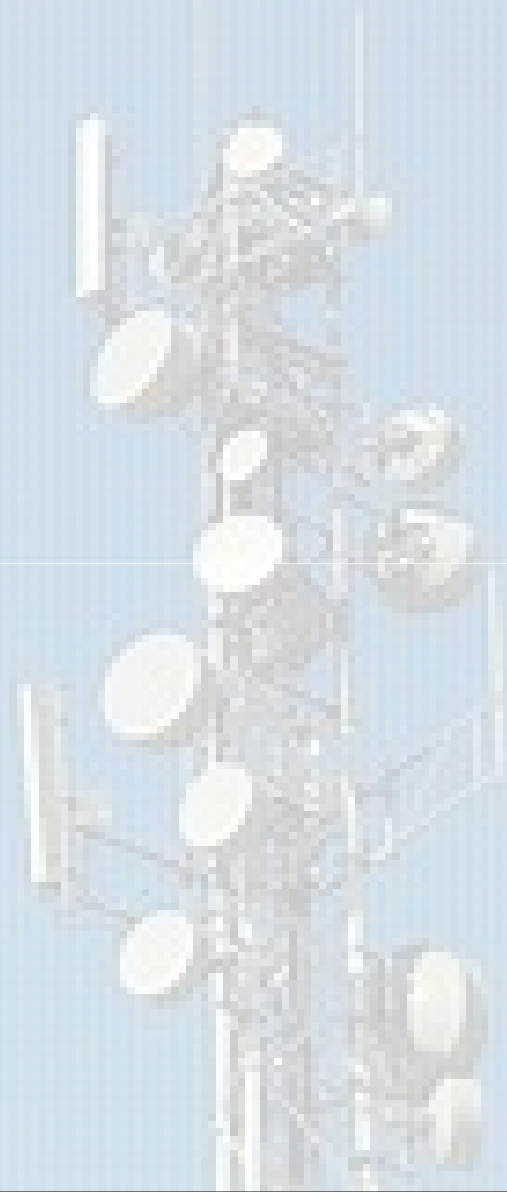# Insaid Telecom Consultancy Project

CDF Team 1002

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March 2022

Agenda

- Introduction
- Problem Definition
- Description of the Data
- Actionable Insights from EDA
- Conclusion

Introduction
Overview of Insaid Telecom and the existing Telecom Market scenario

- **About Insaid**: It is a leading Telecom player providing 2G/3G and 4G Services. It has Pan India Coverage across all states and key metros. It has 50 Million active devices on its network. It is seeking to understand the user behaviour of 30 Million devices on its network so that its clients can better cater to address the audience requirements and needs.

- Prevailing Market condition: The spectrum auctions are scheduled in August 2016, Telecom players including Insaid have plans to selectively bid for the auctions and spectrum with the prime aim of strengthening existing 4G network coverage and bringing forth new Services to the Market. The current Average Revenue Per User(ARPU) hovers between Rs 145-149~

- The Industry is moving from Voice Centric to Data centric approach. Insaid Telecom is also cognizant of the changing Market Dynamics with the introduction of another new player launching 4G LTE and VoLTE services in India with aggressive tariff plans.

Problem Definition
Insaid Telecom's current requirements

- Considering Changing Market dynamics and Competition **Insaid Telecom** understands that customizing offers to specific audience, rolling out newer services, new attractive offerings, ensuring optimum user experience is most essential for **Insaid Telecom to remain profitable, competitive and retain its Market Leader position**

- In this consulting assignment, A study of the 30 Million active devices dataset is to be done by analysing user's demographic characteristics based on their mobile usage, geo-location, and mobile device properties. Doing so will help the developers and brand advertisers around the world who are working with **Insaid Telecom to pursue data-driven marketing efforts which are relevant to the Insaid Telecom users(subscribers) and cater to their varied preferences***.

- Further Insaid Telecom besides **Pan India** is keen to further focus on the **State of Maharashtra**

- **Expected outcome**: The consultancy outcomes in terms of what is the right way forward for Insaid Telecom, by suggesting actionable insights from the analysis. Further to this, the subsequent execution will directly impact the Insaid Telecom offerings and revenue in a positive manner.

Description of the Data
Data Acquisition and Description

The first dataset consists of the information about events_data.

Records	Features	Dataset Size
3252950	7	286 MB

ID	Feature Name	Description of the feature
1	event_id	Identity of the passenger
2	device_id	Unique Device ID
3	timestamp	Time stamp of the Device Activity
4	longitude	Longitudinal Information of Device
5	latitude	Lattitudinal Information of Device
6	City	City
7	State	State

The third dataset consists of the information about gender_age_train.

Records	Features	Dataset Size
74645	4	2.3 MB

ID	Feature Name	Description of the feature
1	device_id	Unique Device ID
2	gender	gender of the user
3	age	age of the user
4	group	age group of the user

The Second dataset consists of the information about phone_brand_device_model.

Records	Features	Dataset Size
87726	3	2 MB

ID	Feature Name	Description of the feature
1	device_id	Unique Device ID
2	phone_brand	Phone Brand in Multiple langauges
3	device_model	Device Model in Multiple langauges

 A total of 3 Datasets have been provided for the purpose of Telecom Consultancy

# Actionable insights from EDA
Count of unique Device Id's per state
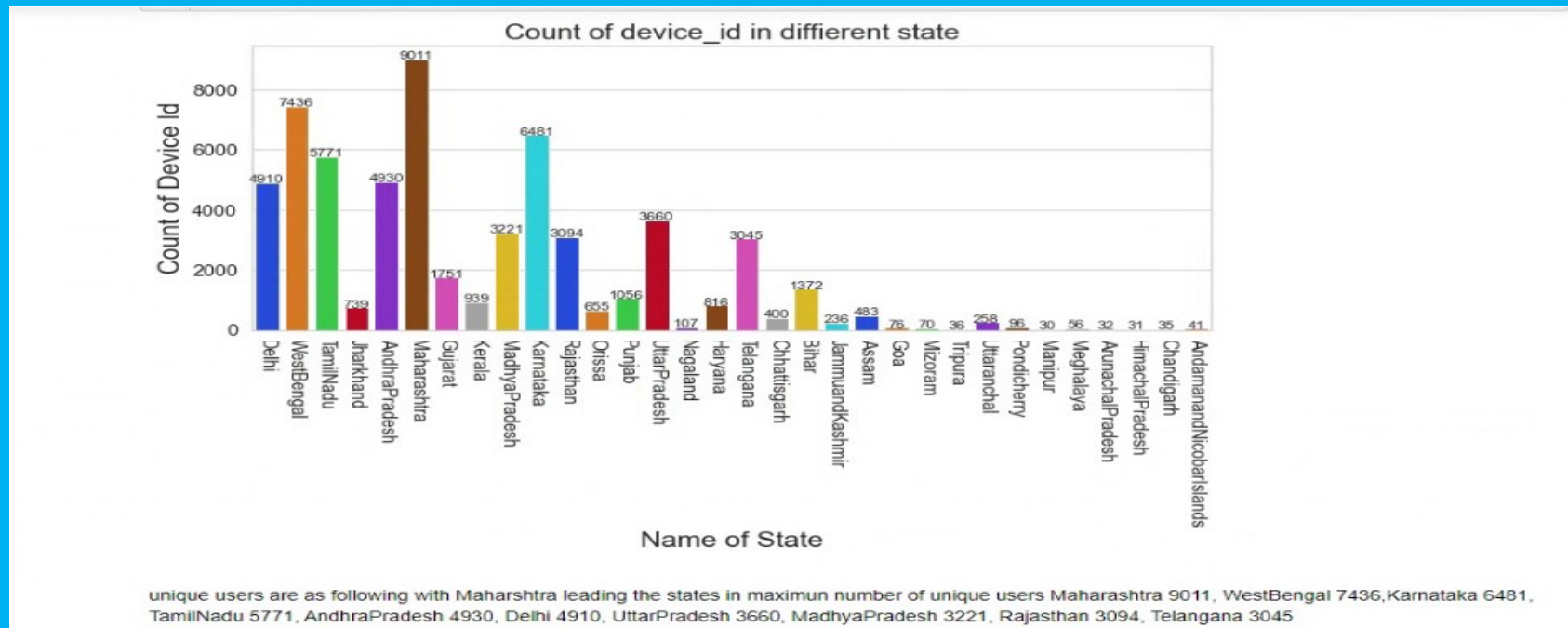
The state leading with the maximum unique device id's is 1. Maharashtra 9011, followed by 2. West Bengal 7436, 3. Karnataka 6481, 4.Tamilnadu 5771, 5.Andhrapradesh 4930, 6.Delhi 4910,7. Uttar Pradesh 3660, 8.Madhay Pradesh 3221, 9.Rajasthan 3094 and 10.Telangana 3045.

By the above the **Top 5 states in the order of unique Device ID's hence Subscribers is Maharashtra, WB, KTK, TN and AP**

Actionable insights from EDA contd..
## State wise pattern of maximum minutes of usage(MOU) across device id's
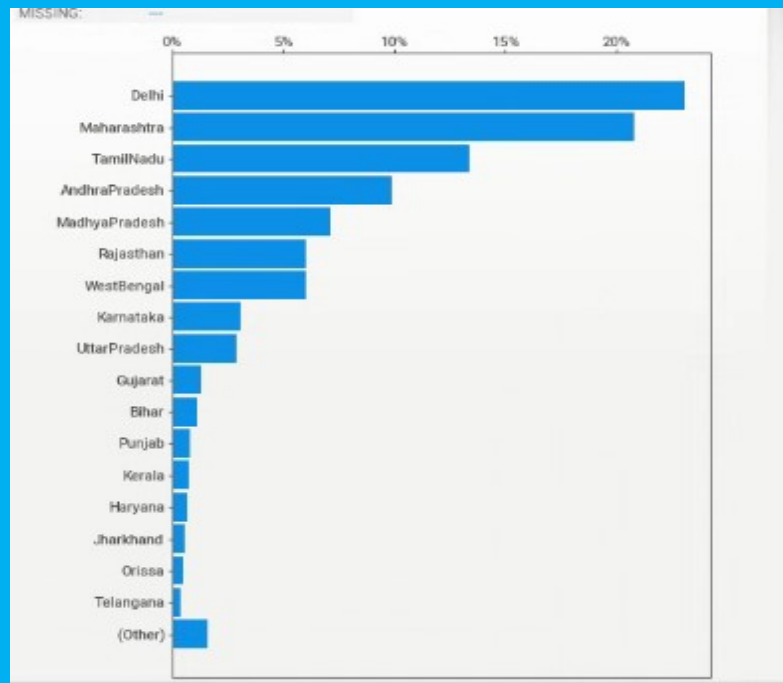
The Top 5 states in terms of maximum MoU generated are **Delhi followed by Maharashtra, Tamil Nadu, AndhraPradesh and Madhya Pradesh whereas Delhi is 6th in order of no of unique Device ID's/Subscribers but they generate maximum traffic**

* MoU is assumed basis the no of instances of that unique device id, more the instances, more the MoU

Actionable insights from EDA contd..
Top 10 Mobile Brands across India

Distribution of Users across Phone Brands
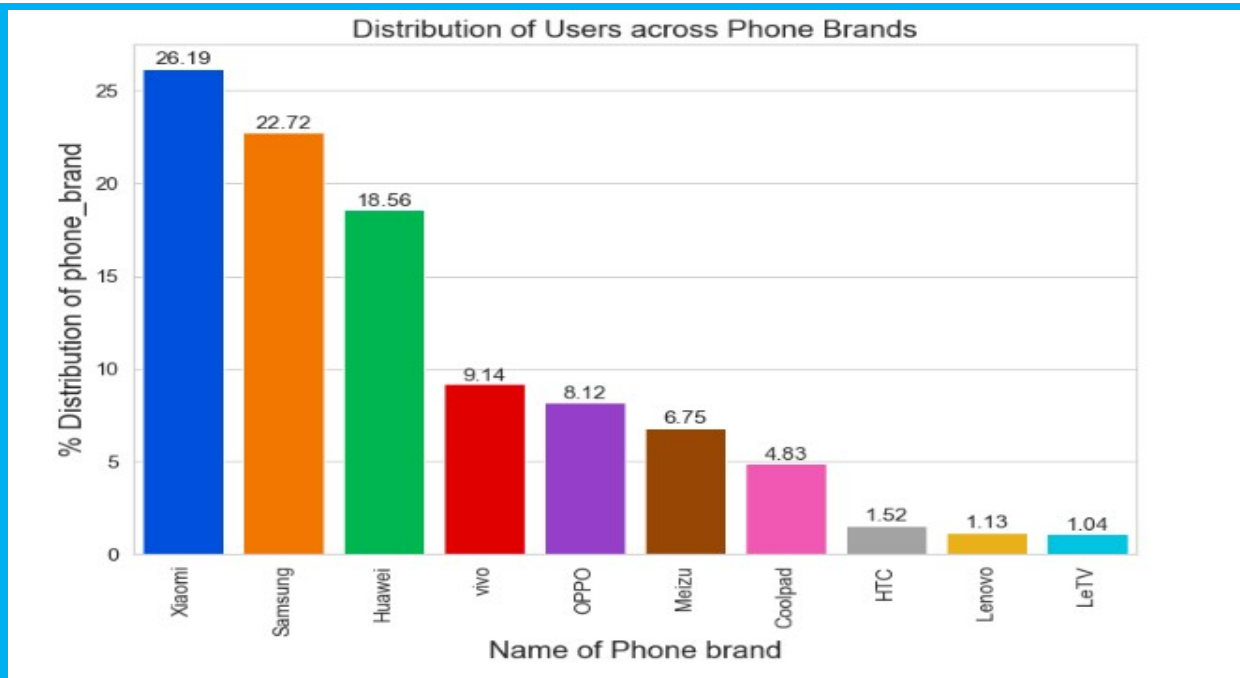
| phone_brand	device_model
Xiaomi	Redmi note
	MI 3
	MI 2S
Samsung	Galaxy Note 3
Xiaomi	MI 4
Samsung	Galaxy S4
	Galaxy Note 2
Huawei	Glory 6
	Honor Play 4X
	Mate 7

phone_brand device_model
Xiaomi Redmi(4G)(cost Rs 14000)
MI 3 (not a 4G but 3G yes device)(Rs16000)
MI 2S (2G/3G) (Rs34000)
Samsung Galaxy Note 3 (4G) (Rs 30000)
Xiaomi MI 4 (3G) (Rs 30000)
Samsung Galaxy S4 (3G) (Rs 50000)
Galaxy Note 2(4G) (Rs 24000)
Huawei Glory 6 (3G) (Rs 19,999)
Honor Play 4X (4G) (Rs 9900)
Mate 7 (4G) Rs 66000

In terms of the **Top 10 Mobile brands being used across all the states, Xiaomi leads followed by Samsung, Huawei, VIVO, OPPO, Meizu, Coolpad, HTC, Lenovo and LeTV. Samsung and Xiaomi Mi4 are premium Mobile Brands and it showcases the economic potential of the Insaid Telecom Subscribers at a Pan India Level.**

There could be more targeted campaigns for this segment of premium subscribers and more potential for growth as well. It also showcases that Insaid Telecom can safely go for customer segment based Marketing campaigns

Actionable insights from EDA
## Mobile Brands being used across states basis MoU and Gender
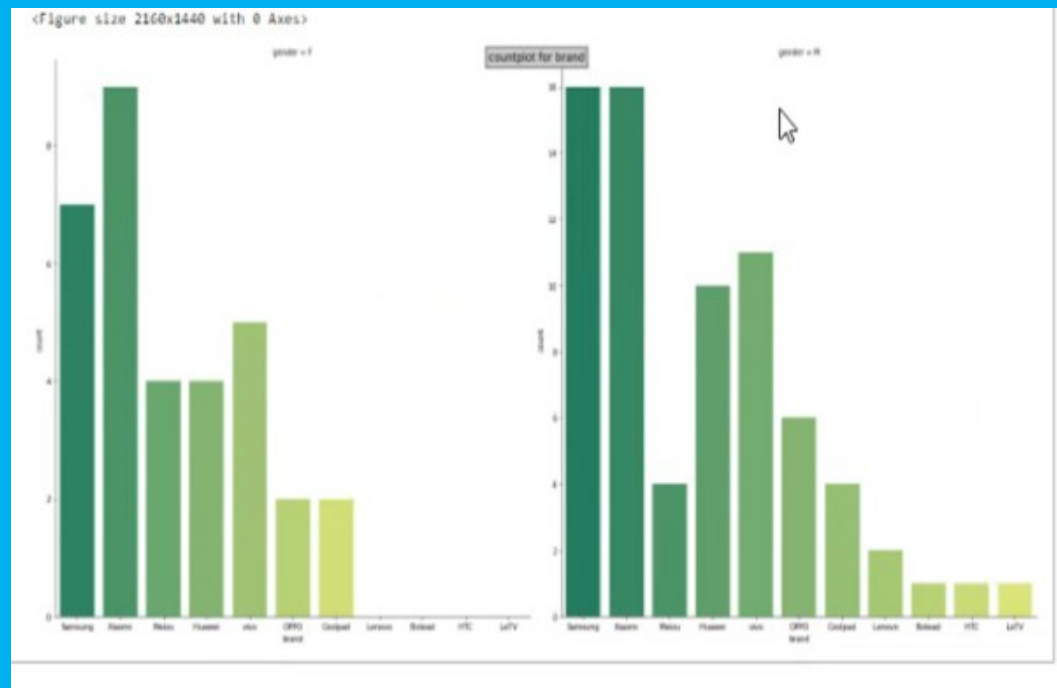
In terms of the Female and Male usage of the top 10 Mobile brands being used across all the states:

Females use Xiaomi followed by Samsung and ViVo

Males use Xiaomi and Samsung on an almost equal basis followed by ViVo and Huawei.

This showcases that on an individual gender preference basis Xiaomi, Samsung and ViVo are the Top choice of Males and Females at a Pan India Level, again these are premium brands across 3G/4G Smartphones hence definitely potential to grow this customer segment with attractive customized offers and marketing strategies.
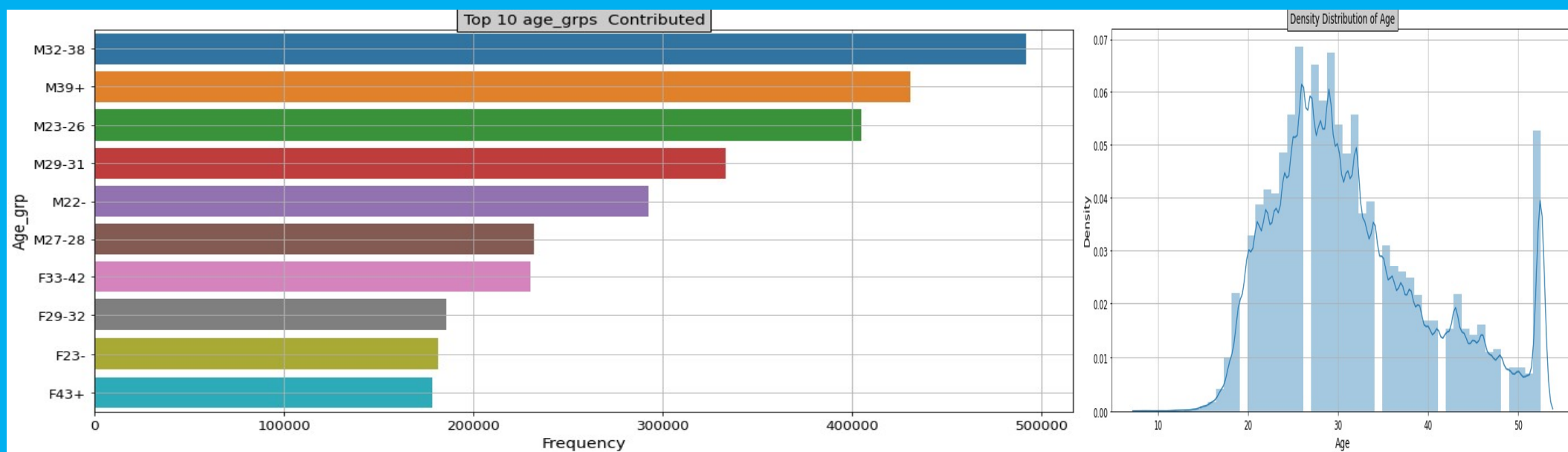
Actionable insights from EDA contd..
Gender Distribution at Pan India level
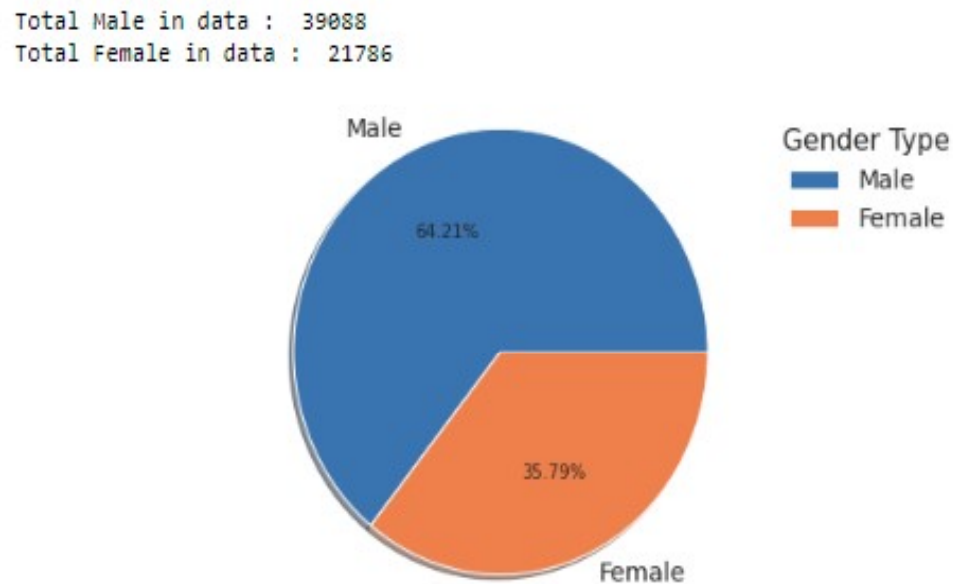
Total distribution of Males (64.21%) and Females (35.79%) across India with unique device_id
Insaid Telecom may think about having targeted campaigns for both the genders at a Pan India Level

Actionable insights from EDA
## Top 10 Age groups contributing to maximum MoU

Top 10 age groups contributing to maximum MoU M32-38, followed by M39+, M23-26, vs Unique ID view?

Clearly at a Pan India level the advertising campaigns and customized offers for Males between age group>29 years and <40 years is a segment of focus. Whereas in females it is >22 years of age with good MoU in F33 years and onwards

Similarly there is growth potential for males > 22 years onwards till 28 years, normally new entrants to work, Mid Level working professionals and working professionals settling down on the personal and professional front. In case of Females growth potential for 22 years and onwards with Females 33 years till 42 have high MoU

Actionable insights from EDA contd..
Age distribution of users on Insaid Telecom Network across India
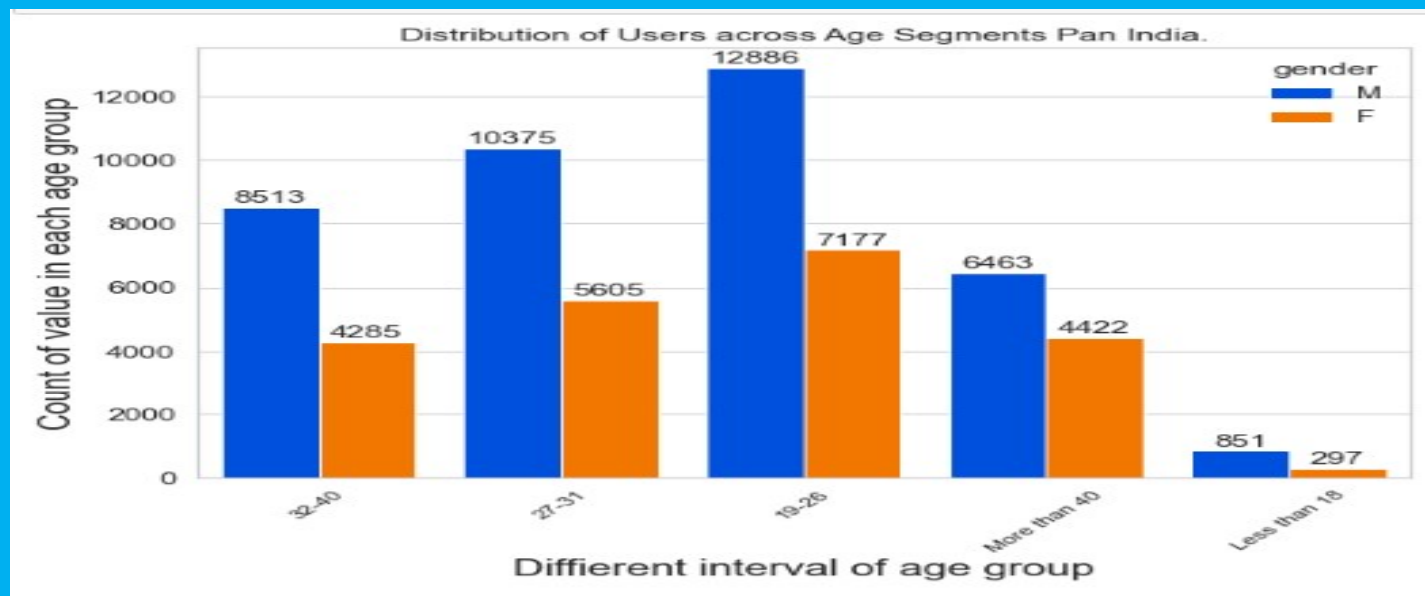
Distribution of Users across Age Segments Pan India.

It is observed that maximum users fall in the 19-26 followed by 27-31 and 32-40 age bracket at a India level, potential to grow Male subscribers base from 27 years+ onwards. With targeted campaigns also for first time young males joining the workforce whereas for females maximum usage is seen at 19-26, 27-31 and More than 40+. For Female of Age group 32-40 we have potential to take out attractive schemes and customized offers in the professionally and personally settled down phase of their life.

Actionable insights from EDA contd..
Hourly distribution of subscriber usage across the Days at Pan India
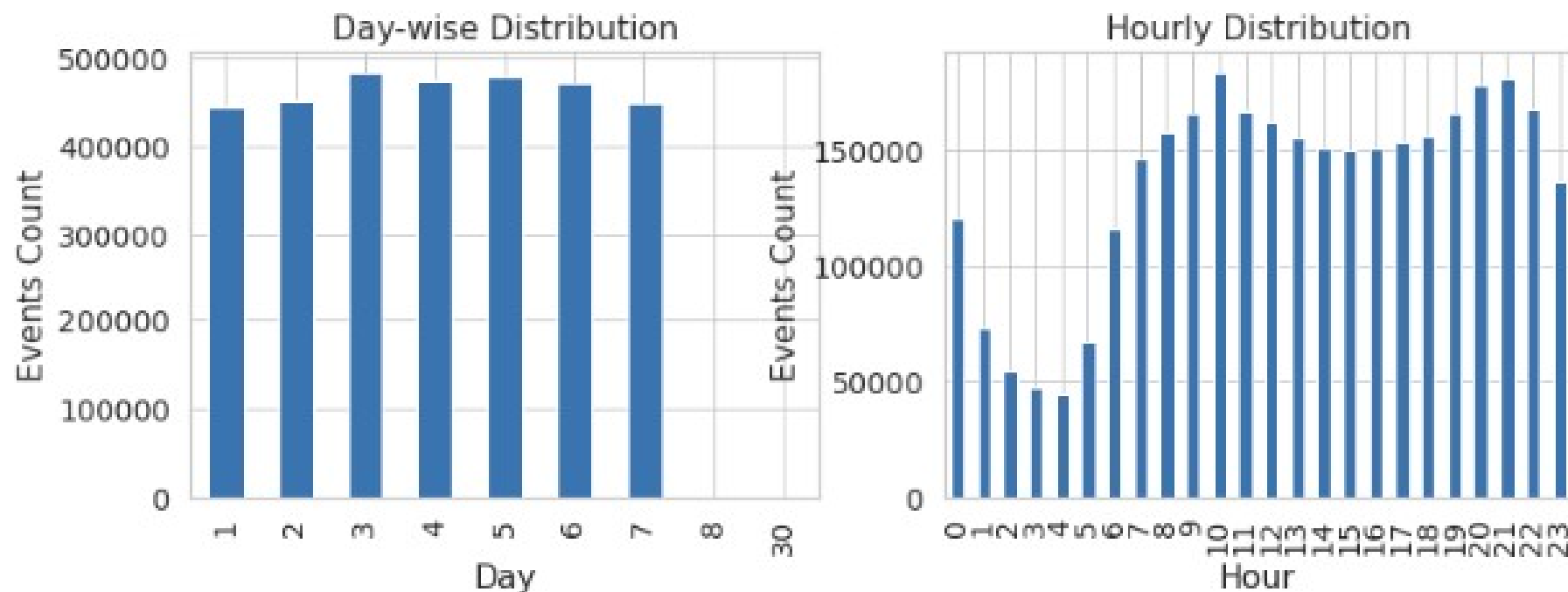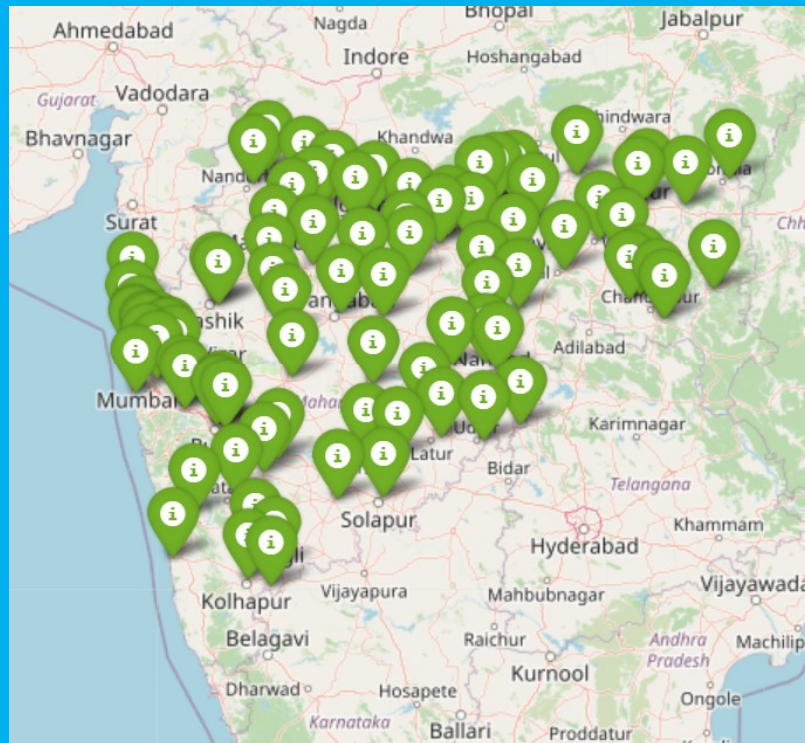

Peak Hours are seen at 10:00 decreasing in day time and peaking again at 2000 and 2100 hours and 2100 Hrs.

Two actions to be taken – dynamically increasing Network resource capacity during this time. Carefully plan for campaigns keeping note of these hours.

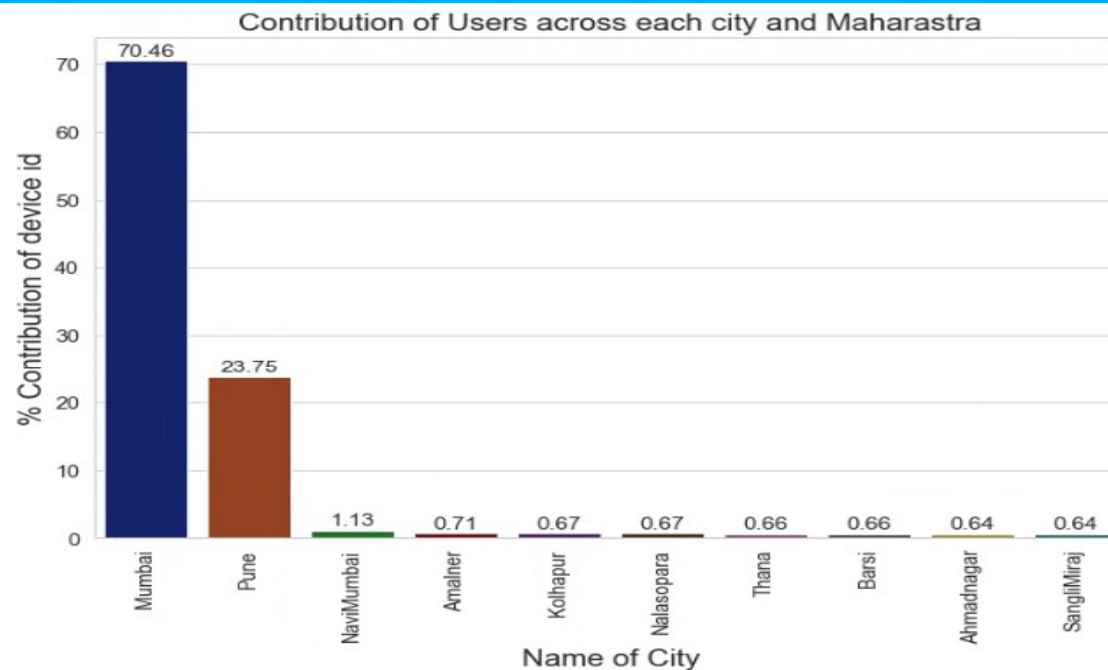# Actionable insights from EDA contd..
Plotting via Folium, The state of Maharashtra

Plotting via Folium the Longitudes and Latitudes across the cities of Maharashtra

Actionable insights from EDA contd..
User Distribution across Top 10 cities of Maharashtra in %

Contribution of Users across each city and Maharastra

In the state of Maharashtra Mumbai accounts for 70.46% of the device id's and Pune accounts for 23.75% of the device id's. The spread of Mobile usage across the rest of the cities in Maharashtra is minimal with only Navi Mumbai accounting for ~1% coverage

Actionable insights from EDA contd..
Distribution of Male and Female users at Maharashtra


```
Total Male in Maharastra :  5952
Total Female in Maharastra :  3059
```
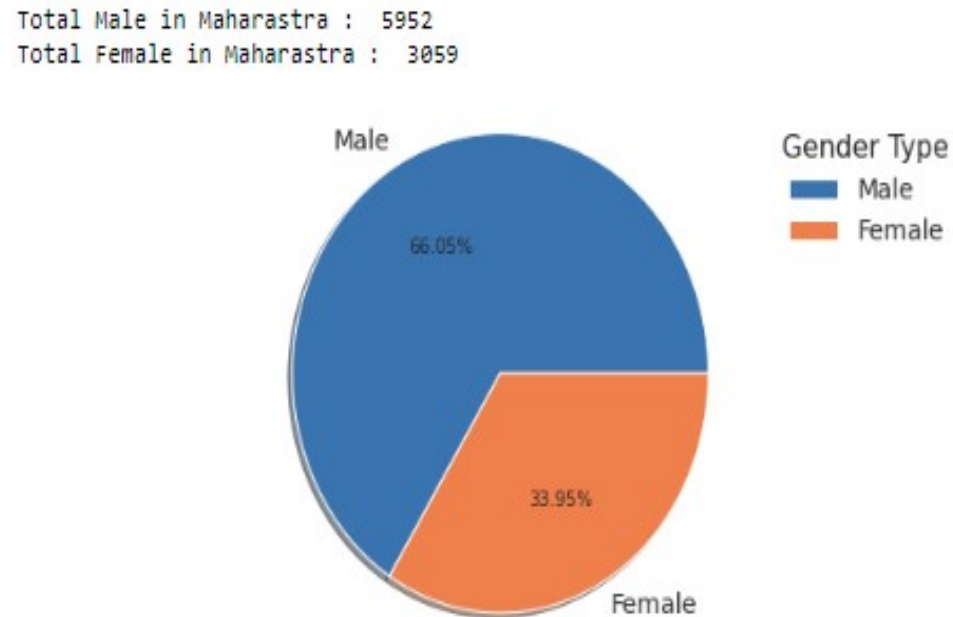
Total distribution of Males (66.05%) and Females (33.95%%), the distribution is almost similar to the trend seen in overall Pan India distribution of Male/ Female distribution.

Insaid Telecom may think about having targeted campaigns for both the genders at a Pan India Level.

Actionable insights from EDA contd..
Age distribution of users on Insaid Telecom Network across phone brand
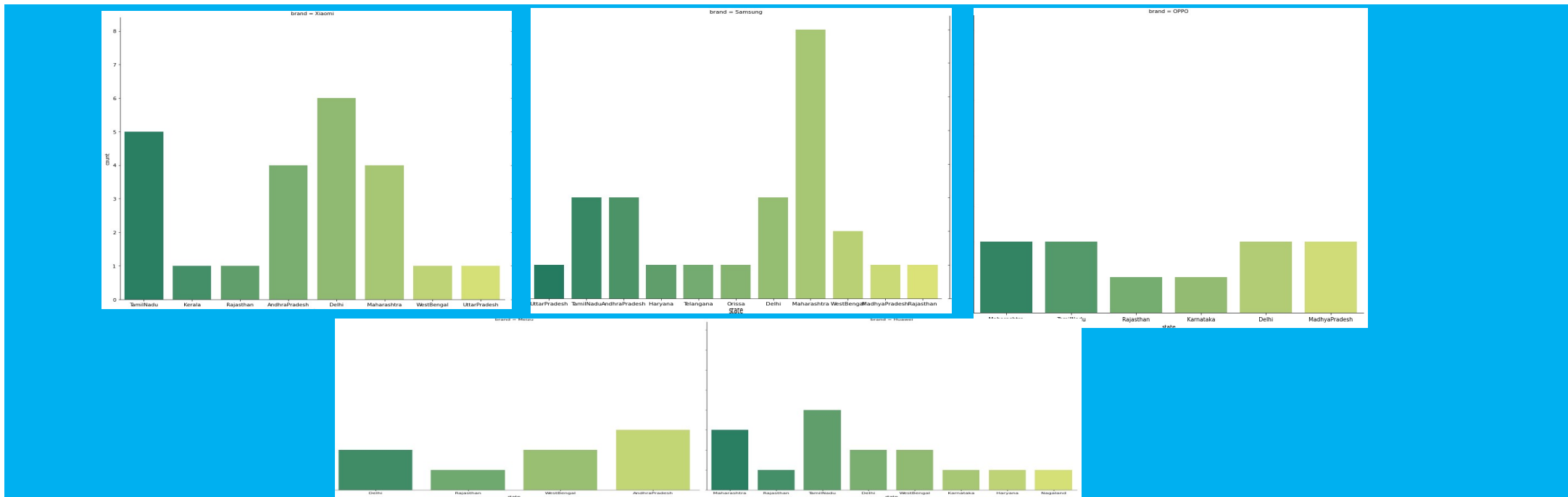

Amongst the Top 10 Mobile Brands, It is clear that Maharashtra state significantly leads the Samsung brand device usage across states. Samsung is a upmarket Brand hence definitely potential for having premium services for the subscribers in Maharashtra to have the share of the wallet. Also in readiness for the expected competition in next quarter.

Also Delhi leads in the Xiaomi brand device usage across states followed by TN, AP, Maharashtra
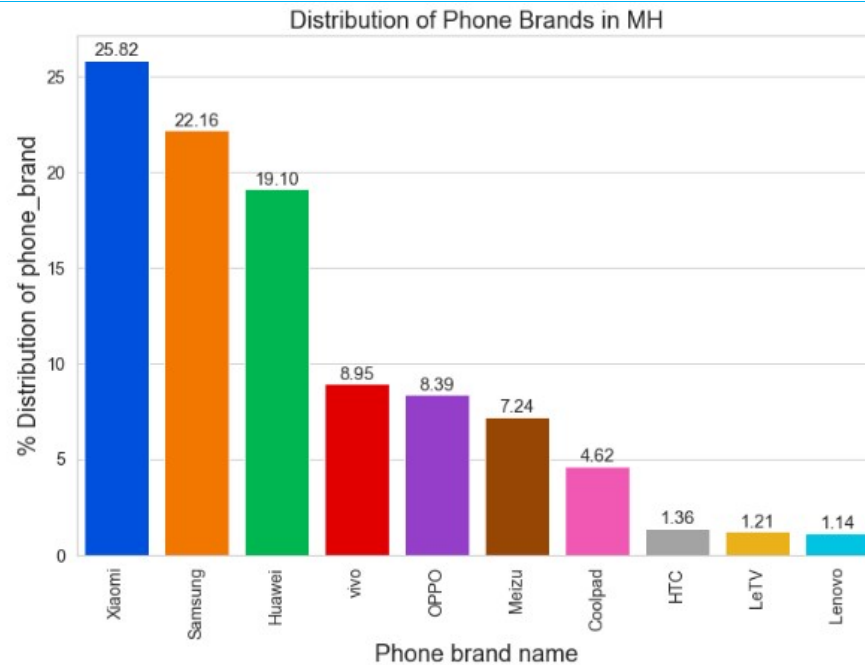
Actionable insights from EDA contd..
Age distribution of users on Insaid Telecom Network across Maharashtra
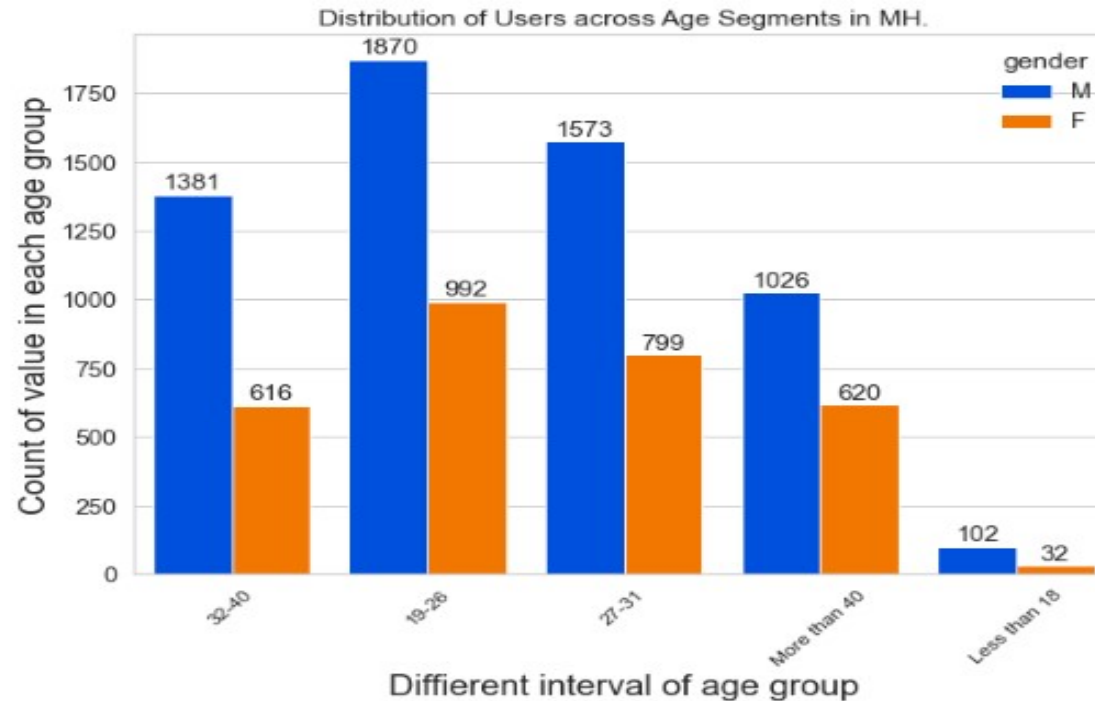
Distribution of Users across Age Segments in MH.

It is observed that maximum users fall in the 19-26 followed by 27-31 and 32-40 age bracket at Maharashtra level, potential to grow Male subscribers base from 27 years+ onwards. With targeted campaigns also for first time young males joining the workforce whereas for females maximum usage is seen at 19-26, 27-31 and More than 40+ . For Female of Age group 32-40 we have potential to take out attractive schemes and customized offers in the professionally and personally settled down phase of their life.

Actionable insights from EDA
Phone Brand distribution on Insaid Telecom in MH
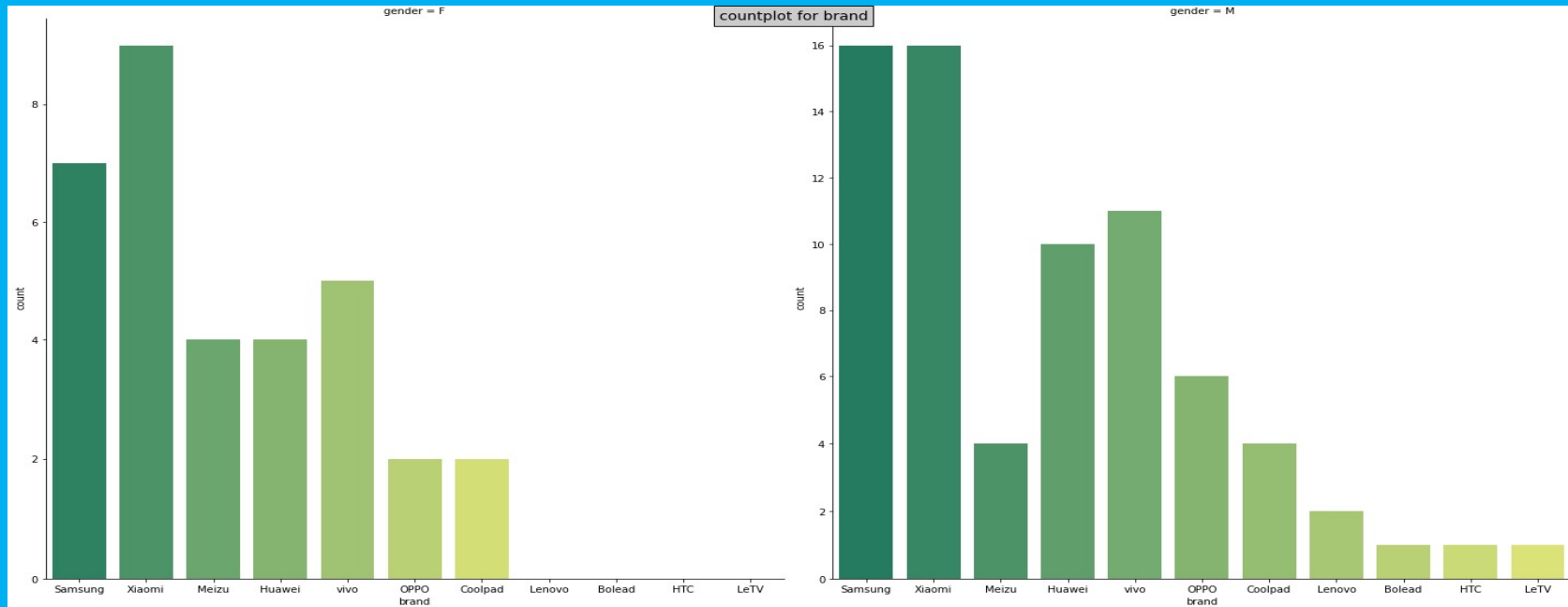

Top 10 Brands in Maharashtra are Xiaomi, Samsung Huawei, ViVo, OPPO, Meizu, Coolpad, HTC, LeTV and Lenovo.

Actionable insights from EDA
Gender distribution of users, Phone Brands on Insaid Telecom Network in Maharashtra

Maximum Phone brand usage by Males Xiaomi followed by Samsung and ViVo

Maximum Phone brand usage by Females Samsung followed by Xiaomi and ViVo

Actionable insights from EDA
Hourly usage of subscribers on Insaid Telecom Network in MH
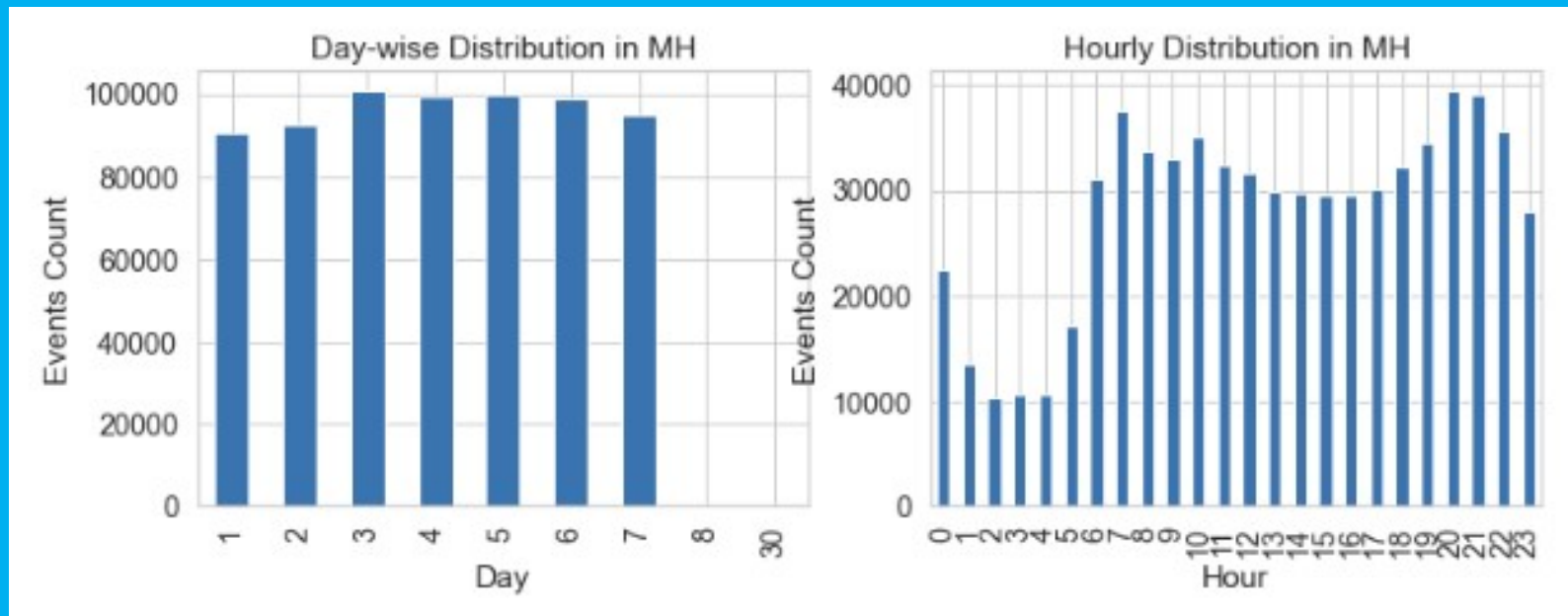
Peak usage at 20:00 followed by, 21:00, 07:00, and 2200 hrs. Insaid Telecom Network needs to maintain peak network performance during these hours to **avoid outage, handling load and accordingly address congestion challenges. Advertisers should carefully plan for customized offerings during this time including adjacent hours could be leveraged.**

Actionable insights from EDA
Hourly usage of subscribers on Insaid Telecom Network in Pune
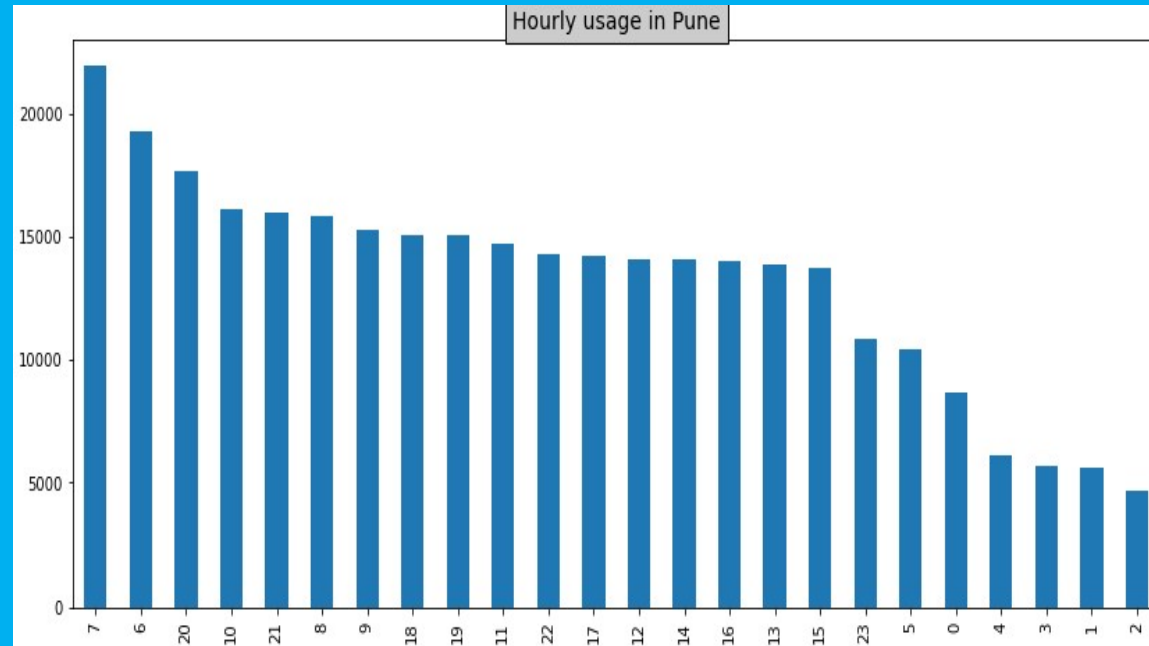

Hourly usage in Pune

Peak usage at 7:00 followed by 6:00 and 2000 hrs. Insaid Telecom Network needs to maintain peak network performance during these hours to **avoid outage, handling load and accordingly address congestion challenges. Advertisers should carefully plan for customized offerings during this time including adjacent hours could be leveraged.**

Actionable insights from EDA- Conclusion

Inference and actions at Pan India Level

- **States :** Top 5 states in order of Subscribers is Maharashtra, WB, KTK, TN and AP and will be the focus states

- The Top 5 states in terms of maximum MoU generated are Delhi followed by Maharashtra, Tamil Nadu, Andhra Pradesh and Madhya Pradesh

- **Top 10 Mobile brands** being used across all the states, **Xiaomi leads followed by Samsung, Huawei, VIVO, OPPO, Meizu, Coolpad, HTC, Lenovo and LeTV.**

- T**argeted campaigns for premium subscribers and more potential for growth as well. Insaid Telecom can safely go for customer segment based Marketing campaigns .**

- **Gender distribution** Male and Female Subscribers use Xiaomi followed by Samsung and ViVo, Males use Xiaomi and Samsung on an almost equal basis followed by ViVo and Huawei**. Xiaomi, Samsung and ViVo are the Top choice of Males and Females at a Pan India Level, premium brands across 3G/4G Smartphones**

- **potential to grow this customer segment with attractive customized offers and marketing strategies.**

- **Age**: It is observed that maximum users fall in the 19-26 followed by 27-31 and 32-40 age bracket at a India level, potential to grow Male subscribers base from 27 years+ onwards. With targeted campaigns also for first time young males joining the workforce whereas for females maximum usage is seen at 19-26, 27-31 and More than 40+ For **Female of Age group 32-40** we have potential to take out attractive schemes and customized offers in the professionally and personally settled down phase of their life.

- **Hourly Usage: Peak Hours** are seen at **10:00** decreasing in day time and peaking again at 2000 and 2100 hours and 2100 Hrs. Two actions to be taken – dynamically increasing Network resource capacity during this time. Careful planning for campaigns taking note of these hours.

Actionable insights from EDA- Conclusion

Inference and actions for Maharashtra

- In Maharashtra, Mumbai accounts for 70.46% of the device id's and Pune accounts for 23.75% of the device id's. The spread of Mobile usage across the rest of the cities in Maharashtra is minimal with only Navi Mumbai accounting for ~1% coverage

- **Age: It is observed that maximum users fall in the 19-26 followed by 27-31 and 32-40 age bracket at Maharashtra level, potential to grow Male subscribers base from 27 years+ onwards. With targeted campaigns also for first time young males joining the workforce whereas for females maximum usage is seen at 19-26, 27-31 and More than 40+ . For Female of Age group 32-40 we have potential to take out attractive schemes and customized offers in the professionally and personally settled down phase of their life.**

- Top 10 Mobile Brands, Xiaomi followed by Samsung leads usage across Maharashtra. Both are upmarket Brand s; Potential for premium services for the subscribers in Maharashtra to have the share of the wallet.

- **Gender Distribution** : Similar to pan India Level Observation. Top brands are Xiaomi, Samsung and Huawei.

- **Basis Subscriber usage of Males vs Females there is potential to have targeted campaigns for Females**

- **Hourly usage:** Peak usage at 20:00 followed by, 21:00, 07:00, and 2200 hrs. Insaid Telecom Network needs to maintain peak network performance during these hours to **avoid outage, handling load and accordingly address congestion challenges. Advertisers should carefully plan for customized offerings during this time including adjacent hours could be leveraged.**

- In Pune city Peak usage at 7:00 followed by 6:00 and 2000 hrs. Insaid Telecom Network needs to maintain peak network performance during these hours to avoid outage, handling load and accordingly address congestion challenges. Advertisers should carefully customized offerings during this time and adjacent spill over hours could also be leveraged

- In addition to the same Focused Ads campaigns can also be considered in Mumbai and Pune on specific Location(Longitude and latitude) with high subscriber base (considering Mobile usage and unique Subscriber counts)

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Thankyou