Extraction of Risk Factors  
Through VOC Data Analysis  
for Travel Agencies  

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Abstract. Many businesses utilize a variety of ways to collect VOC (Voice of Customer) data, which is a very important information in establishing their management strategies. Conventional channels would include telephone calls, mails, and internet or on-site surveys. Social media such as SNS (social network service) networks and internet message boards have recently become a major source for VOC. Correct feedbacks of customers are mainly in the form of atypical data including voice and texts. Thus, a tool called Buzz monitoring is usually used to this atypical data, since general analysis methods can not deal such a big amount of data. This paper attempts to present a way of extracting risk factors from analyzing atypical data of VOC in the form of texts. An empirical research was conducted to apply the proposed model to one of the biggest travel agencies in Korea to extract actual risk factors. The identified risk factors are expected to help the travel agency arrange remedial measures to cope with customers' complaints.  

Keywords: Travel Agency, Customer Feedback, Survey, VOC (Voice of Customer).  

1 Introduction  

All businesses exert much effort to gather accurate customers' feedbacks so as to strengthen their competitiveness. Thus, various methods are used to collect VOC (Voice of Customer). Among them, most frequently used channels would include telephone calls, emails, or offline surveys. These days, voices or feedbacks from customers are collected realtime from social media. The amount of such atypical data is so huge that conventional analysis methods can not handle it[1]. Thus, various tools have been recently introduced that can analyzed the so-called big data. Buzz  

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monitoring system can automatically search and collect various kinds of information on the internet, and it can analyze such atypical and non-structured big data[2].

The current paper intends to analyze VOC on travel agencies. In particular, it presents a model using buzz monitoring tool to analyze atypical VOC data on travel agencies' services in the form of text messages and to extract risk factors representing clients' complaints. The proposed model was applied to a major travel agency in Korea in order to extract risk factors particular to that company. VOC under discussion is atypical data from their text answers to open-ended survey questions.

2 Analysis of VOC data for Travel Agencies.

2.1 VOC (Voice of Customer)

The importance of customers' voice and feedbacks has been increasing, and listening to their voice is now considered as one of the crucial keys to success or failure of any business. In particular, businesses in service industry actively utilize VOC to strengthen their competitiveness. VOC clearly represents customers' needs and it is crucial for any attempt to enhance customer satisfaction or develop new service. Thus, in the rapidly changing service industry, establishing a system to analyze VOC should be a core part of competitiveness and lie at the center of any business management.

A systematic customer feedback system based on VOC might enable firms to maintain a high quality of communication with customers. Moreover, the VOC system can get better and better as the employees’ awareness of perception of customers gets higher. These efforts would play an important role in enhancing the competitiveness of companies as well as customer satisfaction [3].

Therefore, VOC analysis intends to identify ever-changing needs of customers and, consequently, to help develop a new product or service. That is, the system can collect VOC data through a variety of channels, identify and analyze customers’ changing desires, and convert it into necessary information for development of a product or service [1]. In general, more accurate VOC is atypical data in the form of voice or text messages. Thus, the current research deals with atypical VOC data, particularly text answers to open-ended survey questions [4].

2.2 Process of VOC data analysis for travel agencies

The present research presents analysis of atypical VOC data applicable to travel agencies with an intention to identify customers’ needs in the tourism industry and eventually to extract risk factors represented in their complaints [5]. To that purpose, first, a detailed analysis knowledge system for the tourism industry was established. Then, a series of analyses of customer discourse, customer satisfaction and risk factors were classified and each category was analyzed with a set of evaluation items, as illustrate in Table 1.
Table 1. Evaluation Items for Travel Agencies

<table>
<thead>
<tr>
<th>Category</th>
<th>Evaluation elements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consumer discourse analysis</td>
<td>1) What do they say in certain circumstances?</td>
</tr>
<tr>
<td></td>
<td>2) How much does VOC account for in consumers' discourse?</td>
</tr>
<tr>
<td></td>
<td>3) What are the keywords explaining their discourse?</td>
</tr>
<tr>
<td>Consumer satisfaction analysis</td>
<td>1) How much are they satisfied in certain circumstances?</td>
</tr>
<tr>
<td></td>
<td>2) What are the positive elements?</td>
</tr>
<tr>
<td></td>
<td>3) What are the negative elements?</td>
</tr>
<tr>
<td>Risk factor analysis</td>
<td>1) What context accounts for the greatest portion of discourse?</td>
</tr>
<tr>
<td></td>
<td>2) What are the reasons for inconvenience/displeasure/negation?</td>
</tr>
<tr>
<td></td>
<td>3) What are the most risk factors for certain circumstances?</td>
</tr>
</tbody>
</table>

Actual analysis process was designed as follows to perform analysis of the evaluation items for VOC data for a travel agency illustrated in Table 1.

**STEP 1. Classification of Circumstances**

Circumstances of tourists are classified into 7 categories: reservation process, optional tours, guide, itinerary, lodging, food and shopping, as shown in Figure 1.

![Fig. 1. Classification of Tour Clients Feedbacks](image)

**STEP 2. Analysis of Satisfaction**

Ratio of consumers' certain discourse on circumstances and sensitivity elements are analyzed as shown in Figure 2.
2.3 Extraction of risk factors (title 2 before and after spacing)

The analysis of atypical VOC data collected from customers proceeds in the following way. First, a detailed analysis knowledge system is established and then evaluation items for each category is set up in order to extract risk factors in three stages. At stage 1, the circumstances are classified into 7 groups: reservation process, tour itinerary, guide, optional tours, lodging, food and shopping. The next stage performs analysis based on buzz monitoring system. Semantic analysis of a variety of customers’ perception, experience and sensitivity in particular circumstances is conducted. Then, types of VOC are extracted, and positive/negative expressions of sensitivity are classified and analyzed. Based on these results, risk factors for each of the seven circumstances are extracted.

Also, we propose an risk issue alarm system with the following process to utilize the risk factor extraction system.

1) VOC data from tour clients is recorded and saved.
2) VOC data is received and classification criteria for analysis are designed.
3) VOC data is analyzed through research framework process.
4) Risk factors for each circumstance/evaluation element are extracted.
5) A ruleset for risk factors is designed.
6) The designed ruleset data is registered in the system module.
7) In monitoring VOC for a client company by realtime collection and analysis engine for online big data, if a risky issue is detected, the system immediately sends a push alarm message via email or SMS.

3 Empirical Case Study

The proposed system for VOC data analysis was applied, as a sample case study, to a major travel agency in Korea. The results of analysis are as follows. First, analysis of VOC data for a set of 7 categories was made: reservation process, optional tours, guide, itinerary, lodging, food, and shopping. The atypical data under discussion
consists of the answers to open-ended survey questions. Of the 7 categories, the current paper presents the results of analysis of two categories: reservation process and optional tours.

1) Reservation process: A set of 18,438 VOC messages related with reservation process were analyzed. Information-seeking inquires for contact points, schedule, and itinerary accounted for 22% of the VOC data. The rest of the data was questions about the following topics: guide & staff, transportation, payment & cancellation, and immigration, each accounting for a similar portion of 11 to 13%.

2) Optional tours: A set of 8,359 VOC data associated with optional tours were analyzed. 35% of the client’s inquires had to do with the components of a package tour, free time and the types of optional tours. Specifically, much VOC was inquiries about scuba diving, cruises, and massage services. Cost-related questions on such elements as additional cost, admission fees, and overcharging accounted for 26% of the data. A couple of risk factors for each of the two circumstances were extracted: insufficient information offering and inadequate schedule for reservation process, and package tour price and compulsory option tours for the category of optional tours.

4 Conclusions

VOC is very important information for effective business management. A variety of channels are utilized for businesses to collect VOC data: telephone calls, mail, online or on-site surveys, internet message boards, and social media including SNS. Most of the data with accurate and spontaneous feedbacks are atypical data in the form of voice and text messages. Such big and atypical data are hard to analyze by using conventional analysis methods. A new tool called 'buzz monitoring' has been recently used to analyze big data.

The present paper appealed to the buzz monitoring tool to propose a way of analyzing atypical VOC text data and extracting risk factors for travel agencies. The proposed model was applied to a major travel agency in Korea and VOC in the form of answers to open-ended survey questions were analyzed. The data was categorized into a set of 7 categories: reservation process, tour itinerary, guide, optional tour, lodging, food and shopping. To present an empirical case study, VOC for two of these categories, itinerary and optional tour, were analyzed so as to extract risk factors. Future studies will include the remaining categories to come to a more comprehensive conclusion. This particular company is expected to take the extracted risk factors into consideration in arranging plans to meet customers' demand [6].
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References