Risks and Benefits of Social Computing as a Healthcare Tool

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ABSTRACT

Cybercitizen describes a frequent user of the Internet or in other terms, a member of an online community (cybercommunity). This digital space can be used to participate in educational, economical and cultural activities. Social computing is an approach to Information Technology (IT) that is used to create virtual teams across different organizations or communities which enhances collaboration, collection and sharing of information. It allows different stakeholders to come together in order to communicate and share information in a more effective way using cybercommunities. Individuals are increasingly making use of social computing applications as healthcare tools.

This paper describes how social computing applications are being used as healthcare tools. Benefits associated with such use are described and the risks highlighted. This information may help raise awareness in terms of the benefits that individuals and medical professionals can reap from employing social computing applications as healthcare tools, whilst also cautioning them to consider the risks associated with such use.

Keywords: Social computing, cybercommunity, cyber world, healthcare, risks, benefits

1. INTRODUCTION

Human beings are naturally societal and thus require relationships with others in order to survive [1]. This can be witnessed in the need for having a place to belong or a certain group of people to relate to. Social computing is an approach to Information Technology (IT) that is used to create virtual teams across different organizations or communities which enhances collaboration, collection and sharing of information [2]–[4]. It allows different stakeholders to come together in order to communicate and share information in a more effective way using cybercommunities. Social computing has made this easier because these social connections are no longer limited to physical contact but they can occur in the cyber world as well. It has been found that many individuals are increasingly relying on social computing to access health information or to track their health conditions and care [5], [6].

The purpose of this paper is to highlight the concept of social computing as a healthcare tool, as well as define the risks and benefits of social computing as a healthcare tool. In this paper, social computing will be defined and described, the application of social computing as a healthcare tool will be discussed, and the benefits and risks associated with it will be highlighted. The results presented in this paper are based on a literature review. The paper ends with a brief discussion and future work.

2. SOCIAL COMPUTING

The Internet used to be just a "read-only" service which had little user interaction, also referred to as Web 1.0 [7], [8]. However, things have evolved and now people can read and contribute to content on the Internet – allowing interaction and collaboration [7]. This is known as Web 2.0 and social computing falls under it. Some of the essential characteristics of social computing include the following [3], [8]–[10]:

- **Connectivity:** This is about the formation of relations with people in a group.
- **Collaboration:** This is the sharing of resources, ideas, knowledge experiences in a cyber-community. This can be experienced as both negative and positive. Positive collaboration can be experienced when people collaborate in order to facilitate one another. Negative collaboration on the other hand is when it becomes adversarial or competitive.
- **Community:** This is the grouping of people who have similar interests and may be of spatial closeness.

There are various applications of social computing. The following are examples of such applications [1], [4], [8]–[13]:

- **Blogs:** This is typically a personal diary that is kept in cyber space where an end-user can edit it without requiring web publishing skills. An example of a blog service provider is Blogger (www.blogger.com).
- **Social games:** This is an online activity whereby users play an online game on a social media platform e.g. The Sims (www.thesims.com.thesims.com).
- **Social networks:** Websites that provide social interaction for users to be able to develop groups of friends or communities of people with common interests e.g. Facebook (www.facebook.com).
- **Social media:** Audio or video content is uploaded by individuals on the Internet in order to create a platform for sharing and discussion e.g. YouTube (www.youtube.com).
- **Social knowledge sharing:** On the Internet, users come together across geographic confines to contribute to a collective pool of knowledge e.g. Wikipedia (en.wikipedia.org).

As mentioned it has been found that many individuals are increasingly relying on social computing to access health information or to track their health conditions and care [5], [6]. Social computing as a healthcare tool will be discussed in more detail in the following section.

3. SOCIAL COMPUTING AS A HEALTHCARE TOOL

The combination of social computing applications and health gave rise to the concept of Health 2.0 [6]. This can be defined as a network of Web 2.0 applications that empower the user to take control of their healthcare [7], [14], [15]. It is about availing information to patients which will assist them in making rational and informed healthcare decisions. With the rise of social computing technology, patients are looking for ad-hoc ways to connect to one another and share their healthcare experiences [14]. Hospitals and other health organizations also use social computing for promotions and gauging consumer experiences [5]. Social computing connects patients, doctors, caregivers and other healthcare providers to help them interact actively in the care of a patient. Below are examples of social computing applications and how they can be used as a healthcare tool.

- **Blogs:** Patients use blogs in order to share their stories and empower one another outside the doctor's office [14], [16]. Bloggers use their sites to share the knowledge they have about diseases and illnesses and also raise awareness and educate others on treatment options and where to get useful resources [14].
- **Social games:** The nature of online social games promotes potential learning environments as they are very captivating and engaging [13]. Due to increased access to the cyber world through mobile devices, it is expected that the application of casual gaming will be increasingly leveraged to drive health behaviour change [17].
- **Social networks:** Social networks/peer networks are formed around diseases through health communities in order to provide support groups, and self-help groups [18], [19]. They can help patients in the decision making process and also dealing with consequences of those decisions [15]. Patients with chronic conditions can cope better by using social networks to communicate with other patients to discuss symptoms and treatments [18], [19].
- **Social media:** Podcasts and live video feeds are used to deliver new health information to patients and healthcare providers in a universal manner [16].
- **Social knowledge sharing:** Tools such as medical wikis also exist on the Web. Patients can get disease-specific information from them, which can help in getting more information about their symptoms [16].

In the section that follows, the benefits of social computing applications as healthcare tools will be described.

3.1. Benefits of social computing applications in healthcare

The following benefits related to the social computing applications discussed in the preceding section have been identified [13], [14], [16], [18], [20]–[23]:

- **Blogs:** The participants of blog websites get first-hand information from healthcare professionals and also from other patients that share their experiences on such blogs. Another advantage of blogs is that they are easy to use, because they are just like diaries/journals written online.
- **Social games:** When playing social games that are health-related, patients can get better access to information and support through pre-programmed education modules. Social games also promote behavior change with positive feedback for patients. They are also motivational for young people who are difficult to influence when dealing with health problems. Games can also play a role in improving players' moods, promoting relaxation and warding off anxiety.
- **Social networks:** Patients gain a psychological sense of community as they meet virtually with others to share experiences and gain knowledge on health topics they are interested in. This also helps to fight social isolation because online they feel like they belong to a certain group and thus are never alone in dealing with their health problems.
- **Social media:** Podcasts provide continuous and personalized education and training for medical professionals that are in remote areas. They are also used to deliver educational material to patients related to health, nutrition, and wellbeing. The World Health Organization also makes use of podcasts to distribute public health information and related news from around the world.
- **Social knowledge sharing:** Health and medical wikis are an example. They provide quick updates on what is current in the health domain. Wikis are also used in medical education by students to share web resources and links.

In the following section the risks related to social computing applications as healthcare tools will be described.

3.2. Risks of social computing applications in healthcare

The risks associated with the use of social computing applications for healthcare purposes include [5], [6], [13], [14], [16], [24], [25]:

- **Blogs:** There is a lack of reliability of the information provided in blogs which raises trust issues. Medical information provided in social computing platforms is prone to inaccuracy. Information quality is deemed the most important attribute for users of health information. According to [14] "The quality of the information on wikis, blogs and social networking sites is debatable".
- **Social games:** The use of social games for health education has been associated with risks for both mental and physical health. Constantly playing online games may lead to seizures and muscle injuries. Social isolation can also result from people playing social games so excessively that they disconnect from their physical environments.
- **Social networks:** Patient data provided in social networking sites can be misused by third-parties. This raises the issue of privacy and it remains a primary concern for the users of social computing. Another problem is that individuals can take the information provided by healthcare professionals out of context. This is because not everyone is health literate. Health literacy has been formally defined as the ability of an individual to read and understand prescription bottle labels, appointment slips, and other important health-related materials. Social computing requires individuals who use the platform for health reasons to be able to perform these tasks in order to fully reap the benefits of participating in their healthcare.
- **Social media:** People who create podcasts may only present information that is relevant or favourable to them, which promotes bias. This can mislead individuals who use this information.
- **Social knowledge sharing:** Wikis are prone to vandalism and hackers. This means that information can be changed or removed. The fact that information is provided anonymously on wikis raises concerns of the person's integrity and how factual the information they provide is.

The preceding sections described benefits and risks of using social computing applications for healthcare purposes. Table 1 summarises these risks and benefits.

Type	Benefits	Risks
Blogs	First-hand information Ease of use	Lack of reliability Trust issues Information inaccuracy
Social games	Educational awareness and learning Positive behavior change Motivational Improve wellbeing	Mental health problems Physical health problems
Social Networks	Psychological sense of community Fight social isolation	Misuse of patient information Privacy concerns Information used out of context
Social media	Support for medical professionals in remote areas Education and training	Misleading information

Social knowledge sharing	Quick update of new developments Resource sharing	Vandalism and hackers Information inaccuracy

Table 1: Risks and benefits of social computing applications that are used as a healthcare tool.

4. DISCUSSION

Social computing is a trend that has brought about change in the way that healthcare is being offered as it promotes information sharing, collaboration and so forth. Patients, and healthcare providers alike, are looking for new ways to increase patient knowledge and support self-management in order to improve healthcare outcomes. Combining healthcare tools and social computing applications creates new levels of patient participation in their own healthcare. Patients are connected with the healthcare providers as well as other health stakeholders participating in their healthcare.

As stated previously, blogs, social games, social networks, social media and social knowledge sharing tools are examples of social computing applications that can be used as healthcare tools. The benefits of these include promoting information exchange between patients and healthcare providers. Patients are empowered to take more ownership of their health and participate in decision-making. Education and training is also provided for medical professionals, which may make them more proficient in their field. Patients are also given health education training and awareness.

As much as there are these advantages, risks also exist. These relate to the quality of the information provided and also the well-being of the individuals, possible abuse of privacy, misunderstandings from the readers of information provided by healthcare providers, mental and health problems and also misinformation due to bias. The benefits of these social computing applications offer great opportunities for the health industry even in light of the risks.

5. CONCLUSION AND FUTURE WORK

The purpose of this paper was to highlight risks and benefits that come with the use of social computing applications as healthcare tools. Social computing was discussed, giving examples of the applications. The use of these applications as healthcare tools was described, as well as risks and benefits associated with employing social computing applications as healthcare tools. Future research includes finding ways to mitigate risks that particularly face social computing applications when they are used as healthcare tools.

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