

Text Analytics on Amazon Reviews

Varun Patwardhan Harshini Chepyala Soumya Shalini Rajkumar Selvam

INTRODUCTION

DATA DESCRIPTION

RESEARCH PROBLEM

ANALYSIS AND RESULTS

RECOMMENDATIONS

CONTENTS

Interesting Facts Amazon Reviews



- Almost 90% of consumers consider online reviews highly important when purchasing a product from unfamiliar brand
- Even when purchasing from known brand, 67% of women consumers still mostly consider online reviews
- Amazon is topmost site for reviews, 90% of amazon consumers consider online reviews determinative
- For the 43% of consumers who check online reviews for items they've purchased before, they do so to see if others have had a similar experience and also to see if there is a better product option
- ☐ Moreover, consumers consider themselves savvy discerners of reviews, with 97% saying they can tell almost all of the time the credibility of a posted review.
- 3 key determinants of trust for an online review: how much the person sounds like me, amount of detail in the review, and noted as a verified purchaser

Review insights from Amazon



- **Business Strategy**: Manufacturer's can make use of insights from reviews in order to:
 - ☐ Monitor the **negative topics** discussed about the products
 - ☐ Find the **features** of their products which are **most attractive**
 - ☐ Check the market perception differences in **comparison to competitors**
 - ☐ Check the market opportunities for new features for **further product innovation**
 - ☐ Check the **fitness of their product segments** with market segment
- Such analysis can provide quantifiable metrics which can be used in further downstream applications for tracking real- time perception and trends
- ☐ We focused on one particular category for reviews: Mobile Phones.
- ☐ We focused in particular on Unlocked models as they are mostly sold on Amazon.

INTRODUCTION

DATA DESCRIPTION

RESEARCH PROBLEM

ANALYSIS AND RESULTS

RECOMMENDATIONS

CONTENTS

DATA DESCRIPTION



Data Source:

Review Data scraped from amazon.com reviews for popular locked phones:



- ☐ Apple iPhone 6 Unlocked Smartphone, 16 GB
- ☐ Blu Vivo XL2 5.5" 4G lte GSM
- SAMSUNG
- Samsung Galaxy S7 G930F

Data Features:

Product_Name

Review_Date

Rating_Out_Of_5

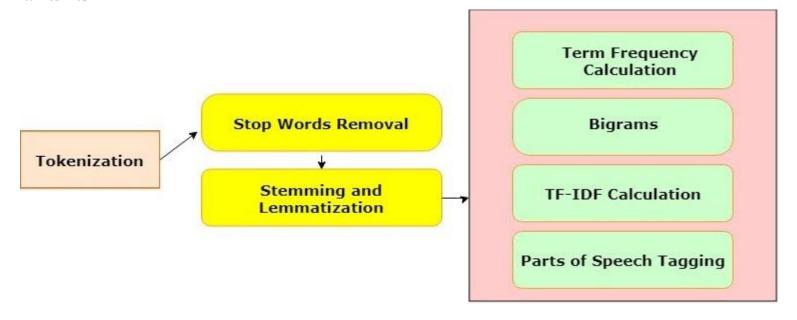
Review Title

Review_Text

DATA PREPARATION



☐ For feature extraction we aimed to derive major **entities**, **themes**, **categories**, **intentions**, **themes** and **sentiments** from customer reviews for each selected brand



INTRODUCTION

DATA DESCRIPTION

RESEARCH PROBLEM

ANALYSIS AND RESULTS

RECOMMENDATIONS

CONTENTS

RESEARCH OBJECTIVE



- ☐ Find common topics discussed for unlocked mobile phones
- Explore the differences in the focal topics for low and high rated reviews
- Explore the differences in topics for different manufacturers
- Explore the differences in products with 4.0 and 5.0 ratings as this serves interesting insights for manufacturers
- ☐ Check the impact of influence of specific topics on overall rating
- Perform sentiment analysis for reviews with specific topics to see overall perception about particular product features

INTRODUCTION

DATA DESCRIPTION

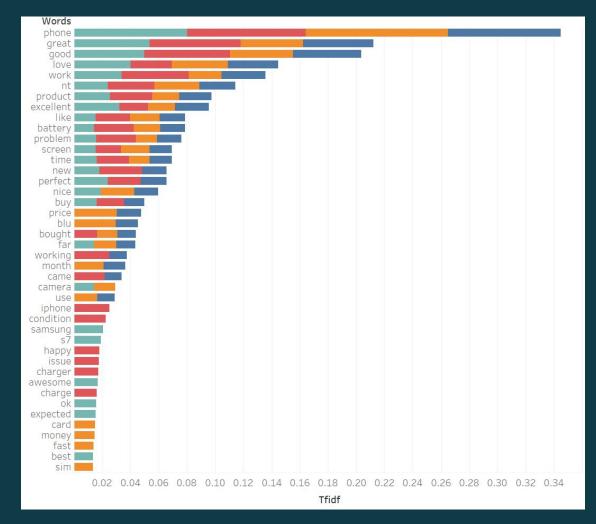
RESEARCH PROBLEM

ANALYSIS AND RESULTS

RECOMMENDATIONS

CONTENTS

Comparison of tf idf scores of Top 25 features under each category

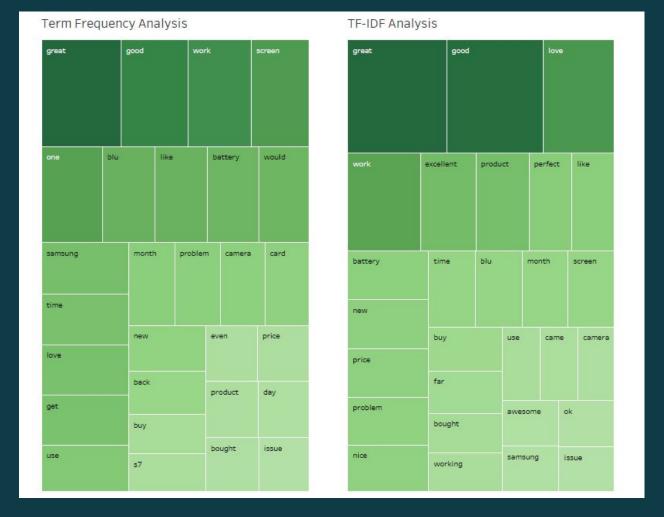


Type

all

■ blu■ iphone■ samsung

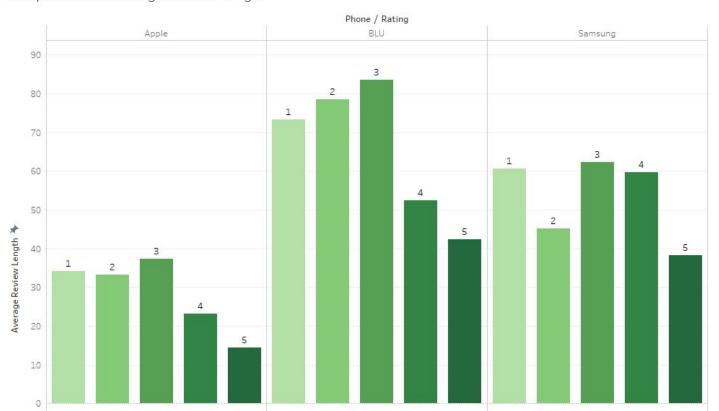
Analysis and Visualization of TF and TF-IDF to identify the initial user topics



Review length vs Rating

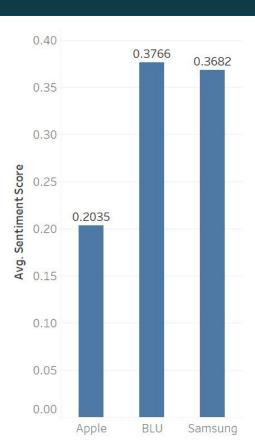


Comparison of Average Review Length



Avg sentiment score vs. Brand





TEXT CLUSTERING



Cluster	Cluster Themes	Cluster Description	Fred	Percent	RMSSTD
1	Good perception on phone	+card sim international +'sim card' +unlock +version sd +carrier	341	15.71	0.122003819
	accessories	+expect awesome +thing +memory battery +amaze far			
2	Feature Satisfaction	+love +product great excelent +'great product' excelente 'excellent	232	10.69	0.119538706
		product' excellent +happy +recommend 'on time' +work +phone			
		perfect +satisfy			
3	Problems arising with time	+work +buy +problem +month +charge +return working +time	583	26.87	0.124601225
		+day +turn +battery money +issue +receive +start			
4	Overall Product Satisfaction	+phone +good +great price +'great phone' excellent +'good phone'	455	20.97	0.120355803
		+nice quality +camera +fast +perfect awesome +memory			
		+condition			
5	Neutral or bad perception on	+apps +case blu +screen +drop back +year +want sd +camera	559	25.76	0.134822845
	features and accessories	+service first +update			

CLUSTER THEMES



```
like expected some
worked great some
worked great ok SD version
unlocked both able though need micro put
really much perfect well after GB
getting far nice slot case issues SIM back international
love just best SIM back international
memory just all big small still little price works
work ever cards because life new Card
Galaxy go more easy two
free glass awesome used fast
good problem even buy only
using screen know about
thing battery
                                                                          ame thing battery
```

```
absolutely amazing WOrks

one complaints charger excellent
wont far condition
impressed again Excelente any getting awesome
more gold fast expensive problems second really arrived definitely
birthday recommend buy
loving quality without working seller Thank
now charm purchased xl myself look month
well camera use much im Thanks niece
received all ove perfect just
time trouble like recommended about good
came someone Shipping described gift after
Excelent only customer satisfied item perfectly
using Great packaging husband
brand
Nice everything delivered
new
                                                                            absolutely amazing WOrks
```

1

CLUSTER THEMES



```
batterybought buy condition

problems great issues charge recommend couple verything

update bad months any last Works

charger few box reset apps turn worked love reviews times price less after another even new will save if far used seller charging two day more using started time money really again like one refurbished

month know use only device well came product came product same same charge recommend couple reduction.

same charge recommend couple turn worked love another even new without waste some without about started time money really again like one refurbished

return all work happy still purchased other received
```

```
even Excellent
quality internal highly
carrier far
definitely
want life love perfect
well like because expected much ever
before still easy looking GB say without
pleased Camera
enough Android data any go way time some
Price Thank one service
lot apps condition Overall using awesome
since now problems amazing storage only
battery call about works product all
really everything resolution
T-Mobile bought comes recommend
use best
```

```
best case

best case

warranty

really like make

only last Android need glass having even

app different apps bought little any time
first came screen months great

Vivo still lot SD year GB go pay

without since never getting other fast one

without since never getting other fast one
buy XL better using about SIM before right
bad quality

want Justinee price because
quality want Justinee price because

charger back
```

WORD CLOUDS:



Scratch Crack **Exactly Describe** Hold Charge Customer Service Some Reason About Week Everything Fine Daughter Love Apple Store Big Deal Little Nervous Shut Off Front Face Bad Review Sim Card Shut Down Able Set Worth Wait Battery Life Brand New Thank Guy Minute Itas Waste Money Perfectly Fine Spend Over Only Thing Shutter Sound After Read Son Love Certify Refurbish
Day Late
Give Star Fast Delivery
Charge Port
God Black
God Black Few Month Volume Button Straight Talk Face Camera Down Drain
Screen Protector
Highly Recommend
Complete Waste Headphone Jack Couple Day Definitely Recommend Dy Dy Less Week Charger Original Other Customer Condition Single Write Review Completely Dead Take Cricket Extremely Disappoint Wish Give Cut Off Satisfy Customer Give Zero Meet Expectation Outside Country Battery Gate | Iphone User

Apple

Samsung

Android Marshmallow Highly Recommend Absolutely Love Screen Protector Watch Video Water Resistant Turn Off Arrive Time Tell Me Week Ago Sd Card Micro Sd Gorilla Glass International Version Hand Down Gold Color Card Slot Battery Life Memory Card Contact Seller Contact Seller Low Light Sim Card Last Year American Sim American Sim High Quality Customer Service Give Star Wifi Call Factory Unlock Headphone Jack Nano Sim Voice Call Definitely Recommend Couple Month Rear Camera Bring Back Box Open Note Edge Exynos Processor ressor Few Minute Battery Drain Front Face Cool Down Improvement Over Shut Down Happy Purchase Factory Reset Update Nougat Surprise Me Perfect Condition Overheat Problem Wi Fi Operate System Wireless Place Water Resistance Mobile International More Information Water Damage Customer Support Update Review Verizon Store Fast Delivery Several Time Under Warranty Upgrade Htc

Protector Already Picture Quality Internal Memory Work Perfectly Turn Off Connect Wifi Absolutely Love Charge Port Shut Off . Start Act Dual Sim Gorilla Glass Sd Card Text Message Allow Me Screen Protector Bell Whistle Waste Money Vivo XI Gold Color Card Tray
Less Year Sim Card Slow Down Att Sim High
Cant Beat Customer Service Can live Customer Service Can Live Fell Off Highly Recommend Samsung Galaxy
Shut Down Power Off Price Tag
Worth Money
Star Sams Might Recommend Anyone More Expensive Stay Away Higher End Give Star Write Review Hard Reset Beat Price Read Review Some Reason Day Later Perfectly Fine Straight Talk Water Damage Tech Support Plenty Storage Six Month Samsung Apple Every Single Customer Support Definitely Recommend Download App Iphone Galaxy Silicone Case Ghost Touch Something Wrong Protective Case Storage Space Randomly Restart Internal Storage Sdmemory Card

Blu Vivo

ANALYSIS PLAN



We created a list of 886 terms to describe 10 user defined topics

- accessories
- camera
- Connectivity
- General Good Perception
- □ look_feel
- price
- Problems arising with time
- service
- ☐ Sim and sd card
- performance

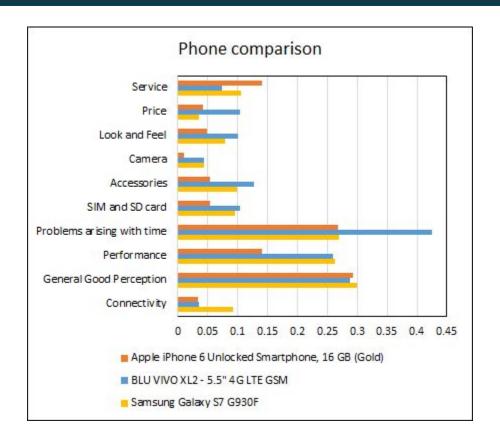
TOPIC	_TERM
accessories	headphone
accessories	adapter
accessories	cover
accessories	protector
accessories	jack
accessories	socket
accessories	charger
accessories	dual sim
accessories	chip
accessories	sticker

ANALYSIS PLAN



- Sentiment Analysis of all reviews to see overall perception and also perception about particular attributes of the products based on the topics
- ☐ Clustering of reviews based on topic weights to analyze the relation of products with market segmentation
- Regression analysis to check the impact of of topic weights on overall rating
- Check the topic differences in low rated and high rated reviews and how they compare for each product
- ☐ Check the topic differences in reviews with 4.0 and 5.0 rating for each product





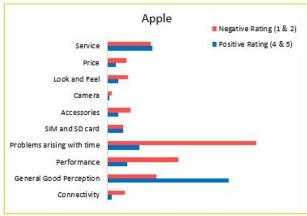


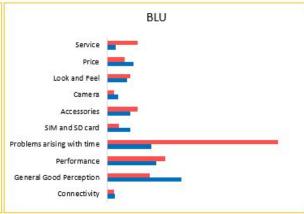
Positive vs Negative - Customer Rating Approach

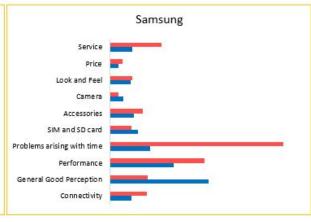




SAMSUNG







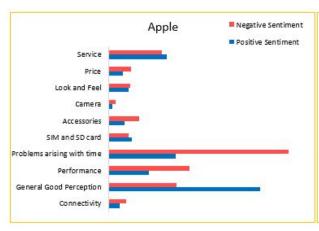


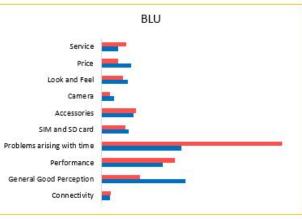
Positive vs Negative - Sentiment Score Approach

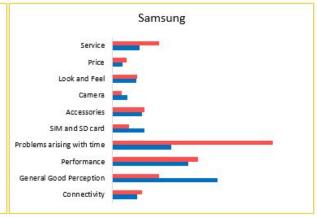




SAMSUNG









Observations from Overall Perception of Customers:

- Apple pushes comparatively more frequent s/w updates. So people talk more about it, but overall have good perception about it
- iPhone users are very sensitive and reactive even when there are minor issues, as their expectations are very high for the price they paid.
- Samsung has too many bloatwares and the software updates are causing more issues.
- ☐ For Blu, people are satisfied with price resulting in a positive perception, as compared to Samsung and iphone.
- ☐ Blu customers are comparatively more satisfied with the features like camera, accessories, etc. due to their minimal expectations



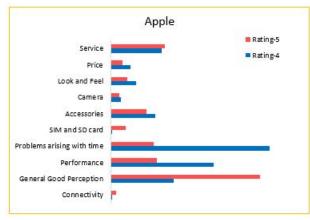
Comparison of Ratings-4 and Ratings-5

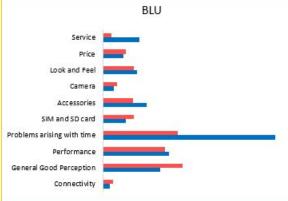
What factors can improve the ratings from 4 to 5?

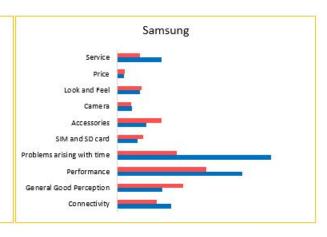




SAMSUNG







RESULTS - REGRESSION



- When we performed regression analysis to check the influence of topic weights on the review rating, we found below topics have significant impact on rating:
 - **□** Connectivity:

This topic is described terms which specify the phone's compatibility with different carriers internationally. Mention of this topic in reviews had **significant negative impact** on overall rating

□ General Good Perception:

This topic is described terms which specify general good remarks about the phone and discuss overall perception. Mention of this topic had **significant and highly negative** impact on the rating

RESULTS - REGRESSION



- When we performed regression analysis to check the influence of topic weights on the review rating, we found below topics have significant impact on rating:
 - **□** Performance:

This topic is described terms which specify overall performance of the phone (Speed, compatibility, features etc.)Mention of this topic had **significant positive impact** on the overall rating

□ Problems arising with time:

This topic is described terms which specify the diverse problems encountered over time with phone use.Mention of this topic had **very highly significant negative** impact on overall rating

RESULTS - REGRESSION



- When we performed regression analysis to check the influence of topic weights on the review rating, we found below topics have significant impact on rating:
 - □ Service:

This topic is described terms which specify overall service quality this includes customer service and continued support by product manufacturer. Mention of this topic had significant negative impact on overall rating

☐ Price:

This topic is described terms which specify comments about price or perceived value of money for the product. Mention of this topic had **significant positive** impact on overall ratings.

INTRODUCTION

DATA DESCRIPTION

RESEARCH PROBLEM

ANALYSIS AND RESULTS

RECOMMENDATIONS

CONTENTS

RECOMMENDATIONS



Rationale behind Recommendations:

- Monitor reviews associated with problems arising with time topic and use the feedback to improve the product.
- Focus on the differences in the topics and sentiment in 4 and 5 rated reviews to understand customer satisfaction and areas of improvement. Do the similar analysis for competitors as an input for SWOT analysis
- ☐ Focus on 1 and 2 rated reviews to understand features with negative reception by market
- Verify that the market positioning strategy they have decided is reflected in the reviews

RECOMMENDATIONS



How to improve customer ratings from 4 to 5:

All Phones:

-Improvement in modules that fails over the time

Apple:

-Improvement in performance of the phone

Blu:

-Improvement in after-sales service, warranty services, consistent performance over time

Samsung:

- -Improvement in performance of the phone
- -Introduce the ability for customers to remove unwanted bloatware
- -Being more transparent/clear about different versions like International, US, etc.

RECOMMENDATIONS



Recommendations to improve overall customer satisfaction and sales:

- iPhone users are extremely sensitive to issues they encounter. Smoother after-sales services like warranty, software updates, etc. will have a significant impact on sales.
- Being more transparent/clear about different versions like International, US, etc.
- Improvement in consistent device performance avoiding the problems over time.
- Providing the ability for customers to remove unwanted bloatware



QUESTIONS?