

@Archivist_Community: UCINET Social Network Analysis and Archivists on Twitter

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Abstract

This study measures the effects of Twitter usage among archivists in order to begin to identify and evaluate social media for future use for the archive community. The study analyzes the statistics to provide quantitative evidence of what is going on “behind the scenes,” and the correlation to the content of the tweets and the number of responses. Using social network analysis (SNA), a database was constructed to build the social network, nodes, ties, identify the relationships, create the measurements for the various weights connecting a number of different ties. UCINET software was used to conduct the social network analysis. The consideration of various weights and connections to a number of ties provides an insight into how the archival community uses Twitter.

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1 Introduction

As a profession, archivists rely heavily on professional support and networks since many work as lone arrangers. The development of national, regional, and local organizations such as the Society of American Archivist, the Midwest Archives Conference, and the Louisiana Archives and Manuscripts Association, filled the profession’s needs for decades. As technologies developed, these organizations leveraged them for better communication and networking among archivists with the introduction of email listservs, websites, and discussion forums. Despite the technological platform, archivists continue relying on professional networking, and are increasingly moving toward independent platforms, such as Twitter, to fulfil their needs.

Social networks allow individuals to connect with individuals and groups with whom they share common interests either personally or professionally. Unlike previous studies focused on archival repositories, this study explores and analyzes the Twitter network of individual archivists. Applying social network and content analysis, the study highlights the clustering trends including, but not limited to, geographic, institutional, organizational, and topical. The purpose is to better understand how archivists communicate within their professional network and the strengths of their connections within the network. Businesses conduct similar studies to learn information about their consumers. Understanding the communication paths and content will provide archivists better awareness of their professional networks and best means for leveraging these networks. This study addresses the following research questions:

- What kinds of archival professional networks exist?
- What kinds of interactions take place within the social network?
- How strong are these interactions?

2 Literature Review

Social media allows for connectedness of communities. The popularity and widespread use of social media applications rests upon the user community and typically the larger the user population the more successful the application, as the Web 2.0 has become has made it possible for the development of collaborative online communities (Benkler, 2003). Archivists, like many other professions, use social media to connect themselves to each other, researchers, and archive collections. The real push being the evolution of analog records to digital counterparts in the archival profession added a seemingly overnight change to how archivists can present information to patrons (Gelfand, 2013). A few studies in recent years began identifying how archives adjusted to the influx of new technology. The incorporation of the variety of technologies into culture and the types of information generated continues changing the archivist’s role (Yakel, 2006). With these changes, the users are changing and requiring different types of information. An exploratory study conducted by Samouelian (2009), found that archivists are moving in the direction of incorporating social media tools into their digital collections and websites, and found

archivists who had implemented social media had done so with little to no pre-implementation planning, although the repositories did receive positive feedback from users. In addition, Crymble (2010) surveyed a selection from the archival community to determine usage patterns of institutions using Facebook and Twitter among individual and institutional users. The study found no correlation between the frequency of posts and the growth of number of fans/followers. Crymble identified the Library of Congress as the greatest success in maintaining a substantial user community.

However, few comprehensive studies explain discrete outcomes and effectiveness of the social media incorporation by archivists. Without this knowledge, archivists are unable to make targeted efforts and know if they are reaching as many people as possible. Social network analysis is a framework that measures structural relations between members of a network. The ultimate purpose of social network analysis (SNA) is to explain the behind the scenes development and interactions in a network. John Barnes first theorized the concept of SNA in 1954.

The strength of SNA comes from its visualization potential and measurement of an immense framework. Nodes represent actors that are a part of the social network. Nodes are represented by points in a network and the edges are represented by lines. Together they are the visual representation of a social network. When describing the analysis of relationships between the nodes and edges, the terms actors and ties are used as descriptors. The information gained from conducting a study using social network analysis of archivists' use of Twitter would provide the archivist profession with much needed insight.

3 Methodology

3.1 Sample

The study's sample population was constructed following a modified snowball technique beginning with 5 main hub archivists with over 1,000 followers. The sample continued building through the inclusion of 3 generations of followers from the main hubs (the follower of the follower of one of the initial group). The sample of Twitter users includes users from around the world, but is limited to those who tweet in English. Additionally, the sample excludes any user who cannot be verified as an archivist through analysis of their profile description, or comparison with organizational directories (such as SAA), but includes archival graduate students and academics (each of which represents further delineations of the sample population). Finally, the sample population is limited to public Twitter accounts. The resulting sample includes 4,907 users and 96,001 interactions or links between users. Table 1 identifies the user accounts with the highest number of followers in the study. In order to anonymize the participants of the study and to increase space in the SNA visualizations, all nodes were given a codename. Due to space, the focus of this study only included the codenames given to the main actors. These codenames are found in Table 1.

Username	Code Name	# of Followers in Study	Total # of Followers	% of Followers in Study
archivesnext	A1	2127	7425	28.6%
anarchivist	A2	794	4842	16.4%
archivesopen	A3	649	3705	17.5%
Footage	A4	641	8335	7.7%
Dferriero	A5	636	3360	18.9%
Tjowens	A6	590	4949	11.9%
EvilArchivist	A7	515	1275	40.4%
DigiArchivist	A8	489	2212	22.1%
margotnote	A9	453	2913	15.6%
minniwed	A10	453	1347	33.6%

Table 1. Accounts with Highest Number of Followers in the Study

3.2 Data Analysis

Initial analysis of the data identified general user trends through descriptive statistical analysis of the number of tweets per day and age of the users' accounts. In-depth analysis utilized social network analysis (SNA) through construction of a database to build the social network, nodes, ties, identify the relationships, create the measurement for the various weights connecting different ties. The social network analysis used UCINET software for visualization based on a Tweet Retweet Node-Node Matrix

(TRNM). The TRNM records not only who tweets and retweets whom, but also the frequency of the interaction. The frequency indicates the connection strength between actor i and actor j . The layout of the matrix is displayed in equation 1.

$$TRNM = \begin{pmatrix} t_{11} & \dots & t_{1n} \\ & t_{ij} & \\ t_{n1} & \dots & t_{nn} \end{pmatrix} \quad (1)$$

The SNA also analyzed the network centrality of the matrix. The degree of a node refers to the number of the connection maintained by that node in a network, and indicates its influence or interaction strength in the network. The degree can be divided into out_degree and in_degree in a directional network based on the following equations:

$$IDegree(i) = \frac{\sum_{j=1}^q f_{ij}}{q-1} \quad (2) \quad ODegree(j) = \frac{\sum_{i=1}^q f_{ij}}{q-1} \quad (3)$$

4 Findings & Discussion

The majority of users averaged less than 1 tweet per day (75.3%). A second grouping of users tweeted 1-9.99 times per day (22.6%) with the remaining users averaging more than 10 tweets per day (2.1%). Although a handful of users adapted Twitter early reflective of accounts older than 7 years (5%), the majority of accounts are between 4 and 7 years old (50%) with only 6% of users creating accounts during the previous year.

Figure 1 is a visualization of the entirety of the archivist Twitter network. The five green nodes in the center of the visual are the actors in the study that were found to be the most influential in the network. Figure 2 is the ego output for those five main actors, this visualization demonstrates high influence of actor A3. Figures 3 and 4 are the visuals for the in and out degree measurements. In Figures 3 and 4 it is evident that five green nodes have significant values for both the in and out degrees, thus indicating that the interaction levels are high in both creating information to the Twitter network and responding to information within the Twitter network.

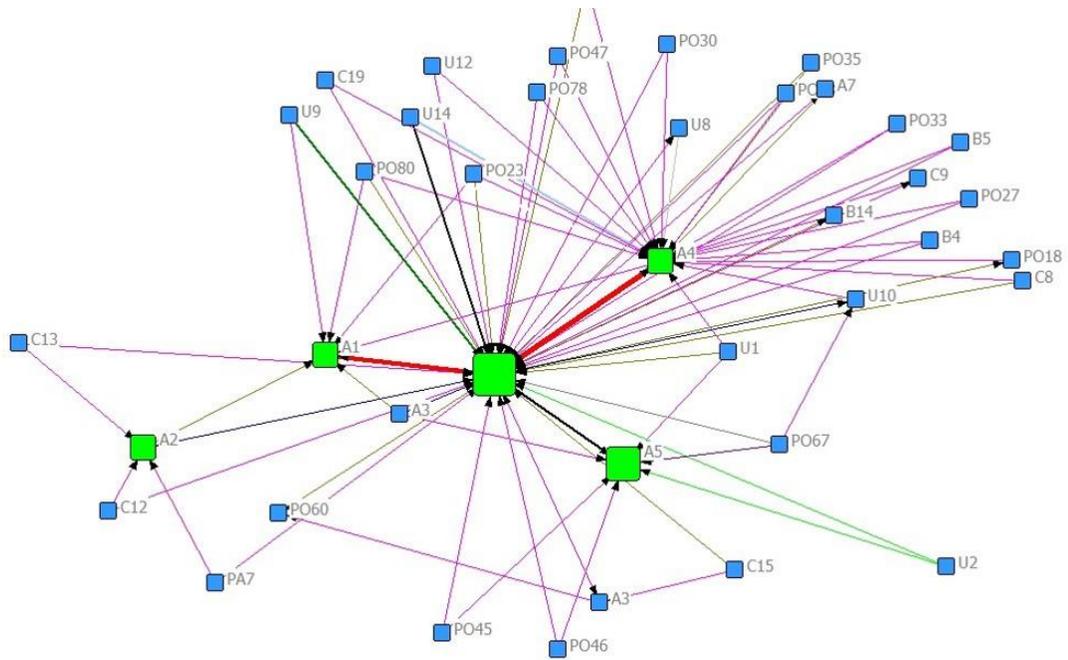


Figure 3. In Degree

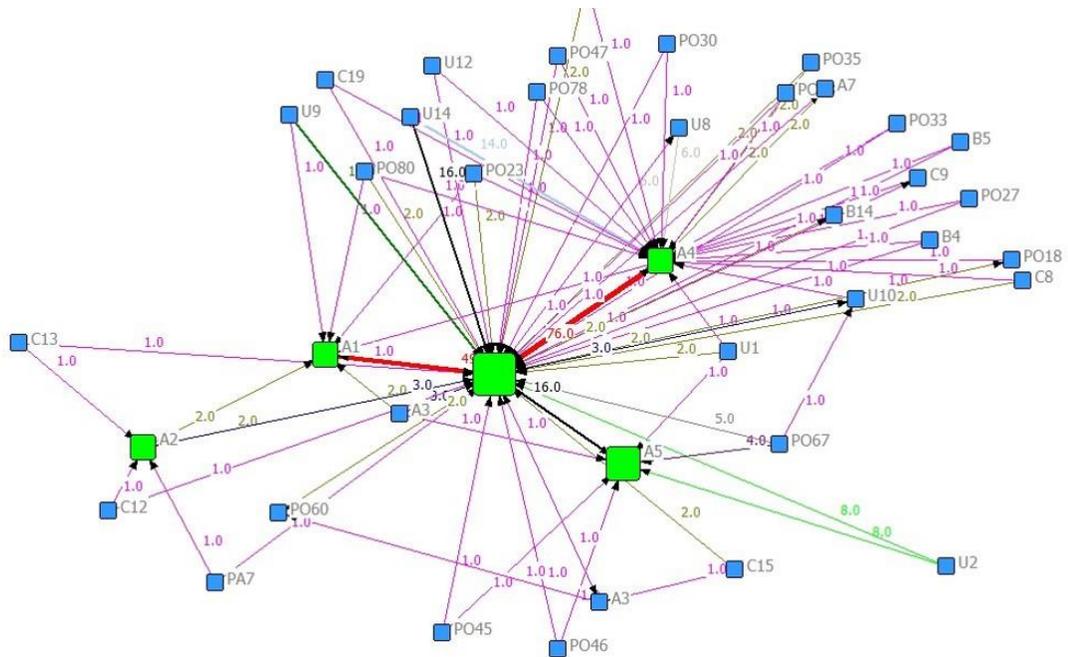


Figure 4. Out Degree

5 Conclusion & Future Work

The study identifies the existence of strong archivist social network on Twitter. The most highly measured nodes of the network had high in and out degrees, which indicates that these actors had high interaction levels. Interestingly, these actors also had the highest number of followers out of the selected archivists that were studied. This finding indicates that the higher the number of followers the more information will be created for the Twitter network, and the more likely the archivist will be to respond and interact with other participants of the network, thus influencing themselves. Based on these findings, the authors will continue analyzing the archivist social network through weighting of additional factors such as account age and geographical areas. Additional future studies will focus on qualitative analysis of individual tweets

within the network, and tracking the use of specific hashtags, such as conference focused (#AERI, #SAA2015) and topical (#ThatDarnList, #AskAnArchivist).

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