

Smartphone Product Perception, Emotional Expression and Brand Image Perception

-- A Content Analysis based on Online Reviews

Xiaoyan Zhang, Linlin Dong, and Yimu Ni

School of Economics and Management, Shanghai Maritime University, Shanghai, China

Abstract

With the development of economic globalization, the competition in the smartphone manufacturing industry is becoming increasingly fierce. Based on the brand image perception theory, this paper uses the method of online comment text analysis to analyze the text data of mobile online comments on the JD website, studies consumer brand perception tendency through high-frequency word statistics, conducts emotional analysis through Semantic network maps, obtains the brand perception image of the website from the perspective of consumers, and thus divides the perception factors of consumers' positive and negative emotions. Conduct semantic and emotional analysis on comments on JD website, study consumers' overall image perception of mobile phone brands, and propose relevant suggestions to improve their image.

Keywords

Mobile Phone Brand; Brand Image; Word Frequency Analysis; Image Perception.

1. Introduction

In recent years, the iteration speed of smartphone technology updates has become increasingly fast. In terms of global shipments, Samsung, Apple, and Huawei once held the top three positions, while in the high-end market, they are mainly dominated by the top two. Data shows that these two companies account for about half of global smartphone shipments. However, since 2016, the global smartphone market has tended to be saturated and the growth rate has significantly slowed down. With the arrival of the 5G replacement wave, the shipment volume of smartphones has ushered in a new round of growth, reaching 1.355 billion units in 2021. But just one year later, global smartphone shipments in 2022 will decrease by 10% year-on-year, and the downward trend will continue until 2023, with the decline improving to a year-on-year decrease of 5%. Global smartphone shipments will reach their lowest level since 2014. The concentration of smart phone brands has been increasing year by year, and the overall market is approaching saturation, and market competition is becoming increasingly fierce. Therefore, how smartphone companies can survive and develop better through countermeasures has become an important issue faced by the smartphone industry.

Based on brand image perception theory, this paper uses word frequency analysis to cognitively analyze the text data based on cell phone online reviews on Jingdong website, triggered by cognitive and emotional dimensions, and uses the "cognitive-emotional" model to study the brand image perception of Apple cell phone. The brand image of cell phones on Jingdong website was analyzed by semantic network diagram to obtain the brand perception image of the novel website from consumers' perspective, and to classify the perception factors of positive and negative emotions of consumers. Semantic sentiment analysis is conducted on the comments on the Jingdong website to study consumers' overall image perception of the cell phone brand. And suggestions and countermeasures to enhance the brand image are proposed.

2. Literature Review

2.1. Brand Image Theory

2.1.1. The Concept of Brand Image

According to marketing guru Philip Kotler, a brand is a name, term, mark, symbol or design, or a combination of them, whose purpose is to identify the products or services of a seller or group of sellers and to distinguish them from those of competitors. It has its own personality, culture, image and value, and it can be said that the brand is the bridge between the consumer and the product.

Brand image is one of the core elements of a brand. At present, there is no unified definition of brand image internationally, and different scholars hold different views on the concept of brand image. Hunt proposed that brands have image characteristics that represent consumers' first impressions. Biel defines brand image as the comprehensive association of consumers with all aspects of the brand, such as brand attributes, brand logo, etc. Chinese scholars Wang Chunyang and Qu Hailin pointed out that emotional components will have a significant impact on consumer satisfaction and revisit intention. In terms of research methods, in the past, most of the data were obtained through expert consultation, in-depth interviews, statistics, and questionnaires. However, with the advent of the Internet age, scholars gradually began to use Big data to collect and mine data, and applied word frequency analysis, emotion analysis, and Semantic network analysis to the research of brand image perception. Some scholars believe that brand image is consumers' subjective evaluation and association of perceived brand attributes, as well as their perception and cognition of the brand. Some scholars also believe that brand image is the brand characteristics displayed by a brand in the market and society, and it is a recognition and evaluation of the brand by consumers.

2.1.2. The Connection between Consumers and Brand Image

Dobnian and Zinkhan first attempted to define the concept of brand image through extensive literature on brand image. Reynolds takes consumers themselves as the entry point and believes that brand image is consumers' perception of product attributes and usage, thereby establishing a relationship with the brand, which will affect consumers' behavioral intentions. When Aaker studies the connection between brands and consumers, he regards brand image as a type of brand association, believing that it is better to establish consumers' brand associations than to remind them of a positive association with the original brand. In studying the relationship between brand assets and brand image, Biel defines brand image as associations associated with the brand. Describing a brand image as a set of attributes and associations that connect consumers with the brand name, and pointing out that consumers like brands because they encapsulate meaning, they constitute a shortcut to simplify choices. In the brand concept, Keller's perception of the brand generated by consumers' memories is called brand image.

Fan Xiucheng, a Chinese scholar, studied the evaluation of brand image, he believed that there were rich connotations in brand image, including consumers' perceptions and views, and found that brand image had an impact on consumers' purchase behavior. Wang Changzheng is conducting in-depth research on the concept of brand image by referring to foreign literature. He analyzes the definition of brand image from two different perspectives, including the perspective of consumers and the perspective of enterprises.

2.2. Perceived Image

The concept of perceptual image was first introduced in the early 1970s, and traditionally perceptual image refers to consumers' perceptions and feelings about a particular destination or object. Subsequently, after a large number of scholars' research, it was found that

"perceptual image" does not only exist in the field of general destination image, but also in other fields.

Combining the understanding and interpretation of brand image by various scholars, this paper argues that brand image is the comprehensive impression of consumers on the product characteristics provided by the brand. This paper will study cell phone brand image from three dimensions: cognitive image, emotional image and overall image. It is believed that brand image is the comprehensive impression of consumers on the product features provided by the brand, representing the comprehensive evaluation of the cognitive, emotional, and overall image dimensions of the brand by consumers.

2.3. Web Text and Content Analysis Method

With the advent of the digital era and the widespread of online shopping behavior, online evaluation has become an important reference for consumer decision making, so this paper selects online evaluation as the source of research data. Compared with questionnaires, online text analysis is a more direct and intuitive way to understand consumers' opinions, and it is more convenient for researchers. Text analysis or content analysis is a research method that provides an objective and quantitative description of explicit content. The greatest advantage of text analysis over questionnaire-based multivariate analysis is that it captures the complete psychological perception of consumers. The discourse analysis in text analysis mainly analyzes the number, word frequency and content proportion of the text, which emphasizes more on the meaning and understanding of the text itself compared to the discourse analysis. At present, it is mainly used to explore the focus and content evolution of a certain field and to summarize its lexical features, so as to explore the laws and meanings of the text. Therefore, this paper chooses the network text analysis method to study.

3. Data and Methods

3.1. Mobile Phone Brand Selection

With the continuous expansion of the mobile phone market, various mobile phone brands are also emerging. In such a fiercely competitive market environment, the shaping of mobile phone brand image is particularly important. As major mobile phone brands, Apple and Samsung dominates the market with its technology, and Chinese mobile phone brands also have their cost-effectiveness advantages to occupy a portion of the market share. Due to the fact that Apple is the world's first smartphone with high sales volume, long history, significant influence, and more universality, this article chooses the Apple phone brand as the research object.

3.2. Research Methodology and Data Sources

Cell phone reviews are consumers' evaluations of cell phone brands after completing purchase activities, which can intuitively reflect consumers' feelings. Combining the authority and influence of cell phone sales websites, this study crawled the network review data of Jingdong platform and initially collected a total of 3003 cell phone network reviews through Houyi collector. The collected reviews were analyzed by using word frequency analysis and semantic network analysis in text analysis, and the image perception of cell phone brands were studied from three aspects: cognitive image, emotional image and overall image.

3.3. Data Pre-processing

The accuracy of data is crucial for subsequent image analysis, therefore, data preprocessing is necessary. Firstly, manually deduplicate 3003 comments, delete comments that are clearly unrelated to the phone. Manually swiped comments, advertising comments, and semantically unclear comments, delete meaningless emoticons, symbols, numbers and so on. Integrate duplicate text in the same comment. The Second, considering the effectiveness of the review

text, the review data of the newer and hotter cell phone models of Apple brand were selected as the web text for the image perception study. After pre-processing, 3003 valid comments were finally obtained.

4. Research Results and Analysis

4.1. Cognitive Analysis

4.1.1. Analysis of High Frequency Words

The final comment data were processed by ROST CM6 software, and the top 30 words with high frequency were exported through high-frequency word analysis, in which meaningless inflectional auxiliaries, adverbs and other phrases were deleted, and words with similar meanings were unified to obtain the final cognitive high-frequency word list. The top 30 words were extracted, as shown in Table 1.

Table 1. iPhone's high frequency words vocabulary, lexical, frequency summary table

Sort by	Words	word frequency	Wordiness	Sort by	Words	word frequency	lexical category
1	Speed	1930	Noun	16	Satisfaction	519	Adjectives
2	Photo shoot	1887	Verbs	17	Feel	502	Noun
3	Run	1761	Verbs	18	Use	446	Verbs
4	Effect	1676	Noun	19	Genuine	443	Noun
5	Screen	1530	Noun	20	Good to see	419	Adjectives
6	Very good	1437	Adjectives	21	Games	378	Noun
7	Appearance	1416	Noun	22	System	377	Noun
8	Sound effects	1063	Noun	23	Beautiful	358	Adjectives
9	Time	1044	Noun	24	Color	351	Noun
10	Shape	996	Noun	25	Jingdong	332	Noun
11	Smooth	948	Adjectives	26	Continuity	316	Noun
12	Standby	900	Noun	27	Set out	311	Verbs
13	Apple	778	Noun	28	Received	294	Verbs
14	Clarity	759	Adjectives	29	Battery	289	Noun
15	Soon	677	Adjectives	30	Comfortable	283	Adjectives

Word frequency reflects how often words appear in online texts. The higher the frequency, the more important the meaning represented by the word. Wordiness can directly reflect the focus of attention, emotional attitude of consumers who buy cell phones, as well as their purpose and motivation for buying the phone. According to the chart, speed and photography topped the list, indicating that the majority of users buy Apple phones due to the photography feature, while the most attractive feature to consumers is its operating speed.

From the perspective of lexical analysis, among these 30 words, there are 5 verbs, accounting for 16.7% of the total. "Photo" is the most frequently used verb, with 1,887 occurrences, reflecting that today's Apple consumers are most concerned about the photo function, even more than performance and appearance. The second and third ranking of "run" and "use" represent that consumers of Apple phones are more concerned about the performance of Apple phones, which is a major selling point of Apple phones. The performance of Apple's mobile phones as a major selling point, after years of comparison and competition with other mobile phone brands, finally with its leading chip technology and processor technology in the performance of the advantage. The fourth and fifth ranking of "delivery" and "received" reflects that consumers not only evaluate a brand of cell phones from the perspective of cell phones, but also express logistics, delivery speed is also an important indicator, according to the data collected, most of the positive comments are accompanied by "fast delivery" and other similar comments, and the opposite "no delivery for several days" is also the main source of some of the bad comments. In the text of consumer reviews, comments related to verbs such as "sent out" and "charged" are often negative, such as "sent out goods too slow, waited for a long time" and "timeout". "Overtime", etc.

Among these 30 word frequencies, there are 17 nouns in total, accounting for 56.66%. These terms refer to appearance, performance, cell phone quality, brand and cell phone service packages. Among the terms related to appearance, "screen" appears most frequently, indicating that cell phone users pay more attention to the screen, followed by "speed", "appearance" and "Battery". "Game", "speed", "standby", "battery", "battery" In recent years, mobile gaming has become a more popular form of entertainment with its fast advantages, and consumers usually go for a better configuration of mobile devices for a smoother gaming experience, so not only performance The same is true for the battery life, which is also a major concern for consumers who love handheld games. The larger battery, stronger battery life can maintain longer game time, and the enhanced battery in the new Apple phone makes the new phone a popular choice for consumers. The third and fourth ranking of "screen" and "appearance" refers to the unique design of Apple's cell phones. This shows that it is also very important to attract consumers in terms of design.

Among the 30 high-frequency words, there are 8 adjectives, accounting for 26.66%. All of them are positive emotion words. The adjectives extracted from the review texts are mainly positive emotion words, indicating that choosing an Apple phone brings more positive emotions to consumers. "Good" and "satisfied" reflect consumers' personal positive emotions after purchase. Words such as "clear" and "fast" reflect consumers' consensus and evaluation after using the phone. "Beautiful" and "comfortable" are positive comments on the appearance and feel of the phone.

4.1.2. Cognitive Dimensional Analysis

For further cognitive analysis, the word frequencies were coded and categorized by combining the characteristics of 30 word frequencies and divided into 7 categories, which were design, performance, usage, feeling, range, sound quality, logistics, and formality. Table 2 was obtained. After clustering, it can be seen that the highest percentage is design, accounting for 23.3% of the total, while the least is formality, accounting for only 1.87%. Consumers are more concerned about product design than with whether the product is genuine.

Table 2. Word frequency statistics of each dimension

Dimensi onality	Content							Perce ntage
Design	Appearance (1416)	Screen (1530)	Shape (996)	Handedne ss (502)	System (377)	Beautifu l (358)	Color (351)	23.30 %
Perform ance	Speed (1930)	Running (1761)	Fluent (948)	Clarity (759)				22.73 %
Uses	Taking pictures (1887)	Effect (1676)	Games (378)					16.59 %
Feelings	Very good (1437)	Satisfact- ion (519)	Good looking (419)					10.00 %
Continu ity	Time (1044)	Standby (900)	Continuity (316)	Battery (289)	Comforta ble (283)			11.92 %
Tone quality	Sound effects (1063)	Sound quality (270)						5.61 %
Logistic s	Soon (677)	Jingdong (332)	Set out (311)	Received (294)	Logistics (279)			7.98 %
Formali ty	Genuine (443)							1.87 %

The design dimension "appearance" accounts for the majority, indicating that in all aspects of product design consumers are more concerned about the appearance of the product, and the most important of which is the "screen", the latter "shape "System" is Apple's unique IOS operating system, which facilitates the use of consumers and the office with its high fluency and simplicity. The "color" is also a point of concern for consumers, and on Apple's website, you can see that the sales of different colors are different, like "pink" and "blue". "Finally, "beautiful" represents the positive sentiment of consumers in the performance dimension. The next level is the performance dimension, "speed", "running", "smooth" and "clear" respectively reflect the consumer The performance evaluation mainly lies in the smoothness of the phone's operation and the clarity of the screen. The "use" dimension reflects the purpose of the consumer's purchase, with a large proportion of "photo" and a small proportion of "game". The perception dimension is often linked to other dimensions, reflecting positive consumer sentiment about various aspects of the Apple phone. The "standby" and "time" dimensions in the "battery life" dimension reflect consumers' concerns about the phone's standby capability, and the high level of concern about the battery life. In the "logistics" dimension, "soon" indicates the positive sentiment of consumers, and "Jingdong" is the main logistics method chosen by consumers. "Genuine" is the least important of all dimensions, but it does not mean that it is not important. According to some of the evaluation texts, many consumers who bought cell phones found that the phones were not brand new or original, but "refurbished" or "rebuilt" when they sent them for repair. "This will greatly affect the consumer's purchasing experience and bring negative impact.

4.1.3. Visual Analysis

By filtering in the Excel file, all the web evaluation texts were divided into four years of data saved as TXT files, and the TXT texts of the four years of data were imported into ROST CM6 software separately to obtain the following Figure 1 Figure 2 Figure 3 Figure 4 four word cloud maps for visual visual analysis of cognitive images.

industry chain bright eyes this year experience manufacture
 signal **performance** charging announce advantage
 consumption function advantage news conference increase
processor installation **appearance** Android actual
 dense **screen** technology square millimeter continuation
 fast charging **cost performance** overall power model
 recover feel mature mobile phone **take photos**
 changing machines time launch cameras **effect** whole transistor
 up-to-date new product edges and comers **expectation**
 smooth version system research and development **endurance**
 beauty **apple** design battery evaluate configuration

Figure 1. Apple's brand image word cloud in 2020

next time not stuck Jingdong preferential experience **use**
 deserve package performance charging believe seller
 shape **appearance** nice standby advantage **screen**
 function advantage **Good** news conference increase business
 cost performance **apple** Android feel **mobile phone**
take photos receive function quality **effect** time serve
 certified products clearness shopping cost performance
 attitude logistics game color characteristic **endurance** white
 sound quality battery system classical delicate frame design
 expectation **smooth** version satisfied research and development
 beauty **speed** sound effects **run** evaluate appearance value

Figure 2. Apple's brand image word cloud in 2021

not stuck Jingdong preferential experience **use** signal
 pixel memory upgrade suitable sound processor **shape**
appearance size nice Android package perfect
Screen standby cost performance total feel
 mobile phone photo camera **take photos**
 operate receive **effect** convenient fashion daily **time**
 serve mode certified products **smooth** clearness
 game satisfied meet with function characteristic real
 system classical endurance color durable **apple** design
 quality black shopping frame **run** question **speed**
sound effects sound quality buy express delivery

Figure 3. Apple's brand image word cloud in 2022

not stuck senior next time Jingdong preferential **use** deserve
 experience pixel charging memory resolution ratio function
 send out goods suitable **shape appearance** enough
 size **nice** android perfect customer service price **screen**
 standby cost performance feel **mobile phone**
 photo camera **take photos** operate receive rest assured
effect time mode **smooth** certified products easy
clearness game satisfied meet with characteristic attitude
 express delivery delicate system endurance comfortable **apple**
 design texture quality shopping **run speed** suitable
 question **sound effects** sound quality color pink

Figure 4. Apple's brand image word cloud in 2023

The evolution of high-frequency words from 2020 to 2023 shows that consumers are paying more and more attention to the appearance of cell phones, and the proportion of appearance is increasing year by year, and consumers' perception of cell phone brands is also getting stronger. It is also clear from the word cloud chart that the word "Apple", which has a large proportion in 2020, has a significantly weaker proportion in subsequent years, which indicates that consumers' perception of the brand itself is decreasing year by year, and the strength of the brand to influence consumers' purchase is also decreasing, while the factors that attract consumers are more importantly reflected in the product's Function and performance. Comparing the four graphs, we can see that the proportion of "photo" in consumers' perception has been increasing year by year since 2021, indicating that consumers' attention to the photo function of Apple cell phone products has been gradually increasing, reaching the highest in 2023, the same proportion as the word cell phone. At the same time, it can be seen that the proportion of high-frequency words representing cell phone product performance such as operation, speed and smoothness also increased year by year since 2021, so this is also the focus of consumers' attention. From the effect shown in the word cloud chart of each word from 2020 to 2023, it can be seen that the function of "taking photos", the performance of "running", "sound" and "speed", as well as the "shape" and "screen" have an increasing influence on consumers' choice year by year. This also shows that consumers for cell phone purchase reference content has changed, for cell phone experience and requirements have changed, more inclined to the choice of product features and performance, rather than the product brand.

4.2. Affective analysis

Sentiment analysis is to analyze the sentimental words in the text of online reviews left by consumers after purchase to reflect their emotional attitude and overall impression of the cell phone brand. Therefore, in order to analyze the overall association between word frequencies, line eigenvalue co-word matrix analysis and semantic network analysis were conducted on the text. The scoring system on the Jingdong website was used to rate 4-5 stars as positive, and 1-3 stars as moderate and poor as negative. The data were imported into ROST CM6 software to obtain Figure 5 and Figure 6.

4.2.1. Positive Emotion Analysis

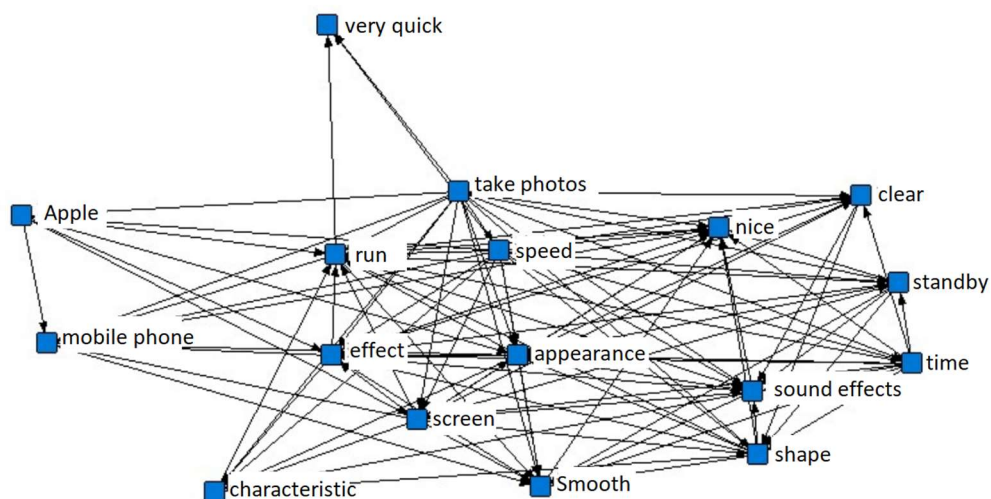


Figure 5. Positive semantic network diagram

Roughly divided into three levels. The core layer "speed" "appearance" is mainly represented by product attributes. The middle layer "run" "nice" represents the positive emotional tendency, "sound" represents the product attributes "taking pictures" "effect" represents the purpose of consumer purchase. The outer layer includes product attributes, as well as consumer emotions.

ROST CM6 software for sentiment analysis, and the number, percentage and segmentation of comments with positive, negative and neutral sentiment were counted to obtain the following statistics.

Table 3. Visitor sentiment analysis statistics

Positive emotions:	214 Articles	82.31%
Neutral mood:	22 articles	8.46%
Negative emotions:	24 Articles	9.23%
Among them, the results of positive emotion segmentation statistics are as follows:		
General (0-10):	44 articles	16.92%
Moderate (10-20):	44 articles	16.92%
Height (above 20):	126 articles	48.46%
Among them, the results of negative emotion segmentation statistics are as follows:		
General (-10-0):	18 Articles	6.92%
Moderate (-20 - 10):	2 bars	0.76%
Height (below -20):	4 articles	0.15%

From the statistical analysis of emotional categories, it can be seen that Apple users' positive emotional comments account for 90.25%, which shows that consumers' overall emotional satisfaction with Apple phones is high.

Further breakdown of positive emotions, it can be seen that the gap between moderately positive and generally positive comments is large, and the comments of generally positive emotions are as high as 214, accounting for 82.31% of the overall comment data. Despite the positive emotions, the consumers represented by this part of the comments should be treated with caution to prevent this part of the consumer's emotional attitude toward the cell phone brand from turning into neutral or negative emotions.

The number of neutral emotion comments is 22, accounting for 8.46% of the total number of comments. The total number of negative comments is 24, accounting for 9.23% of the total number of comments. Although the number is small, the content of the comments is noteworthy. In this part of consumers' review texts, the problems are often clearly pointed out, and it is necessary to make full use of this part of texts to improve the cell phone products and services to enhance their satisfaction. Further combining word frequency analysis with consumer online review texts to analyze negative sentiment, it is easy to find that negative sentiment mostly comes from performance, range, price, service and other reasons.

Service issues are related to customer service staff and after-sales completeness, such as comments "goods more than 20 days to arrive, fully unblocked after the same city put 5 days, I launched a return merchants directly hang up to rush logistics dragged to the logistics to the goods in the closure of the return without any explanation, after the second launch of the return or without any explanation off, this is not to mention the quality of goods light this service attitude are poor comments. " "Poor customer service attitude, no after-sales to speak of." Fully exposed the current cell phone after-sales management there are services difficult to meet the shortcomings of consumer demand. Therefore these aspects are also the brand needs to pay attention to and further improve the place.

In summary, consumers' emotional attitude after purchasing the product is dominated by positive and positive emotions, but general positive emotions and general negative emotions are the focus of attention for consumer satisfaction improvement.

5. Conclusion and Discussion

5.1. Conclusion

In this study, through cognitive analysis, consumers' product reviews are divided into design, performance, usage, feel, range, sound quality, logistics, and formality. The evolution of high-frequency terms from 2020 to 2023 reveals that the important factors influencing consumers to purchase Apple cell phone products consist of photo features, design, and product performance. Through sentiment analysis, product attributes and product usage are the parts that contain both positive and negative perception factors. The brand name of the product appears in the positive semantic network graph, which indicates that consumers hold positive attitudes towards Apple cell phone products. The negative semantic network diagram is mainly composed of product logistics and after-sales service, which is a point that Apple phone sales staff should pay special attention to. Through the overall analysis, it shows that consumers' emotional tendency toward Apple cell phones is mainly positive and positive.

At present, consumers' attention to the "photo" function of cell phones has increased significantly, and is one of the core competitive elements of cell phone brands. Photography, together with the performance of the phone and the battery life, build up the brand image in consumers' minds. According to the word frequency analysis, different brands of cell phones are different in the minds of different consumers. Sentiment analysis points out that consumers are more concerned about the quality of after-sales service. The overall analysis of the semantic network diagram shows that Apple cell phone has built a good brand image in consumers' mind with its beautiful design and excellent quality. Brand image building is a complex project that requires efforts in many aspects, such as products, services, marketing and word-of-mouth communication. Only by doing the best in these aspects can we really win the trust and loyalty of consumers and increase the market share and profit of the brand. Therefore, cell phone brand enterprises should focus on brand image shaping, so as to succeed in the competitive market. Cell phone brand image shaping is not only a simple marketing strategy, but also an expression and transmission of brand value and brand culture.

5.2. Discussion

5.2.1. Product Side

The cognitive, emotional, and overall analysis reveals the aspects that consumers value more in their choice of cell phones. In terms of products, product quality, design and performance are the dimensions that consumers are more concerned about, therefore, it is important to strengthen product development as well as innovation and increase product choices in terms of appearance and color. Cell phone brand companies should continue to innovate and improve the quality of their products and services to meet consumers' needs and expectations. Further improve the performance and functions of the products in terms of technology; enhance consumers' experience of using the products. Strengthen the research and development of the characteristics of the cell phone brand to form the unique advantages and technology of the brand, so as to play their own brand advantages in the process of competition with other cell phone brands.

5.2.2. Promotion Aspect

Merchants will sell products with some promotional tactics, such as price guarantees, price reductions, or small gifts. According to the text of some of the bad reviews, sometimes the merchant forgets to include what he calls a small gift, such as a cell phone film, which can bring negative emotions to consumers, even greater than the positive emotions brought by consumers who receive small gifts. It is suggested that training can be enhanced to improve the accuracy of the work of the merchant when shipping, to minimize the situation of missing goods after the consumer receives the goods. And you can reduce some no real meaningful price

reduction sales strategy, when consumers buy the product found that they did not get a discount when the negative impact is great, the brand image also has an impact.

5.2.3. Price

From the text of some of the bad reviews can be concluded that a large part of the consumers who gave a bad review because the phone to buy the hands of the business will reduce the price, which is part of the reason for the negative feelings of consumers. Since Apple has a high price strategy and cancels a lot of the add-ons for lower prices when buying a phone, consumers have to face extremely high threshold prices, which discourages many potential consumers, and the durability of Apple phones also makes consumers willing to buy Apple phones will not go to a new phone in the short term, which This has led to a decline in sales of Apple phones in recent years. The response is to launch some lower-priced models to attract more consumers.

5.3. Limitations

The sample selected in this paper is not comprehensive enough, and only Apple cell phone brand is included, which leads to the conclusion that objectivity is not so sufficient; only the text data of reviews on Jingdong website and Zhongguancun website are collected, and the data of other platforms are not collected; because the website will display the higher-rated Pin Theory in priority when crawling data, so the data statistics of positive and negative reviews statistics will be inaccurate.

References

- [1] Wang Wei. An empirical study on the effect of online word-of-mouth evaluation on cell phone sales[J]. *Modern Marketing*,2022,(2).
- [2] Xu Jiarui. An analysis of Xiaomi's cell phone brand marketing strategy[J]. *Mall Modernization*, 2022,(3).
- [3] Wang Zhuo. A decision model for cell phone manufacturers based on consumer preference segmentation[J]. *Review of Economics and Management*,2022,38(5).
- [4] Wang Xiangyu. A study on marketing strategies of domestic smartphones[J]. *Modern Marketing*, 2022, (2).
- [5] Yang Guopin,Tian Zhongjing. The impact of economic globalization on the development of smartphones in China[J]. *Modern Marketing (Lower Journal)*, 2015,(03).
- [6] Zheng Yuanyuan. Analysis of the current situation and countermeasures for the development of China's smartphone industry[J]. *Ji Fu Times*,2015,(10).
- [7] Yang Y. Study on the optimization of smartphone marketing strategy of Huawei [D]. *Huazhong Normal University*,2021.
- [8] Lu Xingwu and Hao Gang. on the development trend of China's smartphone market[J]. *Heilongjiang Foreign Trade and Economic Cooperation*, 2011,(05).
- [9] Shang Pengfei. Li Tieke Model construction and empirical evidence of factors influencing consumer brand loyalty[J]. *Statistics and Decision Making*,2018,(11).
- [10]Zhang Aidong. Ruminant the formation process and influence of cell phone brand loyalty[J]. *Northern Economy and Trade*,2019,(07).
- [11]Wang Shuai. A review of brand loyalty research[J]. *Journal of Henan Mechanical and Electrical High School*,2010,18(06),56-59.
- [12]Liu, Jiant. A literature review on brand definition and brand equity theory[J]. *Journal of Economic Research*,2012,(31),195-199.
- [13]YunYun Yang, Lucy Akers, Thomas Klose, et al, Text Mining And Visualization Tools---Impressions of Emerging Capabilities[J]. *World Patent Information*, 2008,30(4): 280-293.
- [14]Maaz-ur-Rehman. A STUDY OF FACTORS AFFECTING BRAND LOYALTY:A CASE STUDY OF PEPSI LAHORE, PAKISTAN[J]. *Central North University*,2022.

[15] Vim. growing brand loyalty with innovation and purpose [J]. M2 Presswire, 2022.