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The use of social media by adults with chronic illness: analysing the support mechanisms of four social media platforms

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Abstract

Social media technologies are increasingly utilized by patients, leading to development of online social groups where patients share experiences and offer support to their peers on these platforms. In order to gain an understanding of this growing trend, this study conducts a technology feature analysis of the technology features of four of the most used social media tools to date: Facebook, Instagram, Reddit and YouTube in order to determine how the features, functionalities and affordances available on these social media tools. We discover that the Uses and Gratifications Theory can augment the Honey Comb framework to examine the features of social media technologies.

Keywords Technology Use, Social Media, Technology Feature analysis, Uses and Gratifications Theory, Honey Comb framework.

1   Introduction

Social media use is on the rise, facebook.com has been identified as the most used social media website in the world followed by youtube.com (Fernández-Luque and Bau 2015). The acceptance and unprecedented uptake of social media tools by the general public has in turn led to the development of a diverse ecology of social media platforms with specialized scopes. Each of these social media platforms offers its users a specialized feature set that enables them to present themselves and connect with other users around the globe (Kaplan and Haenlein 2010; Kietzmann et al. 2011).

In line with the wide spread use of social media tools, a growing number of chronically ill adults make use of these technologies to better understand and manage their illness. As a result, social media tools are increasingly utilized in the healthcare domain by patients with chronic illnesses (Househ et al, 2014). Social groups formed online, enable patients with rare illnesses to find others beyond the geographical barriers that once isolated sufferers of chronic illnesses (Fourie and Julien 2014). While a number of empirical studies have been conducted in the social media domain, there is a lack of studies generating theories on social media and it's use contexts; the rich insights offered on social media tools offer IS scholars an opportunity to move beyond descriptive studies, towards theory generation (Kane et al. 2014; Urquhart and Vaast 2012).

The features, capabilities and therefore affordances of social media tools keep evolving based on user needs which blurs the differences between each category of tools and in turn could influence the patterns of use enacted through these platforms (Kane et al. 2014; Malhotra and Majchrzak 2005). As a result, IS research is compelled to adapt existing theory from this domain or develop new theory to describe and analyse social media applications and behavioural theories (Majchrzak 2009; Majchrzak et al. 2013). Studies on social networks and online environments differ in the IS and healthcare research domain in two key areas: IS researchers tend to be focused on the informational content exchanged on these networks while healthcare researchers are focused on the emotional and psychological aspects of communities enacted through social media (Rubenstein 2015).

In the healthcare context, social media affords new behaviours and interactions to patients and caregivers than what was previously possible in older technologies such as discussion forums and bulletin boards (Agarwal et al. 2010; Majchrzak et al. 2013; Merolli et al. 2013; Pousti et al. 2014). Adults with chronic illness tend to join a variety of social media tools to "shop around" for a platform that supports their illness management needs (Bender et al. 2013). Each social media tool has a specific scope, features and core functionalities which could yield different affordances during appropriation. Therefore, we examine four of the most used open social media tools: YouTube, Reddit; Instagram and Facebook in order to identify the affordances that may be derived by adults with chronic illness (Sareah 2015).

The research question of this study is:

How and to what extent do different social media tools yield affordances to chronically ill users?

This case study forms part of a larger research project that investigates the appropriation of social media tools by patients with chronic illness. The larger study consists of three major phases:

1)   Phase one is the examination of four different social media environments. The goal of this phase is to identify the features and functionality of these four social media tools in order to identify the perceived affordances for adults with chronic illness.

2)   Phase two involves the investigation of how patients with chronic illness use social media. In this phase, we conduct a content analysis of the postings and online interactions of patients with chronic illness on each of these platforms.

3)   Phase three involves a follow-up online discussion with the participants identified in phase two. This allows us to better understand how and why they utilize these tools. This discussion will give us a deeper understanding of their perceptions, attitudes and emotions that influence appropriation of social media by patients with chronic illness.

In order to address the research question, this research in progress paper focuses on the first phase of the study as outlined above. We examined the features of these four social media tools, identified the functionalities and categorized these functionalities into the perceived affordances that may be derived by patients with chronic illness.

This paper proceeds as follows: The next section gives an overview of related studies on the use of social media platforms. We then discuss the research methodology that guides this investigation.

Following that, we outline our findings discovered through the technology feature analysis of these tools. This section is followed by a discussion outlines the key insights we uncovered from the data analysis. Finally, we conclude this paper by discussing our next steps and future directions.

2 Related studies

Chronic diseases are complex non-curable medical conditions with prolonged implications on sufferers and their communities (Pousti and Burstein 2014). Studies have cited the number of Australians with chronic illness at 7 million and the yearly spending on their health management at 60 billion dollars (Georgeff 2014). Social media usage by patients could be considered a facet of the global e-health initiative which comprises the use of digital technologies to assist the healthcare system (Hajli 2014; Hajli et al. 2014). Scholars have suggested that the move to digitization of healthcare efforts through mechanisms like social media could result in reduced overall individual and public sector spending on managing illness and maintaining and individual's well-being (Hajli 2014; Hajli et al. 2014). Indeed, it is suggested that these technologies could alleviate the cost and burden of illness management while also improving the healthcare service quality from both an individual perspective and on the healthcare sector (Agarwal et al. 2010; Pousti et al. 2014). In addition, social media allows the user to craft and present a public image to their connections (Kaplan and Haenlein 2010).

Social media as a broad topic is particularly challenging to the IS discipline as theorizing these tools could take a number of congruent approaches, such as social network perspective, personal behaviour perspective, affordance perspective and many other approaches commonly used in this discipline, while these technologies are constantly evolving in features and functionality (Kane et al. 2014; Majchrzak et al. 2013).

In the following sections we discuss social media and it's definitions; social media use in the healthcare domain; feature analysis of social media tools and we discuss the research methodology.

2.1 Defining Social Media

Social media technologies are a set of internet based tools that facilitate creation and exchange of user generated content (Kaplan and Haenlein 2010; Kietzmann et al. 2011; Ngai et al. 2015). In defining social media, researchers have used a number of terms such as: social computing; web 2.0; social networking sites and others to define this group of internet based technologies that enable creation and dissemination of user generated content (Kaplan and Haenlein 2010; Kietzmann et al. 2011; Ngai et al. 2015). While a number of technologies may be classified as social media ranging from bookmarking sites such as digg.com to rich media sites such as SecondLife which offer a fully immersive experience to users, these sites have different capabilities and there is a current limitation in classifying these sites by their capabilities (Alfaro et al. 2012; Kaplan and Haenlein 2010).

2.2 Social media technology use studies in the healthcare domain

Digital technologies such as social media and other technological innovations could assist the healthcare sector, leading to decreased costs and administrative effort for care delivery, increasing practice efficiency and supporting patient self-management (Agarwal et al. 2010; Georgeff 2014). Accordingly, a number of researchers have explored the role of social media in illness management, information credibility, potential impact on service provision and patient satisfaction (Hajli 2014; Pousti, Urquhart and Linger 2014). Although there are IS scholars who have examined chronic illness management on social media technologies, their studies tend not to distinguish between older technologies nor the affordances granted by the various types of social media tools (Merolli et al., 2013; Pousti et al., 2014).

Motivations for using social media groups include the desire for support and information from people suffering the same conditions as other participants of the study (Bender et al., 2013). Most of the study participants had adopted and then discarded other groups for reasons such as: anxiety due to insensitive information, lack of engagement by other users and because information that was provided to them was not relevant to their situation. Similarly, Merolli et al (2013) conducted a literature review to discover affordances, health outcomes and effects of social media use in chronic disease management. Social support and improved psychosocial outcomes were discovered as a benefit of participation in these communities. In addition, a measure of control over their identities, access to information for disease management, flexibility afforded through asynchronous communication with peers, ability to share experiences and the flexibility of the system were also reported as benefits to participation on this medium (Merolli, Gray, and Martin-Sanchez 2013). However, studies in this area seem to take an intervention or information behaviour approach that does not shed much light on the

mediating role of technology. Chung (2014) argues that despite the extensive literature in the domain, little is known about how individuals use online social groups. Chung (2014) states that usage patterns impact the outcomes obtained from using the technology. In addition, changes in the features and functionalities of systems impact the benefits obtained by using social media (Chung 2014). Adults with chronic illness tend to try out a variety of tools in the course of their illness management journey (Bender et al. 2013). Therefore, an examination of the social media tools they use, could yield interesting insights into the usage patterns and appropriation behaviour of these users (Chung 2014).

2.3   A Technology-feature analysis of various social media tools

There has been a limitation in studies that examine the features of technology in the IS field. Fulk & Gould (2009) argue that a feature based examination of the technology artefact could enhance understanding in the IS field by enabling a richer description of the research context. This approach enables theoretical development to consider what features of the technology are available to be utilized by the user and how these are used (DeSanctis and Poole 1994; Fulk and Gould 2009).

Furthermore, an examination of the technology features of an information system could yield insights that enrich studies on technology adoption, adaptation and use (Alfaro et al. 2012; Fulk and Gould 2009; Kaplan and Haenlein 2010; Kietzmann et al. 2011).

Majority of research in IS tends to take a systematic perspective where an IS tool is examined as a sum of its components, with the features of the technologies being overlooked (Alfaro et al. 2012). This holistic perspective to theorizing technology use is problematic as it overlooks the differences and variations in the vast ecology of tools, different features offer different capabilities (Orlikowski 2000). Previous research suggests that even minor variances in IS features could result in different usage patterns amongst its users (Robey and Markus 1988). Identification of the features and the value they generate for a user could lead to a deeper understanding of user appropriation behaviour because a user might not use particular features on a technology or might not appropriate it faithfully (Alfaro et al. 2012; DeSanctis and Poole 1994). Examining technology features enables researchers gain insight into the triggers for sense-making that a technology artefact offers its' users. Studies on classification of the various social media tools culminated with the work of Kaplan & Haenlein (2010) who attempted to systematically classify social media tools using theories from the areas of mass communication and social theories to inform their investigation (Kaplan and Haenlein 2010). Building on the research conducted by Kaplan & Haenlein (2010), Kietzmann et al (2011) defined a framework describing the functionalities provided by social media to corporations.

This seminal work culminated in the development of a framework that enables corporations to identify the affordances offered to them by different social media tools. However, this framework did no touch on these concepts and functionalities from the perspective of the average user, but examined the functionalities social media could offer to a firm (Kietzmann et al. 2011). Additionally, the study did not examine the technological mechanisms through which these affordances could be accessed. This influenced the study by Alfaro et al (2012) who built on the work of Kietzmann et al (2011) and classified 25 social media sites through classification by features and capabilities. In addition, they went a step further in linking the mechanisms of these social media tools with the affordances and functionalities defined by Kietzmann et al (2011). However, while they examined the various mechanisms through which various media display their capabilities; their study was limited to enterprise social media packages. Additionally; their study stopped at identifying the features that might be available in various social media packages without linking these features with the functions they serve to the user (Alfaro et al. 2012).

Therefore, we extend the work of these scholars by examining the mechanisms and underlying affordances of social media tools that might influence the use context and patterns of a chronically ill user. The following section contains the research methodology and highlights our findings from the initial study.

3   Research Methodology

We used the global social media report compiled by smartinsights.com where they present the most used social media sites for the year 2016. This report was used to narrow down the potential sites for inclusion in the study. We chose Facebook, Instagram, YouTube and Reddit because they supposedly encourage self-presentation, reporting and interactivity with other users on the platform. Facebook is a hybrid site that offers video, text, image sharing and other entertainment capabilities. YouTube is a video-sharing site that encourages distribution of self-produced video content. Reddit's core functionality is the sharing of text-based posts with others who may or may not be members of the site.

Similarly, Instagram is an image-sharing site which centres on the distribution and interaction around self-produced images.

Initially, we examined these four platforms to identify the technology features of these social media sites. Next, we identified functionalities that were derived as a result of these technology features. Since our aim was to identify the perceived affordances provided by these four social media tools, we applied the honeycomb framework by Kietzmann et al (2011) as a practise lens to help us understand the key concepts to aid us to classify functionalities of these social media platforms(Alfaro et al. 2012; Kaplan and Haenlein 2010; Kietzmann et al. 2011). We chose the honeycomb framework because it could help us to gain a holistic understanding of key functionality of social media.
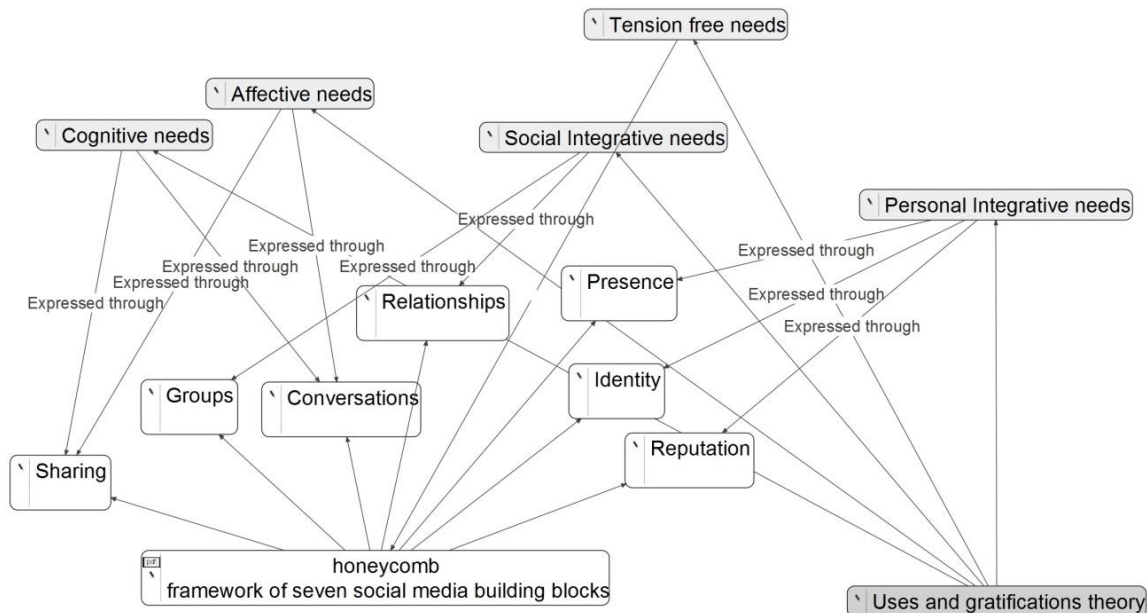

Figure 1: Linking Kietzmann et al (2011) Honeycomb framework with the Uses and Gratifications theory by Katz et al (1973)

However, the honeycomb framework does not account for entertainment features or functionalities we identified during our classification. Therefore, we applied the uses and gratifications theory (Katz et al. 1973), which allows the examination of medium in terms of it's contents and attributes. In addition, uses and gratifications had a number of overlapping concepts with the core concepts posited by Kietzmann et al (2011). Therefore, we combined the concepts of uses and gratifications theory the honeycomb framework as illustrated in Figure 1 above, this allows us to account for all the features and functionality we identified on these four platforms.

4 Findings

In this section, we identified the features of each of the four social media platforms and we list the collective technology features of these four tools in the section below:

- News/Activity Feed: A news feed keeps the user updated on the actions of each of the other members of the user's network.

- Content Recommendation: this feature generates a list of posts that might interest the user which have been curated and suggested based on the user's activities on these sites. For instance, displaying related news posts after a user has viewed a video or text post on a topic such as health and fitness.

- Content publication: this allows users to publish content that is visible to 1-n members of their selected network depending on each platform's broadcast privacy capabilities.

- Event Creation: This feature allows users create social events and generate a virtual calendar which allows participation in the event by other users in the selected network.

- Social Plugins: This group of features enable the users to share external content on these social media platforms. In addition, social plugins enable users to utilize one profile across a wide

variety of sites that they visit by allowing them sign in and use their existing profiles to interact with external sites.

- Posts/Comments/Discussions: This feature allows users create posts or comment on posts and carry out discussions on any topic.

- Messaging services: this allows the user to communicate between 1-n respondents in a private communication channel.

- File Sharing/Manipulation: This allows the user to upload share and manipulate files to the other members of their network.

- Entertainment/Games/Gamification mechanisms: these tools may incorporate some gaming systems or gamification mechanisms such as follower count on Facebook and Instagram in order to incentivize users to do more on the platform.

- Social Groups: this function allows the creation of designated spaces for users to congregate and interact with each other over a shared interest, for instance Reddit subreddit.

- User Profile: this allows the user to create a public persona through which other members of the network identify him.

- Reactions: Allows a user communicate with other users through a pre-set library of emoticons; such as thumbs up for like or a heart emoticon for love.

- Search: Allows the user to search within the platform for a specified term or related terms.

- Personalization: Allows the user customize the way content is displayed to him or the look and feel of his public profile.

- Privacy settings: Allows the users take measures to protect themselves and their content from being displayed to unauthorized users or the public

- Payments: This feature allows the user integrate a digital wallet with the social media tool, merging his online financial identity with his identity on the tool.

- Tagging and Hash-tagging: This enables users to add special keywords to content they post on these sites enabling other users search for that content by it's tag or hashtag.

- Call Conferencing: allows the users make internet calls to others on their network, the functionalities provided by each platform could range from video calls to audio only calls.

Following the identification of the technology features outlined above, we categorized the functionality, using figure 1 as a guide in order to identify the perceived functional affordances that might be derived by patients with chronic illness.

5 Discussion

Based on the findings outlined in the previous section, we discuss the perceived affordances that might be derived from the four social media sites examined. In addition we present the corresponding functionalities on each of these platforms in table 1 below. In the data analysis we identified a further block that could augment the work of Kietzmann et al (2011), therefore extending the honeycomb framework in the context of the average social media user.

Sharing: Social media sites form a place where users can exchange content with each other through the platform. Sites such as Instagram have image-sharing features, comments and like mechanisms that supports this affordance. Whereas, for sites such as facebook, the features such as post creation, comments, media-sharing mechanisms and reactions.

Groups: The ability for virtual place-making is a key affordance for open social media. Users congregate either in specifically created "groups" or around a medium to exchange ideas and share knowledge. Facebook supports this through features such as groups, posts and pages. Reddit affords users groups through sub-reddits and the chat-lounge. Instagram and YouTube have a similar mechanism where this is afforded to users to a lesser degree because virtual place-making centres on uploaded content of interest, for instance a controversial picture or video.

Conversations: These social media tools afford users the opportunity to engage in asynchronous communications without the limitations of time or geography. This affordance is supported on sites such as facebook through the chats tab, hash-tagging, through posts and comments on pages.

Similarly, YouTube supports conversations through posting of video content, hash-tagging messaging feature, liking or disliking content and discussion through comments or video replies. Instagram supports it to a lesser extent through liking or disliking content, chat feature, hash-tagging and comments. Reddit primarily affords users conversations through private messaging, up or down-voting of content, ability to award users with rewards (Reddit gold), creating posts and comments.

Perceived Affordances	Platforms degree of support			
	Facebook	Instagram	Reddit	YouTube
Sharing	High	High	High	High
Groups	High	Low/None	High	Low
Conversations	High	High	High	Medium
Relationships	High	Medium	Low	Low
Presence	High	High	Low	Low
Identity	High	High	Low	Medium
Reputation	Medium	High	High	High
Entertainment	High	Low	Low	High

Table 1. Rating Social media tool features through the identified perceived affordances in the studies

Relationships: Relational affordance is the extent to which users can create and maintain existing relationships with others through the social media site. Facebook primarily focuses on relationships, the contacts list, follow, friend suggestion, groups, pages all are designed to maintain and create connections between users. Reddit primarily supports this to a lesser extent through subreddits, subscription and friends features. YouTube supports this to a lesser extent through the channel subscription option and exposes the user to newer related content through it's recommendation engine. Instagram supports this through the follow mechanism and recommends accounts to follow based on the user's activities.

Presence: Enables the user know if other users are available online, social media sites afford this to users through features such as contacts list, and number of active users lists. Reddit uses the number of active users feature to signal the availability of others to users in it's subreddits. Facebook uses the contacts list and online status to indicate presence between users. Instagram and YouTube have limited support for this affordance as illustrated in table 1 above.

Identity: Social media sites such as Facebook, YouTube and Instagram enable the user's to display a public self to other users through features such as profile pages. Instagram has a higher focus on public image/identity with features such as image uploads, video uploads, the use of filters to manipulate and enhance the image presented to other users. Facebook also affords the user the opportunity to craft a virtual identity through the profile page where mechanisms such as profile picture, posts and newsfeed activity enable the user to project a desired public identity. Reddit has low support for identity with the profile page mostly focused on the overall score and reputation of the user which is depicted through the

Reputation: social media sites afford users a way to gauge the reputation of their peers, features such as down voting, number of followers, like, reaction, dislike and karma are used as a means to determine the social standing of themselves and others. Reddit affords this through a point system called karma which is allocated to the user as a result of his posts and comments on the platform. Facebook, Instagram and YouTube use likes and number of followers or subscribers.

Entertainment: Social media sites proffer mechanisms to support the tension free needs of a user. This could come through mechanisms such as games, videos or posts. Sites such as YouTube provide entertainment through videos pushed by it's recommendation algorithm that offers a user content to match their mood. Facebook has a gaming platform integrated with it's other features which offers a plethora of games to users which are paid and free. Reddit and Instagram afford the user entertainment to a lesser extent, Reddit has specific subreddits that might fulfil the tension free needs of the user and Instagram does not directly provide technology features that might afford users entertainment.

Our study suggests that a combination of the Uses and Gratifications theory with Kaplan's honeycomb framework could aid in identifying the features and classifying the perceived affordances of Facebook, Reddit, YouTube and Instagram. As concerns this study; a social media tool presents certain action possibilities to a chronically ill user; but perceptions of those functions depend on different use contexts depending on the features and core capabilities of the social media platform. Furthermore, through identification of the underlying concepts and their representation of these tools, we are able to understand the technological context of technology use patterns. This could aid healthcare service providers in understanding more about the needs, background and usage patterns of their users, which could aid in addressing disparities in service provision (Agarwal et al. 2010).

6   Future directions

This first part of the larger study examining appropriation of social media by adults with chronic illness, gives a more in-depth understanding of the features and underlying affordances behind Facebook, YouTube, Reddit and Instagram. Following this study, we will conduct four case studies with users of these tools. We plan between 30 and 40 in-depth qualitative interviews to examine user interactions and the role of social context across social media tools (YouTube, Facebook, Instagram and Reddit) to understand adoption, adaptation and use of these tools. This first step enables our study to be cognizant of the impact of the environment (technology artefact) on this phenomenon being investigated. Analysing social media tools with various types of interaction capabilities will illuminate the affordances that impact continued use. Identification of these could lead to the generation of social media tools by designers of healthcare online intervention programs that have low attrition rates. The study will generate the outcomes to the chosen theories based on findings for theoretical replications (Yin 2009). Also, multiple case studies will ensure replicability and minimize the potential impact of extreme cases on findings (Phelan 2011).

Data collection of user posts on these platforms is currently underway. Social media users on Reddit; YouTube; Instagram and Facebook are currently being solicited to participate in the study. These initial findings will inform the development of a design framework and model that encapsulates social media adoption, adaptation and use from the affordance perspective of Sociomateriality.

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