The Journal of Academic Librarianship xxx (xxxx) xxx–xxx

Contents lists available at ScienceDirect

The Journal of Academic Librarianship

journal homepage: www.elsevier.com/locate/jacalib

Build It and They Will Come? Patron Engagement Via Twitter at Historically Black College and University Libraries

Brenton Stewart[a,*], Jessie Walker[b]

[a] School of Library & Information Science, Louisiana State University, 271 Coates Hall, Baton Rouge, LA 70803, United States
[b] Department of Computer Science, Jackson State University, 1400 John R. Lynch Street, Jackson, MS 39217, United States

ARTICLE INFO

Keywords:
Twitter
Social analytics
HBCU
Sentiment
Follower
Propagation

ABSTRACT

This study is a social media analysis on the use of Twitter at Historically Black Colleges and University (HBCU) libraries. While information science researchers have begun examining how libraries use social media, the vast majority of these studies are situated at large flagship research-intensive universities. Additionally, there currently exist deficiencies in research on social media deployment at HBCU libraries. We leverage, the IBM Watson's analytic engine, to systemically examine over 23,000, tweets over an eighteen-month period, around a set of objective measures including propagation of retweets and sentiment to assess follower engagement. The analysis found little evidence of follower engagement with library generated content. However, we observed a substantial volume of library tweets coalesced around institutional boosterism, rather than library related phenomena. This non-library related content represented the vast majority of retweets, but paradoxically was propagated by non-followers. Additionally, tweets relating to institutional boosterism produced the most positive sentiment within the data.

Introduction

Academic libraries have readily adopted social networking into their day-to-day information services and some researchers posit social media "*can be an effective method of student outreach*" (emphasis added) (Dickson & Holley, 2010). However, do we really know if libraries are connecting with users via social platforms? Leveraging social media under the banner of outreach is the public performance of a rhetorical refrain known as Library 2.0. A derivative of Web 2.0 that describes the second iteration of the Internet emphasizing increased interaction and collaboration; Library 2.0 describes an ambiguous assortment of activities that include some form of user interaction with digital information communication technologies that can support a participatory library culture (Deodato, 2014). The problem with Library 2.0 and adoption of technologies like Twitter is the relative absence of empirical evidence demonstrating these tools are in fact connecting with library users. John Bushman argues the library profession engages in an "uncritical hype of technologies" that "celebrate[*s*]" while offering little if any "evaluation" (Buschman, 2003, 161). Similarly Deodato (2014) suggests that Library 2.0 rhetoric "focuses too heavily on the technology itself rather than the phenomena that it makes possible"(742). Of the few studies examining Twitter in academic libraries, we found they were situated in research- intensive universities, ignoring not only smaller colleges and university libraries but also libraries serving a large number of minority students. This analysis of Historically Black Colleges and Universities libraries presents an opportunity to observe both occurrences. Our research asks the broad question: Are users engaging with library generated content on Twitter?

We measure engagement by examining a set of objective measures namely retweets and sentiment. These objective measures allowed us to produce a more reliable data set around user behaviors with the following research questions: Are followers retweeting library content? What sentiment is expressed around library generated Tweets? Our study adopted Attfield, Kazai, Lalmas, and Piwowarski's (2011) definition of engagement as "the emotional, cognitive and behavioral connection […] between a user and a resource" (2). Researchers have measured engagement across a multitude of social media platforms: For example Arapakis, Lalmas, Cambazoglu, Marcos, and Jose (2014) examined user engagement in news sites, with a focus on sentiment, O'Brien (2011) used a qualitative approach to study online news reading practices, while other researchers have focused on volume and retweets (Stvilia & Gibradze, 2014).

The libraries we examine do not provide explicit objectives for their Twitter presence; most institutions however, position the "library" as an organization that "support[*s*]" the "information" needs of the "university" in their Twitter profiles. We assume they are attempting to

* Corresponding author.
E-mail addresses: brentonstewart@lsu.edu (B. Stewart), jessie.j.walker@jsums.edu (J. Walker).

http://dx.doi.org/10.1016/j.acalib.2017.09.016
Received 30 January 2017; Received in revised form 21 September 2017; Accepted 22 September 2017

establish what Joseph Deodato calls a "participatory library culture" via social media. In this space "users are encouraged to create and share information, resources, [and] metadata […] rather than being passive consumers of top-down library information systems" (Deodato, 2014, 746). Twitter profile data for these libraries suggest an attempt to implement narrowcasting, which selectively uses communication media to target "specialized-interest (or niche) audiences" (Watson & Hill, 2006 192). In this case the narrowcasting encompasses entities possessing close affiliation with the libraries, whether current students, faculty, or others, likely to utilize this specialized content. Although library-generated Tweets are freely accessible to everyone in the Twitter universe, their contents are not disseminated as a mass media broadcast.

Literature review

In this section we present an overview of relevant research on Twitter activity among academic libraries. The popularity of Twitter among young college age students has prompted many in academia to adopt the micro-blogging service as a strategy to promote enhanced engagement with course content among students (Junco, Heiberger, & Loken, 2011; Parslow, 2009). However Dickson and Holley (2010) found the way in which academic libraries leverage Twitter produces radically different outcomes. Some institutions use Twitter passively as a broadcasting service (Aharony, 2010; Gunton & Davis, 2012; Milstein, 2009). Other libraries have adopted a more interactive strategy, promoting discussion with followers, albeit with varying levels of success (Cuddy, Graham, & Morton-Owens, 2010, Del Bosque, Leif, & Skarl, 2012). Other researchers have sought a more intensive understanding of library interactions with followers.

The study conducted by Kim, Abels, and Yang (2012) examined how followers interacted with library-generated content, specifically identifying the individuals who retweet academic library messages. Their analysis consisted of 571 tweets from 10 institutions included in *US News and World Reports'* "Best Colleges and Universities" for 2012. Their findings revealed constituent units within the university and students comprised the largest populations retweeting library content, comprising 30% of retweet activity. Shulman, Yep, and Tomé (2015) found similar results; their analysis of two academic libraries sought to identify "influential" followers in a library's network (179). Despite comprising less than 10% of total followers, institutional accounts were the most powerful, meaning they not only retweeted the most but also, were vehicles through which tweets extended well beyond the libraries' network of students, faculty, and staff.

Stvilia and Gibradze (2014) explored factors that made academic library tweets "useful" – measuring both the number of retweets and rate of favorability. Data was collected using a Twitter API, resulting in 753 tweets, from six public university libraries in the United States. The study showed the most retweeted and favored content related to academic support services and library as place. A text mining approach guided Al-Daihani and Abrahams' (2016) analysis. Data comprised 23,707 tweets, collected from 10 highly selective universities in the United States and United Kingdom. Analysis revealed the most common word frequencies in library tweets were "open", "special collections", and "save-the-date." Additionally, tweets relating to resources were the most common category of original tweets disseminated. Al-Daihani and Abrahams suggest text mining as a helpful tool for decision-making, marketing, and outreach. The aforementioned research has done much to advance our understanding of how Twitter is currently used in academic libraries, as well as reveling some aspects of follower behavior. However the previous research is overwhelmingly situated at large and elite universities and does not quantify user engagement at a micro-level of analysis that measures engagement such as hashtags or emotionalism around each text.

Methodology

The study captured Twitter activity from sixteen HBCU's libraries, over an eighteen-month period (December 2013–July 2015), using the IBM Watson Twitter Analytic Engine, following Suh et al.'s model of data extraction and hashtag categorization (Suh, Hong, Pirolli, & Chi, 2010). IBM Watson analytic engine is a collection of supercomputers designed by IBM as a practical tool for diverse user communities. This collection of supercomputers supports unique program sets such as social media analytics, medical research, and smart device monitoring/analytics such as health sensors and building thermostats. The Twitter analytic tool is a subset of the social analytic engine that is designed to aggregate Twitter data streams into component elements such as: sentiment, propagation, tweet, and network analysis. We found 16 active Twitter accounts (i.e. accounts with at least one tweet) out of 100 four-year HBCUs. Watson utilized the following variables to measure the aforementioned research questions: library followers and sentiment. Sentiment analysis, also known as opinion mining, is a methodological approach that identifies the contextualized emotional elements of text with numerical values on a scale of positive, neutral, and negative. This makes it possible to adjust the sentiment of a given term relative to its environment (usually at a tweet or sentence level); positive (1), neutral (0), and negative (-1). For example the following "I love libraries" vs "I hate libraries" would receive a score of 1 and -1 respectively. The word "love" rates as positive (1), while libraries rates as neutral (0) and hate rates as negative (-1). This technique is often used to analyze a broad assortment of texts including blogs, news reports, speeches, movie reviews, and social media activity. Watson's harvesting approach was composed of the following three components: extracting data from the data provider (i.e. the Twitter data servers) via the Twitter application program interface (API); parsing tweets; and storing the data in a NoSQL database that resided in IBM Watson. This allowed the exploration of Twitter relationships between information producers and followers (i.e. libraries and followers). IBM Watson's analytic engine treated each library's Twitter username as a seed that corresponded to followers, limiting each library's data set to 15,664 users having any connection to the library. Fig. 1 provides a graphical representation of the manner in which data was harvested within Watson analytics.

Once a sufficiently sized collection was cultivated (about 160,000 tweets), data was separated into conversations (total tweets exchanged in one day) and propagation, with particular attention given to hashtag groupings within said conversations. Watson further reduced the conversations by examining only the first-level retweets within the conversation as depicted in Fig. 1. Hashtags were utilized as sub-labels to categorize conversations and themes, as illustrated in Fig. 2. Additionally, tweets were aggregated by sentiment scoring that automatically associated a piece of text with a score that denoted a combination of positive and negative sentiment expressed in the text of the tweet or retweet (Pang & Lee, 2008, Thelwall, Buckley, & Paltoglou, 2011, Thelwall, Buckley, Paltoglou, Cai, & Kappas, 2010). As a result, each tweet was scored on a scale ranging from -2.5 to 2.5, based on the number of occurrences of positive and negative words appearing in English. These scores were then sorted into two ratios which took into account all non-neutral tweets and only those which scored ≥ 2.5 or ≤ -2.5, which resulted in extremely positive and extremely negative opinion respectively.

Results

Tweet statistics

The dataset comprised 23,354 institutional tweets, 13,259 hashtags, 1074 mentions, and 6880 retweets. The largest collection of tweets was from Huston-Tillotson University with 3197, while the smallest from Mississippi Valley State University (1 tweet). Table 1 presents an overview of Tweet statistics for HBCU library accounts including