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The impact of Twitter on libraries: a critical review of the literature

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Abstract

Purpose – The paper aims to present a critical review on the adoption and use of Twitter in libraries. Twitter, a microblogging service, is becoming more and more popular among libraries as a means of reaching users and as a marketing tool for their services.

Design/methodology/approach – The method of systematic review is used to identify, collect and critically present all relevant literature. Papers' aims were analyzed to identify the emergent themes and sub-themes in an effort to gain a better understanding of libraries' use of Twitter.

Findings – A systematic and critical analysis of the literature revealed the specific reasons why a library should adopt Twitter; the specific examples and thoughts on how Twitter could be used to promote libraries' interests; the different ways Twitter had affected diverse aspects and functionalities of libraries; and the attempts to provide guidelines for librarians.

Research limitations/implications – This literature review has implications for research in that libraries could explore the way public view their presence on social networking sites such as Twitter to better gain from it. In addition, it indicates what libraries should expect when they adopt Twitter. This study reviews only papers published between 2007 and 2013 in the English language.

Originality/value – This paper contributes in identifying, collecting, analyzing and critically presenting published research referring to the adoption of Twitter in the field of Library Science. In addition, it identifies and discusses the main issues librarians and libraries need to consider, when faced with the challenge of adopting Twitter.

Keywords Libraries, Librarians, Systematic review, Twitter, Web 2.0, Social networking sites

Paper type Literature review

1. Introduction

Social networking sites (SNSs) have gradually gained an important share of time in people's daily routines. Numerous social sites have emerged, such as Twitter, Facebook, MySpace, and LinkedIn, to name just a few, all promising to enhance the users' experience on the Internet. Boyd and Ellison (2007) defined SNSs as Web-based services that aim to allow users to create a profile, link with their acquaintances, and be able to view and interact with their connections. These SNSs aim to connect people of diverse groups from different places and to promote interaction and sharing of experiences in

real-time. They have penetrated into almost every aspect of business (LinkedIn) and social (Twitter and Facebook), as well as educational aspects of users' lives.

Libraries, as institutions, primarily aim to assist users in finding necessary information, no matter when they need it and no matter where they are. A number of studies reported that more and more users adopt SNS not just for leisure and fun but also for finding and exchanging information with peers (Mack *et al.*, 2007; Chu and Meulemans, 2008; Connell, 2008). Other papers tried to review the literature on libraries' use of a specific SNS, such as Facebook (Vassilakaki and Garoufallou, 2014). Libraries, as the main organization responsible for managing information, could not just stay aloof of such a development. This paper focuses on one particular social networking site, Twitter.

Twitter is a microblogging service which enables users to write and read status messages that are 140 characters long or less. These messages are called *tweets* and are about anything that the user wants to express as a message (Ovadia, 2009). It was exactly this functionality that made Twitter popular among different scholarly groups. In particular, a vast number of papers refer to the use of Twitter in politics (Conover *et al.*, 2010, 2011; Wigand, 2010a, 2010b), especially during elections (Carafano, 2009; Lampos, 2010; Tjong *et al.*, 2012); when physical disasters occur (Acar and Muraki, 2011; Doan *et al.*, 2011; Li *et al.*, 2011); for exploring health issues (Heaivilin *et al.*, 2011; Paul and Dredze, 2011; Signorini *et al.*, 2011); in business (Miller, 2009; Coon, 2010; Culnan *et al.*, 2010; Zhang *et al.*, 2011); for sentiment analysis (Cui *et al.*, 2011; Jiang *et al.*, 2011; Kouloumpis *et al.*, 2011; Naveed *et al.*, 2011); for social network analysis (Sousa, 2010; Yardi and States, 2010; Harkreader, 2012); and also in education (Parslow, 2009; Thames, 2009; Roblyer *et al.*, 2010; Kassens-Noor, 2012).

In the context of library science, only Clevenger *et al.* (2011) attempted to review the relevant literature, but focused mainly on recording the changes that the new SNS introduced, specifically for public and academic libraries. However, the present paper aims to present a systematic review of papers concerning the adoption and use of Twitter in libraries, and concentrates on identifying the possible uses and impact of Twitter in the library and information science (LIS) field. This review contributes to identifying, analyzing and presenting in a critical way all the research undertaken and summarizes the challenges posed when adopting Twitter in libraries. Consequently, this will contribute to identifying possible areas of interest and promoting research in addressing these challenges. Finally, it provides a new approach to the relationship between libraries and SNS by focusing on the way researchers have treated the use of Twitter, how libraries have adopted Twitter and the impact of Twitter on libraries.

This paper is structured as follows. Initially, the methodological approach undertaken for conducting the systematic review is outlined. The emerging categories from the analysis of the relevant literature are then described. Finally, conclusions are presented accompanied by recommendations regarding directions that research takes in terms of Twitter's impact on libraries.

2. Methodology
The literature review has followed the rules of systematic review (Hemingway and Brereton, 2009). Search phrases such as "Twitter and libraries" and "Twitter and librarians" were run on different LIS databases, such as ACM Digital Library; Library, Information Science & Technology Abstracts (LISTA); Library & Information Science

Abstracts (LISA); CITESEER; Google Scholar; e-prints in Library & Information Science (e-LiS); and Digital Library of Information Science & Technology (DLIST). The searches were conducted between February and March 2013, and 630 papers were identified. The relevance of the papers was judged based on the title and the abstract. Overall, 51 papers were identified as reporting research on a library's use of Twitter. The reference sections for these papers were checked for any other relevant documents. However, no additional papers were identified. The final selected literature dated between 2007 and 2013 (Figure 1). The literature considered was in English, mainly due to language restrictions.

The final 51 papers were then extensively read through to identify emerging themes and patterns. In particular, each paper's aims were considered and four basic themes emerged:

(1) the reasons behind libraries adoption of Twitter;

(2) the ways in which Twitter was used;

(3) Twitter's impact on different aspects of libraries functions; and finally

(4) attempts to provide guidelines for libraries.

Each paper was then assigned to each theme; when a paper had more than one aim, it was assigned to more than one theme (see Figures 2 and 4).

Further analysis of the literature revealed that the papers fell into different types of materials, such as journal articles, conference proceedings, book chapters or theses, to name just a few. The majority of the relevant literature (39 papers in total) fell into the journal article type, whereas the rest of the paper types counted only a few of each type of publication (e.g. six conference proceedings papers and three book chapters). In addition, no trend could be distinguished in regard to the specific source of publication as the articles were published in a variety of different scientific journals (Figure 3).

2007 — Stephens, 2007;

2008 (2) — Chua, Goh and Lee, 2008; Wilson, 2008

2009 (10) — Carscaddon and Harris, 2009; DeVoe, 2009; Dudley, 2009; Holland and Verploeg, 2009; Milstein, 2009; Mullan, 2009; Ovadia, 2009; Primus, 2009; Steiner, 2009; Tay, 2009;

Year of Publication

2010 (21) — Aharony, 2010; Chu et al., 2010; Click and Petit, 2010; Cragg, 2010; Cuddy, Graham and Morton-Owens, 2010; Donahue and Gamtso, 2010; Fields, 2010; Gragg and Sellers, 2010; Griffey, 2010; Hastings, 2010; Ireland and Simmons, 2010; Kooy and Steiner, 2010; Mathews, 2010; Murray, 2010; Oguz and Kajberg, 2010; Rainie, 2010a; 2010b; Starr, 2010; Stuart, 2010; Tagtmeier, 2010; Wells and Mason, 2010;

2011 (6) — Anttiroiko and Savolainen, 2011; Loudon and Hall, 2011; Mastel, 2011; Smith, 2011; Suraweera, Mae and Hubilla, 2011; Verheul, 2011;

2012 (9) — Bosque, Leif and Skarl, 2012; Hamilton, 2012; Nadagaddi, 2012; Nicholas, 2012; Osborne, 2012; Salisbury, Laincz and Smith, 2012; Saw et al., 2012; Stranack, 2012; Sung, Hepworth and Ragsdell, 2012;

2013 (2) — Shiri and Rathi, 2013; Stuart, 2013;

Notes: The relevant literature was grouped based on year of publication starting from 2007. For each year, author's name as a citation was included in alphabetical order based on the first author's name. Finally, a total number of the papers assigned under each year was included. As can be seen, "libraries' use of Twitter" is quite recent as the literature dates back to 2007 and there was a boom of interest in 2010 as in this year, 21 papers were written

Figure 1.
Number of identified relevant papers per year

Figure 2.
Emerging themes
and assigned papers
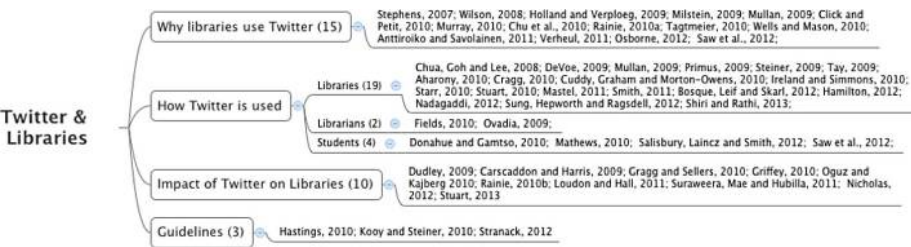
Notes: The relevant literature based on expressed aims was assigned to emerging themes and sub-themes. As such, for each theme and sub-theme authors' names in the form of a citation was assigned. Citations were presented in alphabetical order based on the first author's name. Finally, for each theme and sub-theme, a total number of papers assigned was included. It can be concluded that the second theme "how libraries use Twitter" counts the most publications
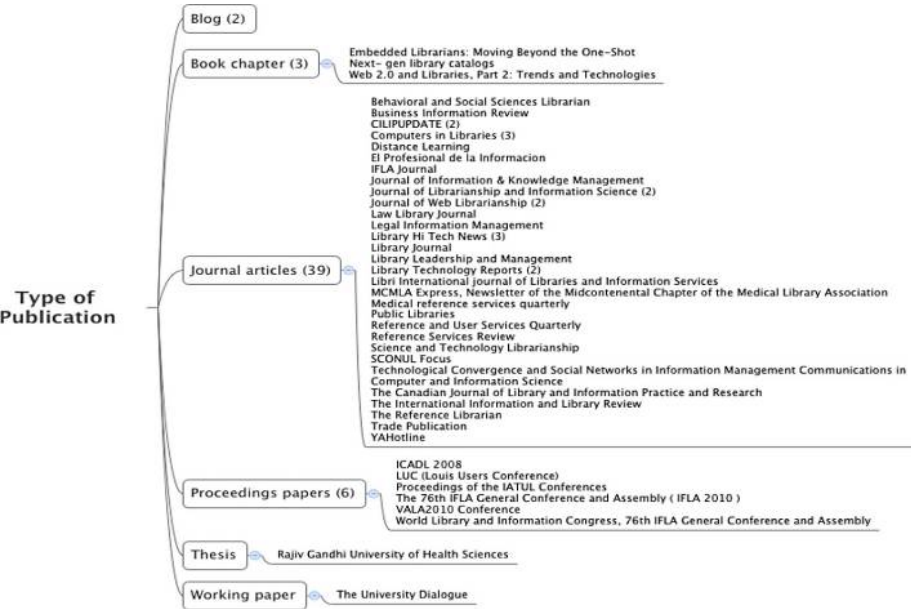
Figure 3.
Identified papers'
type of publication

Notes: The identified literature was grouped based on the type of publication. In particular, for each type of publication (blog, journal article and proceedings paper), a total number of the papers assigned and the citations of the assigned papers were presented. Different types of publications were identified, but the majority of the published literature, 39 papers, fell in the journal articles type

Finally, no conclusive remarks could be drawn regarding the specific methods used, mainly due to the limited number of studies which reported findings and thus adopted clear methodological approaches. The presentation and critical discussion of the identified literature falls into the themes aforementioned.
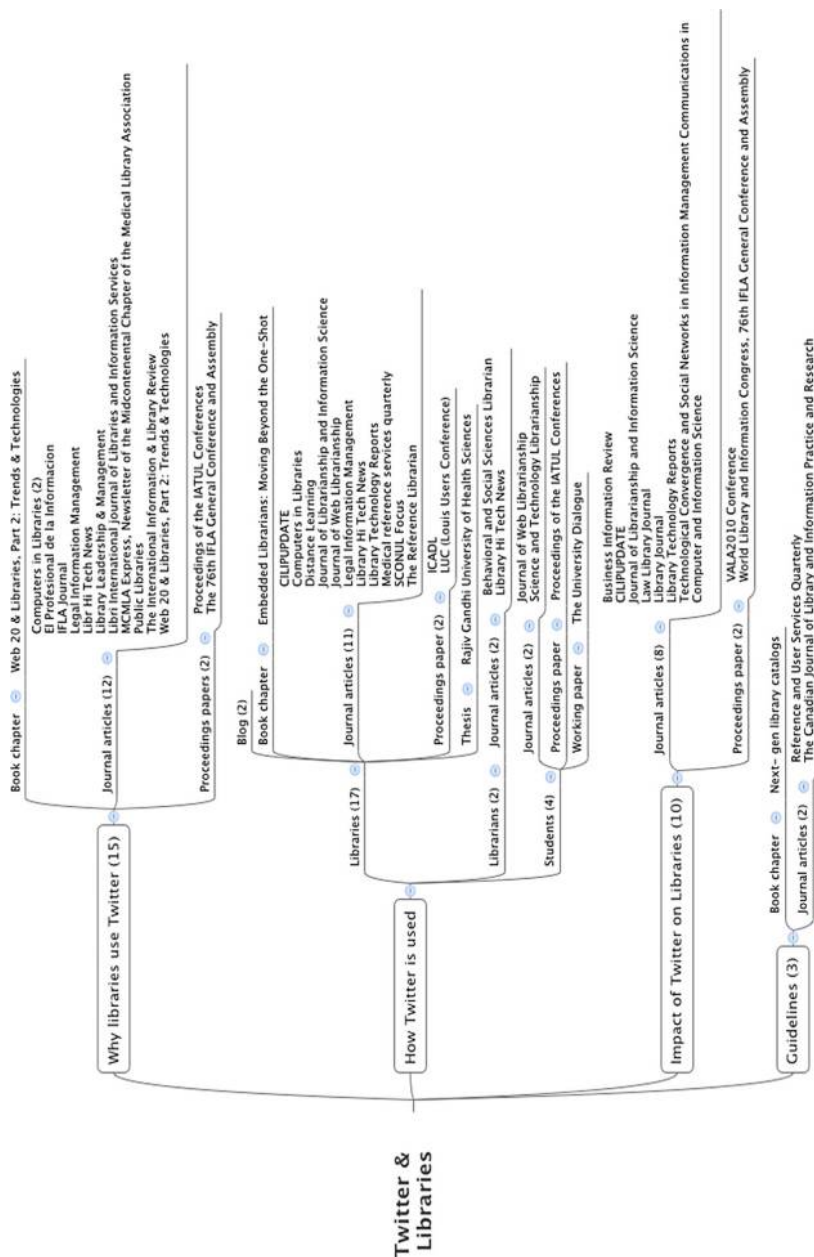
Notes: The emerging themes (e.g. how libraries use Twitter) and sub-themes (e.g. libraries) were further enriched with the type (e.g. blog) and the name of the specific source (e.g. *Journal of Web Librarianship*) of publication for each assigned paper. No preference to a specific source of publication was identified

Figure 4.
Source of
publications
assigned to emerging
themes

3. Findings – themes

3.1 Why libraries use Twitter

Fifteen papers reported on the particular reasons why libraries should use Twitter. Specifically, Holland and Verploeg (2009) explored the difficulties that library administrators deal with on a daily basis and named free advertising as the main reason behind why libraries turn to Twitter and SNS. Mullan (2009) claimed that use of SNS would contribute to law librarians being more productive. Building on this, Chu *et al.* (2010) explored the use of SNS in academic libraries. Among others, they sought to understand the reasons behind the use of Twitter in libraries and found that the 77.8 per cent of the libraries used SNS for work purposes.

Creating and promoting a sense of community among libraries and users was also another reason identified for libraries to adopt Twitter. In particular, Murray (2010) argued that Twitter could assist library administration and leadership by promoting a sense of community. This sense of community was also identified by Verheul (2011) who argued that Web 2.0 tools help in developing a community around the digital library.

Similarly, the importance of libraries reaching out to users through Twitter was also promoted in several studies. Stephens (2007) argued that libraries could use Twitter to change the way they exchange messages. Wilson (2008), Milstein (2009) and Click and Petit (2010) argued that Twitter could be used to deliver technology news and engage in interaction with library users. Wells and Mason (2010) and Tagtmeier (2010) recognized the use of SNSs, such as Twitter and Facebook, as one more way to reach users. Furthermore, Anttiroiko and Savolainen (2011) found that public libraries used SNS to market their services to users. In addition, Osborne (2012) suggested the use of SNS as a way for libraries to more easily approach teenagers and market their services in a way akin to how teenagers connect and share content with their friends. Along the same lines, Saw *et al.* (2012) investigated the use of SNS by international students. They stressed the need for libraries to take advantage of this new trend and enhance the library experiences of international students. Finally, Rainie (2010a) argued for the need for librarians to embrace the changes due to the emergence of Web 2.0 and to serve as SNS nodes. Overall, libraries and librarians used Twitter for a variety of different reasons ranging from traditional (to provide services) to modern and trendy (to enhance users' library experiences).

3.2 How Twitter is used

A total of 25 papers provided details on the specific ways Twitter was used, mainly to address the reasons aforementioned. Specifically, three sub-themes emerged regarding the way libraries (19 papers), librarians (two papers) and students (four papers) used Twitter.

3.2.1 Libraries. Nineteen papers reported on the specific ways libraries adopted Twitter. In particular, seven papers described the way specific libraries adopted Twitter to promote their interests and reported on the lessons learned. Chua *et al.* (2008) explored the emergence and adoption of Web 2.0 applications on the Web sites of 90 libraries in North America, Europe and Asia, and found that SNSs were the most used Web 2.0 technology to reach users. Cuddy *et al.* (2010) provided details on the way Twitter was used by the New York University (NYU) Health Sciences Libraries, mainly as an outreach tool along with Facebook and the library Web page. In addition, Ireland and Simmons (2010) outlined a session focusing on how Twitter was used by the University

of New Orleans library to provide high quality reference services in times of economic austerity. Starr (2010) illustrated how Twitter assisted the California Digital Library (CDL) to promote its news and events to wider audiences. Building on this, Mastel (2011) described the way the University of Minnesota used Twitter to provide services to previously underserved staff. In addition, Smith (2011) presented the adoption of Twitter by the Durham University Library as part of its marketing policy. Hamilton (2012) reported on the way Twitter was adopted to promote class discussion and research. Furthermore, Nadagaddi (2012) described the development of a social media digital library to manage content found in political and business profiles in different SNSs. Finally, Shiri and Rathi (2013) reported on the way Twitter was adopted in a large public library where emphasis was given on proposing a tweet categorization scheme; 2,500 tweets produced from 2009 to 2012 were considered and 13 different categories were identified, such as library operations, information sharing, feedback seeking, events and advisory services, among others.

The relevant literature (seven papers) also focused on specific types of libraries (e.g. law, public and institutional) with the view to record the way in which they adopted Twitter. Specifically, Mullan (2009) explained the benefits and the ways law librarians should employ Twitter as part of their daily routine. In addition, Primus (2009) outlined how distance libraries adopted Twitter among other information communication technologies. On the other hand, Cragg (2010) focused on academic business libraries and the way they used Twitter and other SNSs. Likewise, Bosque *et al.* (2012) explored the ways academic libraries used Twitter. A total of 296 academic libraries were randomly selected from a list of 1,460 institutions compiled by the Carnegie Foundation. During analysis, emphasis was placed on layout and design, content and number of tweets and account followers. They discovered that only 101 out of 296 academic libraries had a Twitter account, the majority of them used Twitter to offer reference services, and the number of followers was proportional to the number of years since the library had obtained a Twitter account. The ways in which institutional libraries used Twitter was the focus of Stuart (2010), whereas Sung *et al.* (2012) explored the use of SNS as part of public libraries engagement with the local community.

Possible patterns of Twitter use among different types of libraries were explored by Aharony (2010). In particular, Aharony (2010) explored the way in which public and academic libraries used Twitter to connect with users and to market their services and activities. He found different use patterns between the two types of libraries, specifically regarding the number of tweets, linguistic differences and content published.

In addition, three papers outlined the way that Twitter could be used to promote and enhance libraries' reference services. In particular, DeVoe (2009) and Tay (2009) focused on how the adoption of Twitter could enhance the efficiency of reference services and stressed the need for libraries to constantly tweet and, thus, promote their presence. Finally, Steiner (2009) focused on describing Twitter's functionality and argued that it could be used as a reference service tool if the library promotes its presence to users.

3.2.2 Librarians. Two papers described in detail the way librarians adopted Twitter. In particular, Ovadia (2009) suggested that, as well as accomplishing user outreach and collecting valuable feedback, Twitter's functionality could assist librarians in behavioral and social sciences. Finally, Fields (2010) explored librarian's adoption of Twitter professionally and personally, specifically suggesting that there are differences

between the two types of use and questioning the personal adoption of Twitter for promoting reference services or for enhancing his/her professional status.

3.2.3 Students. Four papers explored the way students used Twitter. Specifically, Donahue and Gamtso (2010) investigated the potential use of Twitter for retrieving information when conducting academic research. Sharing the same views, Mathews (2010) explored whether students were using their library Twitter account during their daily interaction with Twitter and found that their library's account was regularly used for homework and assignments. Extending this research, Salisbury *et al.* (2012) investigated user adoption of SNSs and the reasons behind its use. They found that although SNSs are well known and accepted, students do not readily identify them as a way to access library resources. Finally, Saw *et al.* (2012), extending the research conducted by Mathews (2010) and Salisbury *et al.* (2012), looked into both domestic and international students' preferences at Bond University for specific SNSs, the reasons for adopting each, and what role libraries could play in this context. They found that both international and domestic students shared the same preference for specific SNSs; all students created a Twitter account only recently; and they used SNSs not only for social activities but also for finding information.

3.3 Twitter's impact on libraries

The use of Twitter and its impact on libraries was another area of significant interest. Ten studies tried to identify and measure the impact that Twitter has on libraries and reported their findings. Dudley (2009) argued that SNSs, such as blogs and Twitter among others, have changed the electronic discussion lists and online communication. Carscaddon and Harris (2009) argued that Twitter helped in overcoming information overload, as friends and subscribers can be seen as filters to credible information. Gragg and Sellers (2010) described the possible impact of Twitter on law librarians. In particular, they focused on presenting the good and bad features of Twitter, and how these could be useful for law libraries.

Moreover, Griffey (2010) identified privacy as another area which Twitter, and SNSs in general, have influenced. Griffey (2010) outlined two specific challenges:

(1) librarians need to provide help and guidelines in accessing and using these networks; and

(2) a librarian's duty to protect users' information.

Focusing on public libraries, Oguz and Kajberg (2010) also pointed out the need to form a new vision for public libraries so as to adapt to Web 2.0 tools and SNSs. Thus, Rainie (2010b) documented the changes and the emergence of new communities as an outcome of user adoption of SNSs and outlined the new roles that librarians needed to play.

Loudon and Hall (2011) tried to evaluate microblogging services, especially the use of Twitter, as a professional tool and for information services provision. Extending this research, Suraweera *et al.* (2011) stressed the importance of SNSs and Twitter for libraries. In this context, Stuart (2013) emphasized the impact of SNSs, especially Twitter and Facebook, on British university libraries and the need for them to market their presence on these social sites. Finally, Nicholas (2012) argued that SNSs will eventually lead libraries to become even more alienated from information, communication and scholarly users.

3.4 Guidelines
Three papers focused on providing guidelines for libraries in terms of adopting Twitter. In particular, Hastings (2010) provided detailed guidelines into how Twitter could be integrated into libraries activities with the view to promote outreach. Kooy and Steiner (2010) focused on privacy, identity management and disclosure issues, reported on the lessons learned from the Georgia State University Library, and provided policies on how academic libraries could use Twitter. Finally, Stranack (2012) suggested a series of guidelines on how to become a connected librarian through the use of SNSs such as Twitter.

4. Conclusion, recommendations and future research
SNSs have become an essential part of a user's daily life. As such, libraries and librarians ought to keep track of these changes and provide valuable assistance to users through different strategies of using SNSs. One such strategy is the adoption of Twitter, a microblogging service. In the field of library science, a significant number of studies, dating from 2007, reported on libraries' adoption and use of Twitter. These papers mainly presented the reasons behind such an adoption and the specific ways Twitter was used for meeting the various needs and purposes of libraries. As a result, only a few studies used a specific research method (e.g. questionnaire, interview) to report on findings regarding libraries' use of Twitter. Further research, which will employ specific research methods, is needed to report on the growing trend of libraries, librarians and students using Twitter.

The identified relevant literature focused on four main themes:

(1) the reasons behind libraries' adoption of Twitter;
(2) the ways in which Twitter was used;
(3) Twitter's impact on different aspects of library functions; and finally
(4) a set of Twitter guidelines for libraries.

In particular, it was found that libraries adopted Twitter for a variety of reasons ranging from free advertising (Holland and Verploeg, 2009), to the enhancement of librarians' productivity (Mullan, 2009), to the promotion of libraries' work (Chu *et al.*, 2010), to the libraries' reach to users (Tagtmeier, 2010), to the renewal of services to users (Anttiroiko and Savolainen, 2011; Osborne, 2012) and to the enhancement of the user experience (Saw *et al.*, 2012). These were the main reasons identified that lead a library to adopt and use Twitter. More research is needed to establish more significant reasons for libraries to adopt Twitter. It is also worth exploring whether the aforementioned reasons apply to any library or differ depending on the type of library (e.g. public, academic and institutional health library).

In terms of how Twitter was adopted, case studies of specific libraries employing Twitter were reported (Cuddy *et al.*, 2010; Starr, 2010). It was also found that different patterns of Twitter use existed among different types of libraries (Aharony, 2010). Further research is needed to explore and identify these patterns for all types of libraries. Research was also reported for diverse types of libraries, such as law libraries (Mullan, 2009), academic business libraries (Cragg, 2010), institutional libraries (Stuart, 2010) and public libraries (Sung *et al.*, 2012). In this context, further research regarding similarities and differences of Twitter use among different types of libraries or even among the same

kind of libraries (e.g. law to law libraries) is needed to reach broader conclusions. Moreover, students use Twitter as a means to find information and thus communicate with libraries (Donahue and Gamtso, 2010; Salisbury *et al.*, 2012). As such, reference services could benefit from the use of Twitter (DeVoe, 2009; Tay, 2009; Steiner, 2009). Further research concerning the way reference services, as well as other library services, could benefit from the use Twitter is considered important.

As any new technology or development, Twitter affected different aspects of libraries. In particular, it was found that libraries' use of Twitter had an impact on the way the discussion was conducted in an online environment; online privacy; overcoming information overload; the emergence of new online communities; and, finally, library marketing policy (Carscaddon and Harris, 2009; Dudley, 2009; Griffey, 2010; Rainie, 2010b; Stuart, 2013). As a result, there is a growing need for librarians to adopt new roles to live up to user's expectations for innovative ways of communication and access to information. One could justify that libraries should focus their efforts in developing guidelines for librarians, as well as for users, regarding accessing and using information on emerging SNSs.

Finally, the importance of providing guidelines to libraries on how they could use Twitter was stressed by Hastings (2010), Kooy and Steiner (2010) and Stranack (2012). As such, a growing need for guidance and assistance emerged and relevant research is needed to provide a framework for uniting libraries' efforts to comprehend, adopt and use these SNSs to advance and promote libraries' services and roles to their clientele.

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