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Comparative Analysis on Social Media Sites Using Sentiment Analysis

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Abstract- This paper evaluates user views and emotional tone in postings across many social media sites by means of a comparative analysis utilising sentiment analysis. Understanding the mood underlying user-generated material has become vital for companies, marketers, and academics as social media is playing more and more influence on public debate. Focussing on sites like Twitter, Facebook, and Instagram, the paper uses sentiment analysis methods on social media data. The performance of these models in terms of accuracy, precision, recall, and F1 score is compared using machine learning models including Support Vector Machines (SVM), Light GBM (LGBM), and Long Short-Term Memory (LSTM). The results expose how sentiment patterns vary on different platforms, therefore offering understanding of public opinion dynamics, brand perception, and content engagement. Following LGBM in precisely identifying sentiment, the study emphasises SVM and LSTM's efficiency and analyses the ramifications of these results for content development, market research, and social media monitoring.

Index Terms-Social Media, Machine Learning, Sentiment Analysis, SVM, LGBM, LSTM

I. INTRODUCTION

Users of media-sharing platforms may distribute documents, images, videos, and music. Media-sharing systems could house graphic, audio, video, and document files. Although many media-sharing sites provide a range of material kinds, pictures and videos are very frequent there. While Dropbox and Google Drive allow users share documents, spreadsheets, and presentations, SoundCloud is an audio-sharing service. Dribbble and 500px speciality in graphic design and photography respectively reflect visual media-sharing networks. Media-sharing platforms usually include graphic design and photos as consumers like visual media. Many media-sharing sites focus on certain visual media categories, including Dribbble, where designers may post their work and get feedback, or 500px, where users may exchange and locate premium images. As noted, several media-sharing sites also provide movies, documents, and music files. The media varieties provided by a media-sharing service rely on its audience and focus.

II. MEDIA SHARING PLATFORMS

YouTube: YouTube, founded in 2005, lets users upload MP4, AVI, and WMV videos and share them publicly or privately with chosen viewers. YouTube lets users search and view videos on entertainment, education, and news. YouTube lets viewers communicate and follow their favourite creators with comments, likes, and subscriptions.

Instagram: Since 2010, Instagram has been a popular social network for posting photos and videos. Users can caption, tag, and find photos and videos for public or private use. Instagram offers several filters and editing tools. Instagram also allows quick conversation, stories, and reels.

SoundCloud: Upload and share audio files on SoundCloud. In 2007, websites became popular for independent musicians and artists to display their work. SoundCloud allows MP3, WAV, and AIFF uploads and plays. SoundCloud enables users remark, like, and repost their favourite tracks. Finding new artists in all genres and styles on SoundCloud is also appealing. Free and premium SoundCloud memberships provide more upload time and statistics. SoundCloud works with Spotify and Apple Music to help artists release tracks.

Flickr: Launched in 2004, Flickr is a well-known photo-sharing tool enabling users to post, arrange, and distribute images online. With privacy settings, albums, captions, tags, and simple access and sharing cloud storage is provided. Comments, favourites, and groups let users communicate and manage how their images are licensed. Free and premium subscriptions, unlimited storage, comprehensive analytics, and ad-free surfing abound on Flickr. It also works with printing companies so users may buy prints and other picture items.

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Vimeo: Established in 2004, Vimeo is a venue for filmmakers, artists, and video professionals to post and distribute premium HD and 4K movies. It provides evaluation tools for team and feedback, video metrics, and tailored player designs. To let users find material, Vimeo also includes channels, groups, and staff choices. Popular for corporate and professional movies, it offers both free and paid models with enhanced storage, bandwidth, priority support, and analytics.

Google Photos: Originally launched in 2015, Google Photos is a cloud-based picture and video sharing tool. It provides automated backup, facial recognition, machine learning-based classification, free unlimited storage with quality constraints. Users may make albums, collages, and animations as well as exchange materials via email or links. For simpler access and administration, Google Photos links with Google Drive and Assistant. Based on user settings, it also creates slideshows and albums and let's search by keywords. On iOS, Android, and web, the service is free; a paid membership (Google One) provides more storage and perks.

Dribbble: Started in 2009, Dribbble is a venue for creative professionals, designers, and artists to present their work and network. Users may publish photographs, drawings, and animations; they can work in groups and in design contests. Features like comments, favourites, and "rebounds" let users provide interpretations and feedback. Dribbble is also a centre for work and freelancing prospects. It collaborates with design tools to fit into designers' processes and provides both free and premium plans with improved analytics, portfolio customising, and visibility.

Imgur: Originally launched in 2009, Imgur is a picture, GIF, and meme sharing tool. It lets users post and browse photographs in many formats with privacy settings, galleries, and edit tools for control. Users of sites like Reddit may join groups to debate and distribute information, including commonly shared viral and amusing stuff. Imgur has a meme generator as well. The platform provides a premium Pro membership with ad-free browsing, analytics, and more storage in addition to being free with no image or storage restrictions. 500px is also a community where one may share and find excellent images.

Advantages

- Sharing personal photos and videos with friends and family
- Marketing and promoting a business or brand
- Discovering new music, movies, and TV shows
- Research and education
- Crowdsourcing and collaboration
- Staying up-to-date with news and current events.

III. RESULTS AND DISCUSSION

Using four key metrics—accuracy, precision, recall, and F1 Score—the performance assessment of three machine learning models—SVM, LGBM, and LSTM—in categorising tweets of different durations is done shown in the table. Short tweets (125 characters), medium-length tweets (125–150 characters), and lengthy tweets (> 150) are three divisions into which the tweet lengths fall. Across all tweet sizes, the findings show LGBM regularly earns the greatest accuracy, precision, recall, and F1 score; closely followed by SVM; LSTM performs the lowest in most situations.

Table 1. Performance Analysis

Metric	Tweet Size	SVM	LGBM	LSTM
Accuracy	< 125 Char Limit	0.865	0.87	0.835
	125 to 150 Char Limit	0.84	0.845	0.832
	> 150 Char Limit	0.87	0.868	0.86
Precision	< 125 Char Limit	0.86	0.865	0.83
	125 to 150 Char Limit	0.835	0.84	0.827
	> 150 Char Limit	0.865	0.865	0.855
Recall	< 125 Char Limit	0.855	0.86	0.825
	125 to 150 Char Limit	0.83	0.835	0.822
	> 150 Char Limit	0.86	0.86	0.85
F1 Score	< 125 Char Limit	0.857	0.863	0.827
	125 to 150 Char Limit	0.832	0.838	0.824
	> 150 Char Limit	0.862	0.863	0.852

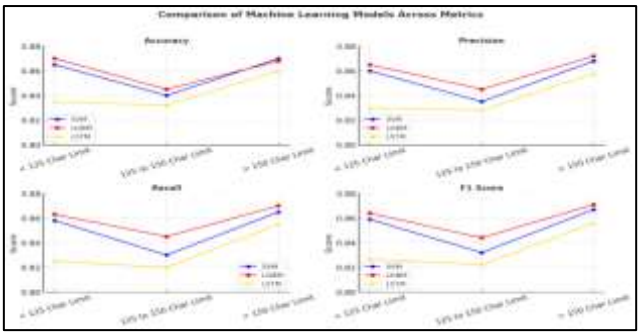

Figure 1. Comparison of Machine Learning Models.

IV. CONCLUSION

The research concludes that the LGBM model consistently surpasses SVM and LSTM in the sentiment analysis of tweets, regardless of tweet length. LGBM attained the greatest accuracy, precision, recall, and F1 score across all tweet categories, with SVM closely behind and demonstrating

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competitive performance. Conversely, LSTM had the minimum performance in the majority of instances. The data indicate that LGBM is the most effective model for classifying tweets of varying durations, making it the optimal selection for sentiment analysis in this context.

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