

# Customer Redemption & Cross Sell Analysis





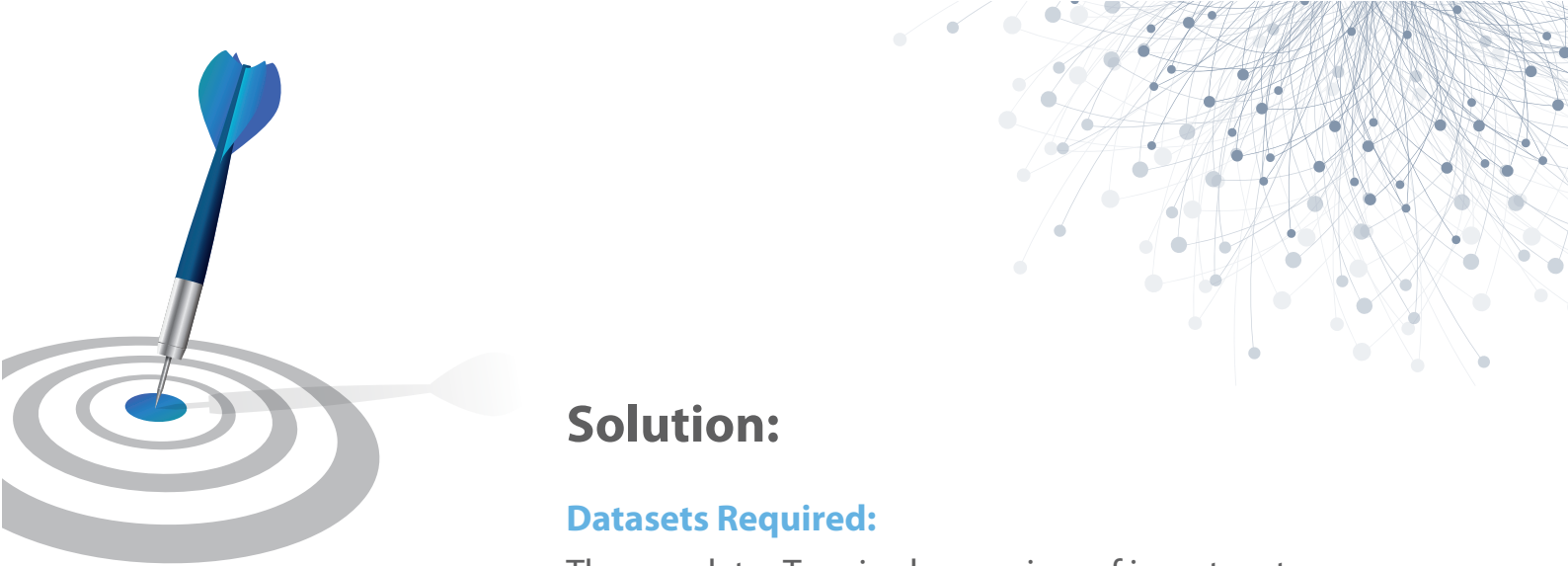
## Problem Statement:

Asset Management Companies nowadays face increasing amount of pressure from their competitors in acquiring as well as retaining the customers by diminishing the redemptions. Identifying investors having high possibility of fund redemption in the near future, well before hand, would help the AMC's to make offers and prevent the investor from redeeming the funds. The attributes that identify the redemption by a customer are complex in nature to analyse like investor's transaction pattern, market conditions, demographic's etc. AMC's would also want to identify investors who would have a high probability of buying other funds along with funds that they would have already bought. Analysing this huge dataset without much of manual intervention and with optimised and accurate output is essential for making successful and beneficial predictions.

## Objective:

Studying the Mutual Fund Market life cycle, its characteristics and transaction history of investor to predict the Redemption in future.

Create and identify segments of users based on their behaviour and demo graphics, in order to enable AMC's to cross sell their products.



## Solution:

### Datasets Required:

The raw data rTequired comprises of investors transactions and buying history, customers demographics, market conditions and sentiments and customers account information.

The datasets contain information about millions of customers and which is a mix of active and inactive customers. The active customers are further a mix of advised and PI investors.

### Pre-Processing Data:

The raw dataset is heterogenous in nature and hence would require cleansing like:

**Removal of outliers to remove noise in the dataset.**

**Handling missing data points.**

**Normalization of data.**

**Merging of all datasets to map with the customer dataset.**

### Feature Extraction and Variable Selection:

This helps identify the variables based on which a subsequent machine learning model is built. The features are extracted from the raw dataset using various algorithms which will then be scaled and normalized to facilitate model building. The features / variables extracted help discover hidden information in the dataset which would be included the machine learning model built.



## Algorithm Overview:

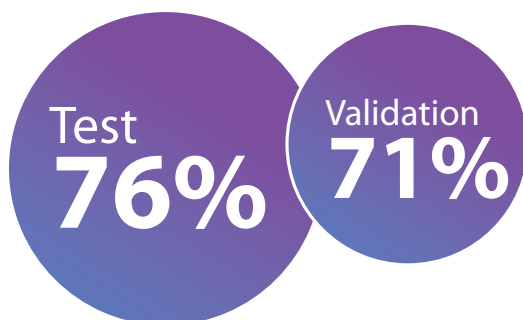
### Redemption:

Before actual implementation of the algorithm the data is split into training, cross validation and test dataset. The model is built using the training data set and validated using the test and validation sets to get better accuracy over any new dataset exposed to the model.

Various algorithms are implemented to improve on the results and get the best possible accuracy over the test and validation set.


This Machine Learning Classification problem is resolved using Random Forest algorithm along with various other optimizations against variables and tuning the right knobs of the algorithm to get best possible predictions. Predictions could be done of the current month using the previous month's data.

The accuracy obtained on different data is as following:



### Cross Sell:

Cross Sell analysis is done on the customer specific dataset comprising of customer's demographics and his historical activity in terms of buying patterns. Customers are segmented based on their demographics and their product affinity to group and identify customers showing similar behaviour.



Various clusters are created for various combinations of demographics and product affinity and then each cluster gets analysed for different association rules between inter and intra clusters to get customers who could be targeted for cross selling of the products.

## Benefits:

### Redemption:

- Redemption prediction helps AMCs to identify and target customers who plan to redeem their funds in future well before hand, giving the AMCs enough time to retain their customers.
- It helps reduce customer attrition and improve AMCs share in funds in the market thus helping in growth.

### Cross Sell:

- Cross Selling Analysis helps AMCs to recommend next best product that a customer can buy which helps increasing customer equity
- It helps establishing customer loyalty and improving market position of the AMC.



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