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Use Customer Analytics in Your Processes. Yes, But How?

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ABSTRACT

As a retailer, you always aspire to offer the products and promotions that your customers desire.

The challenge: Gain the insights portraying your customers' real "desires", and then imbibe those correctly in your retail processes.

The current paper highlights the need and ways to utilize customer analytics. It focuses on challenges and tries to explore workarounds. It further explores the "need" to use customer analytics across varying degree of retailer readiness and formats. It offers a sample case study using retail industry solutions.

INTRODUCTION

Retail comes closest to customer interaction than any other type of business. The retail industry offers multiple customer touch points, such as the in-store experience, online purchases, marketing, brand awareness, and many more. As a retailer, you strive to make the best use of every customer interaction in order to gain a deeper and more accurate understanding of your customers, their needs, and their spending desires. The ultimate goal is to gain and retain customer loyalty. But this has several challenges, such as difficulty in:

- gaining visibility of the customer
- understanding a customer's needs, spending patterns, and preferences
- discovering product associations and opportunities for cross-sell
- predicting a customer's response to your marketing initiatives
- predicting when a customer would stop shopping with you and move to your competitor

Another challenge is incorporating this information into your business processes from defining a business strategy, setting goals, creating assortments, marketing ingenuity, and providing better customer service.

Customer analytics is a methodology that helps you to deal with these challenges and supports you to become more customer focused. Customer analytics uses statistical techniques to uncover the underlying traits in a customer's purchase history and makes use of a customer's known characteristics to predict future responses.

By better understanding customers' needs, greater is the chance for a retailer to survive and excel.

APPROACH

This paper describes the customer analytics approach for resolving each of the above challenges. The approach is divided into the following sections:

- Challenge
- Method of resolution
- Best practices
- Business utilization of gathered insights
- Use of SAS Customer Analytics to obtain the necessary insights
- Real life examples from retailers who are using SAS Customer Analytics

The term SAS Customer Analytics used in this paper includes SAS® Customer Insight for Retail and SAS® Transaction Insight for Retail solutions.

The intended audience for this paper is a retail business user who needs to gain basic understanding about different methods used in customer analytics. The paper does not cover statistical concepts and procedures.

CHALLENGE: GAINING CUSTOMER VISIBILITY

A marketing manager at a retailer has following questions:

- How do I identify the distinct customer groups who shop at my stores?
- What is the distinction of customers belonging to one group from the other?
- For which customers should I focus on increasing average ticket value?

A category manager needs to know:

- Which customers form the core group for my product category?

Methods

This exercise, called customer segmentation, aims to create groups of customers that exhibit similar shopping behavior. The choice of an indicator to judge similarity can vary based on the purpose. It could be a simple group-by on a set of demographic data or a statistical analysis of customers' shopping behavior over a period. Here are two methods of grouping customers based on their shopping behavior:

1. Recency, Frequency, and Monetary (RFM) segmentation is the most often used technique of dividing the customer base into segments based on recency, frequency, and monetary value of their purchases.
2. Product purchase-based segmentation creates customer segments based on similar shopping behavior for chosen products or product categories. It is more detailed and hence offers more specific insights.

Best Practices

To segment customers, the RFM method primarily chooses:

- recency of purchase calculated with reference to the date of analysis
- monetary value of total purchases during the evaluation period
- number of purchases during the evaluation period

To segment customers, the Product purchase-based method chooses:

- the aggregate monetary value across specific product categories over a period as the key parameter
- the historical period based on type of retail and product purchase cycle

Notes

- It is essential to combine all the available identifications pertaining to a single physical customer before forming customer segments. For example, a shopper might have registered for multiple loyalty programs and hence could have several identities. These identities need to be combined based on derived keys. The derived keys can be formed on the basis of first and last name, address code and phone numbers, or using any other properties.
- Identify all customers who belong to the same household. This helps to direct a single marketing communication per household.
- It is necessary to separately group the corporate customers and individual customers so that different strategies can be designed and executed.
- For the RFM method, gross margin or profit from total purchases in the evaluation period is always a desired monetary parameter, but this value is often not available or is not easy to derive, especially in grocery retail.
- For the RFM method, the desired period of evaluation for grocery retail is usually a quarter, so that every customer is evaluated over a three-month period. The evaluation period may vary by type of retail and should consider the purchase cycle of typical product. For example, the evaluation period will be yearly for electronics.
- For the RFM method, customers who have not purchased in over a year are considered inactive and are usually not included in this process. The period to judge inactivity depends on the purchase cycle of the product and hence will vary. For grocery retail, this interval would be a quarter.
- For product purchase based segmentation, either all product categories or the top 'N' product categories can be chosen depending on the insights needed. Customers will be segmented based on their average monthly

purchase amount for the chosen product category. Normally, a purchase history of 12 months to 24 months will be considered.

Business Utilization

- Customer segmentation acts as the foundation for subsequent analyses, such as spend analysis, basket analysis, response analysis, and retention analysis.
- Using RFM segments, the retailer gets a quick overview of the profitability of current customers.
- Based on the average spend and frequency distribution of each segment, a retailer will focus on increasing the average basket value or average frequency of purchase.
- The key insight available is the migration of customers across different segments. It enables the retailer to understand how the business value of the segments change over time, and hence acts as a feedback for the marketing strategy.

SAS Customer Analytics

SAS Customer Analytics enables segmentation of customers using below methods by providing pre built model templates.

- RFM Segments on basis of recency, frequency of purchase, and gross margin evaluated over a period of three months.
- Product purchase-based customer segments on average amount spent per product category for the top fifty product categories.

SAS Customer Analytics also enables the segmentation of stores, which helps you gain further insight into invisible or unregistered customers.

Real Life Examples

A major supermarket chain:

- segmented its customers on the basis of total visits as Frequent, Regular, and Irregular shoppers, and on the basis of total average spend per visit as Good, Average, and Low shoppers. These nine segments served as basis of every strategic decision. The historical data for past 12 months was used.
- grouped the transactions based on ratio of spend in each product category. A cross tab analysis of each customer segment and transaction groups enabled the category manager to identify her core customer segment and analyze product preferences of each customer segment.
- recreated customer segments every month, which helped to study customer migration and evaluate the effectiveness of its strategy
- utilized this information to increase spend of low spenders and increase frequency of purchase of Irregular shoppers

Another retailer which operates department stores, hypermarkets, and an online channel aimed to gain customer insights in order to support the marketing initiatives executed by its vendors. The retailer was able to provide important insights to his vendors in terms of core customer segments for their products and details on the segment's shopping traits and demographics. The vendors were able to design offers that were better suited to the customer preferences.

CHALLENGE: UNDERSTANDING CUSTOMERS' NEEDS, SPENDING PATTERNS, AND PREFERENCES

A marketing manager needs to understand:

- the composition of each customer segment based on life stage, age group, and other socio-economic factors
- the distinction of customers who belong to a specific group

A category manager needs to know:

- the characteristics of its core customer segment

Methods

This exercise, called customer profiling, highlights the distinction among customer segments based on multiple dimensions and gives a clearer picture of the kind of customers present in each segment.

The customer segments are profiled using socio-economic-demographic variables to give a marketing perspective to the behavioral segments. Although the segments are not created on basis of demographics, the profiling process reveals that they still have distinct demographic distributions.

Best Practices

Profiling of customer segments is done using variety of data:

- demographic information such as age, gender, postal codes, occupation, marital status, gender of head of household, income, household size, number of children, education, ethnicity, customer lifetime, and so on
- transactional data, such as time of shopping, return behavior, promotion behavior, and average basket size
- data from responses on online communities

Note

- It is recommended that you create bands of individual values for profiling variables in order to achieve ease in interpretation.

Business Utilization

As a retailer, customer segment profiling supports your need to understand the distinctiveness of each customer group so that you can:

- offer an assortment for a specific set of customers who exhibit similar profiles and hence are likely to choose an item from the assortment
- design effective campaigns based on the target segment's lifestyle and shopping habits

SAS Customer Analytics

SAS Customer Analytics enables profiling on the basis of:

- demographic data
- transactional data

SAS Customer Analytics also enables profiling of store segments using census and third-party data. This helps in understanding the characteristics of the shoppers belonging to each store segment. The retailer can also identify the nuances of products that are preferred by shoppers belonging to particular store segments.

Real Life Example

A retailer created customer segments for his department stores using visit and spend data and profiled each segment using:

- the ratio of department spending across all departments
- ethnicity

- gender
- ratio of visits on special days (member days) and during a specific period (back to school promotion)
- weekday versus weekend purchases

The marketing team was able to design specific campaigns for shoppers who spent heavily on cosmetics and toiletries. These campaigns promoted new brands in cosmetics category.

CHALLENGE: DISCOVERING PRODUCT ASSOCIATIONS AND CROSS-SELL OPPORTUNITIES

A marketing manager needs to know:

- How to increase revenue per customer by increasing the Average Transaction Value (ATV)?
- How to sell to existing customers in a cost effective way?

The aim is to analyze the shopping baskets of a group of homogeneous customers and to discover products that are often purchased together. These items can become ideal candidates for an up-sell or cross-sell campaign.

Methods

This exercise, called basket analysis, highlights the set of products that are frequently purchased together within a single purchase. It helps to understand what products the customers are buying together and in which order. Large amounts of purchase data is analyzed over time. Basket analysis is based on the calculation of the frequency of an event occurring by itself or in combination of other events (analysis of associations).

This analysis is performed for each customer segment. The behavior of high-profit customers can be distinguished through the analysis of the associations in buying patterns. In addition, this analysis also helps in formulating a business strategy in order to increase the proportion of high-profit customers.

The purchase rate for each product is calculated to identify products with the highest affinity. An effective strategy to carry out a profound customer basket analysis is to analyze at different levels of product hierarchy.

At first, associations should be defined between product categories. Then after identifying the categories that show the highest affinities, conduct an in-depth analysis involving only those products that belong to these product groups.

The strength of an association rule is measured by the lift value and the confidence, which is a conditional probability of the products being bought together. The lift value measures the strength of the association between two products.

- A lift value greater than one indicates a positive association.
- A lift value of one indicates that the two products are independent.
- A lift value lesser than one indicates a negative association between the products.

Best Practices

The analytical approach to choose and the benefits drawn from the analysis depend heavily on the type of input data. Conducting basket analysis for each customer segment helps to understand the product associations that are very unique to that customer segment.

Conducting basket analysis per store segment helps to discover product associations occurring due to purchases from unregistered shoppers too.

It is important to execute association analysis at the subclass level of merchandise hierarchy because:

- The number of SKUs is usually high, so the interpretation of results becomes difficult and less effective to act upon.
- Introduction of new SKUs within a category is likely to tweak the results.

It is necessary to scope the input data based on

- time period - The length of the period is based on the type of retail. Consider the last three months of transaction data for grocery retail.

- customers - Consider active customers and exclude employee purchases.
- stores - Consider stores that are fully operational and offer the products under evaluation.
- products - To uncover less obvious product associations, it is necessary to exclude products that are in very high demand.

Interpretation of rules can be made effective by

- excluding products that have obvious associations and analyze affinity of products with lower consumption. As a result, you can uncover the less obvious product associations.
- translating the subclass level rules to business descriptions so that the business users can easily understand and utilize the information.

Business Utilization

The information derived from basket analysis can be used in number of ways. The output depends on the scope of data considered during analysis. For example:

1. Focus on Best Associations between Products

   As a scope, consider all the transactions that have taken place in all customer segments and all existing product groups. Identifying the products with the highest correlation can lead to association rules that are valid for the whole of the population. The results are used to:

   - redefine the store layout and regroup the merchandise inside the store
   - choose the items to promote through marketing campaigns

2. Focus on Specific Products

   The objective of this analysis is to promote particular products. The focus is on analyzing transactions that involve only relevant products.

   The analysis takes the entire customer population into consideration. The results are used to:

   - implement marketing actions, such as cross-selling and up-selling using the specific products
   - create a catalog aiming to promote specific product categories or private labels

3. Focus on Customer Base

   The objective of this analysis is to understand the type of purchases made by specific customers or segments. This analysis helps to define marketing actions that are specifically tailored for a particular customer segment. The results are used to:

   - define up-selling and cross-selling campaigns for a specific customer segment in order to improve customer loyalty or increase profitability
   - create distinct advertising brochures for each customer segment

SAS Customer Analytics

SAS Customer Analytics enables basket analysis to be performed for each customer segment and for each store segment. It offers pre-built model for analysis and a multi-dimensional report for easy interpretation of association rules by business users.

Real Life Example

A retailer gained better insights into transactions and product affinities, which helped to improve merchandising and marketing decisions, including catalog planning, assortment planning, advertising flyers, and product placements in store displays.

The retailer also used an exploratory model to understand the sequence of acquisition of the product subfamilies. The input data considered the following:

- the sequence of receipts of cardholder customers
- the sub class level of the product hierarchy
- one year's transactions
- all comp stores (comp means that the store has been operational for the complete period, which may be one year or a season)
- excluded all employee transactions
- focused on product departments with low demand

A theme-based retailer used SAS Customer Analytics to build a product recommendation engine for his customers. The results of association analysis helped the retailer to generate best cross selling item list for each customer segment. In addition the retailer was also able to identify rules that worked well for specific channels like web and mail delivery.

CHALLENGE: PREDICTING CUSTOMER RESPONSE TO MARKETING OFFERS

The key challenge for any marketing manager is to reduce the marketing expense and improve customer response to company's offers.

To achieve this, the retailer needs insights that enable him to design an offer that is

- for the product that the customer desires
- at the price at which the customer values
- communicated using the medium preferred by customers

Method

This method, often called response modeling, aims to explain the factors which are responsible for getting a favorable response from the targeted customers.

The primary goal of response modeling is to generate a list of customers that are likely to respond to a given offer in the near future. Then customers with a higher propensity to respond can be targeted with special offers.

The basic idea behind response modeling is to improve customer response rates by targeting prospects that are most likely to respond to a particular campaign or promotion or to accept new products.

Instead of mailing or communicating with every customer in the customer database, you can select only those customers who exhibit highest probability of positive response.

This is achieved by building a data mining model based on historical data. After building the analytical model, the retailer executes the model considering the desired customer segments to predict their behavior. The process of executing the model is called scoring.

Note

It is necessary to conduct response modeling for a group of customers who have similar purchase behavior. Considering customers that are grouped on similar characteristics avoids negative influence on the results, which may be caused because of dissimilar purchase traits.

Best Practices

To get the complete benefit of response modeling, it should be combined with the results of segmentation and customer basket analysis. Thus the retailer will be equipped with answers to key questions, such as who to target, with what products, and using which media and offer.

Typical influencing indicators that are used to identify response are:

- customer demographics, such as age, gender, occupation, income band, marital status, education level, location
- shopping characteristics, such as the average value of a basket, the total value of the transactions, the average number of transactions, the total value of return transactions, the increase or decrease in transaction value over last quarter, segment migrations over a period, response to offers over a given period, the average proportion of full price items in baskets, and so on. These variables are typically aggregated over a period of 12 to 24 months. The period should be selected based on the type of retail business.

Business Utilization

Response modeling helps you to rank your customers so that the probability of reaching the responders is increased significantly, as compared to a random selection of customers in a campaign.

It enables you to:

- contact only the customers who are likely to respond. As a result, you can save money on marketing communications or spend the same amount of money but generate more business and improve the average transaction value.
- communicate the most relevant offers to the right customer segments and strengthen customer relationships, which will lead to loyal and more satisfied customers.
- couple this insight along with promotional analysis and forecasting for improvements in inventory control.

SAS Customer Analytics

SAS Customer Analytics assumes that the retailer has a periodic one-to-one communication with customers. The one-to-one communication or offer can be the same to a group of customers, as long as it is possible to track the customer's response to the offer. It offers response modeling for each customer segment and provides an easy–to-read business report for consumption by marketing team.

Real Life Examples

A retailer used the above technique to identify key purchase characteristics that were influential in promoting a first-time shopper to a regular customer and then to an excellent customer.

The retailer discovered several key influences in terms of

- type of products purchased in first month
- type of advertisement that received a high response
- number of shopping trips during the first three months

Response modeling enabled the retailer to design offers to accelerate conversion and improve customer's purchase frequency.

Another retailer aimed to improve the reactivation rate of their dormant customers. They used the response prediction technique and tested various marketing options to maximize the rate. They were able to reduce the reactivation cost and improve the reactivation rate (when compared to conventional sample-bundled direct mail).

In the process, the retailer discovered some key characteristics of the reactivated customers:

- longer membership record
- purchased a large amount at one time

CHALLENGE: RETAINING CUSTOMERS

Retailers want to retain core or high value customers. Hence, it is important to identify these customers early and take the necessary steps to retain them.

As a retailer, it is difficult to identify the exact instance of a customer's disassociation. Hence, you need to predict the customer's intention to leave the relationship. To accomplish this, a retailer needs to identify the customers that are at risk of discontinuing their purchases.

Imagine a scenario where a customer's membership with your loyalty program is about to expire, and the customer is unlikely to renew it. Chances are high that you would lose this customer to a competitor.

Method

A retention model identifies the customers who are at high risk of attrition before actual attrition occurs.

The scope of the analysis is dependent on the business objective and is defined by

- identifying the target event to be predicted (definition of attrition).In this example; the event is non-renewal of an expiring membership by the customer
- set of indicator variables that are used as basis for prediction
- period of observation
- the target population of customers to be analyzed

The process of building the model is iterative until a final model is produced.

Note

Exploration of data is an important step before modeling. Simple statistical analysis helps to understand the trend of the data and the variations in terms of characteristics for the customer segment being monitored.

Model creation is an iterative exercise and needs to be tested periodically by the analyst with some help from business users.

Best Practices

This analysis is executed for individual customer segments since customers who belong to the same segment tend to exhibit similar characteristics.

Typical influencing indicators are found to be

- customer demographics, such as age, gender, occupation, income band, marital status, education level
- shopping characteristics, such as monthly average ticket value, number of transactions, number of returns, quarterly sum of total value, sum of total returns, loyalty points accumulated, points redeemed, and bonus points accumulated
- duration of existing membership
- customer's migration history across various customer segments

Typically, six months of transaction data is used for the analysis. It is necessary to evaluate the time needed for data readiness, time needed for conducting analysis, and time needed to take business actions such as launching special offers for the high risk customers. For example; marketing initiatives or offers are communicated two or three months before an actual event, such as the expiration of membership.

Business Utilization

Recruiting new customers is much more expensive than retaining old ones. Hence, it is important to predict which existing customers are likely to leave or churn, so that strategies can be implemented to retain them. Early detection of customers who are likely to discontinue shopping is a key insight for every retailer. It enables the retailer to investigate the customer's shopping needs and points of dissatisfaction. Then the retailer can take appropriate steps to prevent the customer from leaving.

Consequently, retailers can spend marketing dollars more effectively by focusing on high-value customers who may be at risk of being lost.

SAS Customer Analytics

SAS Customer Analytics supports creation of a retention model. It provides all the necessary indicators in form of customer characteristics and purchase history.

Real Life Example

A retailer achieved the above objective using SAS Customer Analytics. Customers who had joined a particular loyalty program were chosen for the analysis.

The objective of the project was to improve retention by spotting members with a high risk of attrition before the end of their membership period. For this retailer, the membership is renewed every 2 years. The existing renewal rate was far below the desired renewal ratio.

Retention modeling uncovered the following factors, which influenced the renewal decision of members:

- recency of latest transaction
- years of membership
- total visit count in last three months
- average monthly redemption of reward points

This technique enabled the retailer to identify the members who were unlikely to renew their membership and initiate actions to attract them back.

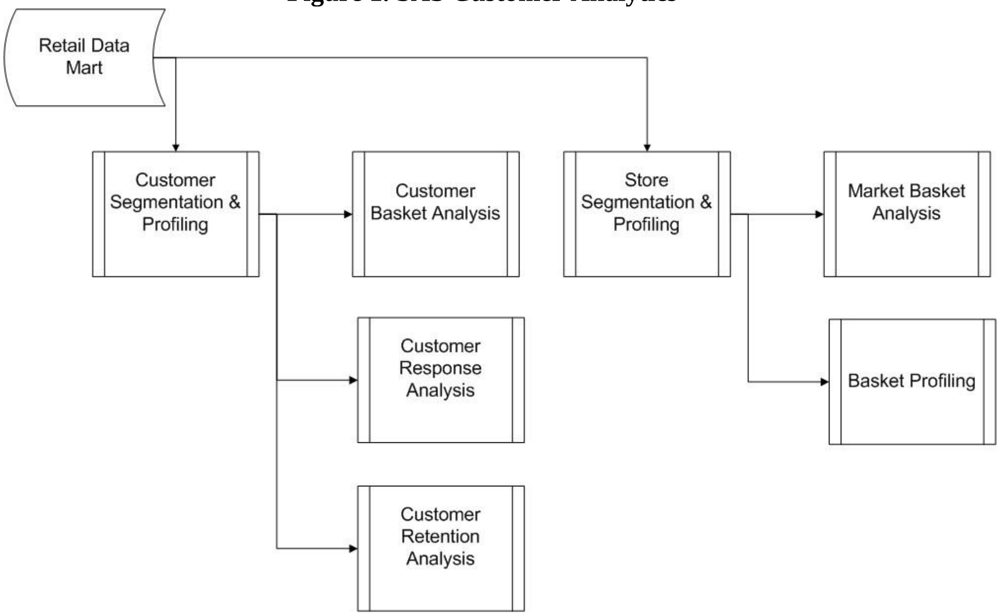
CONCLUSION

Customer analytics has been a popular approach over the years. Every retailer uses at least a basic form of customer targeting and attempts to localize his assortment and fine tune his offers.

Based on a varying degree of readiness, several retailers have implemented or are in process of implementing an analytical approach. It has helped to improve their response rate as well as increase customer loyalty. Every retailer has definitely discovered insights that aided to improve their bottom line. The constraints have been mainly around availability of customer and product data, which is mostly in the form of attributes.

SAS Customer Analytics enables a retailer to utilize the available data and move ahead in an incremental manner to gain better insights into customer characteristics, shopping behavior, and customer preferences. Using this information, the retailer can predict customer responses and the customer's association with the retail chain. SAS Customer Analytics provides the necessary framework, including a data model, analytical components, and reporting architecture to enable usage of derived insights into business processes. The insight generated from each of the analytical model is fed back to the Retail Data Mart and is available for consumption into the retail business process.

Figure 1. SAS Customer Analytics



As a retailer, SAS Customer Analytics helps you to derive insights from the visible as well as invisible customers and enables you to:

- understand your customers better and design strategies for individual customer segments
- manage products offerings
- improve on marketing communication and offers
- retain customers and gain loyalty

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RECOMMENDED READING

Doug Wielenga, “Identifying and Overcoming Common Data Mining Mistakes” SAS Global Forum 2007 Paper 073-2007

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