Executive Summary of Micro-Mortgage Analytics

One of the major problem in Banking Industry is to predict whether the customer would pay back the loan or not and this problem gets complex when the bank specifically deal with low income category people which has high risk of defaulting.Now, the Micro-Mortgage industry is highly leveraged and the loan amount is comparatively high compared to car or bike loans so special care should be taken and try to use the most of machine learning to predict the right customer for the business.Another challenge is the Credit Officer who manually visit the Applicant's Home to check all the documents which involves huge cost to the bank and the process is also inefficient.

Traditional Decision Making:

The interview based field assessment is conducted by a credit officer from the bank who personally visits the applicant's residence and workplace in order to assess and verify the details provided by the applicant during loan origination phase.The credit officer then creates a story about the applicant's life by asking questions about his /her family ,education,living conditions,income,expenses,liabilities,assets,work and so on.In the instance of self-employed individuals, the credit officer would also spend a day with the applicant and observe the income and expenses incurred so as to create a P/L statement.Finally, the completed verification and assessment statement would result in a qualitative record of the person's ability to regularly service the loan. As we can see that despite the benefits associated with field-based assessment this method is time-consuming and also cost-incurring for the bank.As per a 2010 study by the monitor on the Indian micro mortgage industry, the cost of originating a loan was sometimes be as high as 31% of the total transaction cost incurred.

Machine learning Approach:

The data acquisition and collection process at every stage of applicant assessment could be the greatest source of competitive advantage.If we can build an application scoring model using the data generated from the field-level interactions would enhance the decision making at the branch level.

The Monitor study on micro-mortgage sector reports that as per industry estimates, for a loan of INR 400,000 loan origination would cost INR 8,000.This Constitutes 31% of the total transaction cost and 2.8% of the total loan disbursed.In addition to the loan origination cost, a NPA provision of INR 4,000 and a loan servicing cost of INR 13,844 brought the total transaction cost to INR 25,844.Upon sanction of the loan, the loan applicant would be charged a non refundable amount equivalent to 2.5% of the sanctioned amount towards loan processing fees.So in this instance INR 10,000.

Finally, evaluation of loan sanction probability early in the process by the credit team could reduce field costs- the 31% cost component incurred in every transaction - by identifying credit worthy customers before the credit officer's visit.The model would also reduce incorrect sanctions of more risky loan applications owing to subjective evaluations made by credit officers and would thereby help the standardization of decision making.

Models Used: KNN,Decision Tree,Random Forest,Naive-Bayes etc.

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