

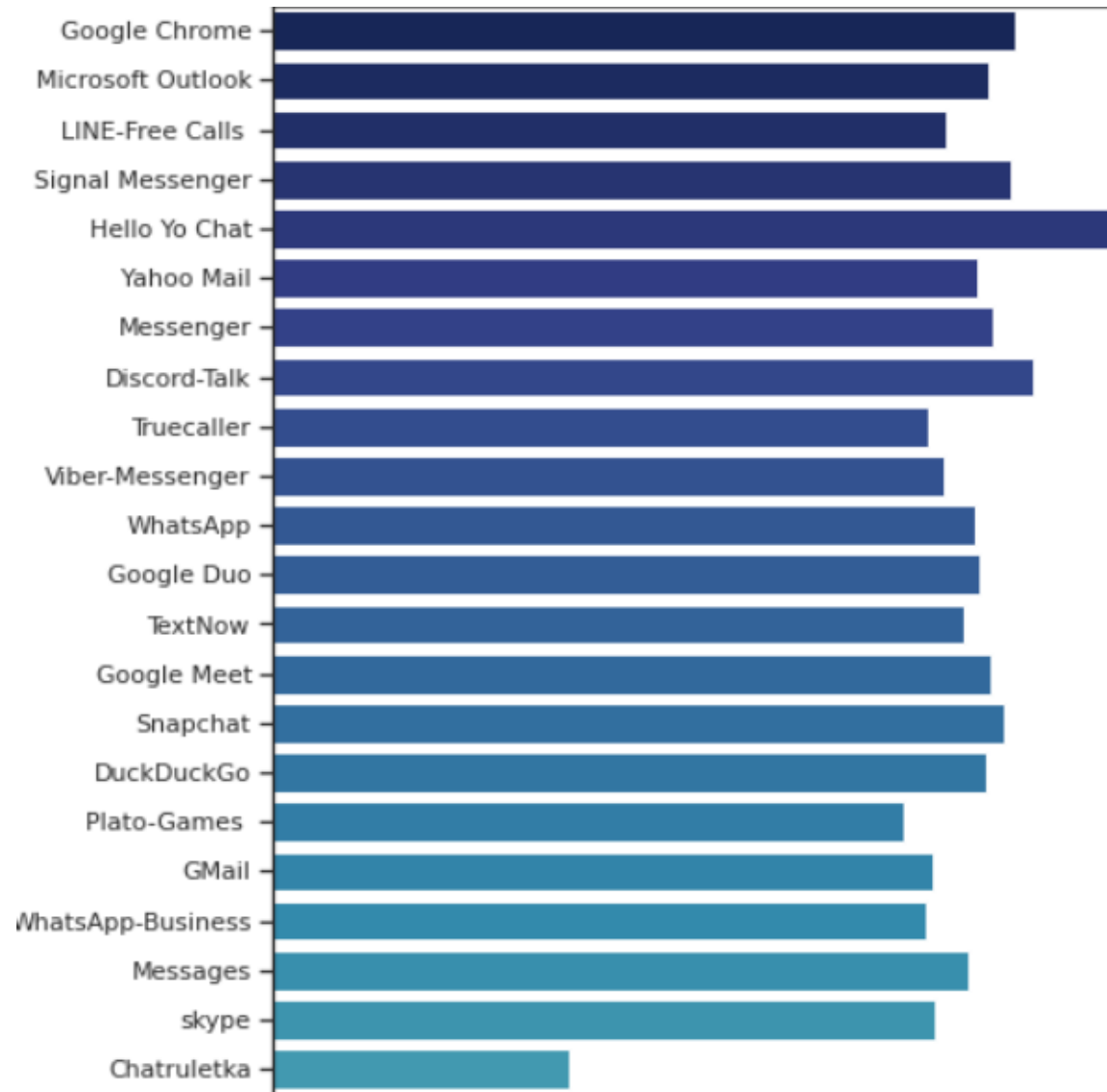
# AppGPS

Apps Analysis Using NLP



## Question

What do people like  
and dislike about the  
Apps in the Google  
Play Store?



## Approach & Goals

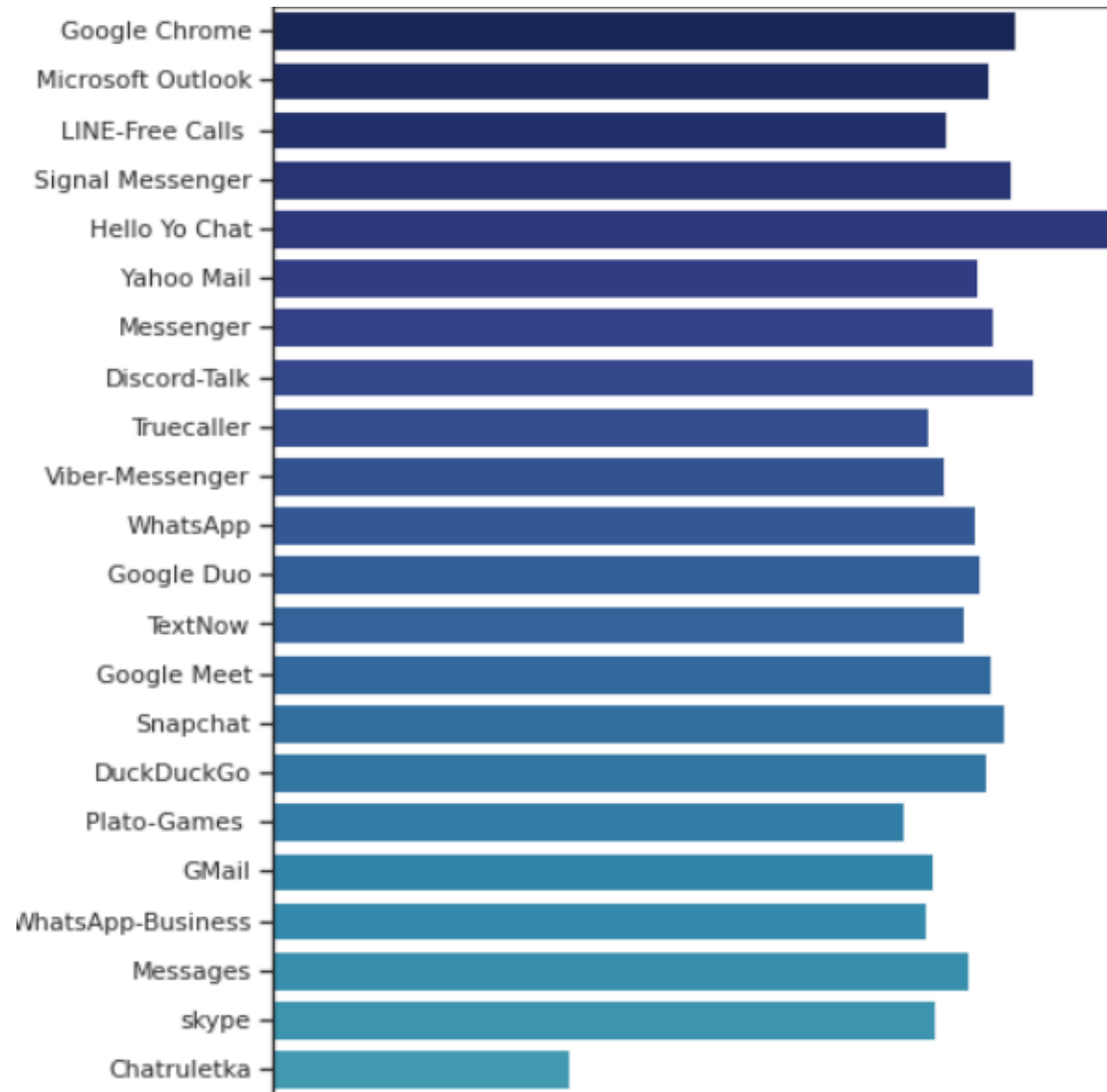
Analyze user reviews to identify requirements, opinions and their acceptance of the apps

1.

Train a prediction model of user acceptance

2.

Visualize common words, requirements and opinions



# AppGPS - Layout

- **Data Mining**
- Data Cleaning & Encoding
- Model Training
- Data Visualization
- Outcomes

Google Chrome  
Whatsapp  
Microsoft Outlook  
Bigo Live  
Signal Messenger  
Line-Free Calls  
Discord-Talk  
Yahoo Mail  
Truecaller  
Messenger  
Google Duo  
Kakaotalk  
Viber-Messenger  
Snapchat  
Skype  
Duckduckgo  
Plato-Games  
Google Meet  
Messages  
Whatsapp-Business  
Google Go  
Opera Browser  
Firefox Browser  
Microsoft Edge  
Brave Browser  
Messenger Lite  
Samsung Email  
Google Voice  
Telegram

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snapchat  
skype  
duckduckgo  
plato-games  
google meet  
messages  
whatsapp-business  
google go  
opera browser  
firefox browser  
microsoft edge  
brave browser  
messenger lite  
samsung email  
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Samsung Email  
Google Voice  
Telegram

# AppGPS - Layout

- Data Mining
- Data Cleaning & Encoding
- **Model Training**
- Data Visualization
- Outcomes

10100001010
1010100101
0010010001
0100101010
0100101001
0101001001
1010101010
10100001010
1010100101
0010010001
1010000100
1010100101
0010010001
0100101010
0100101001
0101001001
1010101010
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0100101001
0101001001
1010101010
1010000100
1010100101
0010010001
0100101010
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1010000100

google chrome  
whatsapp  
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kakaotalk  
viber-messenger  
snapchat  
skype  
duckduckgo  
plato-games  
google meet  
messages  
whatsapp-business  
google go  
opera browser  
firefox browser  
microsoft edge  
brave browser  
messenger lite  
samsung email  
google voice  
telegram

Google Chrome  
Whatsapp  
Microsoft Outlook  
Bigo Live  
Signal Messenger  
Line-Free Calls  
Discord-Talk  
Yahoo Mail  
Truecaller  
Messenger  
Google Duo  
Kakaotalk  
Viber-Messenger  
Snapchat  
Skype  
Duckduckgo  
Plato-Games  
Google Meet  
Messages  
Whatsapp-Business  
Google Go  
Opera Browser  
Firefox Browser  
Microsoft Edge  
Brave Browser  
Messenger Lite  
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Google Voice  
Telegram





# AppGPS – Data Mining

**Place:** Google Store - USA

**Category:** Communication

**Amount:** 50 Apps

**Sample:** 45.609 Reviews

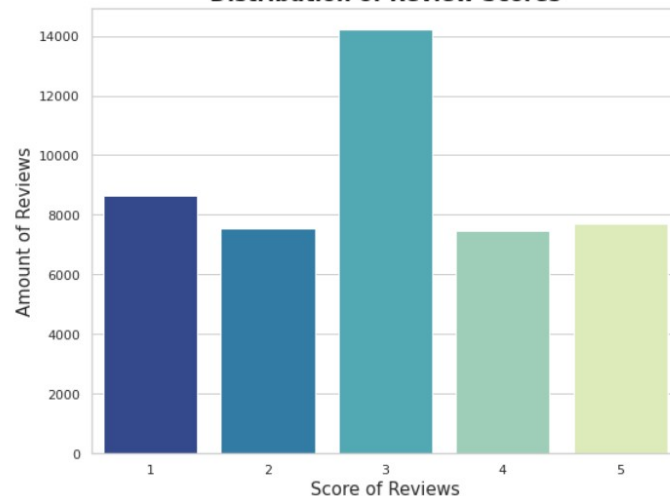
**Period :** 2013-2021

**Parameters:** Most Relevant & Newest

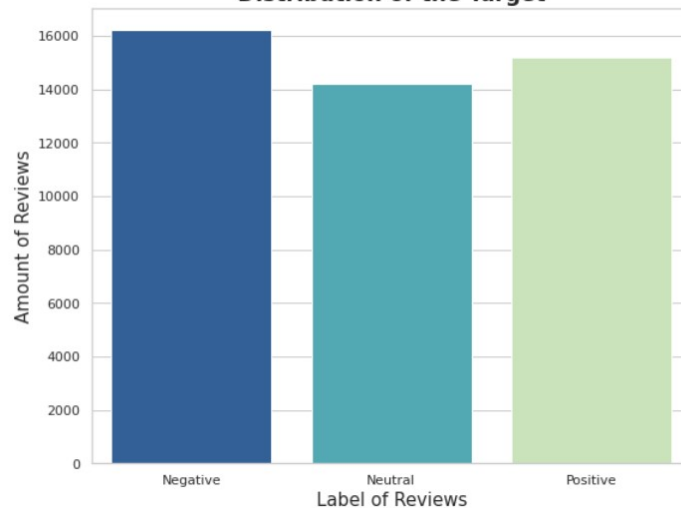
**Distribution:**

1	8.659
2	7.561
3	14.222
4	7.449
5	7.718

**Distribution of Review Scores**



**Distribution of the Target**





# AppGPS – Data Mining

**Place:** Google Store - USA

**Category:** Communication

**Amount:** 50 Apps

**Sample:** 45.609 Reviews

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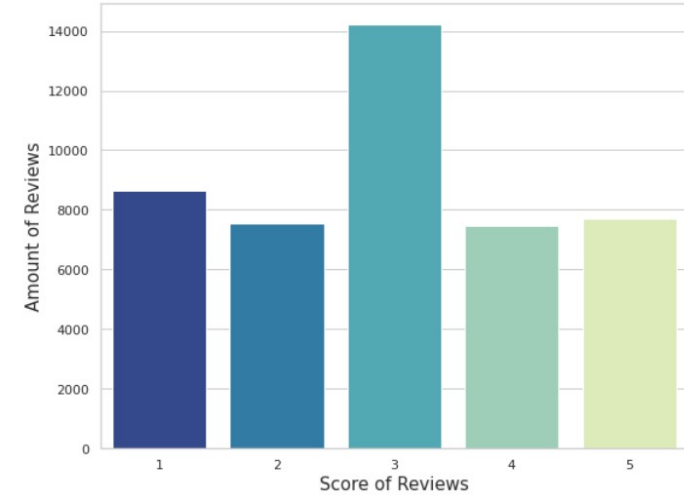
**Distribution:**

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2	7.561
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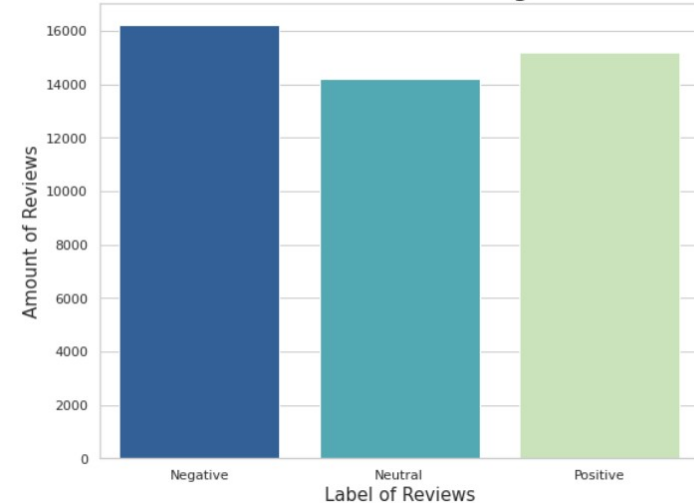


<b>Negative:</b>	16.220
<b>Positive:</b>	15.167
<b>Neutral:</b>	14.222

**Distribution of Review Scores**



**Distribution of the Target**



# AppGPS – Data Cleaning

**From images to words**  
49 Columns  
Regular Expressions



J J

★★★★★ March 9, 2021



☀️ U MUST USE THIS APP! 🍑🍑🍑🍑🍑 ProtonMail is Great for Privacy 😊. Very easy to import emails from other email accounts. 🍌 Minor annoyance 😞; Push notification will list all the emails that have come in even though I have already checked them on my PC hours earlier. Color scheme is bland. 🌟🌟🌟🌟🌟 5...

# AppGPS – Data Cleaning

**From images to words**

49 Columns

Regular Expressions

**Only words with meaning**

3 Columns

Lemmatize



J J

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0	ch.protonmail.android	Negative	ready public release lack basic functionality ...
1	ch.protonmail.android	Neutral	rating service service awesome feature android...
2	ch.protonmail.android	Positive	protonmail waaaaay day ready prime time sadly ...
3	com.android.chrome	Negative	get update chrome stop work reason try clear c...
4	com.android.chrome	Neutral	tab group month experimental feature ui diffic...
5	com.android.chrome	Positive	actually grow love app bell whistle originally...

# AppGPS – Data Cleaning

**From images to words**

49 Columns

Regular Expressions

**Only words with meaning**

3 Columns

Lemmatize

**From words to numbers**

21.890 Columns

Bag of Words



JJ

★★★★★ March 9, 2021



☀️ U MUST USE THIS APP! 🍌🍌🍌🍌🍌 ProtonMail is Great for Privacy 😊. Very easy to import emails from other email accounts. 🙄 Minor annoyance 😞; Push notification will list all the emails that have come in even though I have already checked them on my PC hours earlier. Color scheme is bland. ⭐⭐⭐⭐⭐ 5...

0	ch.protonmail.android	Negative	ready public release lack basic functionality ...
1	ch.protonmail.android	Neutral	rating service service awesome feature android...
2	ch.protonmail.android	Positive	protonmail waaaaay day ready prime time sadly ...
3	com.android.chrome	Negative	get update chrome stop work reason try clear c...
4	com.android.chrome	Neutral	tab group month experimental feature ui diffic...
5	com.android.chrome	Positive	actually grow love app bell whistle originally...

	aa	aaa	aaaa	aaaaaaaaaa	aaaaaaaaaaaaaaaaaaaa
appid					
ch.protonmail.android	0	0	0	0	0
com.android.chrome	0	0	0	0	0
com.asiainno.uplive.aiglamour	1	0	0	0	1

# AppGPS – Classification Model

## Sample

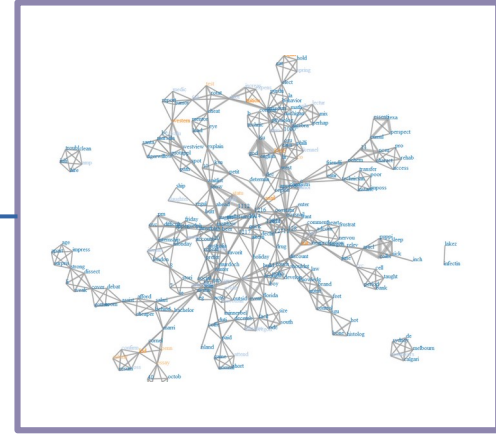
Rows: 1.569  
Columns: 3.231

**nltk.WordNetLemmatizer**  
**TfidfVectorizer**  
**RandomForestClassifier**

**72%**

Prediction Score

	aa	aaa	aaaa	aaaaaaaaa	aaaaaaaaaaaaaaaaa
appid					
ch.protonmail.android	0	0	0	0	0
com.android.chrome	0	0	0	0	0
com.asiainno.uplive.aiglamour	1	0	0	0	1



**Polarity**

**Positive**

**Negative**

# AppGPS – Visualization - Polarity

## Polarity of each app:

- 1 Negative acceptance
- 1 Positive acceptance

1. **Google Duo:** 0.211
2. **TextNow:** 0.193
3. **WhatsApp Business:** 0.189

## Acceptance of Apps Regarding the Reviews



# AppGPS – Visualization - Polarity

## Polarity of each app:

- 1 Negative acceptance
- 1 Positive acceptance

1. **Google Duo:** 0.211
2. **TextNow:** 0.193
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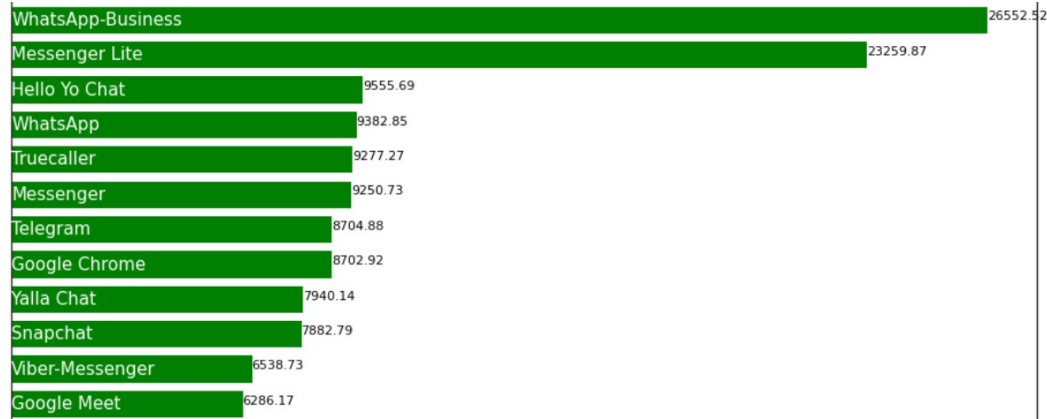
## Relevance of reviews (Polarity):

1. **WhatsApp Business:** 26.552
2. **Messenger Lite (Facebook):** 23.259
3. **Hello Yo Chat:** 13.452

## Acceptance of Apps Regarding the Reviews



## Relevant Reviews for the users



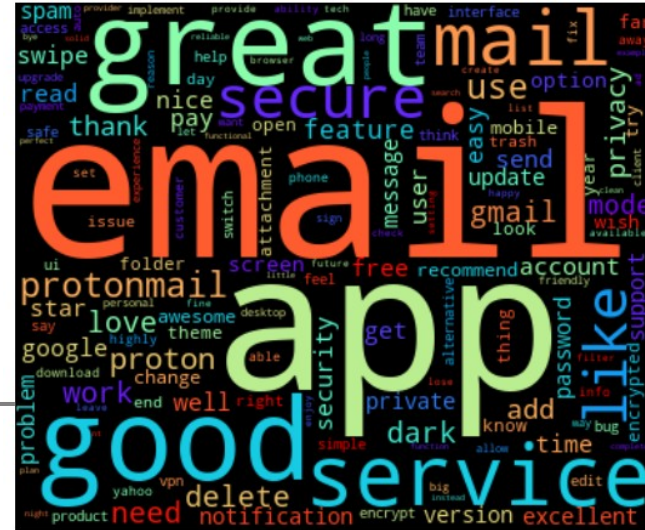


# AppGPS – Visualization - Wordcloud

## ProtonMail Wordcloud

### Positive Reviews

- Performance
  - secure, service, use.
- Feelings:
  - great, good, like.



## AppGPS – Visualization - Wordcloud

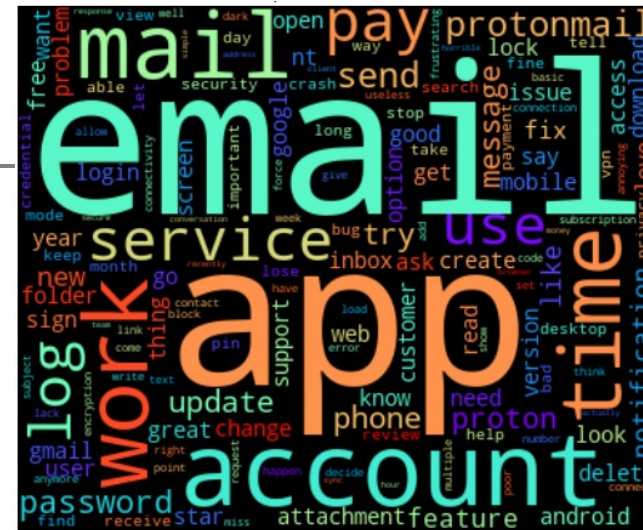
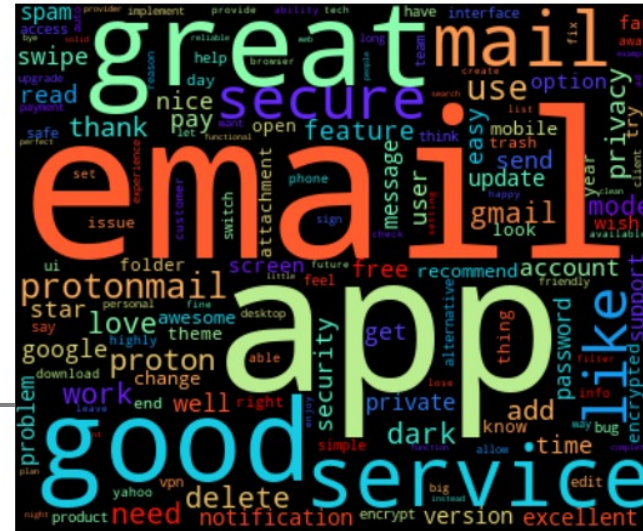
# ProtonMail Wordcloud

## Positive Reviews

- Performance
  - secure, service, use.
- Feelings:
  - great, good, like.

## Negative Reviews

- Performance
  - account, work, service, use.
- Opinions:
  - pay, time.



## AppGPS – Visualization - Wordcloud

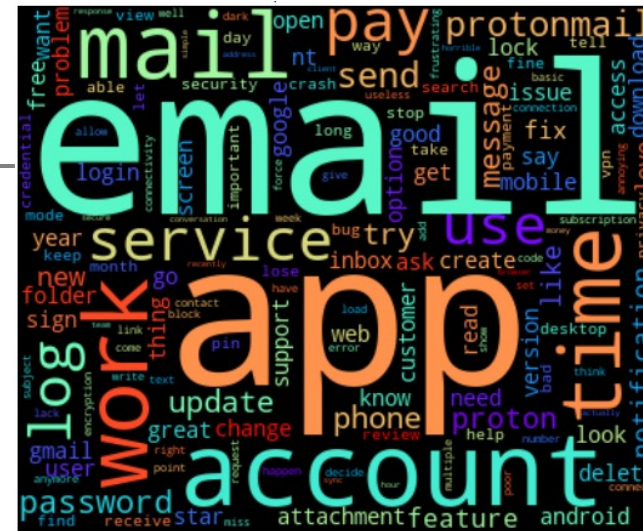
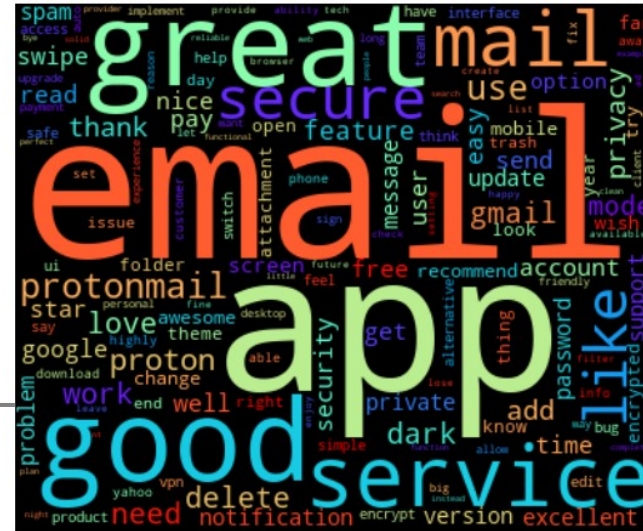
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# AppGPS – Outcomes

- Data does not tell about cultural, technological and demographic conditions

Adblocker Browser	Negative	work great recently app crash opening pixel re...
	Neutral	app great week ago block happen like video go ...
	Positive	app kind chatty little frustrating design bloc...
BOSS Calls	Negative	receive verification msg verify number transfe...
	Neutral	app easy use easy recharge credit card informa...
	Positive	great long distance rate go international netw...
CallApp	Negative	call record record call voice inform time feel...
	Neutral	good interface usability pay version app clunk...
	Positive	confusing screen pop know advertisement phone ...
Chatruletka	Negative	bad app world highly recommend instal app work...
	Neutral	good app young guy wish like sort filter gende...
	Positive	app nice button little disappointed hand touch...
Contacts Google	Negative	attempt numerous time contact google avail acc...
	Neutral	great simple use problem samsung dual messenge...
	Positive	recent update state get hang check search cont...
Discord-Talk	Negative	love app update mobile app perform like trash ...
	Neutral	great app easy use rating lower issue consiste...
	Positive	year highly useful communicate friend easily r...
DuckDuckGo	Negative	give app star love moment lately eat battery t...
	Neutral	early render review comment future app literal...
	Positive	like sense security search great fast battery ...
Firefox	Negative	firefox android year today spontaneously stop ...
	Neutral	like browser think secure place surf web eye p...
	Positive	love browser thing consider fester wound defau...



## AppGPS – Outcomes

- Data does not tell about cultural, technological and demographic conditions
- **NLP analysis of reviews does not provide what exactly people do like and dislike about apps**

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# AppGPS – Outcomes

- Data does not tell about cultural, technological and demographic conditions
- NLP analysis of reviews does not provide what exactly people do like and dislike about apps
- **NLP analysis of reviews is a relevant approach to:**
  - identify the tendency of user acceptance
  - compare user acceptance in relation to others apps
  - characterize the preliminary needs of users
  - characterize the community of users in Google Play Store

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	Neutral	app great week ago block happen like video go ...
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# AppGPS

# Apps Analysis Using NLP

Jose Muñoz Alvis | 2021

## IronHack – Data Analytics

