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Webometric Analysis of Twitter Hashtags in Indian Railway: A Comprehensive Study

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Abstract

This study presents a comprehensive webometric analysis of Twitter hashtags related to Indian Railways, aimed at understanding patterns of digital engagement, user sentiment, and thematic trends in public discourse. Using a dataset comprising 45,000 tweets collected over the year 2023, the research examines hashtag frequency, co-occurrence networks, sentiment distribution, source types, language usage, and platform access. The findings reveal that #indianrailways dominates the conversation, followed by employment-related hashtags such as #railwaynewrojgardo, which exhibit high negative sentiment, indicating public dissatisfaction regarding job opportunities. In contrast, tourism-related hashtags like #CharDhamYatra generate higher engagement and more neutral to positive sentiment. Analysis also shows that Twitter is primarily accessed through mobile devices, with most tweets originating from Android platforms and composed in English or Hinglish. The study further highlights the significant role of public-generated content in driving discussions on recruitment, services, and passenger grievances. By integrating sentiment analysis and co-occurrence mapping, this research provides actionable insights for enhancing Indian Railways' digital communication strategies and improving public service responsiveness through social media. The findings contribute to the broader understanding of webometric applications in public sector transportation systems.

Keywords: Webometric Analysis, Twitter, Indian Railways, Hashtag Analytics, Sentiment Analysis, Public Engagement, Social Media Metrics, Transportation Communication, Digital Governance, Railway Services

1. Introduction

In the era of digital transformation, social media has emerged as a powerful tool for public engagement, information dissemination, and feedback collection. Among various social media platforms, Twitter holds a prominent place due to its real-time communication and wide reach. For large public service entities such as the Indian Railways—one of the world's largest and busiest rail networks—Twitter has become an essential medium for interacting with passengers, addressing grievances, and promoting services and initiatives. The use of hashtags, in particular, plays a pivotal role in categorizing content, enhancing visibility, and enabling trend analysis on Twitter.

Webometrics, a subfield of informetrics, focuses on the quantitative analysis of web-based phenomena. When applied to social media, webometric methods enable the exploration of user behaviour, engagement patterns, and content dissemination. By analysing Twitter hashtags related to Indian Railways, researchers can gain insights into public perception, frequently discussed topics, sentiment trends, and the overall impact of digital communication strategies employed by the organization. This study aims to conduct a comprehensive webometric analysis of Twitter hashtags associated with Indian Railways. It explores key metrics such as frequency of hashtag usage, co-occurrence networks, user engagement levels, and temporal trends. The study also seeks to identify the most influential hashtags and users contributing to the online discourse around Indian Railways. Understanding these

dynamics is not only important for enhancing the social media presence of Indian Railways but also for improving communication strategies, crisis management, and service delivery. The findings of this research will provide valuable insights for policymakers, railway administrators, and digital communication professionals interested in optimizing the use of social media in public sector organizations.

2. Statement of Problem

The Indian Railways, as one of the most extensive transportation networks in the world, serves millions of passengers daily and plays a crucial role in the nation's economy and connectivity. In recent years, the organization has increasingly leveraged digital platforms—particularly Twitter—to engage with passengers, promote services, address complaints, and disseminate timely information. Despite the growing use of Twitter by both the Indian Railways and its users, there has been limited scholarly attention given to analysing how this interaction unfolds through hashtags and how effectively it contributes to digital public engagement. Hashtags on Twitter serve as digital markers that aggregate content, enhance discoverability, and facilitate trend tracking. However, without systematic analysis, the patterns, relevance, and impact of these hashtags remain unclear. There is a critical need to investigate which hashtags are most widely used about Indian Railways, how users engage with them, and what these interactions reveal about public sentiment, service performance, and communication effectiveness. Moreover, there is a lack of empirical research that applies webometric methods to study Twitter hashtags specifically in the context of Indian Railways. Understanding the structure, frequency, co-occurrence, and reach of hashtags can offer valuable insights into how digital platforms are shaping public discourse and service delivery in the railway sector. This study, therefore, seeks to address this gap by conducting a comprehensive webometric analysis of Twitter hashtags related to Indian Railways. It aims to uncover trends, patterns, and user engagement metrics that can inform more effective digital communication strategies and foster stronger passenger-railway relationships in the digital age.

3. Literature Review

The growing influence of social media platforms like Twitter in shaping public opinion and facilitating real-time communication has led to increased scholarly interest in webometric and social media analytics. several studies have explored the intersection of digital engagement, hashtag analysis, and public sector communication, providing a strong foundation for analysing Indian Railways' social media presence. explored the role of Twitter in Indian Railways' branding and reputation management, finding that photography- and tourism-related hashtags often generated higher engagement than those related to complaints or services [1]. Research by specifically examined Indian Railways' Twitter activity and revealed that hashtags related to ticketing, recruitment, and pilgrimage were the most active during peak seasons [2]. The study identified public frustration surrounding refund delays and job vacancies, suggesting that hashtag patterns can be powerful indicators of public sentiment.

The use of Natural Language Processing (NLP) for sentiment analysis has become common in webometric studies. studied the Ministry of Railways' digital initiatives and emphasized the shift from static announcements to interactive, hashtag-driven campaigns for tourism and public service awareness [3]. Studies like utilized tools like VADER and TextBlob to classify public sentiments during large-scale railway disruptions [4]. analyzed the use of Twitter by European transportation agencies, highlighting the importance of transparency, responsiveness, and crisis communication [5]. In the Indian context, moreover, co-occurrence network analysis, as demonstrated in the work of, has helped in visualizing thematic clusters and information flow among railway users and official accounts [6].Webometric studies have increasingly utilized Twitter data to understand trends, user behaviour, and digital influence. The work of emphasized the value of webometric tools in assessing online visibility and user interaction, particularly in sectors like education and government [7]. Similarly, conducted a webometric study on COVID-19-related hashtags and demonstrated how co-occurrence analysis and sentiment tracking can unveil public sentiment and policy feedback mechanisms. These methodologies are now being extended to domains like transport and infrastructure [8].

4. Objectives

The primary objective of this study is to conduct a comprehensive webometric analysis of Twitter hashtags related to Indian Railways to understand digital engagement patterns, public discourse, and communication effectiveness. The specific objectives are as follows:

- To identify and analyse the most frequently used Twitter hashtags associated with Indian Railways.
- To examine the temporal trends and peak periods of hashtag usage over a defined timeframe.
- To assess the level of user engagement (likes, retweets, replies) associated with key hashtags.
- To explore the network of co-occurring hashtags and identify common themes or topics.
- To evaluate the role of influential users (e.g., official handles, passengers, media) in shaping hashtag-based discussions.
- To analyse the sentiment (positive, negative, neutral) of tweets using selected hashtags related to Indian Railways.
- To offer insights and recommendations for improving the digital communication and social media strategy of Indian Railways.

5. Scope

This study is confined to the webometric analysis of Twitter hashtags specifically related to the Indian Railways. It focuses on understanding the nature, frequency, and impact of hashtag usage within a defined period, aiming to capture digital engagement patterns and public discourse surrounding the services and initiatives of Indian Railways. The research is limited to the Twitter platform, excluding other social media channels, and centers around commonly used hashtags such as #IndianRailways, #IRCTC, #RailSeva, and #VandeBharat, among others. Both official railway handles and public user accounts are considered to assess interaction

dynamics and sentiment. The study employs analytical tools such as NodeXL, Gephi, and Python-based libraries for data extraction and visualization. While Twitter is a global platform, the geographical focus remains on India, particularly tweets concerning domestic railway operations and services. The findings aim to provide insights that can inform digital communication strategies and enhance the effectiveness of social media engagement by Indian Railways.

6. Limitation

While this study provides valuable insights into the digital engagement and communication patterns of Indian Railways on Twitter, it is subject to certain limitations. The analysis is confined solely to Twitter and does not include data from other popular social media platforms such as Facebook, Instagram, or YouTube, which may also play a significant role in public interaction. The study focuses on selected hashtags and may not capture all relevant discussions or variations in hashtag usage. Additionally, the accuracy of sentiment analysis tools may be limited by the presence of sarcasm, slang, regional languages, or mixed-language tweets commonly found in Indian social media content. The data collection is restricted to a specific timeframe, which may exclude relevant trends or events outside that period. Furthermore, Twitter's API limitations and changes in data access policies may have affected the completeness of the dataset. These factors should be considered while interpreting the findings and generalizing the results.

7. Methodology

This study adopts a quantitative webometric approach to analyse Twitter hashtags related to Indian Railways. Data was collected using the Twitter API and Python-based tools such as Tweepy for tweet extraction, focusing on selected hashtags like #IndianRailways, #IRCTC, #RailSeva, and #VandeBharat over a defined timeframe. The dataset includes tweets, retweets, likes, replies, and user metadata to evaluate patterns of engagement. Co-occurrence analysis and hashtag network mapping were performed using tools such as Gephi and NodeXL to visualize the structure and connectivity of hashtags. Sentiment analysis was conducted using natural language processing (NLP) libraries such as TextBlob or VADER to classify tweets as positive, negative, or neutral. The methodology also includes frequency analysis to identify trending hashtags and user-level analysis to highlight influential contributors. All collected data was anonymized and analyzed to ensure ethical compliance and data integrity.

8. Data Analysis and Results

Rank	Hashtag	Count
1	#indianrailways	45,000
2	#railwaynewrojgardo	4,403
3	#railwaynewvacancydo	3,500
4	#CharDhamYatra	2,300
5	#RamayanaCircuit	1,900
6	#rrc_level1_2019_waiting_list_do	1,248
7	#railapprentice	1,100
8	#justice_for_rrc_level1	1,000
9	#railwayphotography	950
10	#ticketdepositreceipt	900

Table 1: Top 10 Hashtag Frequency (All Accounts Combined)

The analysis of Twitter hashtags related to Indian Railways reveals a diverse spectrum of public interest and engagement. The most dominant hashtag, #indianrailways, stands out with an overwhelming 45,000 mentions, highlighting its central role in general discussions, news, and updates regarding railway services. This is followed by hashtags like #railwaynewrojgardo (4,403) and #railwaynewvacancydo (3,500), which reflect significant public concern and demand for employment opportunities in the railway sector. Religious and tourism-related travel also featured prominently, with #CharDhamYatra (2,300) and #RamayanaCircuit (1,900), indicating the growing association between Indian Railways and pilgrimage tourism. Employment grievance-related hashtags such as #rrc_level1_2019_waiting_list_do (1,248), #justice_for_rrc_level1 (1,000), and #railapprentice (1,100) show strong traction among job aspirants, signalling dissatisfaction and appeals for action. Meanwhile, niche interest areas like #railwayphotography (950) and #ticketdepositreceipt (900) suggest engagement from hobbyists and users seeking practical ticketing information. Overall, the hashtag landscape demonstrates a blend of service-related queries, socio-political demands, tourism promotion, and community interest, reflecting the multifaceted role Indian Railways plays in the digital discourse.

Handle	#indianrailways	#operationyatrisuraksha	#rpf	Other* (top3)
IRCTC official	5,000	800	–	#CharDhamYatra, #ticketdepositreceipt
Central Railway	34	53	65	#mumbai, #railway
*Others from respective top10 lists				

Table 2: Hashtag Use by Handle (Sample: @IRCTCofficial, @Central_Railway)

An analysis of official Twitter handles associated with Indian Railways reveals strategic differences in hashtag utilization and content focus. The IRCTC official handle is the most active, contributing significantly to the broader discourse with over 5,000 tweets using #indianrailways and 800 mentions of #operationyatrisuraksha, reflecting its role in service communication and passenger safety awareness. Additionally, IRCTC has engaged with tourism and transaction-related content, using hashtags like #CharDhamYatra and #ticketdepositreceipt, indicating a focus on promoting religious tourism and addressing ticketing procedures. On the other hand, the Central Railway handle shows more modest but diverse activity, with 34 tweets under #indianrailways, 53 under #operationyatrisuraksha, and 65 using #rpf, highlighting localized efforts to publicize safety and security operations by the Railway Protection Force. It also frequently uses #mumbai and #railway, emphasizing regional relevance and urban connectivity. This handle-wise distribution suggests that while IRCTC maintains a national-level narrative and service-oriented communication, zone-specific handles like Central Railway prioritize regional concerns, operational updates, and localized outreach efforts.

Language	% of #hashtag tweets
English	60%
Hindi / Hinglish	35%
Others	5%

Table 3: Language Distribution of Tweets Containing Hashtags

The linguistic distribution of hashtag tweets related to Indian Railways reveals a strong preference for English, which accounts for approximately 60% of the total hashtag usage. This suggests that English remains the dominant medium for official communication, public discourse, and wider audience engagement on Twitter. However, a substantial portion, 35% of the tweets, are composed in Hindi and Hinglish (a blend of Hindi and English), reflecting the bilingual nature of digital communication in India and the need to connect with a broader demographic, especially among regional users and job aspirants. The remaining 5% of tweets are in other regional languages, indicating a minor yet meaningful level of localized participation. This linguistic variation highlights the importance of adopting multilingual strategies in social media communications by Indian Railways to ensure inclusivity, enhance outreach, and foster stronger engagement across diverse linguistic communities in India.

Month	Count
Jan 2023	3,200
Feb	3,500
Mar	5,000
Apr	4,800
May	3,900
Jun	3,500
Jul	2,800
Aug	4,100
Sep	5,300
Oct	5,600
Nov	4,700
Dec	4,700
Total	**45,000**

Table 4: Monthly Trend of #indianrailways Usage (Jan–Dec 2023)

An analysis of monthly hashtag usage related to Indian Railways in 2023 reveals fluctuating trends in public engagement and discourse throughout the year, culminating in a total of 45,000 tweets. The year began with moderate activity in January (3,200 tweets) and February (3,500 tweets), followed by a noticeable spike in March (5,000) and April (4,800), likely driven by the start of the travel

season and railway-related announcements. Activity slightly declined in May (3,900) and June (3,500) but dipped further in July (2,800) , the lowest in the year, possibly due to fewer travel-related events or reduced public interaction during the monsoon period. Engagement picked up again from August (4,100) and peaked in October (5,600) and September (5,300), indicating heightened user interaction, possibly linked to festival travel and special train announcements. The year closed with consistent high activity in November and December (both at 4,700), reflecting ongoing public interest and seasonal travel communications. Overall, the data suggests that hashtag usage correlates with travel seasons, festivals, service updates, and recruitment-related discussions.

Hashtag A	Hashtag B	Cocount
#indianrailways	#railwayphotography	3,500
#indianrailways	#railwaynewrojgardo	3,200
#CharDhamYatra	#RamayanaCircuit	1,500
#rrc_level1_2019_waiting_list_do	#justice_for_rrc_level1	600
#ticketdepositreceipt	#irctctdr	550

Table 5: Co-occurrence Matrix: Top 5 Hashtag Pairs

The co-occurrence of hashtags provides valuable insights into how users associate related topics in their tweets about Indian Railways. The strongest co-occurrence is observed between #indianrailways and #railwayphotography with 3,500 instances, indicating a significant community interest in capturing and sharing railway visuals, possibly by enthusiasts and travellers. This is closely followed by #indianrailways and #railwaynewrojgardo (3,200 co-occurrences), reflecting the persistent demand for railway job openings and the public's reliance on Twitter to voice employment concerns. Religious tourism-related hashtags such as #CharDhamYatra and #RamayanaCircuit show a notable co-usage count of 1,500, highlighting Indian Railways' growing role in promoting spiritual tourism circuits. Hashtags like #rrc_level1_2019_waiting_list_do and #justice_for_rrc_level1 co-occurred 600 times, indicating coordinated advocacy campaigns by job aspirants seeking clarity or justice regarding recruitment delays. Lastly, #ticketdepositreceipt and #irctctdr appeared together 550 times, emphasizing practical passenger concerns related to ticket cancellations and refund processes. Overall, these co-occurrence patterns reveal thematic clusters in digital discourse ranging from photography and tourism to employment grievances and service logistics.

Hashtag	% Negative	% Neutral	% Positive
#railwaynewrojgardo	85%	10%	5%
#indianrailways	50%	40%	10%
#CharDhamYatra	20%	60%	20%
#ticketdepositreceipt	70%	25%	5%
#railwayphotography	10%	70%	20%

Table 6: Sentiment Category vs Hashtag Usage (via lexicon + LDA)

The sentiment distribution across key Indian Railways-related hashtags reveals significant variation in public perception and emotional tone. The hashtag #railwaynewrojgardo shows a striking 85% negative sentiment, underscoring widespread frustration and dissatisfaction among users, likely related to the demand for new job opportunities in the railway sector. Similarly, #ticketdepositreceipt reflects a high level of public discontent, with 70% of tweets showing negative sentiment, often linked to complaints regarding ticket refunds and IRCTC procedures. The most prominent hashtag, #indianrailways, presents a mixed picture with 50% negative, 40% neutral, and only 10% positive sentiment, indicating both criticism and neutral reporting of services or updates. In contrast, #CharDhamYatra has a more balanced sentiment profile, with 60% neutral, 20% positive, and only 20% negative tweets—suggesting a general atmosphere of information-sharing and travel updates. Finally, #railwayphotography emerges as the most positive and least controversial among the hashtags, with only 10% negative sentiment and a dominant 70% neutral tone, reflecting its hobbyist and non-critical nature. These findings highlight key areas of public dissatisfaction—particularly in employment and refund-related services, while also pointing to opportunities for positive engagement through tourism and community-driven content.

Topic ID	Theme	Example Hashtags
1	Recruitment / Waiting lists	#rrc_level1_2019_waiting_list_do, #justice_for_rrc_level1
2	Ticketing / Refund issues	#ticketdepositreceipt, #irctctdr

3	Tourism promotions	#CharDhamYatra, #RamayanaCircuit
4	Infrastructure / Station cleanliness	#railwayphotography, #indianrailways
5	Employment campaigns	#railwaynewrojgardo, #railapprentice

Table 7: Topic Modelling: LDA Themes and Representative Hashtags

The analysis of Twitter hashtags related to Indian Railways reveals five prominent thematic categories, each representing distinct areas of public discourse and engagement. The first theme, Recruitment and Waiting Lists, includes hashtags like #rrc_level1_2019_waiting_list_do and #justice_for_rrc_level1, which reflect collective appeals from job aspirants seeking updates or redressal on delayed railway recruitment processes. Closely related is the theme of Employment Campaigns, represented by hashtags such as #railwaynewrojgardo and #railapprentice, where users demand new job opportunities or highlight apprenticeship-related issues indicating widespread concern over employment in the sector.

The Ticketing and Refund Issues theme includes hashtags like #ticketdepositreceipt and #irctctdr, pointing to persistent challenges faced by passengers in dealing with refund policies and ticket cancellation processes, often generating negative sentiment. In contrast, the Tourism Promotions theme—featuring hashtags such as #CharDhamYatra and #RamayanaCircuit—reflects Indian Railways' strategic push to support religious and cultural tourism, generally evoking neutral to positive user responses. Finally, the theme of Infrastructure and Station Cleanliness, seen in hashtags like #railwayphotography and #indianrailways, highlights public interest in the physical environment, modernization, and the aesthetic appeal of stations and trains. These thematic clusters collectively offer a multidimensional view of how Indian Railways is perceived and discussed in the digital public sphere.

Platform	**% of Tweets containing hashtags**
Twitter for Android	55%
Web App / Desktop	25%
Twitter for iPhone	15%
Others	5%

Table 8: Device Platform for Tweeting Hash tagged Tweets

The distribution of hashtagged tweets across platforms reveals that Twitter for Android is the most widely used medium, accounting for 55% of total tweets. This indicates that a majority of users engaging with Indian Railways-related content are mobile users, likely due to the accessibility and convenience of smartphones, especially in urban and semi-urban regions. Web App/Desktop users contribute to 25% of the tweets, suggesting that a significant portion of interactions also come from office, home, or professional environments, possibly including media outlets, official railway personnel, or advocacy groups. Twitter for iPhone represents 15% of the activity, pointing to a relatively smaller yet notable user base accessing content through Apple devices. The remaining 5% fall under the “Others” category, which includes third-party tools, bots, and lesser-used platforms. This platform-wise usage pattern emphasizes the mobile-first nature of social media interaction in India and the need for Indian Railways to optimize digital communication strategies for mobile users.

Hashtag	**Avg. Retweets**
#CharDhamYatra	120
#indianrailways	90
#railwayphotography	60
#ticketdepositreceipt	75
#railwaynewrojgardo	50a

Table 9: Retweet & Engagement Metrics per Hashtag (Avg. Retweets per tweet)

The average number of retweets per hashtag provides insights into how widely certain topics are shared and amplified within the Twitter community. The hashtag #CharDhamYatra leads in engagement with an average of 120 retweets per tweet, indicating strong public interest and high viral potential, likely due to its association with religious tourism and seasonal travel. Following this, #indianrailways averages 90 retweets, reflecting its central role in general discourse, updates, and national relevance. The hashtag #ticketdepositreceipt also shows notable amplification, with 75 average retweets, suggesting active sharing of passenger concerns related to refunds and IRCTC procedures. #railwayphotography garners 60 retweets on average, highlighting its appeal among

niche communities such as railway enthusiasts and hobbyists. In contrast, #railwaynewrojgardo, despite being widely used, sees a relatively lower average of 50 retweets, which may indicate saturation or fatigue in user-driven employment demands. Overall, the retweet data highlights that tourism and service-related hashtags tend to generate higher engagement and broader visibility compared to grievance or demand-oriented hashtags.

Source Type	#indianrailways	#railwaynewrojgardo	#CharDhamYatra
Official tweets	10,000	300	1,200
Public tweets / Replies	35,000	4,000	1,100

Table 10: Official vs Public/User-generated Hashtag Frequencies

The breakdown of hashtag usage by source type, official tweets versus public tweets and replies, offers important insights into the origin and nature of online discourse surrounding Indian Railways. The hashtag #indianrailways shows a strong presence across both sources, with 10,000 tweets from official accounts and a substantial 35,000 tweets from the public, indicating a balanced ecosystem of institutional communication and public engagement. This reflects the hashtag's wide applicability across service updates, news, and general railway-related discussions. In contrast, #railwaynewrojgardo is overwhelmingly driven by the public, with only 300 tweets from official sources compared to 4,000 from users, underscoring the grassroots nature of this employment-related campaign and the strong demand for job opportunities from aspiring candidates. For #CharDhamYatra, the usage is more evenly distributed, with 1,200 official tweets and 1,100 public tweets, highlighting a coordinated promotional effort by Indian Railways complemented by public interest and engagement. Overall, the data reveals that while certain hashtags are institutionally led (e.g., #CharDhamYatra), others like #railwaynewrojgardo are primarily citizen-driven, serving as digital platforms for advocacy, feedback, or demand amplification.

9. Major Findings

- The hashtag #indianrailways emerged as the most frequently used, with over 45,000 mentions, highlighting its central role in general discussions, service updates, and news dissemination on the platform.
- Hashtags like #railwaynewrojgardo, #railapprentice, and #rrc_level1_2019_waiting_list_do collectively showed high usage and predominantly negative sentiment, indicating strong public concern and dissatisfaction regarding railway recruitment and job-related issues.
- Hashtags such as #CharDhamYatra and #RamayanaCircuit received significant engagement and a balanced sentiment profile, reflecting Indian Railways' successful efforts to promote religious and cultural tourism via Twitter.
- Sentiment analysis revealed that employment and ticket refund-related hashtags (e.g., #railwaynewrojgardo, #ticketdepositreceipt) had high negative sentiment (70–85%), while photography and tourism-related hashtags showed predominantly neutral to positive sentiment.
- Hashtag usage peaked during March, September, and October 2023, correlating with seasonal travel, festivals, and special railway announcements. The lowest engagement was observed in July, possibly due to the monsoon season.
- The majority of tweets (55%) originated from Twitter for Android, confirming a mobile-first user base. Desktop/Web users accounted for 25%, and iPhone users for 15%.
- While official handles (e.g., IRCTC, Central Railway) contributed significantly to hashtags like #CharDhamYatra and #indianrailways, public users dominated discourse around #railwaynewrojgardo and recruitment-related hashtags, indicating citizen-driven advocacy.
- High co-usage was observed between related hashtags, such as #indianrailways with #railwayphotography and #railwaynewrojgardo, suggesting thematic clustering around service appreciation and employment concerns.
- Hashtags tied to tourism (e.g., #CharDhamYatra) received the highest average retweets (120), indicating higher virality compared to demand-related hashtags like #railwaynewrojgardo (50 retweets on average).
- Tweets were predominantly in English (60%), followed by Hindi/Hinglish (35%), with a small proportion (5%) in other regional languages. This reflects the need for continued multilingual engagement strategies by Indian Railways.

10. Conclusion

Our webometric analysis of Indian Railway-related Twitter hashtags highlights distinct patterns in public vs official communication, emotional tone, and co-usage behaviour. These insights can help railway authorities tailor digital engagement, grievance resolution, and promotional campaigns effectively. This study presents a comprehensive webometric analysis of Twitter hashtag usage related to Indian Railways, offering valuable insights into patterns of public engagement, sentiment, and communication strategies in the digital space. The findings reveal that hashtags such as #indianrailways, #railwaynewrojgardo, and #CharDhamYatra serve as focal points of online discourse, each representing distinct thematic clusters including general services, employment demands, and tourism promotion. The predominance of public-originated tweets—especially in employment and grievance-related hashtags—demonstrates Twitter's growing role as a platform for citizen advocacy and real-time feedback.

Sentiment analysis highlighted a polarity in user emotions: while tourism and photography-related hashtags evoked positive or neutral responses, job and refund-related hashtags were largely negative, indicating areas that require greater attention from railway authorities. The study also underscored the importance of platform usage and language diversity, with a majority of tweets posted

via Android devices and a significant portion composed in Hindi or Hinglish. Overall, the analysis suggests that Indian Railways' digital communication strategy is evolving but must be more responsive and inclusive. Strengthening two-way engagement, addressing public concerns promptly, and promoting multilingual outreach can help the organization better connect with citizens and enhance its service perception. As Twitter continues to serve as a vital channel for public interaction, webometric insights such as these can play a crucial role in shaping data-driven decisions and improving public sector communication effectiveness.

Further Research

While this study provides meaningful insights into hashtag usage and public engagement with Indian Railways on Twitter, it also opens several avenues for future research. First, extending the analysis to include other social media platforms such as Facebook, Instagram, and YouTube could provide a more holistic understanding of digital engagement across diverse user bases. Second, longitudinal studies spanning multiple years or major events (e.g., railway accidents, festival travel, or policy announcements) could offer deeper insights into how sentiment and discourse evolve.

Future research could also employ advanced machine learning techniques for more nuanced sentiment classification, including emotion detection and sarcasm identification, which are especially relevant in the Indian social media context where language is often mixed and informal. Additionally, geotagged data analysis could reveal regional trends in hashtag usage, enabling railway authorities to tailor services and communication efforts more effectively. Comparative studies involving other national railway systems (such as Japan Railways or Deutsche Bahn) may also help benchmark Indian Railways' social media performance globally. Finally, integrating passenger satisfaction data and operational metrics with webometric insights could lead to more actionable outcomes, bridging the gap between digital communication and on-ground service improvement.

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