

# Leveraging Natural Language Processing and Sentiment Analysis in Marketing Practices

Dr.Poompavai N<sup>1</sup>, Dr. Elakkiya Elango<sup>2</sup>, Balasubramanian Shanmuganathan<sup>3</sup>

<sup>1</sup>Assistant Professor, Shrimathi Devkunvar Nanalal Bhatt Vaishnav College for Women, Chennai 44

<sup>2</sup>Guest Lecturer, Department of Computer Science, Government, Government Arts College for Women, Sivagangai, Tamilnadu, India

<sup>3</sup>Assistant Professor, Department of Computer Science, DDE, Alagappa University, Karaikudi, Tamilnadu, India

**Abstract-** This paper examines the synergistic combination of Sentiment Analysis (SA) and Natural Language Processing (NLP) in marketing. Using NLP and SA approaches has grown essential as companies look for new ways to comprehend and address client sentiment. This abstract explores the primary approaches to using these technologies to improve marketing strategies. Marketers can obtain significant insights into customer preferences, feedback, and trends by analyzing customer attitudes through textual data. This paper looks into how Natural Language Processing (NLP) and sentiment analysis (SA) can be used to improve customer interaction, refine marketing strategies, and ultimately increase the efficacy of campaigns as a whole. This paper aims to discuss the work of a Natural Language Processing (NLP) specialist who is part of the Growth Hacking Team of a recently established startup that is releasing a new video game. Enhancing early firms' rapid, explosive growth is one of the main goals of a growth hacking team. In order to achieve this, it presents techniques that allow one to reach as many clients as possible at the lowest feasible cost. We wish to map the video game market as part of our growth hacking plan. Our goal is to learn how customers assess the products of our rivals, specifically what features they enjoy and find objectionable in video games. The marketing group can more successfully communicate the idea of our goods if they are aware of what draws gamers to a video game.

**Index Terms-** Natural Language Processing, Sentiment Analysis, Marketing Strategies, Video games

## I. INTRODUCTION

Success in dynamic marketing depends on being aware of and responsive to consumer sentiment. This study explores the complex interactions between Sentiment Analysis (SA) and Natural Language

Processing (NLP) in the context of marketing, highlighting how these two technologies might work together to transform conventional methods[20][12]. The increasing need for businesses to understand and efficiently handle customer sentiment has highlighted the criticality of NLP and SA approaches. Combining NLP and SA becomes essential for improving marketing tactics as companies seek new creative methods to engage with their target audience. This study examines the core strategies that use these technologies to reveal fresh perspectives on consumer preferences, feedback, and developing trends. Marketers can obtain a more detailed insight beyond traditional market research by analyzing client sentiments conveyed via textual data.

Additionally, the study looks into how Sentiment Analysis (SA) and Natural Language Processing (NLP) might improve consumer interaction, strategy optimization, and the overall effectiveness of marketing efforts. Beyond theoretical frameworks, the emphasis is on a real-world application within the Growth Hacking Team of a rapidly growing firm releasing a new video game. For these early-stage companies, achieving rapid and explosive growth is a top priority[8][2]. This article provides insights into the strategies used by a specialized NLP specialist in the Growth Hacking Team.

The following discussion describes the expert's function in charting the video game industry as a component of an all-inclusive growth hacking strategy. The team's objective is to ascertain how consumers assess competing products, focusing on qualities that appeal to and those that provoke concerns in the video game industry. This

understanding enables the marketing team to express the product's distinctive value proposition more successfully, enabling targeted market penetration. This paper essentially links theoretical comprehension and real-world implementation, investigating how the combination of NLP and SA can enable marketing teams to interpret consumer sentiments and produce measurable outcomes in the fiercely competitive world of contemporary marketing strategies.

## II. PURPOSE AND OBJECTIVES OF LEVERAGING NLP AND SENTIMENT ANALYSIS IN MARKETING PRACTICES

Sentiment analysis and Natural Language Processing (NLP) work together as a strategic necessity in today's dynamic marketing environment since they serve different functions and have explicit goals [24][5][10]. By using this cutting-edge language technology, organizations can better understand customer sentiment and develop marketing campaigns that are responsive, educated, and focused on the needs of their target audience.

### *Personalization and Targeting:*

*Goal:* Execute customized marketing plans according to each customer's preferences.

*Rationale:* Marketers' use of natural language processing (NLP) to identify distinctive language patterns makes it easier to target particular audience segments with content, product recommendations, and messaging. The aim is to strengthen customer relationships by providing a more relevant and personalized brand experience [23].

### *Enhanced Customer Experience:*

*Goal:* Enhance overall client satisfaction through language-driven communication.

*Rationale:* Businesses may offer prompt, contextually relevant responses by implementing chatbots and virtual assistants driven by natural language processing (NLP)[17]. It promotes brand loyalty and improves customer satisfaction by streamlining customer interactions and creating a smooth, compelling customer experience.

### *Real-Time Sentiment Monitoring:*

*Goal:* Track and evaluate customer sentiment regarding the company or its offerings.

*Rationale:* Sentiment analysis helps companies remain aware of the ever-changing attitudes of their customers. Real-time monitoring makes Agile responses possible, whether to take advantage of favorable feelings or deal with possible problems to lessen harmful effects [15].

### *Adaptive Marketing Strategies:*

*Goal:* Create flexible marketing plans that can react to the shifting needs of the market.

*Rationale:* NLP systems constantly monitor language usage patterns, customer attitudes, and market developments [4]. This continuous examination helps improve marketing strategies by ensuring they are flexible and adaptable to new changes in the market.

### *Social Media Engagement:*

*Goal:* To proactively interact with customers on social media channels.

*Rationale:* Natural language processing (NLP) techniques analyze large amounts of social media data to find patterns and sentiments. With the help of this feature, companies can engage in dialogues, reply to inquiries, and establish a favorable online reputation [14].

### *Content Optimization and SEO:*

*Goal:* Adapt content to both user intent and search engine optimization.

*Rationale:* NLP helps companies comprehend search intent so they may optimize information to match user requests. In addition to raising search engine rankings, this guarantees that the target audience will find the content engaging [3][18].

### *Brand Perception Management:*

*Goal:* Monitor and control how people perceive your brand on different media.

*Rationale:* Sentiment analysis sheds light on consumers' perceptions of a brand. Proactive management of brand sentiment and reputation is made possible by this insight, which also makes it possible to strategically intervene to match business goals with brand perception [16].

### *Data-Driven Decision-Making:*

*Goal:* Make data-driven insights the basis for marketing decisions.

*Rationale:* NLP and sentiment analysis allow marketers to analyze large datasets and extract meaningful information [9]. It encourages well-informed decision-making in line with changing market trends and consumer expectations.

*Efficient Customer Feedback Analysis:*

*Goal:* To get insightful information from consumer feedback information.

*Rationale:* NLP technology makes it easier to analyze unstructured input, giving rise to actionable insights for bettering services and products and making strategic decisions according to customers' opinions [1].

*Competitive Advantage:*

*Goal:* Use language technology to your advantage to get a competitive advantage.

*Rationale:* Organizations that use NLP and sentiment analysis well can comprehend consumer preferences and market trends on a deeper level [6]. It puts them in a strategic position relative to rivals, enabling more intelligent and creative marketing approaches.

Incorporating NLP and sentiment analysis into marketing operations aims to develop a more data-driven, consumer-focused, and flexible marketing strategy [13][21]. Understanding customer language helps businesses engage with customers genuinely and comprehend their feelings, goals, and changing expectations in the digital age[7].

### III. PROPOSED SYSTEM

*Types of Forecasting Model Algorithm*

We must understand the linguistic characteristics of gamers' statements to determine what qualities make a video game worthwhile to purchase[11][22]. Our job as NLP specialists will be to examine consumer reviews of video games. We shall use many NLP techniques to complete this objective [19]. These techniques will make it possible to gain a deeper comprehension of the opinions and feedback from customers.

*NLP Algorithms for Natural Language Processing:*

*Tokenization:* Dividing textual information into discrete words or tokens.

*NER, or Named Entity Recognition:* recognizing names of products, characteristics, or rivals mentioned in customer reviews.

*Part-of-Speech Tagging:* Classifying textual words into grammatical categories (such as verbs and nouns).

*Sentiment Analysis (SA) Algorithms:*

*Machine Learning Classifiers:* These algorithms have been trained on labeled sentiment data, such as Support Vector Machines (SVM), Naive Bayes, or Logistic Regression.

*Deep Learning Models:* Transformers for identifying intricate sentiment patterns, Long Short-Term Memory (LSTM) networks, or Recurrent Neural Networks (RNNs).

*Lexicon-based techniques:* Assigning sentiment scores to words through sentiment lexicons or dictionaries and then adding up all values to get a total sentiment score.

*Customer Interaction Enhancement:*

*Chatbot Algorithms:* Natural Language Understanding (NLU) algorithms for creating chatbots that can comprehend and react to user moods and requests. These algorithms improve customer interaction.

*Personalization Algorithms:* Utilizing collaborative filtering or recommender systems to tailor consumer encounters to their input and preferences.

*Refining Marketing Strategies:*

*Cluster analysis:* Organizing clients into groups according to their attitudes and preferences to customize marketing plans for various market niches. Association rule mining is finding trends and connections in consumer feedback and behavior to guide marketing strategies.

*Campaign Efficacy Improvement:* A/B testing involves experimenting with various marketing messages or approaches and figuring out which works best using statistical analysis.

*Predictive models:* Using past data and sentiment analysis findings to predict the outcome of marketing efforts is known as predictive analytics.

*Market Mapping Techniques:*

*Competitor Analysis Algorithms:* Feature extraction and sentiment analysis are two methods used to analyze the features and products of competitors. Topic modeling employs Latent Dirichlet Allocation (LDA) algorithms to discover essential topics and themes in market discussions and customer feedback.

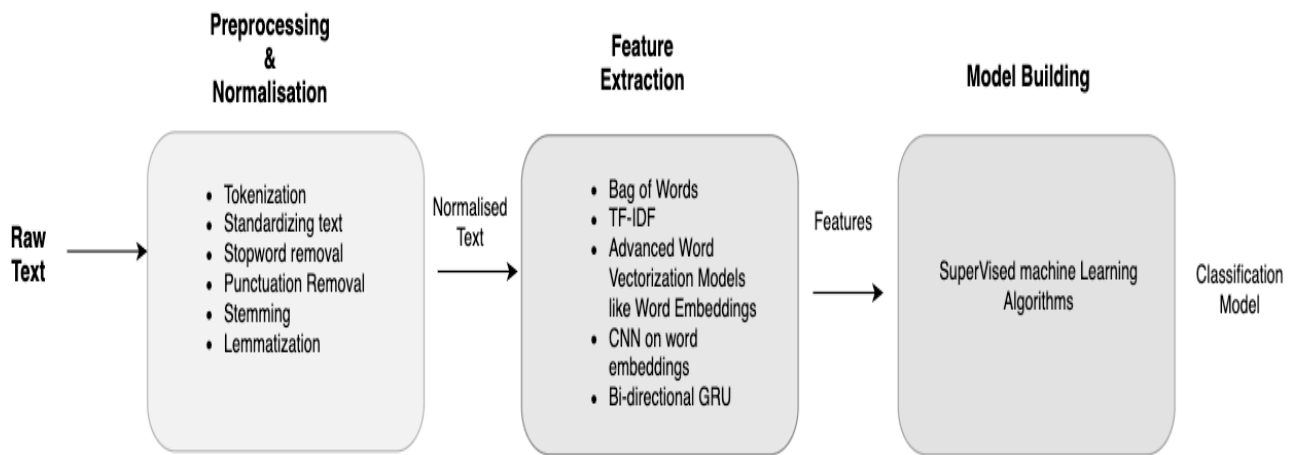
*Data Preprocessing*

Download the Amazon review dataset. Utilizing the reviews on Amazon, create our Dataset. Determine if the video game that consumers purchased is liked or disliked. Label each review with a sentiment score between -1 and 1. Compare the sentiment scores with the review ratings to assess our sentiment analyzer's effectiveness. Determine whether we could appropriately label the reviews by assessing the sentiment analyzer's performance. Explore further

sentiment analysis techniques. Sort reviews into three categories, neutral, negative, and positive, to learn how consumers feel about the video game they bought. Provide the Growth Hacking Team Head with a summary of our findings. Based on your research, list our favorite and most minor favorite aspects of video games.

IV. METHODOLOGY

We must understand the linguistic characteristics of gamers' utterances to determine what qualities make a video game worthwhile. Our job as NLP specialists will be to examine consumer reviews of video games. We shall use many NLP techniques to complete this objective, as shown in fig 1. These techniques will make it possible to gain a deeper comprehension of the opinions and feedback from customers.



An NLP Model Creation Pipeline

Fig 1. Flow diagram of NLP Creation

*Data Sampling*

We use various NLP techniques to gain a more profound knowledge of people's opinions regarding video games. It summarizes the tasks we will perform and the methods we will employ. Using the unbalanced-learn package to sample from imbalanced datasets. Using the dictionary-based sentiment analysis tools included in Python's NLTK natural language processing package to determine the reviews' sentiment value. We are determining the effectiveness

of our algorithm. We are evaluating data in Python using scikit-learn. Utilizing the DistilBERT model, a cutting-edge deep learning technique, to analyze the evaluations. We must run Pytorch, transformers, and the simple transformers packages to construct this model. Before presenting our findings to our supervisor, we evaluated our model and generated descriptive statistics in Python using the sci-kit-learn module. Implement Altair to visualize our results for

terms associated with video games that are preferred and non-preferred.

V. IMPLEMENTATION

Data Collection

The Github dataset in CSV format is used in Fig. 2.

Amazon Fashion	reviews (883,636 reviews)	metadata (186,637 products)
All Beauty	reviews (371,345 reviews)	metadata (32,992 products)
Appliances	reviews (602,777 reviews)	metadata (30,459 products)
Arts, Crafts and Sewing	reviews (2,875,917 reviews)	metadata (303,426 products)
Automotive	reviews (7,990,166 reviews)	metadata (932,019 products)
Books	reviews (51,311,621 reviews)	metadata (2,935,525 products)
CDs and Vinyl	reviews (4,543,369 reviews)	metadata (544,442 products)
Cell Phones and Accessories	reviews (10,063,255 reviews)	metadata (590,269 products)
Clothing Shoes and Jewelry	reviews (32,292,099 reviews)	metadata (2,685,059 products)
Digital Music	reviews (1,584,082 reviews)	metadata (465,392 products)
Electronics	reviews (20,994,353 reviews)	metadata (786,868 products)
Gift Cards	reviews (147,194 reviews)	metadata (1,548 products)
Grocery and Gourmet Food	reviews (5,074,160 reviews)	metadata (287,209 products)
Home and Kitchen	reviews (21,926,568 reviews)	metadata (1,301,225 products)
Industrial and Scientific	reviews (1,758,333 reviews)	metadata (167,524 products)
Kindle Store	reviews (5,722,988 reviews)	metadata (493,859 products)
Luxury Beauty	reviews (574,628 reviews)	metadata (12,308 products)
Magazine Subscriptions	reviews (89,689 reviews)	metadata (3,493 products)
Movies and TV	reviews (8,765,568 reviews)	metadata (203,970 products)
Musical Instruments	reviews (1,512,530 reviews)	metadata (120,400 products)
Office Products	reviews (5,581,313 reviews)	metadata (315,644 products)
Patio, Lawn and Garden	reviews (5,236,058 reviews)	metadata (279,697 products)
Pet Supplies	reviews (6,542,483 reviews)	metadata (206,141 products)
Prime Pantry	reviews (471,614 reviews)	metadata (10,815 products)
Software	reviews (459,436 reviews)	metadata (26,815 products)
Sports and Outdoors	reviews (12,980,837 reviews)	metadata (962,876 products)
Tools and Home Improvement	reviews (9,015,203 reviews)	metadata (571,982 products)
Toys and Games	reviews (8,201,231 reviews)	metadata (634,414 products)
Video Games	reviews (2,565,349 reviews)	metadata (84,893 products)

Fig. 2. Github dataset

Data Preprocessing

Examine the data on video game reviews. Observe the text of the ratings and reviews we will work with for this milestone. Remember that our data is new line-delimited JSON rather than plain JSON. We must install and import JSON in order to read it. Plot the product's ratings on a chart. Examine how each of the five categories is distributed.

Prediction Selection

Select 1500 reviews with a rating of 1, 500-500-500 reviews with ratings of 2, 3, 4, and 1500 reviews with a rating of 5 to create a random sample of the reviews as shown in graph 3. In this manner, we will have a more manageable and well-rounded corpus for Milestones 2-4. Choose 100,000 reviews at random to create a sample of the reviews. In this manner, our work with a larger representative corpus is obtained in Milestones 4 and 5, as shown in Figures3, 5, and 6. Use 42 as a random state to obtain the same results as the sample solution in Figure4 and Graph 2.

Data Preparation

This Dataset is amassed from Github. It is an up-to-date model of the Amazon evaluate Dataset launched in 2014. As within the preceding model, this Dataset consists of opinions (ratings, text, helpfulness votes), product metadata (descriptions, class records, price, brand, and photograph features), and links (additionally viewed/additionally sold graphs) [3]. In addition, this model offers the following features:

*More reviews:* The general range of opinions is 233.1 million (142.eight million in 2014).

*Newer opinions:* Current statistics consist of opinions within the variety May 1996 - Oct 2022.

*Metadata:* We have delivered transaction metadata for every evaluation proven on the evaluate page. Such record consists of:

- Product records, e.g., color (white or black), size (big or small), package deal type (hardcover or electronics), etc.
- Product pictures can be taken after the consumer obtains the product.
- Added extra unique metadata of the product touchdown page. Such unique records consist of:
- Bullet-factor descriptions under the product title.
- Technical information table (attribute-price pairs).

*Developing and Training Model*

Export our datasets into two distinct CSV files. We should have a column for each of the reviews and ratings in both of our tables. Henceforth, we will refer

to the overall key as "ratings" and the review text of the JSON key as "reviews" as shown in fig. 3 and fig. 4. Give our corpora the names big\_corpus and small\_corpus.

VI. RESULTS

We are utilizing the NDJSON. The Dataset is analyzed randomly from sample reviews.

*Results and Discussion -Build our Dataset using a random selection of sample reviews (Sample Inputs and output)*

*A random sample of reviews*

	overall	verified	reviewTime	reviewerID	asin	reviewerName	reviewText	summary	unixReviewTime	vote	style	i
0	5.0	True	10 17, 2015	A1HP7NVNPFMA4N	0700026657	Ambrosia075	This game is a bit hard to get the hang of, bu...	but when you do it's great.	1445040000	NaN	NaN	
1	4.0	False	07 27, 2015	A1JGAP0185YJ6	0700026657	travis	I played it a while but it was alright. The st...	But in spite of that it was fun, I liked it	1437955200	NaN	NaN	
2	3.0	True	02 23, 2015	A1YJWEXHQBWK2B	0700026657	Vincent G. Mezera	ok game.	Three Stars	1424649600	NaN	NaN	
3	2.0	True	02 20, 2015	A2204E1TH211HT	0700026657	Grandma KR	found the game a bit too complicated, not what...	Two Stars	1424390400	NaN	NaN	
4	5.0	True	12 25, 2014	A2RF5B5H74JLPE	0700026657	jon	great game, I love it and have played it since...	love this game	1419465600	NaN	NaN	

Fig. 3. A random sample of reviews

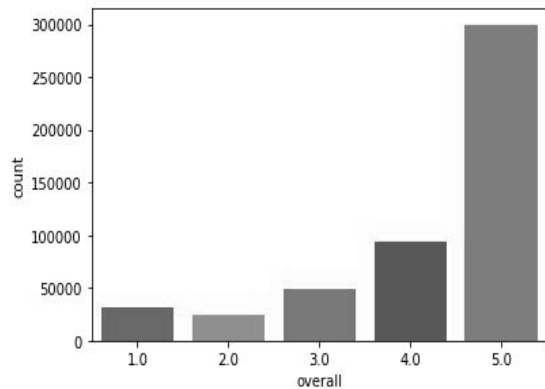


Fig. 4. A random sample of reviews

*Under sampling of Reviews*

Select 1500 reviews with a rating of 1, 500-500-500 reviews with ratings of 2, 3, 4, and 1500 reviews with

a rating of 5 to create a random sample as shown in figure 5. In this manner, you will have a more manageable and well-rounded corpus for Milestones 2-4.

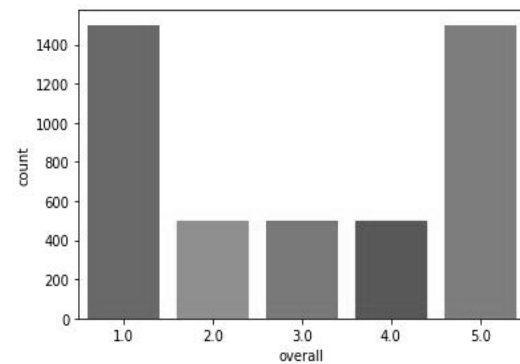


Fig. 5. Under sampling of Reviews

*Creating a Dictionary-based Sentiment Analyzer*

The small\_corpus.csv file produced in the "creating\_dataset" milestone is loading as shown in fig. 6.

*Tokenizing the reviews' words and sentences*

We are going to test various word tokenizer iterations on reviews here as shown in fig.7. Next, we will determine which casual tokenizer would be most appropriate to utilize as shown in fig.8.

id	overall	verified	reviewTime	reviewerID	asin	reviewerName	reviewText	summary	unixReviewTime	vote	styl
0	1.0	True	11 30, 2015	A3AC92K59QLYR8	B00503E852	ben	Game freezes over and over its unplayable	it just doesn't work	1448841600	NaN	{Format: 'Vide Game
1	1.0	False	05 19, 2012	A334LHR8DWARY8	B00178630A	Xenocide	I have no problem with needing to be online to...	The only real way to show Blizzard our feeling...	1337385600	23	{Format: Compute Game
2	1.0	True	10 19, 2014	A28982ODE7ZGVP	B001AWiP7M	Eric Frykberg	NOT GOOD	One Star	1413676800	NaN	{Format: 'Vide Game
3	1.0	True	09 6, 2015	A19E85RLQCAMI1	B00NASF4MS	Joe	Really not worth the money to buy this game on...	Really not worth the money to buy this game on...	1441497600	2	{Format: 'Vide Game
4	1.0	False	05 28, 2008	AEMQKS13WC4D2	B00140P9BA	Craig	They need to eliminate the Securom. I purchase...	Securom can ruin a great game	1211932800	55	{Format: 'DVD ROM

Fig. 6. Small\_corpus.csv file

	reviewText	tb_tokens
2355	First of all I would like to say this game is not nearly as difficult as many people claim. It is very unforgiving of mistakes, but most of the "trash" mobs are harder than the bosses.. Many areas/fights you just will die unless you read a guide or a player left a hint beforehand, because there is no other way to know how you need to prepare. The fights are fun, and normally being hit more than once without healing up means you die, but really once you figure out (or look up) what you need to do for the fight it is extremely easy. When people talk about how brutal it is all they really mean is having to fight your way back to the souls you lost or losing them forever if you die again.. not challenging, just unforgiving.\n\nThe tendency system is extremely annoying. To gain pure white character tendency you need to kill black phantoms. To kill black phantoms (other than players) you need pure black world tendency in that area. For that you need to kill yourself several times in body form (and resurrecting with a stone to kill your body again.) The most frustrating part of all this is if you log in the game while online it resets your world tendency, and can reset it randomly while your playing online.. Pure black is a bit easier, just need to kill some friendly npcs. Its like watching paint dry.. why people love doing this is beyond me.\n\nThere is also an area where you literally trudge around in water picking up loot with very little fighting at like 50% reduced walk speed and chug poison dispels since the water randomly poisons you for several hours.. seriously? Granted you can skip the loot and get through it all in under an hour.. but why have an area like that at all?	[first, of, all, i, would, like, to, say, this, game, is, not, nearly, as, difficult, as, many, people, claim, it, is, very, unforgiving, of, mistakes, but, most, of, the, trash, mobs, are, harder, than, the, bosses, many, areasfights, you, just, will, die, unless, you, read, a, guide, or, a, player, left, a, hint, beforehand, because, there, is, no, other, way, to, know, how, you, need, to, prepare, the, fights, are, fun, and, normally, being, hit, more, than, once, without, healing, up, means, you, die, but, really, once, you, figure, out, or, look, up, what, you, need, to, do, for, the, ...]
3269	awesome!	[awesome]
4006	I would recommend buying this It was just as advertised. Also it came on the time and day that I was told it would come	[i, would, recommend, buying, this, it, was, just, as, advertised, also, it, came, on, the, time, and, day, that, i, was, told, it, would, come]

Fig. 7. Tokenizer iterations on reviews

Casual Tokenizer

	reviewText	casual_tokens	tb_tokens
3430	Beautiful! Create a new look. Excellent. Nice quality. Recommended.	[beautiful, create, a, new, look, excellent, nice, quality, recommended]	[beautiful, create, a, new, look, excellent, nice, quality, recommended]
1813	It was only three chapters in when the game froze during a cut scene and began a high pitched scream for about 30 seconds and then went on like normal. Every cut scene the game decided I didn't want to be holding the weapon I was holding and replaced it with a pistol. Why on earth would I drop a shotgun full of ammo for a pistol with half a clip? Who knows? This isn't the worst game I've ever played and the cut scenes can be enjoyable when they don't look like crap. I would only suggest this to people who enjoy tedious shoot outs, hard boiled detective stories, and don't mind a flawed game. If you can forgive all that's wrong with this game... it might be fun. I for one can't.	[it, was, only, three, chapters, in, when, the, game, froze, during, a, cut, scene, and, began, a, high, pitched, scream, for, about, 30, seconds, and, then, went, on, like, normal, every, cut, scene, the, game, decided, i, didnt, want, to, be, holding, the, weapon, i, was, holding, and, replaced, it, with, a, pistol, why, on, earth, would, i, drop, a, shotgun, full, of, ammo, for, a, pistol, with, half, a, clip, who, knows, this, isnt, the, worst, game, ive, ever, played, and, the, cut, scenes, can, be, enjoyable, when, they, dont, look, like, crap, i, would, only, suggest, this, to, ...]	[it, was, only, three, chapters, in, when, the, game, froze, during, a, cut, scene, and, began, a, high, pitched, scream, for, about, 30, seconds, and, then, went, on, like, normal, every, cut, scene, the, game, decided, i, didnt, want, to, be, holding, the, weapon, i, was, holding, and, replaced, it, with, a, pistol, why, on, earth, would, i, drop, a, shotgun, full, of, ammo, for, a, pistol, with, half, a, clip, who, knows, this, isnt, the, worst, game, ive, ever, played, and, the, cut, scenes, can, be, enjoyable, when, they, dont, look, like, crap, i, would, only, suggest, this, to, ...]
	I have loved every Blizzard game but this one looks to be their first BIG flop. I guess it had to happen sooner or later. They must have gotten to big and are getting dragged down by to many cooks and kitchen(Bad management that used to be great talent but now camp and only bog down the real creatives). It is obvious that dragging out release dates is no longer for a high quality products and is just to	[i, have, loved, every, blizzard, game, but, this, one, looks, to, be, their, first, big, flop, i, guess, it,	[i, have, loved, every, blizzard, game, but, this, one, looks, to, be, their, first, big, flop, i, guess, it,

Fig. 8. Casual Tokenizer

VII. CONCLUSION

In conclusion, sentiment analysis (SA) combined with natural language processing (NLP) is an effective marketing tool, mainly when applied to a growth hacking plan for a new video game firm. Companies can get profound insights into preferences, feedback, and developing trends by leveraging the capabilities of NLP and SA to analyze client sentiments represented through textual data. The importance of a Natural Language Processing (NLP) expert in the Growth Hacking Team of a fledgling company is highlighted in this research. These technologies aim to improve customer experience, engagement, and marketing tactics, ultimately increasing campaigns' overall efficacy and comprehension of customer feelings. The growth hacking team's strategic goal is to help the startup develop quickly and explosively. The methods discussed here will help the team reach this goal by cheaply reaching many clients. Through an extensive market mapping of video games, the team aims to ascertain consumer assessments of rival products, pinpointing preferred attributes and areas of discontent. With this information, the marketing team can more effectively communicate the benefits of their

video game to prospective players, making their message more memorable and captivating. To put it succinctly, incorporating NLP and SA into marketing tactics improves comprehension and triggers strategic choices, leading to a better-informed, more adaptable, and ultimately effective strategy in the fiercely competitive video game market.

REFERENCES

- [1] Ahmad, S. N., & Laroche, M. Extracting marketing information from product reviews: a comparative study of latent semantic analysis and probabilistic latent semantic analysis. *Journal of Marketing Analytics*, 1-15, 2023.
- [2] Anoop, V. S., Thekkiniath, J., & Govindarajan, U. H. Cases Using Natural Language Processing. In *Multi-disciplinary Trends in Artificial Intelligence: 16th International Conference, MIWAI 2023, Hyderabad, India, July 21–22, 2023, Proceedings (Vol. 14078, p. 147)*. Springer Nature.
- [3] Arazzi, M., Ferretti, M., Nicolazzo, S., & Nocera, A. The role of social media on the evolution of companies: A Twitter analysis of Streaming



- Service Providers. *Online Social Networks and Media*, 36, 100251, 2023
- [4] Chath, H. R., & Chhatrala, B. K.. Sentiment Analysis of Online Product Reviews Using Modified Deep Learning Model. Amirifar, T., Lahmiri, S., & Zanjani, M. K.. An NLP-Deep Learning Approach for Product Rating Prediction Based on Online Reviews and Product Features. *IEEE Transactions on Computational Social Systems.*, 2023.
- [5] Ermakova, T., Fabian, B., Golimblevskaia, E., & Henke, M. A Comparison of Commercial Sentiment Analysis Services. *SN Computer Science*, 4(5), 477, 2023.
- [6] Gómez-Pérez, J. M., García-Silva, A., Berrio, C., Rigau, G., Soroa, A., Lieske, C., ... & Lynn, T. Deep Dive Text Analytics and Natural Language Understanding. In *European Language Equality: A Strategic Agenda for Digital Language Equality* (pp. 313-336). Cham: Springer International Publishing, 2023.
- [7] Hartmann, J., Heitmann, M., Siebert, C., & Schamp, C. More than a feeling: Accuracy and application of sentiment analysis. *International Journal of Research in Marketing*, 40(1), 75-87, 2023
- [8] Hartmann, J., & Netzer, O. Natural language processing in marketing. In *Artificial Intelligence in Marketing* (Vol. 20, pp. 191-215). Emerald Publishing Limited, 2023
- [9] Huang, H., Asemi, A., & Mustafa, M. B. Sentiment Analysis in E-Commerce Platforms: A Review of Current Techniques and Future Directions. *IEEE Access*, 2023
- [10] Jain, R., Kumar, A., Nayyar, A., Dewan, K., Garg, R., Raman, S., & Ganguly, S. Explaining sentiment analysis results on social media texts through visualization. *Multimedia Tools and Applications*, 1-17, 2023
- [11] Kamal, M., & Himel, A. S. Redefining Modern Marketing: An Analysis of AI and NLP's Influence on Consumer Engagement, Strategy, and Beyond. *Eigenpub Review of Science and Technology*, 7(1), 203-223, 2023.
- [12] Kusal, S., Patil, S., Choudrie, J., Kotecha, K., Vora, D., & Pappas, I. A systematic review of applications of natural language processing and future challenges with special emphasis in text-based emotion detection. *Artificial Intelligence Review*, 1-87, 2023.
- [13] Mandal, R., Chen, J., Becken, S., & Stantic, B. Tweets topic classification and sentiment analysis based on transformer-based language models. *Vietnam Journal of Computer Science*, 10(02), 117-134, 2023
- [14] Nguyen, A., Longa, A., Luca, M., Kaul, J., & Lopez, G. Emotion analysis using multilayered networks for graphical representation of tweets. *IEEE Access*, 10, 99467-99478. 2023.
- [15] Qian, C., Mathur, N., Zakaria, N. H., Arora, R., Gupta, V., & Ali, M. Understanding public opinions on social media for financial sentiment analysis using AI-based techniques. *Information Processing & Management*, 59(6), 103098, 2022.
- [16] Radha, p., & bhuvaneswari, n. S. Optimizing sentiment analysis of amazon product reviews using a sophisticated fish swarm optimization-guided radial basis function neural network (sfso-rbfn). *Journal of Theoretical and Applied Information Technology*, 101(11), 2023
- [17] Sampathiraosuneetha, p., & row, s. V. Aspect-based sentiment analysis: a comprehensive survey of techniques and applications. *Journal of data acquisition and processing*, 38(3), 177. 2023
- [18] Spada, I., Barandoni, S., Giordano, V., Chiarello, F., Fantoni, G., & Martini, A. WHAT USERS WANT: A NATURAL LANGUAGE PROCESSING APPROACH TO DISCOVER USERS'NEEDS FROM ONLINE REVIEWS. *Proceedings of the Design Society*, 3, 3879-3888, 2023
- [19] Sumathi, K., & Santharam, K.. Sentiment Analysis on Feedback Data of E-commerce Products Based on NLP. In *Inventive Systems and Control: Proceedings of ICISC 2023* (pp. 387-401), 2023. Singapore: Springer Nature Singapore.
- [20] Tunca, S., Sezen, B., & Wilk, V. An exploratory content and sentiment analysis of the guardian metaverse articles using leximancer and natural language processing. *Journal of Big Data*, 10(1), 82, 2023.
- [21] Tyagi, N., & Bhushan, B. Demystifying the Role of Natural Language Processing (NLP) in Smart City Applications: Background, Motivation, Recent Advances, and Future Research

Directions. *Wireless Personal Communications*, 130(2), 857-908, 2023

- [22] Vollero, A., Sardanelli, D., & Siano, A. Exploring the role of the Amazon effect on customer expectations: An analysis of user-generated content in consumer electronics retailing. *Journal of Consumer Behaviour*, 22(5), 1062-1073, 2023
- [23] Wankhade, M., Rao, A. C. S., & Kulkarni, C. A survey on sentiment analysis methods, applications, and challenges. *Artificial Intelligence Review*, 55(7), 5731-5780, 2022.
- [24] Worth, P. J. Word embeddings and semantic spaces in natural language processing. *International Journal of Intelligence Science*, 13(1), 1-21, 2023.