has to be targeted with special potential and fast tracking system with as low as possible SLA.
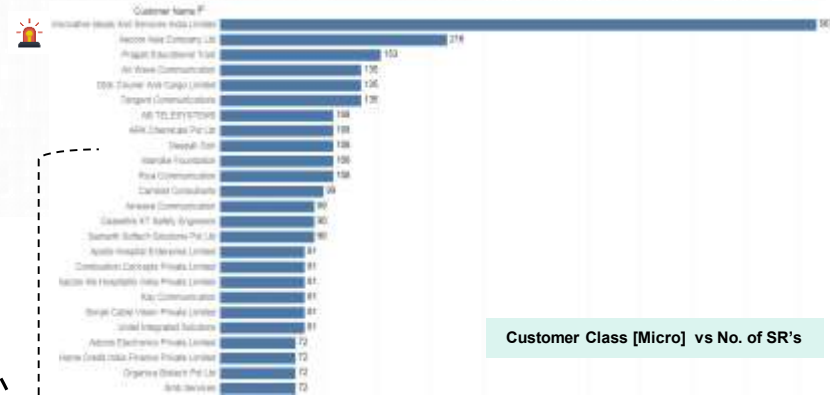

1. Customer Type vs No. of SR's

Customer Type
- Gold
- Platinum
- Solitaire

0%
13%
87%

2. Customer Class vs No. of SR's

Class Desc
- Itaire
- t Card
- tinum
- d

- Key
- Medium Enterprise
- Small Enterprise
- Micro
- Corporate
- Individual

27%
1%
3%
4%
4%
15%
73%

Customer Class [Micro] vs No. of SR's

Customer Class [Corporate] vs No. of SR's
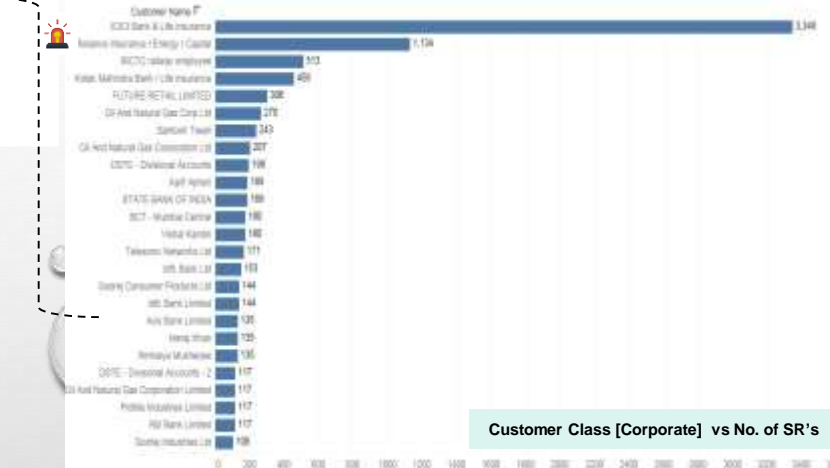
Highs :
 - **<1%** SR's are raised by Solitaire customer's.
Lows :
 - **73%** SR's are raised by individual's
 - **27%** SR's are raised by Corporate's, Small & Medium Enterprise or sectors, need special attention to avoid churn out to competitor.
 - ICICI Bank & Reliance Energy has reported most issues from corporate customer class & Innovative Ideas and Aecom Asia Pvt Ltd from Micro customer class
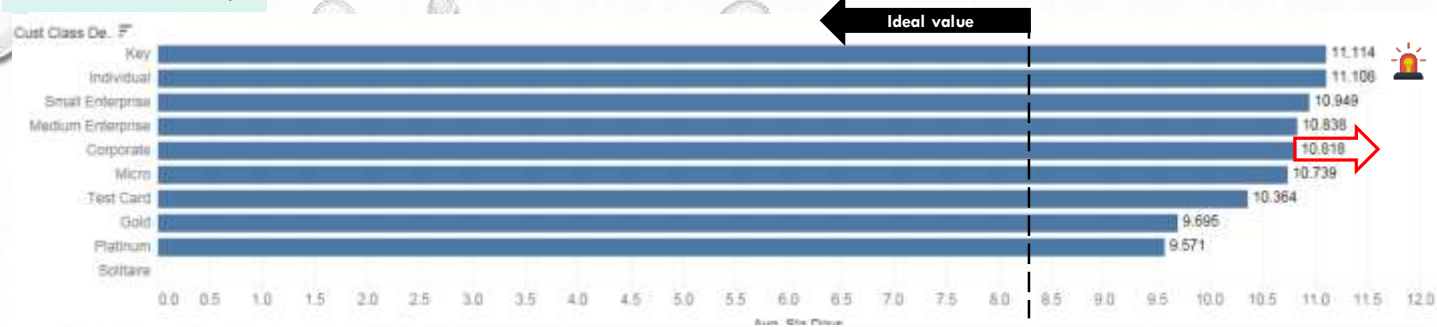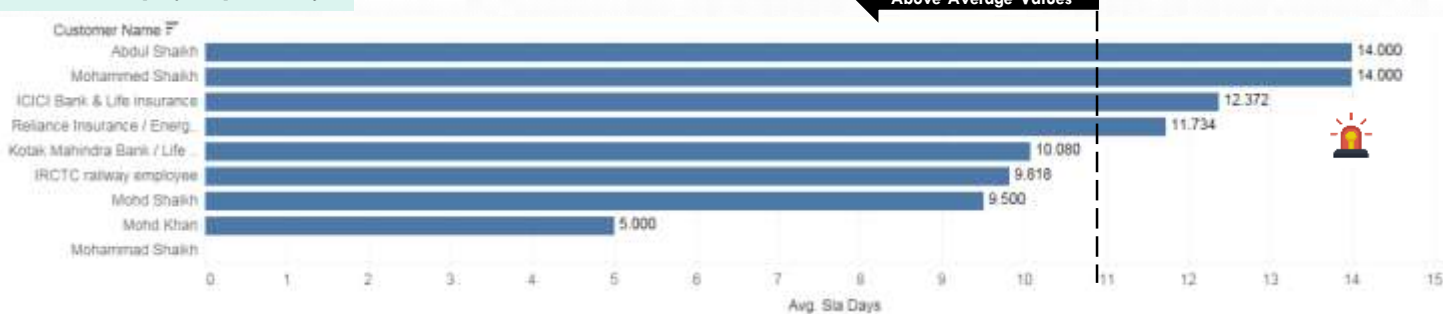
3. Business Problem : To acknowledge & convey which customer's or class have reported frequent issue and which customer's has to be targeted with special potential and fast tracking system with as low as possible SLA [Continue.........]

Customer Class vs SLA Days

Customer Class [Corporate] vs SLA Days

Solution / Suggestion :

- Avg. SLA has to minimize [Currently Avg. SLA >=10 Days].
- Focus required for Key, Small / Medium Enterprise and Corporate Account ["high SLA days"]
- Special benchmarks to be made to reduce SLA days for ICICI bank and Reliance Energy ["SLA above the Avg of Corporate Account"], as they directly links companies performance and reputation.
- Special solutions to be planned for corporate account & Small / Medium Enterprise to avoid churn to competitor due to high SLA and repetitive complaints.

4. Business Problem : To check for the existence of Geographical locations with maximum SRs registered and distinguish by different SR status which needs attention.

No. of SR's raised vs Geo location

No. of SR's raised vs Geo Location [Mumbai]
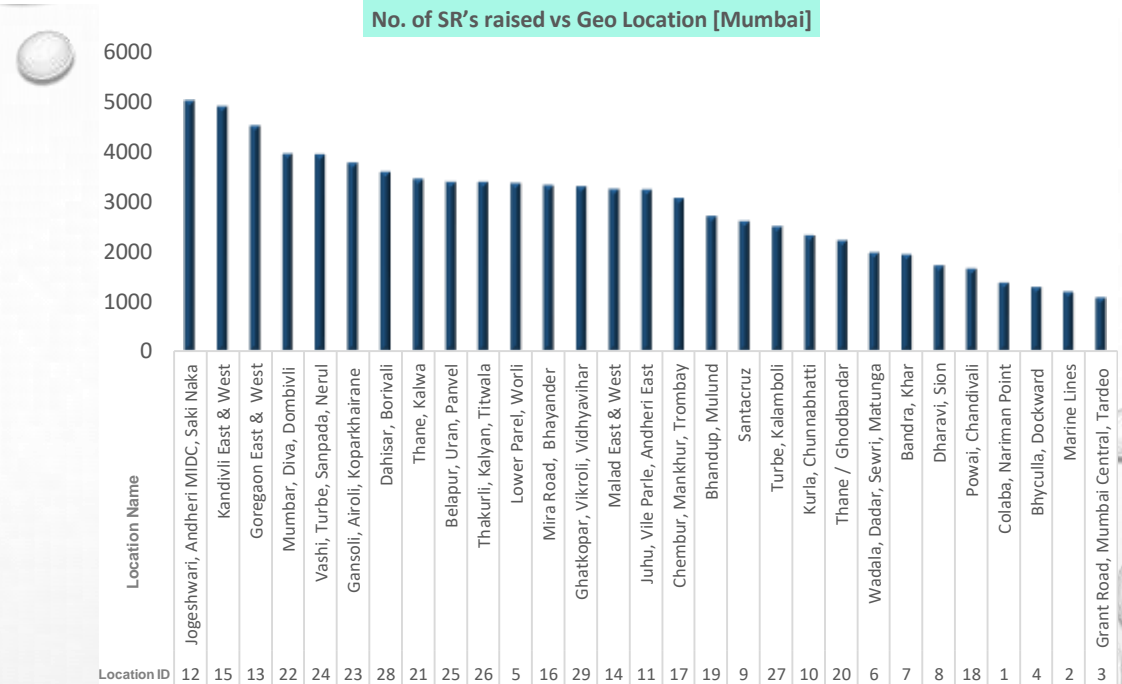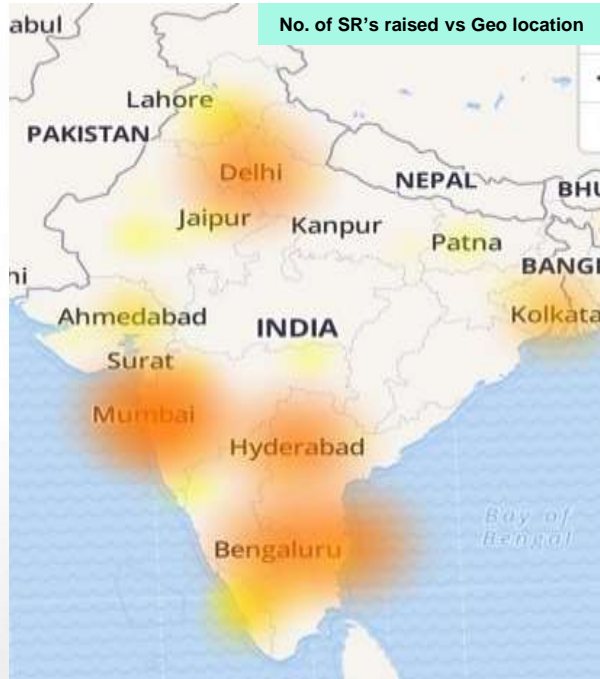
Highs :

- <=5% Complaints are from Rest of India.
- For Mumbai :: Location ID 1 to 4 :: Lowest SR's :: High Customer Satisfaction Index
- Kolkata with least complaints raised and best amongst the metro city.

Lows :

- 37% of complaints reported from Mumbai, followed by Bangalore [21%] & Delhi [19%]
- For Mumbai :: Location ID 12, 13 & 15 :: Highest SR's :: Low Customer Satisfaction Index

4. Business Problem : To check for the existence of Geographical locations with maximum SRs registered and distinguish by different SR status which needs attention [Continue............]
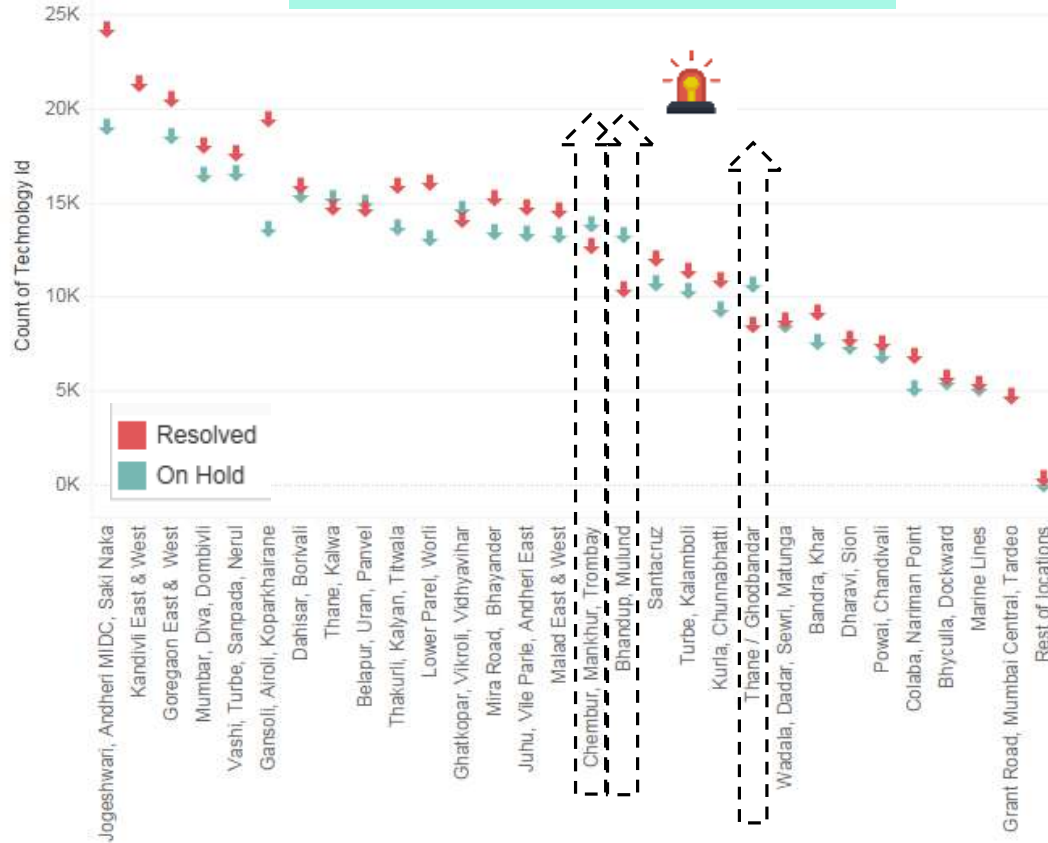

No. of SR's raised vs SR status vs Geo location [Mumbai]

Solution / Suggestion :

- Prime Focus for marketing & network team for improvement : Mumbai.
- In Mumbai : Jogeshwari & Kandivali location's has the **highest SR's raised and SR Status : Resolved too** – Need to get RCA for repeated SR's occurrence's.
- In Mumbai location like : Chembur / Bhandup / Mulund / Thane ghodbander has **high On-Hold to SR's raised ratio** – needs fast track closer with appropriate solutions

5. Business Problem : To check performance based on SLA days by comparing start date (Service request raised date) and resolution date along with On-Hold dates, which need attention and faster closer

Resolved SR's vs SLA days
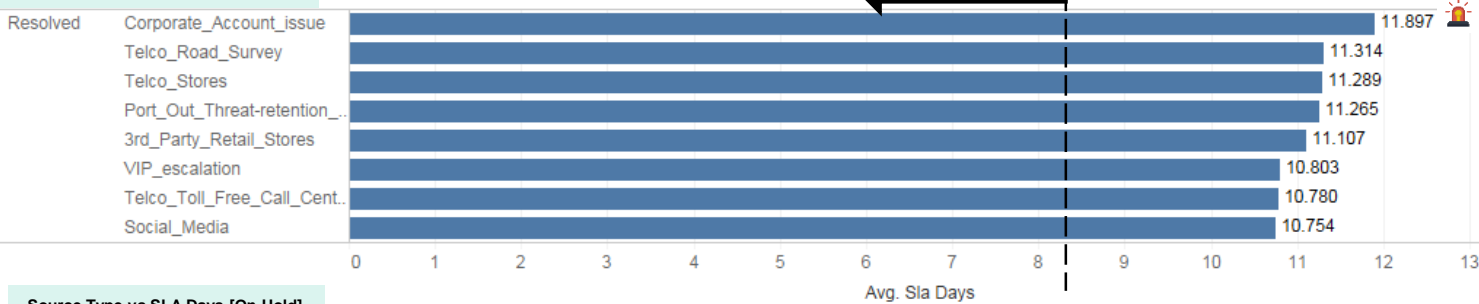

No. of SR's :: Resolved
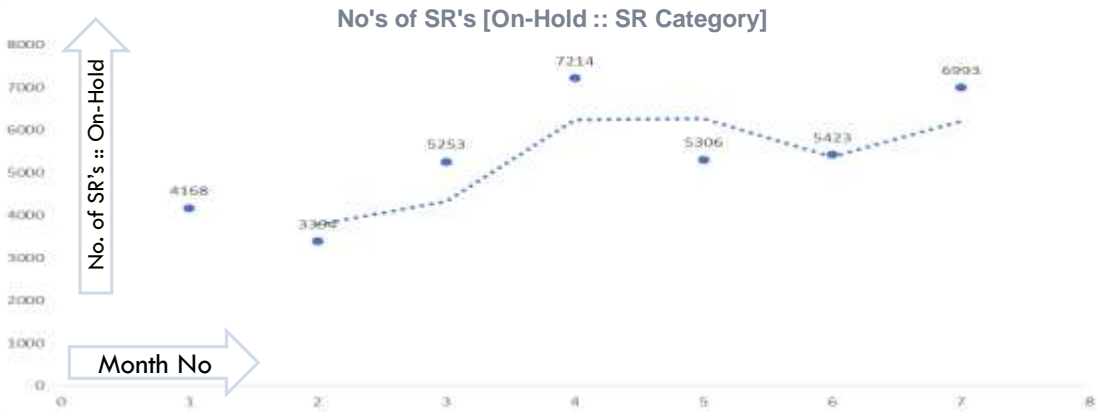
SLA Days

Highs :
 - 48% SR's under **Resolved** category have <=5 days SLA days.
 - 2 to 4 Days is the average SLA days.
 - Social Media has the lowest SLA days

Lows :
 - Minimize SLA days, should target >=8 days SLA days [**39%**].
 - Month on Month - **Increasing Trend -** No. of SR's under SR Status :: On-Hold.
 - Month on Month – **On Hold cases :: increased** for Telco Toll free, 3rd party retail store & Social media

No's of SR's [On-Hold :: SR Category]

No. of SR's :: On-Hold

Month No

5. Business Problem : To check performance based on SLA days by comparing start date (Service request raised date) and resolution date along with On-Hold dates, which need attention and faster closer [Continue……..]

Source Type vs SLA Days [Resolved]

		Avg. Sla Days
Resolved	Corporate_Account_issue	11.897
	Telco_Road_Survey	11.314
	Telco_Stores	11.289
	Port_Out_Threat-retention_..	11.265
	3rd_Party_Retail_Stores	11.107
	VIP_escalation	10.803
	Telco_Toll_Free_Call_Cent..	10.780
	Social_Media	10.754

Ideal value

Source Type vs SLA Days [On-Hold]

Source Desc	201804	201805	201806	Sr Month 201807	201808	201809	201810
3rd_Party_Retail_Stores	2,772	2,655	4,905	8,919	7,371	7,047	8,667
Corporate_Account_issue	252	378	1,350	2,376	2,241	1,728	1,899
Port_Out_Threat-retention_	8,073	7,758	8,199	11,034	3,879	3,708	6,480
Social_Media	3,996	2,565	3,465	5,004	3,402	2,880	3,780
Telco_Road_Survey	1,251	999	2,241	2,916	1,827	1,575	1,863
Telco_Stores	3,402	2,844	5,247	5,454	3,960	2,970	2,754
Telco_Toll_Free_Call_Cent.	17,127	12,870	21,132	28,566	24,489	27,774	32,580
VIP_escalation	630	477	720	630	387	414	585

Solutions / Suggestion :
- Avg. SLA has to minimize to less than <=8 days [Currently Avg. SLA >=10 Days].
- Focus required for Corporate Account ["**highest SLA days**"]
- Special benchmarks to be made to reduce SLA days & reduce On-Hold cases for Telco Toll free, Port Out Treat, 3rd party retail store & Social media cases as they directly links companies performance and reputation.

EXECUTIVE SUMMARY – BUSINESS PROBLEM & SUGGESTION

Sr. No	Business Problem	Tables Used	Highs	Lows	Suggestions & Solutions
1	To acknowledge which service's across technology is doing well & the most frequent issue type faced by the customer which needs attention.	sr_details technology issue_type	▪ 2G Voice has very less contribution [i.e majority of customers = smart phone user] ▪ Roaming issue is very rarely reported, hence there is no intra-inter roaming issues.	3G – Voice [33%] , 4G – Voice [17%] & 4G – Data [32%] is Major Chuck for Voice & Data related issues respectively	▪ Focus required on resolving 3G Voice issues & 4G Data Issues. ▪ Insist to push customer's to use VoLTE service which has higher performance metric. ▪ Areas were Coverage & Capacity Augmentation is required which need to be done via network team ▪ Faster closer and Special focus on On-Hold cases for 4G data issues [Major chuck]
2	To acknowledge which is the most used source for reporting issues & the most frequent used sub-source type by the customer which needs attention and lower SLA.	sr_details sr_source sr_subsource	▪ ~1% SR's are obtain via Source Mode : VIP escalation ▪ Social Media has the lowest SLA days.	▪ 19% SR's reported :: Source :: Port Out Threat desk. AND 8% from Social Media, Major chunk from Sub source : Twitter [70%] ▪ Corporate Account has the highest SLA days	▪ More Focus on resolving Telco Call center & Port out cases. ▪ Guidance and training to customer care faculty to understand customer's VOC and try to resolve issues. ▪ Avg. SLA has to minimize [Currently Avg. SLA >=10 Days]. ▪ Focus required for Corporate Account ["highest SLA days"] ▪ Special benchmarks to be made to reduce SLA days for Corporate Accounts , VIP escalations, Port out desk and Social media cases as they directly links companies performance/reputation and helps to avoid churn out to competitor & loss of revenue.
3	To acknowledge & convey which customer's or class have reported frequent issue and which customer's has to be targeted with special potential and fast tracking system with as low as possible SLA.	sr_details customer customer type customer class	▪ <1% SR's are raised by Solitaire customer's.	▪ 73% SR's are raised by individual's ▪ 27% SR's are raised by Corporate's, Small/Medium Enterprise. ▪ ICICI Bank & Reliance Energy [corporate class] and Innovative Ideas [Micro class] most issues reported	▪ Avg. SLA has to minimize [Currently Avg. SLA >=10 Days]. ▪ Focus required for Key, Small / Medium Enterprise and Corporate Account ["higher SLA days"]. ▪ Special benchmarks & Solution to be planned : - Reduce SLA days for ICICI bank and Reliance Energy ["SLA above the Avg of Corporate Account"] - Resolve frequently reported issues for Corporate account & Small Enterprise as they directly links companies performance/reputation and helps to avoid churn out to competitor & loss of revenue.

EXECUTIVE SUMMARY – BUSINESS PROBLEM & SUGGESTION

Sr. No	Business Problem	Tables Used	Highs	Lows	Suggestions & Solutions
4	To check for the existence of Geographical locations with maximum SRs registered and distinguish by different SR status which needs attention.	sr_details / sr_location / sr_status	▪ <=5% Complaints are from Rest of India. ▪ Within Mumbai :: **Location ID 1 to 4** :: Lowest SR's ▪ Kolkata with least complaints raised [best amongst the metro city].	▪ **37**% of total complaints reported from Mumbai [Highest], followed by Bangalore [**21%**] & Delhi [**19%**] ▪ Within Mumbai :: **Location ID 12, 13 & 15** :: Highest SR's :: Low Customer Satisfaction Index	▪ Prime Focus for marketing & network team for improvement : **Mumbai.** ▪ In Mumbai : Jogeshwari & Kandivali location's has the **highest SR's raised and SR_status :: Resolved** too – Need to get RCA for repeated SR's occurrence's. ▪ In Mumbai location like : Chembur / Bhandup / Mulund / Thane ghodbander has **high On-Hold to SR's raised ratio** - Fast track closer with appropriate solutions.
5	To check performance based on SLA days by comparing start date (Service request raised date) and resolution date along with On-Hold dates which need attention and faster closer	sr_details / sr_status / customer type	▪ **48**% SR's under **Resolved** category have <=5 days SLA days. ▪ **2 to 4 Days** is the average SLA days. ▪ **Social Media** has the **lowest SLA days.**	▪ **Minimize SLA days,** should target >=8 days SLA days [**39%**]. ▪ Month on Month – **Increasing Trend** [No. of SR's under SR Status :: On-Hold]. ▪ Month on Month – **On Hold cases :: increased** for Telco Toll free, 3rd party retail store & Social media	▪ Avg. SLA has to minimize to less than <=8 days [Currently Avg. SLA >=10 Days]. ▪ Focus required for Corporate Account [**"highest SLA days ~11.8 days"**] ▪ Special benchmarks to be made to **reduce SLA days** & **reduce On-Hold cases** for Telco Toll free, Port Out Treat, 3rd party retail store & Social media cases as they directly links companies performance and reputation.

RECOMMENDATIONS

1) Encourage customers to use more efficient mechanisms such as Telco App, SMS and Telco Stores to report service issues
   (Toll free call is inefficient and resource, cost intensive)

2) Involve Engineering to look at stability issues with 3G Voice and 4G Data as they are the technologies with most issues.

3) Involve Engineering to get RCA along with Strong plan to improve Locations where higher % of Voice and Data issues are observed

4) Streamline resolution process to reduce time to resolve requests

LESSONS LEARNT (ON PROJECT)

1) Cleanup unneeded data - there is too much data that is not relevant to the analysis/goal at hand, cleaning it helps focus efforts on desired goals
2) Always keep the desired state/goals in mind to keep the analysis focused on the dimensions that matters.

Thank you !!