Determinants of Online Customers’ Satisfaction and Dissatisfaction: A Study of Online Customer Reviews

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Abstract
We analyze the determinants of online customers’ reviews through the latent semantic analysis (LSA) method. We find that the products and communication are the determinants for both satisfaction and dissatisfaction. Operational factors are more influential on satisfaction while post-service affects dissatisfaction more. Dissatisfied customers are more emotional than satisfied customers.

Keywords: Determinants, Customer satisfaction, Customer dissatisfaction, Latent semantic analysis

Introduction
Online shopping is growing rapidly with the development of e-commerce. A great number of customers prefer online shopping to the traditional brick-and-mortar store shopping because of the advantages offered by online shopping such as convenience, time-saving, and so on (Boyer and Hult 2006). Online consumer ratings and reviews serve as word of mouth, which could be considered as a new element of marketing strategy (Chen and Xie 2008) and may influence potential customers’ purchase intentions. However, most literature solely has focused on numerical ratings and ignored customers’ reviews, which play an important role in building online stores’ reputations and customer trust (Pavlou and Dimoka 2006). Customers learn a lot from online reviews and such reviews greatly influences purchase decisions (Zhao et al. 2013).

Online customers often show their satisfaction and dissatisfaction in their reviews. Previous studies showed that positive reviews increase online stores’ sales, while negative reviews decrease sales (Chevalier and Mayzlin 2006). Therefore, trying to strengthen online
customers’ satisfaction and lessen their dissatisfaction is an efficient way for stores to have better sales performances. However, because of information overload when it comes to customer reviews, it is difficult to find out the determinants of customer satisfaction and dissatisfaction (Cao et al. 2011). In this paper, we used the text mining approach to discuss factors influencing customer satisfaction and dissatisfaction. This approach targets the reviews that present us with considerable depth because they are most helpful in predicting customers’ decisions (Mudambl 2010).

The objective of this study is to find the determinants of customer satisfaction and dissatisfaction from online customer reviews. In detail, our research questions are: Are the reasons leading to online customers’ satisfaction and dissatisfaction the same? If not, what are the most influential factors leading to satisfaction and dissatisfaction?

The rest of our manuscript is organized as follows: Section two reviews the literature and presents our contributions; section three introduces our research method; results and implications are discussed in section four; and conclusions and extensions are provided in the last section.

**Literature Review**

Previous studies discussed the impact of online consumer reviews on sales (Zhu and Zhang 2010). Positive reviews would generate efficient positive word-of-mouth, which led to increased customers’ loyalty, trust, and the company’s reputation (Pavlou and Dimoka 2006). As a result, online stores would have an increase in relative sales (Li and Hitt 2008).

Positive customer reviews were generated due to customer satisfaction. Previous studies discussed a great deal about the determinants of customer satisfaction, such as order fulfillment (Thirumalai and Sinha 2005); decision customization and transaction customization (Thirumalai and Sinha 2011); and service quality (Yang et al. 2004). However, the determinants of online customer dissatisfaction were rarely discussed, although they play an important role in reducing stores’ sales because of negative word-of-mouth. Therefore, a comprehensive review of influential determinants of customers’ dissatisfaction is necessary.

Empirical studies have been the main approach to analyzing the antecedents and consequences of customer satisfaction. Most of the data has come from customer ratings or proposed scores, and therefore regressions and ANOVA are often used (Thirumalai and Sinha 2011). However, customer satisfaction and dissatisfaction are reflected in customer reviews in more details in form of literal expression (Pavlou and Dimoka 2006). Therefore, an exhaustive analysis of customer satisfaction and dissatisfaction through customer commentary is needed.

Our study fills the gap by discussing and comparing the determinants of online customer satisfaction and dissatisfaction using the text mining technique, LSA. Our study provides three contributions: first, it is one of the first studies to discuss the determinants of online customer dissatisfaction and compare them with the determinants of online customer satisfaction. Second, we focus on customer reviews instead of customer ratings or proposed scores to analyze customer satisfaction and dissatisfaction. This is considered to be a more exhaustive method for analyzing the reasons customers are satisfied and dissatisfied. Third, our method, LSA, provides
a more objective approach to analyzing contexts because of its mathematical characteristics compared with the elementary summary.

Methodology

Data Collection
Our data were collected from a well-known online shopping rating website: resellerratings.com. There are online customers’ reviews for 61,178 stores. Customers post their ratings scores, 1 to 5, and their reviews of their online shopping experience. Each online store is a company and transactions happen in the form of business to customers (B2C).

Our sample review size was 200. Namely, there were 100 samples of positive reviews and 100 samples of negative reviews. In detail, we selected the first 100 stores from the best customer-rated stores list and first 100 stores from the worst customer-rated stores. Then for the first 50 stores selected from the best customer ratings list, we randomly picked up one review with a customer rating of “5” for each store. And for the other 50 stores, we randomly picked up one review with a rating of “4” from each store. We considered reviews with scores ratings of 4 or 5 as comments from satisfied customers.

Similarly, for the first 50 stores selected from the worst customer ratings list, we randomly picked one review with a customer rating of “1” from each store. And for the other 50 stores, we randomly picked one review with marked customer rating “2” from each store. We considered reviews with scores of 1 or 2 as comments from dissatisfied customers. The data were collected in April 2013.

Research Method

The reviews were generally long, each 50 to 500 words. Therefore, it was hard to summarize the customers’ main points without any technical analysis tools. For the purposes of our research, we used text mining, the process of extracting useful, meaningful, and nontrivial information from unstructured text (Netzer 2012), to tackle this information overloading issue. We used a well-accepted text mining technique: LSA, which is an algebraic-statistical method that can detect the underlying topical structure of a document corpus (Evangelopoulos 2011) and extract hiding semantic structures of words and sentences. Using LSA to evaluate reviews and conduct summaries would be more objective than other approaches because of its mathematical characteristic.

The use of LSA in this study involved three steps. These steps follow the well-established text mining procedures as discussed in prior studies (Li and Joshi 2012). A total of 100 positive reviews were consolidated in a spreadsheet; another 100 negative reviews were consolidated in another spreadsheet. This data set was loaded to a leading data mining tool: Rapidminer 5.0 and was processed in the following steps.

The first step was pre-processing and term reduction. Each spreadsheet was converted into a document object in Rapidminer 5.0 and was assigned a unique document ID sequentially.
before it was analyzed. Then the documents went through a series of pre-processing procedures.
1) All the letters in these documents were transformed into lowercase. 2) The documents were
tokenized with non-letter separators. 3) The “stopwords” (which include the trivial English
words such as “and,” “the,” “is,” “are,” “a,” “an,” and so on) in the identified word list were
removed because these words don’t provide meaningful information and their presence
unnecessarily increases the dimensionality. 4) All the tokens that were fewer than two letters (i.e.,
“s,” “x,” and so on) were removed because they don’t contain meaningful information. 5) The
words or tokens that appeared only in one document were removed because they were only
applied to a specific study and don’t indicate any theme. 6) Term-stemming techniques were
applied to the word list. Terms stemming identified the words’ roots and regarded all words with
the same root as one token. Therefore, variants of the same word were combined and the
dimensionality decreased. These term reduction procedures eventually resulted in a word list
with 414 tokens in the positive reviews data set and 633 tokens in the negative reviews data set.

The second step was term frequency matrix transformation. After the first step, all
documents were converted into the term frequency by document matrix. Each cell of the matrix
recorded the frequency of occurrences for a particular token in a specific document. We
transformed the values in the matrix using term frequency, an inverse document frequency
(TF-IDF) weighting method (Husbands and Ding 2001). This approach put more weight on the
rare terms and discounted the weight of common terms so that the uniqueness rather than the
commonality of each document emerged in the result (Sidorova et al. 2008).

The third step was singular value decomposition, applied to convert the TF-IDF weighted
term matrix into the production of three matrices, the term-by-factor matrix, the singular value
matrix (square roots of eigenvalues), and the document-by-factor matrix. The term-by-factor
matrix showed the term loadings on a particular latent factor. The document-by-factor matrix
presents the document loadings to a particular latent factor. The singular values (square roots of
eigenvalues) represented the importance of particular factors.

The interpretation of LSA results was similar to the interpretation of factor analysis
(Evangelopoulos 2011). This study associated each factor with its high-loading terms and
documents to assist in factor interpretation. For each solution, we created a table containing all
high-loading terms and documents sorted by absolute loadings. Then, the factors were labeled by
examining the terms and documents (reviews) related to a particular factor, interpreting the
underlying area, and determining an appropriate label. Thus, all of these terms and documents
were interpreted and the factors were labeled with practical meaning according to their
containing high-loading terms.

**Results and Discussion**

**Factors for Positive Reviews**

An analysis of the LSA based on positive reviews was presented to find the influential factors
determining positive reviews. Table 1 exhibits the top four factors identified by LSA, each of
which represents an aspect of positive reviews. In Table 1, the significance of each factor is
indicated by the singular value. Note that each factor contains more than 400 terms and we selected the top 10 terms as the “high-loading terms” for demonstration purpose. LSA results indicated these four factors cover over 95% of all the unique terms and reviews, which meant these factors were able to represent all the aspects of positive reviews.

Table 1 – The Top Four Factors Identified by LSA from Positive Reviews

<table>
<thead>
<tr>
<th>Factors</th>
<th>Interpretations (Labels)</th>
<th>Singular Values</th>
<th>High-Loading Terms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Factor 1</td>
<td>Shopping Experience</td>
<td>1.661</td>
<td>dai, condit, confirm, com, receiv, I order, arrive_dai, i_receiv, i_made, issu,</td>
</tr>
<tr>
<td>Factor 2</td>
<td>Fast Delivery</td>
<td>1.513</td>
<td>fast, easi_order, fast_ship, quick, quick_ship, websit, ship_product, super_fast,</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>fast_deliveri, promptly_ship,</td>
</tr>
<tr>
<td>Factor 3</td>
<td>Excellent Service and Product</td>
<td>1.452</td>
<td>excel, product, great_product, excel_servic, servic_i, custome_servic_i,</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>price_great_product, Excel_custom, price_great</td>
</tr>
<tr>
<td>Factor 4</td>
<td>Good Communication</td>
<td>1.397</td>
<td>good, good_peopl, Good_peopl_deal, deal, time, people, email, great_commun, sai, help</td>
</tr>
</tbody>
</table>

From Table 1, we can find out that there are four factors generated by LSA. Factor 1 can be named “Shopping Experience.” Online customers generally described their online shopping experience such as their booking experience, product-receiving experience, and so on before they posted their positive reviews. These statements of shopping experience were generally objective and less emotional. Purchasing time, customer location, product usage, and so on were often mentioned in the shopping experience. Factor 2 can be named “Fast Delivery.” Delivery is an operational issue and plays an important role in online shopping (Rao et al. 2011). Previous studies have shown that delivery companies and delivery services, such as tracking, influence customers’ perceived service quality and satisfaction (Heim and Field 2007). In our study, we show that speed plays the most important role in delivery since “fast,” “quick,” and “promptly” frequently appeared in these high-loading terms. Factor 3 can be named “Excellent Service and Product.” Excellent customer service, such as fast response and good packaging, could be considered a strong benefit for customers. This could efficiently reduce customer perceived risks associated with long physical distances between the customer and seller. Product quality is the core of online shopping. There seems to be no surprise that excellent products make customers satisfied. Factor 4 can be named “Good Communication.” Although online shopping prevents customers from facing the sales people directly, they try to communicate with sales people through e-mail or phone. Receiving help from salespersons or considering them as good service providers could strength online customers’ satisfaction.
Factors for Negative Reviews

An analysis of the LSA generated from negative reviews is presented in Table 2 to determine the factors influencing negative reviews. Table 2 exhibits the top six factors identified by LSA, each of which represents an aspect of negative reviews. The analysis process is the same as in the positive reviews.

**Table 2 – The Top Six Factors Identified by LSA from Negative Reviews**

<table>
<thead>
<tr>
<th>Factors</th>
<th>Interpreations (Labels)</th>
<th>Singular Values</th>
<th>High-Loading Terms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Factor 1</td>
<td>Charging</td>
<td>1.502</td>
<td>credit, card, credit_card, charg, char_credit_card,</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>card_compani, credit_account, i_disput_charg,</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>claim_credit_card, disput,</td>
</tr>
<tr>
<td>Factor 2</td>
<td>Poor Customer Service and Emotional</td>
<td>1.461</td>
<td>custom_servic, custom, service, i_wish, wish,</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>complaint, believ, read, wish_i_read</td>
</tr>
<tr>
<td>Factor 3</td>
<td>Defected Product</td>
<td>1.407</td>
<td>item, defect, mistak, correct, refund, order_item, part, cancel,</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>refund_mondi_i, disappoint_</td>
</tr>
<tr>
<td>Factor 4</td>
<td>Magazine</td>
<td>1.362</td>
<td>magazin, subscript, paid, i_paid, bill,</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>i_disappoint, disappoint, magazine_compani, poor, receiev_magazin,</td>
</tr>
<tr>
<td>Factor 5</td>
<td>Communication</td>
<td>1.350</td>
<td>mail, e_mail, respond, voic, matter, phone, tri, answer, fraud,</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>voic_mail,</td>
</tr>
<tr>
<td>Factor 6</td>
<td>Sales People</td>
<td>1.315</td>
<td>contact, care, i_get, longer, worst, compani_i, people, chat,</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>commun, contact_i</td>
</tr>
</tbody>
</table>

Compared with satisfaction factors, there are more dissatisfaction factors as shown in Table 2. Factor 1 can be named “Charging.” Failure to obtain a refund is listed as the first reason for online customers to be dissatisfied. Customers’ reasons for seeking refunds may include not receiving products, receiving defective products, or simply product return. Our results are consistent with Qu et al. (2008), who indicated that online customers in general put more weight on post-transaction services than online-transaction services when they rate the merchants’ performances. It seems that merchants should at least refund customers when customers return products or don’t receive products. Otherwise, customers complain heavily. Factor 2 can be named the “Poor Customer Service and Emotional” factor. Poor customer service makes the customer dissatisfied and customers’ negative reviews will negatively influence potential customers’ decisions. This factor shows the regretful feelings of customers who wished they had read the negative reviews of previous customers earlier. Customers’ negative emotional expressions tend to decrease the reviews’ informative value and influence their evaluation toward the products and the rating toward merchants significantly (Kim and Gupta 2012). Factor 3 is the “Defected Product.” Customers’ disappointments are from “defective items” and they strongly want to get a refund. Merchants’ mistakes or customers receiving incorrect items may be another
source of customer complaints. Considering that purchasing a product is the purpose of customers’ online shopping, it is no surprise that they would be dissatisfied when the products they receive are not what they ordered or wanted. Factor 4 can be named “Magazine.” A notable proportion of dissatisfied customers are magazine subscription customers. Most of the reasons for the complaints are because they received a wrong volume of magazine or did not receive the magazine. The incorrect products customers receive may occur because each magazine has so many volumes and it is sometimes difficult to describe it on the website. This is why magazine companies receive so many complaints and the dissatisfaction factor is listed separately. Factor 5 can be considered as “Communication.” The absence of or slow responses through mail, email, voice-mail, or phone incurs customer dissatisfaction. Similar issues are listed in factor 6, which is referred to as “Sales People.” Waiting for longer time periods to be able to contact sales people or getting a poor attitude from them makes online customers complain a great deal. Therefore, low levels of communication, either because of the slow response or sales people’s bad attitude, causes serious customer dissatisfaction in the online shopping business.

Comparison between Satisfaction Factors and Dissatisfaction Factors
From the above discussion, we can deduce that the determinants of online customer satisfaction include fast delivery, excellent services and products, and good communication. The determinants of online customer dissatisfaction include low levels of post-sales service, customer service, product quality, communication, and salespersons’ attitudes. When we compare factors among the satisfied reviews and dissatisfied reviews, some findings can be shown as follows.

➢ Product is the core to incur customers’ satisfaction and dissatisfaction

The purpose of online shopping is to get products. Therefore, it is no surprise that the good condition of a product will incur satisfaction from customers and a defective item or mis-delivered item will incur dissatisfaction. Besides its quality, price may also play an important role in customers’ satisfaction with products since most of the customers are price-sensitive. It is reflected by the high loading term of “great price” in satisfaction factor 3.

➢ Communication plays an important role in both satisfaction factors and dissatisfaction factors.

Good communication, including a friendly attitude from salespersons and quick responses from the email or phone, could give customers strong feelings of control and mitigate the perceived online purchasing risks (Mazaheri et al. 2011). No answers from the company or poor service provided by contact sales people would incur customers’ complaints because they lower customers’ trust in the stores.

➢ Operational factors play a more important role in satisfaction factors while post-service is more essential in dissatisfaction factors.

Fast delivery, as one of the operational factors, is one of the most important sales efforts from merchants. Previous studies show its benefits on online customer satisfaction (Rao et al.,
However, it seems that slow delivery may not play an essential role in incurring customer dissatisfaction. The reason may be because online stores offer many options for delivery and the slower options come at cheaper delivery prices. Many stores even offer free delivery service and tracking service. Therefore, customers seem to be patient with the delivery process considering the lower price or even the free delivery at times.

On the other hand, inferior levels of post-purchase service, especially not offering refunds, play an essential role in dissatisfaction. Customers seek refunds when not receiving products or after returning products. Credit card charges are not tolerable if the products needs to be returned or are not received. Being charged without getting satisfactory products was the main source of online customer dissatisfaction.

- **Dissatisfied customers are more emotional than satisfied customers.**
  
  Satisfied online customers generally state their shopping experience before they write their compliments concerning products and services. These shopping experiences are fairly objective, customers telling the stories of what happened during their selecting, ordering, and receiving process. However, dissatisfied customers are more emotional. They post their negative emotional comments using words such as “wish” and “believe” in their reviews. Studies show that negative emotions such as regret greatly influence customers’ store ratings and the writing styles they use in their reviews (Kim and Gupta 2012).

- **Magazine companies have more dissatisfied customers than other industries.**
  
  Dissatisfaction with magazine stores is specifically listed as a factor in our results. Considering the difficulty to describe a magazine through a website because there are so many volumes for a magazine and the contents of magazines are not clear before receiving them, it is not surprising that customers are dissatisfied when they do not receive the exact volume of a magazine they ordered, the wrong magazine, or even do not receive a magazine at all. On the other hand, there is no specific industry incurring customers more satisfaction than other industries, as it is not shown in our satisfaction factors.

**Conclusions and Implications**

**Concluding Remarks**

Based on the current study of online customers’ positive and negative reviews using LSA, we found that there are different reasons leading to online customer satisfaction and dissatisfaction. While both products and communications are influential factors in customer satisfaction and dissatisfaction, we found that operational factors such as fast delivery play a more important role in customer satisfaction, while post-purchase service, especially, offering refunds, may lessen customer dissatisfaction. In addition, we found that dissatisfied customers are more emotional when they post their reviews than satisfied customers. Lastly, the magazine industry has more dissatisfied customers than other industries.
Managerial Implications

Previous studies offer recommendations for online store managers to increase customer satisfaction. However, dissatisfaction factors are rarely discussed, although they are at least equally as important as satisfaction factors. Customer dissatisfaction shown through negative reviews could greatly and negatively influence sales because most customers read the reviews before they buy the products from online stores (Zhao et al. 2013), and negative reviews create negative word of mouth, which plays an important role in online sales.

Therefore, besides the factors leading to customer satisfaction, managers should also pay attention to the factors incurring customer dissatisfaction. Our study emphasized the role of post-purchase service, especially offering refunds to mitigate the dissatisfaction of online customers. Managers should refund promptly once the products are returned or are have been confirmed to be lost in the delivery process. A fraudulent transaction is even more intolerable because it could destroy the reputation of an online store. In addition, managers should pay more attention to the product itself and keep open communication lines with customers, because both factors are influential when it comes to online customer satisfaction and dissatisfaction. Lastly, one way to increase the customers’ satisfaction is to strengthen the stores’ operational abilities, for example, making fast deliveries is an efficient way to obtain customers’ compliments.

Future Research Extensions

Our study provides an investigation of customer satisfaction and dissatisfaction factors from customer reviews in online shopping contexts. Future research can extend our work several ways. First, based on the samples we collected, our results and discussions are based on the business to customer (B2C) market. Future research can also discuss the customer to customer (C2C) market, and an exhaustive comparison of the results would be consequential. Second, our customer reviews are about different stores in different industries. Discussions based on special industries such as the magazine or book industry, the electronic product industry and so on provide more targeted results and implications that are practical for managers to take actions. Third, future research may attempt to find out whether the satisfaction and dissatisfaction factors are different among customers with different identities (such as gender, age, or region). A cross cultural study could be conducted to provide a more comprehensive picture for determining the influential factors affecting online customers; attitudes of their shopping experiences.

References


