

WIRELESS SUBSCRIPTION

Objective

- To get the prediction accuracy of Subscribers by Auto-AI and SXI and compare.
- Target 20% increase in Subscription rate is **20%** from current levels.

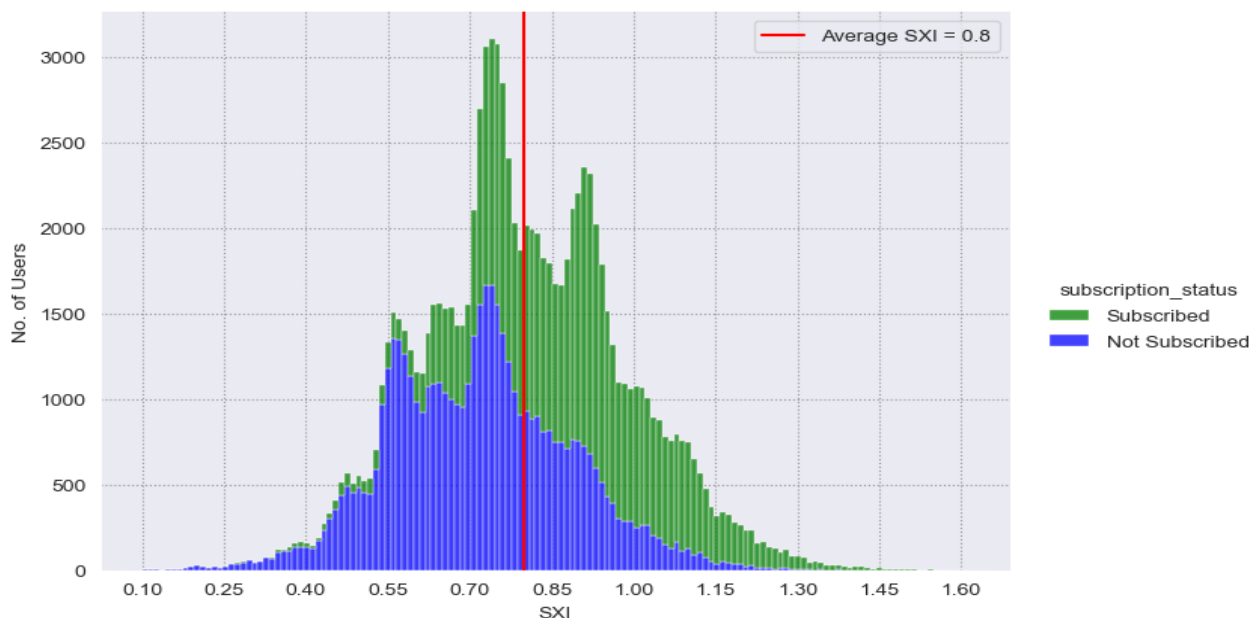
SXI Hypothesis

- SXI is a proxy/surrogate for all features responsible for ensuring Subscribers or Non-Subscribers.
- The higher the SXI, the better is the visitor/user engagement rate and through it the desired Subscription rate and hence increasing SXI score should lead to higher Subscription rate.

SXI Definition

- Sriya Expert Index (SXI):** Dynamic score/index obtained from a proprietary formula consisting of weights from 10 ML algorithms. SXI is a super feature and is a true weighted representative of all important features. Converts a multi-dimensional hard to solve problem into a simpler 2-dimensional solution (problem solved).
- SCORE + CORRELATE = IMPROVE**

Discussion & Results



1. Exploratory Data Analysis

100,000 people were distributed to 49,562 Subscribers and 50,438 non-Subscribers.

So, 49.56% are the current Subscribers and 50.44% are non-Subscribers.

2. SXI - Exploratory Data Analysis

The current Average SXI is **0.8**. No. of total Subscriptions above 0.8 is **47,771** and of these **32,979** are Subscribers and **14,792** are non-Subscribers. So, Subscription rate (%) is **69.0%** and non-Subscription rate is **31.0%**.

Correspondingly, No. of total Subscriptions below 0.8 is **52,229** and of these **16,583** are Subscribers and **35646** are non-Subscribers. So, Subscription rate (%) is **31.75%** and non-Subscription rate is **68.25%**

So SXI is a perfect proxy/surrogate for Subscribers and above average SXI the ratio of Subscribers is **1.39X** overall average and below average SXI this ratio of Subscribers is **0.64** overall average. So, the increase in SXI leads to increase in Subscription rate.

3. Predictive AI

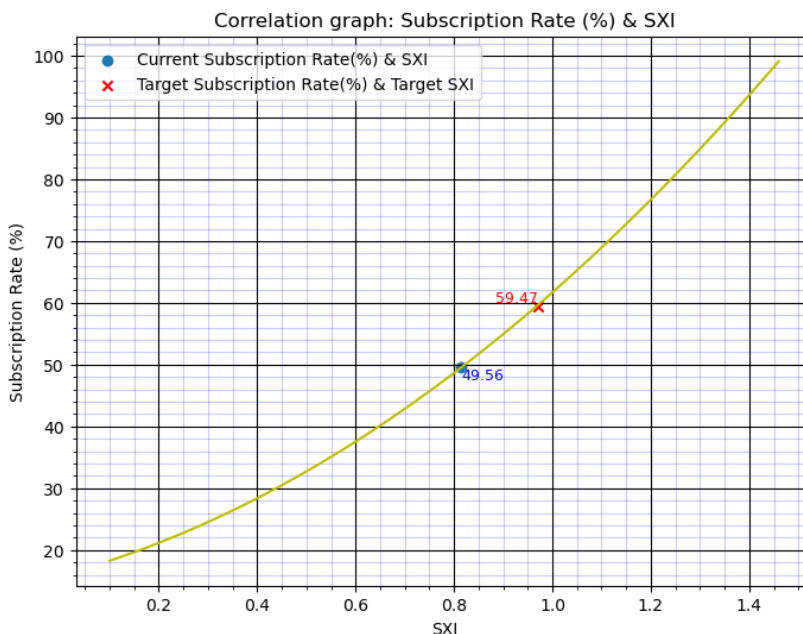
- Auto-AI Prediction accuracy is **67%** and the best performing algorithm is **XGBoost**.
- SXI Prediction accuracy of Subscribers is **98%**.
- Ratio of SXI/Auto-AI prediction accuracy is **1.46**.

4. Precision AI

The desired increase in target outcome is the increase subscription rate by 20%. The original Subscription rate is **49.56%** so, a **20%** increase should lead to a **59.47%** overall Subscription rate (49.56×1.2), which means **59,474** from 1,00,000 would become Subscribers rather than current **49,562**.

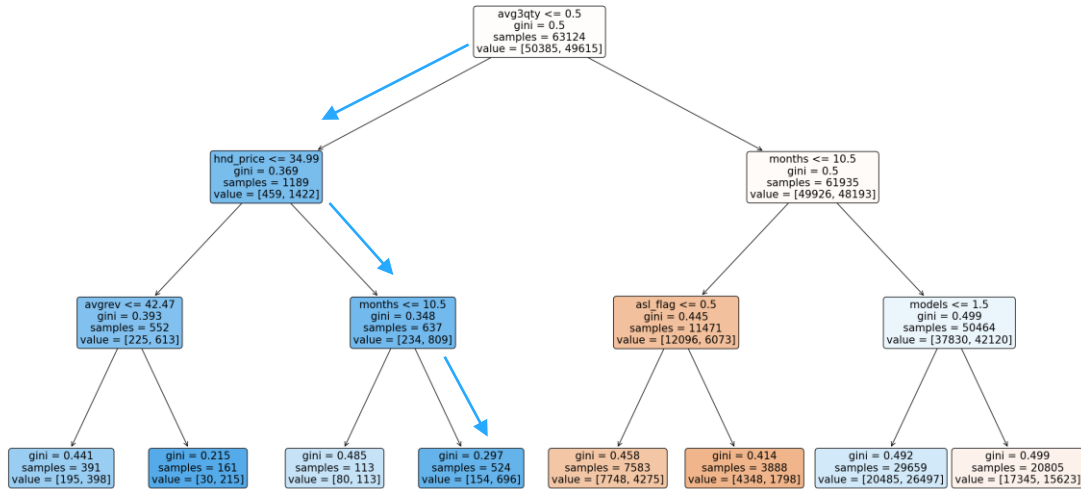
9912 additional number of subscribers

The correlation between SXI and the Subscription rate is **0.99**. This implies that SXI and Subscription rate are highly positively correlated to each other. Hence, an increase in SXI will definitely result in increase in Subscription rate.



Current SXI and Target SXI Decision Trees

a. Current SXI Decision Tree



Interpretation

Node 1: Average monthly number of calls over the previous three months < 1 (Total value for the split from parent node: 49615)

- **Left split: 1422 - majority positive class; gini:0.369, Right Split: 48193; gini:0.5**
(Total value for the next split: 1422)

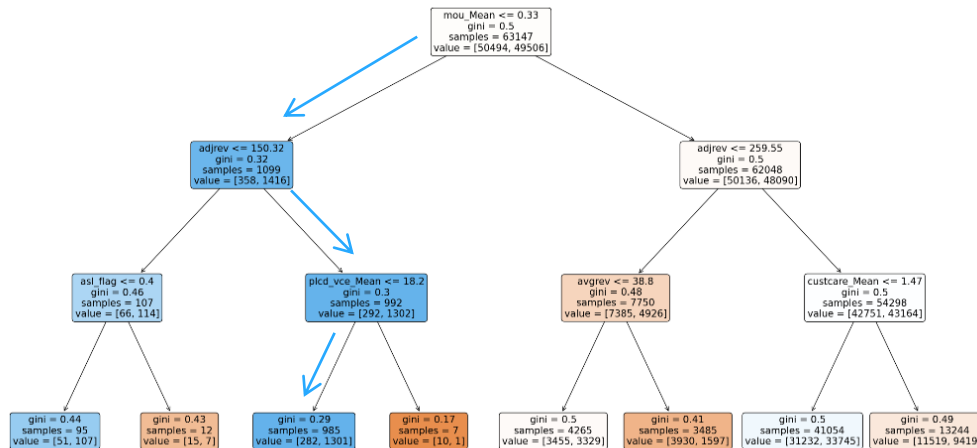
Node 2: Current handset price > = \$34.99

- **Left split: 613; gini:0.393, Right Split: 809 - majority positive class; gini:0.348**
(Total value for the next split: 809)

Node 3: Total number of months in service >= 10.5

- **Left split: 113; gini:0.485, Right Split: 696 - majority positive class; gini:0.297** – Final Leaf Node
 - ✓ **696** Subscribers
 - ✓ Success Ratio is: **48.94%** (696/1422) *100 – (Total value of the positive class in the final leaf node/Total value of the positive class after first split) *100
 - ✓ Subscriber/Non-Subscriber ratio is **4.52**

b. Target SXI Decision Tree



Target SXI from correlation curve for 20% increase in target outcome of the subscription rate is **0.97**.

Interpretation

Node 1: Mean number of monthly minutes of use <= 0.33 (Total value for the split from parent node: 495061)

- **Left split: 1416- majority positive class; gini:0.32, Right Split: 48090; gini:0.5**
(Total value for the next split: 1416)

Node 2: Billing adjusted total revenue over the life of the customer <= \$150.32

- **Left split: 114; gini:0.46, Right Split: 1302 - majority positive class; gini:0.3**
(Total value for the next split:1302)

Node 3: Mean number of attempted voice calls placed > 18

- **Left split:1301- majority positive class; gini:0.29, Right Split: 1; gini:0.17 – Final Leaf Node**
 - ✓ **1301** Subscribers
 - ✓ Success Ratio is: **91.8%** (1301/1416) *100 – (Total value of the positive class in the final leaf node/Total value of the positive class after first split) *100
 - ✓ Subscriber/Non-Subscriber ratio is **4.61**

Conclusion

1. SXI Prediction accuracy is 1.46 Auto AI prediction accuracy and hence is **46%** superior.
2. Higher than average SXI users have **39%** higher Subscription rates than overall average of all users.
3. **9912 additional number of subscribers**
4. Target **20%** increase in Subscription rate is achievable by raising target SXI to **0.97** from current **0.8** levels.
This would result in **59,474** would become Subscribers from current **49,562** levels.

Initial Increase from
current levels:
20% or 9912.

SXI Impact
Potential

5. Based on the inference from the correlation graph w.r.t SXI there is a **potential 99.99 % compounded increase** if all recommendations in target SXI are completely implemented.

Compounding Increase
from current levels:
99.99% or 49,557.

SXI Impact
Potential