

Understanding Consumer Complaints

NLP



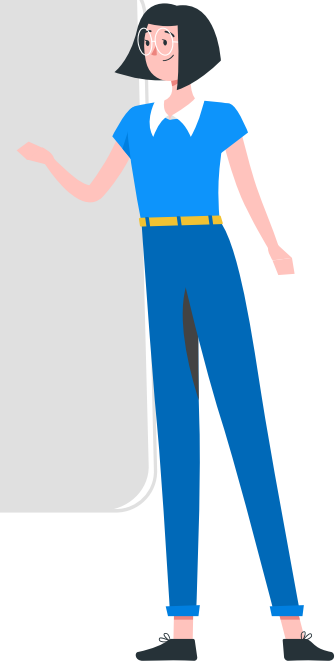



Problem Statement

- How financial institutions improve their services and overall satisfaction rate?

Proposed Solution

- Use Topic Modeling
- Extract complaints
- Identify topics





“The Consumer Financial Protection Bureau (CFPB) is a regulatory agency charged with overseeing financial products and services that are offered to consumers. The CFPB is divided into several units – research, community affairs, **consumer complaints**, the Office of Fair Leading, and the Office of Financial Opportunity.”

—Investopedia

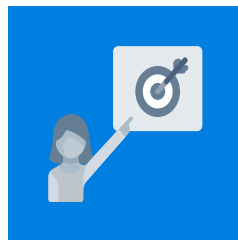




Data



- Consumer Complaint Database



- Only limit to IL
- Exclude credit report product/sub-product





Workflow

1

Data Cleaning

- Pandas

2

Tokenization

-NLTK,
Gensim

3

Lemmatization

-NLTK

4

Vectorization

- Scikit-learn,
TfidfVectorizer

Workflow 2

5

Document-Topic
Matrix

- Latent Dirichlet
Allocation (LDA)

6

Coherence score

- Gensim

7

Num of Topics

- Gensim

8

Topics

- Pandas

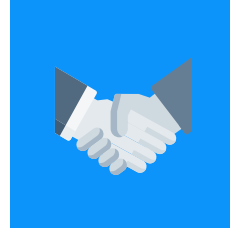
Results



Fraud



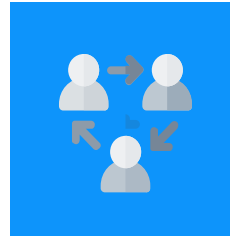
3rd Party Vendor

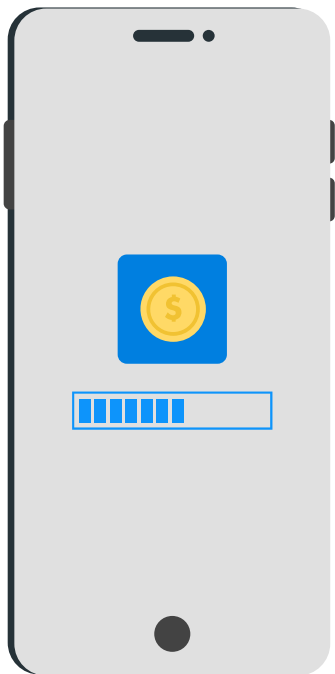


Communication

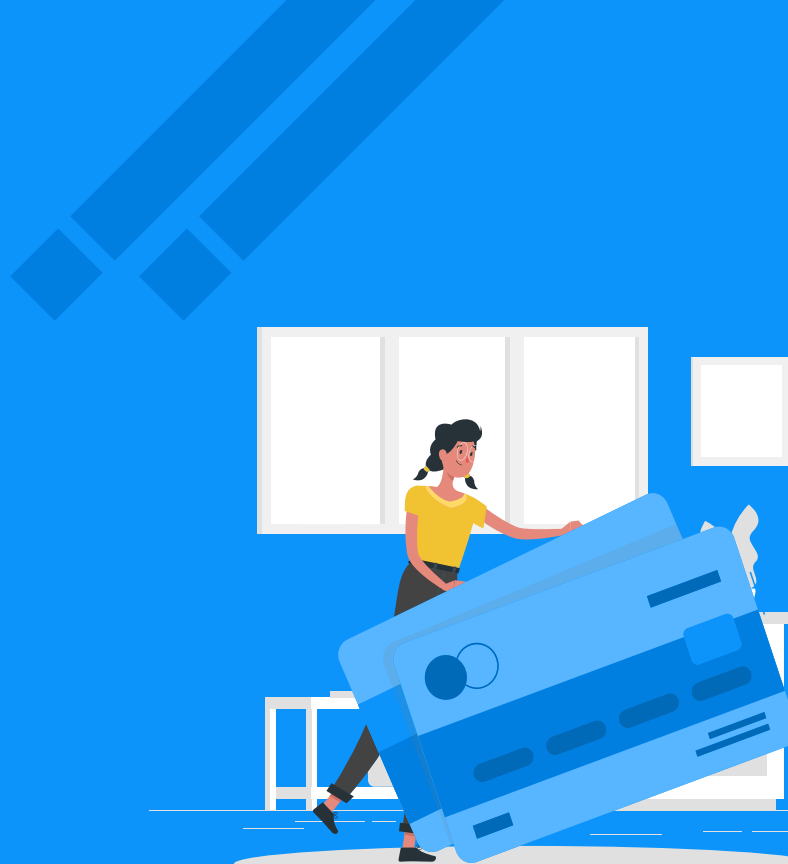


Horizontal Communication





1



Fraud



Topic 1 - Fraud

Keywords

card, charge, credit, make, fraudulent, account, purchase, use, report

Complaint Example

... have had multiple credit cards stolen from the mail. Most credit card companies, upon being notified, have immediately canceled the **card** and refunded the **fraudulent** charges. BANK, on the other hand, has refused to cancel the charges, claiming since the card was physically present, I am responsible. My BANK credit **card** had never been used in the previous 5 years, and yet, upon being used for a number of charges, no fraud alert or notification was sent to me. I personally noticed the charges when I was billed, and immediately notified BANK.



2

**3rd Party
Vendor**



Topic 2 – 3rd Party Vendor

Keywords

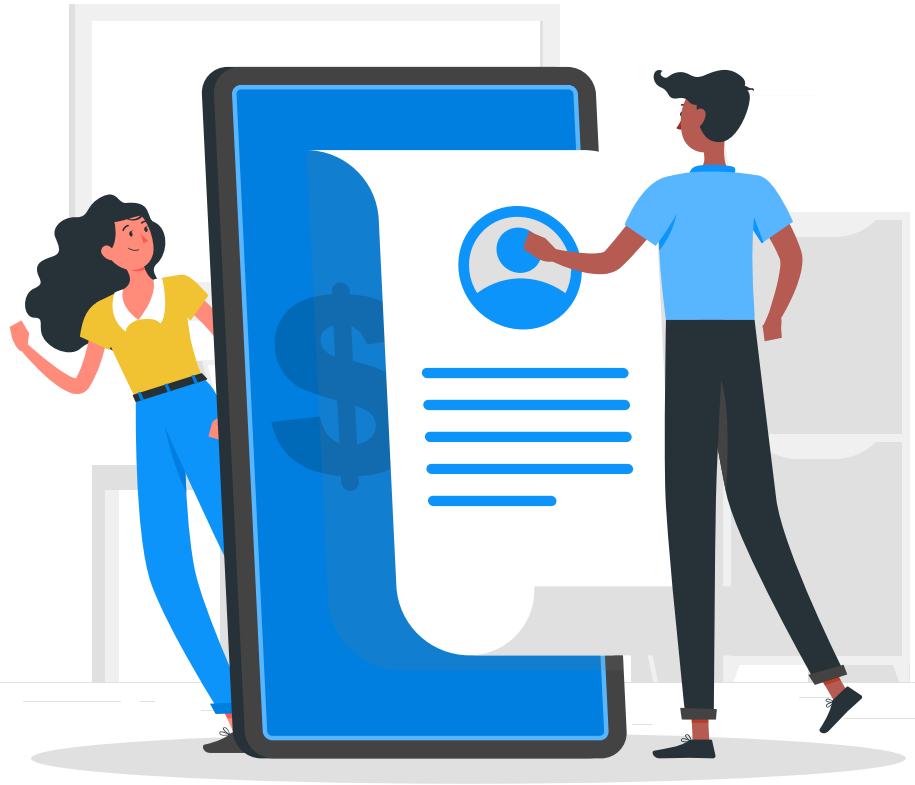
Account, bank, money, transaction,
paypal, close, use, open, access, america

Complaint Example

...I made a purchase via **Paypal** for {\$900.00} USD. the amount was converted to {\$1000.00} CAD and was transferred to seller after taking out fees. Seller later on XX/XX/2021 decided that he does not want to go through the transaction and returned me the full amount of {\$1000.00} CAD and so I was expecting to get the full {\$900.00} USD back since there hasnt been significant change in the USD CAD conversion rate. But **Paypal** used two different rates to first convert USD to CAD when i made payment to seller and a different USD to CAD when the seller refunded, resulting in a refund of only {\$860.00} or a loss of {\$37.00} for me without having made a **transaction**.

Communication

3





Topic 3 - Communication

Keywords

send, email, receive, back ,get, return,
money, refund, order, phone

Complaint Example

... he responded by saying it was already sent i again requested for the validation to be mailed to my address and i verified my address xxxx said he would **email** it i said no **email** i prefer by mail on xxxx2019 i received the correspondence via **email** when i strictly requested by mail then i asked for no more calls ...



Horizontal Communication



Topic 4 – Horizontal Communication

Keywords

bank, get, account, check, card, customer,
money, time, make, back

Complaint Example

... 2021 i received a wire for xxxx after it had cleared i withdrew the **money** there was no indication that they were suspicious of the deposit i was given i had no idea there was a problem until i went to the atm and at the **time** i was unable to retrieve my **money** ... in summary i was never notify of the fraud issue they have held my money for a month as of around xxxxxxxx no xxxx responds for to my messages or calls it is very hard to survive since more since covid

Conclusion



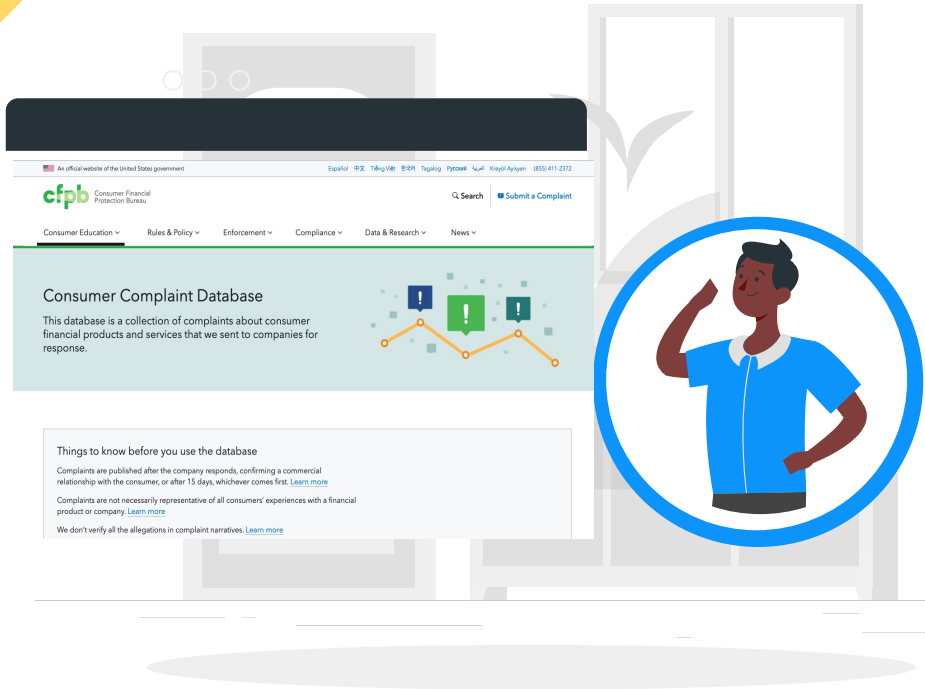
Topic Modeling



Topics



Next Steps





Next Steps



Operational Excellence

Fraud, Risk Evaluation



Communication

External and Internal



Thanks!

Do You Have Any Questions?

CREDITS: This presentation template was created by **Slidesgo**, including icons by **Flaticon**, infographics & images by Freepik and illustrations by **Storyset**.

Appendix





Appendix

Tools

- Pandas
- Matplotlib
- NLTK
- Scikit-learn





Appendix

Number of
Topics

Number of Topics	Coherence Value
4	0.3236
6	0.307
8	0.321
10	0.322
12	0.3257
14	0.3165
16	0.3244
18	0.3221
20	0.3169
22	0.3254
24	0.3347
26	0.3213
28	0.3221



Appendix

Representative
doc for each
topic

Dominant_Topic	Topic_Keywords	Num_Documents	Perc_Documents	
0.0	13.0	credit, report, account, collection, debt, company, remove, agency, bill, owe	30.0	0.0038
1.0	22.0	bank, get, account, check, card, customer, money, time, make, back	55.0	0.0070
2.0	19.0	send, email, receive, back, get, return, money, refund, order, phone	33.0	0.0042
3.0	9.0	card, charge, fraud, credit, make, fraudulent, account, purchase, use, report	601.0	0.0766
4.0	21.0	account, bank, money, transaction, paypal, close, use, open, access, america	211.0	0.0269