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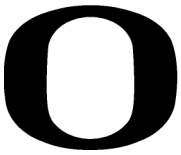

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# A review of Web 2.0 technologies and how they increase participation and transparency in government

CAPSTONE REPORT

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# A Review of Web 2.0 Technologies and How They Increase Participation and Transparency in Government

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**Abstract**

Web 2.0 has revolutionized the way individuals communicate, participate and engage information. Governments have been slow to adopt Web2.0 technologies, while at the same time are criticized for a lack of participation and transparency. Literature from 1999 to 2010 is reviewed to provide examples of how technologies such as blogs, mashups, social networking and wikis can be used to create citizen-focused services that support better decision making, access to collective intelligence, and improved citizen orientation.

*Keywords:* government 2.0, e-government, web 2.0, transparency and participation in government

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## Introduction to the Literature Review

### Purpose

The purpose of this study is to develop an inventory of Web 2.0 technologies that are being applied to government services. The term Web 2.0 refers to web applications that facilitate interactive information sharing, interoperability, user-centered design and collaboration on the World Wide Web (NA Web 2.0, 2010). Specific technologies to be reviewed include, but are not limited to, government blogs and wiki's (Freeman & Loo, 2009), application mashups (Freeman & Loo, 2009), social networks (Freeman & Loo, 2009), and interactive chat rooms (Conroy & Evans-Cowley, 2006). The goal is to examine how these technologies can increase the transparency and citizen participation of government operations. Additional focus is on the privacy and security risks that are associated with Web 2.0 technologies and ramifications such as increased effectiveness, manageability and legitimacy of government information and services (Meijer & Thaens, 2009). Lastly, factors that have slowed the adoption of Web 2.0 in the government sector are reviewed (Chang & Kannan, 2008; Warner & Chun, 2009).

### Problem Area

Government organizations have increasingly been under pressure to increase the transparency of operation and participation in the public process (Batorski & Hadden, 2010). Critics cite that there must be greater accountability within government, and the information it provides must be more accessible (Accenture, 2009; Orszag, 2009; Tapscott, Williams, & Herman, 2007). While these criticisms are not new to government, it is a topic of discussion as adoption of Web 2.0 technologies are on the rise and becoming mainstream (Chang & Kannan, 2008). Governments across the world are looking at Web 2.0 as a solution to address some of

these criticisms, as well as a platform to deliver new services (Osimo, Campbell, Kerr-Stevens, Bishop, & Bryant, 2009).

Web 2.0 technologies are referred to as "networked applications" (Freeman & Loo, 2009, p. 1) and can include, but are not limited to wikis, blogs, and social networking (Freeman & Loo, 2009). These networked applications facilitate interactive information sharing, interoperability, user-centered design and collaboration on the World Wide Web (Web 2.0, 2010). The benefits these applications provide citizens are great as the effect of successful government based Web 2.0 projects is increased participation and transparency, which is an area that government is commonly criticized for lacking (Batorski & Hadden, 2010).

While these Web 2.0 technologies have a high adoption rate in the private sector, the adoption within the government arena is much slower (Osimo et al., 2009). Concerns in the area of security, privacy and copyright laws are just a few of the factors that have slowed implementation (Conroy & Evans-Cowley, 2006). However, as Web 2.0 technologies continue to increase in usage by citizens, government must recognize these factors and develop services that address the critics' concerns related to openness and transparency. If not, government could face greater perceptions of waste, inefficiency, and overall lack of trust (Accenture, 2009).

**Significance**

As the Internet has evolved and Web 2.0 technologies have matured, citizens have increased the breadth of activities they are performing online (Chang & Kannan, 2008). The public doubled its usage of Web 2.0 service between 2003 and 2008 and statistics show that usage of social media exceeds 75% in those under the age of 25 (Chang & Kannan, 2008). Furthermore, Larrumbide (2008) states that of all social media users, 85% of them feel that companies should not only present but also interact via social media. This rise in Web 2.0 usage

provides a great opportunity for government to not only develop new services that utilize this delivery method, but also address transparency and participation criticisms within existing services (Gotze & Pedersen, 2009).

Government has been slow to adopt this evolution of service and has come under significant scrutiny for their lack of innovation in the area of Web 2.0 (Kaylor, Deshazo, & Eck, 2001). Citizens are now increasing the demand for their governments to provide these online services (Evans-Cowley & Conroy, 2006). This population is expecting their government to provide information that is both targeted and personalized (Accenture, 2009). As the government is the "largest holder and producer of information" (Heeks, 2001, p. 16), there is a great opportunity to make this information available and delivered through innovative methods. This demand for new communication methods and increased information comes not only from citizens but also the President of the United States. In his memo on Transparency and Open Government, President Obama called for departments and agencies to "harness new technologies" (Obama, 2009, p.1) to make greater information available to the public. President Obama's Director of the Office of Management and Budget, Peter Orszag, responded by calling for all federal agencies to create an open government plan that publishes information online, improves the quality of government information, facilitates a culture of open government, and creates an enabling policy framework for open government (Orszag, 2009). While this mandate applies specifically to federal government agencies, it is expected that similar rules, especially related to accessibility, will be filtered down to the state and local level (Jaeger, 2004).

**Audience**

The intended audience for this study is government information managers and senior leaders within state, local and federal government organizations. Additionally, this study is

directed to elected officials who may be looking for new methods to facilitate communication with constituents. The primary roles of these individuals are to manage the operation of their government agency, administer the public process and to set policy and direction for efficient operation. Furthermore, these individuals are responsible for making sure citizen requests are both heard and responded to in an effective manner.

The study is designed to examine Web 2.0 as it relates to government-based services. A key goal is to address how government leaders can apply Web 2.0 technologies to current services so that greater transparency and citizen participation is achieved. Additionally, with citizens 50% more likely to vote if they have interacted with politicians online, this study has great value to the elected official (Batorski & Hadden, 2010).

**Outcome**

The outcome of this study is a discussion of benefits, risks and barriers that government leaders can use to develop their own Web 2.0 service strategy. The discussion provides examples of Web 2.0 technologies that demonstrate potential support for improved transparency and participation within government operations. This outcome should be valuable to these government leaders, as it includes strategies to improve citizen satisfaction with their government.

The outcome outlines the risks that government agencies could face when implementing Web 2.0 technologies. To add perspective, it also addresses the factors that hinder adoption, such as, lack of trust, organizational inflexibility and the digital divide and describes how selected government agencies outside the U.S. have addressed them (Osimo et al., 2009). Since it is expected that many in the research audience are not well versed in this domain of

knowledge, and specifically Web 2.0, an important part of this study is a set of Definitions, including detailed definitions of the technologies described in the review.

**Delimitations**

**Topic.** This study aims to create an inventory of Web 2.0 technologies that improve transparency and participation in government. Citizens now expect government to provide information that is both targeted and personalized (Accenture, 2009). As the government is the "largest holder and producer of information" (Heeks, 2001, p. 16), there is a great opportunity to make this information available and deliverable through innovative methods.

**Scope.** The scope of literature focuses on specific Web2.0 technologies that are in use by the public sector and does not focus on private sector implementations. Furthermore, the scope of this topic only includes focus on Web 2.0 technologies that benefit the citizens and does not detail the internal benefits such as the efficiencies associated with Web 2.0 but does mention them as a benefit (Freeman & Loo, 2009**)**.

**Focus.** The study looks for literature on all forms of Web 2.0 technologies that are implemented in a government setting. Specific focus is given to the following applications: Wikis, Blog, Social Networks, Application Mashups, and Interactive Mapping. This specific focus is given as these applications are in use by government today and relevant literature is available. Additionally, a limited set of literature is sought on private sector Web 2.0 applications that can be associated to a government setting. Literature is also sought that addresses the privacy and security risks associated with these Web 2.0 technologies as well as the ramifications of such services (Misuraca, 2009).

**Time Frame.** Since Darcy DiNucci (1999) first coined the term *Web 2.0* in 1999 in her article Fragmented Future (DiNucci, 1999), literature with a publication date before 1999 is not

sought (Falch, Henten, Tadayoni, & Windekilde, 2009). However, greater emphasis is placed on literature written after 2004, since at this time the term rose in popularity when Tim O'Reilly hosted the first Web 2.0 conference (O'Reilly, 2007). Literature is selected before 1999 only when it adds historical perspective to the study. This could include background information on the issues governments face when implementing new innovations, risks associated with increased public participation, and/or the security concerns of government information.

**Selection Criteria.** Literature is selected from peer reviewed journals, recognized industry trade journals, and/or the author's recognition in the field. Selection criteria are established in Critical Evaluation of Information Sources set forth by the University of Oregon (Bell & Smith, 2009). Literature selected has a government focus and does not focus solely on the broad topic of Web 2.0, unless sound associations can be made to government and the services they offer. Additionally, literature is sought on the topic of e-government if the content of that literature can be associated to Web 2.0 and/or the topics of transparency and participation.

**Audience.** The intended audience for this study is government leaders, elected officials, and supporting information managers. The study focuses on the management level concepts and ideas related to Web 2.0, such as the improvements to citizen services that are most relevant to the intended audience. Consequently, the study does not go in-depth into the technical details of Web 2.0, and therefore is not geared to a highly technical audience, although this audience may find value in the study. Also, while citizens may find value in this study, the information contained is strictly focused on a government official's perspective.

**Data Analysis Plan Preview**

Literature collected for this study is analyzed using the conceptual analysis process outlined by Busch et al., (2005). This analysis first begins by defining the research questions and

then choosing the sample literature (Busch et al., 2005). For this study, four research questions are developed (see Research Parameters), and framed as themes that aim to respond to the greater research problem. Analysis then continues by examination of the frequency of specific sets of words that are related to the four central themes (Busch et al., 2005). Further analysis is aided by coding literature based on the identified sets of words and translations rules. The translation rules help to ensure that consistent coding occurs throughout the texts (Busch et al., 2005).

To document this analysis process and coding procedures, both electronic and manual methods are utilized. Before beginning any analysis of the literature, a full text index is first created so that searches can be performed globally on all references. With the index in place an Excel spreadsheet is used to record the results of those searches as well as to document relevant information found in the reading of the literature. This relevant information is categorized based on the four themes of this study.

**Writing Plan Preview**

The Review of the Literature section of this paper is structured thematically around specific topics (Literature Reviews, n. d.) that are defined through examination of the results of data analysis. There are four preliminary central themes, which are closely aligned to the research questions. Those themes are: (a) an inventory of Web 2.0 technologies; (b) improved transparency and participation through Web 2.0 technologies, (c) potential risks to the Web 2.0 enabled government services, and (d) factors that have slowed adoption of Web 2.0 in the government services. Once the themes are developed, the information is reviewed in relation to the needs of the audience and organized into a guide that government leaders, elected officials, and supporting information managers can use to develop a Web 2.0 strategy.

## Definitions

This study reviews literature related to the use of Web 2.0 technologies within a government setting. In reviewing the literature specific terms, both technical and non-technical in nature, are integrated into the study. Definitions are provided to give the reader context to the study as a whole. Definitions are retrieved from both the selected literature and other online sources.

**Application Mashup** – "A web application that combines data from more than one source into a single integrated tool usually accomplished using open application programming interfaces and data sources to produce results that could not be produced individually by the original sources" (Freeman & Loo, 2009, p.72).

**Blog –** A website that is maintained by an individual or group in which regular entries are made on specific topic, events and/or commentaries (Freeman & Loo, 2009).

**Chat Rooms –** A forum for individuals to have live conversations with others utilizing information and communication technologies (Conroy & Evans-Cowley, 2006).

**Digital Divide – "**Refers to the gap between persons who have physical access to digital information and communication technologies, and those who do not" (Chatfield & Alhujran, 2009, p.151)

**E-Government -** The ability for anyone visiting a government website to communicate and/or interact with that government via the Internet in any way more sophisticated than simply emailing a letter (Kaylor et al., 2001).

**Government 2.0** - The application of Web 2.0/Enterprise 2.0 applications and concepts in the public sector (Eggers, 2005).

**Private Sector –** A business that is owned by shareholders and/or individuals (Harrington, ND).

**Public Sector –** An organization owned and funded by the government (Harrington, ND).

**Social Capital – "**Defined as stocks of social trust, norms, and networks which people can draw on to solve common problems" (Komito, 2007 p.78)

**Social Collaboration** – "Processes that help multiple people interact and share information to achieve any common goal. Such processes find their 'natural' environment on the Internet, where collaboration and social dissemination of information are made easier by current innovations" (Social Collaboration, 2009 p. 1).

**Social Network–** Web sites that typically combine other Web 2.0 technologies to build online communities of shared interests delivered in an interactive manner (Freeman & Loo, 2009).

**Web 2.0** - Web technologies, which facilitate interactive information sharing, interoperability, user-centered design and collaboration on the World Wide Web (Web 2.0, 2010).

**Wiki –** Community websites used for collaboration and information sharing (Freeman & Loo, 2009).

**World Wide Web –** A system of interlinked hypertext documents located on the Internet that can be viewed with a web browser (World Wide Web, 2010).

## Research Parameters

This section of the study outlines the overall research design. This includes primary and secondary research questions and the process taken to retrieve literature for the study. In addition this section describes how search results are documented and analyzed to determine relevance to the study and research questions. Lastly, this section details the approach taken to data analysis and presentation, in relation to the four main themes of the study.

### Research Questions

**Main Question.** What are the Web 2.0 technologies that governments have implemented to improve transparency and participation?

*Sub Questions.*

- What are the Web 2.0 enabled government services?
    - What is Web 2.0?
    - What are the success stories?
    - What should government leaders know before implementing Web 2.0 services
- How can Web 2.0 improve transparency and participation?
    - What are the trends in government information
    - What are the levels of participation seen in government
- What are the government risks to Web 2.0?
    - Is there legal ramification with these risks?
- What are the factors that have slowed adoption of Web 2.0?

### Search Process

This study is based on selected literature derived from articles and case studies located in peer-reviewed journals, and reports from industry experts. The literature search focuses on four specific themes: Web 2.0 enabled government services, transparency and participation achieved through Web 2.0, risks associated with government Web 2.0 projects, and barriers that must be overcome for project success. Search databases are chosen based on their relevance to the topic of Web 2.0 and e-government services. Further searches included following reference chains attached to current literature and those found during database searches.

**Search Terms.** The key words used to search for literature for this study are derived primarily from mining preliminary literature collected on the topic, and professional experiences related to the topic. Extended searches in the area of E-Government and Government 2.0 services are completed after the reading several of the articles/case studies in the book *Open Government* (Gotze & Pedersen, 2009). Furthermore, upon exploring Canada's Government Enterprise Architecture (Chourabi, Mellouli, & Bouslama, 2009), the searches are further modified to look for both transparency and participation in Government 2.0 services.

- Government 2.0 Strategies
- E-Government Strategies
- Web 2.0 Government
- Transparency in Government
- Implications for E-Government
- Issues with Web 2.0
- Web 2.0 in Government
- Government 2.0 Impact
- Government Web 2.0 Service Strategy

- Barriers to Government Web 2.0

**Search Results**. The search results vary quite extensively among all the databases searched. Academic Search Premier, ACM Digital Library, and IEEE Computer Science Digital Libraries are the primary sources of literature for this study because these databases contain the greatest amounts of peer reviewed articles, and the most literature specific to this study. It is also found that the term E-Government netted more relevant results than the term Government 2.0, therefore this term is used in more searches than Government 2.0.

While most search terms are similar in all the databases, there is deviation in relation to numbers of results on a certain term. This is the case with the Academic Search Premier database, as valuable results are found on the term E-Government Strategies. It is because of this that secondary searches related to Web 2.0 strategies and implications are searched. Furthermore, the Academic Search Premier database seemed to net the greatest amount of peer reviewed journal articles. In addition to the database searches, relevant literature is found in the reference chains attached to many of the documents and books that are acquired in researching this topic.

**Literature Resources**

Literature found in these exploratory and preliminary search phases is helpful with uncovering specific strategies related to transparency and citizen participation within Web 2.0 enabled government services. Specifically, literature related to social collaboration and mobilization is helpful in gaining a broader picture of Web 2.0 in government (Wamelen & Kool, 2008). Also, literature that discussed the security and privacy issues associated with Web 2.0 helps to frame the ideas around the risks of Web 2.0 (Freeman & Loo, 2009; Warner & Chun, 2009). Lastly, literature from outside of the United States is helpful in analyzing and

comparing what other; more progressive (as it relates to Web 2.0) countries have done to improve government services (Dunleavy, Margetts, Bastow, 2008; Tiamiyu & Ogunsola, 2008).

**Documentation Approach.** Collected literature obtained for this study goes through several levels of documentation in order to both support analysis and classify references. The initial level of classification consists of sorting literature into one of two categories: key references and supporting references. This initial sorting aids in determining if an appropriate number of references is available. The second level of classification consists of sorting literature into three types of sources, including peer reviewed, industry expert, and non-credible source. This level of classification helps determine which sources are credible and to be included in the study. The last level of sorting categorizes specific sections of the literature into the four focusing themes of the study, (a) an inventory of Web 2.0 technologies; (b) improved transparency and participation opportunities through Web 2.0 technologies, (c) potential risks to the Web 2.0 enabled government services, and (d) factors that have slowed adoption of Web 2.0 in the government services. This last level of classification aims to index all literature sections based on the specific theme to allow for efficient data analysis.

**Selection and Evaluation Criteria**

Literature for this study is selected from a variety of sources, including academic and professional journals, research papers, and industry experts. Material is deemed credible if it can pass the standards outlined by the University of Oregon in the Critical Evaluation of Information Sources criteria (Bell & Smith, 2009). Literature is retrieved primarily from the Academic Search Premier, ACM Digital Library, and IEEE Computer Society databases. These databases are searched using keywords and phrases that are directly related to this study. Furthermore, literature is only chosen if the published date is 1999 or later, with greater emphasis placed on

literature published on or after 2004. These are the dates in which the term Web 2.0 was introduced and the concept began growing in popularity (NA Web 2.0, 2010).

Literature is evaluated for relevance to the four main concepts of the study, which include: (a) an inventory of Web 2.0 technologies; (b) improved transparency and participation through Web 2.0 technologies, (c) potential risks to the Web 2.0 enabled government services, and (d) factors that have slowed adoption of Web 2.0 in the government services. These themes are focused within a government context, and therefore literature must address these main themes but also be contained in a government context. Further evaluation occurs by reviewing abstracts, introductions and cursory scans of the text to determine if the content is beneficial to the study. Specific benefits include, literature that offers a unique perspective, literature that presents solutions not found in other literature, and/or literature that challenges previous thoughts or perspectives.

**Data Analysis Plan**

The literature selected for coding in this study is analyzed utilizing the eight-step process of conceptual analysis described by Busch et al. (2005) at the Colorado State University Writing Lab. Conceptual analysis, also known as thematic analysis involves choosing a concept to analyze within a text or set of texts and quantifies that concept by tallying the presence of keywords and/or phrases (Busch et al., 2005). This type of analysis can lead to subjectivity in coding terms that are less explicit and it is because of this that translation rules are established prior to coding of text (Busch et al., 2005). Within this study the main concepts being coded include the four central themes of the study, and are as follows:

- Government focused Web 2.0 technologies
- Improved transparency and participation, enabled by Web 2.0 technologies

- Potential risks to the Web 2.0 enabled government services
- Factors that have slowed adoption of Web 2.0 in the government services

To document this conceptual analysis, both electronic and manual tools are used to aid in coding of texts. The two primary electronic tools utilized are a full text index of all electronic sources and an Excel spreadsheet to record search results and valuable quotes discovered in reading of the texts. The full text index is most beneficial in performing global searches on the terms derived from the conceptual analysis. Manual coding of text also occurs on non-electronic sources and includes writing and/or highlighting key elements of the text. Both electronic and manual coding is documented in an Excel spreadsheet so that one consistent record of analysis is present.

The eight step coding process described by Busch et al. (2005) is detailed for this study as follows:

1. **Level of Analysis**. Both words and phrases are coded.
2. **Number of Concepts Coded**. Coding is conducted in relation to the specific concepts of the study. Four predetermined concepts include government focused Web 2.0 technologies, transparency and participation improvements through Web 2.0, risks to a Web 2.0 enabled government, and the barriers that have slowed adoption of Web 2.0 in the public sector. Concepts are coded based on only the positive occurrences of the key words or phrases. Additionally, the analysis takes an interactive approach so that related concepts can be included as they emerge.
3. **Existence of a Concept**. For this study, the existence of a concept is of much greater importance than frequency. Since some texts cover one or more concepts in great detail,

coding on frequency alone may not tag these texts as relevant. When concepts are discovered in each text they are only coded once.

4. **Level of Generalization**. Terms with similar meanings such as *open* and *openness* are coded once as long as the context is the same. Terms with dissimilar context and/or scope such as *open government* and *open datasets* are coded separately.
5. **Coding Rules**. Coding rules, or translation rules are used to ensure consistent coding occurs in all of the texts (Busch et al., 2005). These translation rules aid in the analysis by creating categories in which similar concepts are coded as the same, for example transparency and openness are coded as the same category.
6. **Irrelevant Information**. Content that is unrelated to the concepts under analysis is ignored. These unrelated words and/or concepts can be defined as words that do not benefit the study and add no significance to it.
7. **Text Coding**. The coding of text occurs by completing global searches on the index created from all electronic references. Results from these searches are recorded in an Excel spreadsheet organized by the predetermined four concepts, along with other key phrases discovered in reading the texts. Manual recording occurs in printed literature and is documented by writing and/or highlighting in the text. All coding, both electronic and manual, is recorded in the Excel spreadsheet to aid in quick discovery.
8. **Analysis of Results**. Once texts are coded, the analysis process looks for patterns and themes within these data results. The researcher attempts to draw conclusions about the themes of the study, in relation to the research questions, in order to organize information for the outcome of this study. The details are described in the writing plan below.

**Writing Plan**

This study examines how governments can improve transparency and participation through the use of government focused Web 2.0 technologies. The rhetorical pattern adopted for use in this study organizes research around themes (Literature Reviews, n. d.). There are four preliminary themes addressed in this writing plan. These themes are related to the four initial concepts that guide coding during data analysis, and framed by the research questions outlined in the research parameters. Research questions and sub questions help to structure the writing plan so that the Review of the Literature section of the paper responds effectively to the purpose of the study and audience needs.

The four preliminary themes are outlined as follows:

1. Web 2.0 technologies – This theme is contained within a government context that focuses specifically on the Web 2.0 services that governments have deployed. The writing in this section addresses what type of Web 2.0 technologies are implemented by governments and how they are adopted. This section also addresses what Web 2.0 is, and attempts to develop a baseline of understanding of the technology.
2. Transparency and participation – This section of the writing looks at the transparency and participation benefits that government agencies have observed as a result of Web 2.0 technologies. Also, this section addresses how Web 2.0 facilitates this improved transparency and participation and addresses citizens needs in how they interact with their government. In addition, the writing also outlines the federal mandates related to improving transparency and participation in government services and reviews the service examples they provide.

3. Web 2.0 risks – The writing in this section addresses the risks that governments face when implementing Web 2.0 services. Specific risks such as security, privacy, and liability are outlined in this section.
4. Factors that have slowed adoption – This last section of the study looks at the factors that have slowed the Web 2.0 adoption within government. The writing specifically addresses both the internal and external factors that have impacted adoption, including the technical issues that have inhibited government adoption.

## Annotated Bibliography

This section presents the key literature that is selected for this study. References are selected for relevance to the primary and secondary research questions and corresponding concepts of the study. Abstracts are included for each entry to give the reader a brief overview of the literature as it relates to government and Web 2.0 technologies. The comments sections define why the reference is included in the study and how the credibility of the reference is ascertained.

Ankolekar, A., Krötzsch, M., Tran, T., & Vrandecic, D. (2007). The two cultures: mashing up web 2.0 and the semantic web. *Proceedings of the 16th international Conference on World Wide Web* Banff, 825 – 834. Retrieved May 12, 2010, from http://dx.doi.org.libproxy.uoregon.edu/10.1016/j.websem.2007.11.005

**Abstract.** A common perception is that there are two competing visions for the future evolution of the Web: the Semantic Web and Web 2.0. A closer look, though, reveals that the core technologies and concerns of these two approaches are complementary and that each field can and must draw from the other's strengths. We believe that future web applications will retain the Web 2.0 focus on community and usability, while drawing on Semantic Web infrastructure to facilitate mashup-like information sharing. However, there are several open issues that must be addressed before such applications can become commonplace. In this paper, we outline a semantic weblogs scenario that illustrates the potential for combining Web 2.0 and Semantic Web technologies, while highlighting the unresolved issues that impede its realization. Nevertheless, we believe that the scenario can be realized in the short-term. We point to recent progress made in resolving each of the issues as well as future research directions for each of the communities.

**Comments.** This reference is selected for coding as it is relevant to the topic of Web 2.0, but also because of its discussion on semantic web and how the two compliment each other. The article describes how through Web 2.0 and Semantic web, greater collaboration and information sharing can occur online. The authors of this article are deemed credible due to their academic affiliations with the University of Karlsruhe. The article is presented in a peer reviewed journal, as well as being presented at the 16th International Conference on World Wide Web.

Bennett, W.L., 2008. Changing citizenship in the digital age. *Civic life online*. Cambridge, MA: MIT Press, 1–24. Retrieved May 12, 2010, from http://www.mitpressjournals.org/doi/abs/10.1162/dmal.9780262524827.001

**Abstract.** Democracy is not a sure thing. Governments and party systems often strain against changes in societies, and some fall prey to corruption and bad policies. Under the right conditions, people may reassert their rights to govern, and produce remarkable periods of creative reform, realignment, and change. In these times, politics becomes a focus of personal life itself, restoring the sense that participation makes a difference. The challenges of influencing the course of nations and addressing global issues may inspire creative solutions from the generations of young citizens who have access to digital communication tools. The cascading advance of media platforms and social software enables unprecedented levels of production and distribution of ideas, public deliberation, and network organization.

**Comments.** This is selected for coding as it discuses the participatory factors of the younger generation as they relate to governement involvement (18 – 25yrs). The article describes what government officials can do to engage with this *online* generation and

how they can best interact. The reference is deemed credible because it is published in a peer reviewed journal. The author has a Ph.D in Political Sciences from the University of Yale and holds an academic position.

Bugs, G., Granell, C., Fonts, O., Huerta, J., & Painho, M. (2010). An assessment of Public Participation GIS and Web 2.0 technologies in urban planning practice in Canela, Brazil. *Cities , 27* (3), 172-181. Retrieved May 12, 2010, from http://dx.doi.org.libproxy.uoregon.edu/10.1016/j.cities.2009.11.008

**Abstract.** Recent advances in Geographic Information Systems (GIS) and Web 2.0 technologies provide new ways of creating sophisticated Web applications that strengthen social interactions based on comments on online maps, which have the potential to improve Public Participation GIS (PPGIS) practices. In this paper, we address this promising approach to analyze the impact of collaborative Web 2.0 tools applied to PPGIS applications in urban planning actions. We develop a Web 2.0 PPGIS application through free, easy-touse tools, which consist of a Web mapping service, with eligible geospatial data layers, where users explore and comment. A database stores the contributions in a format supported by GIS. We also set up a prototype version in Canela (Brazil), to test its usability. The results showed that it is a valuable approach for engaging the public. It could promote communication among users and decision makers in a more interactive and straightforward way. Besides, it is easy to set up and understandable by non-experts. The Web 2.0 PPGIS may serve as a social tool for any spatially-related issue involving community members in any context.

**Comments.** This reference looks at Geographic Information Systems as a tool that compliments Web 2.0. This article discusses one of the two byproducts of Web 2.0 that

this study analyzes – increased participation - that can be achieved in the government planning process. The reference discusses how the web is not only a platform for participation but also for programming which allows for greater amounts of user generated content. The article also describes a test case created in Canela, Brazil that used Web 2.0 technologies and GIS to increase participation in a prototype planning process. This article is deemed credible because it is published in a peer reviewed journal, and also because of the academic occupations of the authors at University of Jaume, and University of Nova de Lisboa, respectively.

Conroy, M. M., & Evans-Cowley, J. (2006). E-participation in planning: an analysis of cities adopting on-line citizen participation tools. *Environment and planning , 24* (3), 371-384. Retrieved May 12, 2010, from Academic Search Premier Database.

**Abstract.** E-government tools provide municipal planning departments with an alternative means to inform and engage their citizenry. We examine the use of information and communication technology e-government tools to promote citizen participation in the planning process. The analysis is based on an examination of municipal planning-related websites for the 590 US cities with a 2000 Census population of 50000 or more. We also explore the influence, which demographic contextual factors have on what tools are provided. Principal findings highlight the dominance of simple, information based, e-government tools. The analyses also suggest that population-related and geographic-related variables are significant and pervasive influences on the provision of these tools.

**Comments.** This reference analyzes online participation tools used for the planning process at government agencies. Within this reference the authors analyze 590 city

websites of cities the size of 50,000 or more. Results from this analysis show that most of the cities in the study did not offer interactive websites, but rather offered one-way static information. Factors that inhibited adoption of interactive websites are found to be a lack of technical understanding and social barriers. This reference is valuable to the study as it directly analyzes one of the themes of this study, improved participation and how it can be increased with Web 2.0 tools. This reference is deemed credible because it is published in a peer reviewed journal. Both authors have a Ph.D. in City and Regional Planning and Urban and Regional Sciences and hold academic positions at Ohio State University.

Curzon, P., Keith, S., Wilson, J., & Whitney, G. (2004). Strategies for finding government information by older people. *Proceedings of the 8th ERCIM Workshop on User Interfaces for All.* pp. 34-41. Retrieved April 3, 2010, from http://dx.doi.org.libproxy.uoregon.edu/10.1007/b95185

**Abstract.** Governments increasingly expect web technology to become their major way of exchanging information with citizens, replacing existing methods. They also give accessibility a high priority. Older people are a major user of government services. We describe a pilot study comparing attitudes of older people to e-government with other ways of obtaining information. We examine what individuals consider important in an information search strategy, and the relative effectiveness of each for achieving an individual's personal aims. We do this in the light of research on the effects of aging on cognitive skills.

**Comments.** This reference examines the social elements of e-government and how e-government affects the older generation and their ability to obtain government

information. The article describes a study that analyzes the ways the older generation responds to e-government, and explores how successful this technology is with this generation. This reference is valuable to the review of literature as it describes some of the risks and possible barriers associated with e-government, which directly connect to the themes of risks and barriers in this study. This reference is deemed credible as it is presented at a recognized research workshop (European Research Consortium for Information and Mathematics) and also because of the academic occupation of the authors at Middlesex University in London England.

Eggers, W. D. (2005). *Government 2.0.* Maryland: Rowman and Littlefield Publishers, Inc.

**Abstract.** A well-written, lively, optimistic book that calls for the transformation of technology in government from lipstick on a bulldog to total information awareness. This book is proactive in nature (see what these governments are really doing), does not call for a wholesale and costly transformation, and employs a subtle shaming of those governments that have not yet joined the 21st century. William Eggers's argument, conservative in nature, states that the world of politics would quickly and markedly benefit from this digital transformation in terms of a fiscal payoff, but a more profound change would result as governments become more transparent, more democratic, and more efficient

**Comments.** This reference is included in the study due to the broad, yet detailed coverage of Government 2.0. This book addresses each of the themes of the current study, and provides examples, both positive and negative, of online government services. This reference is deemed credible due to the author's status as a Senior Fellow at the Manhattan Institute for Policy and Research.

Freeman, R. J., & Loo, P. (2009). Web 2.0 and e-government at the municipal level. *2009 World Congress on Privacy, Security and Trust and the Management of e-Business* (pp. 70-78). Washington: IEEE Computer Society. Retrieved April 3, 2010, from http://doi.ieeecomputersociety.org/10.1109/CONGRESS.2009.26

**Abstract.** Web 2.0 refers to various networked applications utilizing technologies such as application mashups, content syndication, videocasts, wikis, blogs, social networking, user tagging, social bookmarks and content and service rating. Such technologies are designed to reach or attract a greater electronic user audience, thereby increasing the efficiency of egovernment applications. The potential of these technologies for e-government applications at Los Angeles County are analyzed. The government model for leveraging Internet technologies is different from that of commercial enterprises or academia. Thus immediate utilization of seemingly attractive technological opportunities must be tempered by organizational, implementation and social responsibility constraints. Application mashups are regarded as a good business opportunity for the County, and content syndication offers a convenient way for the County to share and disseminate information to the public. However, appropriate attention needs to be paid to issues such as loss of ownership control and authenticity of the final products. Wikis, blogs and social networking require more resources for implementation and present a variety of legal and control problems. The main conclusion drawn is that Web 2.0 presents an interesting opportunity for local governments such as Los Angeles County but that there should not be a headlong rush to implementation without consideration of a variety of other issues.

**Comments.** This piece is included in the current study as it is directly relates to the topic of the study. While this piece looks specifically at municipal government, the content can be extended to all forms of government. This reference provides a review of the common Web 2.0 applications used in government, which is valuable to the review of literature and adds real word examples of Web 2.0. This reference is deemed credible due to Freeman's academic occupation. He has a Ph.D. in Industrial Economics. Mr. Loo serves as Chief Information Officer for Los Angeles County.

Gotze, J., & Pedersen, C. B. (Eds.). (2009). *State of the EUnion.* Bloomington: AuthorHouse.

**Abstract.** State of the EUnion is a compilation of contributions to the debate about the current and future states of government. Themes covered include Government 2.0; Open Government; Democratizing Government; and Co-Creation, Innovation and Values.

**Comments.** This edited reference is selected as it covers a broad range of Web 2.0 topics that are relevant to the current study. While it is recognized that some authors do not hold academic credentials, the majority meet other aspects of the evaluation criteria. Tim O'Reilly, David Osimo, Steve Ressler, and Dan Doney have written other articles included in this study and are considered experts in the Government and Web 2.0 industry.

Heeks, R. (2001). *Reinventing government in the information age : international practice in IT-enabled public sector reform.* New York: Routledge. Retrieved April 3, 2010, from http://books.google.com/books?id=cLbjWEoMC1gC&lpg=PP1&ots=abY9eBeoPl&dq=Reinventing government in the information age&pg=PP1 - v=onepage&q&f=false

**Abstract.** 'Government reinvention' is largely a new terminology and repackaging of longer-term processes of public sector reform. Such processes have been particularly

prevalent since the 1970's when three factors described in this chapter began to combine: a sense of crisis in the public sector, a renewed ideology that provided a response to crisis and, at times, political will and power to enact those responses. Typically those responses did and do consist of five main components: increased efficiency, decentralization, increased accountability, improved resource management, and marketisation. After reviewing development of ideas about the information age, this chapter concludes that 'reinventing government in the information age' means delivering these ongoing reform components with a more overt role for information and with greater use of information technology. The role of information systems and information technology in reform is then analyzed with real-world examples provided around each of the main components of reform.

**Comments.** This article is selected as it describes factors that slow adoption and risks, as these relate to government in the information age. While the date of this reference is near the limits of this research, much of the information on risks and barriers is still relevant today. The author is deemed credible due to his academic occupation as Professor of Development Informatics at the University of Manchester.

Jaeger, P. (2004). Beyond section 508: The spectrum of legal requirements for accessible e-government web sites in the United States. *Journal of Government Information*, *30*(4), 518-533. Retrieved April 21, 2010, from http://dx.doi.org.libproxy.uoregon.edu/10.1016/j.jgi.2004.09.010

**Abstract.** In the United States, a number of federal laws establish requirements that electronic government (egovernment) information and services be accessible to individuals with disabilities. These laws affect e-government Web sites at the federal,

state, and local levels. To this point, research about the accessibility of e-government Web sites has tended to focus on compliance with Section 508 of the Rehabilitation Act. Though Section 508 has the most specific guidelines regarding Web site accessibility, it is hardly the only law establishing accessibility requirements for e-government Web sites, and Section 508 does not apply to many sites that may be required to be accessible by other laws. Until assessment of the accessibility of e-government Web sites accounts for all of the relevant laws, the understanding of levels of accessibility and compliance will be incomplete. This article examines the entire spectrum of federal laws that create legal requirements for accessible e-government Web sites, analyzing the accessibility requirements that the laws establish and the ways in which each of the laws applies to an e-government Web site. This article also suggests research areas that should be included in future assessments to address the entire range of laws related to the accessibility of egovernment Web sites. The issues raised in this article have significant relevance to the design and development of e-government, to the assessment of e-government information and services, and to the inclusion in e-government of the 54 million individuals in the United States with disabilities.

**Comments**. This reference is selected for the study and coding for its discussion on the risks associated with Web 2.0 as it relates to the accessibility of information. This reference describes these accessibility requirements as potential barriers to the progress of e-government. Both these risks and barriers are both key themes to this study and therefore the basis for inclusion. The reference is deemed credible due to the author's standing as a professor at the University of Maryland where he holds a Ph.D. and JD.

Kingston, R. (2007). Public participation in local policy decision-making: The role of web-based mapping. *The Cartographic journal , 44* (2), 138-144. Retrieved April 3, 2010, from http://dx.doi.org.libproxy.uoregon.edu/10.1179/000870407X213459

**Abstract.** New methods of using on-line interactive mapping are reported with a specific focus on how citizens can participate in the delivery and management of everyday services in their neighborhood. Particular emphasis will be placed on how ICTs can be used to facilitate the regeneration of inner city neighborhoods through more integrated approaches to spatial data management. The paper examines how internet mapping is used by the public through an interactive Public Participation GIS and illustrates how public access to on-line maps can help deliver improved services to local communities through the integration of GIS with a range of public services. This has raised some interesting issues in relation to how people understand mapping and their methods of navigation using such a system. With governments across the globe investing heavily in e-Government which includes on-line mapping facilities it is interesting to examine how the public actually perceive and use such systems.

**Comments.** This reference is included in the study for the discussion regarding how Geographic Information System (GIS) services can be used to aid in public participation (one of the two Web 2.0 benefits analyzed in this study). Online GIS services are in use in many government organizations and have an important ability to tie to other Web 2.0 services. This article is published in a peer-reviewed journal. The author holds an academic position at the University of Manchester.

Kunstelj, M., & Vintar, M. (2004). Evaluating the progress of e-government development: A critical analysis. *The International Journal of Government & Democracy in the*

*Information Age , 9* (3/4), 131-148. Retrieved April 3, 2010, from http://search.ebscohost.com.libproxy.uoregon.edu/login.aspx?direct=true&db=aph&AN=17109073&site=ehost-live&scope=site

**Abstract.** The development of e-government in most countries is still primarily aimed at developing electronic services that customers can access via the internet. This has been matched by the methods for monitoring e-government development, which fall far short of providing a true overall assessment. Such a narrow focus on e-government has led to a significant slowdown of development in most countries. Countries have used "quick fix, quick win" solutions, while continued development require above all the development of an integrated government portal and reengineering of back-office processes. The more developed countries are therefore increasingly tailoring their e-government strategies in the direction of customer-orientation and instead of persisting with rigid organizational structures are working on integrating services and processes across individual administrative bodies and institutions and even include private businesses. The development of e-government therefore demands a holistic strategic approach that encompasses the entire public administration and is not limited to individual bodies and institutions, or individual sectors and levels of administration. The methods of monitoring, evaluating and benchmarking e-government development will have to follow the same principles. Based on critical analyses of existing approaches, this paper attempts to define the areas and aspects that must be included within the integrated approach in order to facilitate the progress of e-government towards its strategic objectives, that is the development of services based on user's needs and problems, i.e. integrated services or life-events.

**Comments.** This reference is included in the review as it looks at the progress governments have made with e-government and describes some of those successes. Furthermore the article describes the changes that need to occur within government bodies to support citizen- focused e-government, which can be associated with the second theme of the study. The article provides helpful background on the progress of e-government and describes the difference between an integrated e-government strategy and one that is segregated. This article is deemed credible because it is published in a peer reviewed journal and because of the academic occupations of the authors at the University of Ljubljana.

Lathrop, D., & Ruma, L. (Eds.). (2010). *Open Government.* Sebastopol: O'Reilly Media, Inc.

**Abstract.** The Web can make real-time data accessible to anyone, but how can government leverage this openness to improve operations and communication, as well as increase citizen participation? In this book, leading visionaries and practitioners both inside and outside of government share their ideas on how to achieve and direct this emerging world of online collaboration, transparency, and participation.

**Comments.** This reference is selected as it covers a broad range of Web 2.0 topics that are very relevant to this current review of literature. While it's recognized that some authors do not hold academic credentials, the majority meet other aspects of the evaluation criteria, including Tim O'Reilly, Beth Noveck, Archon Fung, and David Weil. Several of the authors have written other articles included in this current study, and are considered experts in the Government and Web 2.0 industry

Meijer, A., & Thaens, M. (2009). Public information strategies: Making government information available to citizens. *Information Polity , 14* (1,2), 31-45. Retrieved April 21, 2010, from

http://search.ebscohost.com.libproxy.uoregon.edu/login.aspx?direct=true&db=aph&AN=37923139&site=ehost-live&scope=site

**Abstract.** New technological opportunities and increasing demands make it imperative for government agencies to make the information they gather available to citizens. How should they go about this? This paper presents a conceptual framework for analyzing the strategic options open to agencies which have information that could be relevant to citizens. The conceptual framework is constructed on the basis of the literature and tested in a case study. The Directorate-General for PublicWorks and Water Management in the Netherlands gathers traffic information which is useful for citizens when they want to avoid traffic jams. Presently, the agency sells information to intermediaries. The agency wanted to release the information through its own website but this was prohibited by a court ruling. This paper reviews other strategies and proposes that an 'Intel inside' strategy may be a viable option in view of the consequences for effectiveness, manageability, cost-effectiveness, equity and legitimacy. The paper concludes that the conceptual framework proves useful for analyzing the strategic options open to agencies for making government information available to citizens.

**Comments.** This reference is selected for the current study as it discusses the options that governments could use to provide electronic information to its citizens. The reference supports the study in that it describes the opportunities for improved transparency by increasing the public information delivered by government. This reference is deemed credible because it is published in a peer reviewed journal and because Meijer holds an academic position at the Utrecht School of Governance.

Misuraca, G. (2009). Futuring e-government: governance and policy implications for designing an ICT-enabled knowledge society. *Proceedings of the 3rd International Conference on Theory and Practice of Electronic Governance,* Bogota, 83-90. Retrieved April 3, 2010, from http://doi.acm.org/10.1145/1693042.1693060

**Abstract.** The purpose of this paper is to discuss the relation between Governance and Information and Communications Technologies (ICTs) and its implications for policy design in a period of global turbulence and uncertainty. After briefly introducing some of the challenges characterizing the building of an "ICT-enabled Knowledge-Society", and the implications of ICTs for development, the paper discusses potential and limits of e-Government vs. e-Governance. In defining the organizational and institutional dimension underpinning ICT-enabled Governance models, the paper positions e-Government activities within the broader framework of e-Governance (i.e., the governance with and of ICT), as a learning type of dynamics. e-governance involves at the same time a constrained and open relationship with local and global actors and the redefinition of the interaction between freedom and dependencies. Furthermore, the paper presents an overview of selected mega-trends in the area of ICTs and their policy implications for Governments, with a special focus on the case of the European Union. In doing so, the paper introduces some key policy issues around the governance "with and of ICTs", exploring future perspectives towards building an ICT-enabled Knowledge-Society. In this regard, it is important to outline a key question around which the paper is built: what kind of changes will take place in society in the next 10--20 years? And what will be the role of ICTs and emerging technologies in particular, in government operations? The paper concludes identifying clues of the potential benefits, as well as the risks and

barriers connected to ICT-enabled governance, and the expected impacts on society in view of further research.

**Comments.** This reference is selected for the study as it discusses the ramifications of a technology savvy population. Furthermore, this article makes the distinction between e-government and e-governance and describes the policy that must accompany any e-government initiative. This reference is valuable to the study in that it reviews the policy implications that governments should be aware of and the associated risks of improper e-government policies. The article is deemed credible as it was presented at the 3rd International Conference on Theory and Practice of Electronic Governance, and the author holds an academic position at the Swiss Federal Institute of Technology.

Olbrich, P. A. (2005). Legal requirements and modelling of processes in e-government. *Electronic Journal of e-Government , 3* (3), 107-116. Retrieved April 21, 2010, from http://www.ejeg.com/volume-3/vol3-iss3/AlparPaulandOlbrichSebastian.pdf

**Abstract.** In most cases, it is not possible to transfer e-Business solutions and development approaches directly to the public administration. This is partly due to the legal framework that governs public administration. Therefore, the introduction of e-Government has been much slower than one would expect based on existing technology. This paper shows the importance of including the legal framework in modeling efforts for e-Government and how to accomplish this task. The approach is demonstrated using the example of the German Federal Insurance Institute for Salaried Employees, the "Bundesversicherungs-anstalt fur Angestellte"

**Comments.** This reference is selected for the discussion on the legal risks of e-government. This article covers many of the risks that the study outlines and provides

insight for government leaders. In addition to the risks the literature details some of the legal requirements that could pose as barriers for Web 2.0 implementations. Both these risks and barriers are central themes to this study and therefore the basis for inclusion. This reference is deemed credible because it is published in a peer reviewed journal and the author holds an academic position at the University of Marburg.

Open Government. (2009). A progress report to the American people. Retrieved May 2nd, 2010, Retrieved May 2, 2010, from www.whitehouse.gov/sites/default/files/microsites/ogi-progress-report-american-people.pdf

**Abstract.** For too long, the American people have experienced a culture of secrecy in Washington, where information is locked up, taxpayer dollars disappear without a trace, and lobbyists wield undue influence. For Americans, business as usual in Washington has reinforced the belief that government benefits the special interests and the well connected at the expense of the American people. This progress report offers the American people a snapshot of the progress to date, highlights of the Administration's new open government policy framework—the Open Government Directive —together with a roadmap for what's to come.

**Comments.** This reference is chosen for inclusion into the study as it outlines the progress government has made in the area of openness and transparency. This report is a direct result of the President of the United States mandate for government to look for new and technological solutions increasing the openness and transparency of government. This reference is valuable to the study as it describes the progress that has been made with e-government, which includes Web 2.0. This reference is deemed credible as it is published by the federal government and backed by the President of the United States.

Petrik, K. (2009). Participation and e-democracy how to utilize web 2.0 for policy decision-making. *Proceedings of the 10th Annual international Conference on Digital Government Research: Social Networks: Making Connections between Citizens, Data and Government,* 390, 254-263. Retrieved May 2, 2010, from http://portal.acm.org.libproxy.uoregon.edu/citation.cfm?id=1556176.1556222

**Abstract.** This paper investigates in how to utilize ICT and Web 2.0 technologies and democracy software for policy decision making. It introduces a cutting edge decision-making system that integrates the practice of e-petitions, e-consultation, e-rulemaking, e-voting, and proxy voting. The paper demonstrates how under precondition of direct democracy through the use this system the collective intelligence (CI) of a population would be gathered and used throughout the policy process.

**Comments.** This reference is selected for the study as it looks specifically at how Web 2.0 can be utilized in policymaking and specifically how Web 2.0 can be used to bring citizens into the government decision-making process. This article is valuable to the study as it directly addresses the participation elements of Web 2.0, which is major component of this study. This reference is deemed credible due to the author's academic occupation at the University of Queensland, and the fact that he holds a Ph.D.

Wamelen, J. v., & Kool, D. d. (2008). Web 2.0: a basis for the second society? *2nd International Conference on Theory and Practice of Electronic Governance* (pp. 349-354). New York: ACM. Retrieved April 3, 2010, from http://doi.acm.org/10.1145/1509096.1509169

**Abstract.** Web 2.0 applications gain in importance in today's society. This development cannot be ignored by the public sector, because Web 2.0 can take the evolution of E-Government in new directions. This paper discusses the impact of (local) Web 2.0

applications on the further development of E-government. Web 2.0 applications have much potential for the public sector in terms of interaction, participation and transparency. However, examples of websites with transaction or transformation characteristics are rare. For that reason it is too early to speak about a virtual state. In order to realize these two final stages of E-Government, it is important to take into account the potential risks of Web 2.0 applications as well, like isolation, exclusion, violation of privacy and misuse of information**.**

**Comments.** This article is selected for its direct discussion on Web 2.0 and how it is changing our society. Specific focus is on government applications and services, and therefore is relevant to the first theme of this current study. This reference is deemed credible because of its presentation at the 2nd International Conference on Theory and Practice of Electronic Governance and is published by the Association of Computing Machinery.

Warner, J., & Chun, S. (2009). Privacy protection in government mashups. *Information Polity , 14* (1,2), 75-90. Retrieved April 3, 2010, from http://search.ebscohost.com.libproxy.uoregon.edu/login.aspx?direct=true&db=aph&AN=37923137&site=ehost-live&scope=site

**Abstract.** The Web 2.0 technologies allow dynamic content creation using syndications or mashups, extracted from diverse data sources, including government enterprise data. As a primary source of citizen data, the US government has the obligation not only to make public data available for citizen access as stated in the Freedom of Information Act, but also to protect the privacy of individual citizen's records as stated in the Privacy Act. In a mashup, a third party mashup Web application provider requests the individual's

data from the government agencies through Web services. Since the data is public data and not necessarily provided through electronic interactions, individual citizens may not be able to express fine-grained privacy policies on how data may be used. In addition, the government agency's privacy policy is very coarse grained, and the relative sensitivity of individual information is not considered. We discuss the opportunities and issues associated with the programmable web and mashups, provide a Privacy Protection Model for Mashup Applications, using a mashup related multi-dimensional privacy protection space and present policy recommendations to complement the technological solutions. The model and recommendations include deployment of a personal privacy policy network, a distributed system over which citizens can publish their individual privacy policies. These policies are accessible by all web service providers to be consulted in real time by data providers including government agencies for the purposes of automated privacy protection reasoning concerning data release.

**Comments.** This article is selected for the current study as it addresses two main themes of the study. Applications mashups are one of the main Web 2.0 technologies that the study reviews, and privacy and security are some of the main risks associated with Web 2.0. Furthermore these government mashups have the ability to combine public sector information with that of the private sector to create new data sets that can be valuable to citizens. This reference is deemed credible because it is published in a peer reviewed journal and the authors hold academic positions at Georgian Court University in New Jersey and City University in New York, respectively.

Zappen, J. P., Harrison, T. M., & Watson, D. (2008). A new paradigm for designing e-government: Web 2.0 and experience design. *Proceedings of the 2008 international*

*conference on Digital government research. 289*, 17-26. Montreal: Digital Government Society of North America. Retrieved April 21, 2010, from http://portal.acm.org.libproxy.uoregon.edu/citation.cfm?id=1367832.1367839&coll=GUIDE&dl=GUIDE&CFID=92063622&CFTOKEN=84251730

**Abstract.** Innovations in World Wide Web technology coupled with new developments in information design present both challenges and opportunities for the creation of e-government applications that are functional, engaging for users, and that enable the achievement of democratic goals. We review the affordances associated with Web 2.0 technologies and more recent information design research focusing on user experiences that make it possible for government organizations to interact with citizens in new and compelling ways. It seems useful to consider how to design e-government resources that draw on these capabilities to add value through citizen participation in various forms of governance practices. We provide some examples that illustrate how we might pursue e-government designs that engage users in experiences with government.

**Comments.** This reference is selected for the study as it examines Web 2.0 from a design perspective and looks at how that design can bring value and aid in citizen participation. The reference is valuable to this study in that it describes the value that design can bring to Web 2.0, especially in relation to citizen participation but is also valuable in that it shows the risks of improperly designed Web 2.0 applications. The article is deemed credible because Zappen and Watson hold academic positions at Rensselaer Polytechnic Institute and Harrison at the University of Albany, and all possess Ph.D. degrees.

## Review of Literature

### Introduction to Web 2.0 in Government

As government agencies have adopted the use of the Internet as a communications medium, it has resulted in millions of pages of government information being available to citizens (Curzon, Keith, Wilson, & Whitney, 2004). This Internet revolution has spawned the concept of e-government, which aims to increase government efficiency, user convenience, and citizen involvement (Freeman & Loo, 2009). While the use of e-government technologies varies from agency to agency it is generally classified in four distinct stages, which include: (a) the delivery of static information on a website, (b) the ability to perform simple online transactions, (c) vertical integration of government services, and (d) horizontal integration across organizational boundaries (Freeman & Loo, 2009). The fourth stage is commonly facilitated through Web 2.0 applications (Freeman & Loo, 2009).

Web 2.0 applications such as Wikipedia, YouTube, and MySpace (Wamelen & Kool, 2008) allow for easy collaboration among groups of individuals (Ankolekar, Krötzsch, Tran, & Vrandecic, 2007). These applications are distinguished from their Web 1.0 counterparts by (a) the ability to create community through collaboration, (b) the ability to create new datasets through Mashups, and (c) the ability to use technologies such as AJAX to create responsive user interfaces (Ankolekar et al., 2007). These applications are commonly referred to as Web. 2.0, however, the concept is much broader than the scope of these applications in that Web 2.0 is considered a platform of technologies and an architecture for participation (O'Reilly, 2007).

With the generally positive attitudes towards Web 2.0 initiatives that exist among the public at large, government agencies can capitalize on this new technology to potentially improve transparency in operations (Chang & Kannan, 2008). For government agencies,

increasing transparency and participation through Web 2.0 applications could help reverse the trend of discontent in government among the population (Bennett, 2008). This trend is evidenced by the negative attitudes towards government and politics, cynical comments made by the press, and lack of political investment in the younger generation of voters (Bennett, 2008). This seeming lack of interest and dissatisfaction in politics by the younger generation is most notable as it is a trend not only seen in the United States but also in other European countries (Bennett, 2008).

If it is the hope for government to foster greater engagement among all citizens, then government leaders must listen to the needs of all citizens, especially this younger generation (Bennett, 2008). With the high adoption rate of Web 2.0 applications in this younger population, such as social media, government could capitalize on this trend by developing applications that connect and serve the needs of citizens both young and old (Chang & Kannan, 2008). For example, in an attempt to improve accountability, transparency and participation within government operations, President Barack Obama in his first executive memorandum signed the Open Government Directive (Open, 2009). This directive instructs federal agencies to put into place the appropriate policies and procedures that allow them to provide greater information online, as well as instill the values of transparency, participation, and collaboration into the culture of the agency (Open, 2009). The Open Government Directive (2009) also puts forth that federal agencies are to review and update government information policies so that they allow agencies to fully utilize new technologies that support open government (Open, 2009). To assist federal agencies and track the progress of open government initiatives, the White House has created online forums and dashboards that show agencies and citizens the progress that is being made (Open, 2009).

**Potential Web 2.0 Applications in Government**

Freeman and Loo (2009) state that Web 2.0 is changing how citizens interact and acquire information online in general. For government agencies, this is an important trend as approximately one third of Internet enabled citizens use e-government services as part of their normal online activities (Jaeger, 2004). Additionally, nearly two of every three adult citizens have used e-government systems to acquire government information and/or services (Jaeger, 2004). This trend of e-government usage, and the associated Web 2.0 technologies that are moving the Web into a "Participatory Platform" (as cited in Bugs, Granell, Fonts, Huerta, & Painho, 2010, p.173), show great potential for improved government efficiency and effectiveness (Cowley & Conroy, 2006).

Web 2.0 is more than a technology but rather a platform of technologies and ideas that support, among other things, the enhanced access and delivery of information to its users (Freeman & Loo, 2009). From a government perspective, these ideas enable government through Web 2.0 to take one step closer to building a more citizen centered and participator government (Accenture, 2009). Furthermore, these ideas are incorporated into applications such as social networks, blogs, mashups, and tagging that are "breaking the barriers between users and data providers" (Bugs et al., 2010, p. 173). A good reason for this is that Web 2.0 fully supports and encourages the co-creation of content and soliciting feedback from the collective intelligence of the community (Petrik, 2009), and therefore users are both consumers and producers of information (Zappen, Harrison, & Watson, 2008).

The benefits of potential government focused Web 2.0 applications vary from application to application, but support the universal Web 2.0 focus on community and usability (Ankolekar et al., 2007). A summary of these potential applications and benefits is as follows:

**Blogs –** These are web pages maintained by an individual or group in which regular entries are made on a specific topic, event, and/or commentaries (Freeman & Loo, 2009). The value that Blogs bring to government is that they (along with Wikis) allow for the broadest and greatest interactions with citizens (Freeman & Loo, 2009). They also allow for greater democracy, in that they can enable citizens to act collectively (Tapscott et al., 2007). Microblogging, which is a fairly new idea and is seen in Web 2.0 applications such as Twitter ©, allows users to post and read very short messages (Falch et al., 2009). With the number of platforms (web, mobile, SMS) through which individuals are able to subscribe to these microblogging feeds, there is a great opportunity for government to increase the distribution of information (Falch et al., 2009). With the reach that blogs have, they could be used to hold virtual public meetings in which citizens could provide public comments and participate in policy discussions (Freeman & Loo, 2009).

**Mashups** – Application mashups are new content that is created by combining data from multiple sources and using the web as the delivery mechanism (Warner & Chun, 2009). In a government setting, this could be crime data that is combined with mapping data to display a graphic representation of the high crime areas in a community. The "mashing" up of this data is commonly created using Application Programming Interfaces (APIs) to combine the data sources (Freeman & Loo, 2009). While these APIs can take a significant effort to program and utilize, there is growing use of semantic web technologies to associate data sources to common ontologies (Ankolekar et al., 2007). These ontologies aim to create a common vocabulary so that the process of combining data from disparate websites or other electronic sources can become more simplified (Ankolekar et al, 2007). The key benefit that mashups bring to government agencies is

greater transparency to their citizens (Batorski & Hadden, 2010). By extending this information to the public, citizens are able to view and filter the data to suit their interests, and government agencies gain new insight into their community and its needs (Accenture, 2009).

**Social Networking** – Social networking websites are sites that often combine Web 2.0 technologies to create online communities of shared interest that are delivered in an interactive manner (Freeman & Loo, 2009). These social networks, in use on sites such as MySpace ©, Friendster ©, and LinkedIn ©, give their users the ability to read and post messages, chat with connected individuals and communicate using other Web 2.0 applications (Chang & Kannan, 2008). Furthermore, the usage of social networking by citizens has doubled from 2003 to 2008, and for this reason, government agencies should be aware of this new medium and develop policies to support it (Chang & Kannan, 2008). In addition to the use of social networking among individuals, social networking is an effective platform for public outreach that has seen successes in many government agencies (Batorski & Hadden, 2010).

**Wikis** – These are similar to blogs in their function but usually consist of multiple pages and allow the users greater control over the publishing of content (Freeman & Loo, 2009). The value that Wikis can bring to a government is that they can have a great impact on service delivery by enabling mass collaboration and interaction among citizens (Petrik, 2009). Furthermore, their collaborative and interactive nature allows for greater participation and group problem solving (Freeman & Loo, 2009). Lastly, results from a survey conducted by Oxford Internet Institute have shown that 53% of survey respondents felt that wikis were useful and/or essential in collaborating with others

(Dutton & Eynon, 2009). This is an important statistic to governments as they look for new ways to communicate with their constituents.

**Implications of Web 2.0 Megatrends**

For government agencies to capitalize on Web 2.0 and the broader area of e-government, there are three megatrends that must be acknowledged for current and future e-government success. The first is acknowledging that Web 2.0 is current and is relevant in today's government operations, and that it is not only a tool for fun (Misuraca, 2009). With 85% of Americans believing companies should interact with customers via social media, and Americans 50% more likely to vote if they have interacted with government officials online, there is significant potential value both politically and operationally for governments to seriously address Web 2.0 (as cited in Batorski & Hadden, 2010 and Larrumbide, 2008). The second megatrend is acknowledging the future shift from Web 2.0 to Web 3.0, in which the Internet moves to a network capable of connecting everything, from automobiles, to electric meters, to household appliances, to 'whatever can be imagined' (Misuraca, 2009). With the potential improvement in the quality of life this megatrend represents, governments must support this movement and not become a hindrance (Misuraca, 2009). The third megatrend is the emergence of the wireless web and the speed of its penetration around the globe. This megatrend provides a potential opportunity for government agencies to develop new e-government services that will reach many more people and locations, since it involves delivery via an enhanced wireless network (Misuraca, 2009).

**Negative Criticisms of Web 2.0 in Government**

There have been negative criticisms about government use of Web 2.0, such as, Web 2.0 will not change the e-government application but rather just its presentation, and that government

has been too slow to adopt Web 2.0 (Freeman & Loo, 2009; Chang & Kannan, 2008). From the government perspective, Freeman and Loo (2009) state that the potential positive value of these Web 2.0 applications has not been conclusively demonstrated, nor has a business case been clearly defined. However, Freeman and Loo (2009) goes on to state that a business case for Web 2.0 cannot be measured on the costs alone but more appropriately must be made by measuring the impact on agency efficiency, user convenience, and citizen involvement. Freeman and Loo (2009) also states that there is an aspect of efficiency that is gained by increasing the number of users, and therefore the economic justification must come from assessing the growth of users versus the resources required to develop and maintain the Web 2.0 application.

**Examples of Successful Government 2.0 Applications**

Several government agencies around the world have taken steps forward in developing their own Web 2.0 applications and have success stories that go along with them. The city of Canela, Brazil in 2009 developed a public participation global information system (GIS) that utilized Web 2.0 technologies to enable users to communicate easily and dynamically through mapping technology. This system saw positive results and had 91% of survey participants state that they would use the platform often to give their opinion (Bugs et al., 2010). Similarly, the City of Manchester in the United Kingdom created a global information system that allowed citizens to make inquires and/or report problems (Kingston, 2007). In an effort to improve this system the city is in the process of developing additional features that support open and transparent dialog with a geographic focus (Kingston, 2007). Within the United States federal government, there have been many e-government and Web 2.0 solutions implemented from the Open Government Directive (Open, 2009). Specifically, several agencies such as the Departments of Commerce, Energy, Customs, and Veteran affairs are releasing data sets in an

attempt to become more transparent (Open, 2009). These data sets range from the volume of U.S. customs applications, hospital report cards, historical public housing property scores, energy data, and all patent data (Open, 2009). This data is valuable in that it not only shows transparency, but also allows for unique new mashup applications to be built (Open, 2009).

**Lessons for Government Leaders**

As government leaders look to take advantage of benefits of government 2.0, there are several lessons that can be learned by looking at successes that have been occurred in the computer industry (Lathrop & Ruma, 2010). These lessons, provided by Lathrop and Ruma (2010), include:

1. Open Standards Spark Innovation and Growth – This lesson states that there is extraordinary power in open standards and when put in place they fosters innovations. For the government leader this means that implementing e-government systems that utilize open standards could result in benefits not originally thought of.
2. Build a Simple System and Let It Evolve – This lesson suggests that systems that start simple and evolve typically result in a better end product than systems that start with lofty goals.
3. Design for Participation – This lesson states that e-government systems should be designed around the idea of participation. This includes building systems that cooperate with each other's systems by utilizing standard inputs and outputs.
4. Learn from Your Hackers – This lesson states that the true power of an e-government application may come not when the application is released but after it's been used and traditional uses have been broken. An example of this includes mashups in which

data sets are originally intended for a single purpose until users combine that data with other datasets that make up new information.

5. Data Mining Allows You to Harness Implicit Participation – This lesson suggests government should utilize the multitudes of data it collects to build data driven feedback loops that could be used to better serve its citizens. The implicit participation occurs when information gathered from citizens is collected, mined, and utilized for some other, unrelated benefit.
6. Lower the Barriers to Experimentation – This lesson states that government agencies should develop e-government programs that are not focused on being perfect in every right but rather experiments. The thinking is that these programs that are developed from the get go as solutions tend to have fixed specifications and end up less open ended and able to change.
7. Lead by Example – The last lesson suggests that as government begins to build a platform of e-government services that government itself needs to build applications that demonstrate the power of the platform. Once this occurs greater use and collaboration will occur as citizens see the tangible benefits of this platform.

**Trends in E-government Information**

The guiding principles of Web 2.0 technology are openness and transparency; by using these technologies, government agencies have the opportunity to build applications and services that improve the traditional models of government services and their delivery (Osimo et al., 2009). Web 2.0 applications provide the potential to address the criticisms that government agencies have faced in the area of information sharing and public participation (Barrientos & Foughty, 2009; Bugs et al., 2010). Should governments fail to address these criticisms, and not

look for new and modern solutions to improve transparency and participation, they run the risk of decreasing their legitimacy (Meijer & Thaens, 2009). The ramifications of this could be great and include decreased support for future government based initiatives (Meijer & Thaens, 2009). It is because of this lack of openness that all United States federal government agencies are now required to implement new measures that facilitate open and transparent operations (Open, 2009).

Before government agencies look to adopt Web 2.0 technologies, they first must understand the important trends that are occurring in the area of potential information relationships that agencies can build with citizens and outside parties (Meijer & Thaens, 2009). The first trend is the increase in technological opportunities that have greatly improved *the ability to disseminate information and do it at reduced cost* (Meijer & Thaens, 2009). This opportunity has resulted in a greater amount of government information being produced and made available for public consumption (Kaylor et al., 2001). The second trend that must be understood is *the increased participation of citizens in government policy and decision making* (Meijer & Thaens, 2009). This "active citizenship" (Kingston, 2007, p.139) provides immense benefit to all parties, as it actively engages the community within government, and therefore, may result in better services and improvement to the overall fabric of the community (Kingston, 2007).

**Stages of Citizen Participation**

In addition to recognizing the importance of the trend toward increased participation of citizens in government, government agencies must also recognize the various stages of involvement that they can maintain with their citizens. In work done by the Organization for

Economic Co-Operation and Development (OECD), as cited in Kingston (2007), OECD outlines five distinct stages of public involvement:

1. Information and Transaction – government informs citizens (one way process) (Kingston, 2007, p.139).
2. Consultation – government consults with citizens (citizens' responses generally predetermined by government via multiple-choice, closed-question options) (Kingston, 2007, p.139).
3. Deliberative involvement – government engages citizens in consultation process (citizens encouraged to deliberate over issues before final response) (Kingston, 2007, p.139).
4. Government-led active participation – government instigates consultation and retains decision-making powers (Kingston, 2007, p.139).
5. Citizen-led active participation – citizens are actively engaged in decision-making processes, alongside government; citizen decisions become binding; citizens share ownership and responsibility over outcomes (Kingston, 2007, p.139).

Kingston (2007) states that in many cases citizen participation in the government process typically falls into one of the first two stages. Kingston (2007) adds that with specific e-government applications, like web based mapping, there is the potential to move that interaction into stages three through five. He further states that there has been extensive criticism over traditional participation methods, and that is likely due to participatory events occurring at a fixed place and a fixed time, often when the public cannot attend (Kingston, 2007). This is when e-government applications, such as those built on Web 2.0 technologies, can be a benefit as they potentially remove this time and place barrier (Chatfield & Alhujran, 2009).

## Conclusions

As government agencies embark on development of Web 2.0 applications, they must do so with quickness but also with caution. While there are great benefits to developing these applications and services, those benefits must be weighed against the organizational, implementation and social constraints (Freeman & Loo, 2009). However, the time is right and citizens are increasingly feeling more confident with Web 2.0 applications, and therefore, governments have a captive audience (Bugs et al., 2010). Governments that don't capitalize on this opportunity and continue to exclude citizens from their communication strategies will not only increase the divide among them and their residents but also risk loosing some of their legitimacy and governance authority (Bennet, 2008; Meijer & Thaens, 2009). As governments look at developing an e-government strategy, they must buy into the notion that these systems must not only prepare citizens for politics but also improve politics (Bennet, 2008).

It has been stated that e-government should be implemented in a "just do it" (Chang & Kannan, 2008, p.7) approach, however, there are many implications for government agencies, which has lead to a "not so fast" (Freeman & Loo, 2009, p.77) response. Careful considerations must be taken into account in the areas of accessibility and usability (Jaeger, 2004 and Curzon et al., 2004). If new and innovative search methods are created to enhance Web 2.0 applications, agencies will need to ensure that traditional search methods are maintained and enhanced for the greatest accessibility (Curzon et al., 2004). Ensuring equal access to the same information is vitally important when implementing new Web 2.0 services (Chang & Kannan, 2008).

### Examples of Transparency and Participation with Web 2.0 Technologies

There are several examples of how governments are improving transparency and participation through Web 2.0 based e-government applications. While each application may

look and perform differently, they generally all aim to improve transparency of operation, participation with citizens, and efficiency in government function (Freeman & Loo, 2009). One example of this is the Missouri Accountability Portal that allows visitors a single point of reference to see how tax dollars are spent and explore other pertinent information related to the enforcement of government programs (Accenture, 2009). Another example is the state of Rhode Island's use of Twitter © to broadcast the state's daily cash flow. This system allows for users to see in real time the state's gross revenues and expenditures of the general fund (Accenture, 2009). An e-government application that specifically addresses participation is the Virtual Slaithewaite, which is an online mapping and participation platform for the West Yorkshire village of Slaithewaite (Accenture, 2009). Virtual Slaithewaite, allows citizens to zoom, pan and select features on a map of the village and provide comments on selected features (Accenture, 2009). Another e-government application that is focused on participation is Finland's online electronic discussion forum, Otakantaa.fi (Accenture, 2009). This site allows citizens to comment on administrative initiatives that are either planned or underway (Accenture, 2009). In addition, citizens can connect with ministers via online chat, which further enhances the participatory factors of this system. This system is part of a greater initiative in Finland that aims to develop a comprehensive strategy for electronic participation that includes electronic hearings and e-voting (Accenture, 2009).

**Web 2.0 Risks and Related Barriers**

While there are great benefits available to government agencies that implement modern Web 2.0 based e-government services, there are also many risks involved. These risks fall into two broad categories: (a) internal and (b) external, differentiated by who ultimately is affected by the risk. Risks all have the potential for dramatic impact on a government's ability to produce e-

government applications. While these risks can and have been mitigated, they also have created barriers for some governments, and/or caused them to move cautiously, in developing these modern applications. Government agencies must ensure that the systems they implement are secure, accessible, and reliable. A sound e-government policy must be developed prior to implementation if risks and barriers are to be effectively addressed.

**Internal risks**. Internal risks are those risks that directly impact a government agency and its staff members. One of these common risks is improper planning and implementation. Successful e-government projects cannot be achieved by just implementing software alone; careful analysis must occur on the front side to ensure that benefits are achieved (Olbrich, 2005). Furthermore, agencies need to ensure their "e-readiness" (Misuraca, 2009, p. 410) has been achieved so they can successfully implement a Web 2.0 project (Misuraca, 2009). This "e-readiness" includes conducting the appropriate assessment of the needs, constraints, priorities and collateral dimensions of the agency and the project they are intending to implement (Misuraca, 2009). Lastly, for agencies to implement Web 2.0 projects that address the needs of the agency and its citizens, they must first develop a comprehensive e-government strategy (Kunstelj & Vintar, 2004). This e-government strategy must not only look at the customer facing front-office systems and processes, but more importantly the back-office, which is commonly overlooked (Kunstelj & Vintar, 2004). Therefore the risk of implementing e-government services without a well-reviewed and tested strategy could result in failing to meet the needs of the community and agency.

From an operational perspective, there are several risks that government agencies must address when looking to implement e-government applications and services. Key in this group is the lost productivity of employees who have to moderate and respond to posts published on

government blogs and wikis (Freeman & Loo, 2009). Also, due to the risks of inappropriate content being published on the Internet, Web 2.0 applications must be monitored in real-time and therefore this housekeeping could be a burden to employees (Freeman & Loo, 2009). If lines of authority are not maintained and statements regarding a government's position are misconstrued, it could result in legal issues for the agency (Freeman & Loo, 2009).

**Internal barriers.** The internal barriers are those that stall e-government projects due to lack of understanding and/or staffing related to e-government projects. One common barrier is caused by the many regulations and legal requirements by which government agencies must abide, specifically in the areas of accessibility and privacy of personal information (Olbrich, 2005). These requirements are often complex and at times not clear in the area of digital information (Meijer & Thaens, 2009). Barriers are caused by the significant effort that needs to take place in order to ensure proper compliance, especially in the area of accessibility (Jaeger, 2004). Other barriers that have slowed the adoption of e-government include the lack of funding, lack of technical understanding, and lack of implementation understanding, such as accessibility requirements (Freeman & Loo, 2009). If proper strategy is developed prior to implementation, such barriers can be addressed and/or mitigated within the government agency (Accenture, 2009).

From a government operations perspective, barriers such as low prioritization within the agency, institutional resistance, and lack of policy have been barriers to e-government (Chang & Kannan, 2008; Jaeger, 2004). Resistance to e-government can occur within an agency when tension arises between the legal and informal rules regarding information availability (Meijer & Thaens, 2009). Legal rules are often complex and at times not clear in the area of digital information. Another barrier is the policies found at some government agencies that restrict the

use of social media and other Web 2.0 systems while on the job (Freeman & Loo, 2009). While information has shown that some agencies are beginning to loosen these restrictions, they still present a barrier (Smith, 2010).

**External risks.** The external risks that face e-government projects are those risks that come from third parties in the form of regulations and requirements. Requirements such as those set forth in the Freedom of Information Act, American with Disabilities Act, and Rehabilitation Act all present a legal risk for government agencies if not properly addressed in e-government projects (Jaeger, 2004). These acts, with the exception of the Freedom of Information Act, mandate that, "individuals with disabilities cannot be denied participation in or the benefits of e-government websites" (Jaeger, 2004, p.529). This is important for agencies to know as they could risk loosing certain types of funding if they fail to meet these requirements (Jaeger, 2004).

Another external risk deals with building applications and/or services that may not meet the needs of both the older and younger generation. For the older generation it is important that the data included in e-government services is also available through traditional information delivery methods (Curzon et al., 2004). Curzon et al. (2007) state that while older people may have difficulties accessing e-government websites they may be very adept at finding the same information in more traditional ways. In looking at the younger generation, government agencies must build applications and services that allow this generation to communicate, collaborate and seek information using the tools and technologies that are most familiar to them (Bennett, 2008). By doing so, government can gain greater legitimacy from a population that has a decreasing interest in government (Bennett, 2008).

**External barriers.** The external barriers are those barriers that limit the growth of e-government because of the requirements necessary to address the needs of third parties, such as

citizens and other government agencies. These barriers are caused by the extraordinary efforts and skill sets sometimes required to implement e-government applications, especially those that meet the needs of all citizens, old and young, disabled or not (Barrientos & Foughty 2009). Other external risks such as those related to the security and privacy of citizen's information have added to these barriers. This is especially true for agencies that deal with service intermediaries, which are third parties that are contracted share and disseminate government information (Freeman & Loo, 2009). Additionally, with many agencies not employing staff with the skill sets needed to work with the complex Web 2.0 applications (such as mashups) there is at times an internal barrier to enabling these new and usable services (Meijer & Thaens, 2009). It is because of this that some agencies are contracting with intermediaries to provide this service which, as mentioned, creates another barrier in the area of security and privacy (Meijer & Thaens, 2009). However, if these barriers can be addressed within a sound e-government policy, agencies can lessen their risks and limit these barriers as they begin to deliver e-government services (Accenture, 2009).

E-government projects must not succumb to the excessive process and red tape that sometimes bog down government projects (Eggers, 2005). In order for this not to happen, e-government must be supported and possibly mandated at all levels within an agency (Obama, 2009). This includes elected officials supporting e-government both vocally and financially, government leaders cooperating by sharing data, and all parties listening to the needs of their citizens and acting on them (Kingston, 2007). All of these things need to culminate into an e-government strategy that is both documented and regularly reviewed for effectiveness. If e-government is done correctly, agencies could see their legitimacy rise within their population and demonstrate a true citizen focus (Tapscott et al., 2009; Misuraca, 2009).

**Benefits from Transparency and Participation Focused Applications**

The innovative e-government applications noted above are the result of government leaders listening to their citizens and responding by developing systems that address citizen concerns. The result is a great many benefits that can be seen not only by the government leaders but also by the agency as a whole. The amount of political gain that could be achieved from supporting modern applications that increase transparency and participation could be significant. This can be seen in the statistic that shows citizens are 50% more likely to vote if they have interacted with government officials online (Batorski & Hadden, 2010). In addition to the political benefits of Web 2.0 benefits also include (a) better decision-making, (b) access to collective intelligence, and (c) improved citizen orientation.

**Better decision-making.** Government agencies that have built or are looking to build Web 2.0 based applications are taking a new perspective on decision making in their organization (Bugs et al., 2010). These agencies are enabling a bottom up decision-making process, which values the input from both the experts and non-experts in the community (Bugs et al., 2010).

**Access to collective intelligence.** By enabling this bottom up decision-making process, these agencies recognize the great value of the collective intelligence and social capital contained within ones community (Chang & Kannan, 2008). Furthermore, by building applications that support transparency and easy access to information, governments will gain greater accountability, which could result in greater trust (Open, 2009).

**Improved citizen orientation.** Lastly, citizen orientation is one of the most important long term objectives for government agencies and vital in the effective and efficient delivery of government services and goods (Olbrich, 2005). Therefore, building Web 2.0 based applications

that are citizen focused and respond to citizen needs can only benefit and build greater connections between government and its citizens (Tiamiyu & Ogunsola, 2008).

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## Appendix A

### Search Results Summary

| Search Database | Search Terms | Results | Notes |
|---|---|---|---|
| **UO Libraries – Catalog** | Government 2.0 | 26 | Very good results, however not many electronic sources available |
| | E-Government | 9682 | Some good quality results however many unrelated resources |
| | Web 2.0 Government | 122,677 | First page of results was very good, subsequent pages were unrelated. 1 reference found |
| | Transparency in Government | 7 | Poor |
| | Implications "government 2.0" | 3 | One reference found |
| | Issues "government 2.0" | 3 | Poor |
| | Government 2.0 services | 75,355 | Poor |
| **Academic Source Premier** | Government 2.0 | 8 | Poor, the term Government 2.0 seems to net few quality results. 1 reference found |
| | E-Government strategies | 28 | Good results, E-Government seems to return more results than Gov 2.0. 6 references found |
| | Government 2.0 Strategies | 830436 | Too broad of a topic. 1 reference found |
| | Transparency in Government | 667 | Poor |
| | Implications "government 2.0" | 6 | Poor |
| | Issues "government 2.0" | 10 | Good, two references found |
| | Web 2.0 Participation | 89 | Good results on other uses of Web 2.0 in government, planning and mapping. 1 reference found |
| | E-Government participation | 53 | Good results as well. 2 references found |
| **ACM Digital Library** | Web 2.0 in Government | 1824 | Very good, a few new references |

| | | | |
|---|---|---|---|
| | Government transparency | 724 | Similar results from first search |
| | Government 2.0 Impact | 1599 | Poor |
| | | | |
| **Web of Science** | Web 2.0 in Government | 12 | One good reference found |
| | | | |
| **IEEE Computer Society** | Web 2.0 in Government | 100 | Results all were very good and somewhat related to my topic. 2 references found |
| | Government Web 2.0 Service Strategy | 100 | One good reference found |

## Appendix B

## Coding Results Summary

| Author/Source | Concept/Theme | Count | Relevance | Notes |
|---|---|---|---|---|
| Ankolekar (2007) | Web 2.0 | 31 | Yes | p. 825-826, 830, 832 – Artice focuses specifically on Web 2.0 and how it can be supported by semantic technology |
| | E-Government | 0 | No | |
| | Transparency | 0 | No | |
| | Participation | 0 | No | |
| | Risks | 0 | No | |
| | Barriers | 1 | Yes | p. 829 – Discuses the difficulty with programming semantic technology |
| Bennet (2008) | Web 2.0 | 1 | No | p. 3 – mentioned in a quote |
| | E-Government | 0 | No | |
| | Transparency | 0 | No | |
| | Participation | 23 | Yes | p. 1, 3-8, 10-11, 16, 20 – Main focus of the article in relation to youth |
| | Risks | 2 | No | p. 17 - |
| | Barriers | 0 | No | |
| Bugs (2010) | Web 2.0 | 32 | Yes | p. 172-176, 178-180 – Specifically focuses on Web 2.0 technologies in the area of public participation and GIS |
| | E-Government | 0 | No | |
| | Transparency | 0 | No | |
| | Participation | 31 | Yes | p. 172-174, 176, 178-180 – Participation is a main focus of the article, specifically public participation |
| | Risks | 5 | No | p. 172, 173, 178, 180 – Article mentions some relevant risks but majority are related to the field of Planning |
| | Barriers | 0 | No | |
| Conroy (2006) | Web 2.0 | 0 | No | |
| | E-Government | 65 | Yes | p. 371-375, 377-383 – Article is focused primarily on e-government and participation |
| | Transparency | 0 | No | |
| | Participation | 62 | Yes | p. 371-374, 376-383 – Improving participation is among citizens is a main focus |
| | Risks | 0 | No | |
| | Barriers | 1 | Yes | p. 379 – Mentions language and technology barriers as inhibitors to e-government |
| Curzon (2004) | Web 2.0 | 0 | No | |
| | E-Government | 7 | Yes | p. 35, 39, 41 – While not a main focus of the article it does go into |

| | | | | |
|---|---|---|---|---|
| | | | | some detail about e-government information |
| | Transparency | 0 | No | |
| | Participation | 0 | No | |
| | Risks | 0 | No | |
| | Barriers | 2 | Yes | p. 39 – Discusses the physical barriers the older generation has with technology |
| Freeman (2009) | Web 2.0 | 37 | Yes | All pages – Main focus of the article was Web 2.0 in a government setting |
| | E-Government | 9 | Yes | p.70-71, 77 – Similar to above |
| | Transparency | 2 | Yes | p. 71 – Briefly mentioned how transparency could be improved |
| | Participation | 6 | Yes | p. 71, 74, 76 – Similar to above and additionally mentions specific Web 2.0 technology's and it's participation factor |
| | Risks | 1 | Yes | p. 77-78 – Refers to an agencies reputation risk |
| | Barriers | 1 | Yes | p. 77 – Discusses several barriers to implementation. |
| Jaeger (2004) | Web 2.0 | 0 | No | |
| | E-Government | 124 | Yes | All pages – Specifically focuses on e-government and accessibility |
| | Transparency | 0 | No | |
| | Participation | 11 | Yes | p. 519, 524-527, 529 – Discusses how participation is affected if accessibility is not designed into the application. |
| | Risks | 5 | Yes | p. 521. 523, 526, 530 – Discusses existing legislation and legal risks |
| | Barriers | 0 | No | |
| Kingston (2007) | Web 2.0 | 0 | No | |
| | E-Government | 11 | Yes | p.139-140, 143 – Describes mapping as an e-government application and how it can be used in public participation |
| | Transparency | 0 | No | |
| | Participation | 35 | Yes | p. 138-140, 142-143 – Public participation in government is a main focus of the article |
| | Risks | 0 | No | |
| | Barriers | 0 | No | |
| Kunstelj (2004) | Web 2.0 | 0 | No | |
| | E-Government | 85 | Yes | All pages – Main focus of the article is evaluation the progress and effectiveness of e-government |
| | Transparency | 0 | No | |
| | Participation | 0 | No | |
| | Risks | 0 | No | |

| | | | | |
|---|---|---|---|---|
| | Barriers | 7 | Yes | p. 137, 142, 144 – Discusses relevant barriers to e-government |
| Meijer (2009) | Web 2.0 | 0 | No | |
| | E-Government | 0 | No | |
| | Transparency | 0 | No | |
| | Participation | 1 | Yes | p. 32 – Article is very relevant to the topic but doesn't outright mention the coding terms, article discusses gaining participation among stakeholders to aid in policy making |
| | Risks | 1 | No | P. 34 – risk management as opposed to specific risks. |
| | Barriers | 0 | No | |
| Misuraca (2009) | Web 2.0 | 11 | Yes | p. 86-87, 89 – Discuses mega trends around Web 2.0 |
| | E-Government | 23 | Yes | p. 83, 85, 88-89 – Article goes into detail about improving e-government in the future |
| | Transparency | 4 | Yes | p. 84-85, 89 – briefly touches on transparency but is relevant to the study |
| | Participation | 3 | Yes | p. 84, 89 – Similar to above |
| | Risks | 3 | Yes | p. 83-84 – Similar to above |
| | Barriers | 2 | Yes | p. 83, 85 – Similar to above |
| Olbrich (2005) | Web 2.0 | 0 | No | |
| | E-Government | 39 | Yes | All pages – Article covers e-government legal requirements in depth. |
| | Transparency | 0 | No | |
| | Participation | 0 | No | |
| | Risks | 0 | No | |
| | Barriers | 3 | Yes | p. 107, 109, 114 – Some discussion on the barriers to implementation. |
| Open (2009) | Web 2.0 | 1 | No | p. 20 |
| | E-Government | 0 | No | |
| | Transparency | 22 | Yes | p. 1-3, 8-15, 18-20 – Transparency and participation are both main focuses of this article in relation to government and technology. |
| | Participation | 22 | Yes | p. 1, 4-5, 8-11, 16, 19 - Transparency and participation are both main focuses of this article in relation to government and technology. |
| | Risks | 1 | No | p. 7 – Risks mentioned are unrelated to the study |
| | Barriers | 0 | No | |
| Petrik (2009) | Web 2.0 | 20 | Yes | p. 254-256, 259, 262 – Web 2.0 is a main focus of the article specifically related to participation in policy making |
| | E-Government | 1 | No | p. 254 |

| | | | | |
|---|---|---|---|---|
| | Transparency | 3 | Yes | p. 257–258, 262 – Transparency is briefly mentioned as it relates to Web 2.0 applications |
| | Participation | 16 | Yes | p. 254-257, 259-262 – This is main focus of the article. |
| | Risks | 0 | No | |
| | Barriers | 0 | No | |
| Wamelen (2008) | Web 2.0 | 98 | Yes | All pages – Article has a significant focus on Web 2.0 and how it has changed how we live and operate |
| | E-Government | 26 | Yes | p. 349-351, 353-354 – Article connects this Web 2.0 trend with e-government and how government can benefit |
| | Transparency | 6 | Yes | p. 349, 353-354 – Discusses the transparency and participation benefits associated with Web 2.0 |
| | Participation | 5 | Yes | p. 349-353 – Similar to above |
| | Risks | 13 | Yes | p. 349-351, 353-354 – Some relevant risks to the study, some unrelated |
| | Barriers | 1 | No | p. 350 - |
| Warner (2009) | Web 2.0 | 3 | Yes | p. 75, 77 - Article focuses on Mashups which is a common Web 2.0 application |
| | E-Government | 8 | Yes | p. 75-76, 78-79, 81, 88 – Article focuses on Mashups in a government setting and delivered as an e-government service. |
| | Transparency | 0 | No | |
| | Participation | 1 | No | p. 84 |
| | Risks | 1 | Yes | p. 76 – Great discussion on privacy risks associated mashups |
| | Barriers | 0 | No | |
| Zappen (2008) | Web 2.0 | 18 | Yes | p. 17-18, 20, 22, 24 – Article discusses how the design of Web 2.0 can affect it's usage |
| | E-Government | 15 | Yes | p. 17, 20-21, 24 – Discusses the e-government design principals |
| | Transparency | 2 | No | p. 20, 24 |
| | Participation | 13 | Yes | p. 17-21, 24 – Mentions how participation can increase/benefit from well designed applications. |
| | Risks | 0 | No | |
| | Barriers | 0 | No | |