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Sentiment Analysis of Users' Tweets on X Regarding the Saudi Investment in Newcastle United Football Club Using the Big Data Framework

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Abstract

This study analysed the sentiments expressed in users' tweets on X (formerly Twitter) regarding the Saudi investment in Newcastle United Football Club as well as related topics that captured their attention. The study provides an analytical perspective by utilising artificial intelligence (AI) tools for sentiment analysis to measure public attitudes, thus leveraging the big data framework on social media platforms and the informational richness they offer. The analysis sheds light on the attitudes and sentiments of the users of X users towards Saudi investment in global sports. Further, the study highlights the importance of the informational value and significance of data from X in understanding public opinions and sentiments on various issues and topics, particularly given the increasing usage of these platforms. It emphasises that classifying sentiments derived from social media content can provide valuable insights to guide clear decision-making based on understanding people's feelings towards specific issues. The study's findings also reveal the significance of investing in global sports as a means to enhance the country's image in the eyes of the global public. This was evident from the widespread engagement with the Saudi investment in Newcastle United Football Club, which sparked extensive interaction across various countries worldwide. Furthermore, this investment movement positively impacted Saudi Arabia's digital and media presence, particularly following Newcastle's victory in their first championship in 70 years, which generated significant engagement on digital platforms. This interaction was closely linked to Saudi Arabia's ongoing efforts to strengthen its soft power on the international stage. The sentiment analysis of users' tweets on X revealed that neutral sentiments were the most prevalent, followed by positive and then negative sentiments. The analysis also indicated that the topics that garnered the most attention were those related to Newcastle United's performance after the Saudi investment, future signing plans supported by the public investment fund (PIF), and the club's performance transformation following the PIF's acquisition.

Keywords: Sentiment Analysis, Social Media Platforms, Big Data, User Engagement, Newcastle United.

Introduction

In recent years, the significance of big data on social media platforms has emerged as an open source of information that reveals the opinions, attitudes, and sentiments of users. This development is attributed to the rapid growth of advanced smartphones and their easy accessibility, which has led to a notable increase in the number of individuals engaging with social media platforms (Ortiz-Ospina, 2023). This accessibility, along with the widespread adoption of smartphones and the expansion of social media platforms, has enabled people to freely and effortlessly express their thoughts, opinions, and emotions online (Anderson, 2017).

In recent years, the analysis of social media content, including that on 'X' and other platforms, has become a popular field of study due to the massive data generated, which reflects various

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forms of daily human activity. This content highlights real-life events and interactions on a wide scale, providing rich material for collecting public opinions and understanding users' emotions regarding different topics. These technologies are not merely tools for collecting, processing, and analysing vast amounts of data; they provide valuable insights as they represent a virtual space for real-time communication, discussions, and commentary on various issues and topics. Therefore, they can be utilised to understand public trends, emotions, and opinions. According to Abeza (2023), organisations today benefit from modern tools and technologies—such as analytics tools, content creation tools, and scheduling tools—to enhance their social media efforts. They also make data-driven decisions based on specific metrics such as engagement rate, reach, and impressions.

The sports sector is considered one of the most popular topics that garners widespread public attention and sparks extensive reactions and discussions at all levels. Data analysis plays a key role in understanding audience trends and how they engage with these sporting events. This requires collecting large datasets from social media platforms and analysing them using network analysis tools, sentiment analysis techniques, and data extraction methods to identify relevant elements—such as user demographics; the number of posts, comments, and likes; as well as the types of content shared. Such analysis helps to gauge the general sentiment towards these issues and identify the dominant topics driving discussions, ultimately providing valuable insights into public discourse surrounding sports-related topics.

The Saudi investment in Newcastle United Football Club is considered one of the most significant sporting events that has sparked wide-ranging discussions in global media and across social media platforms. Therefore, this study seeks to explore the extent of engagement with the Saudi investment in Newcastle United, the sentiment trends among X users, and the key topics that captured their attention.

The Study Problem

Social media platforms, particularly X, have emerged as rich sources for obtaining information, conducting opinion polls, and understanding public attitudes and sentiments. This is made possible by the extensive discussions and significant commentary on major events and issues that take place on these platforms. Such interactions provide valuable opportunities to measure and analyse the level of engagement and sentiment expressed by X users. The Saudi investment in global sports through the acquisition of Newcastle United Football Club in October 2021 stands out as a major sporting event that received widespread attention and sparked extensive discussions across global media and social media platforms. These discussions reflect the public's opinions, sentiments, and positions regarding this investment, generating massive amounts of big data. This data provides an opportunity to analyse the level of engagement among X users and to understand their sentiments and attitudes towards this significant global sports investment. However, analysing big data generated by social media platforms poses challenges that cannot be effectively addressed using traditional methods. Therefore, this study aims to fill this knowledge gap by analysing big data to explore the sentiment trends of X users towards the Saudi investment in Newcastle United Football Club, their engagement levels, and the key topics that capture their attention.

The Significance of this Study

The significance of this study emerges from several key factors:

- This study provides academic value by employing artificial intelligence (AI) tools for

sentiment analysis to measure public attitudes, utilising the big data framework on social media platforms, which provides rich informational insights.

- The study's findings aim to shed light on the sentiments and attitudes of X users towards the Saudi investment in global sports. Such studies can contribute valuable data regarding the impact and effectiveness of these investments in enhancing the international image of the Kingdom of Saudi Arabia.
- The importance of this study also stems from the strategic direction of Saudi Arabia in investing in global sports and hosting major international sports events, which supports and strengthens the Kingdom's global image and soft power on the international stage.

The Objectives of the Study

1. To identify the level of engagement of X users with the Saudi investment in Newcastle United Football Club.
2. To analyse the sentiments expressed in tweets on X regarding the Saudi investment in Newcastle United.
3. To examine the key issues and topics that dominated the discussions on X regarding the Saudi investment in Newcastle United.

The Questions of the Study

1. What is the level of engagement of X users with the Saudi investment in Newcastle United Football Club?
2. What are the sentiment trends expressed in tweets on X towards the Saudi investment in Newcastle United?
3. What are the key issues that dominated the tweets on X regarding the Saudi investment in Newcastle United?

Review of Previous Studies

In recent years, with ongoing technological advancements, there has been growing interest in textual sentiment analysis on social media platforms, given the significant role that big data plays in measuring public opinion trends. It is not merely a technology for collecting and processing massive amounts of data but also a means of generating more valuable insights (Ismail, 2024; Song et al., 2023; Wang et al., 2021). Sentiment analysis enables governments and organisations understand public opinions regarding their decisions (Hidayat et al., 2021). Furthermore, the studies of Hassani et al. (2020) and Benchimol et al. (2022) highlighted that classifying sentiments derived from social media content can offer valuable guidance for making well-informed decisions based on a clear understanding of public sentiments towards specific issues. Similarly, Göçen et al. (2024) indicated that exploring information sources and sentiments can help policymakers take appropriate and generalisable actions based on large datasets, ensuring the highest level of accuracy across various sectors.

Almania (2024) indicated that sentiment analysis of data extracted from social media platforms can serve as an alternative to traditional opinion poll data, particularly given the increasing usage of these platforms. Similarly, Grimaldi et al. (2020) reported the use of sentiment analysis on relevant tweets to predict the results of the 2019 Spanish elections, thereby revealing that the most accurate prediction of election outcomes was achieved. Similarly, in a study on sentiment

analysis of tweets on X during the 2020 US presidential elections using a big data framework, Elshereef (2022) demonstrated the potential of using X data as an accurate and cost-effective tool for measuring public opinion towards candidates and predicting election results.

Ismail (2024) also examined public opinion trends regarding animal testing by employing deep learning methodologies for sentiment analysis and achieved an accuracy rate of 88.7%. In the customer service context, Misopoulos et al. (2014) found that sentiment analysis of tweets can assist the aviation industry in identifying factors that contribute to customer satisfaction and happiness, providing insights into how the public perceives service sectors.

Moreover, Zhang and Ma (2023) proposed an advanced method for analysing social media sentiment related to sudden disasters, utilising an ALBERT-based model combined with three techniques—TextCNN, hierarchical attention mechanism (HATT), and latent Dirichlet allocation (LDA)—to enhance language representation. The results demonstrated improved accuracy and a deeper understanding of complex sentiments expressed in social media posts regarding disasters.

In the sports context, Mehra et al. (2023) examined the impact of self-censorship on the behaviour of sports fans and spectators on X during the 2022 Winter Olympic Games. Utilising geolocation analysis, sentiment evaluation, and social media analytics, the study revealed significant spikes in negative sentiments following self-censorship warnings. However, the overall sentiment remained positive. The study emphasised that social media provides a freer space for audiences to instantaneously share content across the globe, thus highlighting that sports fans are the driving force behind the success of any sporting event.

Wakefield and Bennett (2018) and Williams et al. (2014) indicated that fans have the ability to limit the reach and visibility of social media messages, which is essential for managing relationships with brands. Additionally, studies by Mamo et al. (2022) and McDonald et al. (2022) confirmed that social media empowers sports fans to actively participate in shaping team decisions and business strategies related to sports. Sports fans also utilise social media to build strong relationships with athletes and sports teams. A study conducted by Navigate Research indicated that 67% of sports fans are more likely to use X compared to non-fans. Furthermore, O'Hallarn et al. (2019) emphasised that analysing fan discourse on social media regarding major sporting events with widespread public participation is crucial for understanding the role of sports in modern society and for effectively managing these events. Such analysis can help improve audience engagement (Lim et al., 2015) and support the management of sports crises (Brown & Billings, 2013).

While previous research has examined sports fans' sentiments and opinions from the perspectives of sales and marketing (Gibbs et al., 2014), fan and rival identity formation (Hambrick et al., 2010), influence on sports-related decision-making (Mamo et al., 2022; McDonald et al., 2022), and the classification of sport-related online interactions (Blaszka et al., 2012), none have specifically analysed social media users' sentiments towards investments in global sports. Given the significant public interest in sports, there is a need to explore how public sentiment can be measured through social media content and to recognise the vital role fans play in supporting, developing, and engaging with sports clubs. Understanding fan conversations provides deeper insights into collective discussions regarding sports.

Methodological Framework of the Study

Type of Study

This study belongs to the category of descriptive research, which aims to collect and analyse data related to a specific event or phenomenon. In this case, the study focuses on observing and analysing the sentiments expressed in X users' tweets regarding the Saudi investment in Newcastle United Football Club utilising the big data framework.

The Methodology of the Study

This study adopts social network analysis (SNA) and sentiment analysis as its methodological approach. These methods aim to understand the activities of individuals on their personal accounts on social media platforms and their interactions with specific topics by forming reciprocal connections related to the network under analysis (Singh, 2024). This enables the measurement of user engagement with other individuals, ideas, and topics (Sheble et al., 2016).

Through this approach, it becomes possible to analyse the content of social media data; identify expressed sentiments; and categorise user groups based on the topics they discuss, their connections, or the positions they adopt. This methodology is considered a mixed-methods approach, which utilises both quantitative and qualitative techniques (Malkawi, 2023). It represents virtual social activity through graphical and computational methods, thus enabling the measurement of strong and weak ties or relationships (Ben Belkacem, 2018).

The Research Tools

The study relied on several contemporary tools, algorithms, and AI techniques to analyse big data from both quantitative (frequencies and numerical data) and qualitative (sentiment analysis and tweet content) perspectives.

To address the research questions, the following three analytical tools were utilised:

- General descriptive data
- Network analysis
- Sentiment analysis

Study Population

The study relied on X as the primary source for collecting relevant data, given its significance as a rich repository of user-generated content that reflects the opinions and discussions of millions of people on local and global events and issues (Nair et al., 2017). X allows for keyword-based search and data extraction, thus providing open and concise data (Linday, 2011). The study population included English-language tweets, but excluded tweets originating from Saudi Arabia to ensure the data reflects a broader international perspective, thereby minimising local bias and providing deeper insights beyond national sentiment.

Data Collection

In this study, Meltwater was used as a tool to monitor and analyse tweets on X. Natural language processing (NLP) algorithms were employed to classify sentiments into positive, negative, and neutral categories. Additionally, Python programming was used for web scraping to collect data by writing and applying English-language keywords for extracting tweets. This process enabled the collection of data regarding user sentiment trends on X towards the Saudi investment in

Newcastle United Football Club and the key topics that captured users' attention. The following keywords were used in the data mining process:

“Public Investment”, “PIF”, “Saudi”, “Saudi sovereign wealth fund”, “Saudi Arabia investments”, “Acquisition of Newcastle”, “Takeover”, “Newcastle”, “NUFC”, “Magpies”

To ensure the collection of highly representative data capable of reflecting international public opinion, data was collected during the period from 1 August 2024 to 30 April 2025. This timeframe was selected as it coincides with the English Premier League season and enables the measurement of audience sentiments three years after the Saudi investment in Newcastle United Football Club. During this period 25,587 tweets were collected, thus providing a substantial dataset for analysing sentiment trends and key topics of public interest.

Data Preprocessing

Accuracy in data processing is critical to avoid misclassification, thus making data preprocessing a crucial step in ensuring the reliability of data analysis. Errors at this stage, known as systematic errors, can negatively impact the validity of the analysis results (Sharda et al., 2021). In this study, the collected tweets were cleaned from noise and irrelevant elements, commonly referred to as textual noise, and the text was tokenised to optimise the performance of NLP and sentiment analysis algorithms. This preprocessing step aimed to enhance the accuracy and reliability of the outcomes of the sentiment analysis.

Sentiment Analysis

In this study, tokenisation was employed as part of the NLP workflow to prepare the data for sentiment analysis algorithms. Sentiment classification was conducted using a three-category scale—positive, negative, and neutral—to determine the overall sentiment trends and user opinions on X regarding the Saudi investment in Newcastle United Football Club.

Information Extraction

At this stage, the focus shifts to transforming the data outputs (generated by the algorithms) into interpretable numerical values. This involved encoding the sentiments as well as labelling the topics extracted through topic modelling algorithms. The process included the following steps:

- Identifying the key topics that attracted the attention of users.
- Clarifying the sentiment orientation (positive, negative, or neutral) associated with each identified topic.

The Findings of the Study

The results of this study are presented based on the analysis of big data conducted by the researcher, focusing on the engagement patterns and sentiment trends of X users towards the Saudi investment in Newcastle United Football Club, utilising AI algorithms for data processing and sentiment classification.

Characteristics of the Analysis Sample on X

The general characteristics of the sample were presented, including tweet statistics during the study period and the temporal distribution (timeline) of the tweets.

General Statistics of the Analysis Sample

Activity	Total
Total Posts	25587
Users	13265
Likes	37875
Replies	13432
Reposts	25748
Quotes	7372
Engagement	541632
Impression	68M
Total Reach	112M

Table (1) Presents the Number of Tweets and Interactions Recorded During the Study Period

The results presented in Table (1) summarise the general statistics of the study sample during the data collection period. The analysis reveals that over 25,500 English-language tweets were published by over 13,200 users. The dataset includes over 37,800 likes, over 25,700 reposts, over 13,400 replies, and over 7,300 quote tweets. The data indicates that likes and reposts significantly outnumber quotes and replies, thus suggesting a high level of engagement with tweets discussing the Saudi investment in Newcastle United.

Furthermore, the table reveals that total engagement with the tweets exceeded 541,000 interactions, while impressions surpassed 68 million, and the total reach exceeded 112 million. These figures reflect a substantial level of visibility and interaction, which likely indicates strong public interest among X users in the Saudi investment in Newcastle United Football Club.

Demographic Data of the Analysis Sample

	Classification Criteria	Frequency	Percentage
Gender	Male	23156	90.5%
	Female	2431	9.5%
Age groups	Between 18 and under 35	14584	57%
	–Between 35 and under 55	7164	28%
	55 and over	3838	15%
Country	The United Kingdom	18397	71.9%
	The United States	2712	10.6%
	South Africa	1330	5.2%
	Other	3148	12.3%

Table (2)

presents the demographic distribution of the analysis sample based on the available user data on X.

The results presented in Table (2) illustrate the demographic distribution of the analysis sample. The findings reveal that male participants accounted for the majority of the tweets, representing

90.5%, while female participants represented 9.5%. This outcome is expected, as male users typically show higher levels of interest in following sports clubs. The analysis also reveals that the age group between 18 and under 35 years constituted the largest segment, which accounted for 57% of the participants. This was followed by the age group of between 35 and under 55, which represented 28% of the participants, while the 55 and over age group accounted for 15% of the participants. These findings are consistent with general patterns, as younger users are more engaged with sports clubs and are the most active demographic on social media platforms.

Further, the results presented in Table (2) also highlight the geographic distribution of tweets by country, thus revealing that five countries accounted for the majority of the tweets. The United Kingdom ranked first with 71.9%, which is an expected outcome since Newcastle United Football Club is based in the country. This was followed by the United States, with 10.6%, and South Africa, with 5.2%. The remaining percentage was distributed among various other countries, such as Australia and Ireland. These results indicate the global interest in the Saudi investment in Newcastle United, thereby reflecting the international reach and influence of sports investments. This finding supports the conclusion of O'Hallarn et al. (2019), who emphasised that analysing sports fan discourse on social media is essential for understanding the role of sports in modern society and for effectively managing sports events based on public discussions and engagement.

Temporal Distribution of Tweets

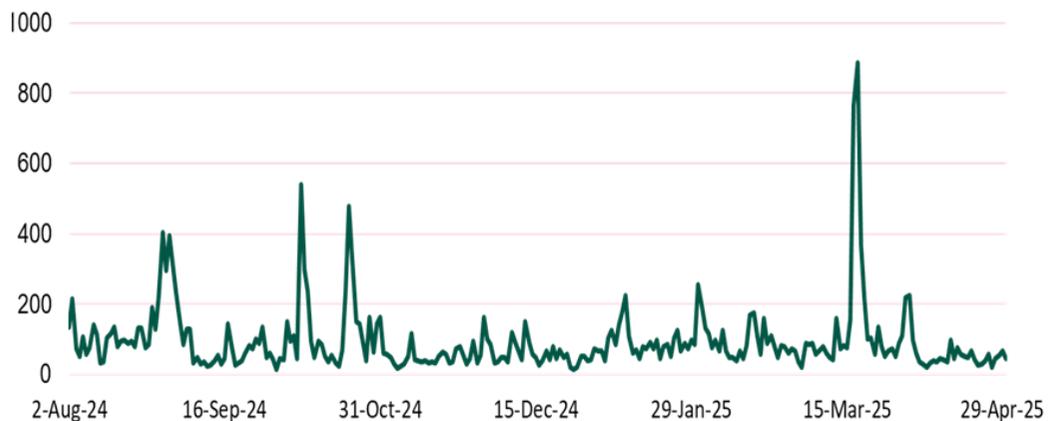


Figure (1): Timeline of Tweets Throughout the Study Period

The timeline presented in Figure (1) depicts the temporal distribution of tweets throughout the study period. The data highlights three major spikes in tweet activity. The first spike occurred in October 2024, which coincided with the anniversary of the Saudi Public Investment Fund's acquisition of Newcastle United. The second spike also took place in October 2024, following the Premier League's announcement that it would not revisit the legality of the Saudi Public Investment Fund's takeover of Newcastle United. The third and highest spike occurred in March 2025, following Newcastle United's victory in the Carabao Cup, marking the club's first major trophy in 70 years. These spikes reflect the strong correlation between key real-world events and audience engagement on X, thereby emphasising the impact of significant milestones on public discourse and digital participation.

Most Frequently Used Hashtags

	Hashtag	Interaction	Users
1	#NUFC	10.8K	4.62K
2	#Newcastle	636	425
3	#NUFCFans	581	349
4	#PIF	343	273

Table (3) Presents the Most Commonly Used Hashtags on X.

The results presented in Table (3) provide a network-based sentiment analysis of the four most frequently used hashtags during the study period. The #NUFC hashtag ranked first by a wide margin, with over 10,800 interactions and over 4,620 unique users contributing to the conversation. This is followed by the #Newcastle hashtag, with 636 interactions and 425 users. In third place was #NUFCFans, which recorded 581 interactions and 349 users. Finally, the #PIF hashtag ranked fourth, with 343 interactions and 273 users. These results reflect the dominance of club-related hashtags—particularly #NUFC—in driving engagement, thus confirming that discussions primarily centred on Newcastle United’s fan community and club identity, with moderate engagement levels on hashtags that directly referenced the Saudi Public Investment Fund (PIF).

Sentiment Analysis of Tweets

The researcher employed sentiment analysis to classify the tweets into three categories: positive, negative, and neutral. This classification enabled a clearer understanding of the emotional tone of the discussions surrounding the Saudi investment in Newcastle United Football Club. Additionally, sentiment trends were analysed based on geographic regions, providing insights into regional variations in user attitudes towards the investment. This approach helps map how different audiences worldwide responded emotionally to the topic during the study period.

Sentiment	Frequency	Percentage
Positive	6754	26.4%
Negative	5194	20.3%
Neutral	13637	53.3%

Table (4)

presents the distribution of sentiment categories identified in the analysis of X users’ tweets

The results presented in Table (4) summarise the overall sentiment distribution of the analysed tweets during the study period. The sentiment analysis classified 13,637 tweets as neutral, thus representing 53.3% of the total and making it the most prevalent sentiment category. Positive sentiments ranked second, with 6,754 tweets, accounting for 26.4% of the total. Negative sentiments were the least represented, with 5,194 tweets, constituting 20.3% of the total. These findings indicate that neutral tweets dominated the conversation, while positive sentiments outnumbered negative ones. This suggests that user sentiment on X leaned more towards positivity than negativity regarding the Saudi investment in Newcastle United Football Club.

The analysis further identified the key issues and topics that dominated the discourse on X regarding the Saudi investment in Newcastle United, along with the sentiment trends associated

with these discussions. The results revealed that neutral sentiments prevailed across the majority of interactions, particularly in tweets focused on tracking Newcastle United's performance following the Saudi investment. This included technical analyses related to future transfer strategies supported by the PIF, commentary on the club's improved performance since the acquisition, as well as to close monitoring of its sporting achievements.

The second major theme involved fan discussions regarding PIF's potential expansion into other sports investments, including the rumoured acquisitions of clubs such as Santos FC in Brazil and AS Monaco in France, with Newcastle United viewed as the centrepiece of this broader investment strategy. Finally, discussions also touched on the future of Saudi investment in Newcastle, particularly in light of reports suggesting a possible reduction in the PIF's foreign investment activities, raising questions regarding the long-term commitment to the club.

The analysis revealed that the dominant positive sentiments expressed in the tweets on X centred on praise for Newcastle United's performance transformation and the club's historic achievement of winning its first trophy in over 70 years. Users particularly highlighted the participation of Mr. Yasir Al-Rumayyan, governor of the PIF, during the celebration of the victory, expressing appreciation for Saudi Arabia's role in global sports investment. Many users viewed this success as a reflection of the strategic vision and effectiveness of the PIF. Positive sentiment also extended to the Kingdom's enhanced international image, positioning it as an influential economic power capable of competing on major global stages. Additionally, users expressed optimism regarding Newcastle United's transformation into a well-managed and commercially successful club after years of decline, thus attributing this turnaround to PIF's strategic planning and investment leadership.

In contrast, the analysis identified key topics associated with negative sentiments in the tweets. One of the most prominent negative narratives involved questioning the authenticity of Newcastle United's fanbase, with claims that the Saudi investment altered the club's supporter base and attracted superficial or less dedicated followers. Another recurring theme was scepticism regarding the involvement of the Saudi government and certain UK government officials in facilitating the takeover deal, raising concerns regarding the political and ethical dimensions of the acquisition. Additionally, a few users on X expressed concerns regarding the PIF's reported shift toward prioritising domestic projects, potentially reducing foreign investments. These users feared that such a shift could weaken Newcastle United's financial capabilities, particularly in light of the Premier League's Financial Fair Play (FFP) regulations, which limit club spending based on revenue and financial sustainability.

Figure (2) presents a visual representation of the distribution of sentiment categories—positive, negative, and neutral—in the tweets analysed during the study period.

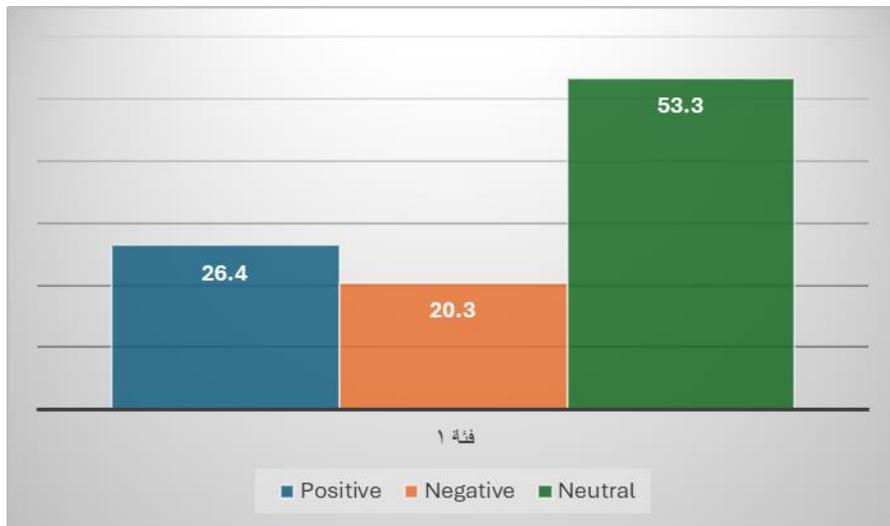


Figure (2): Distribution of Positive, Negative, and Neutral Sentiments in Tweets

Sentiment Distribution by Geographic Region

Countries	Positive		Negative		Neutral	
The United Kingdom	3532	19.2%	3256	17.7%	11608	63.1%
The United States	553	20.4%	450	16.6%	1708	63%
South Africa	292	22%	187	14.1%	849	63.9%

Table (5)

presents the geographic breakdown of positive, negative, and neutral sentiments by geographic region.

The results presented in Table (5) compare sentiment analysis outcomes across the top three countries with the highest number of tweets—the United Kingdom, the United States, and South Africa—during the study period. The analysis reveals a remarkably similar proportion of neutral sentiments across the three countries, averaging approximately 63%. Positive sentiment outweighed negative sentiment in all three countries. South Africa ranked first with 22% positive sentiment, followed by the United States with 20.4%, and the United Kingdom with 19.2%. In terms of negative sentiment, the United Kingdom recorded the highest percentage at 17.7%, followed by the United States at 16.6%, and South Africa at 14.1%. These trends are visually represented in Figure (3), which illustrates the distribution of positive, negative, and neutral sentiments by geographic region.

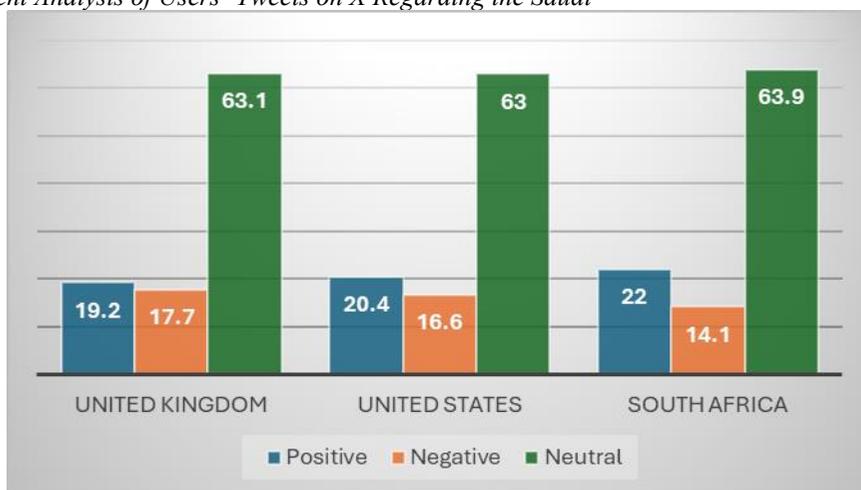


Figure (3): Percentage Distribution of Positive, Negative, and Neutral Sentiments by Geographic Region

Discussion and Conclusion

This study utilised advanced data extraction techniques—including sentiment analysis, topic modelling, and tweet analysis—to identify the sentiment trends in tweets of X users regarding the Saudi investment in Newcastle United Football Club. The research also examined the level of user engagement and highlighted the key topics that captured user attention throughout the study period, which spanned from 1 August 2024 to 30 April 2025. The analysis focused on English-language tweets, and the study produced the following key findings:

- This study presented a clear methodological approach that emphasised the importance of the semantic and informational value of data derived from X for understanding public opinions and sentiments on various social and global issues, particularly in light of the increasing use of these platforms. This capability supports better decision-making processes for both governmental and private organisations. These findings are consistent with the conclusions of Ismail (2024), Song et al. (2023), and Wang et al. (2021), who highlighted that sentiment analysis provides governments and organisations with the ability to understand public perceptions of their policies and decisions (Hidayat et al., 2021). Furthermore, the findings align with Hassani et al. (2020) and Benchimol et al. (2022), who emphasised that classifying social media sentiments can offer valuable insights that enable organisations make clear and informed decisions based on a deep understanding of public attitudes towards specific issues.
- The findings of this study highlighted the strategic importance of investing in global sports as a means of enhancing national image and international public perception. This was clearly reflected in the widespread engagement generated by the Saudi investment in Newcastle United Football Club, which attracted global attention and interaction across various countries. Moreover, this investment movement contributed to boosting Saudi Arabia's digital and media presence, particularly following Newcastle's historic victory in securing their first major trophy in 70 years. This achievement was strongly associated with the Kingdom's ongoing efforts to strengthen its soft power on the global stage. Sports have become one of the key tools that support Saudi Arabia's Vision 2030, which aims to expand the Kingdom's international influence across various sectors beyond oil dependency. This finding aligns with the results of Navigate Research, which reported that 67% of sports fans are more likely to engage on X

compared to non-fans. It also supports the conclusions of O'Hallarn et al. (2019), who emphasised that analysing fan discourse on social media regarding major sporting events with mass public participation is critical for understanding the role of sports in modern society.

- This study analysed English-language tweets on X and identified the most engaged demographic groups. The findings revealed that users aged 18 to under 35 years accounted for over 50% of the participants, which is an expected outcome given that younger audiences tend to be more engaged in sports and are the most active demographic on social media platforms. The study also mapped the geographic distribution of the tweets, with the United Kingdom ranking first in terms of both the number of tweets and user participation, followed by the United States and South Africa. While this result is not surprising—considering that Newcastle United is a UK-based club and the analysis focused on English-language content—it nonetheless highlights the broader global interest in sports investments, thus reinforcing the international visibility and relevance of Saudi Arabia's sports investment strategy.
- The temporal analysis of tweet activity revealed three major spikes in engagement during the study period. The first occurred in October 2024, which coincided with the anniversary of the Saudi Public Investment Fund's acquisition of Newcastle United, as well as the Premier League's announcement that it would not revisit the legality of the takeover. The highest peak was observed in March 2025, following Newcastle United's victory in the Carabao Cup, which marked the club's first major trophy in 70 years. These spikes indicate the significant public engagement and widespread discussions surrounding the Saudi investment in Newcastle United, thus reflecting a diverse range of opinions. While certain users raised questions regarding the nature of Saudi Arabia's role in the acquisition, many Newcastle fans expressed strong support for the club's management and dismissed the allegations. Supporters emphasised that the takeover marked a turning point in the club's history and rescued it from financial challenges, thus raising expectations among its fanbase for greater success.
- The sentiment analysis of X users' tweets revealed that neutral sentiments were the most prevalent, with the majority of discussions focusing on Newcastle United's performance following the Saudi investment, future transfer plans supported by the PIF, and the club's overall improvement in performance since the acquisition. Additionally, users showed interest in PIF's broader sports investment strategy, including potential acquisitions of other clubs, such as Santos FC in Brazil and AS Monaco in France, as well as speculation regarding the future of PIF's investment in Newcastle, particularly in light of reports that suggested a reduction in foreign investment activities. These findings highlight the importance of identifying the topics that capture audience attention, which can help in prioritising future investment strategies, addressing challenges, managing potential crises, and assessing public satisfaction levels. Such insights can support data-driven decision-making aimed at maximising the positive impact of Saudi Arabia's sports investments.
- The findings of this study reaffirm that sentiment analysis of data extracted from social media platforms can serve as an effective alternative to traditional opinion polling, particularly given the high and growing usage rates of these platforms. This conclusion aligns with the findings of Almania (2024) and supports previous research by Grimaldi et al. (2020), Elshereef (2022), and Ismail (2024), which highlighted that sentiment analysis of data from X offers a cost-effective and accurate method for gauging public opinion. Furthermore, the study supports the insights of Mamo et al. (2022) and McDonald et al. (2022), who emphasised that sports fans have the ability to control the reach and visibility of social media messages, thus making this

control essential for managing brand relationships. Social media platforms also empower fans to participate directly in shaping team decisions and sports-related business strategies, thereby reflecting the interactive nature of modern sports engagement.

Conclusion

In conclusion, this study explored the sentiment trends of X users, based on English-language tweets, regarding the Saudi investment in Newcastle United Football Club by utilising a big data analytics approach. The study highlighted the prominence of neutral and positive sentiments, particularly those praising Newcastle's transformation, sporting achievements, and the Kingdom's growing role in the global sports industry. The study demonstrated the effectiveness of social media sentiment analysis as a low-cost, data-driven alternative to traditional opinion polling, providing real-time insights into public engagement and audience reactions. This reinforces the value of using social media analytics to inform decision-making for sports investments, brand management, and fan relationship strategies. Additionally, the temporal analysis revealed peaks of public engagement during key sporting moments and announcements, thus confirming the importance of timing in leveraging public attention and shaping positive narratives. While this study focused on English-language content, it did not capture the sentiment of non-English-speaking audiences, which is a limitation that future research should address by incorporating multilingual data. Furthermore, expanding the analysis to longer or different timeframes could provide deeper longitudinal insights. Future studies are also encouraged to investigate the long-term impact of sports investments on national reputation, the role of social media in crisis management, and the ways in which organisations can optimise their digital strategies to maximise positive engagement and mitigate negative perceptions. Finally, this research emphasised the strategic role of sports in supporting Saudi Arabia's Vision 2030 and demonstrated how big data analytics can contribute to evaluating the effectiveness of such global investments.

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