# Topic Discovery and Sentiment Analysis of App Reviews

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# Background and Significance

## Mobile App industry size
By 2020,
- Estimated 3.3 billion smartphone owners
- Mobile global revenue projected to hit $189 billion
  - Uber had 6.5 billion in revenue in 2016
  - Snapchat reported 825 million in 2017

## Big Data Challenge on Customer Reviews
- Millions of users reviews reported for large apps
  - Snapchat: 1,009,146 reviews
  - Lyft: 869,993 reviews

# Impact of Bad Mobile Experience

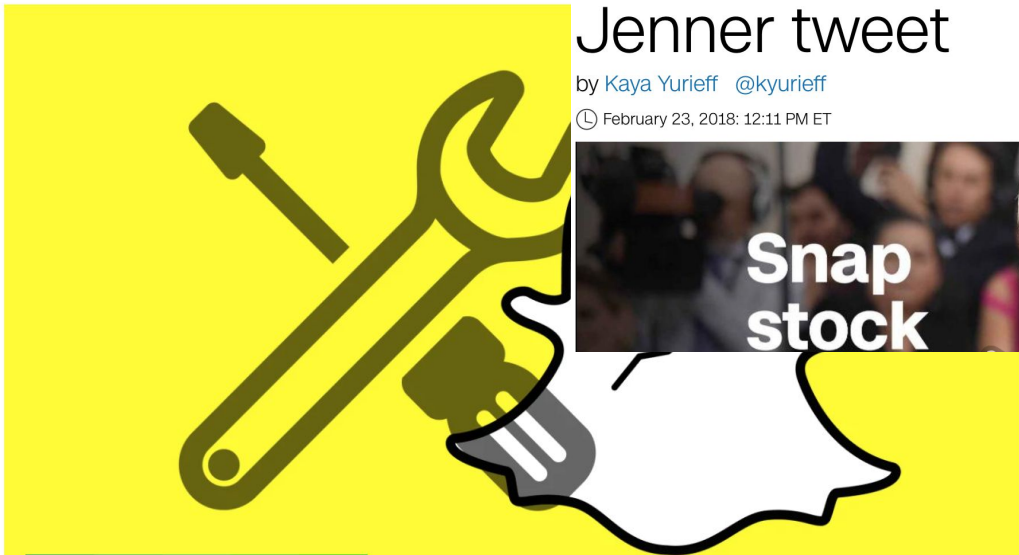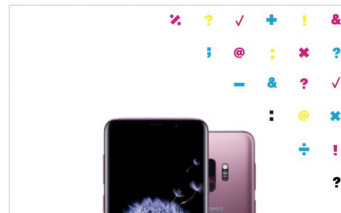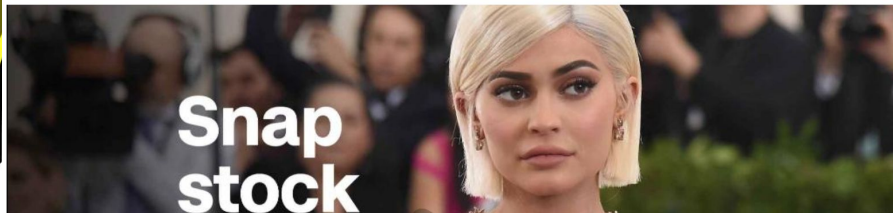**Snapchat's big redesign bashed in 83% of user reviews**

Josh Constine   @joshconstine   /   Jan 11, 2018

Snapchat stock loses $1.3 billion after Kylie Jenner tweet

by Kaya Yurieff   @kyurieff

February 23, 2018: 12:11 PM ET

Recommend 0

# Solution

Topic Extraction and Sentiment Analysis Tool

Collect, Translate, and Analyze customer reviews across top countries of app usage to help mobile operated businesses

# Implementation

# Methods Pipeline

**Collection, Translation, Sentiment extraction**

**Keyword Search**

**Topic Modeling**

**Daily collection of new reviews over 10 countries**

- Translate non-English reviews using Google Cloud Translate API
- Compute sentiment of reviews

**Aggregate ratings and sentiment of reviews from keyword**

- How are users feeling about X feature?

**Use Unsupervised Topic Modeling**

Using Latent Dirichlet Allocation(LDA) to answer:

- What users are talking about
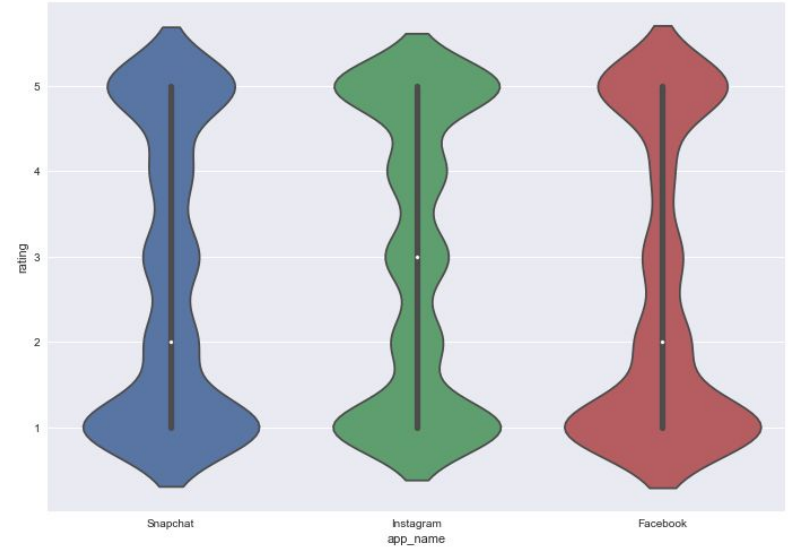
# Memorable Takeaways

# Exploratory Analyses: Social Media

Instagram rated higher than Snapchat and Facebook
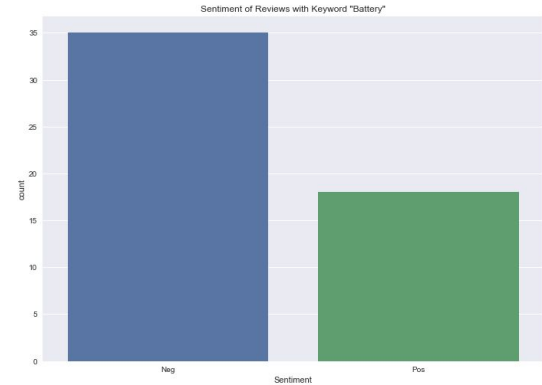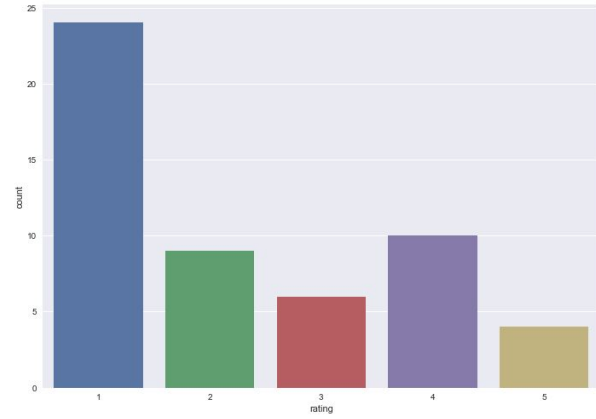
App Rating of top Social Media app(2 wk period)
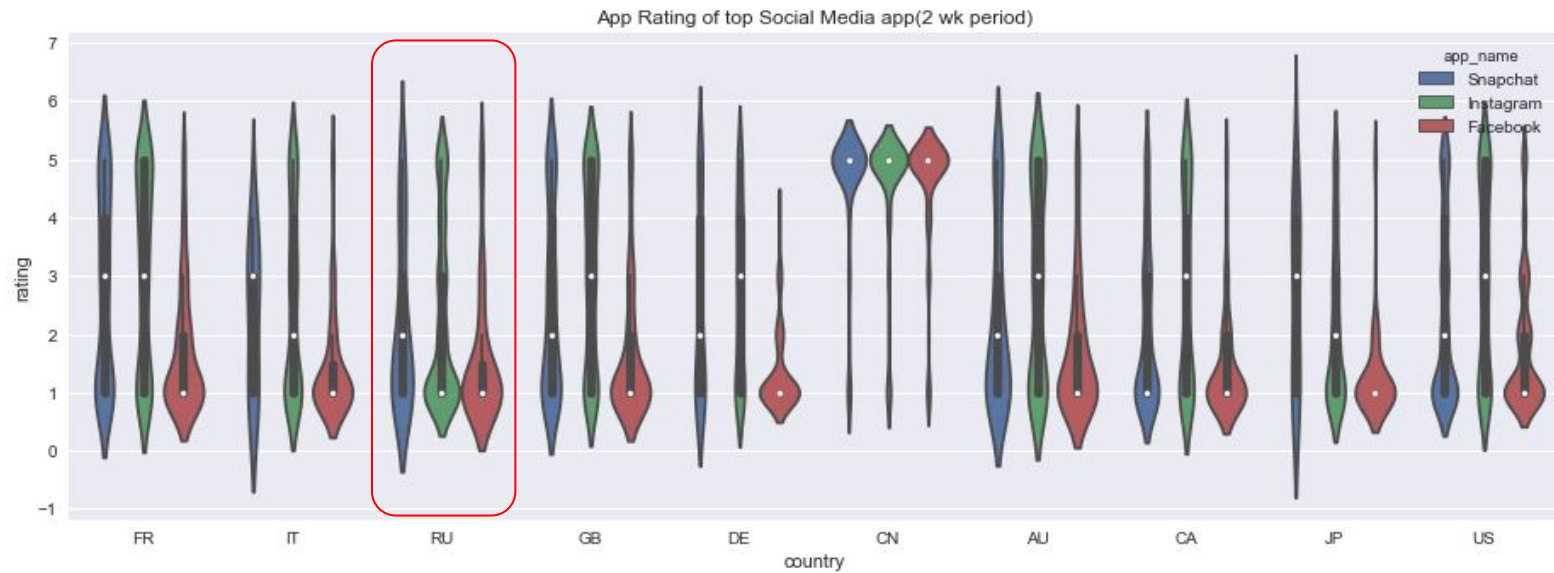
# Sentiment Analysis using Keyword Searches

**Example: What are Snapchat users saying about battery?**

- 53 customers left negative reviews with keyword battery

# Topic Modeling on Customer Reviews

**Example: What were Snapchat users talking about with reviews <3 stars?**

- Using LDA, 20 topics extracted from 1362 snapchat reviews with 1 and 2 star ratings

```
topic 0 : -PRON-     not     like     want     log     -PRON- want
topic 1 : update     new     new update     the     the new     hate
topic 2 : open     close     -PRON- open     not open     message
topic 3 : will     will not     not     let     not let     -PRON- wi
topic 4 : snap     streak     send     lose     friend     day     bitm
topic 5 : internet     say     connection     internet connection
topic 6 : snapchat     old     good     old snapchat     use     inst
topic 7 : app     this     this app     the     the app     trash     u
topic 8 : fix     please     please fix     bug     asap     problem
topic 9 : change     username     account     new account     peopl
topic 10 : register     can&#39;t     can&#39;t register     -PRO
an     garbage     why
topic 11 : bad     very     update     get bad     get     just     eve
topic 12 : be     -PRON- be     -PRON-     message     get     connec
topic 13 : work     not work     wifi     sound     datum     not     f
topic 14 : story     friend     friend story     watch     see     ad
topic 15 : '     -PRON- '     annoying     -PRON-     ' annoying
topic 16 : crash     keep     keep crash     slow     app crash
topic 17 : have     -PRON- have     -PRON-     have try     year
topic 18 : time     time -PRON-     picture     try     -PRON- try
topic 19 : filter     dog     dog filter     old     flower     retur
```

# Impact

- Tool can analyze sentiment discover issues across all apps and across categories
- Machine learning can analyze sentiment and topics over large volumes