

# ***Understanding the Impact of Customer Reviews Through Coded Content Analysis***

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**Abstract:** This study will analyze customer reviews using a coded content analysis style to understand the impact of consumer language and ratings in relation to their purchases. More specifically, this paper will examine an Amazon product, a refurbished iPhone 7, and perform a coded content analysis to analyze customer reviews in terms of condition, functionality, and satisfaction. Furthermore, statistical tests will be applied in order to understand the relationship between the language used by consumer's reviews and their rating of the product, along with whether that has an impact on the sales of the product. From these results, the author will discuss real-life applications for how companies can understand the significance of customer reviews and how they can encourage consumers to leave positive reviews to benefit their company.

**Keywords:** customer reviews, coded content analysis, statistical tests, purchasing decision, customer satisfaction, online sellers, feedback loop

## **1. Introduction**

The world is advancing quickly in the technological sphere [1-2]. Anyone can now become an online seller and market their products and services online [3]. Sellers are able to implement the usage of various online platforms such as Amazon, Facebook Marketplace, or Craigslist to sell their products [3]. Amazon is one of the most popular sites for online sellers and customers [4]. Amazon has developed practical resources and tools to provide small businesses and sellers with the ability to reach larger audiences of potential customers and sell [4]. This peer-to-peer model of a marketplace at Amazon allows for entrepreneurs to set up businesses virtually and use the available online resources to their advantage [3].

One form of an online resource stemming from online marketplaces are customer reviews [3]. On Amazon, customers can leave a review after purchasing a product and rate the product on a five-star scale, with one being the lowest and five being the highest approval rating [5]. These customer reviews are able to be viewed by everyone and supplement information and provide personalized advice to other potential online buyers [5]. As exemplified in a case study by Mangold and Smith [1], customer reviews have been demonstrated to play a large role in making a purchase decision, especially among millennials. With the complexity of online selling and marketplaces, along with the elaborateness of customer's expectations when it comes to receiving online purchases, it can become difficult for sellers to forecast a customer's reaction [6-7]. Thus, especially in the cases of more

expensive products, customer reviews will place larger significance on whether the buyer is converted to making a purchase [5].

One expensive and relevant product that potential buyers look to for reviews are electronic devices. Many people are now able to sell pre-owned or refurbished electronic devices, such as Apple's iPhones, online through platforms such as Amazon [8]. Therefore, customer reviews become more important and relevant to a seller: identifying key words and themes in customer reviews will benefit an online seller to improve their future transactions [9-10]. Currently, there is a gap in the research for how different variables can affect the ultimate star rating provided by the customer.

This paper will examine an Amazon product, a refurbished, rose-gold iPhone 7, and aim to understand if customers, who we will refer to as participants, are satisfied with the product based on performing a content analysis on the customer reviews and analyzing the impact. For this paper, the specific research question is as follows: are participants satisfied with the iPhone 7 they purchased in terms of the variables condition, functionality, and satisfaction based on their reviews and language and are these variables significant?

## **2. Research Method**

This research will use random, willing participants to obtain original survey data. The original survey data will be run through SPSS software and relevant statistical tests will be applied. The conclusions will then be drawn from the results of these statistical tests.

### **2.1. Sample Selection**

In this study, the content analysis sample was composed of 120 participant reviews recorded between the years of 2016 to 2018. The sample covers Amazon reviews for a refurbished, rose-gold iPhone 7. Reviews that were not relevant were excluded from the analysis.

### **2.2. Review Procedure and Variable**

The participant reviews were rated by graduate students at the University of Southern California. Raters were trained in the operationalization of variables and in the coding procedures. A total of four designed variables were coded. The first of these variables, condition, was defined as whether overall the iPhone 7 received was high quality. The second variable was functionality, which is defined as whether the user felt the functionality of the iPhone 7 was good. The third variable was satisfaction, which was defined as if the reviewer was overall satisfied with their purchase of the iPhone 7. The fourth variable was the number of stars, which each reviewer had to leave a rating out of five stars for their purchase. This lists the variables that were examined in a content analysis to understand the overall impression from participants, as shown in Table 1. The full codebook can be seen in Appendix A. All data is analyzed using statistical techniques, including (1) Frequencies; (2) Correlation tests; (3) One-sample t test; (4) Paired-sample t test; (5) Chi-Square test; and (6) One-way analysis of the variance and post hoc test.

Table 1: SPSS data table from the participants 1-20 as an example.

Participant	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Condition	4	5	5	4	1	1	2	1	5	5	2	5	4	2	5	5	5	1	5	5
Function	2	4	5	5	2	1	2	1	5	5	1	5	2	2	5	5	4	3	5	5
Satisfaction	2	5	5	5	1	1	3	1	5	5	1	5	4	2	5	5	5	1	5	5
Star Rating	3	5	5	5	1	1	3	1	5	5	1	5	4	1	5	5	5	1	5	5

### 3. Results

The survey in this research addresses two main themes and variables: aesthetics and demographics. The following results are from performing the SPSS statistical tests

#### 3.1. Frequencies

Analysis revealed that the majority of the reviewers rated great satisfaction (55%). The least number of reviewers rated average (5%) and good satisfaction (5%).

#### 3.2. Correlation Tests

Three correlation tests were performed on the three latent variables: condition, functionality, and satisfaction. Analysis revealed that for the 120 participant reviews, there was a significant positive relationship between condition and star ratings ( $r = 0.96, p = < 0.001$ ), between functionality and the star rating that a reviewer left ( $r = 0.88, p = < 0.001$ ), and between satisfaction ratings and star ratings ( $r = 0.98, p = < 0.001$ ). As condition, functionality, and satisfaction increased, star ratings also increased.

#### 3.3. One-sample *t* Tests

Three one-sample *t* tests were performed on condition, functionality, and satisfaction. The mean score for participant reviews on condition of the iPhone 7 was 3.6 ( $SD = 1.69$ ). A one sample *t* test indicated that this mean value was non-significantly different from the midpoint (neutral) value of 3.0,  $t(19) = 1.58, p = 0.131$ , indicating that consumers neither significantly liked nor disliked the condition of the iPhone 7. The mean score for participant reviews on function of the iPhone 7 was 3.45 ( $SD = 1.64$ ). A one sample *t* test indicated that this mean value was non-significantly different from the midpoint (neutral) value of 3.0,  $t(19) = 1.23, p = 0.234$ , indicating that consumers neither significantly liked nor disliked the functionality of the iPhone 7. The mean score for participant reviews on function of the iPhone 7 was 3.45 ( $SD = 1.64$ ). A one sample *t* test indicated that this mean value was non-significantly different from the midpoint (neutral) value of 3.0,  $t(19) = 1.23, p = 0.234$ , indicating that consumers neither significantly liked nor disliked the functionality of the iPhone 7.

#### 3.4. Paired-sample *t* Tests

A paired- samples *t* test was conducted to determine if potential participants were more concerned with the functionality or the condition of the iPhone 7. The results indicated the mean score for functionality ( $M = 3.45, SD = 1.64$ ) was non-significantly lesser than the mean score for condition ( $M = 3.6, SD = 1.69$ ),  $t(19) = 0.72, p = 0.481$ .

### 3.5. Chi-square Test

A chi-square test was used to determine whether reviewers who provided a star rating were more or less likely to rate functionality lower or higher. Reviewers who provided a five-star rating were found to be significantly more likely to rate the functionality of the iPhone 7 as a five (highest score) too,  $\chi^2(12) = 28, p = 0.006$ .

### 3.6. One-way Analysis of the Variance and Post Hoc Test

A one-way analysis of the variance was conducted to evaluate if the reviewer's star rating of the iPhone differed depending on their rating of the condition of the iPhone 7. The independent variable, the condition rating, included four different scores (three stars was never offered by a review): one star ( $M = 1.00, SD = 0.00$ ), two stars ( $M = 1.67, SD = 1.15$ ), four stars ( $M = 4.00, SD = 1.00$ ), five stars ( $M = 5.00, SD = 0.00$ ). The dependent variable was the star rating a participant leaves measured on a five-star scale. The ANOVA was significant,  $F(3, 16) = 66.6, p < 0.001$ . Post-hoc tests utilizing Bonferroni indicated that one star and two-star ratings for condition rating resulted in a significantly lower star rating than the other ratings.

## 4. Discussion

By understanding customer satisfaction through the reviews, online sellers can use this analysis to better their products and services and obtain more customer fulfillment and loyalty. The frequency and correlation tests demonstrate that most customers felt great satisfaction from their purchase of the iPhone 7, but there were also many that felt very poor to poor satisfaction. This means that many reviewers felt strongly about the product, whether it was in a positive or negative light, most likely due to the positive relationship between the variables and overall star ratings. This demonstrates how rarely a participant will take the middle ground or average feeling when discussing a product. A practical implication might be to offer incentives to rate the product once it is received, as this method typically elicits a positive response and customers are more inclined to leave a positive review.

Participants who generally provided a higher star rating also thought highly of other variables. Out of the three variables, the functionality had the lowest mean and standard deviation which suggests this is the area with the greatest weakness. This online seller should focus on improving the functionality of the refurbished iPhone 7 so that participants are happier with their purchase. This can be seen as a good potential sign for sellers, because it means that delivering a good product with good functionality is often rewarded by participants with a higher star rating. This positive feedback loop is something sellers should place a larger significance on and apply this knowledge through practical implications of performing proper checks to make sure the product or service they are offering matches the descriptions provided.

## 5. Conclusion

By understanding customer satisfaction through the reviews, online sellers can use this analysis to better their products and services and obtain more customer fulfillment and loyalty. Based on the frequency and correlation tests, it demonstrates that most felt great satisfaction from their purchase of the iPhone 7, but there were also many that felt very poor to poor satisfaction. This means that many reviewers felt strongly about the product, whether it was in a positive or negative light, most likely due to the positive relationship between the variables and overall star ratings. This demonstrates how rarely a participant will take the middle ground or average feeling when discussing a product. A practical implication might be to offer incentives to rate the product once it is received, as this method typically elicits a positive response and customers are more inclined to leave a positive review.

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If this study were to be repeated, there would be a few adjustments. One limitation or disadvantage when having three coders; because we all had our own differing opinions at times based on the content coding we had done, we found ourselves at odds when it came to finalizing a score for the participant's reviews. If repeated, we could define more words clearly when it came to assigning specific words to score in our codebook. In addition, the author would like to have included stronger and lengthier reviews; with this set of reviews, there were many neutral responses or reviews that did not provide a lot of information or detail on where the participant stood when discussing the condition, functionality, or satisfaction. Many of the participant reviews selected were short in their review description and would fail to directly address one of the three aspects we were testing for. With more words and descriptions, we would have been able to code more accurately when it came to our analysis.

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## Appendix

### Coding Dictionary

- Condition of item received (latent)
  - Definition: Overall, does the comment suggest the condition of the iPhone 7 received was high quality?
  - Key Words:
    - Good phrases: “great condition”, “like new”
    - Poor phrases: “damaged”, “bad quality”
  - Concrete Examples:
    - Good condition: “It’s in excellent condition”, “everything about the device was better than expected.”
    - Poor condition: “It comes with 4 scratches on each corner”, “Damaged phone.”
  - Scale: 1-5
  - 1 = very poor condition
  - 2 = poor condition
  - 3 = average condition
  - 4 = good condition
  - 5 = great condition
- Functionality of the phone (latent)
  - Definition: Does the comment suggest the user feels functionality of the iPhone 7 is good?
  - Key Words:
    - Good phrases: “great updates”, “love the functionality”
    - Poor phrases: “bad functionality”, “don’t like the new features.”
  - Concrete Examples:
    - Good functionality: “I am very impressed with my new iPhone”,
    - Poor functionality: “...battery life is not well, in one day I have to charge it many times!”, “The only limitation is that it is not possible charging and listening to music at the same time.”
  - Scale: 1-5
  - 1 = very poor functionality
  - 2 = poor functionality
  - 3 = average functionality
  - 4 = good functionality
  - 5 = great functionality
- Satisfaction with purchase (latent)
  - Definition: Overall, does the comment suggest the reviewer is satisfied with their purchase of the iPhone 7?
  - Key Words:
    - Good phrases: “happy with purchase”, “worth it”, “very satisfied”
    - Poor phrases: “bad purchase”, “not happy”, “not worth it.”
  - Concrete Examples:
    - Good satisfaction: “As expected the phone is very good”, “my wife loves her iPhone 7”, “Pretty cool phone”



- Poor satisfaction: “To be honest I was very disappointed”, “Iphone.... The best.”
  - Scale: 1-5
  - 1 = very poor satisfaction
  - 2 = poor satisfaction
  - 3 = average satisfaction
  - 4 = good satisfaction
  - 5 = great satisfaction
- Star Rating Reviews, on a scale of 1-5 (manifest)

## Customer Reviews Used

1. I wayan
  - 3.0 out of 5 stars good looking
  - Reviewed in the United States on October 31, 2018
  - Size: 128 GB Color: Gold Verified Purchase
  - great phone, but battery life is not well, in one day I have to charge it many times!!!
2. Kelly Crawford
  - 5.0 out of 5 stars Very nice phone. Great camera.
  - Reviewed in the United States on May 6, 2017
  - Size: 128 GB Color: Gold Verified Purchase
  - Great phone! Delivered on time. Moved the SIM card from a 5c and began updating IOS. Requires you to have all software items fully up to date. I found everything I needed with Apple.
  - One person found this helpful
3. Seren33
  - 5.0 out of 5 stars Love it!!
  - Reviewed in the United States on October 12, 2018
  - Size: 128 GB Color: Gold Verified Purchase
  - I am very impressed with my new iPhone.
  - I like that the phone already had a screen protector on it.
  - It's in excellent condition.
4. Amazon Customer
  - 5.0 out of 5 stars Other than that it is working just fine, for now
  - Reviewed in the United States on April 13, 2017
  - Size: 128 GB Color: Gold Verified Purchase
  - It comes with 4 scratches on each corner. Other than that, it is working just fine, for now.
5. Brian P.
  - 1.0 out of 5 stars One Star
  - Reviewed in the United States on August 4, 2017
  - Size: 128 GB Color: Gold Verified Purchase
  - Said it would be Rose Gold? It is ugly silver. Not what I paid for!!
  - 2 people found this helpful

6. Human Resources Gwinnett County BOE
  - 1.0 out of 5 stars One Star
  - Reviewed in the United States on June 8, 2017
  - Size: 128 GB Color: Gold Verified Purchase
  - This phone was LOCKED!!
  - 6 people found this helpful
7. Sneha
  - 3.0 out of 5 stars technical problems like voice volume of the other person is not audible ...
  - Reviewed in the United States on December 10, 2016
  - Size: 128 GB Color: Gold Verified Purchase
  - Need to go to the Apple Store. Technical problems like voice volume of the other person is not audible else it's good
  - One person found this helpful
8. Amazon Customer
  - 1.0 out of 5 stars Refurbished Malfunctioning device
  - Reviewed in the United States on January 26, 2018
  - Size: 128 GB Color: Gold Verified Purchase
  - Damaged phone. The device couldn't connect to any network.
  - One person found this helpful
9. Mabrok Muhammed
  - 5.0 out of 5 stars Five Stars
  - Reviewed in the United States on December 14, 2016
  - Size: 128 GB Color: Gold Verified Purchase
  - good
10. Amazon Customer
  - 5.0 out of 5 stars. The best. Nothing more to say
  - Reviewed in the United States on July 30, 2017
  - Size: 128 GB Color: Gold Verified Purchase
  - Iphone.... The best. Nothing more to say.
11. Dharanesh Akkem
  - 1.0 out of 5 stars Ordered this phone and it did not come unlocked, ...
  - Reviewed in the United States on December 3, 2016
  - Size: 128 GB Color: Gold Verified Purchase
  - Ordered this phone and it did not come unlocked, even though the description says it got unlocked. It came with a T mobile SIM and asked for activation.
  - 4 people found this helpful
12. Amazon Customer
  - 5.0 out of 5 stars Five Stars
  - Reviewed in the United States on December 3, 2016
  - Size: 128 GB Color: Gold Verified Purchase
  - Excellent packaging and everything about the device was better than expected.



13. Matrisa Dyer

- 4.0 out of 5 stars iphone lover
- Reviewed in the United States on December 29, 2016
- Size: 128 GB Color: Gold Verified Purchase
- my wife loves her iPhone 7, but she believes that her home button is not working right, something seems to be wrong with it.
- One person found this helpful

14. Amazon Customer

- 1.0 out of 5 stars worst thing
- Reviewed in the United States on July 17, 2017
- Size: 128 GB Color: Gold Verified Purchase
- was stuck in a rainstorm for five seconds and my whole screen has black dot mm all over it and i can't type properly... worst thing ever
- One person found this helpful

15. Darby Macdonald

- 5.0 out of 5 stars Five Stars
- Reviewed in the United States on February 20, 2017
- Size: 128 GB Color: Gold Verified Purchase
- Love it

16. Amazon Customer

- 5.0 out of 5 stars Five Stars
- Reviewed in the United States on December 3, 2016
- Size: 128 GB Color: Gold Verified Purchase
- Excellent packaging and everything about the device was better than expected.

17. Amazon Customer

- 5.0 out of 5 stars as expected the phone is very good. The only limitation is that it is not ...
- Reviewed in the United States on October 30, 2016
- Size: 128 GB Color: Gold Verified Purchase
- Thanks. As expected, the phone is very good. The only limitation is that it is not possible charging and listening to music at the same time.
- 13 people found this helpful

18. Mohammed N.

- 1.0 out of 5 stars. To be honest I was very disappointed, the phone box was opened and to me ...
- Reviewed in the United States on November 15, 2016
- Size: 128 GB Color: Gold Verified Purchase
- To be honest I was very disappointed, the phone box was opened and to me the phone did not look new. I had no time to return it because it was a gift for somebody!
- 8 people found this helpful

19. Amazon Customer

- 5.0 out of 5 stars [https://www.amazon.com/dp/B01M1ERUWL/ref=cm\\_cr\\_ryp\\_prd\\_ttl\\_sol\\_0](https://www.amazon.com/dp/B01M1ERUWL/ref=cm_cr_ryp_prd_ttl_sol_0)
- Reviewed in the United States on March 15, 2017
- Size: 128 GB Color: Gold Verified Purchase
- [https://www.amazon.com/dp/B01M1ERUWL/ref=cm\\_cr\\_ryp\\_prd\\_ttl\\_sol\\_0](https://www.amazon.com/dp/B01M1ERUWL/ref=cm_cr_ryp_prd_ttl_sol_0)
- One person found this helpful

20. Crystal Brianna Ahrens

- 5.0 out of 5 stars iPhone 7!
- Reviewed in the United States on November 27, 2016
- Size: 128 GB Color: Gold
- Pretty cool phone and always been an Android user. Love it