Identification of Telecom Volatile Customers Using a Particle Swarm Optimized K-Means Clustering on Their Personality Traits Analysis

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ABSTRACT

This research uses the telecom customers personality traits (extraversion, agreeableness, and neuroticism) to identify the volatile customers that always use the negative word of mouth (NWOM) in communications with others. Hence, a combination of text analysis and a personality analysis tool has been used to determine the customers personality factors from their chatting textual data. A particle swarm optimized k-means was used in the clustering process. The results provide an overview on how a chatbot conversation text represent the customer behavior. Optimizing the k-means cluster using partial swarm achieves a higher accuracy than using the traditional clustering technique.

KEYWORDS
Customer Loyalty, Customer Satisfaction, Particle Swarm Optimized K-Means, Personality Insight, Personality Traits, Telecom Customers, Word of Mouth

1. INTRODUCTION

When we work with a customer, we should know that customer satisfaction is the first important target (Hill & Alexander, 2006). In general, all the companies depend on customers as their backbone, especially the telecom companies on the significant increase in the number of telecom companies, that leads to customer migration from one company to another and create continuous warfare between the companies. So, all these companies try not only to retain their current customers but also to increase them; but how? And which set of customers that the company should take care of more than others? When dealing with customer behavior there is a set of customers who usually use the word-of-mouth and the same set of customers can negatively affect their neighbors, family, and friends. So, to determine which customers that may affect negatively in the telecom company reputation; will help the telecom company to proactively interact with them. But what is the way to determine this volatile customer? The proposed system defines a solution for all of these problems and more by observing the behavioral characteristics driven from the telecom customer conversations on the chatbot.

The problem entities are the identification of the volatile telecom customers that usually use the word of mouth; If they have a problem with the company, they may use the negative word of mouth and easily affect many other customers like their family friends and neighbors (Sato et al., 2018; Kim et al., 2016; Wilson et al., 2017). If the telecom company provides nothing to proactively interact with them and wins their consent and loyalty, they may cost the telecom company a heavy loss and
puts it in an awkward position. So, this paper tries to help telecom companies to easily determine the high risk and volatile customers by observing behavioral characteristics derived from there textual data on the chatbot conversations and the language used in the conversation text. Analyzing customer textual data defines the big five personality traits that use to determine customer loyalty and customer satisfaction. References Castillo and Javier (2017) and Menidjel and Bilgihan (2017) show that customer loyalty can be determined from the Extraversion, Neuroticism and agreeableness values of the personality traits. Finally, and based on customer loyalty and use of word-of-mouth the proposed system divides customers into four clusters according to the dangerous percent. Hence, the proposed system uses the unsupervised machine learning k-means method in the clustering process whereas the k-means algorithm considers the best data mining clustering algorithm. Su et al. (2017) also says the proposed system uses the particle optimization technique to optimize the clustering results (Yazdani et al., 2017).

The most effective initial therapy for the volatile customer problem occurs if we can discover them in the early days of the problem. The late of discovering this problem or ignoring it costs the telecom company a heavy loss. So, detecting this problem automatically from the customer conversation textual data using machine learning, deep learning, and personality analysis is a vital process to give early warnings before it gets dangerous. Over the past years, there were some partially successful trials for finding a solution to increase the telecom customer loyalty by found a positive correlation between service recovery and customer satisfaction (Ibrahim et al., 2018) Reference Menidjel and Bilgihan (2017) try to find the relationship between big five personality traits, customer empowerment and customer satisfaction in the retail industry using the big five traits.

The assumption behind this methodology is that the calculated effectiveness is that about 92% of the problem symptoms are recognized by analyzing the values of the Neuroticism, Extraversion, and agreeableness of the big five traits of the telecom customer that can see in the customer textual data; as we know that “The pen is mightier than the sword” so we target the textual data of the telecom customer, not something else. All of those symptoms may cannot visually recognizable and cannot be spotted by the easy of the proposed solution. The proposed system is built over a state-of-the-art machine learning algorithm used for the learning process of personality analysis. It is developed by combining these four factors: 1. The chatbot system, 2. Text and personality analysis, 3. Clustering process, and 4.

1.1. Feedback Process

The proposed system contacts with the telecom customers using an AI chatbot and uses the conversation textual data to calculate the customer personality traits (extraversion, neuroticism, and agreeableness) that widely affects the customer loyalty and WOM. What the proposed system tries to do is to automatically recognize the volatile telecom customers and win their loyalty using a mixture of personality analysis techniques and some sort of machine learning and AI algorithms. The proposed system uses IBM Watson Personality insights to analyze the telecom customer personality; whereas it takes the text of the conversation between telecom customer and AI chatbot and returns the customer traits. Really the proposed system helps the telecoms to understand its weakness point for re-correcting it, helps all kind of user to contact with the telecom company by developing a chatbot that understands the both of standard and slang language.

In this article, we will show how companies use their customers’ personality insights to identify the volatile customers, how they compute customer personality traits from the textual data. We will discuss the word of mouth phenomenon (its meaning, types, benefits, and damages). This article will discuss how companies can determine the word of mouth phenomenon in their customer using personality traits. And last this article discuss the conclusion, results, and future work.
A User Centered Innovation Approach Identifying Key User Values for the E-Newspaper
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