Social Media Food Battle: Pizza Hut & Domino's Sentiment Analysis

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Abstract

Today, utilising and analysing social web data cannot be ignorant of marketing, which has a great influence on brands operations and the choices of customers. In this paper, we do a comparison of Pizza Hut and Domino’s by using the data extracted from Twitter. To find out which brand is more popular, we do the research in two aspects, the one is to investigate the response from the public towards the tweets posted from official accounts, by counting the number of retweets, likes, and comments of specific tweets; the other is applying sentiment analysis on the general tweets posted from the public. We use tweepy to pre-process Twitter data, use TextBlob to do sentiment analysis, and visualise the data into bar plots. From the results of both aspects, we find Domino’s is more popular than Pizaa hut? More precise

Key Words

Twitter data, sentiment analysis, social web, Pizza Hut, Domino’s

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Chapter 1 Introduction

1.1 Background

Social media marketing, more?

In modern society, social web sites such as Facebook, Twitter is an effective and important way in the marketing field. It makes communication between brands and consumers easier and tighter (based on immediate and constant interaction), giving a feedback platform for consumers and a developing platform for brands [1]. Many companies send news and information about their products or activities to the social web platform, to give the public an introduction or recommendation, so as to achieve the purpose of advertising and marketing. Therefore, analysing the data from social web sites is necessary and useful for companies, which can help acquire online reputation, develop strategies and improve customer service.

[1] Impact of Social Media on Marketing, Rajiv Kaushik

1.2 Research Question

In this paper, we focus on two famous brands in the pizza market: Pizza Hut and Domino’s Pizza. We aim to answer the question that which brand the public prefers based on the analysis of data from the tweets of official accounts and general users.

Chapter 2 Understand how the social web works

From the appearance of the first company CompuServe which provides social service in 1969, the form of social media has changed and developed significantly, showed in the evolution of newspapers/magazines to web technologies on the Internet/phones [1]. People today share and get information on different social web sites, creating and consuming a considerable amount of data every second. There are many typical social web sites at present, such as Twitter, Couchsurfing in the category of social networking sites and YouTube in the category of social media sites. Meanwhile, apps like Twitter also provide a developer portal to developers to set up developer environments and get access to the premium APIs. Twitter provides three layers of search APIs which are standard, premium, and enterprise. Among them, only standard is open for everyone, but you can request access to a free sandbox version of the premium API by making an application [2].

[2] Analysing Social Media Marketing on Twitter using Sentiment Analysis, MAX MATTILA, HASSAN SALMAN

After understanding the knowledge of the social web, we design a successful social web application by using the Twitter developer, to get the authorization access to Twitter account data. The details are shown in the following steps. First, we go to https://apps.twitter.com/ and use "create an app" to create a developer account, then we follow the instruction after receiving the confirmation email to create an app, after that, through “Keys and Token” item on the webpage, we gain the access to Twitter account data.

In python, we use twitter and tweepy packages to retrieve and extract data. Token and keys are used to get the oauth credential. Our research is designed to analyse the past three weeks’ data (from Jan 24 to Mar 16, 2020). Because Twitter historical data can only search no earlier than one week, we do the search work every week. We search for data for the given dates, specify the key parameters: search\_words (pizzahut, dominos), date\_since and date\_until, finally save the extracted results to a CSV file.

Chapter 3 What data looks like on the social web?

The Semantic Web is the application which applies advanced knowledge technologies to the Web and distributed systems, its core is that using machine-processable languages to extend unstructured information and provide missing background knowledge when needed [3]. Because of the various sources on the web, there could be different vocabularies to describe the same entities. Based on this, the ontology language is designed to specify the word standards, so as to achieve create interfaces or exchange data between applications. These standard vocabularies are called ontologies which define the set of terms in a certain domain such as the domain of describing people, or the relationships, etc, providing information in a semantic format.

For example, "Friends of Friends" (FOAF) is an open, decentralized technology that provides the vocabularies described in the field of people including names, activities and relations to other people, etc. It can automatically merge all the knowledge of one person from multiple profiles on the web [3].

Ontology is written in a formal language with well-defined semantics, and the consensus is established within the community [3]. The World Wide Web Consortium (W3C) has standardised the ontology languages, the Resource Description Framework (RDF), which is one of the most commonly used specifications, has built upon the standardized syntax and logic-based formal semantics.

[3] Social Networks and the Semantic Web, Peter Mika

The RDF data model is expressed in the form of triples: subject-predicate-object, which can also be interpreted as a graph structure. A subject represents a resource, and a predicate represents a feature or an aspect of the resource, all of which are represented as nodes in the diagram [4]. There is a relational representation between subject and object, represented in the diagram by the linked edges [4].

[4] *"Resource Description Framework (RDF) Model and Syntax Specification". www.w3.org.*

FOAF is used in conjunction with another ontology - Semantically-Interlinked Online Communities (SIOC) – to express personal profile and social networking information. SIOC offers a path to connect different online community sites, to overcome the defects of stand-alone systems which is no interconnection between these sites because of differences inside applications and interfaces [5]. SIOC makes it possible to search and retrieve user-generated content from other SIOC-based sites.

[5] Towards Semantically-Interlinked Online Communities, Uldis Bojars, John G. Breslin, Andreas Harth, and Stefan Decker

What we implemented in our research?

Chapter 4 What people do on the social web?

The Internet of Things has brought us convenience but also brought huge data risks. Based on this serious problem, many secure authentication and authorization schemes have been designed to effectively protect our data. Open ID is an open, decentralized standard for authenticating users. It allows users to log in to different services using the same digital identity while ensuring that users are indeed themselves. With the development of the Internet, many web services have collaborated to create mash-up services: users store their resources to one server and are authenticated by this server and authorized to the third-party web application as well [6]. OAuth is an authentication and authorization protocol, and it is a standard for protecting access to web API data. It enables users to grant third-party access to their web resources without sharing their passwords.

[6] Personal OAuth authorization server and push OAuth for Internet of Things, Seung Wook Jung, Souhwan Jung

How do we deal with the data privacy in our research?

Chapter 5 How do we mine, analysis and visualise the social web?

Data mining as one of the hottest topics and technologies in recent year has implemented in a variety of research areas such as computer science, history, etc. The use of mining of social web data is also very important and necessary. As the enormous input data on social webs, irrelevant and repetitive data are needed to clean up when doing the research.

In our research, we need to mine the data from the whole Twitter data pool, the needed data are those related to Pizza Hut and Domino’s Pizza, including the customers’ feeling of these two brands, the statistical results of 'like' and others. We pre-process our data by removing any relevant tweets such as ?

After extracting useful data, we will use sentiment analysis to analyse the data. Sentiment analysis is the interpretation and classification of emotions in text data using text analysis techniques. Sentiment analysis can help companies investigate the customer sentiment towards the products, services, or other aspects need to know. Through the feedback from sentiment, companies can tailor products, improve service and meet the customers’ needs in a great extend.

TextBlob is the selected method for sentiment analysis in our experiment. We first read the Twitter data which already saved in a CSV file. Then we implement the TextBlob from textblob package to group the data into Negative (dislike), Positive (like) and Neutral (no specific feeling). To analyse the results, we create two plots: the popularity score histogram and sentiment bar chart.

6. Personalization on the social web

7. How can we study the social web?

8. What are the challenges for the social web?