STUDYING THE ARAB NETWORKED PUBLIC SPHERE

A REFLECTION ON METHODS

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A summary of the methodological approach to a collaborative research project carried out by the Access to Knowledge for Development Center (A2K4D) Center at the American University in Cairo, the Berkman Center for Internet & Society at Harvard University, Innova Tunisia, and the Arab Policy Institute.

The reach and impact of digital communication continues to expand by the day. Social media and the array of online media sources offer an important source of information on topics of public concern as the number of citizens informed by digital sources continues to grow. These sources include traditional media organizations that have migrated online, newer digitally native media organizations, and social networks inhabited by friends, colleagues, and civil organizations. Digital tools not only facilitate news and information sharing, but are also used to coordinate collective action and build social capital. In this study, we set out to assess the role of the networked public sphere in civil engagement and social mobilization in the Arab world, with a focus on Egypt and Tunisia. In this document we describe the methodologies that we used for this research and reflect on their strengths and limitations.

Digital communication is becoming an important part of, social and political dynamics. The resulting data that is produced can be gathered, aggregated, and analyzed. The breadth and depth of data available to social scientists from online communication is staggering. The rich variety and complexity of digitally mediated activity and the different contexts in which it unfolds means that studying the networked public sphere is better understood through analyzing the interplay of online and offline phenomena in addition to analysis of data from social media and digital communication The methods for studying the networked public sphere are recent enough that they are still under development, and improvements are continuously being made. From a methodological standpoint, we still have much to learn.

For this collaborative project, we employed a variety of methods to inform our analysis and interpretation:

- Digital media mapping at the country and regional scale.
- Tracking digital media associated with specific topics and countries.
- Focus groups and interviews
- Nationally representative surveys.
- A review of prior studies and related literature.

In the following sections we summarize each of these approaches, each of which has particular strengths and limitations that have an impact on our ability to draw inferences and conclusions.

NETWORK MAPPING OF TWITTER AND BLOGGING COMMUNITIES

Network maps based on Twitter communities were created and analyzed for Egypt, Tunisia, and Bahrain in addition to a blogosphere map that included the entire Arab region. The data collection and mapping work were done in collaboration with John Kelly of Graphika, a social media analytics firm.

Social network mapping techniques were used to generate network maps based on the relationships between users: for Twitter the follows relationships between users, and for blogs links between blogs. The network structure is visualized using a physics model layout algorithm (Fruchterman-Rheingold), overlaid with colors representing each account's assignment to a group based on a

clustering of network relationships. Qualitative human judgment is subsequently used to interpret the results of the algorithmically generated network structures. A variety of metrics derived from the maps help researchers to understand and describe the content and communities in the network. For the Twitter maps, this includes accounts followed, mentioned, retweeted, and replied to; the words used and URLs cited in posts; and the data in user profiles. For the blogosphere map, researchers have access to the links to other blogs, the URLs that are cited in blog posts, and the frequency of words that appear in blog posts.

A multistage process is used to determine which accounts are included in the maps. The mapping starts with a seed set of accounts compiled by researchers and is augmented using spidering techniques (for Twitter, acquiring followers and followers of followers, and for blogs, following links). The final map is reduced to a smaller size by including only the approximately 10,000 accounts that are most highly connected to the country-relevant network. This produces maps that are both rich in detail and resolution while being of a tractable size for quantitative and qualitative analysis.[1]

The network mapping offers an aggregate landscape view of portions of the networked public sphere based on longer term relationships among participants in a country or region. The resulting network maps provide a distinct and powerful perspective on the underlying social and political dynamics of a region or country. The basis for the mapping is empirical observations of the decisions of participants; linking, following, mentioning, retweeting are all behavioral measures.

The structural elements of the networks reflect emergent communities in the networked public sphere that would not be observed or studied by other means. The mapping also reveals the topics and perspectives that attract the most attention in this portion of the digital media system and draw together communities with common interests. Additionally, the network map allows researchers to observe the key organizations and individuals that lie at the heart of different communities online.

The mixed methods research protocol provides a quantitative structure and framework for regional and topical experts to engage in detailed qualitative content analysis. This framework enables researchers to study not only the persistent issues, ideologies, and coalitions that emerge in the space but also focus inquiry on different topics that occur during the period of data collection.

Compiling data and developing maps for several countries forms the basis for comparative analysis, adding further context and strengthening the analysis. Comparing networks over time lends further insights on the evolution and dynamics of the networked public sphere.

There are several challenges associated with the country and regional network mapping work. Separate research efforts are required to study different segments of the networked public sphere (e.g. blogs, digital media, Twitter, Facebook). Each is time and resource intensive.

It is not possible to know with certainty whether activity on one platform fairly reflects activity on other platforms or overall online activity. Each portion of the network represents an unknown

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[1] See the full paper for a more detailed description of methods.

segment of society. Without supplementary research, it is not possible to know which segments of a country's population are online and represented in the network maps.

Because of the emphasis on studying the most prominent areas of the networked public sphere, it is possible that topics of interest and importance to smaller portions of the network are not included. Digital communication that does not take place in public fora is not included.

Understanding and interpreting the network maps is time intensive, requiring many hours identifying users and reading posts. Different researchers looking at the same core resources may draw different conclusions from the same networks and data.

ISSUE-BASED DIGITAL ANALYSIS

An alternative approach to analyzing digital media is to identify a specific issue, topic, or controversy, and track the activity rated to that particularly topic across different media platforms. This approach was applied to the analysis of a set of topics in Tunisia and Egypt. This analysis was conducted using Web Radar, a digital media analysis platform. This tool was used for data collection and crawling, querying, and analysis, and includes coverage of Facebook, Twitter, blogs, and other digital media sources.

The data collection for each country starts with identifying the websites associated with the most traffic. This is based on the Alexa.com service, which publishes a list of top visited 500 websites. Foreign news websites and non-relevant content such as gaming, music, and pornographic websites are excluded from consideration.

For Facebook and Twitter, data sets were constructed starting with human-curated lists of the most popular local Facebook pages and the most active Twitter users. Crawling programs and social media public APIs (Application Program Interfaces) were then used to fetch HTML pages and social media content multiple times a day. Additional new sources (websites, Facebook pages, etc.) were identified by extracting and following links from the core data sets. This method was used to create data sets that included content from 14,640 Egyptian sources and 49,660 Tunisian sources. This study draws on over 30 million articles and publications on blogs, forums, and social media in Tunisia and Egypt during the years 2012-2014, and 3.7 billion social interactions of users with the collected content items.

Most of the additional sources in both countries were Facebook pages. The raw HTML content was then cleaned to remove extraneous content (banners, menus, etc.), keeping only the substantive relevant text for each post or article. For example, in the case of a news article, the useful content is the title, the body of the article, and the pictures accompanying the core article. For Facebook posts, user comments are also collected and added to the database.

Once this database is compiled, text-mining techniques are applied to extract the named entities from the text (such as people's names, locations, organizations, brands, products, and concepts). Researchers are then able to isolate and analyze the digital activity associated with a given topic over time across several different platforms. Additional metrics available for researchers include the number of likes, comments, shares, and retweets, all of which are collected through the

Facebook and Twitter APIs. The system also estimates the number of page views for every content item, based on three mathematical models that interpolate the page views: one for Facebook posts, another for tweets, and a third for other websites (news, forums, corporate websites, etc.). Each of these models incorporates several parameters in the interpolation formula. The main parameters are: website average monthly traffic, (the number of Facebook page fans and number of Twitter followers, respectively), the number of content items published during a given day, and the relative popularity of the content item compared to other items produced by the same source during the same day. The models also incorporate the number of Internet users in the country, and user behavior patterns (liking, following, sharing, retweeting, etc.) on social media. An additional feature applies natural language processing algorithms to each content item in order to compute the general tone of the text. This determines whether it is positive, negative, or neutral.

This system offers a powerful window into political and social dynamics by tracking different topics over time and honing in on who engages with a given topic, with whom they interact, and the language that they use.

There are potential limitations with this approach. Each step in the data collection process has a margin of error, and relevant content sources and newly created websites or Facebook pages may be missed. Facebook and Twitter APIs both have query rate limits, although these were mitigated by setting up parallel collection efforts. The Twitter API does not permit the collection of more than 3600 historical tweets from a given Twitter account. The natural language processing algorithms and techniques also have a margin of error (evaluation tests obtained confidence scores that typically range between 70 and 90%). Another possible shortcoming is that social engagement metrics (likes, comments, etc.) are dynamic by nature: A person can still "like" a post that has been published two years ago. In general, the metrics used in this analysis reflect the situation up to 24 hours after the publishing date/time of a content item. The measurement of reach and audience—the estimated number of page views for every content item—is based on other estimations such as traffic from Alexa.com and the number of internet users from national or international statistics sources.

FOCUS GROUPS AND INTERVIEWS

A total of three focus groups[2] were conducted throughout the course of this study, in addition to a set of interviews with a fourth group. A purposive sample was taken to capture accounts from representatives from across the political spectrum in Egypt who have been socially and politically active online. This included non-aligned activists, supporters of the military regime and Islamists together with supporters of the Muslim Brotherhood. The purpose of the focus groups was to gain an understanding of the different perspectives from across the political spectrum in Egypt on the role of the Internet in mobilization and the evolution of the nature and structure of the online sphere in Egypt since the January 25th 2011 revolution.

Three focus groups were conducted in early 2015 in Tunisia as well. The first group involved participants who were active online, especially on Facebook (which is very popular in Tunisia),

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[2] Focus groups included a minimum of 8 participants.

but not active on the ground politically. Participants in the second group were active both online and to some extent offline. The third group of participants was categorized as "activists," with active participation both online and offline. Questions revolved around perceptions and experiences with demonstrations and mobilizations. Questions also included ones centered on participants' motivations to participate and the nature of their participation.

The focus groups proved to be useful in eliciting qualitative views and first-person narratives from participants who have lived through and been part of the topic under investigation. The collective and semi-structured nature of the discussions added a layer of depth. Group discussions steered the conversation in interesting directions and highlighted issues from angles not necessarily pre-determined by the administrators of the focus group. The group discussion allowed for deep introspection on the various topics and prompted participants to think about their own present and past experiences individually and in relation to the experiences and answers from others in the group, adding further depth to responses and content. The ability to hold focus groups over more prolonged periods of time allowed for a comparison of views and reflections amongst, for example, participants with similar political views in light of evolving context on the ground.

While focus groups produce rich, in depth content, purposive sampling and the normative judgment involved in setting selection criteria for participation represented a challenge, especially since criteria is different for the four different groups conducted. For example, one of the criteria set was that participants had to be "active" online. For some groups, this entailed a certain range of followers: non-aligned participants, who are by nature veterans in the online space, could typically have around 30,000 Twitter followers, while regime-aligned participants may either be inactive on Twitter or have in the range of 1000 followers. The same logic applies for Facebook friends and followers. Our normative judgment and local knowledge were used to guide us in setting reasonable criteria accordingly.

Because of time and resource constraints, the focus groups in Egypt were conducted on a relatively smaller sample size and were geographically limited to Cairo. Interviews with participants in other locations would have enhanced the quality and representativeness of results. An additional challenge is that events unfolding on the ground meant that participants were reluctant to gather and participate in a focus group setting; this meant the recruitment and selection process took an extended amount of time. For Islamist participants, interviews substituted for focus groups.
Interviews were conducted with a selection of participants in both Egypt and Tunisia who represented different social and political viewpoints. These interviews offered participants space and time to speak more freely, allowed for flexibility, and provided a useful complement for the focus groups. Scheduling sufficient interviews to ensure a representative selection of participants proved to be a challenge.

SURVEYS

Nationally representative surveys were conducted in Egypt and Tunisia.

A survey of 1050 respondents was conducted in Tunisia in partnership with market research and opinion polling firm Sigma Conseil. The survey instrument is structured into questions around

Internet and social media usage patterns and perceptions of the impact of social media on civic engagement, with a focus on particular events identified previously, such as the assassination of opposition leader Chokri Belaid in February 2013 and the Bardo sit-in that took place in July 2013.

In Egypt the survey was conducted in partnership with the Egyptian Research and Training Center (ERTC). The survey instrument was designed to study knowledge of and perceptions about the Tamarrod campaign. Given the scale of the campaign, this tool was selected due to its ability to capture a large number of responses from the public, using a nationally representative sample. The sample size (n=1055) was much larger than the numbers of participants in the qualitative fieldwork. The survey was used in tandem to interviews with Tamarrod campaign founders conducted by the A2K4D team.

The survey data collected provides a wealth of first-hand information grounded in social context to complement data from digital tools and theory. The survey attempted to quantify and measure participation online and offline, to study the behavior of Internet and non-Internet users, and to assess factors influencing their decision and ability to mobilize. The survey also provided a means to collect responses regarding perceptions of the role of traditional and new media in these processes. The tool also allowed for cross-examination of different variables together, for example patterns of Internet usage against preferences for sources of information and networks of influence.

One of the principal challenges associated with the survey is that the politicized nature of the topic under study and context of events in Egypt meant that a degree of self-censorship and caution was exercised in formulating survey questions. Administering fieldwork nationwide in Egypt requires prior approval from the central agency for public mobilization and statistics (CAPMAS). The agency has the right to request eliminations and modifications of content before approval is granted. Participants may also have been reluctant to answer particular questions.

While a survey captures a larger sample size, the data collection process is depersonalized. As researchers we cannot participate in the data collection, given CAPMAS regulations. Designated and trained administrators who are not involved in the research administer the survey. While the sample for the survey was nationally representative in terms of geographic distribution, Internet users are under represented in the sample. While official figures indicate that Internet penetration at the time the survey was conducted reached 59.7%[3], Internet users represented 33% of the sample surveyed.

Translating the research questions of this work into survey questions with easily quantifiable responses was a challenge. It was also challenging to translate the survey questions from English to Arabic and back to English whilst avoiding alterations to the original meaning of particular words and terms.

While the survey is useful in providing an overview of the issues at hand, the quantitative analysis may sometimes compromise depth in handling issues. As such conducting semi-structured

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[3] ICT Indicators in Brief, May 2015. *Ministry of Communications and Information Technology (MCIT),* http://www.mcit.gov.eg/Upcont/Documents/Publications_1272015000_EN_ICT_Indicators_in_Brief_May_12.pdf. The survey in Egypt was conducted in Q1 2015.

interviews with relevant stakeholders provides much needed depth and detailed insights. Together, these tools capture the issues from both quantitative and qualitative perspectives.

REFLECTION ON METHODS

Each of the methods and approaches that we have applied in this study offers a different view into complex social interactions, and each has a particular set of strengths and limitations. While the network mapping of Twitter and blogs offers a unique landscape perspective on digitally mediated communication, it covers only the discussions and social relationships that are put into public view. Extrapolating the results to other arenas—offline spheres or different online platforms—is problematic without further information. The analysis based on specific topics allows researchers to go deeper into the dynamics surrounding a particular topic, but is hard generalize outside of the topics under study. A strength of both of these approaches is that they are based on observed behaviors and sentiments revealed in the public sphere. The fact that the Arab world has embraced social media offers a vast source of data on matters of social and political interest. People now express their concerns and opinions in the open and these can be automatically collected and analyzed. While the cost of data collection continues to drop, analytical techniques are expanding. The relevance of online phenomenon on media and policy continues to rise as Facebook and Twitter have become a main source of information for a large percentage of citizens.

These digital analysis techniques are not as strong in assessing what goes unsaid and why. While surveys, focus groups, and interviews are subject to reporting biases, they are able to broach topics and elicit opinions that may not be reflected in digital media. This is particularly important for understanding how online phenomena may or may not influence those that are not online. We come away from this research convinced that approaching these questions from multiple perspectives and using a number of complementary research tools greatly strengthens the robustness and explanatory power of such research. Combining qualitative and quantitative fieldwork methods together with digital tools provides analytical depth and context that would not be possible using one of these techniques alone. The combination of speaking to individuals, having on the ground discussions, and collecting data from a larger sample better informs our understanding of the data produced using digital tools. Digital tools perform the important function of providing a different form of data that is not reliant on individuals' recollections or perceptions, but this data is best understood when it is informed with the insights from the field in which events studied actually unfolded. Recognizing the limitations of the various approaches and methods used in this study, the ability to compare results from different perspectives gives us more confidence in the results and conclusions of this study.

For studying complex phenomenon, we find that comparative approaches and metrics are particularly helpful—looking across different topics, across different countries, and across different time periods. Understanding the uptake of a story in digital media, its peaks and dynamic trajectory, is improved by comparing a set of different stories. Analyzing a network map or communities within a map is enhanced when lined up against a set of similar maps. Similarly, holding focus groups over extended periods of time allows for comparisons at different points in time and reflections on events as they unfold. It also has proven to be useful in corroborating results from various digital tools.

Building the capacity for multidisciplinary research is particularly helpful in this field. We were able to include social scientists, activists, software developers, and entrepreneurs in this study. The research was enriched as a result of combined expertise. The results would have been significantly weaker if any of these perspectives and skill sets were missing. Such work strengthens the synergies between research on the interplay between social sciences and technology.

APPENDIX: LINK-BASED METHODS OF STUDYING THE OPEN INTERNET

We made several intensive efforts to study the networked public sphere in Egypt based on a methodology that maps a wide range of digital media actors based on linking patterns between media sources. This approach has proven to be particularly effective at studying discrete online debates or controversies, as for example in Berkman Center studies of the SOPA-PIPA and net neutrality debates in the United States. Despite repeated attempts to locate link-based networks of media in Egypt, we concluded that there is not a viable link economy outside of Twitter and Facebook. This is rooted in two phenomena: 1) the absence of a linking practice in online digital media in Egypt; this applies to both larger publications such as newspapers with online versions and to small digital media outlets; and 2) the decline of the Egyptian blogosphere, where linking out to other sources was more common.

From a methodological point of view, the absence of a robust link economy precludes any study that uses online citation via linking to identify stories and sources or that uses links to assess the impact and prominence of different stories and media sources. In essence, the absence of a network prevents any study of the network. Without the roadmap provided through the link economy, studying digital media is not qualitatively different than collecting and studying print media before the digital era. It is still possible to conduct content analysis on a curated source of media sources using natural language processing and any manner of automated text analysis approaches.

We made several attempts to find a set of media sources with a significant number of links between them. In the first attempt, using the Media Cloud platform, we searched a broad set of Egyptian media sources[4] for stories that included the search term 'Tamarrod' in Arabic and different transliterations of the word in English, in reference to the protests in the summer of 2013 that led to the removal of the Morsi government. We identified a significant number of media sources that reported on Tamarrod, one of the most notable stories in Egypt that year. Within these stories, however, there was not a significant number of links to other stories on the topic. In our second attempt, we built up a more robust media set based on the top 500 Egyptian web sites according to Alexa. Running a search on 'Tamarrod' produced similar results. After spidering every outgoing link from this corpus of stories, we found only three new sources. Another attempt was based on scraping media links for any story on any topic from over 90 popular public Facebook pages from Egypt. This list of media sources that resulted also included very few media sources, although with a significant number of links to other non-news related sources or stories, such as sports and lifestyle. In each one of these efforts, we also conducted a manual review of the media sources to ensure that the paucity of links was not the result of flaws in the automated link harvesting tools we employed.

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[4] The list included both mainstream media sites and prominent blogs.