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# Affording Fragmented Audiences: Multi-Platform Deliberation within the Five Star Movement

Francesco Marolla <sup>a</sup>, Marilù Miotto <sup>b</sup>, Giovanni Cassani <sup>c</sup>, and Francesco Bailo <sup>d</sup>

<sup>a</sup>Department of Social and Political Sciences, University of Milan, Milan, Italy; <sup>b</sup>School of Social and Behavioral Sciences, Erasmus University Rotterdam, Rotterdam, the Netherlands; <sup>c</sup>Department of Cognitive Sciences and Artificial Intelligence, Tilburg University, Tilburg, the Netherlands; <sup>d</sup>School of Social and Political Sciences, University of Sydney, Sydney, Australia

## ABSTRACT

We examine how multi-platform digital environments influence intra-party dynamics within political organizations, focusing on the Italian Five Star Movement (M5S) as a paradigmatic case of extreme digital party. Leveraging a unique dataset spanning five online platforms central to the M5S community – Beppe Grillo’s Blog, the M5S Forum, Meetup, Facebook, and the website of the M5S 2012 online primaries – this research classifies platforms based on their affordances (visibility and associability) to analyze cross-platform activity, communication patterns, and candidate selection. The findings reveal the fragmented nature of multi-platform environments in fostering simultaneously centripetal and centrifugal dynamics within political organizations, highlighting critical implications of digital platforms for intra-party dynamics. We identify significant differences in platform affordances, with communication emerging as either top-down or horizontal. Cross-platform engagement is limited and asymmetric, with grass-roots-oriented platforms fostering cross-engagement as opposed to top-down platforms, reinforcing boundaries that hinder internal cohesion. Leadership communicative influence varies across platforms, suggesting that user behavior and platform design mediate leadership power. Candidate selection reflects both leadership and grassroots dynamics: candidates’ success correlates with local network centrality on Meetup and alignment with leadership messaging on Facebook. Our study reveals how multi-platform environments generate fragmented patterns of internal communication and influence within political parties when they progressively increase their exposure to the mediation of digital technologies and provides insights into their broader implications for democracy, given the centrality of parties in elite selection and the functioning of democratic systems.

## KEYWORDS

Social media affordances; digital parties; cross-platform analysis; Computational Social Sciences; social network analysis

## Introduction

As digital platforms mediate an increasing volume of political communication, they have become powerful political actors whose decisions significantly shape political discourse and

**CONTACT** Francesco Bailo  [francesco.bailo@sydney.edu.au](mailto:francesco.bailo@sydney.edu.au) 

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influence politics (Bratton, 2016; Klinger et al., 2023). Platforms' communication power – broadly defined as the ability to influence, shape, or control the flow of information and, consequently, those who receive this information (Castells, 2009) – derives from their capacity to distribute interfaces to billions of users while maintaining centralized control over their systems' use and access (Bratton, 2016). Platforms' users – including the leadership of political organizations and their audiences – must contend with the platforms' communication powers, navigating architectures and mechanisms that can amplify or suppress their presence.

The fragmentation of the broader media ecosystem driven by technological innovation and its commercialization (Mancini, 2013), as well as by the shift toward individualized, network-based communication patterns, has produced a segmentation of audiences. However, the media environment that people experience remains strongly *interconnected*, as individuals shift their attention across multiple networks and audiences, “receiving political information over an unprecedented number of devices, formats, platforms, channels, and locations” (Thorson & Wells, 2016, p. 320). Recent studies by the Pew Research Center (2024a, 2024b) show widespread multi-platform usage: in the U.S., 92% of adults use at least one platform and over half use four or more; in eight middle-income countries, 71% use at least one and 28% use four or more. This widespread multi-platform use requires political leaders and organizations to handle an environment where audiences are dispersed across platforms with varying affordances (Ronzhyn et al., 2022; Treem & Leonardi, 2013) each shaping distinct distributions of communication power between leadership and their audiences – differences that are the central focus of our study.

While attention has been paid to how digital platforms influence various aspects of public debate (e.g., election campaigns, voter mobilization, and political polarization), less focus has been placed on their impact on political organizations (see Barberà et al., 2021). Platforms are increasingly integrated into parties' internal operations, transforming how they engage members, deliberate policies, coordinate activities, and select candidates (Deseriis, 2021; Gerbaudo, 2019). Data from the Political Party Database Project (2016-2019) shows that out of 268 parties from 48 countries, 96% of political parties promote their presence on at least one social media platform (Scarrow et al., 2022). This integration reshapes communication flows, enables direct interaction between leadership and grassroots, alters decision-making through participatory mechanisms, and reconfigures power dynamics, often bypassing traditional intermediaries (Chadwick & Stromer-Galley, 2016). However, while platforms can foster *centrifugal* dynamics through horizontal participation and decentralization (Bennett & Segerberg, 2012), they may also reinforce *centripetal* dynamics, consolidating leadership power (Caiani et al., 2022; Deseriis, 2021; Dommert et al., 2021; Gerbaudo, 2019). Analyzing how multi-platform environments shape internal party structures is therefore crucial for understanding intra-party dynamics, power balances, and leadership emergence in increasingly digital political landscapes. Namely, how do multi-platform environments simultaneously foster centrifugal (decentralized) and centripetal (hierarchical) dynamics within political organizations, and what are the implications for intra-party dynamics?

To address these questions, we analyze the case of the Five Star Movement (M5S) between 2010 and the Movement's primaries in December 2012, held online before the 2013 general election. We refer to the M5S as a *digital-first party*, following its early adoption of digital platforms for core organizational functions (Barberà et al., 2021; Gerbaudo, 2019). But we consider it also as an *extreme case* of a digital-first party since

nearly all intra-party dynamics were mediated through online platforms during its formative phase. Uniquely, the M5S started its political trajectory as a social media platform – Beppe Grillo’s Blog – before expanding between 2005 and 2010 into other platforms. The M5S combined hierarchical platforms like Grillo’s Blog with decentralized ones like Meetup, leveraging both self-hosted and external platforms to expand its audience. Especially before its 2013 electoral success and subsequent bureaucratization, these platforms were central to the M5S’s organization, mediating nearly all internal dynamics through its public or semi-public digital platform ecosystem. This makes it a paradigmatic case of a digital-first party, where platform architectures directly shaped deliberation, mobilization, and candidate selection. While digital-first parties remain rare, the prominence of platformed communication within parties is growing, and the early M5S illustrates the potential costs and benefits of organizing political activity primarily through platforms, serving as both a model and a cautionary tale for emerging digital-first formations. The M5S’s coalescence years provide a unique opportunity to examine how digital platforms influenced intra-party dynamics, before external dynamics linked to bureaucratization had yet to significantly shape the organization (see Caiani et al., 2022; Crulli, 2023). The challenges the M5S faced – balancing centralized leadership and grassroots participation across diverse platforms, shaped by the affordances of owned and external platforms – mirror dynamics observed in more recent political organizations (e.g., France Insoumise and Podemos), highlighting its continued relevance to understanding contemporary digital politics (e.g., Barberà et al., 2021; Bennett et al., 2018; de Nadal, 2023). Studying this extreme case sheds light on tensions likely to emerge as traditional parties internalize platform-based governance.

We conduct a quantitative analysis leveraging a unique combination of datasets from different social media platforms (Bailo, 2020) and from the voting platform used for the M5S 2012 online primaries (Marolla et al., 2023) to investigate how the multiplatform environment affects various aspects of intra-party dynamics. First, we assess platforms’ communication orientation – ranging from more hierarchical to more decentralized and horizontal – using network measures of two key affordances: visibility and associability. Second, we study the porosity of platform boundaries by examining user co-presence across platforms, as a way to assess internal cohesion within the party. Third, we examine the communication power of leadership and audiences across different platforms by assessing the leadership’s capacity to influence online conversations and the audiences’ capacity to diversify them. Fourth, we consider the influence on candidate selection by analyzing primary outcomes with candidates’ network positions across the digital ecosystem. Through this research, we contribute to cross-platform studies (Bode & Vraga, 2018) and literature on digitalization of political organizations (Barberà et al., 2021), investigating how multi-platform ecosystems could simultaneously foster parties’ internal democracy and facilitate leadership’s control over the organization.

## **The Distribution of Power in Multi-Platform Political Organizations**

Platforms have become essential for political organizations, functioning not only as tools for external campaigning but also as key spaces for internal organization and democratic processes (Barberà et al., 2021; Kreiss, 2012; Scarrow, 2015). Platforms are employed to enable members to engage directly in activities such as policymaking, decision-making, and

candidate selection, fundamentally reshaping traditional organizational structures (Deseriis, 2021; Gerbaudo, 2019). While mainstream political parties have been integrating platforms for their practices (e.g., Dommett et al., 2021), their use has been particularly pronounced among anti-establishment parties and social movements, such as the *M5S*, *Podemos*, *La France Insoumise*, and the Pirate Parties across Europe. These parties have leveraged digital platforms to challenge established hierarchies, mobilize public dissatisfaction, and foster decentralized participation (de Nadal, 2023; Deseriis, 2020; Gerbaudo, 2021). Platforms, thus, disrupted the political landscape, transforming political parties and setting a stage where old and new actors compete for the communication power their technology affords.

The growing *platformization* of political parties (Gerbaudo, 2019) raises crucial questions about platform's influence on politics. The emergence of platforms as both mediators and holders of communication power invites the development of a new framework to understand their role, particularly in the context of political organizations, where power is now contended among platforms, leadership, and grassroots audiences.

To better understand the evolving distribution of power in platformed political organizations, we build on Castells (2009) typology of power in the "network society." Castells identifies four forms of communication power. *Network-making power* is the most fundamental – it refers to the ability to build, shape, and control networks themselves, determining who is included and how the network operates. *Networked power* emerges from one's position within the network, allowing some actors to exert influence over others simply by virtue of their connections. *Networking power* involves controlling who can access the network – who is allowed in and who is kept out. Finally, *network power* refers to the ability to set the rules, standards, and protocols that govern how interaction within the network happens.

In Table 1, we adapt this typology to the context of platformed political parties, providing a theoretical overview on how each form of power is exercised differently by the owners of digital platforms, party leadership, and grassroots audiences. This framework allows us to

**Table 1.** Forms of power in platformed political organizations.

Forms of Power in a network society (Castells, 2009)	Actors Exercising Power		
	Digital Platforms	Leadership	Grassroots Audiences
<i>Network-making power</i> (capacity to shape network structure and reach)	<i>Instrumentarian power</i> (Zuboff, 2018): Power to shape user behaviors through algorithmic design and data	<i>Collective action</i> : Power to strategically organize and mobilize followers top-down	<i>Connective action</i> (Bennett & Segerberg, 2012): Power to coordinate horizontally through decentralized networks
<i>Networked power</i> (direct communicative power within networks)	<i>Curation power</i> (Gillespie, 2018): Power to filter, amplify, or suppress content	<i>Centripetal power</i> : Power to consolidate and centralize control through selective communication	<i>Centrifugal power</i> : Power to decentralize and diversify interactions, enabling grassroots influence
<i>Networking and Network powers</i> (control over network access and standards)	<i>System administration power</i> (Bratton, 2016): Exclusive control over platform rules, access, and content moderation	(Surrendered to Platforms)	

explain the distinct but overlapping ways digital platforms structure intra-party communication and power dynamics.

Platforms' communication power is qualitatively and quantitatively unprecedented from a historical perspective. It derives from their capacity to distribute interfaces to their technologies to up to billions of users while maintaining central control over their systems' use and access (Bratton, 2016). Platforms' sovereignty within the boundaries of their digital architectures faces very few constraints and is exercised through three forms of power. At the lower level, their networking and network powers are part of their *system administration powers*, which allows platforms to determine who can use a platform and what information and communication technologies can be used. At a higher level, their network-making form of power corresponds to their *instrumentarian power* to observe, interpret, and modify user behavior (Zuboff, 2018). This is the power of platforms to "program [...] organize and operate mass communication networks" (Castells, 2009, p. 420). Finally, at the intermediate level, platforms' networked power – the immediate and direct communicative power over the nodes of a network – is defined by their *curation power* (see Gillespie, 2018), which is the power to select the information presented to users through the platforms' interfaces.

As political organizations migrate to digital platforms, their leadership and grassroots audiences must navigate the power dynamics imposed by platform hosts. As platform users, they effectively relinquish networking power – the ability to control access to the platformed network, leaving them vulnerable to deplatforming – and network power, which governs the standards and protocols of interaction. However, within the framework of platform sovereignty, they retain network-making power: leadership can utilize platforms' affordances to drive *collective* action, while grassroots audiences harness them to enable *connective* action (Bennett & Segerberg, 2012).

Building on this understanding of platforms' multifaceted power, we outline two forms of communication power that are critical for the theorization and operationalization of our study: centrifugal and centripetal power. These two theoretical concepts explain the distribution of communication power among leadership and audiences and how this distribution is shaped by the corresponding networked power held by platforms: their curation power. *Centrifugal* power arises when platforms lower barriers to participation, amplify opportunities for horizontal networking, and empower grassroots actors to influence key decisions and policy discussions. Conversely, *centripetal* power emerges as leaderships leverage platform power to consolidate decision-making authority and reinforce hierarchical structures. These powers coexist and interact (in synergy or conflict) in multi-platform environments. Affordances and governance models do not necessarily determine a platform's orientation: notably, decentralized platforms can still amplify prominent actors, while smaller hubs can thrive within broader centralized networks.

If the distribution of networked power among leaders, audiences, and platforms dynamically emerge at the platform level, in a multi-platform environment this distribution can vary significantly. We argue that a platform's communication orientation – whether top-down (promoting centripetal power) or horizontal (promoting centrifugal power) – can be explained and measured by its social media *affordances*. We refer to affordances as the "properties of social media, emerging through the relation of technological, social, and contextual, that enable and constrain specific uses of the platforms" (Ronzhyn et al., 2022, p. 14). Social media affordances are not technical features or communication outcomes but relational properties, real or imagined by users (Nagy & Neff, 2015), arising from the

interaction between the architectures of platforms and the motives of users. Because of this, observed dynamics must be interpreted cautiously: the same social media technology in the context of a different audience could result in different affordances but also a change in motives by the same audience could result in the affordances being used differently.

In the context of political organizations and their internal communication power distribution, we contend that the platform's specific affordances of *visibility* and *associability* (Kim & Ellison, 2022; Treem & Leonardi, 2013) play a key role in enabling centrifugal or centripetal powers. *Visibility* is the property that allows users to see and be seen within a platform, whereas *associability* is the property that allows users to associate and be associated with other users and content (e.g., news, stories, and photos). In the context of parties, visibility and associability shape how members interact, form networks, and access information, influencing whether platforms foster grassroots participation by empowering active users or reinforce leadership control by amplifying loyal members, thereby affecting intra-party dynamics. Visibility and associability emerge along two dimensions: a local dimension and a global dimension. Local visibility and associability enhance communication within small, dense networks, fostering grassroots engagement and supporting centrifugal dynamics. In contrast, global visibility and associability facilitate communication across larger, dispersed networks, amplifying leadership messages and reinforcing centripetal dynamics.

## The M5S Multi-Platform Environment

The M5S provides a fitting context to operationalize our framework, given its early and intensive use of digital platforms for internal organization. Founded in 2009, the M5S disrupted Italian politics with their ideology blending techno-utopianism (Natale & Ballatore, 2014) with populism (Mosca & Tronconi, 2019), in which digital technologies are central for direct democracy. Though claiming a “neutral” ideological stance (Pirro, 2018), the M5S promoted digital participation as the key to restore power to the people and ensure true governance (Deseriis, 2020). To this end, platforms like *Beppe Grillo's Blog*, *Meetup*, *Facebook*, and the *Forum* were used to promote citizen participation in contrast to the traditional parties and media.

The M5S employed various platforms to structure its party organization (Mair & Katz, 2002), each serving a distinct ideal purpose. *Beppe Grillo's Blog*, functioning both as the voice of the *party's central office* and as the leader's own personal voice, promoted the party's main goals and strategies. *Meetup* acted as the core platform for the *party on the ground*, enabling the organization of in-person events about national and local issues for local grassroots groups. The *Forum* served as a deliberating online community, allowing registered members to engage and post proposals horizontally. *Facebook* facilitated the communication of the *Blog's* content to a wider audience, extending the reach of the party's political message. Finally, the e-voting platform established for the 2012 primaries supported the elite selection function.

In *Table 2*, we use the communication orientations and affordances outlined above to characterize the M5S platforms. This characterization will frame our analysis. The *Blog* and *Facebook* reflect a top-down orientation, as M5S leadership uses these platforms to broadcast messages with limited bottom-up feedback, creating a centripetal communication flow that concentrates attention on leadership figures. Although *Facebook* allowed users for

**Table 2.** Comparison of affordances and outcomes across M5S digital platforms.

M5S Platform	Communication Orientation	Affordances			
		Local		Global	
		Visibility	Associability	Visibility	Associability
Blog	Top-down Centripetal	low	low	high	high
Meetup	Horizontal Centrifugal	high	high	low	low
Forum	Horizontal Centrifugal	mid	mid	low	low
Facebook	Top-down Centripetal	high	high	high	mid
E-voting site	Top-down & Bottom-up	mid	low	low	low

considerably higher autonomy than Grillo's Blog, its usage within the M5S was following a hierarchical, one-to-many pattern, as it was especially used by M5S prominent figures to amplify their message beyond the Movement (Bailo, 2020). In contrast, Meetup and Forum reflect a horizontal orientation, supporting M5S's grassroots organizing efforts by promoting peer-to-peer interaction and community building.

We formulate four hypotheses to examine how multi-platform integration influences intra-party dynamics, focusing on platform affordances, cross-platform engagement, distribution of communication power, and candidate selection processes.

First, we expect top-down platforms (Blog, Facebook) to show higher *global* visibility and associability, and grassroots platforms (Meetup, Forum) to show higher *local* visibility and associability (**H1**). Platforms enhancing global visibility and associability affordances are likely to facilitate top-down communication by allowing to broadcast messages to a wide audience (Ellison et al., 2007; Papacharissi, 2009), thus enabling centralized dissemination of information and strengthening leadership influence. Conversely, platforms promoting local visibility and associability affordances could foster grassroots mobilization by enabling users to engage in localized, horizontal interactions and coordinate (Bennett & Segerberg, 2012; Gibson, 2015). These platforms support decentralized communication structures, empowering local coordination and organization.

Second, we expect limited cross-engagement, with users of grassroots platforms (Meetup and Forum) more likely to engage across multiple platforms than users of top-down platforms (**H2**). Although users often engage with multiple platforms for different purposes, this does not necessarily result in integrated political engagement. Platform features such as hashtags and algorithmic recommendations allow content to circulate across domains, exposing users to political communication in varied contexts (Tufekci, 2017). However, previous research suggests that platform boundaries – reinforced by differing user behaviors, norms, and governance models – often lead to fragmented communication patterns that restrict user migration (Steppat et al., 2022; Theocharis et al., 2023; Vaughan et al., 2023). Each platform's unique communication logic and user culture can inhibit cross-platform engagement (Klinger & Svensson, 2015; Steppat et al., 2022; Theocharis et al., 2023; Vaughan et al., 2023), and specific affordances and user experiences create barriers that keep users within familiar environments (Sundar & Limperos, 2013). Platform loyalty further affects engagement patterns, with users choosing to engage deeply within a single platform rather than spreading their activity

(Brandtzaeg & Heim, 2011). A platform's communication orientation can inherently influence users' propensity to engage across platforms. Users of horizontally oriented platforms, emphasizing grassroots participation and decentralized communication, may be more inclined to seek broader, multifaceted engagement to fulfill their participatory needs (Gibson, 2015). These platforms can act as engines of internal cohesion, encouraging users to bridge platform boundaries.

Third, we expect leadership's communication power to be stronger on top-down platforms (H3). The hierarchical nature of some platforms versus the grassroots-driven and localized associability of others suggests how affordances can align with or counteract organizational hierarchies, impacting the distribution of communication power (Gibbs et al., 2013). On the Blog and Facebook, visibility and associability can amplify top-down communication (Ellison & Boyd, 2013; Leonardi, 2014). Conversely, the affordances of grassroots-oriented platforms like Meetup and the Forum foster spaces where leadership influence may be moderated or resisted by user-driven interactions (Bennett & Segerberg, 2012). The networked nature of grassroots platforms can encourage redistribution of attention and shift influence away from leadership, diluting their dominance in discourse (Jenkins et al., 2013).

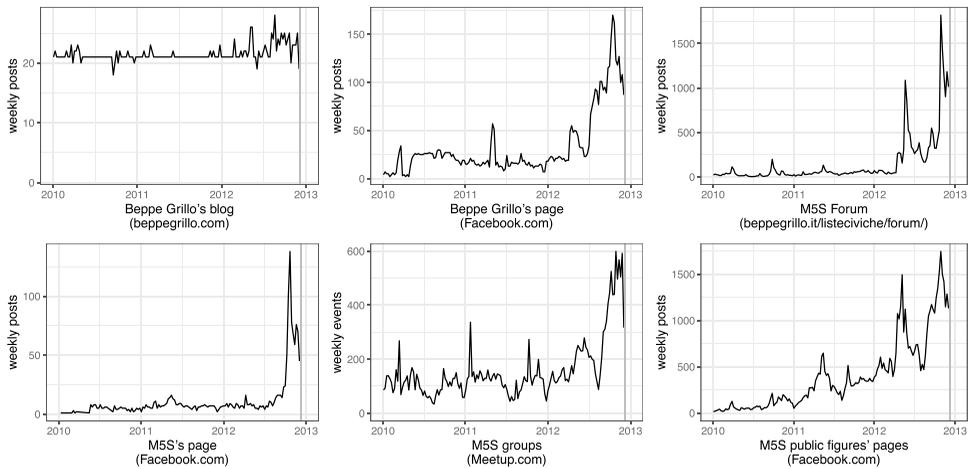
Finally, we hypothesize that the candidate selection process will reflect the interplay of top-down and horizontal engagement, shaped by leadership and audience-driven dynamics (H4). Centralized platforms can enhance leadership influence via viability and endorsement cues (Lau & Redlawsk, 2001), where voters perceive candidates close to leadership as more viable and capable of attaining power. Conversely, grassroots-oriented platforms enable candidates to build social networks and enhance electoral performance (e.g., Cruz, 2019). Active participation on these platforms also allows candidates to showcase strong track records, increasing their chances of being elected (Kam et al., 2010). Nevertheless, leadership may also affect selection outcomes via governance mechanisms like interface design (Marolla et al., 2023) and content curation policies. By controlling information availability on their voting platforms, leadership can influence election outcomes by leveraging the availability heuristic, where individuals rely on easily recalled information.

## Research Design<sup>1</sup>

We address the four hypotheses using different quantitative methods, including text and network analysis. Data from the online voting platform and the ranking of candidates resulting from the online vote was collected in 2013 (Marolla et al., 2023), while the data from the Blog, Meetup, Facebook, and the Forum was collected in 2015 (Bailo, 2020).<sup>2</sup> The temporal scope of the analysis is limited by the integration of the different platforms into the M5S's online ecosystem<sup>3</sup> and the online primaries on 7 December 2012. [Figure 1](#) shows the frequencies of new threads and Meetups between January 2010 and December 2012.

## E-Voting Data

The voting platform data were scraped from the website hosting the online primaries. The dataset contains, for each candidate: name, surname, age, profession, gender, screen position by district, and whether the picture contains the party's logo. Candidates' previous



**Figure 1.** Activity frequency between 2010 and 2012 on platforms.

candidacy in local elections was obtained by merging the voting platform data with the data of the Italian electoral results at different levels between 2007 and 2012.

### **Social Media Data**

Social media platform data from the Blog and the Forum was scraped (Bailo, 2020). Data from Meetup and Facebook was collected using their public APIs. Meetup groups linked to the M5S were identified using selected search terms. Facebook data was instead collected based on public posts published on Beppe Grillo's page, the page of the Five Star Movement and the pages of 944 M5S leaders identified through snowball sampling.

### **Platform Networks**

We derive two types of networks from social media data: a network of users and a network based on the content of their postings. For the Blog, Facebook, and the Forum, a directed network of users was drawn based on users' replies to each other's postings. For Meetup, an undirected link was drawn between two users if they registered to attend the same event. The network of users, based on interactions like replies and co-attendance, represents relational dynamics within and across platforms, enabling analysis of communication patterns, audience cohesion, and the distribution of power between grassroots and leadership. Networks relating users' postings based on their content were drawn based on results from topic modeling (more details below) and entity recognition using spaCy. Network statistics were measured both at the global level, or at the level of the largest connected component, and at the level of single nodes. Communities were identified using the Walktrap algorithm for large networks (Pons & Latapy, 2005). We relied on user names to map users' behavior across platforms. To reduce the chance of matching user names belonging to different individuals, we excluded usernames that did not contain a given name and a surname or that contained non-alphabetical characters. We also excluded combinations of given names and

surnames that were too common as they appeared more than twice in a list of 2.7 million unique profiles created using details of Facebook users commenting or liking public posts published by the Movement and its leadership.

### ***Affordance Measurement***

The affordances we are interested in to characterize platforms are high-level properties. We measure them using as proxies metrics from the networks of users. To estimate local visibility, we use the link reciprocity ratio, assuming that users who exchange comments must be able to keep track of each other's activity. Similarly, local associability is measured as the link transitivity ratio under the assumption that the presence of a relatively high number of close triplets signals a capacity to maintain local communities. At the global level, visibility is captured as the standard deviation of the in-degree distribution with high values signaling the potential for, while not necessarily the realization of (Nagy & Neff, 2015), high visibility across the platform. Global associability is measured by the mean distance between each node and all the other nodes, with a high-value signaling low global associability and a low-value high associability.

### ***Measure of Communicative Power***

For each post by Grillo on the Blog, we collected the comments posted on the same platform, the posts on the Forum, the Facebook posts, and the descriptions of Meetup events posted in the next 7 days. For each platform, we then measured the degree of overlap with the original leader's post considering uni-, bi-, and tri-grams that recur in both. We sampled 10% of all posts on each platform to compute baseline n-gram frequencies. This accounts for the possibility that n-grams recur across multiple posts simply because they are generally frequent, rather than signaling direct influence from leadership communication. All texts were lightly pre-processed to exclude punctuation and links. Next, we calculated the percentage of n-grams from Grillo's post that reappeared on each platform. To calculate this percentage, we first identified n-grams that appeared at least three times more frequently in the specific week compared to baseline. We then divided this count by the total number of uni-, bi-, or tri-grams. We excluded uni- and bi-grams containing stopwords and tri-grams containing more than one stopword. The overlap in n-grams in consecutive communication acts has been extensively used to measure alignment in dialog (Srivastava et al., 2025; Fernandez & Grimm, 2014). We employed the same approach in a different context. The choice to examine exact overlaps rather than general shared meaning allows us to focus on users who adopt the leader's precise wording after it appears chronologically, signaling that they not only discuss the same topics but use the exact same words.

### ***Topic Modeling***

We trained two Contextualized Topic Models (CTM) (Bianchi et al., 2021) using an Italian sentence transformers model (sentence-bert-base-italian-uncased). A first CTM was trained on the posts published by Beppe Grillo on his Blog between 2005 and the online primaries in December 2012, while a second CTM was trained on a sample of five comments to each of the same Grillo's posts. The two CTMs aim to capture the language of the leadership and

the language of the Blog's audience, respectively. We converged on 26<sup>4</sup> topics for each model: this number was obtained by the average coherence score of five models for each number of topics between 15 and 30.<sup>5</sup> The 26 resulting topics for each CTM were independently labeled by two coders (first and third author) using the topics' 25 most representative words: only the topics that were assigned a similar label by the two coders were included in the following analyses. Through this methodology, we aim to capture the degree to which a user is associated with certain words having similar statistical distributions in the underlying corpora. This offers a finer-grained characterization of the underlying construct than using keywords, as these may be highly polysemous and conflate different themes (consider, for example, *energy* which is found in texts about mobilization and about energy production and consumption): CTMs, by relying on contextualized language models, are able to tease these apart and attribute them to different distributions. To determine whether platforms discuss similar or divergent topics, we classified all posts from each platform using both CTMs. This process generated a vector for each post showing the prominence of each topic identified by each CTM. We then trained two separate Linear Discriminant Analysis (LDA) classifiers using as predictors the weights associating topics to postings by each CTM separately and as a dependent variable the platform where the posting was published. We trained both LDA classifiers on 2,000 posts from each platform and then tested them on all remaining posts. If we can predict which platform a post comes from based on its topic composition, this indicates that different platforms feature discussions on distinct, at least partially segregated topics.

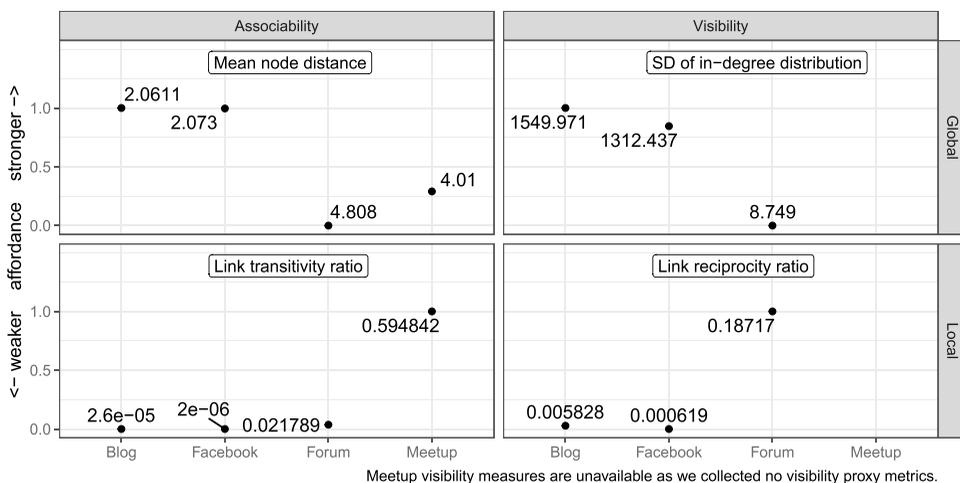
### **Modeling Primary Results**

To model candidates' rankings in the 2012 online primaries (vote counts were unavailable), we used features from the e-voting and social media platforms, including network centrality (single and cross-platform), topic heterogeneity based on candidate engagement, and measures of proximity to Beppe Grillo derived from network analysis and topic distribution similarity. We opted to use random forests (RFs) to study whether there is a robust relationship between different sets of predictors and the electoral outcome. RFs avoid the assumption of a linear relationship between dependent and independent variables and are robust to collinear predictors since each tree leverages a fraction of the available independent variables (one-third, in our case). We ran different RF models with varying sets of predictors, running each model 100 times to derive robust estimates. We input predictors in batches to monitor whether adding new predictor sets improves the variance explained in our dependent variable: candidate rank in the election. We unit-normalized ranks by district so that first-place candidates have a value of 0 and last-place candidates have a value of 1, regardless of the number of competing candidates per district.

## **Results**

### **Cross-Platform Affordances**

First, we measured the visibility and associability of platforms at the local and global scales. [Figure 2](#) presents the four network metrics that we use as a proxy to measure affordances. The results align with expectations: Meetup and the Forum afford local and horizontal



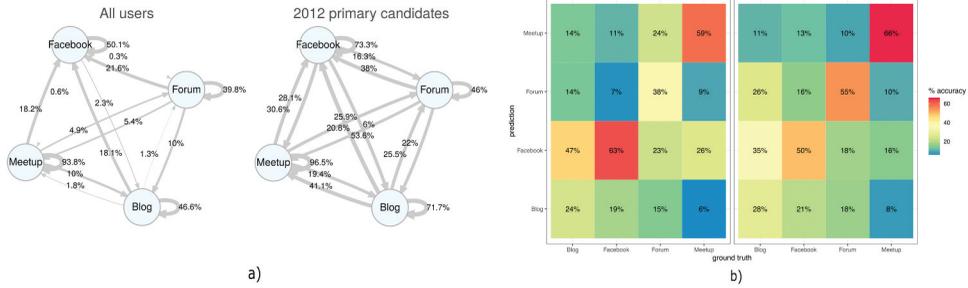
**Figure 2.** Normalized network measurement of affordances across platforms.

communication, while the Blog and Facebook afford global but top-down communication. The Forum does afford very strong local visibility and local associability – with about one directed tie in five being reciprocated and 2% of triplets closed – but limited global visibility and associability. Similarly, because of a combination of design choices and geography, Meetup offers extremely high local associability, with 60% of the triplets being closed, and low global associability. Although Facebook provides features to engage with a network of close friends and navigate their comments – making the platform a hybrid with both horizontal as well as top-down communication fed to users by the platform’s curation mechanisms – most of the communication within the Movement’s pages is oriented vertically with extremely low local visibility and associability and high global visibility and associability. The Blog’s affordances – which did not allow users to curate a profile or a friend list – are remarkably similar to those of Facebook, suggesting that the two might have played, at least at the time, a similar centripetal role, focusing the attention of the M5S audiences on the leadership.

### **Cross-Platform Integration**

We measure cross-platform integration using the network of users linked by their engagement and the network of content linked through topic modeling. [Figure 3\(a\)](#) shows the proportion moving across platforms. The percentage values on the arrows indicate, for each platform of origin where the first activity is recorded, the proportion of users active a second time (through a posting or participation in an event) on the same platform and on the other three platforms. As expected, we detect significant barriers to cross-platform activity, as evidenced by the proportion of users active a second time on a *different* platform being always a fraction of those active again on the *same* platform. More importantly, we show that the two horizontally oriented platforms, the Forum and Meetup, tend to see a higher proportion of their users moving to the other platforms while the Blog and especially Facebook, significantly less so. This signals a difference in terms of audiences.

Finally, in [Figure 3\(b\)](#), we report the confusion matrix resulting from classifying postings using LDA classifiers trained on each CTM’s topic distributions. High

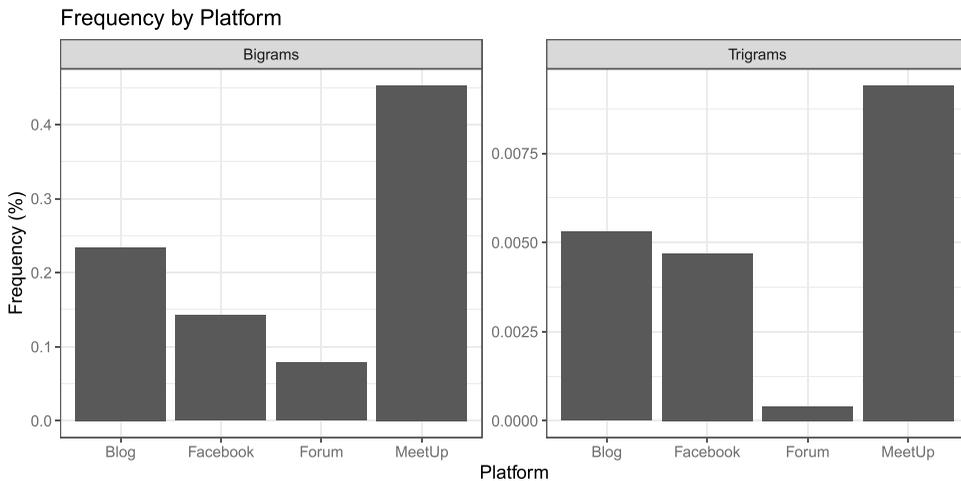


**Figure 3.** Cross-platform user migration and topic fragmentation. Note: Panel (a) shows directional flows of users who posted across M5S platforms. Arrows originate from a user's first platform and point to subsequent activity. Arrow thickness represents frequency. Panel (b) shows confusion matrices from a Linear Discriminant Analysis (LDA) classifier trained on topic distributions obtained using Contextualized Topic Models (CTMs) trained on postings from the base (left) and leader (right); color reflects how well platform-specific topics predict the source of a post. Strong red diagonals indicate platform-segregated discussions.

accuracy shows that one could predict a post's hosting platform from the topics a CTM detected, and thus that different topics tend to be discussed in each platform. We thus report a degree of fragmentation with platform-specific topics emerging especially on Facebook and Meetup. This indicates a distinction in discussion preference, also suggesting different audiences.

### ***Analysis of Communicative Power***

We use the proportion of uni-, bi-, and tri-grams which appeared in a posting by the leadership and then recurred verbatim in postings on different platforms in the following week. We consider only n-grams which occur three times more frequently during that week than expected based on their average frequency across weeks to exclude n-grams which overlap just because they are naturally frequent. The percentage of shared uni-grams shows two clear clusters which only partially align with our hypotheses. The comments on the blog and the posts on the Forum in the week following a post by Grillo on the Blog show the lowest degree of overlap, indicating that the discourse on these two platforms did not follow specific communicative patterns which appeared in the communication by the leadership. On the contrary, Facebook posts and descriptions of Meetup events show a similar and considerably higher proportion of communicative patterns proposed by the leadership. However, as shown in Figure 4, bi- and tri-grams show that the communication on Meetup was much more heavily influenced than that on other platforms, with Facebook and the Blog being rather similar. Therefore, while the keywords (uni-grams) recurred also on Facebook, more specific phrases used by the leader recurred more on Meetup. This signals a tension between the horizontal nature of the platform and its use in the M5S, where it acted as a sounding board of the leader's communication.



**Figure 4.** Verbatim overlap of leadership discourse across platforms. Note: Bars represent the percentage (y-axis) of bi- and tri-grams (faceting) from Grillo's blog posts that appeared more frequently than baseline in user-generated content on other platforms (x-axis) over the following week. Higher values indicate greater lexical alignment with the leader's posts.

### Multi-Platform Effects on Online Primaries

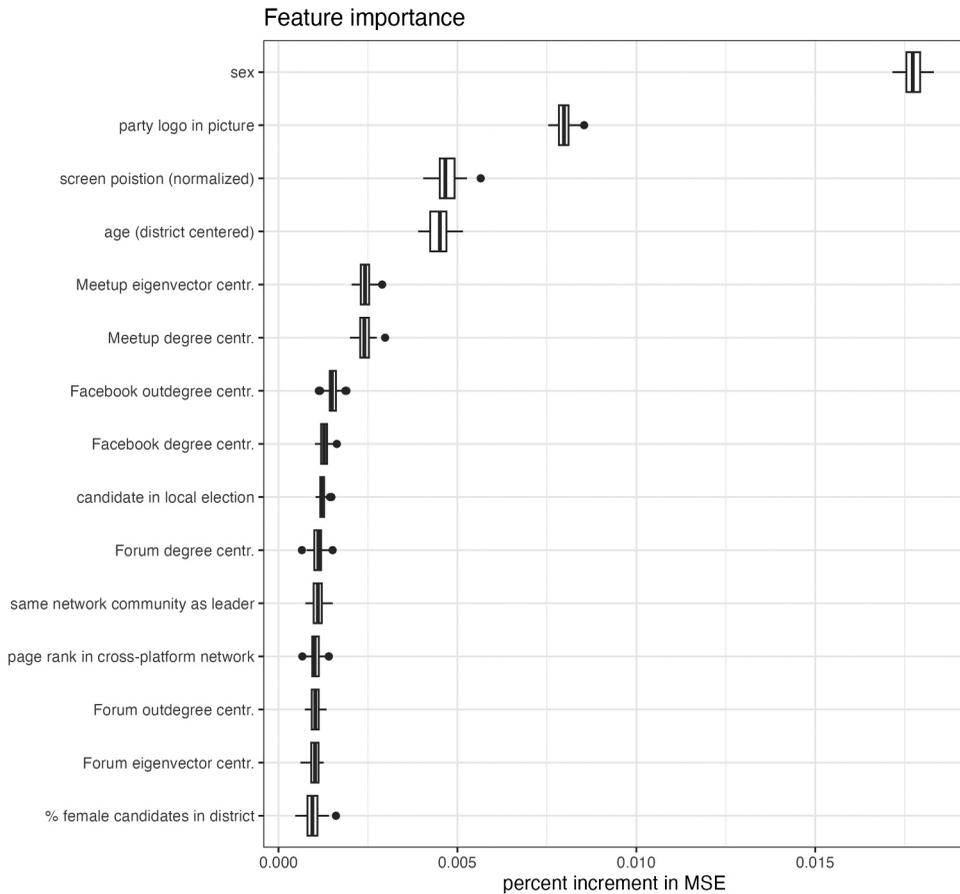
Finally, we used RFs to predict the ranking of a candidate in the primary election based on features of the voting platform and on the online activities of a candidate, to test whether being more active on certain platforms or communicating more about certain topics produced an electoral payoff. We present in Table 3 the variance explained by the different random forest models, indicating the change in variance explained with respect to simpler models, following the inclusion of predictors in consecutive batches.<sup>6</sup>

Figure 5 shows the bootstrapped feature importance scores over 100 runs of the same model, to provide a more reliable estimate of the contribution of each feature across different runs of the same model. Feature importance is computed as the percentage by which the Mean Squared Error increases if a variable is removed: the more the error increases, the more knowing what value that variable takes helps modeling the dependent variable. For example, knowing whether a candidate is male or female helps the most: female candidates were likelier to rank toward the top (see Marolla et al., 2023). Variables available to the voters through the

**Table 3.** Variance explained and  $\Delta$  with respect to immediately simpler models. Sets of predictors capturing conceptually related aspects were entered together and kept when the variance explained improved (positive  $\Delta$ s). Each RF model was run 100 times to derive robust estimates.

	Interface	Local elections	Online presence	Platform centrality	Network measures (*)	Topics
Variance explained	19.616 [19.555; 19.677]	22.195 [22.127; 22.264]	24.535 [24.459; 24.610]	25.338 [25.268; 25.408]	<b>26.327</b> <b>[26.249; 26.400]</b>	25.618 [25.534; 26.691]
$\Delta$ variance explained	–	2.579	2.339	0.804	<b>0.987</b>	–0.712

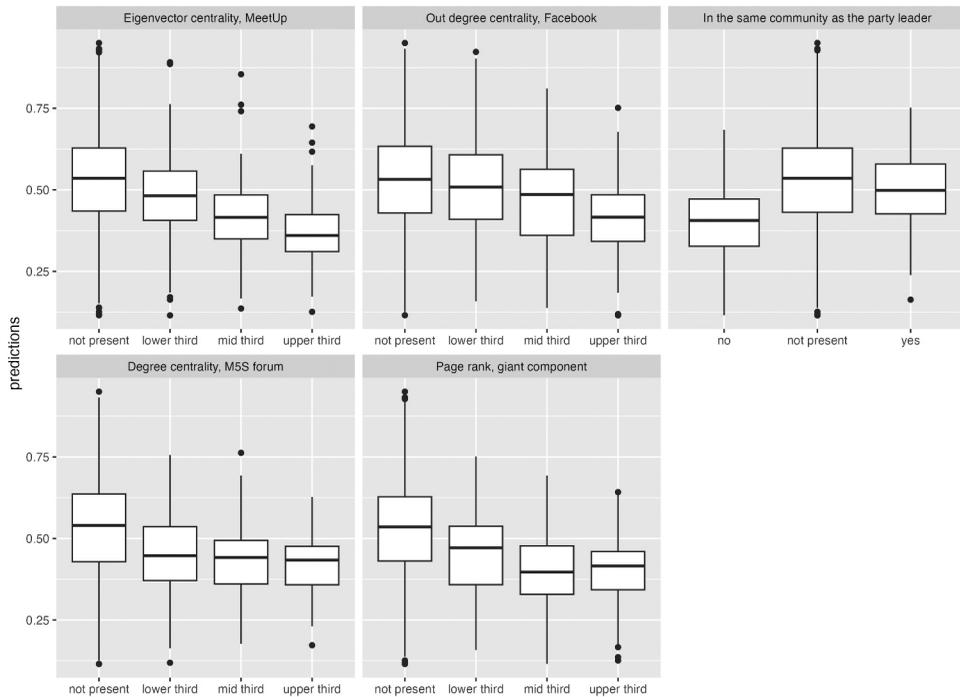
(\*) We report results for the network measures extracted from the giant component of the cross-platform user network. Measures extracted from the user-location, user-organization, and user-person networks did not afford better predictions when combined with network measures extracted from the cross-platform user network.



**Figure 5.** Predictive value of variables for candidate ranking in online primaries. Note: Bars indicate the percentage increase in Mean Squared Error (MSE, x-axis) when each selected variable (y-axis) is excluded from the random forest model. Longer bars imply greater importance for predicting candidate performance in the 2012 M5S primaries, since excluding that variable causes a larger error.

interface of the voting platform are consistently more important, followed by different platform-specific measures of centrality, with Meetup and Facebook appearing as more central. Network metrics extracted from the giant component appear to be moderately important, especially the page rank and the presence of a candidate in the same community as the leader.

Moreover, [Figure 6](#) shows the relation between a few notable variables and predicted rank, to better characterize the relation between predictors and outcome that the RF learns. We see that candidates with higher eigenvector centrality on Meetup compared to other competitors in the district tend to rank better, in line with expectations. A similar, yet weaker pattern appears considering *Facebook out degree centrality*. We also notice that candidates not in the leader's community appear to rank better. Degree centrality on the Forum shows a penalty for candidates who were not on the Forum, with little variation relating to activity. Finally, the page rank of a user in the cross-platform network shows a benefit for more active candidates.



**Figure 6.** Relationship between candidates' predicted rank in the 2012 online primaries and selected predictors in the best random forest model.

## Discussion

This study explores how a multi-platform environment shaped M5S intra-party dynamics by analyzing 3 years of online activity leading up to the 2012 online primaries across five key platforms. The M5S's unique trajectory provides an ideal context to examine these dynamics. As one of the earliest digital-first parties, it illustrates how platforms structured internal – not just external – political communication. Focusing on its emergence and coalescence period, we aimed to understand the impact of a multi-platform environment on intra-party democracy before the consolidation of a national leadership with the 2013 general election and the bureaucratization of the party. By measuring centripetal and centrifugal dynamics in the M5S multi-platform environment, we offer important insights into the distribution of communication power across diverse platforms and its effects in shaping political organizations in electoral democracies.

First of all, our findings support H1: platforms within the M5S ecosystem differ significantly in their global and local visibility and associability affordances. This result provides empirical support not only for the well-established claim that social media enable diverse communication patterns (e.g., Boyd & Ellison, 2007; Karpf, 2012) but also for the idea that integrating multiple platforms with varied affordances can simultaneously foster both top-down and horizontal interactions within the same organization. Such integration can give substantial flexibility to organizations, especially in their emergence phase. We find that the potential of platforms like Facebook and Grillo's Blog facilitated top-down communication by enhancing *global* visibility and associability (e.g., Ellison et al., 2007; Papacharissi, 2009). Conversely, platforms like Meetup and the Forum enabled grassroots mobilization through high *local* associability and visibility,

fostering decentralized, horizontal communication power (Bennett & Segerberg, 2012; Gibson, 2015). Although our visibility and associability measures are not exhaustive, they offer a methodological innovation for categorizing platform affordances by measuring related network properties. Our findings highlight how platform affordances shape the distribution of power between leadership and grassroots by selectively allocating visibility and associability, globally or locally. While platform administrators cannot fully control these affordances, they exercise significant networked power (Castells, 2009). Through curation mechanisms, platforms can modulate affordances reclaiming substantial communication power from both leadership and grassroots actors.

Second, our findings lend support to H2, showing that platform boundaries constrain cross-platform communication (Steppat et al., 2022; Theocharis et al., 2023; Vaughan et al., 2023). Specifically, our results showed that while a minority of M5S users participated across multiple platforms, a vast majority were only active on a single platform. Yet, cross-platform activity was not symmetric. Users of the grassroots-oriented Forum and Meetup platforms were more likely to also be active on other platforms than users of Grillo's Blog and Facebook, which conversely showed minimal propensity to engage elsewhere. This suggests that a multi-platform environment could accommodate diverse audiences and demographics, but that different audiences (likely because of different political interests and attitudes to participation) may also move asymmetrically across platforms, playing different structural roles with different degrees of influence. In the M5S case, users of horizontally oriented platforms are observed to seek broader, multifaceted engagement, potentially acting as engines of internal cohesion, connecting top-down communication flows with platforms of grassroots mobilization. However, our data capture the coalescence phase (2010–12) of what would ultimately become a successful political organization (the M5S). In less successful cases or during a phase of decline, these mechanisms could reverse, amplifying centrifugal dynamics and potentially fragmenting the organization as engagement with centralized communication diminishes. This invites further research in different organizational contexts.

Third, our findings provide mixed support for H3, indicating that the distribution of power between leadership and audiences within each platform did not consistently align with the affordances observed to emerge from those platforms. The terminology used by Grillo on his blog was relatively absent from users' comments on the same site, while it was more prominent in texts published on Meetup. This does not support claims that platforms characterized by high global visibility and associability necessarily amplify top-down communication (e.g., Ellison & Boyd, 2013; Leonardi, 2014), as we observed this only on Facebook. Similarly, we also found partial support for literature suggesting that grassroots-oriented platforms always result in spaces where leadership influence is moderated or resisted by user-driven interactions (Bennett & Segerberg, 2012), the Forum showed very low proportions of leadership communication reproduced by its audience, but Meetup showed the strongest influence of leadership communication. The analysis of communication power distribution across different platforms supports a view of affordances not as necessary outcomes but as properties, highlighting a platform's potential rather than its necessary actualization. Indeed, in the context of a political organization operating across platforms that enable both centripetal and centrifugal flows, it is easy to envision that the full realization of these properties could ultimately lead to the organization's dissolution. In the case of the M5S, the thematic alignment of leadership and the grassroots active on Meetup was likely a necessary condition for the successful coalescence of the political organization in the run-up to the 2013 general election. And yet, even in early phases (emergence or coalescence),

affordances might indicate possible fault lines delineating an organization's different audiences. The fact that, unlike the Meetup audience, the Forum's audience (the arena for policy deliberation) fully leveraged the centripetal affordances of its platform may have provided an early indication of existing but latent internal conflicts. Future studies could further explore the role of affordances in a multi-platform environment, particularly during the later phases of an organization's life cycle.

Finally, in relation to H4, results indicate that both leadership and platforms' audiences had a degree of influence on candidate selection in the 2012 online primaries, but through different channels. Grassroots engagement on Meetup positively impacted electoral success, aligning with studies linking network size to electoral performance (Cruz, 2019), while similar activity on the Forum had no significant effect. This implies again the existence of different audiences in the two horizontal grassroots platforms but also a possible structural early isolation of the Forum from the rest of the organization. Leadership influence was instead mostly exercised through curation mechanisms and the design of the voting interface, influencing voter behavior via the availability heuristic (see Marolla et al., 2023). These findings highlight the nuanced power dynamics of multi-platform environments. Both the leadership's power, derived from administering the voting platform, and the communicative power of certain audiences, particularly those on Meetup, contributed to shaping the outcomes of the 2012 online primaries. Although these results testify to the potential of Internet technologies for internal democracy, they also point to significant power asymmetries, between platforms' administrators and users, and among multi-platform audiences.

## Conclusions

This paper proposes a multi-platform approach to understanding intra-party dynamics, offering an innovative framework rooted in platform affordances – global and local visibility and associability – to analyze how platforms shape communication and power distribution. By examining the interplay between centripetal (centralized) and centrifugal (decentralized) powers, it provides new insights into the complex dynamics of digital ecosystems, which are observed to be able to simultaneously enable grassroots engagement while maintaining top-down communication flows. This affordance-based perspective, combined with an analysis of cross-platform boundaries and fragmentation, advances our understanding of how political organizations operate within complex, multi-platform environments.

It is important to recognize the study's limitations. First, the analysis of digital traces cannot fully disentangle whether the observed dynamics stem from platforms' affordances or from the strategic practices and behaviors of their users. As our analyses suggest, while affordances are crucial in defining the boundaries of possibilities and constraints, they neither determine intentions nor guarantee specific outcomes. Second, it remains unclear whether the observed results on network centrality reflect influence cultivated within the online platforms or preexisting popularity gained through other offline or online channels. Third, although the measurement of visibility and associability is innovative, it provides only proxies and does not capture their full complexity. Finally, the focus on a single, successful case of a platformed political organization limits the generalizability of the findings, underscoring the need for further research across diverse organizational contexts to validate and extend these conclusions.

The coexistence of diverse platforms in a multi-platform environment creates opportunities and challenges for political organizations. When leadership and grassroots actors align, their

efforts can complement each other, fostering synergy. Leveraging the complementary affordances of different platforms can enhance participation and mobilization, often yielding outcomes that surpass those achievable on a single platform (Schreieck et al., 2024). This is what we argue happened in the M5S in the years culminating with the 2012 online primaries and the unexpected electoral success in the 2013 general election. Yet we also observed that multi-platform environments afford the integration of fragmented audiences, as distinct user groups form around different platforms with varying communication norms, complicating efforts to maintain consistent messaging and organizational cohesion (Chadwick, 2013; Klinger & Svensson, 2015). Centrifugal and centripetal communication powers can clash along these fault lines accelerating the decline and collapse of the organization. Leadership's attempts to impose a unified narrative for collective action can face resistance from grassroots actors employing horizontal coordination and connective action logics, fostering fragmentation and organizational incoherence (Tufekci, 2017). While the M5S is an extreme case of digital party, our findings offer insights on the challenges that more traditional parties might face as they expand digital operations – particularly tensions between centripetal and centrifugal powers as they are shaped by platform affordances.

The growing centrality of digital platforms in structuring political communication raises concerns about their capacity to concentrate communicative power and constrain democratic agency. These concerns become especially pressing when platforms' instrumentarian, curation, and system administration powers align and are deployed toward explicit political ends. The 2024 US presidential election starkly illustrated these dynamics: for the first time, a major commercial platform visibly exercised all three forms of power – network-making, networked, and networking – as outlined in Table 1. This alignment reveals how digital platforms can synergistically shape political communication, consolidate centripetal power, and constrain both leadership and grassroots actors' agency within public deliberation.

## Notes

1. We refer to the online supplementary materials for more details on data and statistical methods.
2. We selected these platforms because they were central to the M5S's organizational structure and communication strategy during the period under study. Twitter has not been considered in the analysis due to its relatively low usage within the M5S and limited penetration in Italy during the study period, making it less central to the movement's communication strategy.
3. The use of the Blog and Meetup started in 2005, Beppe Grillo's Facebook page was created in 2008, while the Forum was set up in 2009 within the domain of the Blog (Bailo, 2020).
4. As a robustness check, we trained two BERTopic models, observing again the highest coherence at 26 topics.
5. We initially ran 10 models for a range of topic numbers, specifically those spaced by increments of 5 between 5 and 35. Observing that the highest average coherence scores occurred within the range of 15 to 30, we subsequently ran five additional models for each individual topic number within this narrower range.
6. See the online supplementary materials for an exhaustive list of which predictors were added at each step and an explanation of how each was coded.

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No potential conflict of interest was reported by the author(s).

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## Notes on contributors

*Francesco Marolla* is a postdoctoral researcher in the Department of Social and Political Sciences at the University of Milan. His work focuses on voting behavior, democratic legitimacy, and ideological change in European democracies, with a particular interest in how institutional and generational factors shape political engagement. He combines theory-driven analysis with a range of methods including survey research, multilevel modeling, and, more recently, computational approaches such as text and network analysis. He currently works within the POSTGEN project – Generational gap and post-ideological politics in Italy (<https://www.postgen.org/it/home-en/>).

*Marilù Miotto* is PhD student at Erasmus University Rotterdam, at the School of Social and Behavioral Sciences. Her work is focused on understanding the effects of generative AI on citizens' trust in news media. She currently works within the AlgoSoc project - Public Values in the Algorithmic Society (<https://algosoc.org/>).

*Giovanni Cassani* is Assistant Professor in the Department of Cognitive Sciences and Artificial Intelligence at Tilburg University, where he teaches Natural Language Processing and Data Science. He works in Computational Linguistics and Psycholinguistics as well as in Computational Social Sciences, applying computational methods to the analysis of textual data.

*Francesco Bailo* is a Lecturer in Data Analytics in the Social Sciences at the University of Sydney and Deputy Director of the Centre for AI, Trust and Governance. He is interested in researching forms of political engagement and political talk on social media. He has researched the emergence and dynamics of online communities, the role between news organizations and social media, and the interdependence between social media activists and news organizations.

## ORCID

Francesco Marolla  <http://orcid.org/0000-0001-6561-1329>

Marilù Miotto  <http://orcid.org/0009-0007-8612-9225>

Giovanni Cassani  <http://orcid.org/0000-0003-3917-3315>

Francesco Bailo  <http://orcid.org/0000-0001-5971-1921>

## Open scholarship



This article has earned the Center for Open Science badges for Open Data and Open Materials through Open Practices Disclosure. The data and materials are openly accessible at <https://doi.org/10.7910/DVN/MHLAOT>

## Ethical Approval

This study was approved by the REDC 2022.65, under the ethics approval code of the Tilburg University.

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