



ISSN: 1545-679X

Information Systems Education Journal

Volume 8, Number 28

<http://isedj.org/8/28/>

June 15, 2010

In this issue:

Got Web 2.0? A Review of Web 2.0 Tools for the Information Systems Curriculum

Patricia Sendall
Merrimack College
North Andover, MA 01845 USA

Wendy Ceccucci
Quinnipiac University
Hamden, CT 06518 USA

Alan R. Peslak
Penn State University
Dunmore, PA 18512 USA

Abstract: This paper discusses the importance of incorporating Web 2.0 technologies across the Information Systems (IS) curriculum. The Web 2.0 paradigm is not new; although the term itself was coined in 2004 by Dale Dougherty of O'Reilly Media, Inc., (Anderson, 2007) the concept of a collaborative workspace was the original vision of Tim Berners-Lee, the inventor of the World Wide Web. The Economist Intelligence Unit (2007) reports that approximately 80% of all corporations believe that Web 2.0 has the potential to increase revenues. Others have stated that health of one's business could be seriously damaged if these technologies are not being utilized. This manuscript first presents a review of the importance of Web 2.0 technologies. This is followed by a comprehensive overview of the multitude of technologies that make up Web 2.0. The goal is to provide a detailed reference to understanding these tools so that they can be readily understood by students and easily incorporated into current information systems curricula.

Keywords: Web 2.0, blog, wiki, podcast, social networking, information systems pedagogy, collaborative learning

Recommended Citation: Sendall, Ceccucci, and Peslak (2010). Got Web 2.0? A Review of Web 2.0 Tools for the Information Systems Curriculum. *Information Systems Education Journal*, 8 (28). <http://isedj.org/8/28/>. ISSN: 1545-679X. (A preliminary version appears in *The Proceedings of ISECON 2008*: §3135. ISSN: 1542-7382.)

This issue is on the Internet at <http://isedj.org/8/28/>

The **Information Systems Education Journal** (ISEDJ) is a peer-reviewed academic journal published by the Education Special Interest Group (EDSIG) of the Association of Information Technology Professionals (AITP, Chicago, Illinois). • ISSN: 1545-679X. • First issue: 8 Sep 2003. • Title: Information Systems Education Journal. Variants: IS Education Journal; ISEDJ. • Physical format: online. • Publishing frequency: irregular; as each article is approved, it is published immediately and constitutes a complete separate issue of the current volume. • Single issue price: free. • Subscription address: subscribe@isedj.org. • Subscription price: free. • Electronic access: <http://isedj.org/> • Contact person: Don Colton (editor@isedj.org)

2010 AITP Education Special Interest Group Board of Directors

Don Colton Brigham Young Univ Hawaii EDSIG President 2007-2008	Thomas N. Janicki Univ NC Wilmington EDSIG President 2009-2010	Alan R. Peslak Penn State Vice President 2010
Scott Hunsinger Appalachian State Membership 2010	Michael A. Smith High Point Univ Secretary 2010	Brenda McAleer U Maine Augusta Treasurer 2010
George S. Nezelek Grand Valley State Director 2009-2010	Patricia Sendall Merrimack College Director 2009-2010	Li-Jen Shannon Sam Houston State Director 2009-2010
Michael Battig St Michael's College Director 2010-2011	Mary Lind North Carolina A&T Director 2010-2011	Albert L. Harris Appalachian St JISE Editor ret.
S. E. Kruck James Madison U JISE Editor	Wendy Ceccucci Quinnipiac University Conferences Chair 2010	Kevin Jetton Texas State FITE Liaison 2010

Information Systems Education Journal Editors

Don Colton Brigham Young U Hawaii Editor	Thomas Janicki Univ NC Wilmington Associate Editor	Alan Peslak Penn State University Associate Editor
--	--	--

Information Systems Education Journal 2008-2009 Editorial and Review Board

Samuel Abraham, Siena Heights	Cynthia Martincic, St Vincent Coll	Michael Smith, High Point Univ
Ronald Babin, Ryerson Univ	George Nezelek, Grand Valley St U	Karthikeyan Umapathy, UNFlorida
Sharen Bakke, Cleveland St	Monica Parzinger, St Mary's Univ	Stuart Varden, Pace University
Wendy Ceccucci, Quinnipiac U	Don Petkov, E Conn State Univ	Laurie Werner, Miami University
Janet Helwig, Dominican Univ	Steve Reames, Angelo State Univ	Bruce White, Quinnipiac University
Scott Hunsinger, Appalachian St	Jack Russell, Northwestern St U	Belle Woodward, So Illinois Univ
Kathleen Kelm, Edgewood Coll	Patricia Sendall, Merrimack Coll	Charles Woratschek, Robert Morris
Frederick Kohun, Robert Morris	Li-Jen Shannon, Sam Houston St	Peter Y. Wu, Robert Morris Univ
Terri Lenox, Westminster		Kuo-pao Yang, Southeastern LA U

EDSIG activities include the publication of ISEDJ and JISAR, the organization and execution of the annual ISECON and CONISAR conferences held each fall, the publication of the Journal of Information Systems Education (JISE), and the designation and honoring of an IS Educator of the Year. • The Foundation for Information Technology Education has been the key sponsor of ISECON over the years. • The Association for Information Technology Professionals (AITP) provides the corporate umbrella under which EDSIG operates.

© Copyright 2010 EDSIG. In the spirit of academic freedom, permission is granted to make and distribute unlimited copies of this issue in its PDF or printed form, so long as the entire document is presented, and it is not modified in any substantial way.

Got Web 2.0?

A Review of Web 2.0 Tools for the Information Systems Curriculum

Patricia Sendall
patricia.sendall@merrimack.edu
Management Information Systems
Merrimack College
North Andover, Massachusetts 01845 USA

Wendy Ceccucci
wendy.ceccucci@quinnipiac.edu
Information Systems Management
Quinnipiac University
Hamden, Connecticut 06518 USA

Alan Peslak
arp14@psu.edu
Information Sciences & Technology
Penn State University
Dunmore, Pennsylvania 18512 USA

Abstract

This paper discusses the importance of incorporating Web 2.0 technologies across the Information Systems (IS) curriculum. The Web 2.0 paradigm is not new; although the term itself was coined in 2004 by Dale Dougherty of O'Reilly Media, Inc., (Anderson, 2007) the concept of a collaborative workspace was the original vision of Tim Berners-Lee, the inventor of the World Wide Web. The Economist Intelligence Unit (2007) reports that approximately 80% of all corporations believe that Web 2.0 has the potential to increase revenues. Others have stated that health of one's business could be seriously damaged if these technologies are not being utilized. This manuscript first presents a review of the importance of Web 2.0 technologies. This is followed by a comprehensive overview of the multitude of technologies that make up Web 2.0. The goal is to provide a detailed reference to understanding these tools so that they can be readily understood by students and easily incorporated into current information systems curricula.

Keywords: Web 2.0, blog, wiki, podcast, social networking, information systems pedagogy, collaborative learning

1. INTRODUCTION

Incorporating new technologies into one's curriculum can feel at times daunting. "Unlike most disciplines across the academy, technology disciplines are in a constant state of change. In order to stay current in their

field and in the classroom, academic technologists are expected to not only keep up with, but to stay ahead of, those changes" (Sendall, Poteat & Noonan, 2008). Recently, some of those changes have included Web 2.0 technologies. Knowing that Web 2.0 technologies are here to stay, it is incum-

bent upon us as educators to prepare our students for the workplace by incorporating these technologies into our curriculum. So, where do we begin? Where in our curriculum do we incorporate these technologies? Which specific Web 2.0 technologies do we choose? How can we possibly add one more thing and still cover what we need to cover in our classes? The purpose of this paper is to provide a Web 2.0 primer for faculty who are interested in incorporating some of these technologies into their teaching but who, for a variety of reasons, haven't had an opportunity yet to do so. This paper provides Web 2.0 terms, tools and resources with which to get started.

2. WHAT IS WEB 2.0?

Web 2.0 is a term which describes "new" collaborative Internet applications. The primary difference from the original World Wide Web, or Web 1.0, and Web 2.0 is greater user participation in developing and managing content, which changes the nature and value of the information. According to McLean, Richards, & Wardman (2007), key elements of Web 2.0 include:

- Really Simple Syndication (RSS) to rapidly disseminate awareness of new information
- Blogs to describe new trends wikis to share knowledge; and podcasts to make information available "on the move".

Web 2.0 enables and facilitates the active participation of each user. Web 2.0 applications and services allow publishing and storing of textual information, by individuals (blogs) and collectively (wikis), of audio recordings (podcasts), of video material (vidcasts or vodcasts), and of pictures, etc. (Ullrich, Borau, Luo, Tan, Shen, & Shen, 2008). Web 2.0 tools are becoming increasingly important to both individuals and businesses throughout society. As an example, the medical community needs to be aware of these technologies and their increasing role in providing health information "any time, any place". Many contemporary health professionals in Australia use the Internet to participate in continuing professional development (CPD) activities, for email communication, and to search for clinical information (McLean, Richards, & Wardman, 2007).

There has been a lot of hype around the notion of Web 2.0 in recent years, but in reality the technologies haven't been around for all that long (it just seems that way). The term was officially coined in 2004 by Dale Dougherty, a vice-president of O'Reilly Media during an internal team discussion while planning for a future Web conference (Anderson, 2007). In 2007, Sir Tim Berners-Lee, the inventor of the Web, stated that Web 2.0 was a "piece of jargon" that no one even knows the meaning of (Anderson, 2007). His vision for the original Web, or Web 1.0, was that of a collaborative workspace, a read-write Web, where everyone would be able to share their work and others would be able to edit it in a "single, global information space." With Web 2.0, his vision has come to fruition (Sendall, Ceccucci & Peslak, 2008).

Web 2.0 should not be confused with Internet2. According to a Pew Internet study (Madden & Fox, 2006), Web 2.0 is *not* a new and improved Internet network and it does *not* have a separate backbone. Web 2.0 is a term which describes new collaborative Internet applications. The primary difference between Web 1.0 and Web 2.0 is that the latter fosters collaboration and greater participation in content (McLean, Richards & Wardman, 2007). In addition, Web 2.0 technologies utilize "collective intelligence, providing network-enabled interactive services, giving users control over their own data" (Madden & Fox, 2006). Web 2.0 technologies (or services) include blogs, wikis, podcasts, vodcasts, RSS/Atom feeds, social networking, and social bookmarking. These technologies facilitate a more socially connected Web.

3. IMPORTANCE OF WEB 2.0 TO BUSINESS

Web 2.0 technologies have begun to change the way we do business. According to Wyld (2008), "we may indeed be seeing the birth of an entire new management style - 'management by blogging' as a way of promoting a better relationship between management and employees." Others have observed that traditional "Management 101" has become a thing of the past. According to Fumero (2006), the Web 2.0 phenomenon, or the socialization of the Web, is the basis of a real "sharing economy". Progress must be made to integrate these tools seamlessly if

Web 2.0 techniques are to be a part of the business environment (Chin, 2008). A recent study indicated that by not using Web 2.0, companies can seriously damage their businesses health (Keep Taking the Web 2.0, 2007). The statistics are telling:

- According to the Economist Intelligence Unit (2007), almost 80% of corporations believe Web 2.0 has the potential to increase revenues
- The global market for Mobile Web 2.0 (social networking, user-generated content, mobile search and mobile instant messaging) will increase from \$5.5 billion currently to \$22.4 billion in 2013, according to Juniper Research (Pearce, 2008)
- Social networking and user-generated content is predicted to grow from \$1.8 billion this year to \$11.2 billion in 2013, while growth in mobile search and mobile IM will be more measured (Pearce, 2008)
- Marketers view social networking sites (SNS) as a burgeoning and attractive proposition for marketing. Media analysts predict that advertising on SNS sites will surpass \$2b annually by 2010 (Vasquez, 2006 as cited in Wyld, 2008, p.449)
- According to Klein (2006), "there's no doubt about it, blogs are hot. With their interactivity and their ability to position even micro-business owners as niche experts, blogs are the 'it' marketing trend."
- Sifry (2007) reports that, according to the blog analyst firm Technorati, as of April 2007:
 - There were more than 70 million weblogs in existence
 - About 120,000 new weblogs are created each day
 - There are 1.4 new blogs created every second
 - There are 1.5 million blogs posts per day
 - There are 17 blog posts per second
 - It took just 320 days to grow from 35 to 75 million blogs
 - Japanese is the #1 blogging language at 37%, with English second at 33%
 - Technorati is tracking 230 million posts with tags or categories
 - Thirty-five percent of all February 2007 posts used tags
 - 2.5 million blogs posted at least one tagged post in February
 - In 2006, 19.4 million bloggers (55%) were still posting 3 months after their blogs were created (Sifry, 2006)
- All told, the blogosphere continues to double in size every six months (McLean, Richards, & Wardman, 2007)
- In 2006, with approximately 60 million blogs in existence, the blogosphere was 60 times larger in size than it was in 2003 (Sifry, 2006)
- Approximately half of all blogs are "active" or updated in the last 90 days (Perone, 2005)
- The blogosphere is a highly international environment (Wyld, 2008)
- In the business world, blogs are becoming increasingly important and are starting to be used quite extensively in the law (McLean, Richards, & Wardman, 2007)
- Collaborative creativity promises to be a key business skill in upcoming years (Evan, 2006)

In light of all of this evidence, one study found that almost half of business managers do not understand the benefits of Web 2.0 technology (Anonymous, 2008). Some critics assert that unless industry wakes up to Web 2.0, it will remain a consumer-only tool "at a significant cost to business" (Keep Taking the Web 2.0, 2007). According to Lenhart & Fox (2006), the blogosphere is a younger, more diverse population than society in general. This makes bloggers (and blog readers) particularly of interest to advertisers, marketers and political candidates. "As the 'net generation moves into the workforce", [employers] are going to "expect social networking, blogging, forums, etc." (Harvey, 2006 as cited in Wyld, 2008).

Based on these trends, it is essential that educators incorporate Web 2.0 technologies into their curriculum. By incorporating wikis and other Web 2.0 technologies into the classroom, educators can better prepare

students to make innovative uses of collaborative software tools (Parker & Chao, 2007). Typically, these types of initiatives fall to the faculty in the technology disciplines. However, according to Atwell (n.d.), "most education systems have acted with at best suspicion and often downright hostility to social networking systems and technologies. Yet these are the very systems and tools which businesses are increasingly seeing as central to future knowledge creation and distribution." This clearly has to change if our students are to succeed in the workplace.

According to Parker & Chao (2007), today's students will not only manage business innovations of the future, but in many cases will drive them. Rather than being limited to today's skills, students must learn the skills of the future. Educators need to "teach what wikis and other social software may mean to business, not just as a phenomenon, but also as a skill" (Evans, 2006). Saulnier (2007) agrees that today's graduates are expected to possess technical competency in Web 2.0 skills. In addition, he believes that these students must also possess basic business competency and leadership skills and that the Millennial generation is rapidly making an impact on the business communication processes. He considers several trends regarding the influence of social software and the effect of Millennial students on the corporate workforce:

- There is a perceptible increase in the use of multi-function cell phones, text messaging, and instant messaging (IM) and in business communications
- Given the growth in geographically dispersed and international workforce, the use of Wikis and blogs are on the rise to build a sense of community
- Social software provides an effective way for people to socialize as the number of telecommuting employees multiplies
- The use of social software enables a distant and dispersed workforce to collaborate more effectively
- The use of wikis to manage projects and to collaborate is on the rise, particularly in the software development industry
- There is an increased use of social networking sites, such as MySpace and Facebook, in business as a marketing tool,

wikis for project management and collaboration, and blogs to publish content

- There has been a growth in virtual teams
- New social networking tools are being developed explicitly for corporate America
- Virtual world Second Life is already being used at 125 colleges and universities worldwide (Lamont, 2007) and over 14 million people have already used it at least once and boasts over fifty thousand businesses (www.secondlife.com).

Once these newer technologies are better understood and appreciated, educators can evolve their teaching strategies to help their students remain competitive in the global society (Gooding, 2008). Social constructivist theory proposes that we learn best in collaborative environments, in which students' ideas are exchanged and enriched by those of other students (Vygotsky, 1970 as cited in Essex, 2007). Social constructivists believe that we learn by social and communal activities; meaning is shaped and knowledge is constructed through discussion with peers, teachers, and the greater community and then reflected upon (Higgs & McCarthy, 2005; Fumero, 2006). Teaching and learning with Web 2.0 is "cooperative, collaborative, and conversational", providing students with opportunities to "interact with each other to clarify and share ideas, to seek assistance, to negotiate problems, and discuss solutions" (Miers, 2004, p. 4; Parker & Chao, 2007). Web 2.0 applications take full advantage of the network nature of the Web: they encourage participation, are inherently social and open (Ullrich, Borau, Luo, Tan, Shen, & Shen, 2008).

What follows is a *Web 2.0 primer* that includes definitions of terms and resources; this contains links to videos and Web sites which will assist information systems (IS) educators in incorporating important Web 2.0 technologies into their course offerings.

4. WEB 2.0 TERMS, TOOLS AND RESOURCES

There are a numerous websites and videos available on the Web to help educators explain Web 2.0 concepts and to incorporate Web 2.0 tools in the classroom. A few of these videos include:

- Web 2.0 in Just 5 Minutes:
http://youtube.com/watch?v=rDqGQ59jw_Y
- What is Web 2.0?
<http://www.youtube.com/watch?v=0LzQIUANnHc>
- Common Craft has developed a series of "Plain English" videos that are short, unique and understandable videos in a format they call Paperworks. These videos are available free from the company's website (www.commoncraft.com) or from YouTube.
 - Wikis in Plain English
 - PodCasting in Plain English
 - Social Networking in Plain English
 - Blogs in Plain English
 - Social Bookmarking in Plain English
 - RSS in Plain English

101 Web 2.0 Teaching Tools (2007) Lists 101 free online tools that you can use in the classroom including aggregators, bookmark managers, classroom tools, collaboration tools, course management tools, office suites, office tools, productivity tools, public content management tools, and storage tools. *Web 2.0: A Vehicle for Transforming Education* includes practical and accessible overviews of some of the most commonly used and most useful technologies. The article serves as an idea generator, especially for educators looking for ways to update their courses or to explore new concepts in learning (Gooding, 2008).

Blogs— The term web-log, or *blog*, was coined by Jorn Barger in 1997 and refers to a simple webpage consisting of brief paragraphs of opinion, information, personal diary entries, or links, called *posts*, arranged chronologically with the most recent first, in the style of an online journal (Doctorow *et al.*, 2002, as cited in Anderson, 2007, p. 7); an informal online journal, usually reflecting the author's personal thoughts, generally published in reverse chronological order with the latest entry at the top (McLean, Richards, & Wardman, 2007). Most blogs also allow visitors to add a *comment* below a blog entry; blog software also facilitates *syndication*, in which information about the blog entries is made available to other soft-

ware via RSS (Anderson, 2007); an online journal that can be updated regularly with entries typically displayed in reverse chronological order; blogs now encompass not only text but also video and audio material (Wyld, 2008); designed for putting up content quickly (Essex, 2007).

Blogs are a valuable tool that can be easily incorporated into the educational environment. Blogs can be used to create reflective or writing journals, discuss ethical issues, or as a dialog for group work. You can create a blog within Blackboard (depending on the version your campus is currently running) or there are numerous blog development sites:

- Blogger (www.blogger.com)
- Blogster (<http://www.blogster.com>)
- Blogstream (<http://www.blogstream.com>)
- Class Blogmeister (<http://classblogmeister.com>) is specifically developed for educational use

There are also a number of Blog search tools:

- Technorati (<http://www.technorati.com>) is a directory of blogs and the most well-known blog-search tool
- Google Blog Search (<http://blogsearch.google.com>)
- Yahoo MyWeb (<http://myweb2.search.yahoo.com>)

In addition a website called, CoComment (<http://www.cocomment.com>) will track all the comments or blogs that you post on different Websites by creating a tiny bookmarklet and a single Web page (Alexander, 2006).

Collaboration - Collaboration sites enable groups to share documents and other information. In February of this year, Google released a new online app called the team edition that allows team members to collaborate. Team members can share and develop a website, share calendars, and share documents, presentations and spreadsheets (www.google.com/apps). Group members must be within the same Internet domain.

There is also a new collaboration network called *Twine* (www.twine.com) that is in beta version. It currently takes approximately a

week or more to get accepted into the "Twine Network". The aim of Twine is to enable people to share knowledge and information. It is used to connect people with each other "for a purpose". It is not based around socializing, but to share and organize information you're interested in. This website has great potential for educators and students to share bookmarks, thoughts and ideas, and files. Educators can create different subject areas or twines; students can then post files and information in this twine. These twines can be publicly accessible or private.

Folksonomy—is the result of personal free tagging of information and objects (anything with a URL) for one's own retrieval [*sic*]. The tagging is done in a social environment (shared and open to others). The act of tagging is done by the person consuming the information (Vander Wal, 2005, as cited in Anderson, 2007, p. 17). Although folksonomy tagging is done in a social environment...it is not collaborative and it is not a form of categorization; groups of people with a similar vocabulary can function as a kind of 'human filter' for each other (Vander Wal as cited in Anderson, 2007, p. 18); a collaborative semantic tagging process (Fumero, 2006); a term describing the collaborative categorization of content such as Web pages, links and images by allowing users to spontaneously assign "tags" to specific items (McLean, Richards, & Wardman, 2007); del.icio.us was one of the first popular folksonomic sites (Alexander, 2006)

Gadget—a mini application that resides on a computer desktop or personal home page, typically found in the Windows environment; provides a myriad of functions, including customized news and stock quotes, calendar, dictionary lookups, cartoons and games; available for the Windows Vista desktop, Google Desktop and Windows Live and iGoogle (<http://www.google.com/ig>) personal home pages; called "Widgets" in the Mac and on Yahoo's personal home page; gadgets in Windows provide a raft of useful functions that are always available on the desktop or that can be called up in an instant (Gadget, n.d.)

Mashups - Mashups are a Web application that presents information integrated from a variety of sources. (McLean, Richards, & Wardman, 2007); Web sites that take dy-

namically changing pieces of information from completely different sources and combine the data into an integrated user experience, one that continues to change and grow as the underlying information changes, for example, the group behind housing-maps.com created a mash-up that took the listing of apartments for rent on Craigslist and mapped them onto a Google map of each city (Maloney, 2007); new content and functionality created by combining Web content together (Ullrich, Borau, Luo, Tan, Shen, & Shen, 2008) In another example, Murthy and Farkas had graduate IS students create a mashup by using Google Maps and Yahoo Traffic Web Services (Murthy & Farkas, 2007). Videos available for classroom instruction on mashups are:

- What is a Mashup?
<http://www.youtube.com/watch?v=ZRCp2CZ8DS8>
- 7 Cool "Mashup" Websites - What Are Mashup Websites?
<http://www.youtube.com/watch?v=oMIEggjrik>

Mashup editors developed and under development:

- Google Mashup Editor is "an AJAX development framework and a set of tools that enable developers to quickly and easily create simple web applications and mashups with Google services like [Google Maps](#) and [Google Base](#). Google Mashup Editor is a great tool for grabbing information from feeds and letting users see and manipulate it."
<http://code.google.com/gme/>
- Adobe is developing a mashup interface code-named 'Genesis' that will allow business users to pull together "workspaces" that combine assets like business application data, documents and analytics, along with collaboration tools such as instant messaging.
<http://blogs.adobe.com/mashup/>

Microblogging - Microblogging is a type of blogging that enables users to post short messages that are distributed within their community. (Ullrich, Borau, Luo, Tan, Shen, & Shen, 2008) Microblogs are usually short sentences notifying their community what the current activity or interest is. Twitter

(<http://www.twitter.com>) is a popular microblogging site.

Microcontent—was first introduced and defined by Anil Dash 2002; microcontent is being used as a more general term indicating content that conveys one primary idea or concept, is accessible through a single definitive URL or permalink, and is appropriately written and formatted for presentation in email clients, Web browsers, or on handheld devices as needed. Today's weather forecast, the arrival and departure times for an airplane flight, an abstract from a long publication, or a single instant message can all be examples of microcontent" (Microcontent, n.d.). Rather than following the notion of the Web as book, Web 2.0 is predicated on *microcontent*. Blogs are about posts, not pages. Wikis are streams of conversation, revision, amendment, and truncation. Like social software, microcontent has been around for a while. But Web 2.0 builds on this original microcontent drive, with users developing Web content, often collaboratively and often open to the world (Alexander, 2006); microcontent is information published in short form, with its length dictated by the constraint of a single main topic and by the physical and technical limitations of the software and devices that we use to view digital content.

Multimedia sharing – Multi-media sharing websites allow users to share video or picture files. These websites include:

- Photo sharing sites—Flickr (www.flickr.com), SnapFish (www.snapfish.com); Picasa (www.picasa.com), Shutterfly (www.shutterfly.com) and SmugMug (www.smugmug.com)
- Video sharing sites—YouTube (www.youtube.com); Wikipedia lists over 40 video sharing sites (http://en.wikipedia.org/wiki/List_of_video_sharing_websites)
- Two websites that enables a user to download or convert video files free of charge include:
 - Catch Video (<http://catchvideo.net>)
 - Movavi (<http://online.movavi.com>)

Podcasts - Podcasts are audio recordings, usually in MP3 format, of talks, interviews

and lectures, which can be played either on a desktop computer or on a wide range of handheld MP3 devices; originally called audio blogs (Anderson, 2007); made by creating an MP3 format audio file (using a voice recorder or similar device), uploading the file to a host server, and then making the world aware of its existence through the use of RSS; this process is also known as *enclosure*; Podcasting allows audio content from one or more user-selected feeds or channels to be automatically downloaded to one's computer as it becomes available, then later transferred to a portable player for consumption at a convenient time and place (Lee, McLoughlin, & Chan, 2008)

- Apple's iTunes podcast directory <http://www.apple.com/itunes/store/podcasts.html> contains a large number of educational podcasts that could be incorporated into one's course. It also includes instructions on how to create a podcast (Essex, 2007).
- Audacity <http://audacity.sourceforge.net> is a free multi-platform application for recording podcasts.

RSS—Really Simple Syndication, or Rich Site Summary, or RDF Site Summary is a Web 2.0 syntax for syndicating content. Searchers can use RSS to be alerted to relevant news headlines, blog postings, podcasts from radio, tables of contents of published electronic journals, and updates on results from a previous search; RSS sends "feeds" to a website aggregator; readers can have a "persistent search" waiting in cyberspace to send an alert when new information of interest is published (McLean, Richards, & Wardman, 2007); a family of formats which allow users to find out about updates to the content of RSS-enabled websites, blogs or podcasts without actually having to go and visit the site; information from the website is collected within a feed and 'piped' to the user in a process known as syndication (Anderson, 2007); RSS/Atom feeds allow users to pull the data without ever visiting the site itself (Ullrich, Borau, Luo, Tan, Shen, & Shen, 2008)

- RSSfeeds.com (<http://www.rssfeeds.com>) provides a searchable directory of RSS feeds with over 85,000 feeds listed and categorized

Social Bookmarking or Tagging - Social Bookmarking is the practice of saving bookmarks on a public Web site and "tagging" them with keywords. You can then organize and share your bookmarks with others. According to del.icio.us, "a tag is simply a word you use to describe a bookmark. Unlike folders, you make up tags when you need them and you can use as many as you like. The result is a better way to organize your bookmarks and a great way to discover interesting things on the Web." For educational purposes social bookmarking simplifies the distribution of reference lists, bibliographies, papers, and other resources among peers or students (Lomas, 2005). Tag clouds are groups of tags (*tag sets*) from a number of different users of a tagging service, which collates information about the frequency with which particular tags are used; this frequency information is often displayed graphically as a 'cloud' in which tags with higher frequency of use are displayed in larger text (Anderson, 2007). To view an example of a Tag Cloud go to <http://del.icio.us/tag/>. Some social bookmarking sites include:

- Blink List (www.blinklist.com) is an online bookmark manager that offers the option to either share or keep your list private.
- CiteULike (<http://www.citeulike.org>) is a free online service that helps you to organize your academic papers.
- Del.icio.us (<http://del.icio.us.com>) is one of the most popular social bookmarking managers that uses bookmarklets or tags, that allows you to add bookmarks to your list and categorize them. Del.icio.us also has an section that focuses on e-learning (<http://del.icio.us/elearningfocus/web2.0>) which is sponsored by JISC (Anderson, 2007).
- Digg (<http://www.digg.com>) is devoted primarily to technology topics, accepts submissions of stories that users consider worthy of public attention. Users can then vote for, or "digg," stories they like, and the site promotes the results accordingly (Alexander, 2006).
- Library Thing (<http://www.librarything.com>) is an easy library-quality catalog that connects you

with people who are reading the same things.

- StumbleUpon (<http://www.stumbleupon.com>) uses ratings to form collaborative opinions on website quality.

Social networking—a broad class of Web sites and services that allow you to connect with friends, family, and colleagues online, as well as meet people with similar interests or hobbies. Many of these allow you to create a profile where you can post photos, information about yourself like location, hobbies, and relationship status, and send and receive correspondence with online contacts (Social Networking, n.d.). Social networking is "the use of Internet technologies to create value through mass user participation." (McLean, Richards, & Wardman, 2007). Examples include:

- MySpace (www.myspace.com) is the leading social networking site
- Facebook (www.facebook.com) is a "social utility that connects you with the people around you." Made popular by college students.
- Bebo (www.bebo.com) is "a social media network where friends share their lives and explore great entertainment."
- LinkedIn (www.linkedin.com) for professional networking
- Second Life (www.secondlife.com) "is an online 3D virtual world imagined and created by its residents"; uses "Linden Dollars"; populated by customized avatars
- Google Lively (www.lively.com) enables visitors to chat and interact with others in user-designed rooms, using an customized avatars; will compete directly with Second Life

Social software—has emerged as a major component of the Web 2.0 movement including blogs, wikis, podcasting, videoblogs, and social networking tools like MySpace and Facebook (Alexander, 2006); they are tools on the Internet that "let anybody be a publisher and journalist. It lets anyone distribute their ideas potentially to tens of millions of people." (Kornblum, 2006).

SocialText—Socialtext

(<http://www.socialtext.com>) allows users to set up accounts, then write and revise their collaborative work. Socialtext, along with some earlier wiki implementations, like TWiki (<http://www.twiki.org>), supports blocking access to selected pages except by passwords, narrowing the pool of potential collaborators (Alexander, 2006).

Web widget—A Web widget is a portable chunk of code that can be installed and executed within any separate HTML-based Web page by an end user without requiring additional compilation; other terms used to describe Web widgets include: gadget, badge, module, capsule, snippet, mini and flake (Web Widgets); a name for a variety of controls that can be used in Web forms, dialogs, and wizards to elicit information from users (Bollaert, 2002).

Wiki—a webpage or set of webpages that can be easily edited by anyone who is allowed access (Ebersbach *et al.*, 2006, as cited in Anderson, 2007, p. 8); a collaborative tool that facilitates the production of a group work (Anderson, 2007); a collaborative environment, allowing multiple users to work on the same document, although not at precisely the same time (Essex, 2007); Wikis typically organize information into topics while blogs organize information in reverse chronological order; Wikis are expected to evolve and often expand into something of a permanent knowledge base (Parker & Chao, 2007). The most recognized wiki is Wikipedia (www.wikipedia.com); recently, Google launched Knol (<http://knol.google.com/k#>) to compete with Wikipedia. There are numerous Wiki development sites:

- WikiSpaces, “wikis for everyone”, (<http://www.wikispaces.com>) also has an educational wiki space called *EduWikis* (<http://educationalwikis.wikispaces.com>) that provides resources for educators wanting to incorporate wikis into their teaching.
 - Twiki (<http://twiki.org>) is a structured wiki, typically used to run a project development space, a document management system, a knowledge base, or any other groupware tool
 - Writeboard (<http://www.writeboard.com>) “Sharable web-based text documents that let you save every edit, roll back to any version, and easily compare changes”
- Some wikis specialize in education only:
- Wiki in Education (<http://www.wikiineducation.com/display/ikiw/Home>) blog contains 10 case studies written by teachers that describe how they're using the wiki to transform courses and engage today's students in a range of environments. It is the first book to focus specifically on the wiki in education *and* be developed and published using a wiki, so it actively demonstrates the tool in action.
 - Wikiversity (http://en.wikiversity.org/wiki/Wikiversity:School_and_university_projects) demonstrates how an open content website works. Many of these example projects have resulted in both advancing the student's knowledge and useful content being added to Wikipedia (Wikipedia: School and university projects, 2008).
 - WikiEducator (http://www.wikieducator.org/Main_Page) is an “evolving community intended for the collaborative planning of education projects linked with the development of free content; development of free content on Wikieducator for e-learning; work on building open education resources (OERs) on how to create OERs; networking on funding proposals developed as free content.”
 - Medpedia (http://www.medpedia.com/index.php/Main_Page) “is the collaborative project to collect the best information about health, medicine and the body”; launches the end of 2008.
 - Second Life Educator's Wiki (http://www.simteach.com/wiki/index.php?title=Second_Life_Education_Wiki) “find colleagues and collaborators to help you with your education work in Second Life; for support in research, dissertation writing and promoting collaboration among researchers/student researchers, Limited to students pursuing advanced degrees”

Vodcast—a video incarnation of a podcast (Boulos, Maramba, & Wheeler, 2006); a registered trademark of SeaChange Int'l, coined in 2001, referring to a video on demand (VOD) multicasting technology (Vodcast, n.d.). Instructions on how to create a vodcast can be found:

- <http://www.freemarketingzone.com/rss/create-vodcasts.html>
- <http://www.macworld.com/article/46066/2005/07/howtovodcast.html>

5. CONCLUSION

As noted, Web 2.0 skills are seen to have tremendous potential for both individuals and business. In fact, the authors and their students have specifically worked with a major international food corporation on means and methods to best leverage these technologies in a corporate environment. Parker and Chao (2007) assert that collaboration creativity promises to be a key business skill in upcoming years. Therefore, it is incumbent upon us as educators to blend these technologies into our curriculum in order to prepare our students for careers in business and other professional endeavors.

In recent years, there has been a general assumption made by employers that students will enter into the workforce with a variety of computing skills. Knowledge of simple computer applications, such as word processing and spreadsheets, is no longer sufficient. Students will be expected to build and execute corporate blogs, and advise executives on the benefits of social networking sites. They are likely to be called upon to help develop acceptable use policies for corporate blogs and wikis and other Web 2.0 technologies (Payne, 2003; Sarkar, 2005; Wyld, 2008). Research shows that these technologies will enable companies to gain or maintain a competitive advantage over their competition.

According to Attwell (n.d.), the development and implementation of digital technologies has led to "pressures on education and training systems, both in terms of the changing demands from society – especially from employers – for new skills and knowledge but also from the changing ways in which individuals are using Web 2.0 technology to create and share knowledge." Therefore, IS educators and others in higher edu-

cation must be called upon to prepare our students for the workforce. Web 2.0 technologies are here and here to stay.

We look forward to expanding our efforts in both developing specific Web 2.0 curricula as well as working with business in implementing these tools. We encourage others to contact us to participate in furthering these endeavors.

6. BIBLIOGRAPHY

- 101 Web 2.0 Teaching Tools. (2007, November 7). Retrieved March 31, 2008, from Online Education Database: <http://oedb.org/library/features/101-web-20-teaching-tools>
- Alexander, B. (2006). "Web 2.0: A New Wave of Innovation for Teaching and Learning?" *EDUCAUSE Review*, 41 (2), 32-44.
- Anderson, P. (2007, February). "What is Web 2.0? Ideas, Technologies and Implications for Education." Retrieved May 31, 2008, from JISC Technology & Standards Watch: <http://www.jisc.ac.uk/media/documents/techwatch/tsw0701b.pdf>
- Anonymous. (2008, May 28). "WorkLight: Lack of Web 2.0 Knowledge Amongst Managers Poses a Security Risk." Retrieved June 22, 2008, from http://www.itseccity.de/?url=/content/worldwidenews/productsnews/080609_wor_akt_worklight.html
- Attwell, G. (n.d.). "Web 2.0 and the changing ways we are using computers for learning: What are the implications for pedagogy and curriculum?" Retrieved May 31, 2008, from <http://comparative.edu.ru:9080/PortalWeb/document/show.action?document.id=15492>
- Bollaert, J. (2002, June 1). "Using Web widgets wisely, Part 1." Retrieved June 28, 2008, from IBM: <http://www.ibm.com/developerworks/library/us-widget/>
- Boulos, M. N., Maramba, I., & Wheeler, S. (2006, August 15). "Wikis, blogs, and podcasts: A new generation of Web-based tools for virtual collaborative clinical practice and education." Retrieved May 31,

- 2008, from BMC Medical Education:
<http://www.biomedcentral.com/1472-6920/6/41>
- Chin, L. (2008). "21st Century Teacher Professional Development: The Importance of Wikis and Blogs - Implications for Business Education." Proceedings of the Academy of Business Education. Hilton Head, NC.
- Economist Intelligence Unit. (2007, April 17). EIU Media Directory. Retrieved June 23, 2008, from
<http://www.eiuresources.com/mediadir/default.asp?PR=2007041701>
- Essex, C. (2007). "Web 2.0: New Tools for Distance Learning." *Distance Learning*, 4 (3), 47-54.
- Fumero, A. (2006). "EDUWEB 2.0: iCamp & N-Gen Educational Web." WEBIST 2006. Madrid, Spain: Telematics Engineering.
- Gadget. (n.d.). Retrieved June 28, 2008, from TechWeb Network:
<http://www.techweb.com/encyclopedia/defineterm.jhtml;jsessionid=FFVQ2FEHNTXWAQSNLPSKHSCJUNN2JVN?term=gadget&x=28&y=14>
- Gooding, J. (2008). "Web 2.0: A Vehicle for Transforming Education." *International Journal of Information and Communication Technology Education*, 4 (2), 44-54.
- JISC Tackles the Brave 2.0 World. (2007, April). *Information World Review* (234), p. 10.
- Keep Taking the Web 2.0. (2007, May 27). Retrieved June 22, 2008, from
<http://www.internetretailing.net/news/keep-taking-the-web-2.0>
- Klein, K. E. (2006, May 15). "Does Your Small Business Need a Blog?" Retrieved June 20, 2008, from BusinessWeek:
http://www.businessweek.com/smallbiz/content/may2006/sb20060515_027053.htm
- Kornblum, J. (2006, December 26). "Web-based video storms the planet." Retrieved 20 2008, June, from USA Today:
http://www.usatoday.com/tech/news/2006-12-26-video-impact_x.htm
- Lamont, I. (2007, May 19). "Teaching in Second Life: One instructor's perspective." Retrieved June 20, 2008, from Terra Nova:
http://terranova.blogs.com/terra_nova/2007/05/teaching_in_sec.html
- Lee, M. J., McLoughlin, C., & Chan, A. (2008). "Talk the talk: Learner-generated podcasts as catalysts for knowledge creation." *British Journal of Educational Technology*, 39 (3), 501.
- Lomas, C. P. (2005, May). "7 Things You Should Know About Social Bookmarking." EDUCAUSE Learning Initiative.
- Madden, M., & Fox, S. (2006, October 5). Riding the Waves of "Web 2.0". Retrieved May 31, 2008, from Pew Internet:
http://www.pewinternet.org/report_display.asp?r=189
- Maloney, E. J. (2007, January 5). "What Web 2.0 can teach us about learning." *The Chronicle of Higher Education*, 53 (18), p. B26.
- McLean, R., Richards, B. H., & Wardman, J. I. (2007). "The effect of Web 2.0 on the future of medical practice and education: Darwikinian evolution of folksonomic revolution?" *Medical Journal of Australia*, 187 (3), 174-177.
- Microcontent. (n.d.). Retrieved June 28, 2008, from Wikipedia:
<http://en.wikipedia.org/wiki/Microcontent>
- Murthy, N., & Farkas, D. (2007). "Web Development in the Graduate IS Curriculum." *ISECON*, 24, p. 2743. Pittsburgh.
- Parker, K. R., & Chao, J. T. (2007). "Wiki as a teaching tool." (A. Koohang, Ed.) *Interdisciplinary Journal of Knowledge and Learning Objects*, 3, 57-72.
- Pearce, J. Q. (2008, May 24). "Mobile Web 2.0 Revenues to Reach \$22.4 Billion by 2013: Report." Retrieved June 23, 2008, from MocoNews.net:
<http://www.moconews.net/entry/419-mobile-web-20-revenues-to-reach-224-billion-by-2013-report/>
- Saulnier, B. M. (2007). "Child is Father to the Man: Social Software in the IS 2007 Curriculum?" *Information Systems Education Journal*, 5 (37), 3-10.
- Sendall, P., Ceccucci, W., & Peslak, A. (2008). "Web 2.0 Matters: An Analysis of Implementing Web 2.0 in the Classroom." Unpublished manuscript.

- Selwyn, N. (2007). "Web 2.0 applications as alternative environments for informal learning - a critical review." OECD CERIKERIS International expert meeting on ICT and educational performance. Cheju Island, South Korea: Organization for Economic Co-Operation and Development.
- Sifry, D. (2006, April 17). "State of the Blogosphere." Retrieved July 25, 2008, from Sifry's Alerts:
<http://www.sifry.com/alerts/archives/000432.html>
- Sifry, D. (2007, April 5). "The State of the Live Web, April 2007." Retrieved July 25, 2008, from Technorati:
<http://technorati.com/weblog/blogosphere/>
- Social Networking. (n.d.). Retrieved June 28, 2008, from tucows:
<http://www.tucows.com/article/1903#terms-s>
- Ullrich, C., Borau, K., Luo, H., Tan, X., Shen, L., & Shen, R. (2008). "Why Web 2.0 is Good for Learning and for Research: Principles and Prototypes." World Wide Web Conference 2008 (pp. 705-714). Beijing, China: International World Wide Web Committee (IW3C2).
- Vodcast. (n.d.). Retrieved June 28, 2008, from Wikipedia:
[http://en.wikipedia.org/wiki/VODcast_\(Sea_Change\)](http://en.wikipedia.org/wiki/VODcast_(Sea_Change))
- Web Widgets. (n.d.). Retrieved June 28, 2008, from Wikipedia:
http://en.wikipedia.org/wiki/Web_widget
- Wikipedia: School and university projects. (2008, June 20). Retrieved June 23, 2008, from Wikipedia:
http://en.wikipedia.org/wiki/Wikipedia:School_and_university_projects
- Wyld, D. C. (2008). "Management 2.0: a primer on blogging for executives." *Management Research News*, 31 (6), 448-483.