



## Know All About Your Customer

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**Abstract**— We are in the period where businesses must surely apprehend their customers' experience and behaviour to succeed (or even survive). It is imperative that they can quickly tap into Big Data sources and leverage that data to gain critical insight. This paper covers various channels that generate a large amount of data to feed business analytics and facilitate companies to know everything about their customer.

Today we are in the era of the customer where customers, not businesses, are pushing business settlements. For this purpose, it is more necessary than ever for companies to get to know their customers on a profound level, and they are beginning to tap their business analytics for this.

**Keywords**— Social media customer sentimental analysis, enterprise social computing, promotion optimization, segmentation, customer profitability, click stream analysis, CDR processing, multichannel interaction analysis, loyalty program analytics, churn prediction.

### I. INTRODUCTION

The Customers are the key people in any business organization. Today successful companies are focused on achieving the ways to know everything about their consumers. Business adopt technologies to optimize customer relationship that will allow for an organization striving to improve profitability, revenue and also customer satisfaction.

Why companies can now choose and acquire a broad range of channels for getting all information related to their customer. Action oriented analytics is necessary to provide the way to know and profile potential customers and refine sales. Companies that have this knowledge about their customers and use it to their profitable advantage are wildly successful.

### II. SOCIAL MEDIA CUSTOMER SENTIMENTAL ANALYSIS

Sentiments are central to almost activities of human because they are critical influencers of our behaviors. The opinions of others help us to make the right decision. Today businesses and organizations need to know customer or public opinions about their products and services. The new customers also want to know the opinions of experienced customers of a product before purchasing it, in a political election the candidates refer to others opinions before committing voting decision. In the past, to access the views of others it took long process depending on levels; when an individual needed it he or she asked colleagues and for institutions, it conducted the surveys.

Today the growth of social media simply the way of accessing opinions of others through different channels like posts and comments on facebook, twitter, discussions forum, blogs. These channels increase the relevant amount of information that enables the companies to know everything about their customer without spending much energy. However, finding and monitoring opinion on various channels and filtering information contained in them remains astonishment task because of the generation of diverse sites. Every site provides a large amount of opinion text that is very complicated for decoding. The reader will have difficulty filtering and identifying relevant sites and summarizing the sentiments from them, why we need the automated sentiment analysis tool.

In recent years social media, we have witnessed that information available on social media have helped to reshape businesses and sway public attitudes and emotions, which have profoundly impacted on our social and political systems.

Sentiment analysis has been examined at three levels: document level, sentence level and entity and aspect level.

**Document level** consists of classifying a whole opinion document express a positive or negative sentiment (Pang, Lee and Vaithyanathan, 2002; Turney, 2002). For example, given a product evaluation, the system determines whether the review expresses an overall positive or negative opinion about the product. This task commonly known as document-level sentiment classification. This level of analysis assumes that each document shows views on a single entity (e.g., a single product). Thus, it is not applicable to documents that evaluate or compare multiple objects (Bing Liu, 2012).

**Sentence level** determines whether each sentence expressed a positive, negative, or neutral opinion. This level of analysis related to subjectivity classification (Wiebe, Bruce and O'Hara, 1999), which identifies sentences (called objective sentences). That prove genuine information from sentences (called prejudiced sentences) that express personal views, opinions. Nevertheless, we should remark that subjectivity is not comparable to sentiment as many real sentences can signify ideas, e.g., "We purchased the car last month, and the shield wiper has happened off." Researchers have also analyzed clauses (Wilson, Wiebe, and Hwa, 2004[3]), but the clause level is still not enough, e.g., "Apple is doing very well in this lousy economy[2]."

**Entity and Aspect level:** Both the document level and the sentence level analyzes do not find what precisely people wished and did not like. Aspect level performs the fine-grained analysis. Aspect level was earlier called feature level (feature-based sentiment mining and summarization) (Hu and Liu, 2004). Rather of viewing at language constructs (documents, paragraphs, sentences, clauses or phrases), aspect level directly looks at the opinion itself. It based approaching the concept that an idea consists of a sentiment (positive or negative) and a target (of opinion).

An opinion without its target being recognized is of inadequate use. Understanding the weight of opinion Dummies also helps us learn the sentiment analysis problem better. For example, though the sentence "although the service is not that great, I still love this restaurant" obviously has a positive tone, we cannot say that this sentence is entirely active. In fact, the sentence is positive about the restaurant (emphasized) but cynical about its service (not indicated). In many applications, opinion targets are represented by items and their different aspects. Thus, the goal of this level of analysis is to discover sentiments on objects and their points. Both the document level and sentence level groups are already highly challenging. There are two types of opinions, i.e., regular opinions and comparative views (Jindal and Liu, 2006). A standard view denotes a sentiment only on a particular entity or an aspect of the substance, which expresses a positive attitude on the point tasted. A comparative opinion compares multiple objects based on some of their shared elements, which compares two products based on their feelings (an aspect) and expresses a preference.

Profoundly sentiment analysis allows companies to evaluate brand health through analyzing sentiment on a regular basis.

Sentiment analysis will enable an organization to understand people feelings towards their brand and their business.

Having an excellent tool to automate sentiment analysis allows the company to get a quick overview of their brand situation without having to dive into each mention. Knowing their customer based on social media sentiment analysis can also be used to measure the level of competition by finding how their brand or product is being perceived in comparison to their competitors. Gaining that opportunities allow to shape their market positioning against their competitors.

Finally, social media play an extremely role for knowing and understanding customer perceptions about their industry, brand, products and services by following both facts and opinions.

### **III. ENTERPRISE SOCIAL COMPUTING**

Today Businesses are no longer single-location, single building entities. The successful businesses built on global relationships, personalized communication, and easiest ways to access information. Enterprise social computing focuses on connecting businesses ecosystem like connecting people to people, data to data, content and people, through that connection companies can now discover and know their potential. Introducing social computing with the key walls of the enterprise drives an accelerated and improved communications culture that enables the organization to build greatest assets. The elements of social computing contain twitter, social networking, social bookmarking sites, instant messaging, wikis, multiplayer gaming and open source development and blogs. Web 2.0 is a framework for applications that supporting the processes of social computing.

Businesses with social computing can empower and motivate employees and, as a result, create benefit for the company. Companies can also use social computing to get closer to their customers and promote their brands. Social computing can improve customer relationship management (CRM), allowing companies to follow public opinion about its brand and respond quickly to customer problems. Many larger organizations have also begun to use crowdsourcing for research. Corporate use of social computing applications sometimes referred to as Enterprise 2.0.

Social computing accelerates key business collaboration element. It incorporates different approaches for collaboration in supporting infrastructure, well-defined user experiences, and tasks formulated for various business areas, taking into account the culture of how people interact and collaborate. It also refers specifically to how users build networks of relationships to explore their interests and activities with others (Rawn Shah, 2010). Social media, another traditional term, refers to online content or methods to create, share, or build upon this content through social media. By definition, a social environment is a virtual place where interactions between people involved in social computing take place. It has no shape or form; instead, think of it as the vessel in which the ideas and interactions were mixed in a complicated recipe. Let's explore some of the attributes that make exceptionally effective social computing for business collaboration. Although social computing offers ease in the creation, dissemination and exchange of information, viral network capacity inherent difference. With social computing, there can extend the reach of people and content beyond the established networks and the traditional boundaries of the workplace. This unique capability allows people to harness the intellectual capital of a larger ecosystem. Social computing lets their ask a question and gets help from people who do not know or are beyond its established network of friends and colleagues.

The capacity for self- organization of networks or communities of interest that harness the collective wisdom of a larger ecosystem allows companies to leverage the power of collaboration. Because they are transparent, communications do not increase general and administrative expenses. These integrated powers of social computing make it an extraordinary platform collaboration to achieve productivity gains, encourage innovation and enhance the value delivered to customers and other stakeholders.

### **IV. CUSTOMERS SEGMENTATION**

Customer for the businesses is the center of the universe; we cannot solve their customer needs if we do not know what they are. Getting anything that can help we understand and connect with their client is gaining step.

Businesses can by communicating and providing better offers to the customer based on their behavior and demographics. Customer segmentation allows to the activities the different ways to group their customers by Business rules; supervised clustering-decision trees, unsupervised clustering, etc. How should businesses use customer segmentation? That depends on the business goal and customer attributes; segmentation without a goal is no value.

Customer segmentation has the potential to allow vendors to address every customer in the most efficient manner. The use of a large amount of available data on customers (and potential customers). An analysis of customer segmentation allows marketers to identify discrete groups of customers with a high degree of accuracy based on the demographic, and behavioral and other parameters.

Focused on Customer Segmentation, it is always easier to make assumptions and use "hunches" to define rules that segment customers into logical groupings. For example, customers who came from a particular source, who live in a given place or who purchased a particular predictor service. However, these grouping on the high level rarely lead to desired results.

It is obvious that some customers will spend more than others during their relationship with a company. The best customers pay a lot for many years. Good customers pay modestly over an extended period, or will spend much in a short time. Others do not spend too much and will not take long.

The correct approach to the analysis and segmentation is to segment customers into groups based on predictions as to the total future company value.

Moreover, with the aim of dealing with each cluster (or individually) the most likely way to maximize that future, or for life, value.

Segmentation allows businesses to treat their customers in a relevant way based on their characteristics. Thus, it can satisfy all its customers, meeting the needs and desires of its customers, and also use the most appropriate methods in marketing more effectively. That segmentation should be used to determine what companies want to achieve and use that to decide on the plan. If a corporation has certain business rules to meet the business rule segmentation must be used. If we want to join an RFM (Recency, Frequency, and Monetary) approach or some other metrics that are provided themselves to the use of quantiles, then it will be your focus. If we have a known target, we can use that segmentation. The last approach, segmentation unsupervised k-means clustering, is certainly the most flexible and powerful approach that requires fewer assumptions about their client population. No matter which method we use, segmentation has no business value unless we have a clear objective. The performing segmentation should reflect that goal to be able to explore the results. Therefore, we should try more than one method to evaluate the "goodness" of different approaches in their environment. Businesses can even combine different methods if the situation warrants.

## **V. CLICKSTREAM ANALYSIS**

Clickstream analytics is the manner of collecting, analyzing, and reporting a total of data on which viewed pages - which are the outcome of the succession of mouse clicks each visitor makes. With clickstream businesses can know which pages web is visiting and in what order. With traffic analysis, web marketers can look at the key metrics that affect the user experience as some pages served to the user. Moreover, how fast or slow is to load a page, the amount of data forwarded before a user passes on, and how many times a visitor connects the back or stops button on their browser. By using clickstream marketers can quantify user behavior while on the site to get an idea of the effectiveness of the website to generate sales. Clickstream data shows what pages users persist, what items are placed into or removed from a shopping cart, and what items are purchased.

Clickstream data analysis helps marketers to know which paths on the web site are hot and which are not. This information allows companies were providing most of the resources of the Internet, where they were needed to optimize the user experience on the site.

Armed with information from clickstream analytics and traditional market assessment resources, marketers can optimize the click - way by making changes to the site to reduce bounce rate and increase conversions.

As drivers may take different routes to reach the same destination, customers take different paths online and end up buying the same product. The market basket analysis helps marketers discover what interests customers have in common, and shared paths they took to get to a particular purchase. Clickstream is valuable information to determine the most efficient way to a site visitor can take to research and buy a product.

Clickstream analysis provides a marketing advantage through predictive analysis Next Best Product (NBP). NBP is related to the basket analysis, NBP analysis helps marketers see what products, and customers tend to buy together. Because these purchasing correlations are recognized, and marketers can look at what the customer purchases and send offers in real time for the products, They most likely will buy next, increasing the chances of another sale, either during the same visit online or in the future. Clickstream analysis and other relevant user data give marketers a granular aspect of the individual customer segments of that are using the website. As a result, marketers can gain actionable information to help personalize the user experience and convert more visitors to the web browsers to buyers.

Clickstream analysis is a valuable tool companies can use to boost sales by optimizing every aspect of the user experience on their sites from the first click of the mouse to the last. However, Clickstream tracking can surrender even added value when consolidated with other customers' data, including transactions, interactions email, mobile and social information, CRM data and so on.

## **VI. CUSTOMER PROFITABILITY ANALYSIS**

Customer profitability analysis is a process of assessment which focuses on the cost allocation and revenues to segments of the client base, rather than allocating income and expenses to actual products, or units or departments up the corporate structure of the producer. Approaching the return from this angle can sometimes provide valuable information on how each step of the design process, manufacturing, and ultimately selling a good or service incurs the cost and generates income. Many companies use customer profitability analysis as a means of streamlining operations, so they provide the highest degree of efficiency and cost-effectiveness, creating the lowest level of cost.

Normally the traditional cost accounting is not able to identify the costs of products and services, distribution costs and delivery cost for individual customers. Businesses can help identify the client activities and track costs allocated to specific customers. Traditional cost accounting can provide unique information management customers and customer segments.

The Benefits include: protecting existing highly profitable customers, and reprising expensive services, based on cost-to-serve; Discounting to gain business with a low cost-to-serve clients; negotiating win-win relationships that lower service costs to cooperative customers; conceding permanent loss customers to competitors;

Attempting to capture high-profit customers from competitors (Kaplan and Cooper, 1998:181). Customer profitability analysis has become an important new management accounting tool based on the recognition that each client is different and that each dollar no revenue also contributes to the firm profitability. Customers use the company resources differently; therefore customer costs vary from one customer to another.

The following issues should consider in customer profitability analysis: how to develop reliable customer revenues; Customer and cost information; how to recognize future downstream customer costs; how to incorporate a horizon of several in the analysis; how to know the different driver's customer costs. (Foster and Gupta Sjoblom 1996: 10). Customer profitability analysis requires a more comprehensive review of costs associated with customer service.

Customer Profitability

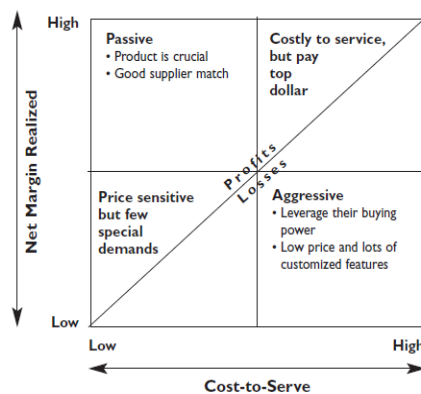


Figure 1: Customer profitability

Source: Kaplan and Cooper 1998:193

This ABC model based on the client facilitates company analysis how to become a provider to clients who want low-cost products and minimum service and also how to provide services to high-margin, high cost - to Service customers. Thus profitable customers it can be acquired and retained in many different forms. Increasingly, companies are the use of pricing based on where menus cost pricing to the client is defined by both the amount and type of products purchased and by the method of delivery and customer service costs. Menu based pricing based on ABC model that determines the client service costs and handling (Kaplan and Cooper, 1998: 193-194).

The business objective is not only to improve employee or customer satisfaction at any price, but rather to manage those relationships to improve long-term corporate profitability. Managers should understand these relationships and drivers' customer profitability so they can better manage and improve organizational performance. Managers must make decisions always involving compensation. They need to determine how much to invest in human resources and clients. To make these decisions they have to analyze returns that are likely from those investments, costs of such investments and management incentives instead of the investments. This guide provides a better understanding of customer profitability analysis to help managers in the allocation of corporate resources. Holding customer profitability and understanding the drivers of clients and corporate value can lead to improving the overall company performance.

## VII. CDR PROCESSING

Call monitoring and recording applications used by telecommunications companies generate an enormous amount of call detail records (CDR), in real time, and businesses regularly need to take advantage of this data to increase productivity. The volume of appeals and data captured by the call monitoring applications is so high that it is impossible to analyze and conclude the network performance and customer manually.

The process of creating a call billing record by the band and handling of billing event and service record information associated with the call. Call record processing comprises receiving the call record, guiding the record for the particular billing account, determining the history, and routing the document to the appropriate database for collections or account settlement (Avi Ofrane, Mr. Lawrence Harte, 2013).

Call Detail Record (CDR) Processing Operation

This figure shows the general process that is used to classify and measure (bill) a call. This diagram reveals that a call detail record results as it catches within the rating process. In the first level, a rate band is determined. Then, the identification information on the CDR is utilized to identify a particular customer's account (guide the record). The client's rate plan created and the unit (usage) and heated (per event) charging rates are accumulated and counted. The fresh information (rate band, call charge amount) added to the call detail record and it is moved to the billing pool, as it is ready to be billed (Avi Ofrane, Mr. Lawrence Harte, 2013).

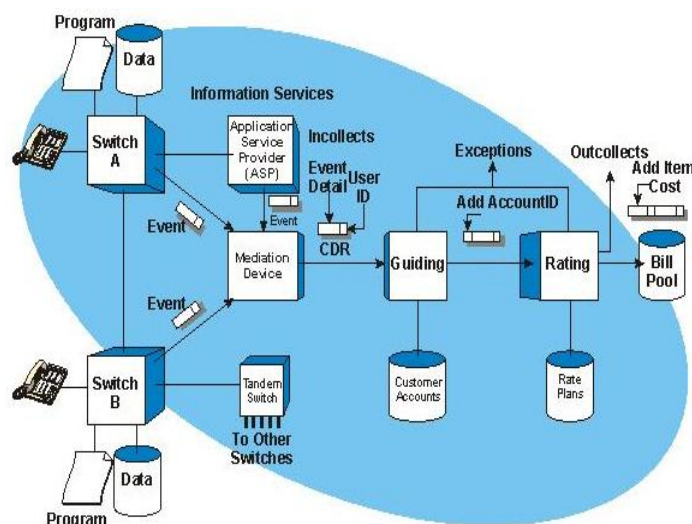


Figure 2: CDR Processing operation

**Source:** Avi Ofrane, Mr. Lawrence Harte 2013:1

When “problem calls” occur sparingly, but often enough, can negatively affect the productivity and efficiency of a thriving business. These calls are often not reproducible or predictable.

For example, when a call swiftly withdraws during the core of a call in one way without other; there is the echo, or noise, or level issues in one way and not the other. There are signaling matters such as - “no win”, “no ringing or ringback”, “no call contact”; “mid-call digits” not passed reliably during an IVR transaction[1]; figures are split or consolidated causing incorrect called or calling numbers.

When such calls happen, and users complain, engineers want data to investigate “why such a problem happened”, but the volume of appeals presents a needle in a haystack condition. Analyzing the CDRs allows us to Drill-down to problem calls and identifies the cause; Monitor everyday transactions; Distinguish customer behavior; Network usage and performance monitoring or periodic or weekly basis; trunk sizing and utilization.

### VIII. MULTICHANNEL INTERACTION ANALYSIS

All day, customer service departments manipulate thousands of interactions. Now, beginning companies are taking account of both traditional channels and new services (i.e. Customers calling, chatting, physical output, emailing, field service, Voice, the web, etc.) to serve demographic segment changes in all geographies. It is also providing customer access to new channels while improving flexibility in the delivery of customer value. Customers expect to treat like multichannel buyers entitled to use the web to search for information about products, buy and negotiate returns through any number of outlets. They usually examine items more than once across multiple channels. For example, we can research online, via the store, flip through a catalog at home, access to a mobile application, and then go online to do more research before making their purchase decisions. With these sophisticated multi-channel strategies, many companies are enjoying a strong base and revenue growth in their business. The company that uses best practices strive to provide an experience that is uniformly sales consistent, convenient, appropriate and compassionate to customer demands across all channels, to execute demand generation in the multichannel environment.

These interactions with customers through multichannel are a gold mine of vision, helping we get closer to customers.

Each interaction, passing over any communication channel is an opportunity for their business to improve productivity, customer loyalty, and revenue growth. The ability to seize these opportunities through millions of customer interactions is what allows service organizations to provide exceptional service.

Multichannel interactions analysis handles each day in viable real-time business decisions using post call analysis.

Multichannel Interaction analysis enable the businesses to listen and analyze their customer’ past and current activities; understand what drives their customers to contact the contact center; to predict which client is about churn or buy product; to identify the most effective best practices and highlight each agent’s knowledge and skills gaps .

Multichannel Interaction analysis allows businesses to have a unified view of these various communications channels and enables companies to extract the enormous amount of valuable information from the interactions through them. Leveraging the knowledge once was hidden, businesses can boost customer satisfaction and a positive impact on the primary metrics such as first contact resolution, average handling time, and loss of customers, sales, and collection efficiency debts.

### IX. LOYALTY PROGRAM ANALYTICS

Building relationships among their most valuable and loyal customers can increase profit margins for their business. Loyalty program Analytics gives timely fact-based insight into the whole process loyalty program - including the effectiveness of promotions and loyalty relationships. It offers insight that is personalized, relevant and actionable to allow employees to make better decisions. Companies can optimize their programs to drive member behavior, create value and reduce costs so the company can quickly realize profits.

Loyalty programs have become sophisticated marketing tools by applying big data analytics, which analyzes the collected customer information by correlations, patterns and trends in customer buying behavior. With the results of this analysis, retailers can now accurately predict the content of a client's shopping basket and can be applied properly oriented marketing. Analysis of significant data is also used by retailers to take operational decisions such as where to open a new store, what products to stock and what discounts offered in the shop. All is forsaking of customers and revenue from retail.

## X. CHURN PREDICTION

In the businesses and telecommunication, customers can choose from multiple service providers and actively exercising rights of switching service provider to another. The term churn is a combination of *change* and *turns* that means the discontinuation of a contract, it used also to describe customer attrition or loss.

The churned customers grouped into three main groups:

**Active /deliberate** -where the client decides to terminate his contract and choose another service provider because of different reasons like dissatisfaction with the quality of service; too costly , not competitive price plans, no rewards for customer loyalty, no perception of the service plan, bad support, no information about the reasons and predicted resolution time for service problems, no continuity or fault resolution, privacy concerns, etc.

**Rotational /incidental-** customer quit the contract without the aim of switching to a competitor. Reasons for this are changes in the circumstances that prevent the consumer from further claiming the service, e.g. \_financial problems, leading to hopelessness of payment; or change of the geographical location of the client to a place where the company is not present or the service is unavailable (Vladislav Lazarov, Marius Capota).

**Passive / non-voluntary churn** –Here company terminates the contract of his customer itself. To predict for active and rotational churn (voluntary churn), it is very complicated. Moreover, while the churn incidental only explains a small fraction of the overall churn is particularly interesting to predict and react Taking adequate measures to prevent the deliberate rotation. In order to avoid voluntary termination of contract customers, however, the company has to know the position of churners with a small probability of error in prediction and why this particular customer c has decided to leave the company to a competitor.

## XI. CONCLUSION

Overall, there is much to be passionate about business analytics at this point. Its applications extend to almost all fields of practice and research including healthcare, retail and manufacturing.

Capture the data whether their customers interact with their website/web application from a smartphone/tablet/computer. Enrich that data by associating it with data that resides in different data stores to make sure we can "connect the dots." Compare the data as early as possible in their processing to gain complete, accurate and timely and effective insights. In brief, by making sure the right data is ready for efficient analytics, companies can discover new ways to appreciate truly their customer experience and optimize business results.

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