Primary Psychiatry. 2008;15(12):32-34

Web Browsing: *The Ultimate Medical Information Resource*

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Today's computers actually have more power and memory than most users need. Ten years ago, a high-end computer with the fastest processor, most memory, and large capacity hard drive would cost over $3,000, destined primarily for computer gamers and video editing. Today, even the most basic computers (under $1,000) have sufficient computing power for the majority of users, who typically only use office productivity software such as a word processor, spreadsheet, and database programs, as well as a Web browser to access information on the Internet. As health information and medical software increasingly become Web based, such as the National ERx initiative,[1] maximizing the Web-browsing experience has become a must for medical professionals.

ISSUES

The medical office needs a variety of tools, which have increasingly become dependent on the Internet for delivery. Today's practice can no longer maintain high levels of productivity with just practice management software and a word processor for documentation. Electronic communication with patients is increasingly becoming the norm, and eventually Web-based appointment scheduling will be the predominant appointment booking method. Patients will rely more upon e-mail appointment reminders with subsequent integration into their iPhone or Blackberry calendar than the traditional phone call confirmation. Just as the need for intense computing power has diminished over the years, the medical office will depend less upon medical software and information installed on office-based computers and rely heavily on subscriptions to Web-based applications such as electronic health records.

There are many reasons for this switch from office-based computing to Web-based delivery. Access is easier for multiple providers at different locations if the electronic health record system is centralized on the Internet. Timely backup and data integrity is improved since the busy practice manager or physician is no longer responsible for daily backup of records, billing, and scheduling. Communication between multiple health plans and healthcare service providers to streamline financial, clinical, and administrative transactions has now gone online. To enhance the experience with these services requires the optimization of the Web browser.

SECURITY

In the medical setting, the security of the browsing experience is of paramount importance beyond the Health Insurance Portability and Accountability Act. Although the Web is a portal to web-based medical software and medical information, it is also the gateway for vulnerability of computers to viruses and hackers. Phishing is the type of attack that uses both social engineering and technical subterfuge to steal personal identity data and financial account credentials.[2] These social-engineering schemes use "spoofed" e-mails, which appear to be from a credible Website, to lead victims to counterfeit Websites designed to trick them into divulging

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Disclosure: Dr. Luo is consultant to S.M.A.R.T. Link Medical, Inc., on the speaker's bureau of Epocrates, and on the advisory board of Spyglass Consulting.

financial data or providing account information. Medical offices are vulnerable because they often have demographic information such as social security number, birthday, and address that hackers may use for other purposes. Technical subterfuge schemes implore users to click on a button on a Website, which plants "crimeware" onto computers. This software, usually a Trojan keylogger, basically captures keystrokes and sends them to phishers so that they can steal information directly.

AntiPhishing.org[3] provides general advice to consumers to avoid phishing tactics. These include recommendations such as not to use links embedded in e-mails if there is suspicion that the e-mail is not authentic, and checking on the URL to determine if the site is authentic. Even the yellow lock on a URL and its "https://" can be forged by phishers. It is highly recommended that instead of clicking on e-mail links, enter the web site URL directly in the browser to avoid being sent to a phishing site.

There are a variety of tools to avoid phishing sites. Earthlink[4] and Netcraft[5] provide free toolbars that can be embedded into Internet Explorer or Firefox browsers to alert users if they have entered a site that may be risky. GreenBorder is a Windows-based Web browser that provided secured browsing by using virtualization technology to keep the Web browser from being hijacked and taking over the operating system. Google purchased GreenBorder in 2006, and its developers helped contribute to Google's own Web browser, Chrome.[6]

Chrome is an open-source browser compiled by Google from a variety of sources.[7] It uses components from Apple's WebKit, which is incorporated into Apple's Safari browser, and elements from Mozilla's Firefox. These components have been tweaked to run complex Web applications better and to run clean as well as fast. Elements from GreenBorder's technology help Chrome keep each tab in a secure "sandbox" so that they do not crash the browser and improve protection from phishing sites. At present, this product is still in beta and only for the Windows operating system, but Mac OS X and Linux versions are promised.

Microsoft has not been idly watching the secure browsing phenomenon. The new version 8 of Internet Explorer (IE8), now in beta testing, also offers secure Web browsing features.[8] IE8 has a SmartScreen Filter that detects phishing sites, and domain highlighting which focuses the user's attention to the domain name in the URL to spot misleading addresses.

SPEED

Even 20 seconds waiting for a Website to load can create frustration for the medical office. Google's Chrome browser and Microsoft's IE8 are faster than earlier versions of Internet Explorer and Mozilla's Firefox by incorporating various technologies to enhance the speed of access to information. Chrome has a simple interface and a revamped JavaScript engine to improve speed of Web-based applications. Application shortcuts in Chrome are specialized windows in the Chrome browser just for Web applications. They can be invoked from the desktop once the shortcut is created and they also do not display tabs, menus, and the address bar to maximize the application speed and appearance. IE8 has "Web slices," which are favorite Websites that are routinely checked by IE8 for updates and then highlighted for the user. IE8 also has Web accelerators, installed mini-applications that help users copy information on one Website to be used on another with one click.

Fans of Firefox who desire speed but do not want to give up their favorite browser still have options. For the Microsoft Windows operating system, K-Meleon[9] is an extremely fast, lightweight Web browser based on the Gecko layout engine used in Firefox. For Mac OS X, Camino[10] is a specifically compiled web browser based on the same Gecko engine. These browsers, in essence, are similar to Firefox but have fewer features and add-ons. Additionally, their tighter integration with the specific operating system makes a significant improvement in speed.

BOOKMARKS

One of the issues with current Web browsers is many users have important bookmarks on home computers and work computers, and it is a challenge to synchronize the two. An easy solution for Firefox Web browser users is Foxmarks.[11] This product is a free add-on extension to the Firefox browser that enables users to synchronize specific bookmarked sites between different computers as well as access and edit these bookmarks online from a third computer. Bookmarks can be shared between members as well as accessed on a mobile device such as an iPhone. Bookmarks are saved on the server, which functions as a backup. For Internet Explorer, there are many services that work as Foxmarks, but BookmarkSync[12] is recommended because it can sync between IE and Firefox.

For the adventurous, to share bookmarks is a novel way to discover new Websites that have relevant information. Stumbleupon[13] is a Website where members rate other Websites with a thumb up or down and then share this opinion with friends. Stumbleupon will then recommend Websites based on search topics chosen by users. Delicious.com[14] is another popular bookmark-sharing Website. Here, users bookmark Websites and tag them on search terms of their own choosing. Users can then create their own network of colleagues with whom to share favorite Websites or they can search for Websites tagged by other members based on keywords.

WEB APPLICATIONS

As mentioned in a previous "Tech Advisor,"[15] there are numerous Web-based office productivity software programs such as Google Docs[16] and Thinkfree.[17] These Web applications free users from dependence on specific productivity software on a computer as well as from carrying files on a USB flash drive. One advantage of using Google Docs is that a Microsoft PowerPoint presentation slideshow can be run directly from the Web browser. Glide OS[18] takes this premise one step further toward desktop replacement. Glide OS offers Microsoft Office-compatible programs for word processing, spreadsheets, and presentations, but also offers photo and video management, e-mail, calendar, contact manager, and bookmark management. Eye OS[19] is another desktop "operating system" where all software functions on a computer are delivered via the Web browser. Eye OS offers its software via the GNU Affero Public License version 3, which means that one can have one's own private eye OS server for family, company, or network completely free. The source code is available and with eye OS development tools. The software can be customized with new applications that fit specific needs.

CONCLUSION

At first thought, the Web browser appears to be a limited tool for medical information and office management. However, with proper customization, it can be the portal to all functions of the medical office such as communication with health insurance companies using NaviNet,[20] an electronic medical record system such as ValentMed,[21] e-prescribing with NationalERx,[1] medication information with Epocrates Online,[22] and numerous medical content sites such as PsychiatryOnline.[23] Once WiMax, the full wireless Internet for mobile access, arrives, basic Internet tablet devices and inexpensive ultramobile PCs may be sufficient for the daily medical practice. ***PP***

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