

# SAS<sup>®</sup> GLOBAL FORUM 2018

USERS PROGRAM

## Understanding The Influence Of Day Of The Week On Reviews Written

April 8 - 11 | Denver, CO  
**#SASGF**

# Understanding The Influence Of Day Of The Week On Reviews Written

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## ABSTRACT

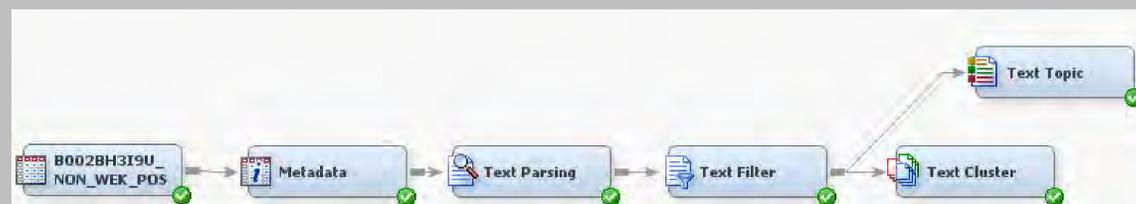
- Today most companies utilize customer feedback to understand customer desires.
- It is very crucial for a firm to know the key feedback and thereby providing synthesized services to their customers.
- Analysis on the effect of day of the week on the way a user reacts.
- Human beings over react when they are under pressures whereas more accepting in nature when they are calm.
- Stressed on weekdays → React more ; Relaxed on weekends → Accept more.
- **Real reason of a review → Is it just because of a users' bad mood that day or genuine defect in product?**
- **This way a company can not only attain excellent customer satisfaction but also be efficient in providing the services.**

## METHODOLOGY

In this research, nearly 10,000 reviews written on Amazon.com for two products from electronics product category are explored.

The process that is followed in this analysis is broadly classified into following steps:

- Data Extraction using Python.
- Data Preparation and initial analysis using Base SAS.
- Initial Text analysis and filtration of the text.
- Review analysis using SAS Enterprise Miner.
- User sentiment analysis using SAS Sentiment Analysis Studio.



## RESULTS

### LG Tone HBS-730 Wireless Stereo Headset – Black

For product LG Tone HBS-730 wireless stereo headset, negative reviews were written about **earbuds** on weekdays but positive feedback is written on weekend.

Cluster ID	Descriptive Terms	Frequency
1	+volume +loud +low set' +volume control' +low +control +ios +set +iphone +music +comfortable +listen +device +button +read	45
2	+pocket +foot +phone +signal +walk +drop +cut +bluetooth +connection +range +lose +listen +pair +keep +headphone	104
3	+audio +support +issue +hbs-700 +connection +music +iphone +battery +ios +device +connect +comfortable different +second +know	116
4	+charge +charger +full +minute +replacement first +day +unit +turn +keep +hold right +work +package amazon	63
5	+model 'previous model' previous +version +old +battery +love +range +second +sound quality' +year +hbs-700 back +cut +issue	33
6	+box +package real +fake +open amazon +order +original +charger +receive +cheap +look +item different +warranty	75
7	+hear +noise people +talk money +problem +work well +item +want +stop +know +button +set back	115
8	+month +bud +ear bud' +ear +warranty +break +wire +stop +last +year +piece +long +design +cheap +work	90
9	+quality +'sound quality' +sound +range +horrible +bluetooth +hope +'bluetooth headset' +review +read +device +good lg +headset +tone	62

Clusters formed for negative reviews on Weekday

Cluster ID	Descriptive Terms	Frequency
1	+headphone +wire +review +issue +range +problem +set +want +pair +little +fit +neck +order +buy well	476
2	+noise +volume +voice +hear +connect +device well +little +thing 'sound quality' +range +time +excellent +quality +problem	423
3	+battery +life +'battery life' +good +long +quality +sound +great +comfortable 'sound quality' +amaze +range +easy +excellent +far	176
4	+phone +music +love +listen +hand +drive +talk +free cell +product able +work +great +'great product' +clear	221
5	+battery +day +last +charge +hour 'long time' +long +week +work +time +listen +wear +comfortable +'great product' +music	148
6	+love +great +recommend +product +buy +purchase +husband +friend +gift family +order +price +'great product' +item +awesome	339
7	+lg +tone +'lg tone' +headset +bluetooth +look +review cell +recommend +friend +long +talk +highly +item +voice	92
8	+ear +bud +ear bud' +piece +stay +neck +fit +little +hold +wear +happy +item +comfortable +thing +hear	177

Clusters formed for positive reviews on Weekend

I LOVE these headphones. The first pair I received was defective - the battery got so hot it burned my neck and it would die after 40 minutes of play. I ordered a replacement and it works beautifully. They are so comfortable I forget I am wearing them - which is exactly how I want wireless headphones to feel. The earbuds are comfortable and delivery great sound quality. The controls are easy to memorize and respond quickly. I am thrilled with this purchase.

5

Examples of reviews on Weekend

Was satisfied with my headset until this morning I look up when my music kept going in and out to see the left side ear bud cord has broken near the connection of the headset. The earbud cords are stiff and this could have come from placing the bud in my ear. Not happy at all. I haven't even had this item 6 months.

2

Examples of reviews on Weekday

# Understanding The Influence Of Day Of The Week On Reviews Written

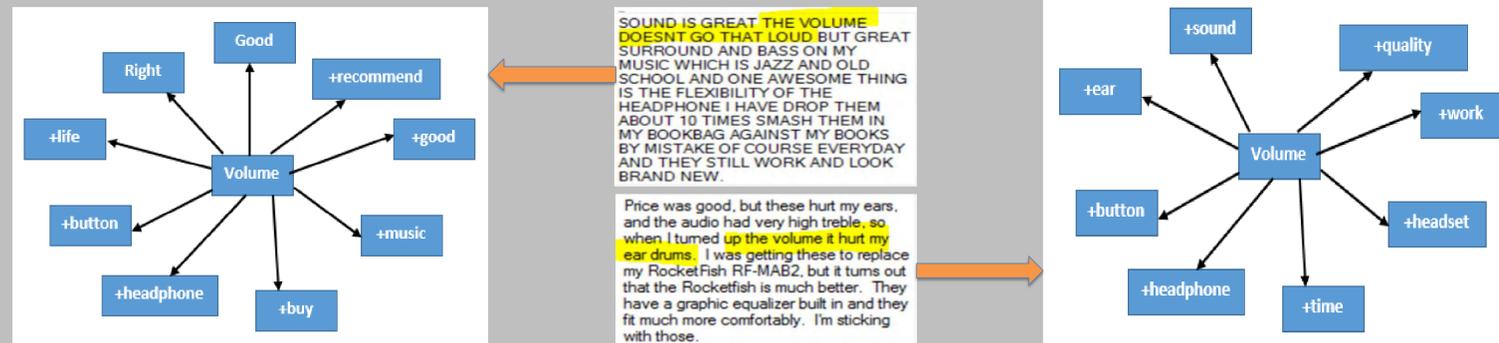
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## RESULTS CONTINUED (CLICK TO EDIT)

### Motorola S305 Bluetooth Stereo Headset w/ Microphone (Black)

Volume seems to be a significant topic in negative weekday reviews. Whereas it is positive on weekends.



Terms connected to Volume and Examples on Weekend

Terms connected to Volume and Examples on Weekday

### Effect of Length of Review

- Neutral Reviews more number of words
  - Explain both positive side and negative side.
- Negative reviews more lengthy than positive reviews.

Analysis Variable : no_words						
Rate	N Obs	Mean	Std Dev	Minimum	Maximum	N
Bad	1100	94.2209091	100.2060993	2.0000000	884.0000000	1100
Good	5339	74.0513205	98.0537850	1.0000000	1460.00	5339
Neutral	620	101.7822581	124.6959313	1.0000000	1559.00	620

Comparisons significant at the 0.05 level are indicated by ***.			
Rate Comparison	Difference Between Means	Simultaneous 95% Confidence Limits	
Neutral - Bad	7.561	-4.329	19.452
Neutral - Good	27.731	17.685	37.777 ***
Bad - Neutral	-7.561	-19.452	4.329
Bad - Good	20.170	12.330	28.010 ***
Good - Neutral	-27.731	-37.777	-17.685 ***
Good - Bad	-20.170	-28.010	-12.330 ***

## CONCLUSIONS

This research illustrates the influence of day of the week on the way a customer writes a review. Specifically, for the two examples considered, data is extracted, prepared and text mining is performed. Manufacturers can leverage this analysis or elements thereof, in their own analysis.

In this research behavior changes are observed using text analysis. Text cluster node and text topic node helped in finding out the significant reviews written by the customer. Text filter node helped in finding out the terms that are related to those significant topics. With this information a company can greatly synthesize its services and optimize the efforts spent on the betterment of the product.

## LIMITATIONS and FUTURE SCOPE

- Does not take into consideration the nature of the customer.
- Applies to a working customer who has work Monday through Friday and has off from work on Saturday and Sunday.
- Does not consider Age factor of the customer.
- Time of the day is one more important factor, which needs to be tracked.

## REFERENCES

- Thomas Y. Lee, "Needs-Based Analysis of Online Customer Reviews".
- Tom Sabo, SAS Federal LLC "Uncovering Trends in Research Using Text Analytics with examples from Nanotechnology and Aerospace Engineering".
- Chakraborty, Goutam and Pagolu, Murali Krishna "Analysis of Unstructured Data: Applications of Text Analytics and Sentiment Mining".
- Episode 36: Science of Deception on June 28 2016 from <http://www.npr.org/podcasts/510308/hidden-brain/>.
- Amazon product data, Julian McAuley <http://jmcauley.ucsd.edu/data/amazon/links.html>.

## CONTACT INFORMATION

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# SAS<sup>®</sup> GLOBAL FORUM 2018

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#SASGF

# 2654 Understanding the influence of the day of the week in the reviews written using SAS® Enterprise Miner™ and SAS® Sentiment Analysis Studio

Sujal Reddy Alugubelli, Oklahoma State University

## ABSTRACT

Understanding customer needs is the most critical aspect in every business. Today most companies utilize customer feedback to understand customer desires. Analyzing what factors affect customer feedback is important for any company. This paper analyses the effect day of the week has on the way a user reacts. SAS® Enterprise Miner™ and SAS® Sentiment Analysis Studio is used to analyze reviews written on weekdays and weekends. By understanding the differences in the opinions expressed on weekdays versus weekends, a company would have better understanding of their customer reviews. In this paper nearly 10,000 reviews written on Amazon.com for two products from an electronics product category are explored. The ratings given, the date on which a review is written and the actual written review are the key fields on which the analysis is carried. The paper systematically analyses the customer reviews and shows a few scenarios where terms that are considered as negative on weekdays are considered as positive on weekends. In one such scenario, “Ear buds” seem to be an issue for one of the products that is analyzed during the weekday where as “Ear buds” are received positively during the weekend for the same product. Likewise, after carefully analyzing the weekend and weekday reviews we can clearly understand the impact of weekdays on the negative reviews.

## INTRODUCTION

In the recent times most manufacturers give utmost importance to the reviews written by users on social networking sites and ecommerce websites. It is very crucial for a firm to know the key feedback and thereby providing synthesized services to their customers [1]. With the huge number of reviews and comments available it is an arduous job to narrow down to the most significant reviews for the betterment of the business. One of the most important factor that a manufacturer could keep in mind while eliminating non-useful reviews is the effect of day of the week on the way a user writes a review.

According to research [4], human beings react differently at different times. They tend to over react when they have some pressures and are more accepting in nature when they are relaxed and calm. As most individuals are stressed on weekdays because of their work load and the things that happen in a day they are bit more arrogant whereas they are more peaceful and calm on weekends. Going by this concept, in this paper analysis is done on weekday and weekend reviews so as to understand the contributing factors of user comment. This can greatly aid a company in understanding if a review on a particular specification is written out of a real reason or was it just because of a user’s bad mood that day.

This way of analyzing the user reviews and thereby providing synthesized services would greatly aid a company in multiple ways. First valuable point is that companies gets to know the true voice of their customers. The company would also save a lot of money and effort that would have been spent on non-significant requirements. This way a company can not only attain excellent customer satisfaction but also be efficient in providing the services.

## METHODOLOGY

The process that is followed in this analysis is broadly classified into following steps:

- Data Extraction using Python.
- Data Preparation and initial analysis using Base SAS.
- Initial Text analysis and filtration of the text.
- Review analysis using SAS Enterprise Miner.
- User sentiment analysis using SAS Sentiment Studio.



Figure 1. Process flow diagram

## DATA EXTRACTION USING PYTHON

For the purpose of this paper, the first step is to collect user ratings and written reviews. Python web scraper is used to extract the reviews from Amazon.com [5] and are parsed. Reviews written for two products pertaining to the cell phones accessories product category are extracted. The data has the information regarding the rating given, written review, the date on which review was written and a few other fields.

## DATA PREPARATION AND INITIAL ANALYSIS USING SAS FOUNDATION

After extracting the data from the website, the second step is to format the data in a proper way suitable for the analysis. The day of the week needed to be obtained from the posted date and the reviews written on weekdays and weekends are to be sorted and should be classified as either positive review or a negative review.

Reviews that had a rating of 5 and 4 are classified as positive reviews and reviews with a rating of 1 and 2 are classified as negative reviews. As an initial step, a ANOVA test is performed so as to see the differences in the ratings given on weekdays and weekends. The results are visualized as shown below. We can clearly see from the plots below that the percentage of lower ratings (1 and 2) on weekdays is more when compared to the percentage on a weekend. This clearly shows numerically that users tend to give comparatively lower ratings on a weekday than on a weekend.

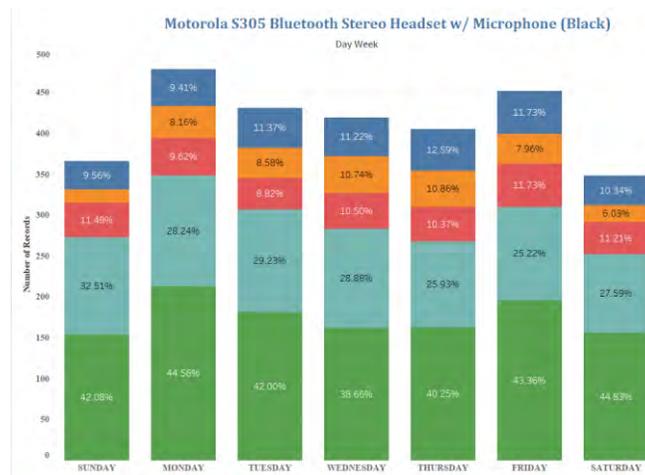


Figure 2. Product -1 Percentage of ratings on different weekdays.

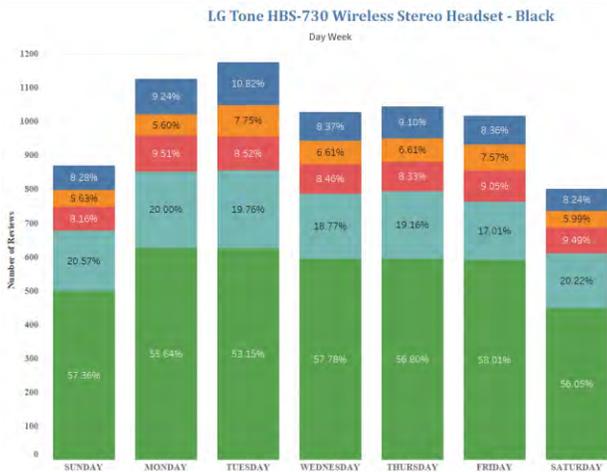


Figure 3. Product -2 Percentage of ratings on different weekdays.

### TEXT MINING AND REVIEW ANALYSIS USING SAS ENTERPRISE MINER

After preparing the data suitably for text mining, data is brought into SAS Enterprise Miner. In this step initially basic text analysis is performed using text filter and text parsing nodes [3] and the frequencies of terms and documents are observed. The initial results are as follows

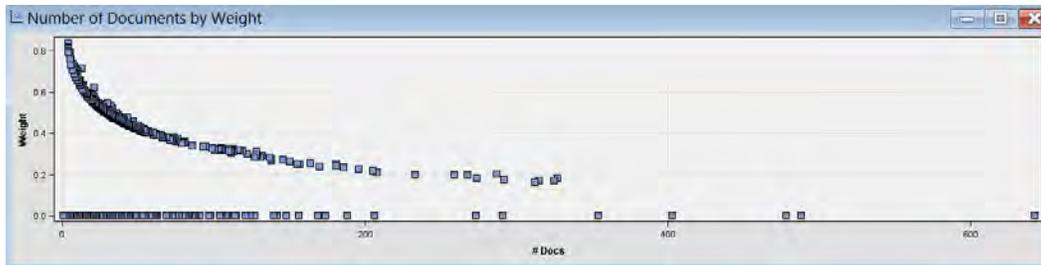


Figure 4. Results of Number of Documents by weight using Text filtering node SAS EM

Term	Role	Attribute	Freq	# Docs	Keep
+ be	Verb	Alpha	2225	642N	
+ have	Verb	Alpha	1329	488N	
not	Adv	Alpha	1249	478N	
+ use	Verb	Alpha	676	400N	
+ do	Verb	Alpha	743	352N	
+ headphone	Noun	Alpha	741	327Y	
+ phone	Noun	Alpha	567	325Y	
+ work	Verb	Alpha	454	311Y	
+ good	Adj	Alpha	423	309Y	
+ quality	Noun	Alpha	394	290Y	
very	Adv	Alpha	444	287N	
+ headset	Noun	Alpha	628	285Y	
+ get	Verb	Alpha	443	273N	
+ sound	Noun	Alpha	350	272Y	
music	Noun	Alpha	418	266Y	
+ ear	Noun	Alpha	414	259Y	
sound	Adj	Alpha	269	233Y	
comfortable	Adj	Alpha	232	207Y	
+ buy	Verb	Alpha	251	203Y	
no	Adv	Alpha	270	203N	
+ great	Adj	Alpha	246	195Y	
s	Noun	Alpha	355	186N	
+ price	Noun	Alpha	220	183Y	
+ listen	Verb	Alpha	228	181Y	
bluetooth	Noun	Alpha	253	173Y	
+ call	Noun	Alpha	243	172N	
great	Adv	Alpha	198	170Y	
also	Adv	Alpha	236	169N	
+ wear	Verb	Alpha	209	160Y	
+ go	Verb	Alpha	193	155N	
battery	Noun	Alpha	162	149Y	
sound quality	Noun Group	Alpha	170	148Y	
so	Adv	Alpha	181	147N	
good	Noun	Alpha	173	146Y	
+ recommend	Verb	Alpha	154	146Y	
just	Adv	Alpha	183	139N	
+ love	Verb	Alpha	157	138Y	
+ hour	Noun	Alpha	178	137Y	
+ make	Verb	Alpha	183	137N	
life	Noun	Alpha	142	136Y	

Figure 5. Results of Terms using Text parsing node SAS EM

## REVIEW ANALYSIS USING SAS ENTERPRISE MINER

Once the initial filtration and analysis is done the following steps are done so as to analyze the written reviews and extract the information that would be useful for eliminating the non-significant reviews and also determine the effect of day of the week on the reviews. This step is the most crucial and the core process of the analysis.

- As the reviews are already classified as positive and negative within weekdays and weekends, the negative reviews written on a weekday are of utmost concern. This dataset is analyzed using the text cluster, text topic and concept links.
- By performing the above mentioned process few significant and moderately important topics are picked.
- Next the weekend positive reviews are analyzed using the text cluster, text topic and concept links. The previous picked topics from weekday negative reviews are looked for in the positive weekend reviews.
- After comparing, if the significant negative comments present in the weekday reviews are also present in the positive reviews of the weekend then most likely those reviews are because of the mood of the customer.

By following the above steps, it yields the results and helps us better understand the true voice of the customers. In addition to the analysis performed we could also perform sentimental analysis using SAS Sentiment Analysis Studio. This can clearly depict what a customer feels on a weekday and what they have in mind on a weekend.



Figure 6. SAS Enterprise Miner model for the analysis

## USER SENTIMENT ANALYSIS USING SAS SENTIMENT ANALYSIS STUDIO

In order to see what a user in general believes on a weekday and determine if it is different from the weekend, sentiment analysis is performed using SAS Sentiment Analysis. By this one can get fair understanding if the reviews written are different on both the cases or are the same.

Using the current data the results of sentiment analysis is as below.

■ Positive ■ Negative ■ Overall

### BEST MODEL is Smoothed Relative Frequency and Chi Square



Figure 7. Best model selected by the sentimental analysis studio

Positive	Negative	Neutral	Type	Body	Weight
			CLASSIFIER	great	0.046423
			CLASSIFIER	price	0.039659
			CLASSIFIER	music	0.024507
			CLASSIFIER	sound	0.024349
			CLASSIFIER	phone	0.023998
			CLASSIFIER	comfortable	0.023585
			CLASSIFIER	love	0.021847
			CLASSIFIER	call	0.018949
			CLASSIFIER	listen	0.016861
			CLASSIFIER	easy	0.015936
			CLASSIFIER	clear	0.013647
			CLASSIFIER	Bluetooth	0.013484
			CLASSIFIER	best	0.013289
			CLASSIFIER	always	0.013184
			CLASSIFIER	far	0.013174
			CLASSIFIER	Great	0.011991
			CLASSIFIER	cell	0.011923
			CLASSIFIER	happy	0.011455
			CLASSIFIER	life	0.011339
			CLASSIFIER	wife	0.010981
			CLASSIFIER	value	0.010981

Figure 8. Statistical rules formed to classify a review as positive

Positive	Negative	Neutral	Type	Body	Weight
			CLASSIFIER	stop	0.067178
			CLASSIFIER	return	0.064698
			CLASSIFIER	poor	0.039243
			CLASSIFIER	disappoint	0.029197
			CLASSIFIER	week	0.027773
			CLASSIFIER	send	0.025152
			CLASSIFIER	waste	0.024742
			CLASSIFIER	not	0.023669
			CLASSIFIER	warranty	0.023093
			CLASSIFIER	Then	0.022898
			CLASSIFIER	minute	0.022034
			CLASSIFIER	month	0.020863
			CLASSIFIER	red	0.020676
			CLASSIFIER	working	0.017632
			CLASSIFIER	completely	0.017486
			CLASSIFIER	stopped working	0.017265
			CLASSIFIER	replacement	0.016953
			CLASSIFIER	useless	0.01647
			CLASSIFIER	plan	0.016339
			CLASSIFIER	refund	0.014933

Figure 9. Statistical rules formed to classify a review as positive

## RESULTS

- In the current scenario, for the product Motorola Stereo Headset, the term volume seems to be one of the significant topics in negative weekday reviews. The same term appears in the weekend significant positive reviews list.
- This clearly raised the flag of uncertainty of the proper feedback. For this purpose, the reviews that consisted of that term were pulled and analyzed.
- After analyzing the reviews, it is evident that there is actually no problem with the volume aspect of the device. So the negative reviews written on weekday regarding volume are only because of bad mood of the customer and not really a problem of the product.
- Similarly, with the second product LG Tone HBS-730 wireless stereo headset. There were negative reviews written about earbuds on weekdays but a lot of positive feedback is written on weekend. Thus it clearly shows the presence of day of the week effect the way people write a review.

So, it seems that there is an effect of the day of the week on the way people write a review. By performing such analysis, companies can better understand the nature of the reviews.

### MODEL: LG TONE HBS-730 WIRELESS STEREO HEADSET – BLACK

Cluster ID	Descriptive Terms	Frequency
1	+volume +loud +low set' +volume control' +low +control +ios +set +iphone +music +comfortable +listen +device +button +read	45
2	+pocket +foot +phone +signal +walk +drop +cut +bluetooth +connection +range +lose +listen +pair +keep +headphone	104
3	audio +support +issue +hbs-700 +connection +music +iphone +battery +ios +device +connect +comfortable different +second +know	116
4	+charge +charger +full +minute +replacement first +day +unit +turn +keep +hold right +work +package amazon	63
5	+model 'previous model' previous +version +old +battery +love +range +second +sound quality' +year +hbs-700 back +cut +issue	33
6	+box +package real +fake +open amazon +order +original +charger +receive +cheap +look +item different +warranty	75
7	+hear +noise people +talk money +problem +work well +item +want +stop +know +button +set back	115
8	+month +bud +ear bud' +ear +warranty +break +wire +stop +last +year +piece +long +design +cheap +work	90
9	+quality +sound quality' +sound +range +horrible +bluetooth +hope +bluetooth headset' +review +read +device +good lg +headset +tone	62

Figure 10. Clusters formed for negative reviews on Weekday

Cluster ID	Descriptive Terms	Frequency
1	+headphone +wire +review +issue +range +problem +set +want +pair +little +fit +neck +order +buy well	476
2	+noise +volume +voice +hear +connect +device well +little +thing 'sound quality' +range +time +excellent +quality +problem	423
3	+battery +life +battery life' +good +long +quality +sound +great +comfortable 'sound quality' +amaze +range +easy +excellent +far	176
4	+phone +music +love +listen +hand +drive +talk +free cell +product able +work +great +great product' +clear	221
5	+battery +day +last +charge +hour 'long time' +long +week +work +time +listen +wear +comfortable +great product' +music	148
6	+love +great +recommend +product +buy +purchase +husband +friend +gift family +order +price +great product' +item +awesome	339
7	+tone +lg tone' +headset +bluetooth +look +review cell +recommend +friend +long +talk +highly +item +voice	92
8	+ear +bud +ear bud' +piece +stay +neck +fit +little +hold +wear +happy +item +comfortable +thing +hear	177

Figure 11. Clusters formed for positive reviews on Weekend

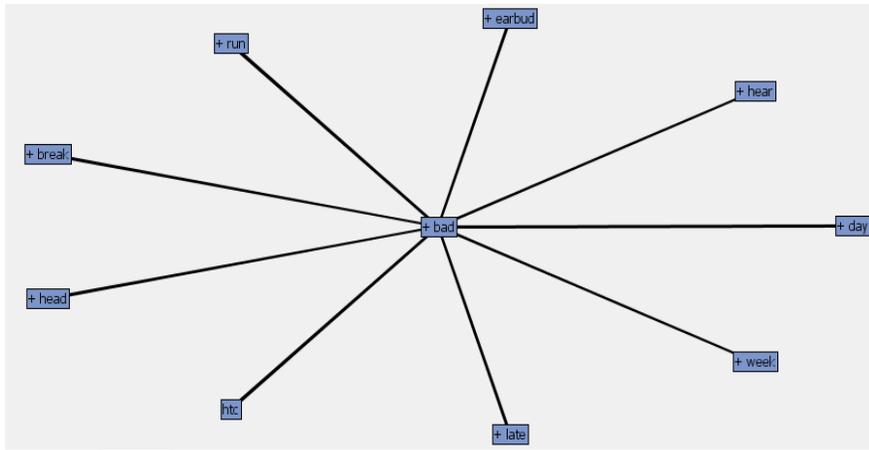


Figure 12. Terms connected to “Bad” on weekday

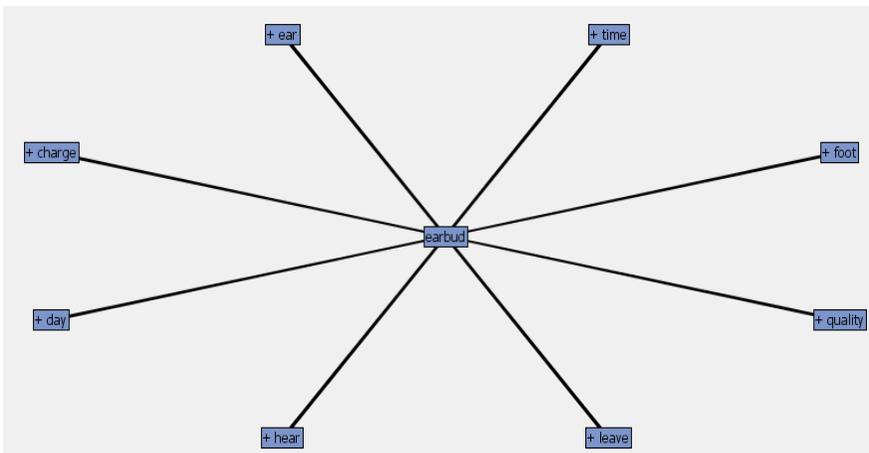


Figure 13. Terms connected to “Earbud” on weekend

<p>I LOVE these headphones. The first pair I received was defective - the battery got so hot it burned my neck and it would die after 40 minutes of play. I ordered a replacement and it works beautifully. They are so comfortable I forget I am wearing them - which is exactly how I want wireless headphones to feel. The earbuds are comfortable and deliver great sound quality. The controls are easy to memorize and respond quickly. I am thrilled with this purchase.</p>	5	<p>They play music from various bluetooth devices. They get fairly loud, block exterior noises and the battery lasts for the entire day. Keep them away from the cat. The dangling earbuds are really tempting to the furball.</p>	5
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Figure 14. Examples of positive reviews about earbud on Weekend

<p>because of the tiny wiring to the earbuds, the wire breaks internally and had a friend cut the wires and resolder them. it happened again a few months later. nice idea but has a design flaw.</p>	1	<p>Was satisfied with my headset until this morning I look up when my music kept going in and out to see the left side ear bud cord has broken near the connection of the headset. The earbud cords are stiff and this could have come from placing the bud in my ear. Not happy at all. I haven't even had this item 6 months.</p>	2
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Figure 15. Examples of negative reviews about earbud on Weekday

**MODEL: MOTOROLA S305 BLUETOOTH STEREO HEADSET W/ MICROPHONE (BLACK)**

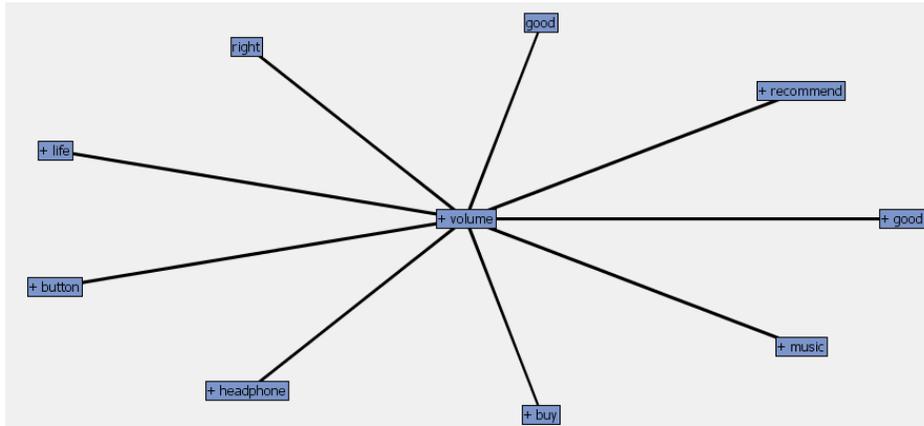


Figure 16. Terms connected to Volume on Weekend

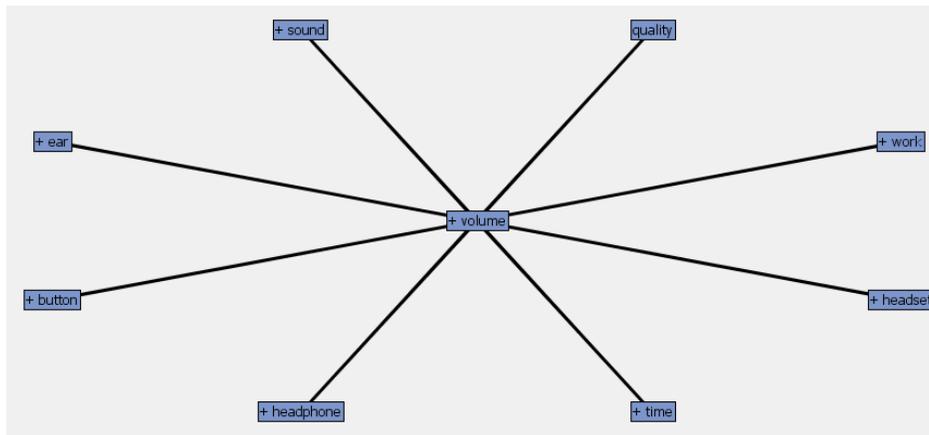


Figure 17. Terms connected to Volume on Weekday

Cluster ID	Descriptive Terms	Frequency
1	+listen +music +'battery life' +able +pair +battery +purchase back first amazon +motorola +life +device +problem +feel	37
2	+device bluetooth price +recommend +issue +keep +headset +phone +great motorola quality +bluetooth +bad +find +connect	56
3	+arrive +mac +iphone +pretty amazon sound +connect +'sound quality' +day quality +easy return +stop +connection +feel	29
4	+loud +hear +ipod +noise +laptop +finally +sound +little +phone +comfortable +connect +fit +connection +bluetooth +return	32
5	+volume +button +'volume button' +hit +break +control +low +look +useless +replace +easy +month +drop +hard +long	28
6	+item +waste money +fail return +window amazon +purchase +week +replacement +time +device +connection +second working	31
7	red 'turn on' +charge +last +running +stop +sweat +month working +light +workout great gym few +week	92
8	+wear +head +uncomfortable +ear +minute +fit +hour +hard +comfortable +hear +phone +design +music +noise +feel	52

Figure 18. Clusters formed for negative reviews on Weekday

Cluster ID	Descriptive Terms	Frequency
1	+touch +ipod +'ipod touch' ipod +pause +play +audio +button +volume +control +wire back +turn well +computer	80
2	+hear +headphone +'bluetooth headphone' +price +first +work +pair great +set +music +bluetooth +little +great +sound +listen	104
3	+headset +'bluetooth headset' +listen +music +look +excellent +want +hear +bluetooth +s305 bluetooth +phone +purchase +player +recommend	94
4	+battery +life +'battery life' +'sound quality' sound +quality +easy +excellent +last +set +hour +iphone +charge +love +buy	57
5	+battery +charge +device +day +hour +last +life +iphone +'bluetooth headphone' +connect +'battery life' +pair +headphone +problem +button	201
6	+motorola +bud +s305 +ear +wear +head +find +comfortable +fit +recommend bluetooth +audio +listen +control +set	81
7	+product +great +price +love +sound +gym +recommend great +fit +good +purchase +thing +buy +excellent +range	134
8	tooth +blue +'mp3 player' +player +answer running able +exercise +wire +phone +problem +audio right +computer +pause	39
9	+watch +movie +tv +ipad +computer bluetooth +play +turn +motorola +audio +range +device +player +find +want	45

Figure 19. Clusters formed for positive reviews on Weekend

<p>Price was good, but these hurt my ears, and the audio had very high treble, so when I turned up the volume it hurt my ear drums. I was getting these to replace my RocketFish RF-MAB2, but it turns out that the Rocketfish is much better. They have a graphic equalizer built in and they fit much more comfortably. I'm sticking with those.</p>	<p>Okay so this thing works. It works fine as a bluetooth device and a headphone. Having said that, there are several issues. The quality is just not upto par. I'm not expecting audiophile quality but c'mon, it's noisy and it at times picks up other signals and noise. The volume is also anemic and thin. The whole thing feels a tad shabby in terms of construction. I returned these immediately.</p>
2	2

Figure 20. Examples of negative reviews about volume on Weekend

<p>SOUND IS GREAT THE VOLUME DOESNT GO THAT LOUD BUT GREAT SURROUND AND BASS ON MY MUSIC WHICH IS JAZZ AND OLD SCHOOL AND ONE AWESOME THING IS THE FLEXIBILITY OF THE HEADPHONE I HAVE DROP THEM ABOUT 10 TIMES SMASH THEM IN MY BOOKBAG AGAINST MY BOOKS BY MISTAKE OF COURSE EVERYDAY AND THEY STILL WORK AND LOOK BRAND NEW.</p>	<p>So far I love the quality of sound both for calls, and for listening to music, or audio books. The volume control is great because it emits a tone change so that you know if you are increasing or decreasing the sound. Over-all good quality at a great price!</p>
5	4

Figure 21. Examples of positive reviews about volume on Weekend

## LENGTH OF REVIEW EFFECT

Analysis Variable : no_words						
Rate	N Obs	Mean	Std Dev	Minimum	Maximum	N
Bad	1100	94.2209091	100.2060993	2.0000000	884.0000000	1100
Good	5339	74.0513205	98.0537850	1.0000000	1460.00	5339
Neutral	620	101.7822581	124.6959313	1.0000000	1559.00	620

Figure 22. Mean number of words for type of review

Comparisons significant at the 0.05 level are indicated by ***.			
Rate Comparison	Difference Between Means	Simultaneous 95% Confidence Limits	
Neutral - Bad	7.561	-4.329	19.452
Neutral - Good	27.731	17.685	37.777 ***
Bad - Neutral	-7.561	-19.452	4.329
Bad - Good	20.170	12.330	28.010 ***
Good - Neutral	-27.731	-37.777	-17.685 ***
Good - Bad	-20.170	-28.010	-12.330 ***

Figure 23. ANOVA results for effect of number of words in a review

## CONCLUSION

This paper illustrated the influence the day of the week has on the way a customer writes a review. Specifically, in the two examples, data is extracted and prepared for text analytics, performed text analytics, prepared data for exploration and reporting. Manufacturers can leverage this analysis or elements thereof, in their own analysis.

In this paper I explored the behavior changes observed using text analysis. Text cluster node and text topic node helped in finding out the significant review written by the customer. Text filter node helped in finding out the terms that are related to those significant topics. With this information a company can greatly synthesize its services and optimize the efforts spent on the betterment of the product.

## FUTURE SCOPE AND LIMITATIONS

- The analysis performed in this paper does not take into consideration of the nature of the customer. So if the type of a customer could be known then evaluation of the results would make much more sense.
- The paper applies to a working customer who has work Monday through Friday and has off from work on Saturday and Sunday.
- May be the product from product categories specific to certain age groups could be analyzed so as to understand if there is an age factor. For example, most video games products are used by younger generations and home appliances are purchased by older generation so products from those products categories would help us understand if there is any age factor on how the behavior changes according to day of week.
- The length of the review written also has a significance in the intension of the review written. Surveys tell us that when customers write a short but harsh comment in most cases it is not a true one and biased by some factor. So we can add the length of a comment factor so as to tune the comments.
- Time of the day is one more important factor, which needs to be tracked. Comments would be better in the early part of the day than in later part by following the concept of change in behavior because of work pressures. So if we could bring in the time factor that would greatly aid the company

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## ACKNOWLEDGMENTS

I wish to express my deep sense of gratitude and indebtedness to the Director of Master of Science in Business Analytics, Dr. Gotham Chakraborty, Spears School of Business, Oklahoma State University for the good lectures on analytics and for his inspiring guidance, constructive criticism and valuable suggestion throughout my project.

I would also like to express my gratitude to Dr. Miriam McGaugh for her valuable suggestions and encouragement at various stages of my project.

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