Lead Score modelling for automotive industry

Introduction

Lead scoring is a strategic sales and marketing approach. It assesses potential customers (leads) by assigning scores based on engagement. This guides resource allocation, prioritizes outreach, and nurtures promising leads for successful conversions and business expansion.

Client is one of the most recognized automobile brands in the world. It is at the echelon of the automobile industry, producing products that are known for a combination of quality, utility, and style, running in over 150 countries and has production facilities at more than 30 locations worldwide.

The client wants to create a systematic approach to construct and assess the effectiveness of a Lead Scoring Model, using a range of factors such as customer engagement patterns and indications of purchase intent.

TransOrg Analytics used classification-based machine learning model to analyze the data and developed a solution for client's sales and marketing teams to prioritize leads, respond to them appropriately, and increase the rate at which those leads become customers.

Solution

Prior to TransOrg's solution, client was using a dealer build model, for indication of purchase intent on monthly, quarterly, and half-yearly basis.

TransOrg commenced by fetching and consolidating data from multiple data sources for further processing and analysis of the data.

Different steps required for the modelling was identified which include data deduplication, feature engineering, multivariate analysis of features, turnaround time analysis, sales time funnel analysis, different brand and segment analysis and developing the model.

TransOrg performed different data cleaning method which include removing outliers outside inter quartile range, validating mobile number and email format, and removing junk and unnecessary email.

Moreover, an additional aspect of the project involved the identification of the sales funnel process. Subsequently, decisions were made based on this identification, guiding the development of models based on data of various stages within the sales funnel process.

Fig-Sales Analysis process

After analysing the data, TransOrg observed that there were many customers having multiple profiles in the source table. So, to treat them as a single customer, created an automated script to merge such kind of customers based on multiple demographic features such as Mobile Number, email .

TransOrg analysed customer base on various categories and scores, and data preprocessing was conducted over customer de-duplication, feature engineering on different data, and sales funnel for every stage was calculated.

Further process of model development was started which included: -

- Transforming categorical variables into numerical representations through label encoding.
- It also encompasses the mapping of features along with their corresponding lead IDs, easing the creation of training and testing datasets.
- The model was then trained on the training dataset and then validated using the test dataset.

- Furthermore, the forecasted probabilities were linked with their respective lead IDs, adding to the comprehensive dataset.
- This arrangement allowed for the extraction of outcomes, enabling the assessment of the model's performance over a specified timeframe.

The approach and solution formulated by TransOrg can be summarised as: -

• First, the scores were derived based on the rules defined by the business and the model was evaluated for the period of some months where the scores weren't aligned with the conversions.

• Machine Learning based model was built to understand the dynamics of customer demographics and behavioural response to predict the conversion probability.

• For better understanding and clarity ML model was built at every sales stage in the funnel to predict the propensity of the customer.

• Model was validated for months for monitoring the performance and hyper tuning it when there is any requirement.

Impact

There was an increase in accuracy, precision and recall value scores with respect to the earlier model which client was using.
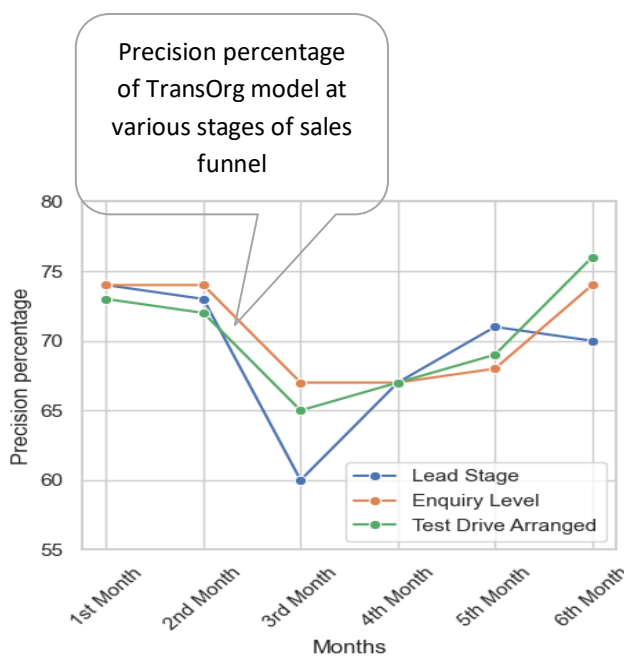
Precision percentage of TransOrg model at various stages of sales funnel

Precision percentage of dealer model that was used earlier by the client.

Months	Old Model	Transorg Model (Lead Stage)
1st month	56%	74%
2nd month	52%	73%
3rd month	48%	60%
4th month	42%	67%
5th month	30%	71%
6th month	45%	70%

TransOrg model (Lead Stage) data.

Fig-Precision percentage vs months   **Tab- Precision comparison between models**

Here the graph mentioned above measures the part of true positive prediction (correctly predicted positive instances) out of all the case that the model predicted as positive, also: -

- o There was an increment in mean precision of around **52%** w.r.t to the earlier model which the client was using.
- o The maximum increase in precision was around **136%** while the minimum increase in precision of the model was around **25%** w.r.t to earlier model compared on monthly basis.
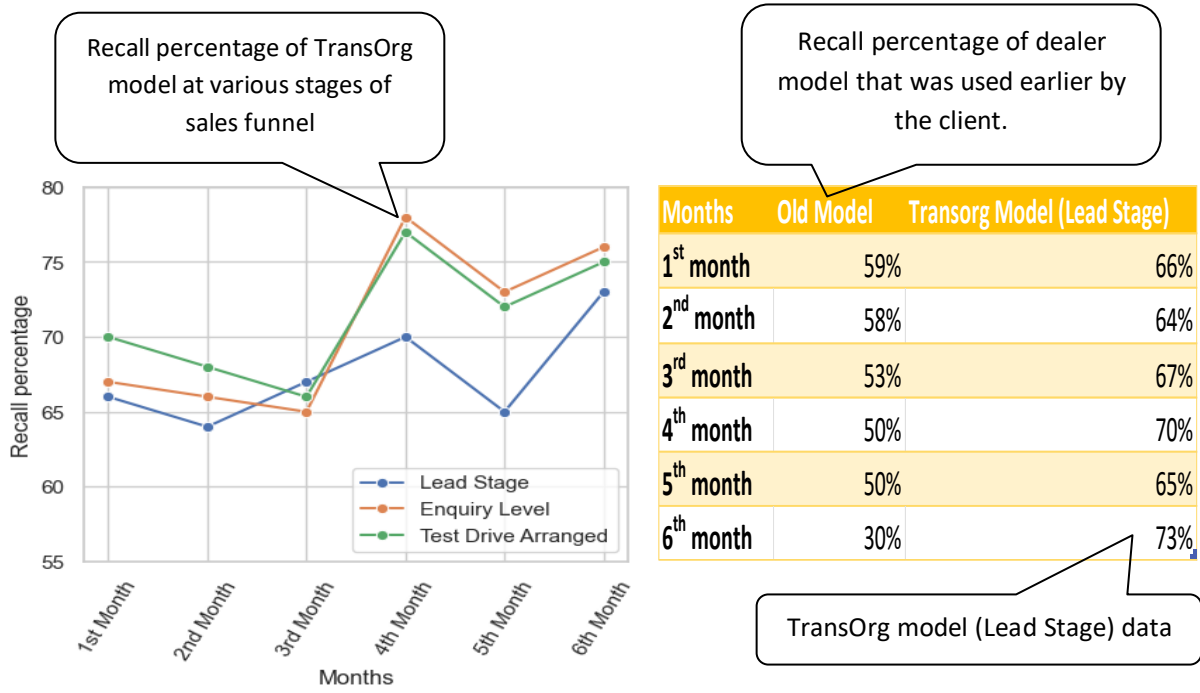
Recall percentage of TransOrg model at various stages of sales funnel

Recall percentage of dealer model that was used earlier by the client.

Fig-Recall percentage vs months

Months	Old Model	Transorg Model (Lead Stage)
1st month	59%	66%
2nd month	58%	64%
3rd month	53%	67%
4th month	50%	70%
5th month	50%	65%
6th month	30%	73%

TransOrg model (Lead Stage) data

Tab- Recall comparison between models

Here the graph mentioned above measures the proportion of true positive predictions (correctly predicted positive cases) out of all actual positive instances, also: -

- o There was an increment in mean recall of around **35%** w.r.t to the earlier model which the client was using.
- o The maximum increase in recall was around **143%** while the minimum increase in recall of the model was around **10%** w.r.t to earlier model compared on monthly basis.

Model development enabled client efficient allocation of resources, focusing sales efforts on high-potential leads, and boosting conversion rates. This well-tuned lead scoring model yielded valuable insights into customer behavior and preferences, enabling informed decision-making, and driving product/service improvements.