Web 2.0 adoption and user characteristics

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Keywords
web, adoption, user, 2, characteristics

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By Jennifer Allyson Dooley, Sandra C. Jones and Don Iverson

Abstract

A literature review and online search were conducted to document the rate of Web 2.0 adoption and to profile user characteristics. Substantial increases over time in reach and growth of the Internet and Web 2.0 by geography, technology, and age were found. Usage of the Internet, blogging, wikis, video sharing, and social networking demonstrates initially high rates among teens and young adults; recent shifts suggest older age categories are now also using Web 2.0. Internet users engage in Web 2.0 for various reasons, such as to seek or create news, entertainment, and even health information. Findings illustrate the potential for marketing and public health researchers as well as practitioners to use Web 2.0 as a platform for behavior change interventions.

Keywords: Web 2.0, social media, user-generated content, adoption, usage

The term Web 2.0 has recently begun to appear in published literature about marketing theory and public health. Nonetheless, Web 2.0 is still a new and under-explored area, particularly as it relates to health promotion and public health applications. The current paper reports findings from a literature review and online search that aimed to determine the rate of adoption for Web 2.0 and the demographic and psychographic characteristics of Web 2.0 users. Implications of the findings for the marketing of public health initiatives are presented.

What is Web 2.0? Web 2.0 involves the use of Web pages as a two-way form of communication between users, allowing them to prepare and share content such as information, photos, videos, and links. Tim O’Reilly is the first person to officially define Web 2.0:

Web 2.0 is the network as platform, spanning all connected devices; Web 2.0 applications are those that make the most of the intrinsic advantages of that platform: delivering software as a continually-updated service that gets better the more people use it, consuming and remixing data from multiple sources, including individual users, while providing their own data and services in a form that allows remixing by others, creating network effects through an “architecture of participation,” and going beyond the page metaphor of Web 1.0 to deliver rich user experiences.

The Evolution of Web 2.0

In its early years, the Internet (now called Web 1.0) had fairly static content, allowing for little to no participation from viewers, with only experienced Web developers having the capacity to modify and update Web pages.

According to Kaplan and Haenlein, Web 2.0 began approximately 20 years before the Web 2.0 world that we know today, with the start of Open Diary, an early form of a social networking site with online diary writers, in an Internet community. Approximately one year after the conception of this site, an online diary writer (or blogger) modified the term Web log into the words we blog, resulting in the truncated word known today as blog.

The birth of more sophisticated social networking sites occurred in 2003 and 2004, with MySpace and then Facebook. The technologies available on these sites instigated the beginning of a world of creation. Internet users “began to create and share photos, pieces of writing, videos, and audio files. They also began rating products and tagging content.” A radical shift in thinking took place as
audiences became engaged with the new technologies. Web 2.0 users as we know them today are now more than just recipients of information – instead they are co-creators with access to technology that allows them to interact, publish, and build relationships with one another. Web 2.0 is no longer a buzzword for marketers, but rather an entire revolution in how users are interacting with the Internet.

### Components of Web 2.0: Social Media and User-Generated Content

Web 2.0 allows users to maintain and build social connections through its Internet applications. **Social media** are the Web-based discussions (occurring on Web 2.0 platforms) between users, which include sharing opinions, experiences, and knowledge. Social media are associated with a content trail: postings, opinions, ratings, discussions, comments, and other clearly marked pieces of information that demonstrate the extent and nature of individuals socializing within a Web 2.0 platform.

Another term derived from the participatory nature of Web 2.0 is **user-generated content (UGC)**, or the content created online by a Web 2.0 user. To be considered UGC, three basic requirements must be met: (1) content must be published publicly on a Web site or a Web 2.0 site, (2) content must display creative efforts, and (3) the information must be created outside a professional routine or practice. A common use example of UGC is blogs and the content created by bloggers.

### Web 2.0 Technologies

There exists a multitude of Web 2.0 technologies that facilitate social media and UGC. Moreover, new sites and technologies are being created and adopted on a daily basis. Below is a brief overview of some of the more common categories of Web 2.0 technologies and examples of popular sites.

**Blogs.** An early form of Web 2.0, blogs are personalized Web sites that allow bloggers to enter textual entries, images, and hyperlinks, or upload video and other media into an online journal or diary format. Blogs allow readers to post comments or subscribe to a feed, and be notified when new entries are posted. Blog content is typically displayed in reverse chronological order. Web site examples include Blogger.com and Livejournal.com.

**Wikis.** Wikis are Web sites where information is entered, edited and organized by interested parties. These writing spaces allow for a large number of pages; a popular example is Wikipedia, an online encyclopedia. The sites are very easy to use and interact with, thus are a useful tool for collaborative authoring.

**Social networking sites.** Social networking sites are personal Web sites that exist within the framework of a larger Web site. Users can form communities by linking up on the sites as friends and forming friend groups. Social networking sites typically focus on building online social and professional networks where sharing videos, text, images, and blogs as well as other media can occur. Popular examples include Facebook and MySpace. The term **tweet** is now used to describe a message sent via Twitter, a social networking site that has achieved significant popularity recently. A tweet is a status update of 140 characters or fewer to answer the question: *What are you doing?*

**File sharing.** File sharing involves making large files available to users on a peer-to-peer network. Sites typically allow users to embed their media into social networking sites, ensuring the site does not function in isolation to other Web 2.0 applications. Recognized sites include Flickr or Fotolog for photo sharing and YouTube for video sharing.

The birth and technological development of Web 2.0 illustrates what scholars have described as “the next generation of person-to-person communication.” Web 2.0 represents an important area of research, particularly in terms of possible implications for researchers and practitioners in marketing and public health.
Methodology

Research Questions

RQ 1: What are the adoption rates of Web 2.0?

RQ 2: What are the Web 2.0 user demographics and psychographics?

Peer-reviewed literature, Master’s and PhD theses, gray literature, and research reports were included in our literature search. A search algorithm guided the review of databases, search engines, Listservs and journals (Figure 1). Keywords included a combination of words in the subject areas of: the Internet/Web 2.0, Web 2.0 technologies/Web sites, Web 2.0 users, Web 2.0 usage, marketing, social marketing, public health, and health promotion. Inclusion criteria were articles that focused on Web 2.0 user demographics, Web 2.0 user psychographics, Web 2.0 rates of adoption, behavior change initiatives being promoted in a Web 2.0 context (commercial and public health initiatives), Web 2.0 evaluation standards, and a willingness to use Web 2.0 by group (age, gender, culture, etc.). Non-English articles and those discussing the technical components of Internet technology were excluded.

Figure 1

Search Algorithm and Sources

Literature Review Findings

Findings from the literature review and online search demonstrate increased Internet and Web 2.0 reach and growth over time and user engagement in Web 2.0 for news, entertainment, and health information seeking purposes. Research findings also illustrate a limited amount of literature about the use of theoretical frameworks to explain why users adopt and diffuse Web 2.0.

Reach and Growth

Internet reach-and-growth trends indicate current global usage. Some differences by groups exist, such as a higher percentage of males versus females using the Internet globally. A substantial increase in the reach of Web 2.0 technologies are also found, with initially high usage among teens and young adults and recent shifts toward adoption in the older age categories.
**Overall Internet Reach and Growth.** The Internet is accessible to, and used by, populations around the world; and Internet use has increased substantially over recent years. In December 31, 2000 there were approximately 300 million Internet users in Africa, Asia, Europe, the Middle East, North America, Latin America/the Caribbean, and Oceania/ Australia. By December 31, 2011 the number of worldwide Internet users was cited at 6.9 billion users (a 528.1% growth rate from December 31, 2000).

**Internet Reach by Geography, Gender, and Minority Group.** Gender differences are found for Internet reach, with men slightly more likely to use the Internet than women regardless of whether they live in a developed or developing country (Figure 2). In Chile, Colombia, Cyprus, Italy, Macao and Mexico the gap between the proportion of men and women using the Internet is eight percentage points or larger.

Figure 2

**Adult Internet Usage by Gender and Geography in 2010**

![Graph showing gender gap in Internet usage by country](image)

In 2007, digital divides existed in North America among minority groups, with African-American and French-speaking Canadians being less likely to use the Internet than Caucasian Americans and English-speaking Canadians (Figure 3).

Figure 3

**North American Adults 18 years and Older and Internet Usage in 2007**

![Graph showing Internet usage by race and language group](image)
In 2011, the digital divides between minority groups in the United States were documented as declining or disappearing; with digital divides instead found among older generations (65 years+), those without a high school education, and individuals who had a household income of less than $20,000USD per year.

Web 2.0 Reach by Geography. The reach of Web 2.0 is more pronounced in certain countries. For example, a study by Nielsen examined the reach of active users and time spent per person on social networking sites and blogs during the month of April 2010. Australian Internet users spend an average of 7 hours and 19 minutes per person in one month on social networking sites, a larger average amount of time than those in any other country (Figure 4). Facebook has its widest reach in Italy, with the next highest reach and usage in Australia, the United States and the United Kingdom (Figure 5).

Figure 4

Social Networking / Blog Sites Reach by Country in April 2010
Reach and Growth by Web 2.0 Technology. The reach and growth of Web 2.0 technologies can be seen by examining the life cycle of blogs, file sharing sites, and - most notably - social networking sites, which all illustrate an increase in adoption over time.

For example, the number of blog records counted by Technorati, a search engine for blogs, increased from 133 million in 2008 to 450 million in 2010 (Figure 6).
Wikipedia has 16 million-plus registered users and more than 3.9 million English articles. Less than a month after YouTube’s fifth birthday, the Google-owned company announced it exceeded 2 billion video views per day. There are now more than 60 hours of video uploaded every minute to the site (Figure 7).
Social networking site usage has also increased over the years (Figure 8). In 2005, only 8% of adults in the United States are documented as having a social networking site; by 2009, approximately 80% of online adults in the United States are documented as using social networking sites at least once per month. In December 2009, the social networking site MySpace had 125 million users and today Facebook has approximately 845 million users.
Reach and Growth of Web 2.0 by Generation. Early data about Web 2.0 adoption suggest that it first began with teens and young adults. However, data from 2009 indicates that adults in all age groups were beginning to increase their usage of Web 2.0 at an astounding rate (Figure 9).

In 2008, 75% of American Internet users’ ages 18-24 years are documented as having a social networking profile but only 7% for adults ages 65-plus. Yet by 2009 there was a substantial growth among older age groups for the social networking site Facebook. From January 4 to July 4, 2009, the overall number of Americans ages 55 years and older using Facebook grew by 514% compared to an increase of only 5% among those ages 18-24 years.
Interestingly, in November 2009, the third online destination by Americans aged 65 years and older is shown to be Facebook: compare this to a year before when it is documented as the 45th visited site, and the results demonstrate that usage of social networking sites for this age group is growing rapidly (Figure 10).

Figure 10

Growth of Web 2.0 Use by Age Group from 2006–2009

2006
- 55% of U.S. youths aged 12-17 use social networks
- 48% of U.S. youths aged 12-17 visit social networks daily or more
- 28% of U.S. adults 18-29 blog
- 7% of U.S. adults 30 years of age and older blog

2007
- Majority of Internet users uploading videos in the U.S. are aged 18-29 years

2008
- February: 65% of U.S. youths aged 12-17 have a social networking profile
- Overall: 35% of U.S. adults 18 years and older have a social networking profile
- The 45th most visited online site is Facebook by American seniors 65 years and older in November

2009
- Facebook usage among those aged 55+ is about 5.9 million
- In November, the third-most visited site is Facebook by U.S. seniors 65 years and older
- 42% of Twitter users are 35-49 years
- U.S. internet users 30-49 years become just as likely as 18-29 year olds to upload videos
- By September, 14% of teens and 15% of U.S. adults 18-29 are blogging
- In September, blogging among U.S. adults 30 years of age and older increases to 11%
Recent data demonstrate that now 65% of American adult Internet users are social networking users of MySpace, Facebook, or LinkedIn. Likewise, half of all American adults are users of social networking sites.\textsuperscript{19}

**Engagement**

Internet users engage in Web 2.0 for various reasons. Specifically, Web 2.0 user engagement differs in news, entertainment, and health-information seeking behaviors.

**News and Entertainment**

Some Internet users are heavily engaged in UGC, while others use Web 2.0 for entertainment purposes. Riegner\textsuperscript{50} categorizes users as *Online Insiders, Social Clickers, Content Kings, Everyday Pros, or Easy Trackers* (Figure 11). Social Clickers are likely to use social media and participate in UGC, whereas Easy Trackers do not participate in communicating with others online and are instead receivers of information.

**Figure 11**

**Internet Use and Engagement\textsuperscript{51}**

<table>
<thead>
<tr>
<th>Online Insiders</th>
<th>Social Clickers</th>
<th>Content Kings</th>
<th>Everyday Pros</th>
<th>Easy Trackers</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Interested in communication activities • Likely to express themselves online • Avid online shoppers and express their opinions about products online</td>
<td>• Heavy communicators online • Seek and maintain online social relationships • Younger than online insiders and not as comfortable financially • Heavily engaged in creating Web pages, or posting comments on blogs</td>
<td>• Addicted to entertainment • Typically young males • Not interested in online communication • Do things like peer-to-peer transfers or writing on message boards/chat rooms for online entertainment</td>
<td>• Heavy online shoppers • Conduct online banking, money management, and investing • Unlikely to publish a personal blog or page</td>
<td>• Fulfilling immediate needs: checking the news, weather, or sports • Don’t communicate much online with others • Prefer to be on and off the Internet quickly • Receivers of information</td>
</tr>
</tbody>
</table>

In 2010 an online advertising network analyzed the interests of users who frequent social networking sites such as MySpace, Facebook, and Twitter by comparing their Web site activity. Users who visit Twitter are mostly consumers of news: 47% of all the traffic Twitter generated is for news traffic, whereas MySpace users consume games and entertainment (28% of the sites traffic generated is for video games and 23% is for celebrity/entertainment content). Facebook users are interested in a broader range of content, including news and entertainment\textsuperscript{52} (Figure 12).
Social Networking Site Information Seeking Traffic in 2010

<table>
<thead>
<tr>
<th>Traffic Generated (based on 237,940 impressions)</th>
<th>Twitter</th>
<th>MySpace</th>
<th>Facebook</th>
</tr>
</thead>
<tbody>
<tr>
<td>News</td>
<td>4.7%</td>
<td>23%</td>
<td>21%</td>
</tr>
<tr>
<td>Video</td>
<td>10%</td>
<td>23%</td>
<td>13%</td>
</tr>
<tr>
<td>Celebrity/Entertainment</td>
<td>10%</td>
<td>9%</td>
<td>13%</td>
</tr>
<tr>
<td>Community</td>
<td>6%</td>
<td>10%</td>
<td>13%</td>
</tr>
<tr>
<td>Business/Finance</td>
<td>10%</td>
<td>13%</td>
<td>13%</td>
</tr>
<tr>
<td>Shopping</td>
<td>9%</td>
<td>13%</td>
<td></td>
</tr>
<tr>
<td>Travel</td>
<td>10%</td>
<td>9%</td>
<td>13%</td>
</tr>
<tr>
<td>Technology</td>
<td>10%</td>
<td>9%</td>
<td>7%</td>
</tr>
<tr>
<td>Other</td>
<td>23%</td>
<td>23%</td>
<td>17%</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
</tr>
</tbody>
</table>

*Health Information.* Several researchers label individuals who search online for health information as *Prosumers* or *e-patients.* In November/December 2008, 61% of American adults are documented as e-patients. These individuals frequent a variety of Web 2.0 sites for health information (21% visit wikis for health information), seek or create Web 2.0 health content themselves (6% start or join health groups), and state that Web 2.0 health information results in their health-behavior changes (Figure 13).

American Prosumer/E-Patient Web 2.0 Behavior from 2007-2008

Web 2.0 users are also more likely to be e-patients. For example, 53% of e-patients consult Wikipedia compared to only 17% of non-health Internet seekers (Figure 14).
American E-Patients’ vs. non E-Patients’, 18 years and older, 2008 Web 2.0 Usage

Dependency. It appears that Web 2.0 sites may result in dependency or addictive behaviors. A June 2010 study of American women found they are becoming increasingly dependent on social media, particularly younger women. For example, more than three in 10 women in the United States aged 18-34 check Facebook first thing in the morning, even prior to brushing their teeth or going to the bathroom (Figure 15).

Facebook Usage among American Women in 2010

Adoption and Diffusion Theories

There is limited published literature from Internet researchers examining theoretical frameworks to explain why some audiences are more likely to adopt and diffuse Web 2.0 technologies in comparison to others. Of those that exist, the characteristics of age generations are being used to explain Web 2.0 adoption, while traditional adoption and diffusion theories are also drawn upon.

Theories of Age Categorization. Luck and Mathews describe different age generations and the characteristics that influence their behaviors throughout their lifetime. Their research, conducted specifically with the Australian youth population, illustrates the generational characteristics that may relate to Web 2.0 adoption. The term iYGeneration is used to describe the first group of individuals to adopt Web 2.0, typically youth born between 1983 and 2000. The iYGeneration are particularly savvy with technology as a result of growing up surrounded by it (e.g., mobile phones, computers, and the Internet). Luck and Mathews posit that environment and circumstantial exposure may explain why the iYGeneration adopted Web 2.0 at a faster rate than other generations.
Traditional adoption and diffusion theory are also been used to explain Web 2.0 usage, such as Roger’s theory of innovation, with the argument that this theory can be applied to age: the younger the audience, the more likely they are to adopt Web 2.0.

Implications: Summary of Key Trends

A literature review and online search to document the rates of Web 2.0 adoption and profile Web 2.0 users illustrates several emerging trends.

Reach and Growth. Substantial increases over time are being documented in reach and growth of the Internet and Web 2.0 by geography, technology and age. Internet access and usage is occurring in regions around the world; however, some digital divides are reported in the United States by age, education and income. When overall time spent on Web 2.0 sites is examined, high rates of reach and usage are found globally, with the highest rates in Australia, the United States and Italy. Japan, Brazil and Germany have the lowest Facebook reach and time spent per person on Facebook than other countries (during the month of April 2010).

Reach and Growth by Web 2.0 Technology. The prevalence of Internet usage, blogging, wikis, video sharing, and social networking is increasing substantially over time. Initially high Web 2.0 usage rates are found among teens and young adults, however a recent shift demonstrates other age groups starting to engage in Web 2.0.

Engagement. Internet users engage in Web 2.0 for different reasons – whether to search for news, entertainment, or health information. While some researchers label and categorize these engagement patterns using segmentation analysis, others analyze the Web site traffic generated by Web 2.0 sites. Interestingly, large proportions of Web 2.0 users not only seek but create online health information.

Web 2.0 Theoretical Frameworks. There is limited information about the use of theoretical frameworks to explain Web 2.0 adoption and diffusion. Researchers to date are using age generational characteristics to explain Web 2.0 adoption, while traditional adoption and diffusion theories are also alluded to as an explanation.

Implications for the Marketing of Public Health: Practice

The current research findings illustrate important implications for the use of Web 2.0 in a marketing or public health practice setting.

Tremendous Potential. Internet usage is now global, suggesting an initiative that incorporates the use of the Internet as a behavior change strategy will (or can) be wide-reaching. Likewise, the increases in rates of reach and growth over time support the tremendous potential that Web 2.0 has to offer practitioners in marketing and public health alike.

Two-Way Communication. With the use of Web 2.0, target audiences can engage in a behavior change initiative using two-way communication rather than the one-way dialogue of the past.

To remain competitive, practitioners may need to consider the changing landscape of communication strategies and use Web 2.0 as a way to reach key target markets whose behavior they seek to influence. Key questions for practitioners to consider are which Web 2.0 platforms their target audiences are using, and how they are accessing these platforms. The research findings demonstrate that Web 2.0 platforms are changing at a fast pace, with some growing more rapidly and consistently (e.g., Facebook) than others (e.g., MySpace). An area not addressed in this article is the usage of mobile applications to access Web 2.0 platforms – and how Internet users are accessing Web 2.0.
Current data trends demonstrate that over 425 million monthly active users of Facebook are also using Facebook mobile products.\textsuperscript{71}

Strategic planning is vitally important for practitioners to determine which sites their target audiences are using and which Web 2.0 platforms they are most influenced by. Successful strategies to market an initiative using a Web 2.0 platform may include but need not be limited to: reaching bloggers to blog about a particular initiative, particularly bloggers who may influence a particular target audience; getting target audiences to create a discussion about an initiative through the use of wikis; engaging with target audiences by sharing videos about an initiative on video-sharing sites (e.g., YouTube); enabling target markets to create their own videos about an initiative; or by creating pages, groups, and forums on popular social networking sites (e.g., Facebook or Twitter).

Age. Web 2.0 is no longer used solely by youth. For practitioners who have steered clear of marketing an initiative through the use of Web 2.0 for fear that only youth are using it, there is now evidence to suggest that other age categories can also be reached in a Web 2.0 platform.\textsuperscript{72}

Type of Information Communicated. If a public health Web 2.0 behavior-change strategy is communicated on a social networking site such as Twitter, MySpace or Facebook, practitioners may want to consider the type of information consumed on these sites to determine if the initiative would be appealing to the users. If the strategy uses entertainment to encourage behavior change, MySpace may be a good platform, whereas if the strategy uses news or information to encourage behavior change, Twitter may an ideal platform. Likewise, ideal places to target users seeking online health information may be wikis, social networks, video-sharing sites, and blogs.

**Implications for the Marketing of Public Health: Research**

The current research findings suggest several implications for the use of Web 2.0 to market a public health initiative.

**Research and Evaluation Strategies.** It will be important for researchers to use research and evaluation strategies with different targets to formulate strategic Web 2.0 decisions for future behavior change efforts.\textsuperscript{73} Since much of the area of Web 2.0 remains under-explored, there is a great deal of information that can be gathered by researchers to learn more about this new communication form.

**Theory Development.** Theory framework research about the characteristics of different age generations illustrates an important step in understanding Web 2.0 adoption and diffusion. Future research in this area may shed light on Web 2.0 behaviors and user characteristics (e.g., age, culture, gender, and psychographics) using theoretical models.

The term ‘Tipping Point’ has been used by bestselling author Malcolm Gladwell\textsuperscript{74} to explain when a behavior crosses a threshold, tips, and spreads. Gladwell argues that to be deemed a Tipping Point, the idea, trend or social behavior must contain three characteristics: be something that is contagious, demonstrate little causes can have a big effect, and display a dramatic change. As shown in this article, Web 2.0 has been contagious, has had a big effect, and has shown a dramatic change over time. However, there is still much that remains unresolved. Future areas for researchers to explore include a theoretical explanation of the Tipping Point phenomenon for Web 2.0; and why some platforms ‘tip’ and others do not.

**Risks and Cautions: Researchers and Practitioners**

Despite the tremendous potential in using Web 2.0 to reach target audiences for behavior change initiatives, risks and cautions nonetheless exist.
One risk that may need to be carefully monitored by health researchers is the relationship between social-media dependency or addiction and negative health outcomes. For example, a key issue facing developed countries around the world is obesity, which has been shown to have a direct relationship between screen-time activities such as watching television, playing video games, or using the computer, particularly among youth.

Thackeray and Neiger describe Web 2.0 as a shift in the process of communication from one “where gatekeepers control the creation and content of information and consumers are less active recipients to one that reflects a multidirectional and more dynamic process with participative consumers” (p. 171). One risk in this shift of communication is that practitioners lose an element of control over their health-related message promoted on a Web 2.0 platform, in terms of content control and dissemination. A potential also exists for Web 2.0 users to experience information overload from the increased availability of messages, forcing them to be more selective in the messages they receive and respond to.

Another risk with Web 2.0 is the presence of anti-health messages on sites that public health practitioners may need to monitor and eventually respond to. For example, social networking sites have recently been documented as a place for teens to view smoking-related content with pro-tobacco messages, thereby encouraging smoking-related behavior.

Conclusion

Traditional forms of media that health educators and researchers have relied on for their practice or research may soon become obsolete, causing researchers and practitioners to re-think how they do things. Web 2.0 is changing the traditional flow of communication into a “bottom-up creation and horizontal sharing of information.” Nonetheless, there still remains much to learn in this new and expanding field of practice and research.

All three authors are members of the Centre for Health Initiatives at the Innovation Campus of the University of Wollongong in New South Wales, Australia. Iverson is also a member of the Illawarra Health and Medical Research Institute at the University of Wollongong.

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