Political Information Dissemination by Domestic Political Actors in Pakistan

Research Question and Method

Research Question: W*hat patterns form in the political information that gets disseminated on digital platforms in relation to local issues and events in Pakistan?*

We developed a comprehensive network analysis framework analysing over 400 hashtag campaigns. For each campaign, we constructed directed temporal networks where nodes represent users and edges represent temporal relationships in hashtag adoption. Edges were established when user B posted a hashtag after user A, with weights determined by relationship frequency and attributes including minimum time differences (Luczak-Roesch et al., 2015, 2018).

Network analysis included computing density, average degree, clustering coefficient, and reciprocity. Node-level metrics encompassed multiple centrality measures (degree, betweenness, closeness, PageRank, eigenvector). To detect coordinated behavior, we implemented three approaches: (1) temporal synchronization analysis examining rapid posting sequences within 60-second intervals, (2) window-based coordination detection analysing five-minute windows with posts from ten or more unique users, and (3) user type distribution analysis tracking different user categories (i.e., bots, spam etc.) within time windows.

Key Findings

Our analysis reveals striking differences between English and Urdu hashtag campaigns in terms of both scale and network patterns. The average degree of centrality for Urdu campaigns (5,507.82) is nearly five times higher than English campaigns (1,121.99), indicating much denser network connections and more intensive participation. This disparity is further reflected in the network metrics, where Urdu campaigns show notably higher PageRank (0.0055 vs 0.0011), betweenness centrality (0.0014 vs 0.0002), and eigenvector centrality (0.018 vs 0.005) values. The distribution of user types is also revealing, while both languages maintain a presence of all user categories, Urdu campaigns show a higher concentration of automated activity, with more bot/hybrid (104 vs 61 on average) and spam bot (90 vs 47 on average) accounts. The nature of campaigns differs as well, English hashtags like #9may, #absolutelynot, and #audioleak tend to focus on specific events or controversies, while Urdu hashtags such as #اب_صرف_عمران_خان and #الیکشن_کراؤ_ملک_بچاؤ appear more focused on ongoing political narratives and issues. This suggests that Urdu language campaigns are utilized more frequently for mobilizing discourses for mass persuasion purposes over time and English language campaigns are often event focused. Furthermore, due to limited content moderation interventions by digital platforms in languages other than English, Urdu hashtags are more often utilized to mobilize extreme rhetoric and narratives, an example is #مسلم_لیگ_ن_دہشتگرد (PMLN are Terrorists).

Key Contribution

Multi-lingual analysis of computational propaganda campaigns has previously focused on multi-country studies and contexts often examining the spread of Russian information operations in multiple language (English, Spanish, French, German etc.) across the world (Lai et al., 2024; Xu et al., 2025). However, our research sheds light on hashtag campaigns in multiple languages within the same political context by similar group of domestic political actors'.

Limitations and Ethical Consideration

This research faces inherent limitations of digital trace data analysis, following the Total Error Framework for Digital Traces (TED-On) (Sen et al., 2021). Platform errors include Facebook's evolving algorithms and content moderation policies. Processing errors stem from our TF-IDF vectorization approach for spam detection (1-3 n-grams, 10,000 features) potentially missing

semantic variations. Analysis errors include our bot detection threshold (200 posts/day) possibly missing sophisticated distributed networks.

In addition, our study focuses exclusively on verified accounts of political actors (politicians, parties, journalists) actively engaged in public political discourse. General users are analysed only regarding their participation in public hashtag campaigns. This approach minimizes privacy concerns while maintaining research validity.

References

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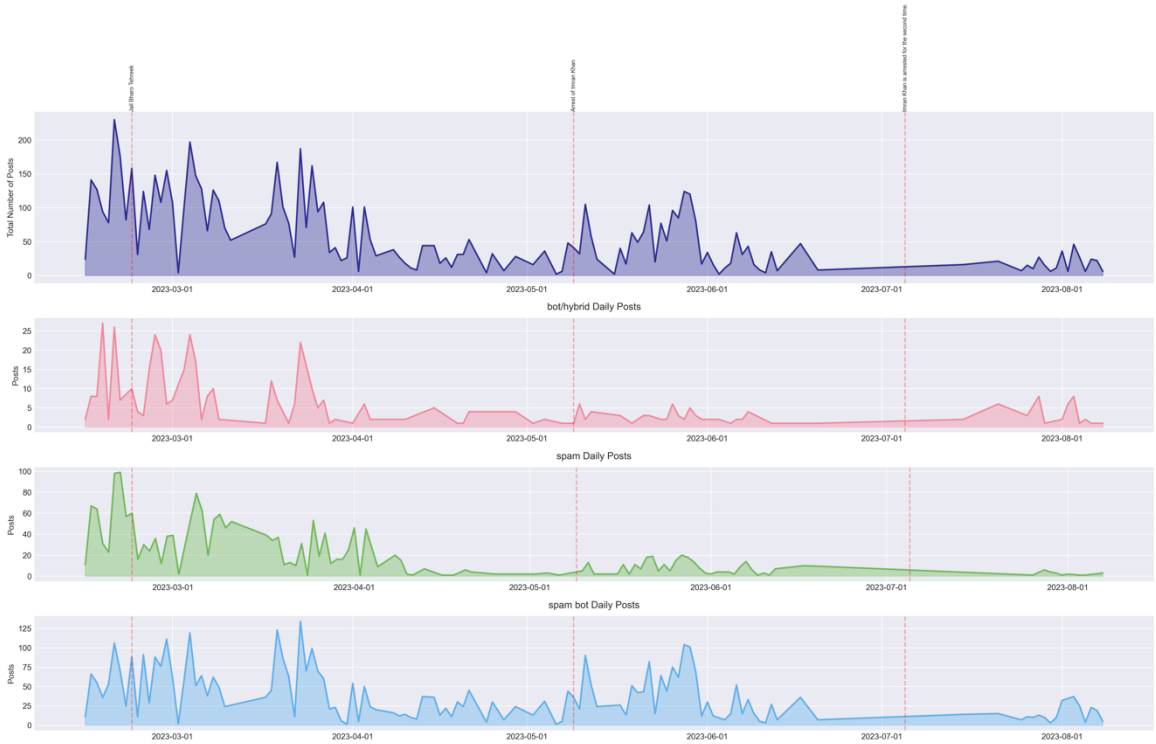
Figure 1: #یہ_جو_نامعلوم_ہے_وہ_سب_کو_معلوم_ہے Time-series Visualization



Note: This is an example of an Urdu hashtag campaign completely initiated and amplified by bot and spam accounts during the tense stand-off between PTI and Pakistan Military Establishment during 2023.