

Implementing Social CRM System for an Online Grocery Shopping Platform Using Customer Reviews

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Abstract— At the beginning of the twenty-first century, a stage began where the prevailing business orientation focused on customer relationship management (CRM), where each customer was treated individually and uniquely, depending on their preferences. Social CRM can be defined as the use of social media services, techniques and technology to enable organizations to engage with their customers. It is a business strategy, supported by a business rules, processes, technology platform and social characteristics, designed to connect the customer in a collaborative conversation. It's the company's response to the customer's ownership of the conversation. Numerous studies have shown the benefits of integrating data from social media/networks into CRM. Moreover, Social CRM benefits from Big Data as it is a technology with a real ability to transform very major aspects of customer relationship management and allows knowledge to be extracted from customer information and converted, in an effective, protected and scalable way, into real business value.

Key Words: customer relationship management, social customer relationship management, Big Data

1. INTRODUCTION

Over the past decade, Customer Relationship Management has been the strategic approach that most of the companies had taken in trying to figure out how to supervise the customer's behavior. Gathering the data about the customer and tracking all the customer transactions was the way through which CRM used to ascertain the individual customer's thinking [1]. Now-a-days social networks are nodes of individual, group and related systems. CRM is not just for sales. Some of the biggest gains in productivity can come from moving beyond CRM as a sales and marketing tool and embedding it in your business – from HR to customer services and Supply-chain management.

Before you actually start selling, the first important rule of sales is to get to know your prospects well: what interests them, what kind of service they are looking for, etc. Today,

one of the best ways to understand this is by following and keeping track of what your prospects say on social media. Millions of people post updates on Twitter, Facebook, Google+, etc. Among those, there are some who talk about the products they are using, their requirements in business, who their major influencers in decision-making are and also which product/service they consider for their needs [5].

Social CRM, also known as CRM 2.0, grew from the changes in the empowerment of the customer. It means that each customer has the products, tools, services, and experiences he or she needs to sculpt an individual interactive relationship with the company in a way that satisfies each of their personal agendas [3]. When a customer commitment policy is effective, with the successful support of social CRM tools and processes, there is a commonly derived benefit planned from the beginning.

Social CRM simply adds a social aspect to the way you think about customers and your relationship with them.

2. RELATED WORK

[2] This paper discusses that the organizations have to understand the importance of using social media, gathering social data, and fusing them into a CRM (Customer Relationship Management). As a result, it has driven companies to appreciate the customer needs and enhance the development procedure of their items or their administrations quality. A multi-agent framework is proposed in this work for extraction online product reputation. Mentioning social media means that we are brought to consider the colossal volumes of information (Big Data).

[3] This paper discusses about Big Data technology which is being able to overcome the difficulties involved in understanding and extracting relevant knowledge from different kinds of data. Also Big Data being a technology with a real ability to transform very significant aspects of customer relationship management, thereby providing

companies with a competitive advantage over its competitors. It allows knowledge to be extracted from customer information and converted, in an effective, secure and scalable way, into real business value. From customer information and through Big Data, a company is able to reveal hidden knowledge of the customer, turning it into opportunities to maximize the business value of each customer, to act preventively, to improve customer satisfaction, to identify new opportunities, or to predict their tendency and intention profile. The paper also discusses that companies are harnessing the power of Big Data and analytics to apply it in customer relationship management.

[4] This paper collects social data then integrates them into a CRM (Customer Relationship Management) which leads companies to understand the customer needs and therefore improves the development process of their products or their services quality. The paper proposes a multi-agent framework for analyzing extracted opinions from social media. In the development process, the paper brings to consideration huge volumes of data (Big Data) and the response time. For this an architecture based on Map/Reduce analysis using Hadoop is made in order to perform the data refinement and sentiment analysis (Sentigem). Finally, a study case using Twitter (Twitter4J API) as a data source is made to verify the effectiveness of the proposed framework.

[5] Web Crawlers works on the extraction of the data from a specific website. The paper proposes a two-step framework namely Smartcrawler for efficient harvesting of deep web interfaces. In the first stage, Smartcrawler performs site-based searching for center pages with the help of search engines, avoiding visiting a large number of pages. To accomplish more accurate results for a focused crawl, Smartcrawler ranks websites to prioritize highly relevant ones for a given topic. And in the second stage, Smartcrawler achieves fast in-site searching by excavating most relevant links with an adaptive link-ranking. To reduce bias on visiting some highly relevant links in hidden web directories. Also the paper discusses about the designing of a link tree data structure to achieve wider exposure for a website.

[6] Aspect-based opinion mining is a combination of Natural Language Processing and Sentiment Analysis. There are three main levels of sentiment analysis: document level, sentence level and aspect level. The paper focuses on the aspect level sentiment analysis or aspect based opinion mining. While analyzing aspect based opinion mining certain factors have to be considered which are: multi-aspect sentences, implicit aspect, domain or language adaptability, comparative sentences and accuracy. Such factors help in analyzing an effective aspect based opinion model. The paper presents a useful model for aspect based opinion mining which covers most of the critical factors for effective opinion mining.

[7] The growth of technology of World Wide Web has changed the way of expressing people’s views, opinions and Sentiments about others. Mostly they use blogs, Social sites, online discussions etc. This leads to the generation of massive amount of data. The paper leverages the sentimental analysis of twitter data using R language which is helpful for collecting the sentiments information in the form of either positive score, negative score or somewhere in between them. When the extraction of the information from petabytes of data is performed the focus is shifted on the analysis of big data. The paper shows the performance estimation on two different platforms R language and Rhadoop tool.

3. PROPOSED ARCHITECTURE

The system architecture consists of all the phases. First, the reviews are collected. After extracting the data, refinement should be done and then analysis of data is performed. The data is to be stored in database which contain all the information and that data is provided to user interface for visualizing the data.

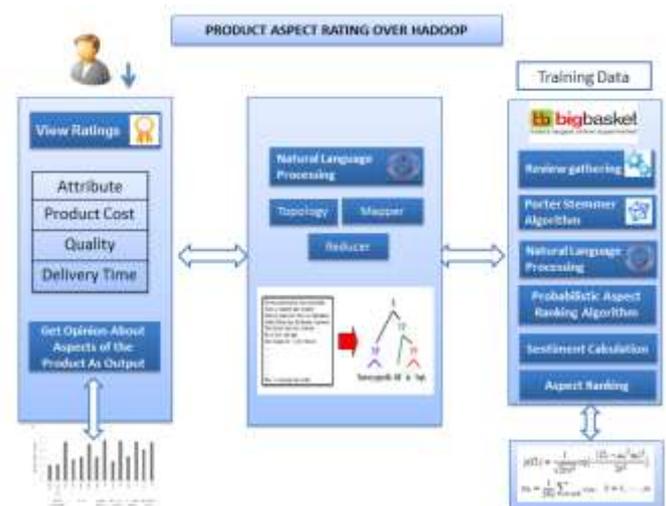


Fig.1 Architecture

4. PROPOSED METHOD

A. Natural Language Processing (NLP)

Natural Language Processing (NLP) pass on to AI technique of communicating with an intellectual system using a natural language such as English. Natural Language is mandatory when you want to hear decision from a dialogue based clinical expert system, etc.

Machine learning refers to the ability of computers to learn from data gathered in its previous experience so that can make inferences on its decisions and behavior when it encounters new data. It evolved from the field of pattern detection and computational learning theory. Whereas programmed systems follow fixed rules for behavior,

machine learning systems get a feel for their behavior based on training data and continuously evolving new data it gathers. There are three reasons for studying natural language processing:

You want a computer to communicate with users in their terms; you would rather not force users to learn a new language. This is essential for familiar users and those users, such as managers and children, who have neither the time nor the inclination to learn new interaction skills.

There is a large storage of information recorded in natural language that could be accessible via computers. Information is continuously generated in many forms such as books, news, business and government reports, and scientific papers, many of which are available online. A system requires proper arrangement of information to process natural language to recover much of the information available on computers. Problems of AI arise in a very clear and unambiguous form in natural language processing and, thus, it is a good domain in which to experiment with general theories.

The NLP make computers to carry out following tasks with the natural languages humans use. The input and output of an NLP system can be :

- Speech
- Written Text

The main components of NLP as given –

1. Natural Language Understanding (NLU)

Understanding involves the following tasks –

- Map the given input into useful representations.
- Analyzing different aspects of the language.

2. Natural Language Generation (NLG)

It is the course of creating major phrases and sentences in the form of natural language from some internal depiction.

It involves –

- **Text Scheduling** – It includes retrieving the relevant content from knowledge base.
- **Sentence planning** – It includes choosing required words, forming meaningful phrases, setting tone of the sentence.
- **Text comprehension** – It is mapping sentence plan into sentence structure.

B. Porter stemming algorithm

Porter stemmer' is a method for removing the commoner flexional endings and morphological from words in English. Following are the steps of this algorithm:-

- Gets rid of plurals and -ed or -ing suffixes
- Turns terminal y to i when there is another vowel in the system.
- Maps double suffixes to single ones: -ization, ational, etc.
- Deals with suffixes, -full, -ness etc.
- Takes off -ant, -ence, etc.

Removes a final –e

5. RESULTS AND ANALYSIS

Analysis of reviews and categorizing them according to predefined aspects is done in the implementation part. Sentiment of every word is calculated according to sentiwordnet dictionary.

The customer's reviews are fetched by using a web scrapper. A web scrapper is an API used to extract meaningful data from a website. The reviews are collected from a social networking site, mouthshut.com.



Fig 2. Big Basket Sentiment Rating



Fig 3. Review by the User

Reviews are analyzed and studied with the help of sentiment analysis and rating is given according to the services. Figure 2 gives the rating given by the user.



Fig 4. Big Basket Rating

6. CONCLUSIONS

Social media can be a very important tool in aiding company's product development cycle. It helps in better understanding of customer's needs and helps in making good relations with them. Social CRM helps retain more customers and also helps in the process of sales and marketing. It enables company's management to take better decisions. Most of the businesses are leading to implement social CRM as part of their daily activities. Social CRM gives perfect feel of what customer's needs are and helps management for fulfilling customer's need. When a customer commitment policy is effective, with the successful support of social CRM tools and processes, there is a commonly derived benefit planned from the beginning. The CRM can be implemented in cloud which is useful for small business and start-up.

7. FUTURE SCOPE

Social Media and E-commerce are a boon to the users and the best key to this is to increase the valuation of the site, to promote it in a better way so that the number of users will increase. One of the important aspects in this is the Recommender Systems. Recommender Systems helps the users to view items which are similar and much better than the item the user has currently viewed or bought. This system being the future scope will not only help the manager but will help the users to a great extent which will increase their valuation and net turn over will rise. Also, rest of the problems encounter in the products will be ultimately vanished as the user will obviously find an alternative to the product with which he/she is currently not satisfied.

REFERENCES

- [1] Shenghua Liu, Xueqi Cheng, Fuxin Li, and Fangtao Li, "TASC: Topic- Adaptive Sentiment Classification on Dynamic Tweets", IEEE Transactions on Knowledge and Data Engineering.
- [2] Fatima ZohraEnnaji, Abdelaziz El Fazziki, Mohamed Sadgal, "Social intelligence framework: Extracting and analyzing opinions for social CRM", Computer Systems and Applications (AICCSA), 2015 IEEE/ACS 12th International Conference on 17-20 November 2015.
- [3] Sergio Orenga-Roglá and Ricardo Chalmeta, "Social customer relationship management: taking advantage of Web 2.0 and Big Data technologies", SpringerPlus 2016 5:1462
- [4] Fatima ZohraEnnaji, Abdelaziz El Fazziki, Hasna El Alaoui El Abdallaoui, AbderahmaneSadiq, Mohamed Sadgil, DjamalBenslimane, "Multi-Agent Framework for Social CRM: Extracting and Analyzing Opinions", 2016.
- [5] Feng Zhao, Jingyu Zhou, Chang Nie, Heqing Huang, Hai Jin, "SmartCrawler: A Two-stage Crawler for efficiently harvesting Deep-Web Interfaces" IEEE 2015.
- [6] JibránMir, MuhammadUsman, "An Effective Model for Aspect Based Opinion Mining for Social Reviews" ICDIM 2015.
- [7] Sunny Kumar, Paramjeet Singh, Shaveta Rani, "Sentimental Analysis of Social Media Using R Language and Hadoop: Rhadoop", IEEE 2016.