Role of Predictive Analytics using Divergent Sources for Customer Segmentation

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Abstract— We live in the Information Era, the era of Big Data. Mountains of data are generated every day. But collecting mountains of data is of no use until we use the data for perception of some meaningful patterns in it. This is possible with predictive analytics which exploit patterns in historical and transactional data to identify risks, opportunities and future events. One such application of predictive analytics is customer segmentation which aims towards a deeper understanding of customer by using the breadcrumbs left by the customers in the form of data.

Key words: Big-Data, Predictive Analytics, Customer Segmentation

I. INTRODUCTION

Since the dawn of civilization, human race has been fascinated by and proactively pursued the ability to predict. By using the current technologies, we can begin forming hypothesis about what events may be occurring in the future by making the massive data collected actionable. Digital data in all shapes and sizes is growing at astonishing rates. This explosion of data brings big opportunities and transformative potential for various sectors such as healthcare, manufacturing industry, etc. The accumulated data can be exploited with Predictive Analytics. Current analytics systems provide means to explore trends in data and using these observations to give future predictions. They are various applications of predictive analytics which include the areas ranging from medicine to geography. One such application of predictive analytics is customer segmentation. Customer segmentation focuses on studying the historical customer data and forecasting the products they may be interesting in based on the buying behaviour observed. The combination of predictive analytics and customer segmentation can generate the insight needed to more effectively and efficiently acquire, grow and retain the right customers.

II. PROCESS OVERVIEW

Using predictive analytics for customer segmentation requires a set of steps to be followed which are as stated below:
1) Gathering Data Sources.
2) Analytics using divergent sources.
3) Creating a predictive model.
4) Performing the customer segmentation.

The steps mentioned above are illustrated in Fig. 1.

A. Gathering Data Sources:

In order to perform analytics it is necessary to define the data sources. In order to collect data we need to define what kind of data is needed and we need to plan from where this data can be collected. In order to know the customer we need following types of data:

1) Transactional Data:
The transactional data includes the purchase history of the customer. There are many conclusions that can be drawn from purchase history such as:
   1) Frequency of buying.
   2) The kind of products that interest the customer.
   3) The range of bill amount.
   4) The brands preferred.

2) Behavioural Data:
Behavioural data includes the personal information of the customer.
   1) Demographic features such as age, gender, educational qualification, marital status, etc.
   2) Professional details.

3) Data from Social Media:
Social Media is the biggest source of data in today's world. Some of the advantages of using social media are:
   1) Social media can be used to provide an identity to a company or brand.
   2) Social media helps a company to build relationships with people who might not otherwise know about the products or services the company offers.
   3) People like pages on Facebook or may follow a brand on Twitter. Depending on what they like follow, one can understand the choice of customers.
   4) Social media such as Facebook allow users to check-in at places. By knowing who is checking in and where, one can encourage visitors to keep coming back.

B. Analytics using Divergent Sources:

Analytics techniques will uncover insights and patterns that highlight relationships & hidden evidences of the most influential variables. These relationships between the influential variables are used further to build the predictive model.

More often the data is unstructured in nature and this calls for some pre-processing on the data. More often the Big Data being processed is heterogeneous and originates from different transactional systems. All of this data needs to be understood, defined, annotated cleansed and audited. In data analysis, the data is cut, sliced and diced and different comparisons are made while trying to derive actionable insights from the data.

Considering the scenario of customer segmentation, it is essential to identify which attributes of the customer will play a vital role in making predictions. These influential attributes can also be assigned weights
depending upon their importance and the same can be incorporated in the predictive model.

C. Creating Predictive Model:
Performing predictive analytics requires building a predictive model. Predictive analytics is the use of statistical analysis over data. The output is insight into the dataset as well as predictions about future activities.

Predictive models are models of relations between a record in a dataset with its attributes or variables. The objective of predictive model is to assess the likelihood that a similar record in different dataset will exhibit the same behaviour.

A predictive model is based on the observations in existing dataset. At times a predictive model might also use mathematical equations to predict the values. The variables that matter the most are identified and are put into a mathematical relation that aims at finding the value of the target variable.

D. Performing Customer Segmentation Using Predictive Analytics:
Customer segmentation is an area of predictive analytics that is useful for any organization. Knowing who your customers are is self-evidently important for an organization’s growth.

Customer segmentation has the potential to allow marketers to address each customer in the most effective way. Customer segmentation allows marketers to identify discrete groups of customers with a high degree of accuracy based on many indicators. The key is to segment customers into groups based on predictions.

Customer Segmentation can be based on following parameters:
1) Organization’s sector
2) Location
3) Buying Patterns
4) Individual’s age
5) Gender
6) Life-style
7) Region
8) Buying behaviour
9) Attitudes
10) Socio-economic group.

Once the predictive model sheds light on significant parameters of the dataset customer segmentation can be performed. Right customers can be targeted at the right time, in a right way based on which segment they fall in. Consider the following examples:

1) If we want to promote sale of laptop bags then we first need to know which customers have bought laptops. Here we will segment customers based on their buying behaviour. We need to look out for customers who are interested in buying electronics and particularly laptop.

2) In order to encourage buying of expensive products, the socio-economic group of customers should be taken into account. The customers belonging to a privileged class in society will be a target for such high end products.

3) Customers can be targeted during sale period. Women usually have a tendency to buy more during this period. In this scenario segmentation should be gender based. It could further be age based as well since younger women shop more.

III. CONCLUSION
Thus, the proposed system encourages the use of predictive analytics for customer segmentation. Customer segmentation is done to manage customer relationships and tailor marketing programs. Customer management becomes
better and easier by using predictive analytics that forecasts customer behaviour. Marketing can be optimized by using identifying the targets for the same. Also with predictive analytics impact of a particular marketing strategy can also be measured. Hence using predictive analytics for customer segmentation can be beneficial.

REFERENCES