International Journal of
INTELLIGENT SYSTEMS AND APPLICATIONS IN ENGINEERING
ISSN:2147-6799 www.ijisae.org Original Research Paper

Analysis of Nigeria's Top Ten Song Lyrics Using Natural Language Processing Techniques

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Submitted:14/03/2024 **Revised**: 29/04/2024 **Accepted**: 06/05/2024

Abstract: The inclusion of lyrics in music enhances its depth and significance by providing a medium for songwriters to express their thoughts, emotions, and experiences. This study aims to analyze the lyrical content of the top 10 Nigerian songs on Spotify using natural language processing techniques. Music consumption platforms such as Spotify play a pivotal role in shaping musical preferences and cultural influences. As the Nigerian music industry continues to thrive, understanding the lyrical content of the top 10 songs on platforms such as Spotify becomes essential. This study examines the top 10 songs Nigerian weekly music chart on November 1 2023 to ensure that the analysis is relevant and reflective of current trends in contemporary music. By exploring the linguistic richness, cultural nuances, and emotional expressions embedded in the lyrics, this study seeks to provide an insightful understanding of how Nigerian music is evolving on a global streaming platform. The methodology involves systematic data collection, thorough text preprocessing, and the use of natural language processing (NLP) tools. Most songs showcased a positive sentiment, focusing on themes such as celebration, joy, and empowerment. Love and optimism were also prominent elements of the lyrical content. Sample generated lyrics that resemble the style of the song were presented.

Keywords: *LDA techniques, Lyrics, Music, Natural language processing, Sentiment analysis*

1. Introduction

Music and song are products that reflect the cultural context in which they originate. Songs serve various social purposes and offer valuable insights into society's values [1]. The inclusion of lyrics in music enhances its depth and significance by providing a medium for songwriters to express their thoughts, emotions, and experiences. The lyrical content of music plays a significant role in storytelling. It enables artists to convey narratives and evoke imagery through their words, allowing for a deeper connection with the audience [2]. Through carefully crafted words that form a narrative, listeners can connect with the deeper themes explored within the songs. These lyrical compositions tackle subjects ranging from love and heartbreak to social issues and personal development.

Natural language processing (NLP) is a discipline in computer science and artificial intelligence that focuses on the examination and comprehension of human language [3]. It encompasses the creation of algorithms and models that empower computers to process, interpret, and generate data written or spoken in a natural language format [4]. The field of natural language processing has garnered significant interest because of its ability to computationally represent and analyze human language. Its applications span various domains, including machine translation, email spam detection, information extraction, summarization, medical research, and question-answering systems [4].

Natural Language Processing (NLP) is a multifaceted field of artificial intelligence that focuses on the interaction between computers and human language, aiming to enable machines to understand and interpret human language meaningfully [5].

Interestingly, the application of NLP to song lyrics extends to the detection of emotional charge and themes, as demonstrated by the use of sentiment analysis tools like VADER, which has been adapted for Ukrainian lyrics [6]. This study showcases the adaptability of NLP methods across different languages and the potential for exploring the lexical richness of artists from various genres. Moreover, NLP's ability to process and analyze human discourse computationally has led to its application in diverse fields, including sentiment analysis, language translation, and text extraction, which are also relevant to the domain of music lyrics analysis [7].

Bringing it all together, NLP is a powerful tool for analyzing song lyrics, providing insights into the emotional and thematic content of music. Its applications in this area are part of a broader trend of employing NLP in various

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domains, reflecting the field's versatility and growing interest in computational representation and analysis of human language [5], [7]. As NLP continues to evolve, its role in music information retrieval and the understanding of lyrical content is likely to expand, offering new perspectives on the intersection of language and music.

The Nigerian music industry has a rich historical tapestry that extends from pre-colonial times to the contemporary era, marked by a variety of music genres and significant cultural and economic impacts. Gani's work outlines the evolution of the industry, highlighting the traditional roles within the music sector and the rise Afro-Pop, also known as Afrobeats, which has achieved international acclaim in the 21st century [8]. The industry not only plays a pivotal cultural role but also contributes to the Nigerian economy by providing employment and fostering professional music groups, as evidenced by the case study of Remdel Music and Video Mart [9].

Contradictions and interesting facts emerge when considering regulatory challenges and the role of women in the industry. While the industry is a driver of the economy, it faces issues with copyright enforcement and contractual difficulties, particularly for new artists [10]. Regulatory bodies are tasked with ensuring that music content aligns with cultural and legal norms; however, there is concern over the release of music that may not be culturally appropriate [11]. Despite the male-dominated nature of the industry, female musicians have carved out a niche with genres like Waka music, offering insights into feminist struggles and the role of women in postcolonial Nigeria [12].

Bringing it all together, the Nigerian music industry is a dynamic and multifaceted sector with deep historical roots and a significant impact on both local and global stages. It is characterized by a blend of traditional and modern elements, economic significance, regulatory challenges, and the unique contributions of female artists. The industry's evolution and current state reflect the complex interplay of culture, economics, and legal frameworks within Nigeria.

The study's findings on the top 10 Nigerian song lyrics offer value and practical application for researchers, artists, industry professionals, and cultural organizations. For researchers, this study provides a valuable case example that has relevance for further research and academic endeavors. Artists can gain from adapting their work to match audience preferences and shaping the development of artistic expression within the country's music industry. Music industry professionals can use these findings to make informed decisions by understanding the linguistic patterns and cultural elements that connect with audiences when organizing, promoting, and distributing Nigerian music on digital platforms.

The objective of this study is to analyze the lyrical content of Nigeria's top ten songs on Spotify using natural language processing (NLP) techniques by implementing sentiment analysis techniques to discern the emotional tone conveyed in lyrics within the Nigerian music scene; and Assessing the potential impact of lyrical content on audience engagement and the overall influence of Nigerian music on global platforms such as Spotify.

In the context of contemporary music consumption, platforms such as Spotify play a pivotal role in shaping musical preferences and cultural influences. As the Nigerian music industry continues to thrive, understanding the lyrical content of the top 10 songs on platforms such as Spotify becomes essential. Past research has delved into the impact of music streaming services, but there remains a notable gap in understanding the specific linguistic and cultural nuances embedded in the lyrics of Nigeria's top ten song on spotify. Unlike previous studies that have primarily focused on broader trends in music consumption and streaming habits, this study endeavors to fill a critical void by applying natural language processing (NLP) techniques to analyze the lyrical content of the current Nigeria's top ten song on Spotify. This study leverages NLP techniques to analyze and gain insights from the lyrics of the Nigeria's top ten song on Spotify.

1.1. Abbreviations and Acronyms

CSV - Comma-Separated Value

DTM - Document-Term Matrix

IDF - Inverse-document frequency

LDA - Latent Dirichlet Allocation

NPL - Natural Language Processing

TF-IDF - Term-frequency/inverse-document frequency

2. Literature Review

The literature in this section showcases the application of natural language processing techniques for analyzing song lyrics.

Explicit Content Detection in Music Lyrics Using Machine Learning [5]. This study examines the application of machine learning techniques to automatically detect explicit lyrics in songs, with a specific emphasis on Korean lyrics. The authors seek to develop a machine learning model that can automatically identify songs with explicit content using labeled datasets from the music screening result list. Their objective was to assess the effectiveness of this model compared with filtering methods that rely on profanity dictionaries.

The researchers used the "song screening result list" provided by the South Korean Broadcasting System, which classifies songs as either pass or fail. The lyrics were then converted into a vocabulary size vector. Various methods of

comparison were employed for this analysis, including term frequency vectors, Inverse Document Frequency (IDF) vectors and selective parts of speech tagging. In addition, two widely recognized classification algorithms, Bagging and AdaBoost, were utilized in this study.

The Bagging model, which incorporates selective parts of speech tagging and the IDF vector, performs better than other models, including the profanity dictionary filtering method. The F1 score for failed songs is 100% higher in this model than in methods that use the Profanity Dictionary. However, the recall rate for failed songs was lower than that at baseline because of limited training data for failures.

Mood Classification with Lyrics and ConvNets [6]

Objective: The objective of this study is to utilize machine learning and deep learning techniques to categorize the mood of music based on its lyrics. The study operates under the belief that lyrics contain valuable linguistic information that can be used to deduce the mood of a song.

Methodology: The researchers developed various models utilizing different approaches including TF-IDF based classification, Word2Vec, Doc2Vec, and Convolutional Neural Networks. These models were trained on a dataset of lyrics extracted from the Million Song Dataset using the LyricWikia API. Mood labels were assigned to the songs based on psychological mood theories. The performance of these models was then compared.

Result: The accuracy results varied across different methods. The TF-IDF method achieved an accuracy of 66.85%, Word2Vec showed a slightly lower accuracy of 60.11%, and Doc2Vec performed slightly better with an accuracy of 61.14%. Deep learning models, such as the Bi-Directional LSTM model, yielded the highest accuracy at 69.01%, while the standard CRNN model achieved an accuracy of 67.04%. Notably, the CNN model outperformed all other approaches with an impressive accuracy rate of 71%. Based on these findings, it can be concluded that lyrics serve as valuable information for accurately classifying music mood. Specifically, CNN-based models trained on lyrics datasets demonstrate superior performance in music mood classification compared to other methods tested in this study.

Automatic Detection of Mispronounced Lyrics in Singing [7].

Objective: This project creates a system that can accurately detect mispronounced lyrics in singing performances.

Methodology: This study proposes a method for enhancing a speech utterance verification system by considering the elongation of vowels in singing. A duration model is introduced in acoustic modeling to accommodate the varying lengths of vowels in singing. The system uses statistical hypothesis testing to compare the probabilities of two hypotheses: one in which the pronounced lyrics match the specified ones and another in which they do not. Vowels are modeled using multiple states duplicated from two to five states to account for variations in vowel length during singing performances. Each state is empirically duplicated four times for improved accuracy.

Results: To evaluate the performance of their system, the researchers conducted experiments using two databases: TCC-300 and DB-S. The DB-S database included various simulated scenarios with mispronounced lyrics, such as wrong lyrics, reversed order, missing lyrics, and incorrect repetition. The evaluation of the system showed an equal error rate of 11.3%, which was significantly better than that of the baseline detection system. This improvement was particularly notable in cases where lyrics were missing or in the wrong order. Overall, this study concluded that the developed system effectively enhances the detection of mispronounced lyrics in singing and demonstrates the feasibility of examining pronunciation in sung lyrics.

A Cross-cultural Comparison of Song Lyrics Using NLP Techniques [1].

This study examines disparities in topic, pronoun usage, lexical diversity, and sentiment between song lyrics from small-scale and large-scale societies.

Methodology: A range of natural language processing techniques were employed to analyze and compare the content of song lyrics across different datasets. These methods. These methodologies included Sentiment Analysis, Part-of-Speech Tagging, Type-Token Ratios, Word Embedding, Word2vec, Term-frequency/inverse-document frequency (TF-IDF) Clustering, Word Set Enrichment Analysis, and other analysis methods, such as calculating the nominal p-value and controlling the False Discovery Rate, to statistically evaluate the significance of the results.

Result: The results indicate that notable differences are observed in the song lyrics based on their originating society's scale.

Natural Language Processing for Music Information Retrieval: Deep Analysis of Lyrics Structure and Content [8]

This study focuses on NLP methods for analyzing lyrics' structure, content, and perception, including tasks such as structural segmentation, summarization, explicit content detection, and emotion recognition.

Mood classification from Song Lyric using Machine Learning [9]

This study uses natural language processing techniques to classify the mood of songs based on their lyrics. This study analyzes song extraction using NLP methods such as data cleaning, Term-frequency/inverse-document frequency,

and latent Dirichlet allocation to connect words with specific mood categories. Several machine learning classifiers, including Random Forest, Decision Tree, Naïve Bayes, Logistic Regression, AdaBoost, and XGBoost, were employed for lyric-based mood classification. After tuning the parameters through grid search, XGBoost achieved the highest accuracy among all classifiers used in this study.

Development of the Artwork using Music Visualization based on Sentiment Analysis of Lyrics [10], explores sentiment analysis of lyrics for creating artwork, linking sentiment analysis results with visual arts to produce moving-image works. Overall, these papers highlight the potential of NLP in analyzing and understanding song lyrics for various purposes, including cross-cultural comparison, music information retrieval, mood classification, and artistic expression.

Mood classification from Song Lyric using Machine Learning [11]

Objective: This research aims to develop a machine learning method for classifying the emotional tone of songs based on their lyrics. This study addresses the need for a more nuanced categorization of songs, moving beyond traditional factors such as genre, artist, or album, and focusing instead on the mood that is often expressed through lyrics.

Methodology: The researchers used natural language processing techniques to analyze song lyrics, focusing on mood classification. They employed machine learning algorithms to classify the lyrics into different mood categories, including Happy, Sad, Angry, and Relaxed. The preprocessing steps involved removing special characters from the lyrics and using a term-frequency/inverse-document frequency approach to evaluate words. The team also implemented Latent Dirichlet Allocation to establish connections between words and mood classes. To achieve optimal results, they applied various machine learning techniques such as Random Forest, Decision Tree, Naïve Bayes Logistic Regression AdaBoost, and XGBoost classifier methods while tuning their parameters through grid search optimization.

Results: The findings of the study revealed that the XGBoost algorithm achieved the highest accuracy rate of 89.19%, outperforming both Random Forest (81.01% accuracy) and AdaBoost (63.68% accuracy). These results indicate that boosting algorithms are more effective than local machine learning algorithms in predicting mood based on song lyrics.

“More Than Words”: Linking Music Preferences And Moral Values Through Lyrics [12].

Objective: This study examined the relationship between music preferences, specifically lyrics, and individuals’ moral values.

Methodology: This study employed various methods, including lyrics processing techniques and user demographic analysis. They used Topic Modeling to categorize songs into topics such as Romantic, Obscene, World/Time/Life, and Death/Fear/Violence. The authors also assessed moral narratives using the Moral-Strength lexicon and conducted sentiment and emotion analyses using the VADER model and the NRC Word-Emotion Association Lexicon. Multiple experiments were performed that incorporated different sets of features, such as sentiment, emotion, moral valence, age/gender data from users, and artist likes/popularity. Prediction models were developed using multivariate regression methodology to analyze this complex combination of factors.

Results: The study showed that individuals who prioritize individual rights and well-being tend to prefer songs with themes of anticipation and trust. Conversely, those who prioritize societal order and group values lean toward romantic themes in songs while disliking those with negative sentiments. The analysis of song lyrics revealed that it is possible to make reliable predictions about moral foundations based on extracted features, with a higher accuracy for binding foundations. Furthermore, positive emotions expressed in lyrics can effectively predict care and fairness, whereas negative sentiments are better predictors of loyalty, authority, and purity. The popularity sensitivity of listeners was also found to be indicative of their moral beliefs, potentially reflecting a preference for prioritizing group-focus over self-focus in their worldview.

3. Methodology

3.1. Data Collection

Data for the Top 10 Songs from Nigeria were gathered from Spotify [13], a digital music service, to serve as the basis for testing NLP models. The most popular track of the week’s Top 10 songs was manually collected from the website and included information such as song titles, artists, and duration. Table 1 shows the top 10 songs in Nigeria (Spotify). In addition, the lyrics of each song were manually obtained from the reputable lyric website tooxclusive.com [14]. All data were stored in a Comma-Separated Value (CSV) file with fields including title, artist, and lyrics. The duration of the song was added later during data preprocessing.

Table 1. Top 10 songs Nigeria - Spotify sample dataset

Artists	*Title*	*Lyrics*
Asake	Lonely at the top	It's lonely at the top (Lonely, lonely, lonely) Money on my mind (Money, money, money) Don't care what they yearning about me in particular…
Burna Boy	City Boys	Ayo, I'm not even gonna lie, I used to call myself a ugly yout, but I'm not even a ugly yout..
Caryon, Ayra starr	Ngozi	Cray way Verse 1 You gimme light, bi ti solar Can feel your love taking over On a good day, I be loner…

3.2. Data Cleaning

Clean and preprocess the collected lyrics using the following python libraries re; for regular expressions. Tasks include removing irrelevant information, handling special characters, converting text to lowercase, removing punctuation, removing numerical values, splitting text into smaller pieces, in this case words (tokenization), and removing words that have very little meaning (stop words). Perform language-specific preprocessing steps to address nuances in lyrics Fig. 1 shows the data in the preprocessing stage.

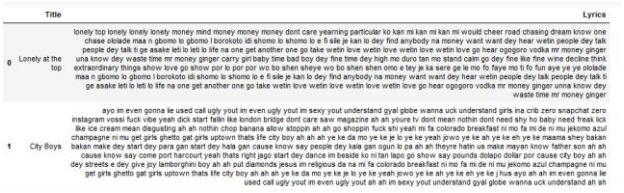

Fig .1 Data in preprocessing phase

3.3. Organizing the Data

The processed data were structured into two formats: a corpus, which is a collection of neatly compiled texts as shown in Fig. 2, and a Document-Term Matrix (DTM) that represents the frequency counts of words in matrix form making it easy for a machine to read using scikit-learn's CountVectorizeras as shown in Fig. 3 The given dataset consists of multiple documents (in this case, song lyrics) where each row represents a different document and each column represents a unique term (typically words but can also be bi-grams such as 'thank you'). The values in the table indicate the frequency of occurrence for each word.

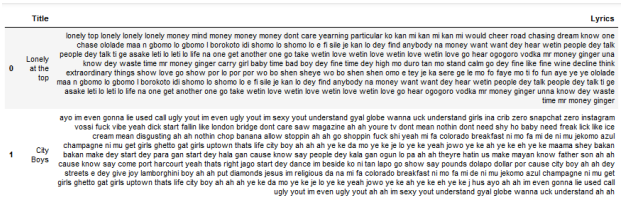

Fig .2 Corpus

	aah	abi	abiyou	address	advice	afrobeat	againoya	agenda	ah
0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	28
2	0	1	0	0	0	0	0	0	0
3	0	0	0	0	1	0	0	0	0
4	0	0	0	0	0	0	2	0	0
5	4	0	0	0	0	0	0	0	17
6	0	1	1	0	0	0	0	0	0
7	0	0	0	0	0	1	0	1	12
8	0	0	0	1	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0

10 rows × 704 columns

Fig .3 Document-Term Matrix

3.4. Exploratory Data Analysis (EDA)

To better understand the dataset, an exploratory analysis was performed using visual methods, including finding common words shown in Fig. 4 and creating word clouds using wordcloud python library presented in Fig. 5, the size of vocabulary, number of unique words and words per minutes visualized using matplotlib, and the amount of time the lyrics talk about an individual (male and female) shown in Table 2.

```
0
lo, dey, money, wetin, love, kan, gbomo, leti, people, na, talk, hear, ginger, want
---
1
ah, ke, ye, im, ni, dey, yout, girls, yeah, start, mu, understand, ugly, mo
---
2
oh, wah, youre, nla, kitana, killing, wa, dey, jeka, idi, scatter, biza, referee, nsala
---
3
dey, know, blood, hit, wanna, shoot, dance, cock, cause, normally, bring, door, dont, floor
---
4
wan, dey, right, oh, wey, talk, wins, dndi, shey, gleayy, bi, waka, inside, collect
---
5
loving, ah, dont, body, leave, say, baby, love, yeah, mean, greedy, im, girl, fi
---
6
killy, whats, iye, carry, fit, say, talk, make, know, dey, bum, sef, need, yansh
---
7
pepper, dey, ah, nah, nahah, omo, ja, im, yeah, money, nla, criminal, smooth, whine
---
8
dey, say, make, leave, everybody, better, eye, una, red, low, sheet, trouble, wey, pass
---
9
line, dey, pepperline, order, oscroh, know, day, born, na, say, let, make, boy, king
---
```

Fig .4 Sample of top 15 words used in each lyrics

Fig .5 Word Could of each lyrics

The largest and most prominently displayed words in the word clouds are likely to represent central themes presented in the lyrics. It is important to acknowledge that the frequency of words reflects their usage and expression rather than just their semantic meaning as shown in fig. 5.

3.4.1. Number of Unique words

The number of unique words quantifies the lexical diversity of a set of song lyrics, measuring the extent to which different words are used. A higher value indicates greater linguistic richness and diverse vocabulary within the lyrics. This suggests that the artist is using a wide array of language to communicate their message or narrate a story, as shown in Fig. 6.

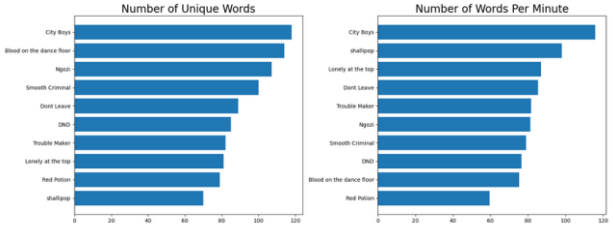

Fig .5 Number of unique words and Number of word per minute.

Table 2. Number of times the lyrics reference male and female

Song Lyrics	*Female*	*Male*
0	2	5
1	6	4
2	9	0
3	0	0
4	0	0
5	11	0
6	0	0
7	4	0
8	0	1
9	2	8

3.4.2. Techniques

1. Sentiment Analysis

Sentiment analysis was performed on the lyrics to determine the emotional tone using the TextBlob Python library, which is built on top of the Natural Language Toolkit (nltk). This process assesses the polarity of the sentiment by categorizing the lyrics into positive, negative, or neutral sentiments. By evaluating these sentiments, the analysis provides deeper insights into the emotional context expressed in the lyrics of the songs. This method allows researchers to understand the underlying feelings conveyed by the artists, offering a nuanced perspective on the themes and messages within the music. Additionally, it helps in identifying trends and patterns in lyrical content over time.

2. Sentiment Labels

Each word in a corpus is assigned polarity and subjectivity labels. The sentiment score of a corpus is determined as the average of these labels. Polarity signifies the degree of positivity or negativity associated with a word, where -1 represents strong negativity and +1 indicates strong positivity. Subjectivity refers to how subjective or opinionated a word is, with 0 denoting factual information and +1 representing highly opinionated content Fig. 8 presents the polarity of the top 10 songs lyrics.

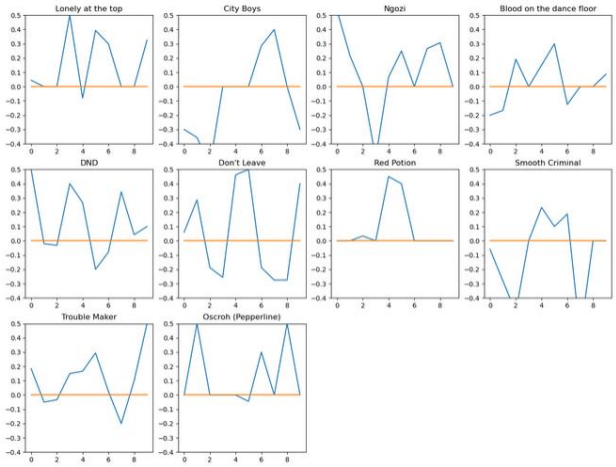

Fig .7 Polarity of the top 10 song lyrics

3. Topic Modeling

To identify different themes and topics present in the lyrics, topic modeling algorithms Latent Dirichlet Allocation was used. This approach helps uncover the underlying subjects or trends that connect with listeners. The cleaned data sample was subjected to LDA with 4 topics, producing the output displayed in Fig. 9.

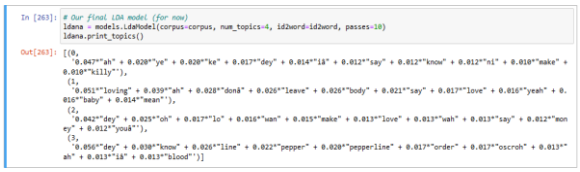

Fig .8 Topic Modelling

4. Lyrics generation using Makov chain

Markov chains was used for basic text generation, which operates on the assumption that the subsequent word depends solely on the preceding one. The first step involves selecting specific text to emulate to generate content that resembles the style of a song's lyrics. Following this is the

creation of a Markov chain function to establish a dictionary and then the development of a function that generates sentences (lyrics). This process requires two inputs: the previously created dictionary and the desired number of words for generation. Each key within the corpus should encompass all words, with the corresponding values being lists of words following these keys

4. Results and Discussion

4.1. Topic Modelling Using Latent Dirichlet Allocation

Table 3. Topics Each Song Contains

Topic 1	*Topic 2*	*Topic 3*	*Topic 4*
Girls, Women	Love	Action,Kill	Time, Money

Topic 1 (Gender Representation): This topic centers around female identity, as evidenced by a high frequency of terms like “girls” and “women” Topic 2 Love and Romance: Love emerges as a prominent theme, as indicated by words like “love” throughout the corpus. Topic 3 (Action and Violence): The co-occurrence of “action” and “kill” suggests themes of violence or fast-paced narratives. Topic 4 (Materialistic Themes): “Time” and “money” co-occurring as topic points towards themes of materialism or social commentary.

4.2. Sentiment analysis

The sentiment analysis conducted on the top 10 Nigerian songs on Spotify revealed a fascinating tapestry of emotions woven into their lyrics. The dominant thread running through most of the songs was a vibrant tapestry of positivity, pulsating with themes of celebration, joy, and empowerment. This resonated with a sense of national pride and the resilience of the Nigerian spirit. Love emerged as another prominent theme, adding a layer of tenderness and emotional connection. This optimistic outlook, coupled with the focus on love, created an overall feel-good vibe in the lyrical content, likely resonating with listeners seeking an uplifting mood.

However, the analysis also revealed a fascinating nuance in some songs. These tracks explored a more complex emotional landscape, where positive and negative sentiments intertwined. Topic modelling could be a valuable tool for deeper investigation. This complexity reflects the realities of life, where joy and perseverance often co-exist. By examining the interplay of positive and negative emotions, we gain a richer understanding of the artist’s message and the depth of human experience reflected in Nigerian music.

4.3. Lyrics Generation

Using the Markov Chains lyrics that were generated, the first 10 words from the song “City Boy” were used as samples. The sample generated lyrics that resemble the style of the song City Boy are presented in Fig. 9, as shown below.

```
generate_sentence(city_boy_dict)

'Pounds dolapo dollar por cause know say people dey para gan cause city boy ah cause know father son ah ah put diamonds je
sus im even ugly yout understand gyal globe wanna uck understand ah ah ah im even ugly yout im even gonna lie used call ug
ly yout ah ah ah ah ah ah im religious da mo ye ke eh ye ke yeah dick start dey dance im even gonna lie used call ugly you
t im even gonna lie used call ugly yout ah ah ah ah ah ah ah ah nothin chop banana allow stoppin ah ah.'
```

Fig .9 Sample Generated Lyrics

5. Conclusion

This study analysed the lyrical content of Nigeria’s top 10 songs on Spotify using natural language processing techniques. It also provides valuable insight into the linguistic richness, cultural nuances, and emotional expressions embedded in the lyrics. Most of the songs showcased a positive sentiment, focusing on themes such as celebration, joy, and empowerment. Love and optimism were also prominent elements of the lyrical content.

This study examines the top 10 songs Nigerian weekly music chart on November 1 2023 to ensure that the analysis is relevant and reflective of current trends in contemporary music. The scope of the study is restricted to the digital music platform Spotify.

Future studies should incorporate listener reviews, data from artist profiles, interviews, and press releases to understand the artists’ backgrounds, intentions, and visual elements such as music videos, album art, promotional materials, and creative influences for a deeper analysis. While lyrics provide important insights into linguistic and thematic elements, integrating sentiments from listeners and considering contextual information about the artists will offer a more complete understanding of the music’s impact and reception.

Conflicts of interest

The authors declare no conflicts of interest.

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