Customer Service in Social Media

An Empirical Study of the Airline Industry

Matthias Carnein, Leschek Homann, Heike Trautmann, Gottfried Vossen

6th March 2017
Outline

1. Introduction
2. Customer Service Performance
3. Data Collection
4. Evaluation
5. Conclusion
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5. Conclusion
Introduction

- Customer Service handles questions or problems regarding products or services
- Traditionally offered by email or phone (e.g., call center)
- Recently, more companies explore social media as an additional channel
  - popularity of mobile devices
  - easy and widespread usage
  - public pressure

Need to measure and monitor performance of customer service in social media
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Performance Measures

Traditional service level measures are
- Average Handling Time (AHT)
- Average Queue Time (AQT)

Social media measures are much harder to define
- no queue of waiting customers
- unstructured nature of conversations
Average Response Time

- How fast does an inquiry \( i \) receive a response \( r \)?

\[ \Delta(i) = t_r - t_i \]

- Average response time over all inquiries for company \( C \):

\[ \text{ar}(C) = \frac{\sum_{i \in I_C} \Delta(i)}{|I_C|} \]

\( t_r \): time of response

\( t_i \): time of inquiry

\( I_C \): all inquiries to company \( C \)
Reponse Rate

How many inquiries receive a company response?

\[ rr(C) = \sum_{i \in I_C} r(i) / |I_C| \]

with \( r(i) = \begin{cases} 1, & \text{if } \Delta(i) \text{ exists} \\ 0, & \text{otherwise} \end{cases} \)
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Data Sources

- Focused on Twitter and Facebook due to popularity
- Selected **48 Airlines** based on largest passenger volume, fleet size and revenue
- Identified **66 Twitter** and **58 Facebook** accounts targeting the English and German markets
- Classified airlines into **4 segments** based on service level and number of flight routes
Data Collection

- Accessed public Facebook and Twitter APIs throughout the year 2016
- Collected all posts directed at the airlines’ Twitter and Facebook pages
- Stored **6,187,835 inquiries** and **1,777,234 responses** in Document Store
Set up

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12
6th March 2017

Introduction Customer Service Performance Data Collection Evaluation Conclusion

Document Store
RDBMS
crawl posts
store posts
analyze posts
get KPIs
store KPIs
Analyzer Process

Host System

Crawler Process

{REST} NGiNX
Visualization

Customer Service Monitor
We continuously monitor the performance of customer service in social media across a wide range of verticals and companies.
The monitor was developed by the ERCIS uni-channel lab - powered by Allvata.

022,038,960 Posts
058,536,977 Conversations
000,000,795 Social Media Accounts
000,000,246 Companies
000,000,016 Verticals

Response Time
Conversation Time
Response Rate
Number of Responses
Number of Posts
Number of Conversations
Time of Post
Time of Response

Average Response Time

The response time is the time delay between a post or comment of a customer and the response from the company.

http://servicemonitor.uni-muenster.de/
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6th March 2017
Selection by Number of Posts

<table>
<thead>
<tr>
<th>Airline</th>
<th>Number of posts</th>
<th>Passengers per year</th>
</tr>
</thead>
<tbody>
<tr>
<td>KLM</td>
<td>404,964</td>
<td>27,740,000</td>
</tr>
<tr>
<td>Iberia</td>
<td>229,677</td>
<td>14,000,000</td>
</tr>
<tr>
<td>Etihad Airways</td>
<td>175,609</td>
<td>17,400,000</td>
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<tr>
<td>Air France</td>
<td>166,225</td>
<td>79,016,000</td>
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<tr>
<td>WestJet</td>
<td>139,560</td>
<td>18,500,000</td>
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<tr>
<td>Lufthansa</td>
<td>155,643</td>
<td>107,000,000</td>
</tr>
<tr>
<td>easyjet</td>
<td>117,301</td>
<td>70,000,000</td>
</tr>
<tr>
<td>Air Berlin</td>
<td>83,696</td>
<td>27,274,777</td>
</tr>
<tr>
<td>Thomas Cook Airlines</td>
<td>75,288</td>
<td>6,700,000</td>
</tr>
<tr>
<td>Air Canada</td>
<td>73,731</td>
<td>41,000,000</td>
</tr>
</tbody>
</table>
Summary / Outlook

- Analyzed millions of customer service requests in social media
- Defined several performance measures to automatically evaluate customer service performance
- Customer service in social media is dominated by full-service network carriers which have the capacity and financial means
- Future work should apply text classification and topic modelling to analyze the content of a message and also focus on other industries

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Questions?