CASE STUDY

Prediction of Delinquency

▶ **Objective**
Prevention of severity of loss by predicting the delinquency likelihood of accounts & ranking the accounts by severity

▶ **Client**
One of the top 5 banks of the US.

▶ **Benefits**
Prevent severe losses by ranking the customers based on expected loss

Other Case Studies

↪ Profitability Analysis for Mortgage Lenders

↪ Predictive Analytics helps in Strategic Marketing!

↪ Churn Prediction for one of the largest telecom companies in India

Project Objective
The project objective was to predict delinquency likelihood of the accounts, expected losses on the delinquent accounts and ranking the accounts by severity in order to prevent severe losses. Accounts from consumer and small-business portfolios were considered for this project.

Client
One of the top 5 banks of the US.

Approach

a) Segment the accounts base according to the specific data from the consumer and small-business units.

b) Carry out standard checks on data quality.

c) Carry out exploratory data analysis to identify possible pre-delinquency triggers.

d) Cluster the customers into meaningful subgroups which can be analysed separately.

e) Derive simple pre-delinquency triggers (involving one to two patterns of behaviour) through data mining for association rules.

f) Use decision tree analysis to derive more complex triggers.

Solution

a) Determine pre-delinquency identification triggers using CART and obtain if-then rules

b) Determine probability of delinquency for each of the accounts. Here the assumption is that the probability will remain the same for next 3 months

c) Predict the incremental balance that a customer might lose over next 3 months, call it expected loss

d) Multiply probability of delinquency by expected loss

e) Rank the accounts based on the expected loss

Benefit
If 10% of the customers are sampled at random the sample is expected to include 10% of the total delinquents. However the highest deciles according to the delinquency probabilities includes 94.5% of the delinquents – lift of 9.45

Deciles	# DQ	DQ Rate	Lift
1	945	6.51%	**9.45**
2	29	0.20%	0.29
3	4	0.03%	0.04
4	3	0.02%	0.03
5	4	0.03%	0.04
6	-	0.00%	0.00
7	1	0.01%	0.01
8	2	0.01%	0.02
9	9	0.06%	0.09
10	3	0.02%	0.03
Total	**1,000**	**0.69%**	**1.00**