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Applying cognitive analysis of social media data to evaluate effects of aviation accidents on airline's goodwill

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During the last decade huge growth of social media took place. Data from social profile has value as an accurate, self-reported, and easy-to-find source of basic demographics and personal opinions. Added with all the networks, interests, socio-economic status and personal values, this data source have a huge potential for analysis.

In recent years modern AI-based technologies were developed to provide cognitive recommendation helping marketers to understand and anticipate customer behaviors based on unstructured data from social media and other online sources. It recommends prioritized target audiences based on key predictors, creating segments based on a rich profile of customer data compiled from multiple sources utilizing complex and robust queries.

IBM Watson represents a huge step into cognitive systems, a new era of computing. Watson builds on the current era of programmatic computing but differs in significant ways. The combination of capabilities makes Watson unique. Natural language processing allows understanding the complexities of unstructured data, which makes up as much as 80 percent of the data in the world today. It's abilities in hypothesis generation and evaluations are based on advanced analytics to weigh and evaluate a panel of responses based on only relevant evidence.

The analysis in this article was made using advanced cognitive technologies from IBM, which provides possibilities for text analysis through natural language processing IBM Watson. Its software is able to analyze large amount of unstructured text, and understand a wide variety of characteristics, including sentiment, entity, emotion, keyword, concept tagging, and taxonomy. Social media analytics technology helps to achieve a holistic view of consumers, market and competitors—all from millions of online sources. [2]

United Express flight 3411 is a regularly scheduled flight from O'Hare to Louisville. The incident took place on April 9, 2017. After boarding a full flight and realizing that four crew members traveling to operate another flight still needed a seat, an unfortunate string of events ultimately resulted in Dr. David Dao being forcefully dragged across the floor and off the aircraft. [3]

It's been almost a year since this high-profile incident occurred. But what has happened following had included anger from customers and a wave of mixed signals from United's leadership that ultimately lead to a firestorm that, as data shows, continues today.

Despite all of the measures taken, United's profits and the market price were unstable during the first weeks after the incident. Then, United reported a 39% increase in profits comparing with the previous year in the second quarter of 2017, as well as increased sales. This tendency is attributed to the lowering of the ticket price and the fact that for many travelers, the price is the primary deciding factor when booking flights.

Nevertheless, no one deny that United's reputation suffered greatly due to the incident with the flight 3411. In modern digital society information spreads rapidly and deeply, and loosing company's goodwill can cause huge long-term consequences. One of these consequences might

be social prejudice. Prejudice affects the everyday lives of millions of people across the globe. Prejudice held by individuals, forces on others just by the spread of information in social media.

To measure the effect of social prejudice that is taking place in United's case, we have conducted sentiment analysis of what people think about United customer service in various social media sources during different periods of time.

Using this concept we can analyze people's opinion on specific topics and make a thoughtful data mining on detailed results. For the first sentiment analysis 2 periods were chosen: the week before the April 9 and the week after. The analysis on picture 1 of the first week shows us the normal distribution of people's opinion on United's performance and customer service - there is approximately 30% of positive and 30% of negative results. Predictably, people's moods changed a lot after the incident: negative feedback almost doubled, and at the same time positive results decreased by 55%. [1]

At the same time, number of mentions of United Airlines during the week after the 3411 flight has grown more than 50 times, reaching 27 thousand of mentions worldwide. More important, that United was mentioned negatively not only on the territory of the US, but also in more than 40 countries across the globe.

To evaluate long-term changes in customer's opinion we analyzed customer's reviews during two equal months - November 2016 and November 2017. The results on picture 2 show that even half a year after the incident, rate of negative reviews has not reached it «pre-3411» results. Even more significant is the fact, that rate of positive reviews decreased in 2 times. [1]

Considering the fact of huge changes in United's customer-relations policy, struggle to become even more client-oriented and to avoid any kind of argues with passengers, it is obvious that review rates have to be higher than ever. But data shows that customers are still not satisfied by the performance of the airline.

All the tendencies described above are the sign of social prejudice. Sometimes, prejudice of minority can strongly influence regular customers, especially what they think, and even the actions they take.

Importantly, prejudice greatly influences what people expect from the company, its product and service, how they feel about its quality and much more. That's why most of United's passengers now feel less tolerantly for the airline and more willing to be negative, just because of the negative people's opinion in social media.

Over the past decade, peoples' behavior under influence of social media transformed significantly. At the same time, latest AI technologies unlock value of unstructured data. This tools enable new approaches in methodology of sociological research, based on facts from self-reported social profiles. Aplication of cognitive analysis allow to make a fast, accurate and effective evaluation of how certain event effects sentiment of society.

Источники и литература

1) IBM Watson Analytics for Social Media: https://watson.analytics.ibmcloud.com

2) The Era of Cognitive Systems: An Inside Look at IBM Watson and How it Works. Rob High http://www.redbooks.ibm.com/redpapers/pdfs/redp4955.pdf

3) United Express Flight 3411 Review and Action Report: https://hub.united.com/united-review-action-report-2380196105.html
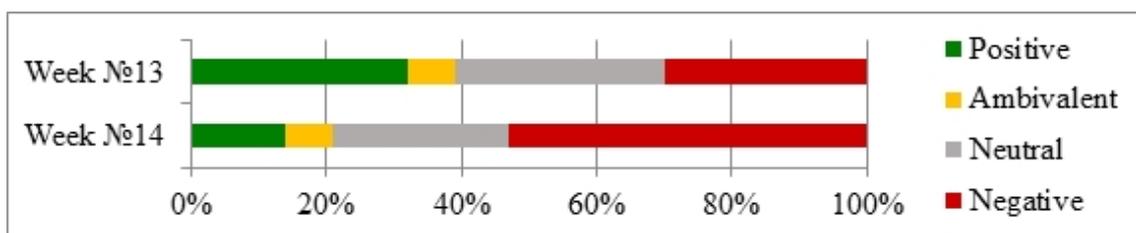
Иллюстрации

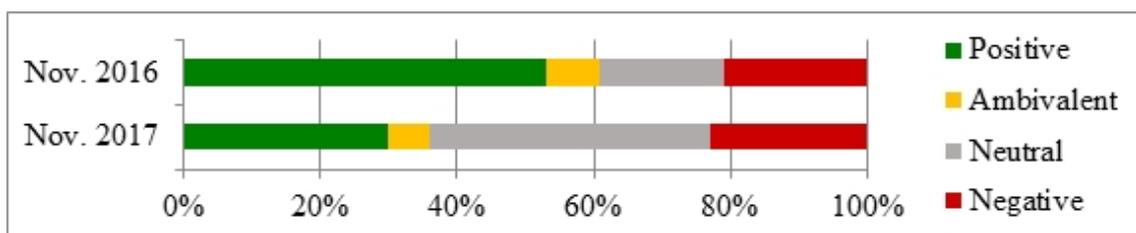**Рис. 1.** Analysis of people's opinion during week №13 and №14, 2017 [1]

Рис. 2. Analysis of people's opinion during Nov. 2016 and Nov. 2017