Pisco Med Publishing

Original Research Article

Sentiment Analysis for the Customer Feedback in the Express Delivery Enterprise Evaluation System

Qi Wang[1], Shan Lu, Jin Lin, Cong Wang, Hongqiang Fan

School of Mordern Post(School of Automation), Beijing University of Posts and Telecommunications 100876

Abstract: Concomitant with rapid growth in recent years of Chinese e-commerce, an express delivery enterprise has developed and customer demand for express delivery services has increased. However, the Chinese express delivery industry has challenges such as low employee education level, sparse information availability, and high customer complaint rate. Big data technology provides a means for extracting customer opinions and studying customer behavior to realize greater overall customer satisfaction. In this study, the Chinese express delivery companies STO Express, YTO Express, ZTO Express, and YUNDA were selected as representatives and corresponding customer complaint information from the State Post Bureau analyzed. Sentiment analysis results indicate that companies can employ service decisions and develop measures to improve customer satisfaction and loyalty.
Keywords: Chinese E-Commerce; Customer Feedback Information; Express Delivery Company; Logistics Industry; Sentiment Analysis; Service Evaluation

1. Introduction

With the rapid development of e-commerce and the widespread use of smartphones, the global express delivery industry has developed rapidly. The rapid increase in the number of express deliveries represents a boon and a challenge for the entire Chinese express delivery industry. Standardization of the express industry would directly improve the service level of e-commerce.

Much research has been conducted on sentiment analysis (SA) and evaluation systems for express delivery enterprises. Lee and Kim (2017) proposed a semi-supervised learning framework that does not require large amounts of tagged data to analyze emotions in online customer reviews. Ni and Tao (2012) and Yan (2016) carefully explored the quality of logistics services and created a quality index system. This study differs from prior studies in that it uses SA to improve customer satisfaction by employing the most authentic customer feedback information, determining the research approach through word frequency statistics, and analyzing the resulting data.

2. Data Sources

Using the 2018 China Express Delivery Enterprise Satisfaction Rankings and the 2018 Express Delivery Enterprise Rankings, the research subjects chosen for this study were STO Express (STO), YTO EXPRESS (YTO), ZTO Express (ZTO), and YUNDA. This study chooses the complaint website of the State Post Bureau was selected as the data source platform. This website provides a platform for customers to express their dissatisfaction with the courier service they purchased.

3. Data collection and cleaning

Through the use of GooSeeker, customer feedback on the State Post Bureau's appeal website can be subjected to second-level crawling; a total of 9166 customer complaints for different express delivery enterprises were collected for the period 2009–2018. It was established that there are 1189 customer complaints for STO, 945 customer complaints for YTO, 796 customer complaints for ZTO, and 884 customer complaints for YUNDA. The data volume for the four research objects was relatively well balanced, as required for this research.

Data cleaning is essentially a two-step process of tokenization and removal of stopwords. The statistical word frequency determination first requires conversion of the data and then application of statistical operations. Finally, the descending order is sorted according to the occurrence frequency of each word, and the statistical word frequency is obtained. Using the word frequency statistics and classification in this section, the next section describes the use of SA to analyze data for different research

1 **About the author:** Qi Wang (1996-), male, from Tangshan, Hebei, China. School of Mordern Post (School of Automation), Beijing University of Posts and Telecommunications, Beijing, China. Master's degree, mainly engaged in the application of big data in logistics.

doi: 10.18282/l-e.v9i3.1574

subjects and research evaluation criteria.

In this study, we selected the method based on sentiment lexicon, and the Chinese sentiment dictionary provided the emotional vocabulary ontology. The dictionary is divided into three parts: words, intensity, and polarity. The data scraped for this research were the appeal information, the higher the score of a sentence, the stronger the negative polarity of the sentence.

After the SA has been completed, the research perspective and the research objects are classified according to customer feedback information and assigned corresponding scores. The total and the average of the emotional scores for each subject company and for the entire industry is obtained for the four research criteria. The higher the score for a particular research perspective, the more negative is the opinion about a certain research company. Table 1 presents the data resulting from SA.

Table 1. Data from SA

Name	Rating category	Research perspective			
		Overall situation	Service	Timeliness	Safety
STO	Total	224654	508984	201191	232030
	Average	189.10	271.46	242.69	276.89
YTO	Total	177970	432168	170860	186111
	Average	188.53	282.09	246.20	287.65
ZTO	Total	130801	317853	131852	112787
	Average	164.53	229.17	215.09	228.78
YUNDA	Total	163868	375025	152532	179483
	Average	185.58	250.02	244.44	264.72
Industry	Total	1544558	3285912	1575181	1460190
	Average	168.53	230.49	210.75	251.84

4. Discussion

It can be seen from Table 1 that STO received the most complaints and ZTO received the fewest; this may be related to the developmental stages for the different enterprises. Only the overall level of the service reported for ZTO is better than the industry average. The service provided by YTO is adjudged to be the worst of the four enterprises—the opinion score is more negative than that for the overall industry. Simultaneously, companies can provide more value-added services; customers with different requirements can choose services they need. Companies can strengthen the management and training of courier workers and provide corresponding service remedial measures.

Among the analyzed companies, customer opinion on the transportation efficiency of YTO is the most negative. To improve the timeliness, companies with transportation-aging issues should establish a more comprehensive information platform that can find routes prone to aging issues through statistics and conduct further analysis on these routes.

The consumer opinions of safety for ZTO are better than that of the entire industry, whereas the safety opinions for YUNDA, STO, and YTO are more negative than that of the entire industry. Among the subject companies, YTO elicits the most serious concern regarding damage and loss. In this case, we suggest that the company improve the operation specifications of the pickup, transportation, sorting, and shipping processes, as well as the damage compensation system for express delivery. It would be beneficial to develop new storage containers, use tracking methods such as RFID and a zip delivery box that can only be opened once, clarify the security person in charge of all aspects of express delivery, and conduct real-time tracking of express delivery in the management information system.

5. Conclusion

This study collected cases from the China Post Office complaint website, and then applied big data and natural language analysis techniques to investigate customer evaluations of the services of various courier companies. The results show that the four most important themes directly related to service experience are “timeliness,” “serviceability,” “security,” and “regionality.” Based on these indicators, we determined the frequency of words under each indicator for each company, the major problems of major express companies, and the major areas where the problems are prominent. The SA performed here indicates that YTO’s situation is the most problematic (of the four companies studied), and their problems with service, timeliness, and security are the greatest. The service remedies mentioned in the previous section can help YTO overcome the problems in these three aspects of their operations.

There are several avenues for further research. The channels available for collecting customer feedback must be further expanded. Courier companies should further expand cooperation with e-commerce platforms and use a wider platform to collect reliable information. In future evaluations, positive feedback can be added to the research analysis. If the content of the customer feedback on different service aspects can be clearly divided during SA, the accuracy of the results obtained will be greatly improved; the resulting changes in decision-making and enhanced service remediation will likely correlate strongly with economic benefit. Effective customer service can maximize customer satisfaction and the success of the express delivery enterprises; this is

an important challenge facing the entire express delivery industry and therefore merits considerable attention in future research and exploration.

References

1 Lee, S., Kim, W., 2017. Sentiment labeling for extending initial labeled data to improve semi-supervised sentiment classification. Electron. Commer. Res. Appl. 26, 35-49, ISSN 1567-4223, https://doi.org/10.1016/j.elerap.2017.09.006.

2 Ni, Z., Tao, Y., 2012. Research on the construction and evaluation of logistics service quality index. *Logist Technol 31*(*19*), 140–43.

3 Yan, H., 2016. Construction of evaluation index system of logistics service capability of express delivery enterprises. *J Huainan Teach Coll 18*(*5*), 39–44.

4 Zhou, Q., Xu, Z., Yen, N.Y., 2019. User sentiment analysis based on social network information and its application in consumer reconstruction intention. *Comp Hum Behav 100*, 177–83. https://doi.org/10.1016/j.chb.2018.07.006.

5 Zou, X., Yang, J., Zhang, J., 2018. Microblog sentiment analysis using social and topic context. *PLoS ONE 13*(*2*), e0191163. https://doi.org/10.1371/journal.pone.0191163.