

Functions of Twitter in Digital Libraries

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ABSTRACT

Twitter is a popular social media tool for people to connect and communicate with one another. In recent years, digital libraries (DLs) have added Twitter to their lists of social media tools as a way to engage with users. However, how digital librarians and users actually use this social media tool is unknown. In order to gain more knowledge about the use of Twitter, the authors conducted an open coding analysis of Tweets from 15 different DLs for the course of one year. Five types of functions of Twitters in DLs were selected and discussed, which represent the problems, promotion, related resources, social connection and social identity of DLs. In addition, their relationships were also explored.

Keywords

Digital libraries, Twitter, social media

INTRODUCTION and LITERATURE REVIEW

There are now 241 million monthly Twitter users, 500 million registered users, and 76% of users are mobile users (Twitter, 2014). Social networks allow individuals to connect with individuals and groups with whom they share common interests either personally or professionally. The identification of a library being perceived as a person and acting as one through posts and connections made via Twitter, has resulted in a number of different types of research. While there are limited studies that discuss the entanglements that a DL encounters as opposed to a physical library, many of the findings are reliable.

Twitter use in libraries has increased noticeably in the past several years. Torres-Salinas et al. (2011) found a 52% decrease of blog usage within the library and information science category in 2006 to 2009, and identified the emergence of Facebook and Twitter as potential causes of the decrease. Many libraries have decided to use Twitter as a bridge to patrons by the sharing of pertinent information. Gunton & Davis (2012) suggested that social media spaces best utilized by libraries to understand and incorporate the experiences that people have using social media applications, such as Twitter. Del Bosque, Leif, & Skarl (2012) analyzed the

use of Twitter in an academic setting. Their study included 19 criteria in layout and design, number of Tweets, and account followers. They found a variety of usage amongst the libraries, particularly, the Tweets fell into the following categories: discussion of resources (55%), library events (24 %), and hours (14 %). Anwyll & Chawner (2013) analyzed the use of social media use in libraries by interviewing 15 librarians. The majority of librarians used social media as a platform to discuss books and library materials, for example, new books. Sewell (2013) examined 432 follower accounts from the Sterling Evans Library at Texas A&M, and found that the majority of the followers consisted of undergraduate students (23.6%), and the followers from the faculty and staff category (7.64%) showed the least amount of participation. In a related study, Jansen, Zhang, Sobel, & Chowdury (2009) analyzed Twitter to study word-mouth-sharing. This kind of sharing in relation to libraries demonstrates that Twitter is widely used by the public as a means to share opinions, and may be a representative of the users' identity.

Social media was created for users to communicate and connect. It is extremely important to learn how users are interacting with libraries and other cultural institutional entities on social media. For example, Aharony (2010) evaluated the differences of Tweets produced by 30 academic and 30 public libraries, including the wording and content of Tweets. The content analysis was broken down into information about, library events, book recommendations, the library collection, library services, references, and the library in general. Twitter can be a multifaceted tool for users. Mulatiningsih, Partridge, & Davis (2013) used a qualitative approach to discover LIS professionals' experience using Twitter. The study found that being connected, building networks, and staying informed were all foundational elements regarding LIS professionals and their use of Twitter. Naaman, Becker, & Gravano (2011) analyzed different trends on Twitter, their findings indicate that exogenous trends that had characteristics centered around a certain event were present. In related research, Bae & Lee (2012) used sentiment analysis to analyze Twitter messages, and found by using Granger causality analysis that the time series and positive-negative sentiments were closely associated with the real world. Meaning that the users are sharing information closely based on news events happening around the world.

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The use of social media in DLs has been steadily climbing in the past few years. DLs that are a part of a parent institution are beginning to seek out their own unique social media pages to distribute information to users and followers. For example, the California Digital Library incorporated Twitter into its toolkit in 2009. "Twitter was becoming an important communication tool among certain groups we [CDL] serve . . . Twitter appeared to offer an opportunity to get CDL's news and ideas out to a wider audience" (Starr, 2010, p. 24). Xie & Stevenson (2014) investigated the types of social media applications including Twitter in DLs, and further characterizes their placements, update frequency, types of interactions between digital librarians and users, various types of roles they played as well as related problems.

A major concern moving forward is that there is little research being conducted on the use of DLs and social media platforms like Twitter. Twitter is a part of culture and the main purpose of libraries is to provide resources and connect with users, and with a more recently constructed field like digital librarianship. It is even more necessary to conduct studies to understand the overall use between social media like Twitter and a DL. Consequently, this study seeks to provide a qualitative approach by conducting an open coding analysis of over 5,000 Tweets made by 15 DLs who have enlisted Twitter. This study addresses the following research question: What are the functions of Twitter in a DL?

METHODOLOGY

The purpose of this study is to conduct an open coding of DLs' Twitter pages to identify the functions of Twitter in the DL environment. The larger scope of Twitter for the cultural institution community is much of the same purpose, as to connect and communicate with users who are or may be interested in the subject area of the institution. Twitter allows the DL staff to work to build an online community and to connect with users whom they would otherwise not be able to communicate due to the online nature.

The DLs selected for this study were English speaking and were located around the world after searching Twitter and using search terms like, 'digital library', 'digital archive', 'library digital.' The criteria for the inclusions were: 1) Each institution selected for this study has a DL. The DL must be English speaking. 2) The DL had to be in existence during the following time span, June 30, 2012 – July 1, 2013. 3). Each DL must have its own Twitter page separated from the library. The study serves as a foundational point to continue research in the area to help practitioners better utilize Twitter and for researchers to move forward with the subject matter, and provides the public with a way to demonstrate a part of their own through the following of different tweets or Twitter users.

Every Tweet of the total 5,713 Tweets from the Twitter pages of 15 DLs were analyzed. The DLs had a Tweet range of 18 - 831, a follower's range of 92 - 9138, and a following range of 37 - 2088. The unit of analysis is each Twitter. Types of Twitter functions were analyzed based on open coding which is the process of breaking down, examining, comparing, conceptualizing and categorizing. Instead of applying existing categories, five coding categories were emerged from the data including Information, Promotion, Related Resources, Social Connection and Social Identity. Multiple types of functions were further analyzed.

Descriptive analyses also were conducted to analyze the frequency of each type of function. One function for each category was presented in this poster based on its frequency of occurrences and its importance. The two authors coded the data independently. If there were disagreements on coding, the authors discussed them based on the definitions until the agreement was reached. In order to avoid repetition, the definitions of each type of function of Twitter and examples are presented in the Results and Discussion section.

In addition, the word similarity of the Tweets was analyzed to provide a richer understanding of the relationships among the five types of functions of Twitter within a DL context. NVivo was chosen to create the visualization results. The stress value was measured using Pearson's correlation coefficient ($-1 = \text{least similar}$, $1 = \text{most similar}$). In this study, a strong relationship was defined as $r \geq .6$. A weak relationship was defined as $r < .6$. No relationship was $r = -1$.

RESULTS & DISCUSSION

The study investigated the content of DLs' Tweets to better understand the functions of Twitter within a DL context. The following illustrates the definitions, examples, and number of Tweets for each type of function: Information-DL-problem, Promotion- DL -collection, Social connection- DL -interaction, Related resources- DL, and Social identity- DL -collection.

Information- DL -problem Tweets refer to the accessibility problems related to website maintenance, DL maintenance, power outage, different formats of digital items, etc. There were 156 Tweets in this type. Here is one typical example related to DL maintenance. *KDL is currently down due to infrastructure issues. We're trying to get it back up and running ASAP. Thanks for your patience! [KY]*. Another example is about accessibility issue of a specific format of a digital item, *@SDAllenToronto The issue is CBC's Flash-based video player <http://t.co/aVvTADWlOu>. But if you can get this link to play, let me know.*

Accessibility to DLs needs to be enhanced. In addition to

maintenance and file format accessibility issues, Tweet might be a good social media tool to attract users with different types of disabilities, such as visual impaired and hearing impaired users to access DLs. In addition, announcements regarding updates on DL compatibility issues for different platforms and new formats of digital items are also helpful.

Promotion-DL-collection Tweets refer to Tweets created to update and inform a Twitter user about a newly added item to a digital collection or new collection in general. There were 915 Tweets in this type. For example, *Check out our latest online exhibit, "Paper for the People," curated by @demiankatz: <http://t.co/r3vkHJ3s5n> #dimenovelfever #exhibits [VIL].* Another example is, *Frank Fitch Notebooks online - We're pleased to announce several notebooks and scrapbooks from the Frank. <http://t.co/Csg6IZEpLY> [KY].*

Promotional Tweets allows the DL to advertise their collections in an online setting. One of the purposes of a DL is to allow more access to collections that might now otherwise be accessible to users. DLs that promote their collections on Twitter open the door to allow users access who may have not otherwise found the DL's website. The outcome for the DL through promotion on Twitter can be a wider range of user and increased use of collections, all through a free social media site.

Social connection-DL-interaction refers to Tweets that occur about any kind of interaction that takes place within the Twitter feed, specifically more general social interactions than are categorized in other codes. There were 1,008 Tweets in this category. Social connection-DL-interaction is more from the follower perspective, for example, *@jpalfrey Awesome! What a brilliant way to explore Africa's literary landscape!* See Figure 1 illustrates the interaction that took place on Twitter.



Figure 1. Interaction example

Connecting with followers on Twitter is the purpose of the social media. It is important for DLs to create an atmosphere that permits an interactive space for their followers. The more that followers feel that they can openly ask questions to the DL and receive a response,

the more active the follower group will be. DLs try to respond to followers as quickly as possible to encourage the interactive atmosphere on Twitter.

Related resources-DL involves Tweets that allow followers to continue finding additional information on the subject that are related to collections, if not from that specific DL but from a related one. There were 180 Tweets in this type. For example, the DL New Zealand shared information about another DL, *Brilliant! LINZ are releasing their aerial imagery data for public reuse: <http://t.co/HxDScrUrbe>.* Another example is from the Calisphere DL who decided to share with their Twitter followers the information from UCSC, *Grateful Dead Archive Online is now live! Explore photographs, recordings, and fan art. Congrats UCSC Library! <http://t.co/Bx1EMMuQ>.*

Related resources-DL demonstrates how DLs connect with other DLs to build an online community. Through establishing relationships within an online community, information can more widely be shared amongst Twitter followers. DLs can build and grow their own online community through reaching out to other DLs on Twitter. This is especially important for DLs that have a lower number of followers because followers of other DLs are more likely to find the DL and begin to follow them.

Social identity-DL-collection refers to Tweets that provide followers with a general sense of the type of DL through the contents of the collection. There were 667 Tweets in this type. The purpose of creating a social identity of a DL is to build the self-concept of the digital collection. The social identity of the DL is easily illustrated to the user through the uniqueness of the digital collection. The Tweet will often include a link to a photograph, for example, Calisphere Tweeted, *We are so honored to have been selected by @US_IMLS as a finalist for the Nat'l Medal for Library Service! <http://t.co/NUtrgCOX>.* Another example is from CBC, *On this day in 1919: Remembering the Winnipeg General Strike 50 years later <http://t.co/Kr88PeNPu8>.*

It is crucial for a DL to build a profile that shows its characteristics because it is critical that users understand the identity of the digital library's presence. Users need to feel a connection with other followers on Twitter, the fact that DL has a Twitter profile and is not a single person does not make a difference. The data collected demonstrates that the development of a profile is one way to articulate to potential users of the DLs characteristics. For example, Tweets that display an aspect of the DL and also encourage interactions are great ways to build a social identity for DLs on Twitter.

Figure 2 displays the word similarity from these 5 types of functions. The visualized data demonstrates that there

is a strong relationship between the types: Promotion-DL-collection, Social connection- DL -interaction, and Related resources- DL. The strong relationship was $r \geq .6$. There is a weak connection $r < .6$ between Social identity- DL -collection, Related resources- DL, and Social connection- DL -interaction. There is no relationship between Information- DL- problem and the other categories according to Pearson's correlation coefficient. The no relationship is due to the unique Tweets that are created within that category. Information-DL -problem constitutes Tweets that deal with problems like accessibility issues, and no other category provides problem solving Tweets. These findings indicate that the terminology found in the DL Tweets are similar in nature. Further analysis of the relationships among different types of functions will help utilize Twitter to its fullest.

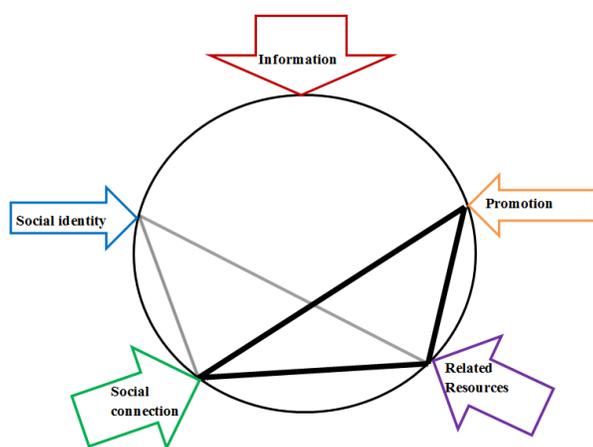


Figure 2. Word similarities

CONCLUSION

This paper reported the findings from the open coding analysis of Twitter postings made by DLs and their followers. The sharing of private information via a public platform is the basic structure of social media. As a Twitter account owner, many users have feeling of ownership, rights, and responsibilities (Jin 2013). Human behavior is complex, but digital librarians can harness those basic structures then, providing linkages to digital items, provides the public with a way to demonstrate a part of their own personally through the following of different tweets or Twitter users. The analysis from this paper provides practitioners with a deeper insight into how digital librarians and users participate using Twitter. It will also help digital librarians to have a richer understanding of social media, which will help promote and provide pertinent information regarding DLs and their unique identities. This paper lays a foundational point for research about DLs and Twitter. The paper was able to discover many characteristics about Twitter use in DLs, and how their followers interact with DLs. More research

with samples on different functions of Twitter and their relationships should be conducted in order to build a deeper understanding of the topic.

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