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Issues in Information Behaviour on Social Media

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ABSTRACT

Background. Social media present a rich environment to study information behaviour, as much of the user interaction is recorded and stored in publicly accessible repositories and on personal devices.
Objectives. This paper surveys the literature of the past nine years on information behaviour related to social media, focusing especially on social networking sites and online discussion forums. It reviews the characteristics of social media users and use, the predominant types of information behaviour, and new types of information found in user-contributed content.
Results. Studies have found clear age, gender and national differences, and differences between local citizens and foreigners, in the frequency and purpose of social media use, the choice of social media sites, number of online friends, and types of information posted. Social media users typically share experiential and practical knowledge in the context of everyday life. Informational support provided by social media users is complemented with socio-emotional support. Predominant types of information behaviour include asking (i.e. request for information), answering with information, unsolicited information sharing, and information integration. Browsing and monitoring are important types of information seeking behaviour on social media. Users use a combination of information behaviours, information sources, and online as well as offline sources for information needs that are important to them.
Conclusion. Social media are evolving into important sources of information that complement traditional information sources. They provide an opportunity to study types of information behaviour related to human interaction, that are difficult to study in physical environments.

INTRODUCTION

Social media applications have encroached into all areas of our lives, and are having a major impact on how we live, work, play, learn, socialize and vote! Social media in its various manifestations present a golden opportunity and rich environment to study information behaviour, as much of the information (in text, image and video format) are recorded and stored in publicly accessible repositories and on personal devices. Yet there is a paucity of social media research from the perspective of information behaviour.

Information behaviour covers a wide range of user behaviour in relation to information and information systems, including information need generation, information creation, seeking, encountering, sharing, giving, assessment, management and use. These are studied in

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the context of different kinds of tasks in work, everyday and play environments. All these aspects of information behaviour can be studied in the context of social media use.

Social media is a broad concept covering a wide range of Internet applications that support social communication between individuals (whether direct or indirect, synchronous or asynchronous), with an emphasis on:

- interaction between users (i.e. conversation or dialogue),
- user-generated content, and
- building of online relationships and communities (adapted from Turban, King & Lang, 2011).

They support all kinds of social interactions, mediated and captured by Internet applications including mobile applications. The online communities that evolve exhibit social and collaborative information behaviour that can be studied.

Social media can also refer to the user-generated content resulting from the online social interaction. Blackshaw and Nazzaro (2004) referred to it as "consumer-generated media (CGM) [that] describes a variety of new sources of online information that are created, initiated, circulated and used by consumers intent on educating each other about products, brands, services, personalities, and issues" (p. 2). The user-generated content reflects information behaviour, but also contains information that users can search for, browse and consume.

Kaplan and Haenlein (2010) identified six types of social media:

1. social networking sites (e.g., Facebook)
2. collaborative projects (e.g., Wikipedia), including collaborative authoring
3. blogs and microblogs (e.g., blogspot.com and Twitter), which support online journaling
4. content communities (e.g., YouTube and Flickr), which support file and content sharing
5. virtual game worlds (e.g., World of Warcraft)
6. virtual social worlds (e.g., Second Life).

In addition, the following types of sites can also be considered social media:

7. online discussion forums
8. consumer review and rating sites (e.g., TripAdvisor and RateAdrug]
9. social question-answering sites (e.g., Yahoo! Answers)
10. collaborative/social bookmarking/tagging sites (e.g., CiteULike and Delicious)
11. online auction sites (e.g., eBay)
12. text communication services (e.g., email and instant messaging service)
13. voice and video communication services (e.g., Skype).

This literature survey focuses on two types of social media applications where there is a substantial amount of user interaction that is captured as user-contributed content—social networking sites and online discussion forums. The survey covers journal articles and conference papers published primarily between 2006 and early 2014, indexed in the Library and Information Science Abstracts database. Selected references in these papers published earlier than 2006 were also consulted.

SELECTION OF PAPERS AND REASEARCH QUESTIONS

Recent journal articles and conference papers on social networking sites and online discussion forums were identified by submitting the following search queries to the ProQuest retrieval system to search the Library and Information Science Abstracts database:

- To retrieve records of articles on *social networking sites*:
  ti,ab("social media" OR "social networking" OR sns OR facebook OR twitter)

(limited to the document types *conference, conference report, journal article* and *literature review*)

- To retrieve records of articles on *online discussion forums*:
  ti,ab("discussion forum" OR "bulletin board*" OR "discussion board*")*
  (limited to the document types *conference, conference report, journal article* and *literature review*).

For the period 2006 to 2013, there were about 2,500 records (mostly of journal articles) that contained the concept of *social media* or *social networking* in the title or abstract, and about 200 records that contained the concept of *online discussion forum*. The breakdown by year is given in Table 1. Available records of articles published in 2014 were also retrieved. The starting year of 2006 was selected because the terms *social media* and *social networking* started to gain traction in the library and information science literature in that year. There were only seven records containing either of those terms for 2005 and for 2004.

The papers were written from a wide range of perspectives: system features and functions; applications in library services, education, business, marketing, advertising and the workplace in general; adoption and diffusion of social media applications in different communities; issues of trust, privacy and ethics; information retrieval and text mining; bibliometrics and social network analysis; etc.

The retrieval set was reduced to 8% of the original set by adding the following terms related to information behaviour:

> *ti,ab("information behavio*" OR information NEAR/1 shar* OR information NEAR/1 seek* OR information NEAR/1 search* OR information NEAR/1 brows* OR information NEAR/1 encounter* OR information NEAR/1 use)*

From a haphazard sample, I estimated that only about three-quarters of these articles address information behaviour issues. Overall, about 5% of the articles that mention the concepts of *social media, social networking* and *online discussion forum* in the title or abstract address information behaviour issues. However, the boundaries of the information behaviour area is very fuzzy, and studies that are not carried out or written up from the perspective of information behaviour can nevertheless have results that are relevant to information behaviour.

The titles and abstracts of the retrieved records were scanned to identify articles that were likely to address the following questions:

1. What are the characteristics of social media users and their behaviour?
2. What types of information can be found in social media sites that are not usually found in "traditional" online information sources?
3. How does information behaviour on social media differ from and complement other online and offline information behaviour? Do social media applications promote particular kinds of information behaviour?

49 papers on *social networking sites* and 29 papers on *online discussion forums* were downloaded for closer examination. In addition, papers that I had collected for an earlier study on health information on social media were also examined.

Table 1. Number of articles indexed in the Library and Information Science Abstracts database with keywords in the title or abstract associated with *social media, social networking* or *online discussion forum*

Publication Year	No. of articles on *social media* or *social networking*[1]		No. of articles on *online discussion forum*[3]	
	All	Narrowed to *information behaviour*[2]	All	Narrowed to *information behaviour*[2]
2013	612	57	29	1
2012	588	42	17	2
2011	385	30	26	0
2010	335	28	29	4
2009	277	15	30	3
2008	161	17	18	3
2007	88	3	19	2
2006	42	1	33	1
Total	2488	193	201	16

[1] Using search query: *ti,ab("social media" OR "social networking" OR sns OR facebook OR twitter)* (limited to document types *conference, conference report, journal article* and *literature review*)

[2] Query terms were added using Boolean AND operator: *ti,ab("information behavio*" OR information NEAR/1 shar* OR information NEAR/1 seek* OR information NEAR/1 search* OR information NEAR/1 brows* OR information NEAR/1 encounter* OR information NEAR/1 use)*

[3] Using search query: *ti,ab("discussion forum*" OR "bulletin board*" OR "discussion board*")* (limited to document types *conference, conference report, journal article* and *literature review*)

CHARACTERISTICS OF SOCIAL MEDIA USERS AND USE

Social Networking Sites

Use of social networking sites (SNS) is prevalent in the United States, and presumably in most other countries. A survey in the United States by Pew Research Center's Internet & American Life Project in 2013 found that about 73% of adult Internet users used a social networking site (Duggan & Smith, 2013). Most of these were Facebook users, but over half used multiple social networking sites. 63% of the Facebook users visited the site at least once a day, with 40% doing so multiple times a day. In another survey in 2013, Brenner and Smith (2013) found that about 60% of Internet users aged 50-64 and 43% of Internet users aged 65 and older used social networking sites.

Several researchers have investigated patterns of and motivations for SNS use, and have found clear age and gender differences, as well as differences between local citizens and foreigners:

- Younger users are more likely to use SNS, use them more frequently and have more SNS friends than older users (Joinson, 2008; Pfeil, Arjan, & Zaphiris, 2009; Sin & Kim, 2013).
- Undergraduates are more likely to use SNS, use them more frequently and have a larger number of SNS friends than graduate students (Lampe, Ellison & Steinfield, 2006; Park, 2010; Sin & Kim, 2013).

- Women are more likely to use SNS, use them more frequently and have more online friends than men (Sin & Kim, 2013; Madden & Zickuhr, 2011; Hampton, Goulet, Rainie, & Purcell, 2011; Moore & McElroy, 2012). A survey at a Singapore university found that women were much more likely to use Twitter and Instagram than men (Khoo, Fang, Tian, Xu & Wu, under preparation). On the other hand, Kim, Sin and Tsai (2014) found from an online survey of undergraduate students at an American university that men used blogs, media-sharing sites (mainly YouTube), social Q&A sites, user review sites and wiki sites (mainly Wikipedia) more often than female students did.
- Women use SNS for maintaining existing relationships, whereas men use it more for developing new contacts (Muscanell & Guadagno, 2012). Men use SNS more for task-oriented reasons and less for interpersonal purposes (Lin & Lu, 2011). Men are also more likely than women to post risky information online (Fogel & Nehmad, 2009; Peluchette & Karl, 2008).
- International students use SNS to keep in touch with family and friends in their home countries, and obtain social support (Cemalcilar, Falbo, & Stapleton, 2005).
- More undergraduates use Twitter, YouTube and Instagram than graduate students. More graduate students use LinkedIn. Chinese international students use mainly Chinese SNS such as Renren, Qzone (QQ), Sina Weibo and WeChat (Khoo, Fang, Tian, Xu & Wu, under preparation). This is not surprising as access to Facebook, Twitter and other United States-based SNS is blocked in China, and Chinese international students have to use Chinese-based SNS to communicate with friends in China.

These broad characteristics of social media users and use are likely to apply to other types of social media as well. In a survey of Icelanders, Pálsdóttir (2014) found that women, younger people and people with more education were more likely to have read and posted information about health and lifestyle on social media sites, as well as commented on, forwarded or "liked" other people's posts.

Future studies should identify more fine-grained characteristics of social media use, and look for unexpected associations. For example, there is a need to study different age ranges, different nationalities, immigrants/foreign students versus citizens/local students, different interest groups, and groups with strong ties (i.e. family groups and close friends) versus weak ties (e.g., professional groups). Users from different educational or professional backgrounds may exhibit different patterns of social media use. Kim, Sin and Tsai (2014) found that engineering undergraduate students used wiki sites more often than social science students, whereas humanities students used media-sharing sites more often than science students. Humanities students were also more likely than science and engineering students to access media-sharing sites for news and opinions.

Some researchers have looked beyond demographic variables and have identified other kinds of factors that affect social media use:

- User perception of the characteristics of the technology (often using the Technology Acceptance Model), such as perceived ease of use, usefulness and interactivity (Choi & Chung, 2013; Choraria, 2012; Shu, 2014)
- Perceived benefits of and motives for using social media, such as gaining social capital (Johnston, Tanner, Lalla & Kawalski, 2013), and entertainment, boredom relief, interpersonal utility (i.e. social interaction), escape and convenience (Cha, 2010)
- Social factors, such as a sense of shared group identity (Flanagin, Hocevar & Samahito, 2014)

- Psychological factors, such as personality types (Balmaceda, Schiaffino & Godoy, 2014; Kim, Sin & Tsai, 2014)
- Perceived risks, such as privacy concerns (Cha, 2010).

Multi-country comparisons are also needed. One such study by Oh and Kim (2014) compared students at a university in the United States with students at a Korean university in their use of social media sites for health information. They found that "fitness" and "diet and nutrition" were the most searched topics for both groups. However, American students were more active on social media and more likely to search for "medicine" and for information on sexually transmitted diseases. For both groups, social question-and-answer sites were the most popular social media site for health information, but American students used social networking sites more than Korean students. The authors ascribed the differences partly to the different healthcare systems in the two countries.

Online Discussion Forums

Savolainen (2011) noted that online discussion forums have a long tradition, with bulletin boards and Usenet newsgroups in the 1980s. Internet discussion forums began in the mid-1990s, and can be considered a Web-based versions of Usenet newsgroups. Savolainen provided a useful review of the literature on Usenet and Internet discussion forums.

Whereas online social networking is dominated by Facebook and a small number of other sites, discussion forums are more egalitarian and are not concentrated on a small number of hubs. In fact, consumer review sites and social question-and-answer sites are often structured as discussion forums, with threads comprising a main post (a review or question) and responses by other users. Product manufacturers often set up discussion forums for their products, with users posting questions and issues encountered, and other users offering solutions.

As discussion forums are usually focused on particular topics and user communities, characteristics of users and use depend on the topic, the user community, the context and the purpose of the forum. Research studies on forums have also focused on particular topics or user communities. Health discussion forums are more studied than other kinds of forums, and have been shown to serve a useful function in helping patients of chronic and severe diseases to manage their condition as well as psychological state. This is discussed later in the paper.

SOCIAL MEDIA SITES AS SOURCES OF INFORMATION

Studies of information seeking in a wide range of contexts have consistently found that human sources are the most preferred type of information source, that is, they are likely to be consulted first and are most frequently used (e.g., Savolainen & Kari, 2004). Case (2012) noted that

> Use of other [information] channels tends to be predicted by the social presence they offer, that is, how much they are perceived as being like a face-to-face conversation with another person, or as Johnson puts it "the extent to which they reveal the presence of other human interactants and can capture the human, feeling side of relationships" (Johnson, 1997, p. 92). (Case, 2012, p. 153-155).

This suggests that social media sites may become preferred sources of information, as they offer some amount of social presence, and some applications convey the immediacy of face-to-face conversation.

However, social media applications have some differences from face-to-face interactions that may affect information behaviour and the types of information shared:

- Except for voice communication services (e.g., Skype), communication on social media is asynchronous and is spread over time as users respond when they are free. As a result, some responses will be more considered and based on consultation of other information sources, compared with responses in real-time interaction.
- Users may not always play close attention to messages posted by their friends, and may exhibit information monitoring and skimming behaviour.
- The social group or user community is much bigger than in face-to-face settings, and so information can be propagated to many more people across geographic boundaries. On one hand there is a higher chance that someone in the network will respond to a question with useful information; on the other hand there is a higher proportion of lurkers or bystanders who leave it to other users to respond.
- The ties between users in an online network may not be as strong as in physical networks. Some "friends" may be completely online friends that users have never met in person.

What is becoming clear is that different social media sites will carry different types of information, and users will gradually discover the informational characteristics of each site and adjust their information behaviour accordingly.

Previous research has found that human information sources are associated with everyday life information (e.g., Julien & Michels, 2000; Agosto & Hughes-Hassell, 2005). This suggests that social media sites will tend to be perceived as sources of everyday life information. Savolainen (1995) noted that previous studies had found that people tended to seek information from their social network for advice, recommendations and questions relating to everyday problems, rather than going to formal sources. These seem to be the kinds of questions and answers being posted on SNS, and the kinds of information being shared.

Sin and Kim (2013) found in a survey of international students at an American public university that nearly 70% used social networking sites for everyday life information either "frequently" or "very frequently." The top five everyday life information need areas were found to be finance, health, news of one's home country, housing and entertainment.

In a 2013 survey at a university in Singapore, entertainment-related information, food-related information and hobby-related information were selected by the highest number of respondents as the types of information they had shared on Facebook (Ramaswami, Murugathasan, Narayanasamy & Khoo, 2014). There were significant age and gender differences: women, younger users, undergraduates, frequent Facebook users and users with more friends were more likely to share entertainment information. Women were also more likely to share shopping and fashion information, whereas men were more likely to share sports-related information and reviews of mobile devices. In a follow-up survey in 2014 with more refined information categories, the top two types of information shared on SNS were found to be funny clips and jokes, and international and local news (Khoo, Fang, Tian, Xu and Wu, under preparation). This was followed by six information categories: social events, food and beverage products, travel destinations/itineraries, health tips, music recommendations and hobby related information. Information shared on Facebook was of the more "frivolous" variety, but there was some indication that as people distinguished between types of friends and the closeness of the relationships, they would share more "serious" types of information such as health, work-related, school-related and product review information (Ramaswami, Murugathasan, Narayanasamy & Khoo, 2014).

Questionnaire data are based on respondents' perceptions, and typically do not contain an indication of the usefulness of the information shared on social media. Content analyses and empirical studies are needed to investigate the nature and usefulness of information obtained from social media sites. Morris, Teevan and Panovich (2010) carried out a small empirical study, in which twelve participants searched the Web while simultaneously posing a question on the same topic to their social network. More than half (58%) received responses from their network before completing their search, and 83% received responses eventually. Some of the information obtained from their network was not retrieved by their Web search. Much of the new information was opinions as well as alternative approaches. At the same time, they received encouragement and emotional support from their network contacts. The authors suggested that it is desirable to query search engines as well as social networks.

The strengths of social networking sites as information sources have been discussed by several authors (e.g., Dugan et al., 2008; Skeels & Grudin, 2009; Steinfield, DiMicco, Ellison, & Lampe, 2009; Morris et al., 2010). They noted that:

- Only humans can provide certain types of information such as opinions, advice and recommendations
- The information sources are personally known to the user to a greater or lesser extent, and are therefore trusted sources and have cognitive authority
- Users can provide localized (geographically specific) information, and current or time-sensitive information
- Information provided by users are customized for the requestor
- Social contacts can perform intermediary functions of researching, synthesis and packaging of information
- Users are able to broadcast a question to a known group of people
- Users can obtain emotional and social support.

These characteristics are true also of information obtained from online discussion forums.

Ironically, people generally do not perceive their social networking site as a source of information, but as a means to network, keep in touch with friends and keep abreast of happenings in their friends' lives. From a survey of non-academic staff at an American university, Lampe, Vitak, Gray and Ellison (2012) found that Facebook users were not very likely to seek information through their Facebook network. Nevertheless, they still perceived the site as providing useful information. The authors suggested that there was more information encountering than information seeking. Similarly, Zheng (2014) found from in-depth interviews of 32 young adults at an American university that they were not motivated to seek health information on Facebook, and the health information they happened to acquire from Facebook browsing was "limited and casual" (p. 165). Williamson, Qayyum, Hider and Liu (2012) found in a qualitative study of 34 students at an Australian university that in general, social networking was not about news, but about interacting with friends. However, other researchers have found that breaking local, national and international news to be an important type of information that Facebook users share and take note of (e.g., Khoo, Fang, Tian, Xu & Wu, under preparation).

Sharing of news is even more prominent on Twitter, a microblogging service which also functions as an SNS. Xu, Zhang, Wu and Yang (2012) examined the motivations for sharing three types of information on Twitter: breaking news, posts from friends and information related to the user's intrinsic interest. They found that breaking news was the most popular type of information shared. Indeed, Twitter has become an important source of news during times of natural and political disasters and crises (Murthy, 2013; Mansour, 2012;

Kim, 2014; Sutton, Spiro, Johnson, Fitzhugh, Gibson & Butts, 2014). Gao (2011) found that Twitter has powerful capabilities for collecting information from disaster scenes and visualizing data for relief decision-making. It can also be used to broadcast disaster relief information to the public.

Whereas SNS are perceived mainly as a tool for socializing and networking, online discussion forums are used mainly for posting questions (i.e. requests for information), responding to questions with information, and unsolicited sharing of information. The percentage of posts that contain questions vary between 10% and 20% (as reported in the literature), and responses to questions vary between 20% and 50%.

Rafaeli and Sudweeks (1997) analyzed Usenet, BITNET and CompuServe discussion groups, and found about 15% of posts were primarily requests for information, and 40% primarily provided information. Savolainen (2001) analyzed posts in a discussion forum focusing on consumer information, and found that 9% of the posts contained a question and 24% provided information in response to a question. Of the posts that responded to questions, 94% drew on personal knowledge. Wikgren (2003) analyzed 30 threads from a Usenet newsgroup focusing on nutrition and health, and found that 14% of the posts contained a question.

Savolainen (2011) analyzed 10 blogs and 40 threads from a Finnish discussion forum focusing on posts related to *depression*, and found that 18% of forum posts and 12% of blogger's posts contained a question. 42% of forum posts provided information. He found that questions posted on blogs and the discussion forums mainly asked for opinions and evaluations of an issue, and less for factual and procedural information. Responses drew heavily on personal knowledge, and sometimes on experts or expert organizations, but rarely on traditional sources such as newspaper, magazines and books.

The strength of discussion forums is in supporting the sharing of experiential and practice knowledge. Experiential and practice knowledge is important in many professions, notably the healthcare profession where it is an important part of *knowledge translation*. Knowledge translation has been defined as "a dynamic and iterative process that includes synthesis, dissemination, exchange and ethically-sound application of knowledge to improve the health of [people] ..." (Canadian Institute of Health Research, 2014). Stewart and Abidi (2012) noted a growing recognition of practice knowledge in medicine as a vital supplement to evidence-based knowledge, to address complex or rare clinical situations. They found that discussion forums help to breach hierarchical barriers so that healthcare professionals feel more comfortable to interact with their seniors or juniors than in face-to-face interactions. Dobbins et al. (2009) observed that an interactive knowledge sharing platform (including discussion forum) could help healthcare professionals to share literature searches, collaboratively appraise evidence, interpret research evidence and its implications, and share their experiences in using the evidence.

A few studies have sought to tease out what types of experiential and practice knowledge can be found on health-related social media sites that are not found in other Web sources. Hughes and Cohen (2011) compared the side effects of two psychotropic medications reported on four consumer drug review sites compared to those listed on two authoritative websites. While both kinds of sites mentioned similar side effects, authoritative websites merely listed the side effects whereas the reviews provided rich descriptions of various manifestations of the side effects in context. User perception of the severity of side effects reported in the review sites was different from what was portrayed on authoritative sites. For example, the sexual effects of a drug were labelled in the authoritative sites as less

severe or severe, whereas reviewers used the expressions “extremely frustrating” and “can’t perform sexually so you get depressed and anxious.”

Chew and Khoo (2015) analyzed consumer reviews for nine drugs on three drug review sites, in comparison to three authoritative health information sites. The types of information found only on drug review sites included drug efficacy, drug resistance experienced by long-term users, cost of drug in relation to insurance coverage, availability of generic forms, comparison with other similar drugs, difficulty in using the drug, and advice on coping with side effects. Side effects were vividly described in context, including severity based on discomfort and effect on their lives. Authoritative drug information websites do not provide an indication of how efficacious a drug is, whereas user posts can provide an indication of how fast a drug works and what kind of improvement the patient can expect.

Though Facebook pages are used primarily for social networking, Facebook groups appear to serve the same function as discussion forums. Greene, Choudhry, Kilabuk and Shrank (2011) analyzed a sample of posts from 15 largest Facebook groups focusing on diabetes. The majority of the posts sampled (66%) described users’ personal experiences with diabetes management. 13% of the posts contained a question, 66% provided information (whether solicited or unsolicited), and 29% provided emotional support. Nearly one quarter (24%) of the posts shared sensitive aspects of diabetes management based on personal experiences unlikely to be revealed in doctor-patient interactions. For example, one post explained how to count carbohydrates in Type I diabetes to enable extended alcoholic drinking sessions without risking ketoacidosis. These discussions provide socio-emotional support for patients to live the life they wish, with recognition of human limitations and daily life issues.

The information profile of discussion forums can differ from one country to another, even if they are on the same topic. Donelle and Hoffman-Goetz (2009) compared cancer-related posts in a health discussion forum hosted by a Canadian and an American association for retired persons. The American forum carried more information about the economic management of the patients’ condition, and difficulties in navigating a healthcare system where insurance companies play a major role. In contrast, the Canadian forum carried more information about cancer and cancer treatment. The authors suggested that the content of the discussion forums reflected needs not adequately addressed by the healthcare system.

TYPES OF INFORMATION BEHAVIOUR ON SOCIAL MEDIA

Compared to other online information sources, social media sites appear to favour the following types of information behaviour:

- everyday life information behaviour, for non-work and non-school information needs
- browsing, monitoring and asking, rather than searching
- opportunistic information acquisition, including serendipitous information encountering and environmental awareness, rather than purposive information seeking
- information publishing, giving and sharing, as much as information seeking
- intermediary roles undertaken by users voluntarily, including information seeking by proxy, information summarizing and information forwarding
- social information behaviour and development of information communities
- information use and evaluation.

An interesting subtype of information sharing behaviour that is gaining the attention of researchers is information forwarding, including reposting and retweeting, and propagation of information in online social networks (e.g., Kim, 2014; Sutton, Spiro, Johnson, Fitzhugh,

Gibson & Butts, 2014). These types of information behaviour are traditionally under-studied. Social media sites afford researchers an opportunity to redress the imbalance, to develop a more rounded and holistic understanding of information behaviour.

Researchers have attempted to construct typologies of social media posts and their content. The major dichotomies are *questions* (i.e. requests for information) versus *answers* (i.e. providing information in response to questions), and *informational* versus *socio-emotional* support. The proportions of posts belonging to the different categories vary depending on the type of social media, the topic and the user community.

Chuang and Yang (2012) found two types of social support in an alcoholism online community on the MedHelp social networking site:

- *informational support*, including facts, advice, information referral, personal stories and opinion
- *nurturant support*, including esteem support, network support and emotional support.

The relative proportion of each type of support was found to depend on the communication medium, with a higher proportion of informational support on the discussion forum. Among the three subtypes of nurturant support, expression of emotional support was the most common. Expressions of emotional support include stressing the relationship the recipient has with others, physical affection, assurance of confidentiality, sympathy, indication of listening or attention, understanding and empathy, encouragement and prayers.

Burnett (2000) and Burnett and Buerkle (2004) divided online behaviour on social media sites into *non-interactive behaviour* (e.g., lurking) and *interactive behaviour*. They divided interactive behaviour into three broad types:

1. *Hostile interactive behaviour*, subdivided into flaming, trolling, spamming and cyber-rape
2. *Collaborative non-informational behaviour*, subdivided into neutral (pleasantries and gossip), humorous (language games and play behaviour) and empathic (emotional support) behaviours
3. *Collaborative informational behaviour*, subdivided into announcement (including personal updates and pointers to external information sources), query (which may be directed to the community or to an individual), response to a query, and group project (e.g., summarizing threads and creating an FAQ document).

Hostile behaviour is often assumed to be unproductive. However, Irvine-Smith (2010) found that hostile posts can be informative. She interviewed 18 participants of a discussion forum on knowledge management, and discovered that some participants found flame wars quite informative and memorable, and that the range of opinions expressed broadened their views. She suggested that Burnett's category of hostile behaviour can be subdivided into informational and non-informational hostile behaviour.

O'Connor (2013) and O'Connor and Rapchak (2012) found that investment discussion forums tended to have more information-oriented posts, and fewer posts that functioned as social (e.g., humour) and hostile, whereas political forums were much less information dense and had more hostile posts.

Social media content affords researchers the opportunity to study three kinds of information behaviour that is otherwise difficult to study:

1. *Critical information behaviour*, including evaluative behaviour and biases
2. *Information integration*, including information summarization and knowledge synthesis
3. *Use of information* in changing opinion and sentiment, and in decision making.

These three types of behaviour are often intertwined. When a user posts evaluative comments on another user's post, this can trigger a discussion and stimulate other users to contribute

related information. Subsequent posts may attempt to make sense of the available information and synthesize the best possible answer.

Information use is more difficult to study as it requires some level of inference. Posters sometimes indicate their reasons for asking a question, and the intended use of the information may be directly stated or implied. Actual use of the information may be reported in a subsequent post. How a user's opinion or sentiment changes as a result of the online interaction can be analyzed by examining a series of posts from the same user.

Some researchers have studied weaknesses and biases in information behaviour. Biased information behaviour appears to be prevalent in financial and political social media sites. Park, Konana, Gu, Kumar and Raghunathan (2010) analyzed posts on a Korean finance discussion forum, and found that investors exhibited confirmation bias in the selection and use of information posted. Further, investors with stronger confirmation bias were found to be more confident, had higher expectations of their performance, traded more frequently, and realized lower returns. O'Connor (2013) also found in her study of posts in three investment discussion forums that investors tended to rely on personal sources of information, blogs and investor guru sites, and tended to use information without critical evaluation.

In contrast, there appears to be more critical and evaluative behaviour, and integration of information on health social media sites, and much less hostile behaviour. Esquivel, Meric-Bernstam and Bernstam (2006) studied the accuracy of posts on an online breast cancer mailing list, and the self-correction of inaccurate information. They found a very small proportion (0.22%) of false or misleading statements, most of which were corrected by other users within an average of four and half hours.

Users' attempts at information integration and knowledge synthesis can be observed through the following types of interactive behaviour:

- contribution of related, complementary or contrary information, experience and opinion
- reference or linking to external sources of information
- evaluation of information or critical comment
- linking or comparing information in two or more posts
- summarizing a set of posts
- drawing inferences and conclusions from a set of posts.

Kazmer et al. (2014) examined the types of knowledge synthesis that took place in an online discussion forum for patients of Lou Gehrig's disease (amyotrophic lateral sclerosis). They found many instances of sharing, linking and pooling together of related information on the causes, treatments, symptoms and co-occurring conditions of the disease, based on personal experiences of the patients and caregivers. They distinguished between three types of knowledge synthesis:

1. *Distributed knowledge*, where no single person has all the relevant pieces of information or complete knowledge on a particular issue, but pieces of information from different people are pooled together to provide a more complete understanding.
2. *Undiscovered public knowledge*, where linking disparate pieces of information and adding a missing relationship between them, or applying an operation on them, allows inferencing of new knowledge.
3. *Authoritative knowledge*, which is "that knowledge taken to be legitimate, consequential, official, worthy of discussion and useful for justifying actions by people engaged in accomplishing a given task" (Suchman & Jordan, 1997, p. 98). Authoritative knowledge is "co-constructed" by a community of users by examining evidence from a variety of sources.

Information integration is also often needed to arrive at a considered decision, especially in a risky or ambiguous situation, or when the quality and trustworthiness of the available information is in doubt. Case (2010) analyzed posts from a few discussion forums for coin collecting, focusing on questions from users who were trying to make a decision to purchase a coin for their collection or to authenticate purchased coins. Case noted that for collectibles, the community of collectors is an important source of information as information in individual posts is generally not definitive. The set of posts cumulatively help the user to make sense of the problem and arrive at a decision, and in addition obtain some emotional support from knowing that "one is not alone and that others are willing to help."

A kind of information integration takes place when a user community attempts to socially construct its identity and self-perception. Greene, Choudhry, Kilabuk and Shrank (2011) studied Facebook groups focusing on diabetes, and found that users actively seek to figure out their identity as a diabetic and as a diabetic community:

> Many discussion threads were initiated by posters who claimed to be "new" diabetics, and received replies from "seasoned" diabetics helping to frame their expectations, alternately encouraging them that their lives would be manageable, while warning them to expect the routine difficulties of the diabetic life. Other discussions were initiated by seasoned diabetics and debated what it meant to be, and at what moment one became, a diabetic. (Greene, et al., 2011, p. 289).

Users shared personal stories of their life with diabetes, and referenced each other's story elements. The group story-telling weaved a tapestry of life as a diabetic.

COMPLEMENTARY INFORMATION BEHAVIOURS

Some studies of information behaviour on social media have found that users exhibit multiple types of information behaviour, which seem to complement and even interact with one other. In particular, researchers have noted that the following types of information behaviour are complementary and related:

1. information in everyday life + work/school contexts
2. searching (the Web) and asking (the individual's social network)
3. informational + socio-emotional support
4. strong + weak ties
5. searching + browsing + monitoring + awareness
6. multiple types of information sources.

Everyday Life + Work/School Contexts

Savolainen (1995) had noted that everyday life and work were sometimes inseparable. In a study of undergraduates' everyday life information seeking at a Canadian university, Given (2002) found their everyday and academic lives to be inextricably tied. Similarly, Kari and Hartel (2007) found that work was after all the most central part of everyday life.

The question then is how work (or school) tasks/needs/information seeking are different from non-work ones, and how they affect each other. Certainly work and non-work information behaviour encroach on each other's expected time and space.

Searching + Asking

At least two studies have found that *searching* (the Web) and *asking* (the individual's social network) to be complementary behaviour when information is needed for important decisions.

Searching is used to identify detailed information and the range of options. An individual's social network is then consulted to evaluate the information sources, and interpret and confirm the information.

In a small study involving 12 participants, Morris, Teevan and Panovich (2010) found that *asking* provided valuable feedback and confirmation of results found using a search engine. They provided some quotations from the participants to illustrate their attitude:

> "I usually start with a search engine. In case of ambiguity I ask my friends on social network/Twitter."
> "I was able to find more options [with the search engine] that I can validate with my social network."
> "[Facebook responses] made me feel comfortable about my choices and my search results."

In a large-scale survey of university students on 25 campuses, Head and Eisenberg (2011) found that, in addition to seeking information from human sources, 83% of their respondents consulted friends/family to help evaluate information sources for personal use. They found that many searches involved decision–making to resolve problems with real–life consequences, and the searches may go on for days. Interviews with students suggested that "when students perceive the consequences to be greater, they are more apt to go off–line to double–check the quality of information they have found with a human–mediated source, or sources."

Informational + Socio-emotional Support

Information provided on social media sites tend to be accompanied with socio-emotional support. Wikgren (2003) studied the information behaviour of participants in a health and lifestyle discussion forum. She found that emotional support and information sharing were closely linked activities:

> Communicating health information in virtual communities is, on the one hand, an exchange of facts and a communication of scientific knowledge, but, on the other hand, a communication of meaning and socioemotional support, and perhaps even a "construction of mastery." (Wikgren, 2003, p. 238)

Godbold (2013) showed that informational and emotional support are inextricably intertwined, and that expressions of emotion in fact supports communication of information and adds to the information. She noted that "emotional cues are an intrinsic element in the informational processes observed." Emotional support is sometimes expressed indirectly by the "tone" of the language, and can have a cumulative effect through consensus in tone and echoing of vocabulary over a sequence of posts. Emotional tones are used to select and reinforce particular perspectives, and to modify understanding of information. Examples of tones that Gobold gave include humorous/playful, worried, confident, unconcerned, reassuring, cheerful, bemused, and fascinated tone. Gradual shifts in tone supported shifts in meaning or sensemaking: "tones, feelings, ideas and meanings combine to form shared sense making online." She proposed that emotion can be considered a kind of information, and users can have emotional needs: "When dealing with threatening situations such as loss of good health or loss of key beliefs, people may be seeking not only for what to think but also for how to feel."

It can be argued that expressions of emotion (direct and indirect) supports social synthesis of information and construction of meaning. More study is needed to determine

what types of information are associated with which types of emotions in different contexts, and the effect of emotion on information transfer, interpretation and use.

Strong + Weak Ties

Social media sites exhibit both strong and weak ties, and weak ties can become stronger over time as users continue to interact online or when they decide to meet offline as well. Granovetter (1973) had proposed the theory of weak ties that distant and infrequent relationships are efficient for knowledge sharing and giving access to new information by bridging disconnected groups and individuals, in contrast to strong ties between family, friends and colleagues.

A study by Goecks and Mynatt (2004) found that there was a strong difference in the sharing of information between strong and weak tie relationships. Information shared with a strong tie group tends to stay within the group whereas information shared with a weak tie is usually shared outside a group and tends to get disseminated further compared to strong ties. This suggests that different types of information are shared via different types of relationships and with different categories of friends. This merits further investigation. Furthermore, relationships can evolve from weak ties to stronger ties over time, with corresponding changes in the types of information shared.

Searching + Browsing + Monitoring + Awareness

Bates (2002) had distinguished between two dimensions of information seeking:

1. *Directed versus undirected information seeking*: whether the information sought can be specified to some extent
2. *Active versus passive seeking*: whether the user takes active action to acquire information, or is passively available to absorb information.

These dimensions were used to define four modes of information seeking:

1. *Searching*, which is directed and active
2. *Browsing*, which is undirected but active
3. *Monitoring*, which is directed but passive
4. *Awareness*, which is undirected and passive.

Searching, *browsing* and *monitoring* are traditional areas of information behaviour research, though *searching* has been studied much more thoroughly than the other two. There have been very few studies of *awareness*. Comparing these four types of behaviour on social media sites may yield deeper insights into how they are different and how users benefit from them. Other authors have proposed their own typologies of browsing/scanning (Marchionini,1995; Choo, Detlor & Turnbull, 2000; McKenzie, 2002) which can also be studied in the context of information seeking on social media.

Multiple Types of Information Sources

People can be expected to consult different types of information sources when the topic is important to them. Search engines make this easier as their search results typically include a range of sources. Head and Eisenberg (2011) found that some people specifically looked for certain information sources, including blogs, government sites, and Wikipedia.

How the different types of information sources (including social media sources) complement and interact with one another, and how users evaluate them, has not been much studied. It is probably more productive to study information seeking in social media sites

within a broader context that includes information seeking on the Web as well as offline in-person information seeking.

CONCLUSION

The rise of social media should herald a new era in information behaviour research. Just as the rise of online databases and digital libraries sparked off a generation of research in online searching, so too social media should stimulate a new wave of research and theories focusing on other types of information behaviour such as asking, answering and information integration. Research on information behaviour on social media can be said to be in a nascent stage.

So far, researchers have found clear age, gender and national differences, as well as differences between local citizens and foreigners, in the frequency and purpose of social media use, choice of social media sites, number of online friends, and types of information posted. It is time to identify more fine-grained characteristics of social media use for different age ranges, communities and nationalities, as well as carry out multi-country comparisons. Beyond demographic factors, social, psychological, technological and motivation factors affecting patterns of social media use need to be investigated in greater depth.

The types of information associated with social media sites are advice, recommendations, opinions as well as experiential and practice knowledge related to everyday life issues, that may be customized for particular users and contexts including geographic location and time. However, everyday life issues encompass a wide range of topics including finance, health, local and foreign news, housing, food and beverage, shopping, fashion, product reviews, and leisure and entertainment (including social events, hobby, sports, music and travel). There is a need to study specific everyday life issues and how their saliency varies according to a person's life stage, situation and community. In addition to informational support, users also obtain socio-emotional support from other users, which may convey more subtle types of information.

Social media is associated with types of information behaviour that have traditionally not been well-studied: asking, answering, information sharing, forwarding, integration, collaborative information behaviour, information use, critical information behaviour, as well as the more passive behaviour of browsing and information encountering. There is a paucity of theory building to explain information behaviour on social media. New information behaviour frameworks and models are needed to structure and synthesize various aspects of social media behaviour.

There are several challenges to studying information behaviour on social media:

1. The different types of social media applications support and encourage different types of information behaviour. Even sites that belong to the same category of social media application can offer quite different functionalities and services.
2. The technology and functionality of social media applications are still evolving.
3. Use of social media is evolving, as users adapt to social media and gradually figure out how to exploit them for their benefit.
4. The type, quality and quantity of user-contributed content are evolving.
5. Users are gradually discovering what kinds of useful information they can obtain from different types of social media sites.

The evolving user behaviour on social media, whether as producer/contributor, consumer or information seeker, makes it a challenge for researchers to obtain stable and enduring results, especially as user behaviour can differ from country to country.

Researchers from almost every field are studying social media content, structure, user behaviour and applications. There is a substantial body of literature covering social network analysis, issues of trust and privacy, and applications of social media in business, marketing, education and organizations, which are not included in this literature survey. However, communication and information behaviour underlie these issues, and the results of information behaviour research can inform studies of social media from other academic disciplines.

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