Incidental Effects of Automated Re-tweeting: An Exploratory Network Perspective on Bot Activity During Sri Lanka's Presidential Election in 2015

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Abstract

The role of automated or semi-automated social media accounts, commonly known as "bots," in social and political processes has gained significant scholarly attention. The current body of research discusses how bots can be designed to achieve specific purposes as well as instances of unexpected negative outcomes of such use. We suggest that the interplay between social media affordances and user practices can result in incidental effects from automated agents. We examined a Twitter network dataset with 1782 nodes and 5640 edges to demonstrate the engagement and outreach of a retweeting bot called Siripalabot that was popular among Sri Lankan Twitter users. The bot served the simple function of retweeting tweets with hashtags #SriLanka and #lk to its follower network. However, the co-use of #Sri Lanka and/or #lk with #PresPollSL, a hashtag used to discuss politics related to Sri Lanka's presidential election in 2015, resulted in the bot incidentally amplifying the political voice of less engaged actors. The analysis demonstrated that the bot dominated the network in terms of engagement (out-degree) and the ability to connect distant clusters of actors (betweenness centrality) while more traditional actors, such as the main election candidates and news accounts, indicated more prestige (in-degree) and power (eigenvector centrality). We suggest that the study of automated agents should

include designer intentions, the design and behaviour of automated agents, user expectations as well as unintended and incidental effects of interaction.

Keywords: Twitter, Bots, Centrality, Politics, Sri Lanka

Introduction

The social and political impact of automated agents, commonly known as ‘bots,’ has gained significant attention in social media research. Current research on bots includes a range of studies, such as work that examine adverse political effects of automated accounts (Bessi & Ferrara, 2016), “robot journalism” (Lokot & Diakopoulos, 2016), use of “blockbots” for prevention of harassment (Geiger, 2016), communication quality (Edwards, Edwards, Spence, & Shelton, 2014), agency (Guilbeault, 2016), and online vandal fighting (Geiger & Ribes, 2010). Use of automated agents in networked communication is not a new idea yet they have become crucial elements of networked communication.

Much of the research related to the topic of bots focus on the role or functionality of bots (Jones, 2015). For instance, Lokot and Diakopoulos (2016) discuss the functions of bots in journalism and suggest a news bot typology that can guide future development of automated agents/accounts. Bessi and Ferrara (2016) discuss how social media bots affected democratic discussions during the presidential elections in the United States in 2016. Edwards, Edwards, Spence, and Shelton (2014) study user perception of communication quality of organizational Twitter bots. These studies have developed a foundation for further work looking at the ways in which automated agents take part in complex social and political processes. As Jones (2015) notes, the question is no longer whether bots can “pass” as humans, but how they can be part of a meaningful social interaction. Answering this question demands research studies that discuss designer intentions, user expectations, as well as behavioral outcomes of the interaction between code and user actions.

Although bots are ‘man-made’, their effects may not always reflect intentions of designers or users. According to Guilbeault (2016), platform features can help bots to escape detection and enact influence. He suggests that Social Network Sites (SNSs) are “a new kind of habitat that imposes habits of self-construction that both humans and bots equally exploit” (p. 5004). Furthermore, Guilbeault claims that bots engage in identity construction that reflects and shapes human action. This view is informed by the notion of agency: the idea that individuals or objects, bots in this case, indicate characteristics of an entity of its own, such as the ability to influence and take responsibility. The agency perspective pays primary attention on the individuals or objects and examines their positions in the contexts in which they function. The sociotechnical perspective, a view that acknowledges the co-existence of and interaction between technical and social elements (Kling, 2000), is a slightly different viewpoint that is useful in understanding nuances in computer-mediated communication. For instance, the collapse of Tay, the chat bot launched by Microsoft in 2016, was caused by controversial content that some user groups saturated into the bot. Tay was designed based on XiaoIce, a chat bot that was successful in China. However, as Neff and Nagy (2016) noted, it turned into an embarrassment due to a group of organized users and a platform-specific culture in a different context. As a result, technical capabilities are situated in interactions, contexts, and perceptions (Kallinikos, 2004). In general, the above studies indicate two central aspects related to the topic: 1) agency, and 2) context, the impact the media ecology has on automated agents.

This study takes a sociotechnical perspective to discuss how the interplay between bot activity and hashtag co-occurrence can result in unintended effects in terms of message outreach. Our intention is to demonstrate indirect and incidental effects of message automation, an area that remains unexplored in current social media research. We frame this study within the context of an ad hoc political issue public using a network data set containing 5640 retweets and "@" replies sent by 1782 users. The dataset represented those who used "#PresPollSL," a hashtag that was popular among Sri Lankan Twitter users during the January 2015 presidential election in Sri Lanka. In terms of theoretical advancement, this study is significant as it shows how hashtag co-use, a user practice, and message automation, a functional aspect of code, can cause unintended political effects. This study has practical relevance as it presents an analysis of how bots shape communication in developing contexts, particularly in South Asia, a region that is underrepresented in social media studies.

Automated Agents in Sociotechnical Systems

Twitter is perhaps one of the best examples of a sociotechnical system (Kling, Rosenbaum, & Sawyer, 2005; Lamb & Kling, 2003). Recently, Halavais (2014) argued that the creative story behind the growth of Twitter as a platform, co-created by its users, has taken on mythical proportions. This push and pull of the designers of Twitter and its users has resulted in distinct conversational and communicative practices such as "@" replies (Halavais & Martin-Elmer, 2009), retweeting (boyd, Golder, & Lotan, 2010) and hashtags (Small, 2011). Further complicating this sociotechnical space are the automated processes occurring on Twitter (Haustein et al., 2016). Though Twitter was designed for human communication, automated and

semi-automated accounts are becoming more ubiquitous on the platform. Zhang & Paxson (2011) noted that 16% of Twitter accounts demonstrated a notable amount of automation. Conservatively speaking, "tens of millions of automated tweets are sent every day" (Mowbray, 2014, p.183). Automatic or semi-automatic programs that mimic human behavior are often referred to as "bots" or "social bots" (Wagner, Mitter, Körner, & Strohmaier, 2012). Mowbray classifies most bots as, "useful, entertaining, or simply delightful," (p.191) with spamming and anti-social bots holding only a minority presence on Twitter.

Recent literature related to bots indicates that role of automated agents span across a broad range. Chu and colleagues (2012) observe that most bots make positive contributions on Twitter through benign tweets like news and blog updates. According to Edwards et al. (2014), users perceive Twitter bots as credible, attractive, and capable of communication as much as their human counterparts. Not only do bots amplify message outreach, they can minimize nefarious behavior, such as online harassment. For example, Geiger (2016) suggests that blockbots can serve as social solutions to issues like online harassment and their use can be extended to help counter-public groups to participate in networked publics.

Conversely, bots can have negative effects in certain contexts. Wagner, Mitter, Körner, and Strohmaier (2012) claim that social bots can attack users to achieve latent purposes especially for those who use Twitter for conversational purposes. While there is a growing interesting in the role bots play in society, there is particular attention paid to their political impact. Bots have been employed to fulfill political objectives such as smear an opponent (Ratkiewicz et al., 2011), embarrass a political candidate (Oremus, 2012), and drown out political dissent (Thomas, Grier, & Paxson,

2012). Bessi and Ferrara (2016) presented evidence on the adverse effects of bots during the 2016 U.S. presidential election. The authors concluded that automated accounts can redistribute influence across suspicious accounts, cause polarization, and spread misinformation.

Several studies related to the topic have elevated the discussion presenting holistic perspectives to understand bots within the context of sociotechnical systems. Guilbeault (2016), for example, suggests an ecological approach, a perspective that situates bots in a broad ecosystem of interactions, shows how social media environments allow automated agents to gain agency. He portrays social media platforms as a new habitat in which new forms of agency, such as bots, grow. The notion of "symbiotic agency" (Neff & Nagy, 2016, p. 4926), "a specific form of proxy agency that users and tools can enact in human–technology interaction," acknowledges the fact that online interactions include mediated experiences, perceptions, and behaviors, as well as human agency. These two studies indicate the need to understand the agency of bots as well as user actions. Neff and Nagy note, "we must watch for how agency flows among and between an algorithm's designer, the designed algorithm, human users, and the resulting content, interaction, or conversation" (p. 4927).

Social media affordances, defined as relational structures between users and technology that enable or constrain behavioral outcomes (Evans, Pearce, Vitak, & Treem, 2017), can cause unintended network outcomes. Our study suggests that interaction between bots, users, and social media affordances can cause incidental effects that alter centrality or power levels for both human and non-human actors. We

identify Twitter hashtags as affordances that can enable new behavioral outcomes. In the following sections, we discuss Twitter hashtags, politics on online platforms, as well as the background of #PresPollSL, the hashtag we use to build this case.

Hashtags as Ad Hoc Spaces

Hashtags, strings that begin with the symbol "#," are common on Twitter. They are specific syntax to signify a variety of things, including events, issues, and people as well as making these more easily discoverable to other users (Small, 2011). Hashtags are important for scholarly work as they help define user groups, identify contemporary topics, and frame issues. Along with trending topics, hashtags have moved Twitter from a sociable medium to a more distributed, mass medium (Halavais, 2014). A hashtag in a tweet indicates that the message will go beyond the user's existing number of followers. For Bruns and Moe (2014), hashtags in tweets "signals a wish to take part in a wider communicative process, potentially with anyone interested in the same topic" (p. 18). As a result, important and timely hashtags can rapidly assemble an ad hoc issue public (Bruns & Burgess, 2011). In this sense, we can think of a topical hashtag (as opposed to non-topical memes or emotions [#fail]) as "a speech at a public gathering—a protest rally, an ad hoc assembly—of participants who do not necessarily know each other, but have been brought together by a shared theme, interest or concern" (Bruns & Moe, p. 18).

Use of several hashtags in a single message is a common practice among social media users (see Figure 1 for an example). From the perspective of meaning, the words used to construct "co-hashtags" can offer interesting insight into converging themes related

to a phenomenon. For example, the tweet in Figure 1 includes the hashtags #srilanka and #PresPollSL. These hashtags represent two related topics, information related to Sri Lanka and the 2015 presidential election. Moreover, as hashtags are technical affordances that enable interactional structures that are searchable online, hashtag co-occurrence can result in messages reaching broad audiences. This effect remains largely unexplored in current social media literature. Our intention is to address this by presenting empirical evidence on how hashtag co-occurrence can trigger bot activity resulting in incidental political consequences. By incidental, we mean aspects of communication that can be seen as "interactional byproducts" that are not necessarily expected by the coders or social media users. These incidental processes can give voice to alternative political perspectives.

[Please insert Figure 1]

Digital Platforms and Politics

According to Jensen, Jorba, and Anduiza (2012), the structural affordances of digitally networked media alter politics in two ways. One is that digital media enable the formation of ad hoc flexible networks of communication outside of traditional networks and media centers. In so doing, this hampers the power of traditional institutional gatekeeping mechanisms. Another way is that digital platforms allow for a, "greater range of expression, which can attract different segments of the population and engage them in varied ways" (p. 5). Twitter, as a social media platform, has demonstrated that it can both encourage political mobilization of flexible networks of communication as well as engage various segments of the population in new ways.

Much of the existing research on Twitter has focused on democratic states that have relatively similar levels of modernization, civil society structures and regime policies toward digital media.

In less stable political contexts, the impact of digital media on politics is noticeably different than more democratic contexts. A notable amount of research in these contexts has emphasized matters of surveillance and censorship (Diebert, 2008; Hughes & Wacker, 2003). However, Jorba and Bimber (2012) compared citizenship practices in both nondemocratic and democratic political contexts to discover themes that resonate among both spheres. Of these, the impact of digital platforms on political voice was an issue of far greater concern in nondemocratic regimes than in democratic states. This is mainly due to the fact that nondemocratic states provide public spheres that, "are nonexistent or insufficiently vibrant for an engaged and open public discussion" (p. 30). In this regard, digital platforms afford spaces for the expression of dissent as well as the rapid spread of alternative news and means for circumventing state control (p. 30). In less liberal contexts, potential digital media audiences comprise the international sphere, internal audiences such as relations among groups of citizens, and the authorities and political elites of the country. Voice is a basic element of citizenship and the opportunity to exercise voice on digital media poses challenges for regimes (Jorba and Bimber, 2012). Given Twitter's unique social and technical affordances as a digital media platform, this paper explores the implications of automated practices on Twitter for providing alternative political voices in the context of Sri Lanka's contentious 2015 presidential election. This election was held in a context in which government leaders were accused of abusing

state media and suppressing media activity during the election campaign. The following section provides an overview of the context.

The Internet, Sri Lankan Politics, and #PresPollSL

Sri Lanka had more than four million internet users and a 19.9% internet penetration by 2014 ("internet live stats," n.d.). According to Hattotuwa (2009), the Internet, the World Wide Web (WWW), and mobile phones in particular provide space for the development of democracy in Sri Lanka; and citizen journalism initiatives, such as *GroundViews*, promote democratic dialogue. Social media are widespread among internet users in the country and Twitter is becoming increasingly popular, especially among young internet users. Social media were heavily used for election campaigns and political discussion and Twitter was no exception. This was particularly the case during the recent presidential race in January 2015.

Sri Lanka's presidential election on January 08, 2015 was a crucial event in the politics of the island nation. Mr. Mahinda Rajapaksha, the incumbent president who provided political leadership to defeat the separatist militant group Liberation Tigers of Tamil Eelam (LTTE), was expecting an extension to his tenure as Sri Lanka's executive president. Although his leadership in ending the civil war gained him immense popularity among the Sinhalese majority, he was accused of corruption and leading the country towards authoritarianism by the opposition. The January 8 election turned out to be a dramatic event as Rajapaksha's main opponent, Mr. Maithreepala Sirisena, who represented the "common opposition," was originally from his own political party. Election campaigning was intense, and both main

candidates utilized social media heavily in their campaigns. Moreover, citizens' use of social media for political activity related to the election was considerably high. However, the opposition heavily criticized Rajapaksha's use of state media to his advantage and argued that alternative voices were oppressed in the country. The election results were shocking, at least from the perspective of the incumbent president Mahinda Rajapaksha, as his former ally and the candidate of the common opposition, Maithreepala Sirisena, won with more than 51% of votes.

Given the intense nature of the election, the ability of new media platforms to provide space for opinion expression was crucial. This was particularly important because the opposition promoted the event as an opportunity for leadership change that brings back governance to the country. The hashtag #PresPollSL was used heavily during the election to discuss politics. This hashtag emerged in direct response to the presidential election as it served as an issue public that facilitated information exchange and debate about the election. Several bots were actively involved with this process, retweeting some of the tweets sent by some users. The fact that nonhuman agents, bots in this case, are involved in a political process opens space to expose the sociotechnical nature of Twitter in general, and the role bots can play in ad hoc political issue publics in particular. However, understanding the role played by an individual actor (or a few actors) requires a shift of focus from conventional sample-based approaches to a more ego-centric approach. Accordingly, this study takes an exploratory Social Network Analysis (SNA) perspective, an approach that allows ego-level inquiry (Marin & Wellman, 2010), to examine the role played by the bot called Siripalabot during the January 2015 presidential election in Sri Lanka.

Method

Data was collected using the social plugin available in the NodeXL network analysis template. This tool gathers relational data on “tweets,” and “replies to” and “mentions” relationships. A network obtained using this tool includes nodes representing users, and edges representing interactions created by replies and mentions. A search for #PresPollSL returned a network dataset with 1782 twitter users. Data obtained included information such as the user name, location, tweet, time of the tweet, description of the user, and the URL of the user account.

We used four ego-level metrics (in-degree, out-degree, eigenvector centrality, and betweenness centrality) to examine the importance of individual actors in the network. The degree is the total number of links (edges) for each network node. In directed networks, incoming degree (or in-degree) refers to the number of links that point a particular node, and outgoing degree (or out-degree) refers to the number of links that point from the node (Barabási, 2012). In Twitter hashtag networks, these two metrics indicate prestige and engagement respectively. Centrality of actors relates to the importance of a node within a network (Zafarani, Abbasi, & Liu, 2014), and centrality metrics can be used to examine the role played by individual actors in a network. This study uses two centrality metrics to examine ego-level dynamics: eigenvector centrality and betweenness centrality. Eigenvector centrality is a basic centrality metric that considers the importance of neighbors. This metric is proportional to the summation of the centralities of neighboring nodes (Zafarani et al., 2014). Eigenvector centrality is an appropriate metric to understand the value or power of a node as it is expressed more in terms of the overall structure of the

network than the local structure of a node. Betweenness centrality measures the extent to which a node is located between other pairs of vertices, and this measure holds that a node is important in a communication process if it sits on many paths (Kolaczyk & Csárdi, 2014). It is the idea that intermediaries are important in networks. Accordingly, betweenness centrality can help detect actors who can connect different distant clusters in a network.

Results and Discussion

Results of the analysis are discussed under two sections. In the first section, we provide evidence on the presence of bots in the #PresPollSL network and demonstrate how hashtag co-use trigger bot activity in the network. Then we present an analysis of four network metrics (in-degree, out-degree, eigenvector centrality, and betweenness centrality) focusing on the prestige, engagement, and power levels of top actors. This helps understand the extent of the impact made by the bot.

Incidental Network Effects of Hashtag Co-use and Automated Retweeting

Figure 2 provides a visualization of the #PresPollSL network. Node sizes were adjusted based on the degree of each node. Upon investigation of Twitter profiles of users in the network, we identified that the largest node in the bottom of the network visualization was a retweeting bot called “Siripalabot.” Siripalabot was a Colombo-based bot that retweeted messages that include hashtags #SriLanka and #lka. These two hashtags are popular among Sri Lankans who share any information of interest about the country. At the time of the study, this bot had 2061 followers and ranked

first in terms of out-degree and 33rd in terms in-degree among the group of 1782 Twitter users in the network. The ego network of the Siripalabot (red color nodes in Figure 2) represented a considerable portion of the #PresPollSL network. #PresPollSL had 1782 vertices connected with 5640 edges. The ego network of the Siripala bot had 537 vertices (30.13% of the total number of nodes in the #PresPollSL network) and 2276 edges (43.85% of the total number of edges in the #PresPollSL network) within the hashtag network.

[Please insert Figure 2]

The #PresPollSL network and the ego network of the bot were compared with a random network, or *G(n,p)*, of the same size to ensure that it is notably different from a randomly generated network. We calculated five network metrics (average degree, average path length, graph density, strongly connected components, weakly connected components) for this comparison. Table 1 provides details of the #PresPollSL network, the ego network of Siripalabot, and the random network. It was noticeable that both natural networks (#PresPollSL and the ego network of the bot) were different from the random network. Average degree of the random network (6.135) was considerably higher than the #PresPollSL (2.912) network and the ego network of the bot (4.238). Moreover, both natural networks had strongly connected components while the random network had only five weakly connected components. This shows that the #PresPollSL network and the ego network of the bot indicates real-world phenomena that is different from a randomly generated network.

[Please insert Table 1]

Siripalabot has a general focus and its functions do not display any political purpose. Although the bot had originally been designed to retweet tweets with "#SriLanka" and "#lka," it had an out-degree of 369 (self-loops excluded) in the #PresPollSL network, indicating that this bot had retweeted tweets that included #PresPollSL 369 times. This resulted in the bot being an actor in the network. In other words, an automated agent with no political purpose had participated in a hashtag designed specifically to discuss politics. This occurs when users who share political messages on Twitter using the #PresPollSL along with any of the two hashtags (#SriLanka and/or #lka) trigger the bot. This results in tweets with #PresPollSL entering Siripalabot's domain of engagement. Consequently, the bot contributed to expanding the outreach of messages that included #PresPollSL and political content. This, we argue, is an incidental effect of the interplay between the Twitter hashtag affordance and the user culture that allows co-hashtag use. This incidental retweeting of #PresPollSL tweets is merely a result of hashtag co-occurrence.

Prestige, Engagement, and Power

An ego-level analysis was conducted using four network metrics (in-degree, out-degree, eigenvector centrality, and betweenness centality) to examine the prominence of Siripalabot in the #PresPollSL network. First, we created four visualizations of the network using the Dual Circular Layout available in the Gephi network analysis software (Figure 1). This layout detects the dominant actors based on each metric and places them in an inner circle. The visualizations in Figure 3 show that Siripalabot dominates the network in terms of out degree and betweennes centrality.

Table 4 provides details of the top five actors based on each of these metrics. Accordingly, the results reveal that Siripalabot has the highest out-degree and betweenness centrality in the network. This shows that Siripalabot is one of the most prominent actors in this network. There were four other powerful Twitter accounts in this network: Presrajapaksa- the official Twitter page of the former president, Srilankatweet (the official Twitter page of Lanka University News), Groundviews (the Twitter page of the Ground Views citizen journalism initiative), Excuzemi (a tech enthusiast and software engineer), and another account called Inspireinfor which did not provide details on its source.

Out-degree is an indicator of active actor engagement and displays the number of times an actor replies to or mentions another actor. Siripalabot was the most active actor in the network as it had the highest out-degree. This is not counterintuitive although human actors are assumed to be active in political activities. Yet in the context of a presidential election, automation increases the efficiency of communication. High betweenness centrality of the bot demonstrates that it has more ability to connect distant clusters of users than other actors in the network. This result is notable as this is an example of a nonhuman agent being able to connect distant groups of Twitter users better than other human actors.

In-degree of a network node displays prestige as it shows the number of times other users mention or reply to an actor. Former president Mahinda Rajapaksha's Twitter account indicates the highest in-degree in this network. The same account has the highest eigenvector centrality, a metric that indicates the power of an actor in terms of the centrality of actors in its network. The Twitter account that promoted former

president Rajapaksha's main opponent, Maithripala Sirisena, ranked second and fifth in terms of eigenvector centrality and in-degree respectively. The citizen journalism initiative *GroundViews* also indicated high centrality and in-degree. Therefore, traditional human actors are dominant in terms of prestige and power in this network. Overall, our results indicate that automated agents can dominate engagement and outreach while human actors make high impact through prestige and power.

To examine the mediated nature of communication in the #PresPollSL network further, we randomly selected several actors whose tweets were retweeted by Siripalabot. It was clear that those actors are general Twitter users who demonstrate low engagement (low out-degree) and low power (low eigenvector centrality). For instance, while Siripalabot had a betweenness centrality of 0.284, Votebahu (an actor whose tweet was retweeted by the bot) had a betweenness centrality of zero. This indicates that Siripalabot has acted as a nonhuman actor who has re-sent the messages of less-central nodes to its network. In other words, Siripalabot makes the voices of less-active twitter users heard by spreading their tweets to a broader community.
The following are some examples for the tweets sent by some actors with low centrality whose messages were retweeted by the bot. Some of these tweets were highly critical of the former President, Mahinda Rajapaksha. For instance, the statement, "[w]e should defeat Medamulana conspiracy," is directly against the former president. On the other hand, the statement "you might find Rajapaksha racing cars under your bed, check before you go to sleep" was a satirical statement that criticized the political atmosphere during that period. The former president's sons were accused of taking unfair advantage of their power to import high-speed racing cars to the country, and some cars (which may or may not belong to them) were found

during that period. It can be assumed that this user either criticized the behavior of the former president's sons or the dramatic nature of incidents in which cars were suddenly found during the election season in unexpected locations. Moreover, some tweets in this list tended to be objective about the political discussion occurring around them. For instance, statements like, "so much drama in SL politics now," and, "all of a sudden everybody around is either a politician or a political consultant since 8th January," were critical of the political environment. However, some tweets portrayed sympathy towards the former president. For instance, statements like, "the earth shakes in Hambantota, may be because Mr. Mahinda lost," indicate sadness about the defeat of the former president. These examples suggest that Siripalabot may not favor any of the political factions related to the presidential election. Rather the agency of the bot is best exemplified by the functional aspect of retweeting versus communication content.

The role of a retweeting bot is two-fold within the structural layers of communication on Twitter (Bruns & Moe, 2014). First, it captures a tweet with specific attributes and retweets it to its followers. This is a significant political impact of an automated agent as it sends messages of less powerful actors to a broader audience. Second, followers retweet the message to their networks mentioning the bot as the source. This is another significant impact of a bot as the action of retweeting or mentioning is triggered by the tweet sent by the bot. However, in this case, the latter was not noticeable. This shows that although the bot provided political content to its network, the followers have not spread those messages to their networks adequately.

Conclusion

In general, #PresPollSL is an example for an ad hoc issue public highlighted by Bruns and Burgess (2011) centered around Sri Lanka's presidential election. On one hand, the above results show how a nonhuman actor can mediate political conversations in an ad hoc community on Twitter. On the other hand, the results show how mediated communication on Twitter allowed multiple political voices that may sometimes be critical of the dominant political figures to emerge in the context of Sri Lankan politics. In general, the results show that Siripalabot is more powerful than other human or organizational actors, and it makes content of less-powerful actors available to a wider group. In this context, the nonhuman agent has given a voice for average people. Providing greater agency to less-powerful actors is a key democratic function particularly when the media environment is tightly controlled by a political regime. While this observation is consistent with the claim (Jorba and Bimber, 2012) that digital platforms provide space for expression and alternative news, it adds another dimension by exposing the involvement of nonhuman agents to this process. In this case, the bot is not biased as it retweets anything with a specific hashtag, and the designer has openly shared his code with the GitHub community. Therefore, unlike the purposefully designed bot activity discussed by Oremus (2012), Thomas, Grier, and Paxson (2012) and Ratkiewicz et al., 2011), the designer of the bot may not have expected such a political intervention from his code. This behavior resembles the ecological view of agency (Guilbeault, 2016) from the perspective that bots can harness social media affordances in ways that do not necessarily inform designer intentions. In other words,the automated agent indicates some functional autonomy. Moreover, the behavior of Siripalabot demonstrates symbiotic agency (Neff & Nagy,

2016) as its role in the #PresPollSL network is enacted by human technology interaction. Similarly, the behavior of Tay, the Microsoft chat bot, was unexpected. Therefore, symbiotic agency can reflect the dark side of human behaviour as well as the threat technologies pose to society (Neff & Nagy). The findings of this study are unique as we show that unexpected interactions emerge not only based on information we feed to networked technologies, but also on the interplay between social media affordances, agents, and user practices. Our results suggest that the study of automated agents should include designer intentions, the design and behaviour of automated agents, and user expectations to inform the study of both unintended and incidental aspects of political interactions emerging within networked systems.

From the perspective of Sri Lankan politics, the bot has created a new (and mediated) space for democratic progress. The 2015 election was held in an environment where the government was accused of control of state media organizations and using public media for its political purposes. Accordingly, media platforms that emphasize multiple political perspectives, especially voices critical of the ways in which social and economic issues were addressed by previous governments, were necessary to promote democratic dialog. In this context, Siripalabot acted as an agent who mediated the communication process by making voices of average people heard. Yet, the extent of this effect could be difficult to predict in other political contexts. Further work is needed in other political media environments to understand the influence created by incidental automated agents. .

These results also demonstrate that the tactical use of social media affordances, co-use of hashtags that trigger automated agents in this case, can help amplify

communication effects. Although we conceptualize bot activity as an incidental aspect of network formation, this knowledge can be used to transform incidental effects into planned political action. This could help maximize the utility of automated agents on social media. However, such use may result in conflict between designers and users if automated activity affects designer expectations negatively. Regardless, as Langdon Winner (1980) observed, artifacts and automated agents have politics whether intended or not. While this study provides interesting insight to understand bot activity, our analysis is limited by the relatively small sample. Data obtained via the Twitter API does not guarantee completeness. Therefore, further work is necessary to strengthen the claims made in this study.

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Figures and Tables

Figure 1: Co-use of Hashtags on Twitter

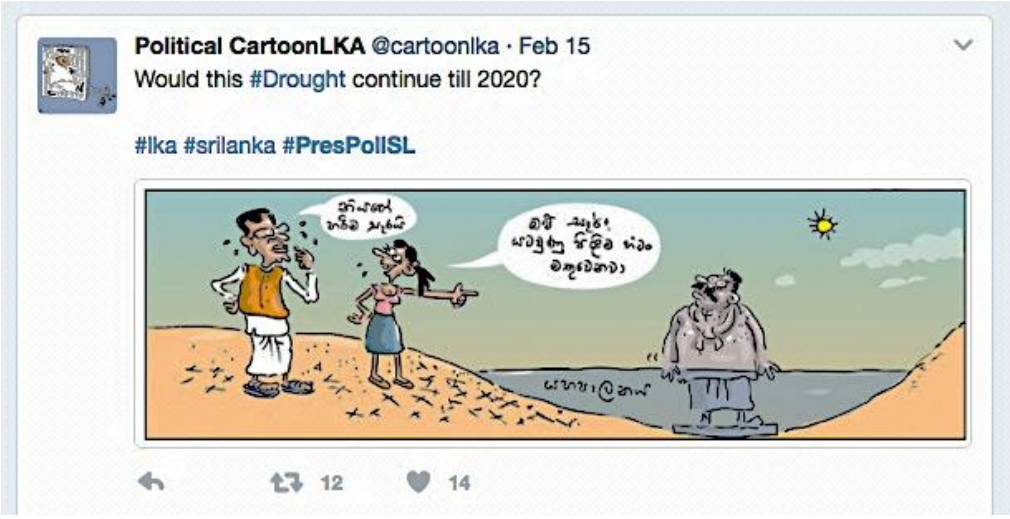


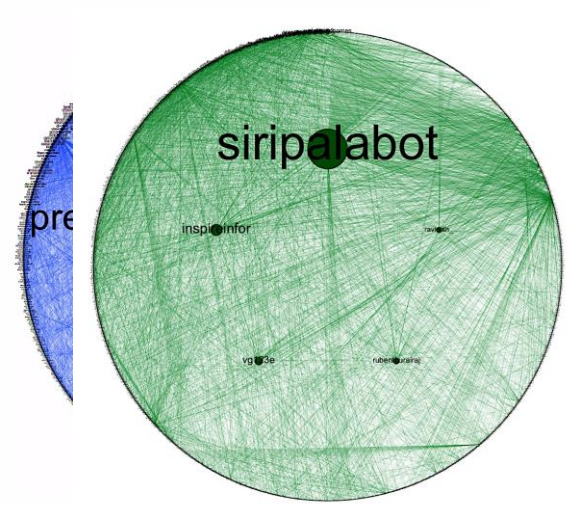
Figure 2: A Visualization of the #PresPollSL Network

Note: Visualized using Force Atlas 2 layout. Self-loops and isolates were removed for visualization purposes

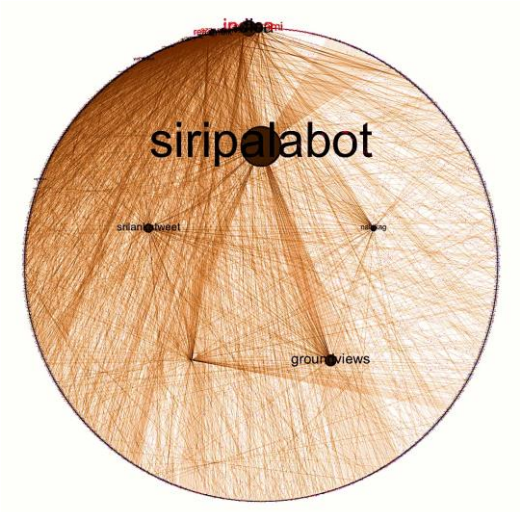
Table 1: Properties of #PresPollSL network and Siripalabot ego Network

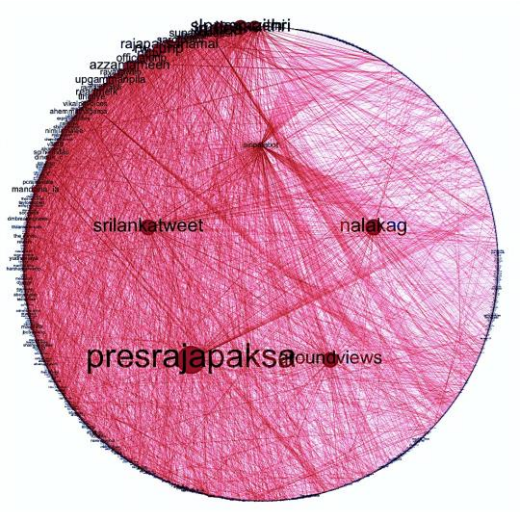
	#PresPollSL	Siripalabot ego network	G(n,p)
Edges (self-loops excluded)	5190	2276 (43.85% of the complete network)	5466
Vertices	1782	537 (30.13% of the complete network)	1782
Average Degree	2.912	4.238	6.135
Average Path Length	4.097	3.426	4.336

Figure 3: Network Graphs



(a) In-degree (b) out-degree





(c) Betweenness Centrality (d) Eigenvector Centrality

Table 2: Ego-level Metrics

Metric	Actors and Ranks				
	1st	2nd	3rd	4th	5th
Out-degree	Siripalabot (529)	Inspireinfor (129)	vg123e (97)	Wnicholasgomes (65)	rubenthurairaj (64)
In-degree	Presrajapaksa (138)	srilankatweet (126)	Groundviews (112)	nalakag (107)	Slpresmaithri (91)
Eigenvector Centrality	Presrajapaksa (1)	slpresmaithri (0.662)	indica (0.634)	nalakag (0.602)	groundviews (0.599)
Betweenness Centrality	Siripalabot (0.284)	indica (0.099)	groundviews (0.098)	excuzemi (0.068)	readmelk (0.044)