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Twitter Sentiment to Analyze Net Brand Reputation of Mobile Phone Providers

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Abstract

We may see competition among mobile providers to acquire new customers through campaign and advertisement war, especially on social media. The problem arises on how to measure the brand reputation of these providers based on people response on their services quality. This paper addresses this issue by measuring brand reputation based on customer satisfaction through customer's sentiment analysis from Twitter data. Sample model is built and extracted from 10.000 raw Twitter messages data from January to March 2015 of top three mobile providers in Indonesia. We compared several features extractions, algorithms, and the classification schemes. After data cleaning and data balancing, the sentiments are classified and compared using three different algorithms: Naïve Bayes, Support Vector Machine, and Decision Tree classifier method. We measure customer satisfaction on five products: 3G, 4G, Short Messaging, Voice and Internet services. This paper also discusses some correlated business insights in a telecommunication services industry. Based on the overall comparison of these five products, the NBR scores for PT XL Axiata Tbk, PT Telkomsel Tbk, and PT Indosat Tbk are 32.3%, 19.0%, and 10.9% respectively.

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Keywords: Naïve Bayes; support vector machine; decision tree; sentiment analysis; brand reputation; twitter; Indonesia

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1. Introduction

Currently, social media has become more popular among young and senior citizens. Social media users often show their expression by writing their complaints to many objects. In 2014, Indonesia had 20 million active users of Twitter [1]. This number highlights the importance of social media channel for sales campaign of many products and services. Nowadays, social media marketing becoming one of the key strategic brand activities in the world. Good responses from people could awake the desire for a product, create brand awareness, encourage a positive attitude toward the product (brand reputation) and affect intentions for buying the products [11]. Driven by this phenomenon, many telco companies trying to acquire more customers with social media marketing. This paper researches sentiment based brand reputation analysis of three well-known mobile providers in Indonesia. They are PT XL Axiata Tbk, PT

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Telkomsel Tbk, and PT Indosat Tbk.Currently, telco companies widely uses NPS (Net Promotor Score) to measure their customer loyalty and satisfaction [12]. Socialbakers shows a massive database of Telco social media statistics using NPS [2]. The common claim is that a higher NPS leads to an increase in customer acquisition. However, viewed from social media perspective, Socialbakers shows that some Telco companies have high NPS score but fewer followers. We conjecture that NPS is not accurate enough to evaluate social media campaign. We argue that NPS might be insufficient and limited in its capability in measuring user satisfaction through social media due to following reasons [12, 14]:

- The method used by NPS is aimed only at existing subscribers (current customers).
- NPS is based on the ultimate questions, i.e., by asking recommendation questions to the customers.
- NPS survey is conducted by sampling some customers. The bigger sample size, the more expensive.
- The presented information does not provide detail breakdown analysis on each product.

As mentioned above, we proposed another quantitative measurement to measure people satisfaction by using Net Brand Reputations (NBR) through sentiment analysis. The differences between NPS and NBR methods are shown in Table 1.

Table 1. Method's Differences

Net Promotor Score	Net Brand Reputation
Collecting data by asking customer recommendation (The Ultimate Question).	Collecting data from social media comments (social media listening).
The score simply by existing active subscriber or customer of the brand.	The scores obtained from the entire community without segmentation.
Quantitative measurement with the following parameters: - Promotor (9-10) - Passive (7-8) - Detractor (0-6)	Quantitative measurement from positive and negative confidence from sentiment classification.

2. Related Work

Automatic sentiment analysis through machine learning has been widely studied. Cho et al. proposed a method to visualize the temporal and spatial distribution of brand images using Twitter opinion mining. They build sentiment dictionary for Korean words [14]. This paper showed how Twitter data could be used for brand image analysis across time and locations. Also, the temporal changes in the brand associative network showed which keywords are the focuses of people awareness.

Taysir et al. proposed opinion mining methodology in helping new customers to make a decision about buying or not buying a product by summarizing the reviews [15]. They classified the review's sentences of a product according to features by calculating the cosine similarity. The study ranked features and polarity. The feature classification categorized a class of product using its synonyms. The polarity classification classified sentences into two categories, either positive or negative, according to the polarity of the sentence.

Yu Zhang and Pedro Desouza presented a concept in selecting appropriate classifier based on the features and qualities of data sources. They compare the performances of five classifier with three popular data source in social media: Twitter, Amazon Customer Reviews, and Movie Reviews [4]. They also developed a new sentiment analysis algorithm to enhance the predictive power and accuracy.

Elliot Bricker presented automated sentiment analysis that focuses on analyzing the content of the online post, determining whether they are positive, negative or neutral [17]. The net sentiment score computes the ratio of positive and negative mentions on a topic. NSS helping company to track their brands. Shiv Singh also measures social media influence by identifying net sentiment for some brands

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