

Threats in Online Communities: A Review

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Abstract— Our society relies on effective and efficient communication. Nowadays, with the help of internet means of communication are increased rapidly. Thus, people from different parts of world are getting close day by day. Apart from emails, social networking sites like Facebook, twitter became the central means through which people stay connected. Along with these general social networking sites, health related social networking sites are also gaining popularity. But, sharing a lot of information emerged with various problems like information privacy and security. This paper gives details about different issues related to information available online on social networking sites. Also, ‘how health related social networking sites are adding more threats to privacy of user?’ is shown.

Key words: Data Security, Data Privacy, Social Networking, Security issues

I. INTRODUCTION

Internet is becoming one of the essential needs of this competitive world. Number of people using internet are increasing day by day. Fig. 1 shows number of internet users in both developed and developing countries. Every year number of internet users are continuously increasing [1]. Along with the internet, new technological innovations of blogs, podcasts, interactive media, and social networking sites provided a platform for people to create, post, and share their messages and content [2].

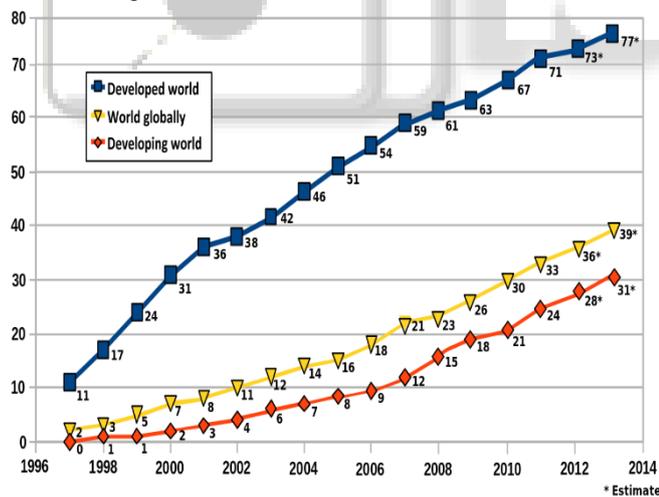


Fig. 1: Internet Users per 100 inhabitants

As per survey done by Pew Research Center’s Internet & American Life Project, social networking site users are around 74% till January 2014. These days use of PC’s, laptops and mobile phones among youths is helping to increase this percentage [3] [4]. By making an online profile, users can use these social networking sites. Through these sites they can share information and messages with their friends. Along with friends these sites have a huge number of strangers too. Therefore, whatever information is shared is visible to unknown [5]. Apart from these general social networking sites, Health social networking sites (HSNS),

virtual communities where users connect with each other around common problems and share relevant health data, have been increasingly adopted by medical professionals and patients. The growing use of HSNS like Sermon and Patients like Me has prompted public concerns about the risks that such online data-sharing platforms pose to the privacy and security of personal health data [6].

All internet users	74%
a Men	72
b Women	76
a 18-29	89 ^{cd}
b 30-49	82 ^{cd}
c 50-64	65 ^d
d 65+	49
a High school grad or less	72
b Some college	78
c College+	73
a Less than \$30,000/yr	79
b \$30,000-\$49,999	73
c \$50,000-\$74,999	70
d \$75,000+	78

Pew Research Center's Internet Project January Omnibus Survey, January 23-26, 2014.
Note: Percentages marked with a superscript letter (e.g., ^a) indicate a statistically significant difference between that row and the row designated by that superscript letter, among categories of each demographic characteristic (e.g., age).

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Fig. 2: Social Networking site users

Fig. 3 shows % of internet users within each age group who consulted online reviews or rankings for respective health-related subjects. This analysis is given by Pew Research Center’s Internet & American Life Project [7]. People along with medical practitioners and different drug companies are getting benefit from all these technologies. But sharing a huge amount of information is creating various critical issues. Following section describes these various issues.

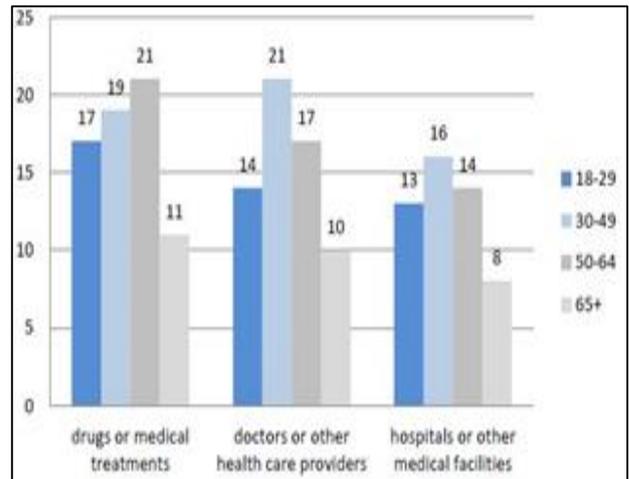


Fig. 3: Consulting reviews and rankings online, by age

II. LITERATURE SURVEY

A. Issues Related To Online Information:

More interesting thing about using these sites is that only a little knowledge about how these sites work is enough to start. The least that a user has to do is to create a profile and get started [5].

- Content ownership: This is important issue related to ownership of content posted online. Who is owner of your social networking profile page? If you delete your page, is the content truly gone or does the social network retain the right to access, use or share your deleted information? Have you read the terms of use for the social networking site? [8]. A recent change made by Facebook to its Terms of Use brought this issue to the forefront. Facebook deleted a sentence from the Terms stating that its users' license grant to Facebook for user content automatically expired when the user removed the content [9].
- Intellectual Property infringement: Having a lot of content and so many ways to access it, intellectual property infringement is an area generating much legal interest. For example, when sharing photos, videos on social media sites copyright infringement comes into picture. When sharing someone else's photo or sharing song through third party without permission results in both criminal and civil liability. If an ex-employee shares a former employer's confidential information, they would be held liable. This raises issue of protection of trade secrets which is another form of intellectual property infringement [10].
- Identity theft: Making fake account or hacking other user's account is serious issue arising these days [5].
- Privacy: Social networking sites are emerging with easy interface which enable users to provide different forms of personal information like age, hobbies, religions, music, blog, etc. but at the same time, these sites do not adequately educate users about the risks of disclosing their personal information [11].
- Comment Controversies: When users on social networking site like Facebook, posts some update, he/she get likes, comments for that posts which may be objectionable. This will lead to controversies. Many such incidents happened these days particularly in India [5].

B. Issue Related To Information On Health Social Networking Sites:

All social networking sites like Facebook, twitter disclose general information about users like age, hobby, religion, hometown, etc. But due to arising of health social networking sites, apart from above general information crucial information about user's health is also get disclosed.

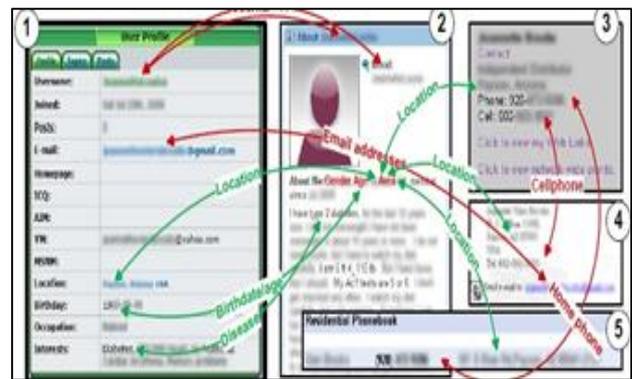


Fig. 4: A real-world example of cross-site information aggregation.

The target patient "Jean" has profiles on two online medical social networking sites (1) and (2). By comparing the attributes from both profiles, the adversary can link the two with high confidence. Furthermore, the attacker can use the attribute values to get more profiles of the target through searching the Web (3) and other online public data sets (4 and 5). By aggregating and associating the five profiles, Jean's full name, date of birth, husband's name, home address, home phone number, cell phone number, two email addresses, occupation, medical information including lab test results are disclosed unintentionally [12].

III. PROTECTING PRIVACY

Privacy protection framework proposed in [11]. Below table gives different recommendations for different privacy policies.

Privacy policy	Recommendations
Privacy Awareness	Sharing the minimum amount of person-specific data to Accomplish the intended purpose. When in doubt, err on the side of providing less data
Privacy by Education	Privacy-awareness education; user-friendly way of setting privacy; use and protection of personally identifiable information (PII) policy; advance notice of any material changes to the privacy policy
Privacy by Design	Building data protection and privacy by design into the platform; sharing anonymized data within and beyond the community
Privacy by Regulation	Ensuring consent to non-medical uses before users' data are used; banning unauthorized re-identification of anonymized data; prohibiting inappropriate uses of health data

Table 1: Recommendations for Protecting the Privacy of Health Data

This framework defines various access levels to different users according to their closeness with user i.e. friend, follower, observer, etc.

IV. CONCLUSION

With the development of technology like internet, laptop, mobile, smartphones use of social networking sites are also increasing. This way of communication is bringing the world

together. But unintentionally, a lot of information, which can be misused, is getting available for other people who are not trustworthy. By aggregating data from health social networking sites with other networking sites more detailed information about user can be obtained. To avoid being a victim, it is necessary to understand the risks of sharing private information, understand the privacy policies of different social networking sites.

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