International Journal of Engineering and Advanced Technology (IJEAT)
ISSN: 2249-8958 (Online), Volume-2 Issue-5, June 2013

Predictive Analytics in Retail Banking

Disha Budale, Dashrath Mane

Abstract: ***Today banks are facing intensive competition due to the gradual growth of many banks as well as due to the increase in demands of the customers. Customers easily switch to another bank if the other bank is providing them more benefits and facilities that they want. To tap these needs of the customers and reduce the customer attrition, many banking institutions are using predictive analytics. Using the predictive analytics banks are trying to improve their relationship with customer, and retain their existing customers and also devise effective mechanism for marketing.***

Keywords- Predictive Analytics; Banks; CRM; Customer Retention

I. INTRODUCTION

Prediction is the forecasting about what will happen in the future, not always based on experience or knowledge but a large amount of historical data and current data are gathered and their behaviour is analysed. Predictive Analytics combine powerful, fully automated discovery and analysis technologies to enable decision maker to prepare for future by learning from past.

In addition, to structured data, a large quantity of unstructured data is originating from the variety of relevant sources. The various data sources are Email, Call-Center, Social-Media, Websites, Customer feedbacks, agents and so on. This structured and unstructured data together combine into the large volume of business data that becomes useful in important decision making activity. Often, there is an immediate need to analyze data at hand, too discover pattern, reveals threats, monitor critical systems and make decisions about the direction the organization should take. Analysis of these data helps the organization in determining next path of action for the betterment of their organization as well as also in determining consumer profit. Statistic Algorithms are associated with trend analysis, pattern generation, and artificial intelligence based on predictions.

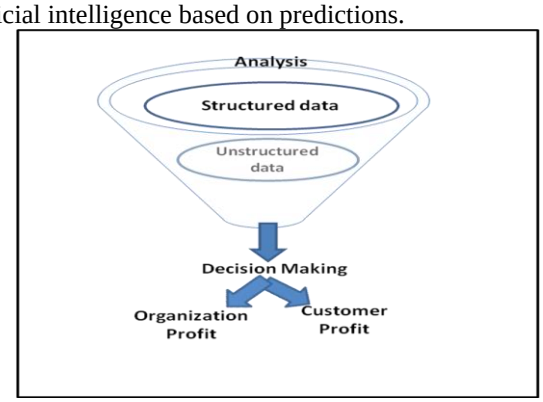

Fig 1. Analysis of data

Manuscript published on 30 June 2013.
* Correspondence Author (s)
Disha Budale, Department of MCA,V.E.S.Institute of Technology, Chembur, Mumbai, India
Dashrath Mane,Department of MCA,V.E.S.Institute of Technology, Chembur, Mumbai, India

II. ANALYTICS IN RETAIL BANKING

Banks can successfully mine the data that are locked as their operational and financial data and utilize them easily for their benefits. In retail banking, customer is the core of their operation, so nurturing and retaining them are important for their success. Due to the technological advancement, customers are using high end devices for their transaction, so there is not much interaction between the customers and bank, so it becomes necessary for the banks to anticipate customer requirement in advance so as to retain them, as the unsatisfied customer can easily change the loyalty if the other bank is providing them with much better services then the current one. Banks need to ensure that their current customer is well satisfied with their services so as to retain them. Customer Acquisition is more costly than customer retention [6]. So it is important for the banks to use analytics in the efficient manner so as to enhance their customer value and maximize their wallet share.

Banks with the current customer have the advantage from their competitors as they have their customer data which they can use to predict what the needs of their customers are and accordingly cross sell/ up sell their product than their counter parts that does not have any idea as to how to influence the customer and acquire them.

Banks spend a lot of time in analysing customer data so as to fulfil the customer requirement and enhance their value. Analytics helps you to make better, faster decision and automate the business process. It helps grow your customer base and retain your most profitable customer, continuously improve operational efficiency, prevent fraud and manage risk and compliance efforts, transform and automate financial processes.

There are also many hidden opportunities that the bank has no way to figure out, for example –potential cross sell/ up sell opportunities- it might happen that the same guy needs some other banking services and competition's marketing tapped into it before our bank could. The bank was at an advantage of already having a relationship with the customer thereby enabling them an access to precious information about him. All these opportunities directly result in revenue leaks and direct losses, and analytics can help fix these[1].

Few other problems that can be addressed with analytics are:

A. Reduce Attrition

Analytics can be used to reduce the Churn. The data can be gathered and the relationship between the data and profile information can be used to develop the churn model to identify the propensity of the customer churning out and can also be used to calculate customer lifetime value. The customer can be segmented into the section of the customer retention by offering them services or products or programs so as to gain their loyalty and maximize their values.

Published By:
Blue Eyes Intelligence Engineering and Sciences Publication (BEIESP)

B. Delinquency Management

Analytics can also be used to identify the delinquent account and develop appropriate strategy for the credit recovery. The delinquency may be because of many reason for examples, the delinquency may be intentional, habitual and genuine. Different mode should be utilized to recover in different cases such as the intentional customer should be identified at the time of application filing itself and for such customer the credit limit should be less, and severe method of recovery should be used whereas for genuine reasons such as recession, job loss, customer opportunities should be given, such as, installment payment should be lowered because if the customer bounce back then they are the very profitable customer to the bank and it is very important for the bank to retain such customer so as to increase their wallet share[1].

C. Cross Selling

Analytics helps to cross sell their products to other portfolios and up sell their products to the customer with interest in their product. This helps the bank to reduce the marketing cost, thereby promoting their products to their interested genuine customer rather than the entire universe[1]. This is one of the efficient manners of using analytics in reducing marketing cost, but it does not mean that campaign management should not be done, because unless you don't promote your products acquiring new customer can be problematic.

III. R PROGRAMMING IN PREDICTIVE ANALYTICS

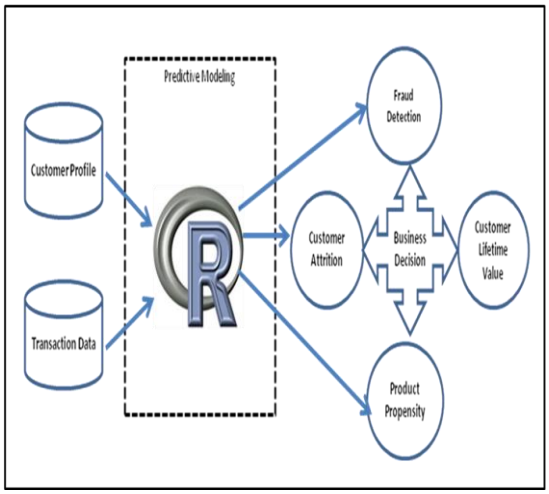

Fig 2. Predictive Analytics with R Programming

Predictive analytics are used to determine churn probabilities, product propensity and Customer Life time Value. Churn Probability is the loss of the customer to the company, Product Propensity is the likelihood of the customer buying the offered products by the company, Customer Life Time Value (CLTV) is the customer's potential monetary worth through course of their relationship with your business, calculated across entire CRM life cycle, including all functions, processes, channels, roles, campaigns, & touch points.

Predictive analytics is a statistics modeling used by the data analyst to understand their organization internally as well as externally. It helps identify trends and patterns, arming decision makers with the best possible information with which to make their decisions. Predictive analytics has a proven track record in the business intelligence field. It is a driving force in influencing their competitive pricing model that gave organization a competitive advantage over their market.

Predictive analytics models are considered to be complex to model implement and analyze as they require specialized statistical and mathematical skills to develop the model and analyze the outcomes. The traditional predictive analytics tools and software packages would require a considerable degree of statistical and mathematical knowledge, to practically use such tools. Predictive analytics is done by the most experienced analyst, but with R – Programming which is an open source code this has become easy to be used by anyone. R Programming is just like any other programming language such as C++ or java, with in-built functions for calculations, model building and so. With R, you can create any algorithm. Currently, there 4000 algorithms in the R-library, ranging from basic Linear Regression to advance models[4]. There is no limit with R- Language.

One way is using R Programming in Predictive Modeling is to calculate churn probability, product propensity and CLTV. Depending upon the need glm () can be used. One such example is, Logistic regression, it is useful when you are predicting a binary outcome from a set of continuous predictor variables. It is frequently preferred over discriminant function analysis because of its less restrictive assumptions[7]. Generalized linear models are fit using the glm ( ) function.

The form of the glm function is ***glm(formula,family =familytype(link =linkfunction), data=)***

In a generalized linear model (GLM), each outcome of the dependent variables, Y, is assumed to be generated from a particular distribution in the exponential family, a large range of probability distributions that includes the normal, binomial, Poisson and gamma distributions, among others. The mean, μ, of the distribution depends on the independent variables, X, through:

$$E(Y) = \mu = g\text{-}1(X\beta) \qquad (1)$$

where E(Y) is the expected value of Y; Xβ is the linear predictor, a linear combination of unknown parameters, β; g is the link function.

Family	Default Link Function
Binomial	(link = "logit")
Gaussian	(link = "identity")
Gamma	(link = "inverse")
inverse.gaussian	(link = "1/mu^2")
Poisson	(link = "log")
Quasi	(link = "identity", variance = "constant")
Quasibinomial	(link = "logit")
Quasip Oisson	(link = "log")

Table I. glm() family types.[7]

The GLM consists of three elements:

1. A probability distribution from the exponential family.
2. A linear predictor η = Xβ.
3. A link function g such that E(Y) = μ = g-1(η).

Published By:
Blue Eyes Intelligence Engineering
and Sciences Publication (BEIESP)

The result of these glm() can be used in predicting the churn probability of the customer, product propensity and even determining Customer Life Time value, based on which the decision makers can make the decisions for the bank, on how to reduce customer attrition, or try to retain their old customers, what products should be offered to their existing customers according to their needs and also in determining the wallet share of the existing customer [3].

IV. CONCLUSION

Understanding the importance of analytics is very important. Banks should understand its potential, and how its power which is limitless can be utilized to the fullest. When using analytics, banks should bear in mind the needs of the customer, which is the base or the core of the analytics to be successful. There is a wide range of data generated everyday which goes untapped from various sources such as emails, social media, CRM and so on. With analytics, retail banks can use this data to drive key business decisions and deliver proactive services to the customers and also formulate business strategies. It has been observed that the use of analytics has been enhanced in the last decade; many companies are using analytics to satisfy their customer, retain them and also make decision about the right product to right customer at right time so as to increase the financial standings of the companies.

REFERENCES

[1] http://blog.thegmid.com/tag/analytics-in-retail-banking/
[2] http://en.wikipedia.org/wiki/Predictive_modelling
[3] http://en.wikipedia.org/wiki/Generalized_linear_model
[4] http://scn.sap.com/community/predictive-analysis/blog/2013/02/12/sap-predictive-analysis-and-hana-like-chocolate-and-peanut-butter
[5] https://en.wikipedia.org/wiki/Prediction
[6] http://www.infosys.com/FINsights/Documents/pdf/issue8/analytics-retail-banking-why-how.pdf
[7] http://www.statmethods.net/advstats/glm.html

Published By:
Blue Eyes Intelligence Engineering
and Sciences Publication (BEIESP)