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THE PEOPLE'S WEB: GOVERNMENT AS NEXUS

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Dedication

To the woman who stood over my shoulder and the sister with whom I swore

Mom and Kate

my heart, my inspiration, my joy

And, to the incredible women who blazed the trail

Chris, Susan, Jeanette, Maureen, Roni, Sarah, Victoria

And my wonderful grandmothers, who passed along the way

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The People's Web: Government as Nexus

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With the advent of new interactive Internet technologies in government, a move from the transactional loop of electronic government to a more web-like structure of interaction is anticipated for government information systems. It has been argued that that web-like structure of information systems will dictate a new organizational form for government organization. Explored within the dissertation are two primary research questions. The first research question relates to understanding the nature of adoption of new interactive Internet tools in government agencies and whether that adoption differs from the adoption process for transactional systems. To understand the nature of interactive technology adoption, presidential directives, legislation, and laws implementing transactional and interactive information systems are evaluated. Discovered in evaluation are the motivating factors in technology adoption and related technology adoption and organizational outcomes. Accompanying that evaluation is an exploration of the new technologies being used by government agencies as a part of the technology adoption process.

To understand the nature of the differences in infrastructure of information systems associated with transactional information technologies and interactive information technologies, a series of case studies were developed. For each case, an exploration of the technology implemented and a map of the Internet architecture for the

technology were constructed. Findings suggest that the adoption process and the information system architecture of transactional and interactive technologies are different. Though it is too early in the adoption and implementation process to discern any impacts to the government organization, the technology adoption and implementation is couched in larger organizational theory. Extrapolations are made to address the future form of the government organization and policy outcomes for continued implementation of interactive systems and the organizational impacts are discussed.

The second research question relates to the value associated with the implementation of new interactive Internet technologies. To understand any value associated with implementation of technologies, a qualitative assessment of the value conversations within government agencies was conducted, an assessment of citizen value ranking of data was undertaken, and a quantitative analysis of differences in customer service scores given the use of interactive information technologies is conducted. This analysis is triangulated against a historical evaluation of increasing and decreasing scores and an exploration of specific evaluations conducted for interactive technology projects. Findings suggest that that there is value in implementing interactive Internet technologies. However, that signal is weak. A suggestion of research is that evaluation metrics be developed to understand the value of implementing of interactive technologies. Policy suggestions are outlined for technology value evaluation.

The concluding outcome of the dissertation is a suggestion of a path forward for interactive Internet technology development in government and an argument for the construct of the emerging organizational structure associated with information organizations.

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Chapter 1: Democratic Innovation

An inherent tension exists between the organizations of democratic governments and information systems. That tension is driven by perceived shifts in power and a theory that systems configuration drives organizational form. Traditionally, the organizations of democracy are centralized units that distribute power through command and control levers, and while there are exceptions, it is generally understood that agencies will follow the rules of the commander and execute what is commanded. The organizational structure is hierarchical and rigid in form.

The common understanding of organizational form associated with information systems is a more networked structure within which power is distributed more evenly and rules are derived from self-organizational codes that allows the network to operate, but in a flexible and flatter way. The organizational form associated with information systems is opposite of the command and control structure. Given its opposite nature, when bureaucratic agencies attempt to adopt information tools and systems, it is perceived as a threat to power and a disruption of the organization.

Additionally, as information systems and tools are incorporated into the organizations of democracy, the relationship of the organization with citizens changes. The nature of the relationship change rests largely upon the functionalities of the information system. The function of the system drives citizen access and interaction with the organization. This

change in relationship and the perception by the organization that with new information technologies new patterns of interaction, both internally and externally, and possibly new power structures often results in hesitance, even resistance to adopt new information technologies.

The argument of this dissertation is that the tension between organizational structure, information systems configuration, and power is driving a new organizational structure for the organizations of democracy. It is argued that the command and control structure of bureaucracies is essential in technology adoption and diffusion among organizations and that as organizations adopt new information technologies the flattened network structure of information systems interacts with the hierarchical structure and results in a new structure. This new structure is comprised of a strong hierarchical backbone around and through which networks flow. That flow rests largely on the functionalities of the underlying information systems. The focus of the development of the organization is on knowledge flows and information transfer within organizations that maximizes the intertwined hierarchical and web structure.

TECHNOLOGY ADOPTION

Some argue that technologies are developed due to an inevitable evolution in the science and engineering knowledge base. An inventor simply has an idea, sparked by a random occurrence, and tries to follow the idea to fruition. Or, a culmination of knowledge reaches a tipping point and dots are connected that result in a new technology. Others argue that the demands of a society for tools that help in achieving tasks in a more

efficient manner drives technology development and adoption. An inventor perceives a need for a certain object and sets about trying to create and develop the object to fit the perceived need. A contract for a product with certain parameters and functionalities is issued and industry rises to meet the technological need.

Technology adoption is often as varied as its creation. Some technologies are adopted immediately, fitting exactly with a need or filling a gap. Some are adopted and used for a purpose entirely separate from their creation. Some technologies are adopted by an external force and imposed on reluctant users who augment existing systems or practices to fit the technology, sometimes resulting in disastrous disruptions and sometimes resulting in real efficiencies. And, some technologies sit on their inventor's shelves, objects of art testament to imagination but not to practice.

For the leader in a democracy, choosing a technology that has not yet been proven but is perceived to be valuable in the society and that has potential value in the governance process is an art and a risk. Equally, pushing for the development of a technology in which great investment must be placed without guarantee of adoption can result in huge wastes of public money and investments. For the leader, choosing the correct technology is imperative.

In the 1960s, the United States government invested in the Advanced Research Projects Agency Network, or the ARPANET. The purpose of the ARPANET was to connect electronic packets of data across a telecommunications line. This connection allowed for data to be transferred from one machine to another machine and eventually to multiple machines in a single communications exchange. Ultimately, the ARPANET became the

Internet, arguably one of the best communications technologies in history and arguably an excellent investment in technology on behalf of the government.

As the Internet evolved, so did the government's use of it. Clinton's 1998 Government Paperwork Reduction Act served as a directive for the government to move essential documents into an electronic format that could be transferred over the Internet (Clinton 1995). In 2002, George Bush signed the E-Government Act, which prompted the agencies of government to move essential business practices into a format that would allow for citizens to conduct operations like paying taxes and applying for certain licenses over the Internet (Bush 2002). Barack Obama's first act as President on January 22, 2009 was to introduce the Transparency and Open Government Directive, which is prompting the use of interactive Internet technologies by government to increase efficiencies in government and to engage citizens in a new format (Obama 2009).

Arguably, each of these acts of the Presidents motivated a shift in the operations of government. These shifts are associated with a difference in the costs of completing the business of government and in democratic outcomes for citizens. For Clinton, the shift was from a government that dealt primarily in paper communications to a government that incorporated electronic communications into operations. The costs associated with producing large amounts of paper were reduced with the ability to publish information on the Internet and citizens had greater access to documents through web pages and electronic communications. Bush prompted a shift from "bricks and mortar" government to e-government. The transaction costs of doing business with the government were greatly reduced and multiple democratic outcomes have been estimated including citizens engaging in regulation development via the Internet, citizens communicating with elected

officials through email, citizens accessing government data available electronically, and others. It is not yet known what shift, if any, Obama has prompted with his Transparency and Open Government Directive.

In a series of articles included in the recently published book, *Governance and Information Technology: From Electronic Government to Information Government*, the authors explore the idea of an “information government.” The concept of information government (i-government) deals largely with understanding the flows of information within, to, and from government. The authors argue that the advent and use by the government of interactive information tools intended to increase access to government, provide opportunities for interaction with government, and increase transparency and the usability of government data, prompts a shift in governance form. The shift is one from e-governance which is characterized by electronic information exchange to complete a transaction to i-government which is characterized by information sharing and collaboration through interactive Internet tools.

This shift in governance suggests a transformation for agencies using technology as elements of pure service provision, as is their role in e-governance, to a primary role of providing tools to assist both government employees and the citizenry in accessing and using government produced data and information and interacting in more productive ways. The assumption is that by providing methods for employees and citizens to use data and information more productively, the government promotes greater internal efficiencies and increased citizen participation. Additionally, by providing data and information and tools to use this data and information, agencies promote growth and development through innovation.

In addition to changing government efficiencies and increasing potential for interaction on the Internet, some structural changes in the organizations of government are also expected. It is expected that the interactive nature of new technologies will “flatten” government by displacing the more command and control structure that is associated with bureaucracy with a more networked structure where power is dispersed among multiple participants of interactive processes. These networks are marked with more collaboration and participation by non-traditional government participants and partners and power is more equal. I-government presents innumerable implications for governance and those who govern, not the least of which is the organizational structure that emerges to support i-government and the potential for new methods of government-constituent relations.

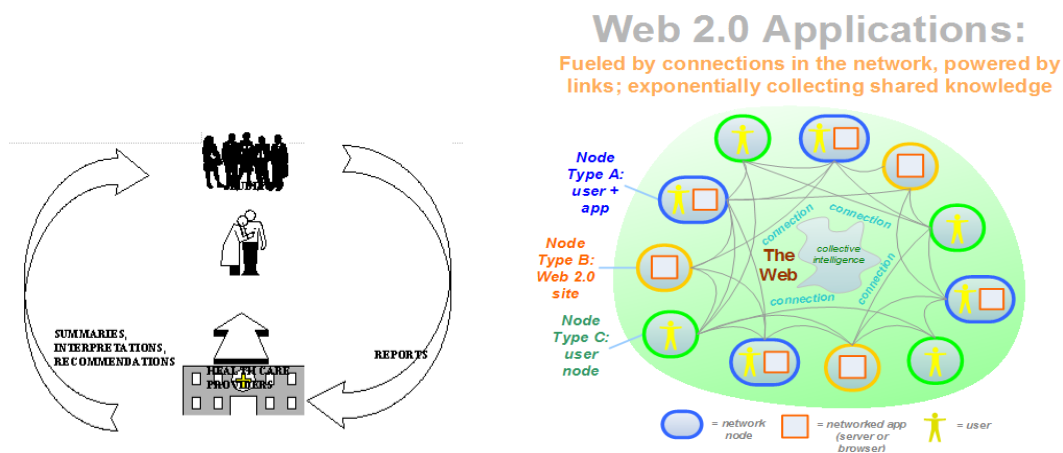
E-GOVERNMENT TO I-GOVERNMENT

An information government is distinguished from an electronic government in its focus on data and information use and management over electronic transactions or building mechanisms for electronic transactions associated with electronic government. Where electronic government is associated with electronic tools and manipulation of tools and software to build transactional capacity, information government is associated with tools that build capacity to exchange information. I-government differs fundamentally from e-government due largely to the differences in information flow. The structure of information flow in e-government is associated with a loop function, where information is exchanged in a closed transaction circuit. The structure of information flow in i-

government is associated with a web structure where data and information are shared among a network of producers and users of the data and information.

Depicted below is the e-government information loop where data and information are exchanged as part of a one way transactional process, for example paying taxes, applying for a license or permit, or a variety of other “bricks and mortar” functions that have been moved online. Alongside the e-government loop is an illustration of the information flow associated with i-government in which data and information are extracted from one web space via tool like a published code which tells users how to take the data from one government web space and link it to another web space and how to add any desired functionalities like a graphic portrayal of the data or a user defined listing of the data or some other function—a process that can be repeated by multiple users, much like adding a mobile widget to a series of web spaces.

Figure 1.1 E-Government Loop and I-Government Web



Source: Government Transaction Loop, www.doh.gov.za
 Source: Interactive Government Web, <http://web2.wsj2.com>

In addition to basic information flow differences, e-government and i-government are comprised of a set of differing characteristics. Those characteristics are defined by how data is managed and shared and the expected outcomes of data sharing. Thus, where e-government applications are seemingly developed to enable efficient, secure data transactions where the government controls the development of tools and the level of participation, i-government is dictated by a desire to exchange information in a method that is most useful to those engaging in data and information exchange. The government's role in i-government is to build a set of standards, or rules, under which data is shared and to provide base data and information to share. Users—both internal to the government and external to the government—decide how and what parts of data to share based on what best suits the purpose of data collection and sharing. I-government is much more about data accessibility and usability than transaction. Summarized in the following table are the primary characterizations of information flow and organizational structure that differ between e-governance and i-government.

Table 1.1 E-Government versus I-Government

E-Government	I-Government
Transactional	Collaborative
One-way information flow	Multi-path information flow
Business management	Knowledge management
Government defined	User defined
Command and control	Networks
Proprietary	Open standards
G2C, C2G, C2C	We

Understanding the e-government platform is important because it provides the platform on which i-government will be analyzed and built—potentially. Some of the tools associated with i-government include wikis, blogs, web conferencing, videos, collaborative spaces, and social networking applications. They also include application programming interfaces (APIs) that allow access to code for data mashups, widgets, and webpage interfacing and data management tools like data extractors and real-time data mirrors. Each of these tools provides access to and different methods of extracting and manipulating data and information provided by the government. The goal of these tools is to provide an easy entrée to a trusted data and information source and the tools to use that data and information in ways specified by the users—within standards and parameters set by the source (government) to promote collaboration, cooperation, and information development and exchange.

Many current and successful instances of development and use of information sharing tools exist. Some examples include internal governmental wikis like Congresspedia¹ and Intellipedia² and Diplopedia,³ external governmental data APIs, like those found on the Office of Management and Budget (OMB) USAspending⁴ and OMB Watch FedSpending⁵ websites, governmental blogs like those found at Gov Gab,⁶ governmental social networking tools like GovLoop,⁷ and government in the virtual world of Second

¹ Congresspedia: <http://www.sourcewatch.org/index.php?title=Congresspedia>

² Intellipedia: <https://www.cia.gov/news-information/featured-story-archive/intellipedia-marks-second-anniversary.html>

³ Diplopedia: <http://www.state.gov/m/irm/ediplomacy/c23840.htm>

⁴ USAspending API Documentation: <http://www.usaspending.gov/apidoc.php>

⁵ FedSpending API Documentation: <http://www.fedspending.org/apidoc.php>

⁶ Gov Gab: <http://blog.usa.gov/roller/>

⁷ GovLoop: <http://www.govloop.com/>

Life,⁸ and data mirrors like those in the Federal Procurement Data System.⁹ These instances are characterized by a conscious effort to share information and promote collaboration and cooperation among agencies, between government units and contractors, and among citizens. Some, like USAspending and the Federal Procurement Data System were created by legislation,¹⁰ while others, like Diplopedia and GovLoop arose from an internal desire of government.

The adoption of and use of information sharing tools associated with a move from an e-government to an i-government has several implications for the structure of government. This structure is associated largely with function and use of government. E-government involves the exchange of information in order to complete a transaction among individual citizens and the government and essentially places exchanges and transactions that would commonly occur in the physical world online. A similar transactional based system exists for government to government and government to business transaction. In these transactions, the government is viewed as providing a service or access to services for citizens, other governmental units, and businesses where the government organizational structure is simply augmented to allow for “business” to be conducted online. E-government is associated with a common vertical or hierarchical structure.

I-government is more about information exchange and sharing, about building a trust system and developing methods for exchanging information and promoting cooperation to create new ideas and new information. This sharing of information to promote

⁸ Second Life Government Examples: http://wiki.secondlife.com/wiki/Real_Life_Government/Examples

⁹ Federal Procurement Data System: <https://www.fpds.gov/>

¹⁰ Legislation like the Federal Funding Accountability and Transparency Act of 2006: <http://thomas.loc.gov/cgi-bin/query/z?c109:S.2590>

cooperation and collaboration looks very different than information exchange to complete a transaction. Transaction promotes an information loop—a finite, confined circle of information exchange between two parties. Information sharing promotes an entire ecology of information—movement and sharing of information among individuals that extends beyond one enclosed instance, incorporates new players in the diffusion and creation of information, provides new pathways for information sharing and development, and contributes to an entire information environment and organizational structure. I-government is associated with a more horizontal or flattened structure.

RESEARCH QUESTIONS

The goal of research is to understand the implications, if any, of i-government. The primary question for research is: as governments incorporate new interactive Internet technologies into government, is a shift from e-government occurring. If so, what is the nature of that shift? Is the shift organic, the incorporation of new technologies into government rising from an innate desire among the people, or is it an exogenous force recognizing a culmination of knowledge resulting in new technologies prompting their adoption? Is the shift, if there is a shift, superficial, something talked about in government memos and in rhetoric, or does it extend to the architectures of agency web spaces that support the new technologies? Changes, or lack thereof, are observed in both the legal and architectural infrastructure supporting interactive Internet technologies. The federal government of the United States of America is the subject of research.

A secondary question relates to the return on investment in these technologies. Does the perceived value associated with new interactive Internet technology manifest? And, finally, given findings from the exploration of any shifts in government form and from deriving any value in new technology adoption, are there discernable implications for the organizational structures of government or for democracy? The purpose of this research is to contribute to the conversation related to the transition from e-government to i-government and to understand any value associated with the interactive Internet tools at the core of that shift.

An hypothesis of research is that the majority of government adoption of new interactive Internet technologies is not organic to the populous—arising from an expressed need or desire of the people—but inorganically prompted by an executive governing body.

While examples like Intellipedia and Diplopedia, interactive technologies adopted by internal agency motivation, exist, it is thought that most government agencies will be prompted to explore and adopt technologies to meet a demand set forth by the executive.

An example of this exogenous adoption is USASpending. OMB Watch developed FedSpending as a mechanism for citizens to track annual spending of the federal government. They used the budget database provided by the Office of Management and Budget. OMB Watch added programming interfaces into their website so that users could connect the data to other websites and built visualization tools so that users could make visual sense—create graphs and charts—of the data.

In 2006, Bush passed the Federal Funding Accountability and Transparency Act (Bush 2006). The Act called for similar capacities as existed in FedSpending. Because time was short to implement the Act, the federal government employees responsible for

implementation contacted OMB Watch and developed a partnership with them to institute their technology within the OMB. The legislation motivated the OMB to adopt and deploy the new technology. It is thought that at during this beginning phase of new technology development, similar legislative and government directives will instigate the adoption of new interactive Internet technologies.

A second hypothesis of this thesis is that a new information architecture—the way information is used and spread throughout a community of users—arises from the use of interactive Internet tools. That architecture is specific to the use of interactive information sharing tools and i-government and distinct from the information loop and transactional nature of e-governance. This new architecture is predicated on the ideas of employing information tools to promote data and information accessibility and usability and collaboration, and the architecture changes based the information tools available for use. It is hypothesized that its shape is more like that of a neural net with varied paths and chains, points of entry and exit, and layers of information.

A third hypothesis is that there is value created through the use of information tools in the form of greater internal efficiencies and increased citizen participation. The value created arises from lowered barriers to entry (access to data and information via a trusted data source) which has the potential to increase participation in government while potentially lowering the burden on government that the increased participation might suggest. Additionally, the use of information tools like wikis and other interactive tools has the potential to increase cooperation among and within governmental bodies and contractors through data and information exchange, and the promotion of new knowledge

creation stemming from collaboration. However, these value measures have not been developed for i-government.

OVERVIEW

In the literature review, the organizational literature associated with government organizations and the Internet is explored. The literature is explored in three different themes, literature associated with the early experiences of the organization of government and the e-government transactional Internet, current experiences of potential i-government and the interactive Internet, and technology adoption and the markers of organizations and the interactive Internet. Provided in the literature review are the key assumptions for observation in exploration of research questions.

The third chapter addresses the research question of the shift from e-government to i-government and the organic or inorganic development of interactive Internet tools at the federal government level follows the literature review. Analysis to address this question involves an in depth assessment of the technologies developed in association with the Open Government Directive, set forth by the Obama administration in January of 2009. In the Directive, Obama called for greater transparency, participation, and collaboration in government. The documents supporting the implementation of the directive explicitly call for posting of data in electronic formats and specific use of technology in the implementation of the Directive. Examined within the chapter are resultant technological differences in technologies developed by the federal government pre and post Directive. Related in the findings are the nature of organic or inorganic nature of technology

development and adoption and the potential impacts on federal organizations. Also provided in the chapter is the context in which interactive information technologies are developed within the federal government.

Discussed in the fourth chapter are the architectural differences between the transactional Internet and the interactive Internet that occur when deploying new technologies in the federal government. Three paths of development are considered, those for transparency, participation and collaboration. For transparency, the primary observation relates to the differences in data for transactional purpose as compared with data to support interactive development of data sets and data tools. For participation, the observation relates to the ability to comment or email in communication efforts as opposed to the more interactive process of submitting ideas, having the ability to rank ideas, and contribute to the decision making process. For collaboration, the observations relate to the ability to use personal expertise to contribute to government. Findings indicate that architectures for new interactive technologies are different, but that the development of architectures for participation efforts suffers in comparison to transparency and collaboration efforts.

Evaluated in the fifth chapter are the constructs of the value conversation surrounding the implementation of new interactive Internet technologies. The conversation occurs in three primary venues. The first venue is a discussion of the assessment of information quality as an evaluation method for i-government. The second is the relationship between customer service satisfaction and the impact of the implementation on interactive Internet tools. Additionally explored is the emerging constructs that agencies use to identify the value of interactive technologies within and among themselves. Used for analysis is a difference in difference model to explore returns to customer service.

Questions explored in the chapter relate to the return on investment in those interactive technologies and shed light on the value constructs surrounding the implementation of interactive Internet technologies.

The conclusion addresses the findings for initial questions of research, the shift from e-government to i-government and the organic or inorganic nature of technology adoption and diffusion, the structure of the resultant architecture, the value constructs of new interactive Internet technologies, and implications for the impacts of technology adoption on the organization. Also included are the implications for policy makers interested in adopting and deploying interactive Internet tools.

CONCLUSION

In the end, two observations remain. I-government differs from e-government superficially and architecturally. For the most part agencies develop and adopt new interactive technologies as prompted by legal instruction set forth by the Executive through the command and control hierarchy. Initially, the core functionality of these new interactive technologies directly relates to the values held within the infrastructure and the desire of the agency to constrict power. However, as agencies comply with the command to incorporate new technologies into the organization to provide and develop high quality information and data and as used by employees and by citizens, a network structure develops around the organizational backbone. This combination of network and backbone are the base for a new organizational structure.

Secondly, understanding any democratizing effects of the new interactive technologies lies heavily on the assumptions of the definition of democracy. If democracy is understood as people involved in the decision making process of government, then, by and large, these new interactive technologies are not motivated for democratic purposes. Rather, they are motivated by policies for organizational development as well as policies for democracy. The democratic language that surrounds their promotion can be thought of as essential components of acculturation for the adoption of new technologies. The role of value in that process, then, is to promote buy in of organizations and citizens to adopt and use technologies to promote development and growth.

In emerging i-government, government organizations enable both internal and external access to high quality information and data that is combined with tools for use while acting as the core infrastructural component of that interaction. They retain and even gain power as interaction around them ebbs and flows and as trust is placed in the data and information they provide. But, they share some of the core responsibilities of agency and spread decision making over a broader group of citizens and partners and they spur innovation. As the command and control structure interacts with the network structure, a new organizational form emerges. That organizational form is a Nexus, where the organizations of democracy are central and where new elements of democracy emerge.

Chapter 2: Transaction Meets Interaction

INTRODUCTION

The broad theoretical question of the dissertation relates to organizational design and development and the interaction of information technology adoption with organizational design and development. The argument of this dissertation is that the nature of the technologies, specifically interactive Internet technologies, being adopted by government and associated with i-government allows for an organizational form that has existed in pieces in other theories of organization, but that differs from the assumptions made by previous theorists, refined and emergent as a new organizational form. The organizational form suggested in this work is a combination of two theories in the body of organizational literature. The first theory is that of technological enactment put forth by Jane Fountain in her work on the organizations of e-government and the second is the theory of networks associated with i-government.

Weberian bureaucracy dictates a command and control structure wherein power is concentrated with a few individuals at the top of a hierarchy and distributed through a strict rule-based system that is defined by a series of strict protocols (Weber 1991). In a less strict sense, the modern Weberian bureaucracy may be interpreted as a form with organizational systems theory where organizations are understood through the structure, relationships, and interdependence between and among these two bodies (Katz and Khan 1966). The Weberian structure rests upon an understanding of government as a siloed

service provider whose system of relationships stems from the military construct. For e-government and i-government, the unpinning structure of the information or electronic system is the structure of interest and the change in relationships and the relationship structure is the component of research interest. As reflected in the structure of the electronic and information systems, it is assumed that the organizational form will consist of a vast network that will be disruptive to the Weberian command and control structure.

Networked systems theory, as applied to e-government and i-government, struggles with the reality of the organizational assumptions like Sleznick's cooptative mechanism, in which the organizational structure is forced to adopt a policy or technology because of threats to its existence and builds on theories like Barnard's informal organizations within formal organizations (Sleznick 1939 and Barnard 1938). For government organization, the technology adoption process often occurs because of legislation or technology push factors that arise from a sense of competition and employee or citizen demand. But the responsibility of government is to be a convener and broker of knowledge, as outlined in i-government. This role as broker encourages interaction with individuals and structures that would be considered non-traditional in the Weberian sense. New relationship structures arise that connect flatter, non-hierarchical participants in informal networks through new paths of information exchange. As Barnard would suggest, the organization must absorb these new forms and adapt.

This adaptation, as facilitated through e-government and i-government systems, results in new decision structures that resemble Follett's circular order patterns in the bureaucracy. Because of multiple and new points of knowledge exchange and because of increased access to information as provided through electronic information systems, actions and

orders start at multiple levels and move through circular patterns between and among managers, employees, and citizens as the chain of action through the formal and informal networks is completed. The hierarchical, linear construct of the bureaucracy adapts, but because the predilection toward cooptation, through the legislative mandate and presidential directive authorities, does not fully lose its form.

The argument in this dissertation is that the emerging governmental organizational form is based on the network-like nature of the technology adopted, by and large information technologies for interaction and knowledge management, and on the Weberian bureaucratic form. It is also argued that the values of interaction associated with those technologies co-opt special meaning in democratic organizations through resonations with democratic values, like interaction and participation. The enmeshments of cooptative properties combined with informal and formal networks that operate with Follett's circular orders construct in the democratic landscape construct a unique organizational form.

The organizational form that emerges with new interactive Internet technologies is a hybrid form between that of hierarchical Weberian bureaucracy and a flat network. It is a Nexus. The government Nexus is a primary convener for information and knowledge, backed by some of the command and control structures of a Weberian bureaucracy and subject to the push or cooptative forces of technology but a beneficiary of innovation that arises from the informal organizations nee networks that form around the government backbone. It is housed on the structure of e-government, but uniquely constructed around the architecture of i-government.

BUREAUCRACY AND TECHNOLOGY ENACTMENT

The seminal work on government organizations and e-government, or the introduction of electronic systems into government organizations, is *Building the Virtual State: Information Technology and Institutional Change* by Jane E. Fountain. In her book, Fountain discusses the nature of bureaucratic organizations and methods for adoption of information technology. She develops a model for the digitization of government organizations which she terms government organization “enactment” of information technology. As part of her enactment model, she outlines a process for information technology adoption and the expected outcomes for the organization of government. Several secondary works have expanded on or refuted her theoretical model of government enactment of information technology and the resultant effects for the government organization.

In her book, Fountain lays out the expected effects to the organization of implementing information systems as part of e-government. Her foundational principles rest on the Weberian definition of bureaucracy. In Weberian bureaucracy, jurisdictional units are subject to law and administrative rules. The activities of these units are carried out as a series of official duties by those who have the authority to administer commands. Both authority to give commands and commands are distributed in a consistent and stable manner. When these elements of authority and commands fall within a jurisdictional unit, Weber terms it a bureaucratic form. When executed in an office, within the office exists a hierarchy that dictates a system of superior and subordinate among personnel. The office is governed by a strict set of consistent, stable rules that is comprehensive and exhaustive (Weber 1991). Fountain relates Weberian bureaucracy to the command and

control organizational structure and claims that it is this structure that supports the government system.

Fountain notes that there are criticisms of the Weberian model. Specifically, she cites research by Richard Cyert and James March, researchers of firm behaviors, that determines that individual actors pursue their own interests outside of the organizational goal or mission (Cyert and March 1963). She also notes that these individual behaviors do not interrupt the politics of the bureaucracy. And, she brings in the counter – theoretical idea that firms are known not to always follow the rules (Wilson 1989). She notes that, although there are some counter-arguments, with few additions or modifications, the Weberian Bureaucracy is representative of the Bureaucracy of the 20th Century and of the Industrial Age (Fountain 2001a, 51). She then outlines the qualities that will change in a bureaucracy as new information technologies are adopted.

As bureaucracies digitize, Fountain predicts that that systems of information will overtake the systems of people in the organization, power hierarchies will cease to exist. Teams, comprised of members that are multi-skilled and who multi-task, will arise that carry out the work of the bureaucracy via electronic means. Information will be stored an accessible, able to be transmitted instantaneously. The coding rules of the information system will dictate the rules of the organization and data and information activities and processes, as well as interaction with fellow employees and citizens will occur in real-time. The command and control structure will be reduced to the configuration of the information system which underlies it (Fountain 2001a, 60-64). She considers this model a model of the market and opposes it to the model of Weberian hierarchy.

Table 2.1 contains Jane Fountain’s comparison of Weberian and of Virtual Bureaucracies.

Table 2.1. Jane Fountain’s Comparison of Weberian and Virtual Bureaucracies	
Elements of a Weberian Bureaucracy	Elements of a Virtual Bureaucracy
Functional differentiation, precise division or labor, clear jurisdictional boundaries	Information structured using information technology rather than people; organizational structure based on information rather than people
Hierarchy of offices and individuals	Electronic and informal communications; teams carry out the work and make decisions
Files, written documents, staff maintain and transmit files	Digitized files in flexible form, maintained and transmitted electronically using sensors, bar codes, transponders, hand-held computers; chips record, store, analyze, and transmit data; systems staff maintain hardware, software, telecommunications
Employees are neutral, impersonal, attached to a particular office	Employees are cross-functional, empowered; jobs limited not only by expertise but also by the extent and sophistication of computer mediation
Office system of general rules, standard operating procedures, performance programs	Rules embedded in applications and information systems; an invisible, virtual structure
Slow processing time due to batch processing, delays, lags, multiple handoffs	Rapid or real-time processing
Long cycles of feedback and adjustment	Constant monitoring and updating of feedback; more rapid or real-time adjustment possible

(Fountain 2001a, 61)

She notes that the expectation of information systems implementation is to disrupt the command and control structure of traditional government. And, although it had not yet

come into vogue, her model of the virtual state is much like the models of later organizational theorists who predict a network model of organization that was expected to rise with the digitization of organizations. In a network organizational model, command structures are flat as power is distributed among the total work force. Employees are multi-talented and can take on a variety of tasks and the organization relies on the rules of the underlying information system to guide organization activity and behavior. A network organization model is very similar to Fountain's virtual state. To test her idea of the introduction of information systems transformation of bureaucracy to virtual state, she develops a model of technology enactment.

TECHNOLOGY ENACTMENT

Fountain's goal in developing an analytic framework to understand the underlying qualities of transitioning to the virtual state arose from her desire to detail her primary assumption that individuals and institutions would enact new information systems and that that enactment would result in a virtual state. Fountain does not believe that organizations will adopt information systems in a manner that results in a flat, networked environment. Rather, she assumes that within that enactment—in the state current to her research—the rules, routines, and norms, along with the power infrastructure, would be reproduced in the information systems adopted and enact a virtual bureaucracy. Fountain suggests a process by which organizations become virtual organizations. She also suggests that over time, and with the influences of exogenous forces, agencies will eventually transition to a virtual state that is a more networked space. Her propositions for observing the transition to the virtual state include:

Proposition 1: Government agencies will resist the potential for dramatic efficiency gains if those gains translate into loss of resources (budget and personnel) for the agency.

Proposition 2: Federal interagency networks will be difficult to build and maintain because the formal institutions of the federal government reward agency-centered activities and discourage cross-agency activities.

Proposition 3: Agencies lack resources for learning to use information technology.

Proposition 4: Intergovernmental and public-private networks will over-shadow cross agency information technology based networks because the institutional context favors those arrangements more readily than cross-agency federal networks.

Proposition 5: Agencies are likely to focus reform efforts on constituents, or “customers,” who are also potential or actual strategic allies in the appropriations process.

Proposition 6: The nature of changes necessary to develop a network will affect the probability of success of the effort.

Proposition 7: The culture, history, mental models, and standard practices of a policy domain or agency will affect technology enactment—that is, whether and how an agency uses the Internet (Fountain 2001a, 102-103).

Within the technology enactment framework, agency structural and power shifts occur largely due to unintended, subtle changes that occur as technology is adopted. However, these shifts are prompted by the users of technology and their use of technology, not the opposite where technology dictates the power shift. Exogenous forces affect the organization that encourages technology adoption and use of technology affects operations, but it is the organization that enacts technology. And, the technology is reflective of the organization.

Fountain applies the technology enactment model to a series of case studies, including an analysis of the Department of Defense. In her case studies, she finds that that early e-

governance still resembles the old command and control structures and has done very little to “break down the silos of government information (Fountain 2001a).” The bureaucratic form holds and the information systems reflect that bureaucratic pattern. In a later study, Andrew Chadwick agrees with Fountain’s assessment. Chadwick argues that the core of e-government lies in the focus on providing transactional services and that the failure to create cross-agency coordination lies in the fragmentation of process and products. Cross-agency collaboration is not used as a service provision mechanism (Chadwick 2006). The bureaucratic, hierarchical system has translated online into transactional information systems.

Fountain could not anticipate the full command and control gesture of the Congress of the United States in coordination with the President of the United States in mandating adoption of information systems across agencies—as occurred in 2002, just one year after Fountain’s book was published. Had a major command gesture not come from both directive bodies of government, Fountain’s model would more than likely be emblematic of the actual progression of e-government, were there a progression, in which the power struggles, rules, and operations of agencies played out in their information systems. However, with the brute force push to agencies to adopt information systems, agencies did adopt streamlined and consistent information systems. These systems were formed largely in relationship to their business information system counterparts. And, while they remained transactional in nature, in part that nature reflected the processes of information systems in the business world, which were used to conduct business transactions.

The inclusion of Fountain’s work is not suggestive of a research product wherein a test of her technology enactment model or a test of i-government using her model is conducted.

Instead, Fountain's work offers an idea of the extremes of organizational structure that were present at the beginning of e-government. Researchers predicted that with the introduction of information systems, agencies would lose their hierarchical form and become flat network operations. Much discussion occurred around the idea of the flat organization and managing within it (Goldsmith and Eggers 2004 and Agranoff 2007). Fountain includes an entire section in her book where she addresses the ideas that there may be a form outside of the hierarchical form and not quite the market form on which the virtual state is based. But no model organizational existed then or exists now for that form. It is a goal of this research to explore that form as related to the shift from e-government to i-government.

Additionally, it should be noted that until Fountain put forward her theory that organizations enacted technology and that technology did not enact organizations, thoughts existed that organizational form would be dictated by the information system of the organization. Fountain's work set the precedent and the benchmark for thinking about the digitization of government organizations, the adoption of technology and the effects to organizational form. And, acknowledge the idea that bureaucracies have some independent agency and form that exists outside of their technology. Technology is representative of the agency and the constituency, not the contrary.

The second work of interest for this dissertation is *Governance and Information Technology: From Electronic Government to Information Government*. In this work, several thinkers of information technology incorporation into government, including Jane Fountain, posit the idea of a shift from e-government to i-government. This shift accepts that information systems have been adopted by government and offers glimpses of the

constructs for the shift from e-government to i-government as seen in the flow of information within government, between government, and between government and citizens (Mayer-Schonberger and Lazer 2007). It is an argument of this dissertation that information flows of government that are associated with e-government are changing with i-government from a transactional flow to an interactive flow. That change in the nature of the flow of information has implications for the organizations of government. Additionally, explored within this dissertation are the change in value constructs for transactional information flows and interactive information flows.

Tertiary works that build on or off of Fountain's work include *Public Information Technology and E-Governance: Managing the Virtual State* by G. David Garson, *Digital Government: Technology and Public Sector Performance* by Darrell M. West, *Governing by Network: The New Shape of the Public Sector* by Stephen Goldsmith and William D. Eggers, and to a lesser extent *Government 2.0: Using Technology to Improve Education, Cut Red Tape, Reduce Gridlock, and Enhance Democracy* by William D. Eggers.

These tertiary works emphasize the idea of government as operating within a flat network where power disruptions are the norm and where networks of influence matter more than the command and control structure of the bureaucracy. Efficiencies are brought about by technology to clear away the barriers of the old command and control structure and there is an idea of the possibility of citizens becoming every day inter-actors in the business of government. In many respects, the daily operations of government become democratic activity. And management happens by developing networks within and across agencies and citizens to complete the tasks of government. The decision making is flatter and the systems of import are the underlying information systems of organizations.

Newly emerging works that are also associated with i-government include *Governance and Information Technology: From Electronic Government to Information Government* and *Wiki Government: How Technology Can Make Government Better, Democracy Stronger, and Citizens More Powerful*. *Governance and Information Technology* is a series of essays that talk about the end of the e-government era and the beginning of the i-government era. For the most part, authors note that e-government did much to make governments more efficient and reduce the costs of service provision, but very little to increase responsiveness and participation in government or support a participatory Internet architecture. Then they begin to discuss a path forward where information and knowledge exchange over multiple devices and with an emphasis on usability and open source will lead the path to i-government. They note that the utopian vision of Internet as a direct method for democracy is limited by the unwillingness of agencies to produce web spaces that do much more than perpetuate the mission of the agency or the goal of service provision. They find hope in new interactive technologies in that they will increase information flows and knowledge generation between government and citizen.

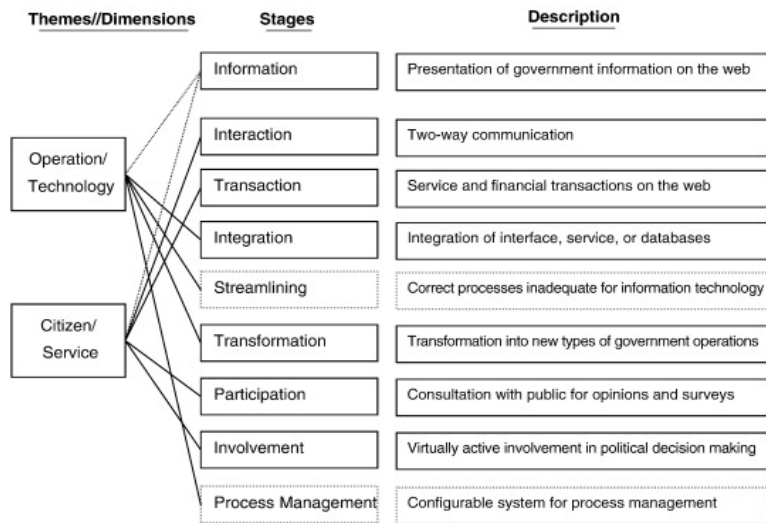
In *Wiki Government: How Technology Can Make Government Better, Democracy Stronger, and Citizens More Powerful* Beth Simone Noveck introduces the idea of collaborative democracy. Through the lens of the Peer-to-Patent project, a collaborative partnership between New York University and the United States Patent and Trade Office to incorporate citizens in the patent review process, Noveck displays the power of citizens engaging with the government and using their professional skills to achieve a better outcome for government. These new works are concerned with exploiting interactive Internet tools to benefit the state and enhance democracy. These benefits

relate to increased knowledge creation and flow and the development of uncommon partnerships to achieve goals of governance. While they do not specifically address the organizational structure of i-government, they do give insight into how the government employs new interactive Internet tools and how the products of that employment play out within the organization.

PHASING IN E-GOVERNMENT, ITERATION INTO I-GOVERNMENT

Jungwoo Lee, in his “10 year retrospect on stage models of e-Government: A qualitative meta-synthesis” introduces a conceptual framework for the phases of technology adoption involved in transitioning to e-government. Lee developed his framework by consolidating ten years of proposed e-government transition models from various authors. Two important themes run throughout the literature on the phases of transition to e-government. The first is that of the role of the citizen in the transition. The second is the staged process of transition phases—staged in that one process must occur before the next. In the following diagram, Lee portrays the relationship between the operational and technological and citizen and service themes of e-government in relationship to their place in the stages of development of e-government.

Figure 2.1 E-government Transition Themes

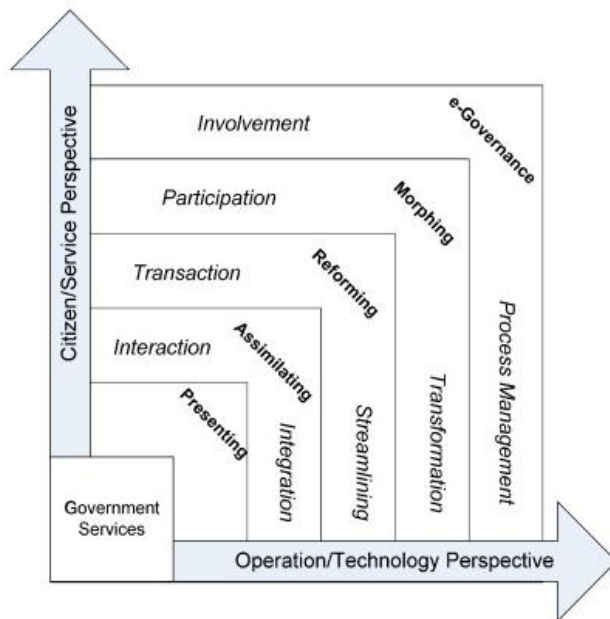


Source: (Lee 2010)

In his model, the agency adoption of technology occurs in tandem with citizen use and incorporation in the process. In all phases, the citizen activity follows the technology adoption and the citizen and agency are subject to the transition process—each acclimating and responding to the phased system. While this is an extreme simplification of the transition process, it highlights one specific quality that differs greatly with i-government. In i-government, the citizens and employees of the agency not only adopt the technology in a cyclical fashion, they adopt it in an iterative fashion—meaning that the citizens and agency participants can give feedback on and even create data and information, even technologies as the organization transitions to i-government. The process of transition is one in which agencies and citizens are fully engaged in the development of technology and in the adoption process.

The second major difference of the transition process to e-government is the staged phasing of transition. Lee presents a consolidated diagram of models of e-government process proposed over the last ten years. Across models, transition was staged in nature, as shown in the following graphic. In the left branch of the diagram (Figure 2.2), Lee presents the perspective of the citizens. In the processes of implementation of e-government, citizens perceive four different stages. Those stages include interaction, where the government presents information about information systems being adopted, assimilation where citizens are able to access information about an agency from an agency website, participation where citizens can apply for and receive services, and involvement where citizens are able to engage in some rule-making activity. From the government perspective, the first stage of technology implementation involves identifying software and systems components that can be integrated across agencies or across existing systems, the second phase involves streamlining systems for consolidation and systemization of technology, the third phase incorporates new functionalities like web fronted databases into websites, and the fourth phase incorporates citizen feedback mechanisms.

Figure 2.2 Phases of E-Government



Source: (Lee 2010)

At the end of the phase structure, the organization has transitioned fully into e-government from a technological and citizen perspective. Lingering items like culture change for the complete structure may be lagged slightly, but it is expected that culture will catch up to technology and will have driven some of the technology adoption. The gradual, but consistent adoption process will push agencies toward the endpoint.

For i-government, the transition process will be significantly different from e-government. Because i-government technologies do not necessarily have a known business value, like the cost-benefit and increased efficiency and effectiveness associated with e-government, and because much of the technology associated with i-government is

not adopted consistently or systematically, many more organizational cultural cues and expertise come into play. Adoption occurs nearly exclusively as Fountain would suggest through individual actor motivation, but as stated previously also involves iteration. Each agency may go through Lee's transition process several times, mostly associated with new technology incorporation, before making a complete transition to i-government. And some agencies, even with a mandate to adopt technologies, will only superficially adopt technologies into the organization until those technologies or the interaction associated with the technologies become essential to achieving agency missions and goals. In this respect, the first order of change is a cultural change. Indeed, when initially introduced in government, i-government and the push for adoption of interactive technologies was couched in the culture shift to Open Government.

Where the primary organizational literature of e-government relates to technology adoption and systems changes, the primary literature associated with the early stages of i-government relates to impacts to organizations due to the nature of the technology adopted. At the core, as adopted at the level of the federal government in the United States, the shift from e-government to i-government is a shift from systems adoption to concept adoption. Explored in the following section are some of the changes in governance concepts that may arise in the shift from e-government to i-government.

THE VALUE CONSTRUCT

For any technology adoption to be sustainable and for agencies to buy into adoption, value must be found in the technology. Jane Fountain looks into the early adoption of

electronic technologies and cites these technologies as being used to communicate messages and static information across organizations, which is viewed as being motivated by the ability to increase the responsiveness of government or increase the power of the state (Fountain 2001a). As the government provides information, it is perceived as being more responsive to citizens and as it becomes an information source people turn to for expertise, it gains power. The benefits to the state are not only found in increasing effectiveness of general operations, but there is a return in customer service valuation and in state power. These customer service and state power gains are value characteristics of both e-government and i-government. Power returns to the state are an intangible effect of technology implementation that is difficult to evaluate.

In e-government, because technology is used to structure the conversations and transactions within government and from government-to-citizen and government-to-business, success is most often measured by observing lowered transaction costs or increases in production chains (Fountain 2001a, see also Garson 2006, and West 2005). By moving some of the services of government online, like provision of information, provision of tax forms, applications for services and licenses, benefits estimations, some human resources functions like applications and basic testing, some training sessions, and other services, the costs associated with those services being offered in the physical world are lessened given the use of large databases and other media services. These cost decreases can often be observed in real budget inputs and outputs. Thus, as systems were adopted a justification of adoption was that these cost saving would produce value for the government organization.

Gunasekaran, Ngai, and McGaughey argue that there are several categories in which evaluation of implementation of information technology systems in organizations fall. Some of these categories include cost-benefit, strategic impacts to organizations, operational performance of the system, outcomes of the system—both tangible and intangible, and financial inputs and outputs of the system (Gunasekaran, Ngai, and McGaughey 2008). The financial inputs relate to decreased transaction costs for citizens and decreased service costs for government. Cost savings are observed tangibly in budgetary statements, while the intangible citizen service is evaluated in customer service evaluation and in case studies of effects to citizens of easier access to government services. They also comment that agencies construct justifications for systems implementation by identifying increases in agency effectiveness at service provision and efficiencies with information management given certain information systems.

Richard Heeks argues that benchmarks be created around phases of information systems development and that in the evaluation stage, the ability of the government to meet the information and service demands of the citizenry is a major component of systems success and that use data provides a glimpse into understanding success at meeting public demand. Others argue that access, service provision quality, and systems sustainability are primary components of information systems value. There is no clear evaluation strategy to determine the value of e-government, but it is understood that there will be increases in service value and decreases in transaction cost with the implementation of e-government systems (Fountain 2001a).

In i-government, very little is known about how value will be calculated. To some extent, measures of efficiency and effectiveness for organizations are important as a

budget justification for introducing and maintaining the information technologies associated with i-government. Martin Eppler argues that information quality will be a marker of value for i-government. He defines information quality as “a condition where the content and its media provide high value to the information producers, administrators, and consumers. Information quality means providing the right information, in the right format, at the right time, at the right costs, to the right people (Eppler 2007, 244).” He argues that if information quality is perceived as low, among other issues, trust in the organization and use of the organization’s online services decrease. Individuals trying to use information that is not clear, incorrect, or that is not of high quality may get frustrated and insist on using only those resources found in the physical world, may burden the organization with calls and other service requests that could be satisfied via an online format, and possibly retaliate by bringing litigation against the agency. Each of these activities increases costs to the agency in service provision and possibly legal fees. Eppler argues that information quality can be observed through customer service surveys, technology usability sessions, and focus groups where questions related to website information usability and value are administered (Eppler 2007, 242-243).

In addition to information quality, value is also expected to be derived in the provision of tools that promote usability of government data and information (Tornatzky and Klein 1982). As e-government was introduced the concept applied to adoption of information systems by government agencies (West 2005). As i-government is introduced, the concept has begun to apply to the data and information presented on government agency websites. Tools to manipulate and visualize data and information are often presented in tandem with data and information to make it easier for citizens and customers to access. In addition to usability, the Obama administration has identified innovation as a value

product of i-government. He houses an innovation gallery of technology products associated with i-government on the main White House web space. This innovation occurs within and outside of the government body using data and information provided by the government (Chopra and Chopra and Vein 2011). There are currently no value metrics for innovation that are used by the government.

E-GOVERNMENT, I-GOVERNMENT, AND CITIZEN PARTICIPATION

At the same time, as transactional information systems were incorporated into government, the concept of citizen as customer arose. Government agencies were encouraged to adopt the citizen “client” or “customer” model of effective management practice found in the private sector into government organizations (Fountain 2001b). The business argument for implementation of information systems was encouraged to derive more customer value for citizens as citizens would be able to access their government from anywhere at any time, to gain information and to conduct the business of being a citizen. The business of the citizen is usually considered to be applying for licenses and benefits, filing tax forms, requesting information and data specific to benefits and services, paying fees, applying for grants, and transacting citizen specific information. As the use of information systems spread and as the systems were sold as citizen service systems and as the functionality of the system was primarily transaction, the concepts of government-to-citizen, citizen as customer arose.

The concept of citizen as customer received criticism as there began to be a perception of stripping of the democratic relationship between citizens and government to one of pure

transaction. In his article “Is a Citizen a Customer?,” Joseph Pegnato argues that the citizen as customer concept is useful in promoting responsiveness and service, but that that the concept is limited in government as government organizations are founded in Public Law and not in “entrepreneurial market concepts” (Pegnato 1997). Brewer notes that narrowly defining the citizen role to customer may deprive citizens of the due process accorded to them in public law (Brewer 2007). He also notes that accountability as defined in business terms is far narrower than when considered in terms of the government-citizen relationship. The citizen as customer concept associated with e-government received criticism because it suggested a relationship between citizen and government as grounded in entrepreneurial activity rather than in public law.

The issue of utmost concern to organizations and researchers was that business concepts had begun to override democratic values. In the early days of e-government, the Internet was understood to break down the hierarchies of government. This elimination of organizational hierarchies was due largely to increased access for citizens to information at a time and place convenient to them (West 2005). With the Internet, citizens were no longer required to seek information and services at a time dictated by a government agency. They were free to access services and information unfettered by the machinations of the bureaucracy. In the early days of e-government, this freedom from the hierarchy of government was considered a new level of participation with government (Fountain 2001a). The ability to transact in a service capacity had become associated with the democratic act of participation. In *Code*, Lawrence Lessig notes that the design of online spaces favors consumers over citizens and business interests over citizen interests (Lessig 1999). This transformation of the concept of citizen as customer and service transaction as participation was not the citizen participation anticipated.

In i-government, role of business transactions and citizen as customer persists. But there is an additional layer added to the business relationship of citizen and government. In i-government, the citizen becomes a collaborator with government to assist in achieving the business of government. The goal of the citizen-government collaborative relationship is to improve the effectiveness of government (Orsazg 2009). The business relationship persists, but takes on new form. That form is derived from the customer relationship that businesses developed with consumers as interactive technologies like wikis became more prevalent in information systems. Crowdsourcing, as the phenomenon is called, was introduced to garner a multidisciplinary perspective and multi-layered solution to a given problem or idea of business (Howe 2009). Essentially, companies would post a call for a certain product or post a problem they were facing to an Internet site where anyone could respond to the call, post research in support of an idea, and eventually be a part of the solution. In business, there is usually a product developed or a monetary profit that arises from these crowdsourcing activities. In fact, they are often used as customer demand gauges and act as mechanism to perpetuate the business-customer relationship.

The concept of calling the crowds or organizing without organizing promoted the finding of experts and expert knowledge in uncommon places (Shirkey 2008). Eventually, a series of challenges that offered monetary rewards were put in place so that an incentive structure to garner the best ideas and people became a part of the crowdsourcing architecture. In i-government, the government engages in similar activities wherein they make a call to citizens to share their expertise with the government to help address a specific issue or problem, and sometimes to achieve a government goal or mission.

Equally, parameters for incentives programs have also been established. In some respects, this crowdsourcing could be considered democratic participation—citizens volunteering their services on behalf of the government. Democracy involves a long history of volunteerism. But, in other aspects, crowdsourcing can be construed as extending the entrepreneurial business customer relationship.

It was expected that e-government would allow more opportunities for citizens to participate in government decision process via an online format in ways that differed from participation in the physical world. In 1994, Steven Clift created the term “e-democracy.” He defines e-democracy as, “E-Democracy is the use of information and communications technologies and strategies by “democratic sectors” within the political processes of local communities, states/regions, nations and on the global stage.” He defines “democratic sectors” as government, media, the citizenry, elected officials, and civic spaces, and “political processes” as provision of information as related to citizen communication, political activity, and campaigns (Clift 2003). These political processes are above and beyond the processes that citizens would encounter in the physical world in that citizens could gain access to any process online at a time and place convenient to them. The conceptual outcome of the online environment is to place the citizen in the center of civic life so that government decisions are improved, trust in government is increased, and stakeholders are involved in new ways of meeting public challenges (Clift 2003).

However, when democracy is discussed in relationship to e-government, it is discussed in terms of the ability of citizens to vote online or the ability of citizens to email or connect with public agencies through an electronic format. Darrell West tells readers a story of

“direct” democracy that occurs online. The Mayor of Baltimore was debating with a local artist over which color to paint the Hamilton bridge. The mayor wished for a Kelly green bridge, where the artist wished for a rust red-brown color. The mayor decided to take the decision to the people and called for an online vote to determine the color of the bridge. Over 5,000 citizens cast votes to decide the bridge color. Forty-eight percent of people voted for Kelly green and 52 percent voted for rust red-brown. The mayor conceded his loss and painted the bridge the rust red-brown (West 2005). Through an online medium, the citizens had the opportunity to make a decision for the city that they would not have had the opportunity to make otherwise.

While there are similar examples of this kind of “direct” democracy, these examples are the exception and not the norm. The vast majority of “participation” that occurs in association with e-government consist of e-mails to government officials and the ability to comment on spaces like Regulations.gov where citizens can enter comments that are recorded in legislation as public commentaries. In his book, the *Myth of Digital Democracy*, Matthew Hindman observes that the political voice of the people is largely dominated by media interests and He also notes that this occurrence is due largely to the architecture of the underlying system. Which echoes Jane Fountain’s finding that information systems were not gaining traction in breaking down the silos of government.

In *WikiGovernment: How Technology Can Make Government Better, Democracy Stronger, and Citizens More Powerful*, Beth Noveck argues that in the 21st Century, given the availability of information technologies that are social in nature and that can connect multiple people with varied expertise and given the complexity of the problems facing the world today, the perpetuation of legitimate democracy and good governance

require collaborative democracy (Noveck 2009). She argues that democracy requires a shift in attitude from of the people, by the people *for* the people to, of the people, by the people, *with* the people. She calls for a resurgence of the citizenry, using their everyday skills and expertise to assist in the perpetuation of government and the nation. This collaborative participation is a form of civic action on behalf of the state. She also argues that this participation will allow for the citizenry to be involved in the policy making process as individual expertise plays a role in that process. Seemingly, with the advent of new social technologies and a shift toward i-government, maturation in actual democracy and democratic participation is expected. This transition of the role of citizen to democratic collaborator is not studied within this research body, but it is an area of interest that affects both the organizations of government and governance form.

<ALT>INFORMATION TECHNOLOGY AND ACTIVISM </ALT>

There is an additional body of work that is associated with democratic activity on the Internet. In e-government, this activity is not typically understood to be positive nor is the government typically understood to be a sponsor of the activity; it is assumed that the government would be a recipient of or subject to the activity and have to respond to it. The activity is Hacktivism or Internet activism through hacking activities. Hackitivism involves hacking into the code of a given website or information system to disrupt the service of the website to limit or stop the information system from processing for a specific political purpose. The Wikileaks event is the most prominent recent example of hacktivism. To execute the Wikileaks event, Julian Assange organized a community of hackers and a community of activists to break into government and corporation

information systems to steal classified data and information. He then posted this information on a secondary web space where anyone in the world with an Internet connection could access it. Through his hacktivity, he compromised the security and information process of business and government to make a political point.

There is an entire field of information and Internet security studies that is concerned with hacktivism, hacking, cyber terrorism, cyber warfare, and personal and national information privacy. That body of work is not included in this research. But, it is important to note that in current i-government associated activities, the government is joining forces with the hacking communities to assist in achieving strategic goals of government. The Department of State has partnered with iHub, a technology company that is comprised of hackers and other information technology specialists, to execute Apps4Africa. Part of the goal of Apps4Africa is to assist in developing innovative code to solve social and development issues in Africa. Hackers assist in code construction and destruction to identify weaknesses in code associated with websites where services are offered. Equally, the National Aeronautics and Space Administration partnered with Google, Microsoft, The World Bank, and Yahoo! to convene hackers from around the world to hack for good as part of Random Hacks of Kindness. As part of the project, participants are given a task of hacking a major critical system that might be weakened during a natural disaster or attack. Partners of the project hold 24 hour hacking contests in which hacker teams and individuals try to break the code of the critical infrastructure. The winner is given a monetary prize and then helps develop the counter code to address the infrastructure coding weaknesses. In cases like these, the government is harnessing activity once thought to be detrimental and using it to achieve the goals of government. It is a shift from the thinking associated with e-government.

Hactivism is often accompanied by the organizing of individuals through the Internet to arrange action and affect political outcomes. Early thinkers in e-government imagined a world in which the Internet opened up enormous opportunities for activism, both hacktivism and political movements that would start online but appear in the physical world. Howard Rheingold writes of entire societies that would exist in pure online format and communities that do, executing all of the functions of normal offline life online (Rheingold 1993). Rheingold documents the use of technology during the so called “Battle in Seattle,” when protesters coordinated online and through cell phones to protest a meeting of the World Trade Organization. The original protest was comprised of a few protesters, but through the use of electronic media, protest activity spread across the globe and full-scale protest movement descended upon Seattle (Rheingold 2002). The Battle occurred in 1999 and set huge expectations for future political activity that could be coordinated online.

A similarly large movement, the Zapatista movement, where in protest to globalization and other infringements on their rights and land, Mexican Zapatistas used a coding action known as FloodNet to block any posting of President Zedillo’s website helped contribute to the practice of “electronic civil disobedience (Meikle 2002).” Klang documents the use of e-mail bombing by organizations like Greenpeace, Amnesty International, Oxfam, Friends of the Earth, and others who overloaded government inboxes with emails about their causes and several denial of service attacks that knocked out websites subject to protest (Klang 2004). McCaughey and Ayers expand on the expectations voiced in Rheingold’s work with a series of case studies on various kinds of cyber activism. They include stories written by several researchers of activism to promote gay rights, fights to

increase awareness of toxins and environmental issues, and action against the World Bank (McCaughy and Ayers, eds. 2003). Like many thinkers at the time, they conclude that the Internet does offer increased opportunity for activism and political movement.

However, until the recent uprisings in Egypt and Libya, it was thought that the grandiose political movements that were possible through the Internet would not manifest. After some initial movement like the Battle in Seattle and the Zapatista, action became more localized and less publicized. In an early study *Cyberpolitics: Citizen Activism in the Age of the Internet*, Kevin Hill notes that while the mode of interaction has changed, politics have not. The Internet simply provides a new mechanism for communicating political thought, but not necessarily action (Hill 1998). In his recent book, *The Net Delusion: The Dark Side of Internet Freedom*, Evgeny Morozov writes of the expansive and democratizing power of political activism thought to be possible and the failure of the power expansion to reach the people. Morozov goes so far as to suggest that the opposite is true. He argues that the subject of political activism is actually the citizenry and that political rights have been limited because of the presence of the Internet (Morozov 2011). One needs only to remember the terrorist attack of Al-Qaeda against the United States on September 11, 2001 and consider the vast power afforded by the resultant Patriot Act of the government to monitor and subdue citizen behavior online to become sympathetic to Morozov's observations.

Earl and Kimport provide a counter argument that social media and the increasing prevalence of social media will provide new means and methods for activism (Earl and Kimport 2011). That activism may not take on the form of political overthrows of government, but it can be used in collective bargaining and collective action, to quickly

communicate needs, outcomes, and goings on of political activities, even organizational activities to organize a response. The key is that for new political and organizational actors, social technologies and media are embedded into the social construct of leadership and the organizing process (Earl and Kimport 2011, 177-179). Thus, regardless of its role, interactive Internet technologies play a role in social organizing and activism. The use of social media and tools associated with i-government are becoming part of the norm of political and non-political activities in ways that both governments and businesses must respond to and employ.

In *Virtualpolitik: An Electronic History of Government Media-Making in a Time of War, Scandal, Disaster, Miscommunication, and Mistakes*, Elizabeth Losh presents studies from more than a decade of e-government and activism research and comments that regardless of technology as governments cross the media-maker and citizen service provider line, they do so in a manner that preserves the power of the state. Losh argues that this constant attention to the preservation of the power of the state actually inhibits meaningful interaction that citizens might enjoy with the state (Losh 2009). Seemingly, Internet technologies are as limiting in their use as they are expanding. In the case of i-government, it is expected that an expansion of the power of citizens, certainly increased engagement with the state, will be afforded by new technologies. But, if the precedent of e-government holds, that power expansion to citizens may come with equal power expansion of the state.

MIND THE GAP

Problems associated with e-government and the federal organization relate largely to citizen access to computers and the Internet. Lisa Servon, in *Bridging the Digital Divide*, notes that with the digitization of governmental services, large portions of the population are left without the ability to access services and are not involved in any participation that occurs online. She identifies several populations related to race, gender, education, income, age, and gender that would possibly be excluded from service provision and participation opportunities. In *Digital Divide? Civic Engagement, Information Poverty and the Internet Worldwide* Pippa Norris, a political scientist at Harvard, observes gaps in freedom and democracy in countries that do and do not have success with implementing information technologies into government. She finds that as information systems are adopted, countries become freer and more democratic. She also finds acceleration of human and political development among nations that provide some level of citizens services online as compared to those that do not—indicating that service gaps decrease overall with the implementation of information systems. Both Sevron and Norris explore options for bridging the digital divide.

Time has taken care of many of the issues associated with digital divide. Information technologies are fairly ubiquitous and several creative and innovative methods for connectivity have been developed. With i-government, the problem of digital divide takes on two new faces; 1) the ability to access web spaces through multiple devices and with varied user capacities, 2) the problem of small worlds. In addition to lingering issues of basic access, the rise of multiple devices forces designers of information systems to consider how to deliver content to varied devices. Ostensibly citizens should

be able to access government information and services and engage with the government through interactive technologies via cell phone, electronic reader, tablet device, and computer. This access requires consideration of applications for data, or one stop real-time data and information sources, as well as interfaces that adapt to multiple device displays. Considerations for accessing real-time data and information and the implications to the organization must also be considered.

And as the government may respond to multiple devices in i-government, it will also have to respond to multiple content providers. The nature of most interactive information technologies like wikis is to accumulate and maintain a community of contributors that collaborate to develop some outcome. These communities are developed around an interest or area of expertise. Additionally, architectural links are designed to include and exclude certain partners and participants. Both limitations due to architecture and limitations due to content area create what is known as a small world. In a small world, exclusivity is bestowed on those who conform to the architecture and to the method of content provision in a manner that is acceptable to the community. And reliance chains are created among those that become leaders or experts which allows for content that is subject to “group think” and bully think. Policies and architectures of i-government with contribute to the development or limitation of small worlds.

An additional branch of study that has intersected with i-government is that of the digital generation. Early texts like *Growing Up Digital* and *Grown Up Digital* by Don Tapscott and *Born Digital* Palfrey and Gasser focus on how the Internet plays out in the lives of younger people—specifically generation Y. They observe that younger generations do not know a world without the Internet and without information technology. This life of

connectedness sets expectations that government will be connected and expectations that government will use the technologies present in the marketplace to conduct citizen communications and deliver services (Tapscott 1999 and 2008 and Palfrey and Gasser 2008). Additionally, for employees of i-government, these younger generations will want to use their technology skills in the workplace. For i-government, potential generational, educational, and experiential gaps may present within the government organization in ways that are not related to the gaps of e-government.

In his book, *Next Generation Democracy*, Jared Duvall brings the generation discussion of young people and technology to democracy and to government, the mentality of service, and expectations of technology. He notes that Generation Y is not only more civically minded than any other generation since the Great Depression, that they are also more technologically minded. Younger generations serve more volunteer hours than other generations and have the highest respect for government employees than 60 years of generations before them (Duvall 2010). They trust government and they wish to engage with government. And they are technologically savvy enough to wish to engage with government through technology. They prefer systems like, open source systems to proprietary systems—not only to engage with, but to develop from. The younger generations are most likely to use government data and information combined with interactive technologies to spur innovations within the organization of government and in the private sector. The preferred method of access is open source—meaning that the code behind projects is public code and can be used for multiple applications. Open source and enthusiasm for government have implications for government information systems and architectures and governance through interactive information technology.

FROM E-GOVERNMENT TO I-GOVERNMENT: THE EMERGING STRUCTURE

In his book, *The Wealth of Networks: How Social Production Transforms Markets and Freedom*, Yochai Benkler writes of the position of the world as being between the *Industrialized Age* and the *Information Age*. The *Industrial Age*, Benkler claims, is built upon the ideas of manufacturing and production. The *Information Age* is built upon the ideas of knowledge creation and exchange. In the space between these two ages, governments and citizens walk the economic line between production chains and knowledge networks. Two very different organizational structures are part of these worlds. The *Industrial Age* relies heavily on the vertical structure of production lines and the *Information Age* relies heavily on networks. Government must work between and bridge these worlds to ensure job creation and movement toward the new economy.

This move toward a new economy is motivated and brought about by the development of new tools to create and share knowledge. The new economy and the development of the *Information Age* will occur at the level of individuals and individual organizations responding to the need to create and share knowledge for individual and organizational success. The emerging organizational structure literature talks largely about governance by and within networks. This form of organization is flat with no hierarchical power system, comprised of pods of multi-disciplinary, multi-agency workers that connect to the private sector to complete specific government tasks as requested or needed by the people. The form of the organization mirrors that of the information systems that underpin it. Flexibility and collaboration are prized over security and uniformity, and trust in the government is placed at the core of effectiveness (Goldsmith and Eggers 2004). Networked government rests on the ability of government to leverage resources—

public, private, citizens, and ally—to achieve the tasks of government. The information shared is specific to task and open to all involved in the task process (Argranoff 2007, Goldsmith and Eggers 2004, and Eggers 2005). Similar differences exist in the participation literature. Participation in I-government is associated with *Crowdsourcing*, *The Wisdom of Crowds*, and *Here Comes Everybody*, where the goals of participation are to help in policy creation, deliberation, and education process.

Both e-government and i-government deal with information sharing and tasking to complete a mission or to engage in a transaction. However, the e-government structure is associated with a transactional structure of that tasking and information sharing and the i-government, network structure is associated with un-structuring and flattening that tasking and information sharing. Neither structure, vertical and horizontal, supports i-government or the development of i-government. In the article *Government Data and the Invisible Hand*, four Princeton scholars, including nationally-known computer scientist Edward Felten, argue:

If the next Presidential administration really wants to embrace the potential of Internet-enabled government transparency, it should follow a counter-intuitive but ultimately compelling strategy: reduce the federal role in presenting important government information to citizens. Today, government bodies consider their own websites to be a higher priority than technical infrastructures that open up their data for others to use. We argue that this understanding is a mistake. It would be preferable for government to understand providing reusable data, rather than providing websites, as the core of its online publishing responsibility (Robinson et al., 2008).

In an i-government, information becomes a central focus in eliciting participation with the citizenry and in educating the public about policy and economic issues facing the government and in collaborating with the people to address the issues of the nation. The goal of producing data in accessible and useable formats is to secure citizen trust in the government as a data and information source. Trust will be built as the government data is used by the citizens and by watchdog and other organizations, which will allow citizens the ability to not only access the data they need, but to filter out errant or inappropriate data. The government will become the head in Chris Anderson's long tail of data providers.

Figure 2.3 The Long Tail



Source: The Long Tail: www.thelongtail.com/conceptual.jpg

In the long tail, eighty percent of information and data is provided by twenty percent of the content providers. As the government provides data and information that can be

trusted as a source for valuable information products and that serve as a platform for innovation, citizens and partners will link to agencies and look to them as a source of trusted information product and value. The agency will become a larger provider of the information share. This role as trusted provider of information and tool to use that information allows for greater service efficiencies and enhanced democratic interaction.

The nature of those efficiencies arises in the ability of citizens to access tools like mapping to tools, weather information and tools, health information and tools, and others to assist and communicate about local, state, and national issues of concern. For example, during the California fires, local citizens used geo data provided by the United States Geological Survey under the Department of Interior to communicate the location of the fires and the availability of resources at that location so that services and resources could be distributed more effectively. The government provided trusted information and tools and through interaction of citizens with that information was also able to provide more efficient services.

Equally, in the private sector, data provided by the government is beginning to prove essential in the development of new business. The founders of Brightscope, for example, mined government data associated with corporate assets and retirement accounts. They discovered dramatic price variation in the fees paid to manage retirement accounts for small businesses. Brightscope now has access to data on 90% of all corporate 401(k) assets and a staff of 30 mining it for cost savings opportunities. The company is valued at multi-millions of dollars. The government played a central role in the development of private business by providing access to high quality and trusted data.

As the government interacts with citizens and as the combined content of government and citizens is developed and the linking architecture of interaction is constructed, increased authority will lie with the state. However, that power is not strictly vertical or strictly horizontal. It is a blended structure that relies on the organizational response to command and control prompts and the interaction of networks to execute the services and missions of the agency. The governmental organization structure, brought about by an increased focus on information sharing and collaboration and tools for supporting cooperation and recognition of the state's central role in data, information, and technology provision, as well as its interest in maintaining its own power, changes to a form that allows for both acceptance of technology and adaptation to technology through interaction of information and data among employees and among agencies and citizens. That form is a Nexus where the government organization is a primary convener for information and knowledge, backed by some of the command and control structures of a Weberian bureaucracy and subject to the push or cooptative forces of technology but a beneficiary of innovation that arises from the informal organizations and networks that form around the government backbone.

Chapter 3: Laying Down the Law, the Structure of New Technology Adoption

INTRODUCTION

Explored within this chapter is the idea of a shift from e-government toward i-government and the nature of the implementation of interactive Internet technologies into the government organization structure. Specifically questioned is the primary mode of initiation into government, organic or more structured, of the technology. Also observed are the nature and function of the technologies introduced and the status of interactive technology development. Additionally provided in this chapter is the context and backdrop for the inclusion and development of interactive internet technologies in government.

OVERVIEW

Discussed in the first section of the chapter are the legislation, presidential directives, and citizen and federal agency activities that set forth e-government and potentially i-government efforts in the United States. Observed is the nature of adoption, technology and other external forces push for adoption or consumer demand pull for adoption, of e-government and i-government efforts. The findings suggest that e-government and i-government occur largely due to the presence of new information technology in the market place, the recognition of the technology to reach business or governance goals, and a push for adoption by the executive levels of government for government agencies.

Also examined here are key elements of legislation and presidential directives that indicate the intent of technology adoption—for more transactional or more interactive purposes. Findings suggest that early e-government legislation established the parameters and practices for the placing the business of government into an online format. Later, legislation including the 2006 Federal Funding Accountability and Transparency Act and the 2009 Transparency and Open Government Directive prompted an increased level of e-government by urging the adoption of better web site practices and functionalities and introduced a new level of interaction with government that is associated with i-government.

Finally, included in the chapter are the technology developments associated with i-government and a discussion of the potential impacts and sustainability of the technologies. The concluding remarks relate to policies and conditions relevant for continued information technology developments and the potential impacts those technologies may have on the organizations of government and in relationship to new methods for interaction within the government and between the government and the citizenry.

For the research herein, the federal government of the United States of America is the primary unit of analysis. A description of the qualitative database developed to support the research within this chapter is in Supplemental 3.4.

LAYING DOWN THE LAW

Two classic arguments for technology adoption relate to technology-push or demand-pull in innovation. In the case that innovation occurs through technology push, the rate of scientific knowledge and development determine the rate of innovation (Bush 1945). In the case where innovation occurs through demand pull, market demand drives the knowledge creation and development of technological innovation (Rosenberg 1969). Both push and pull innovation processes can be present in the adoption of technology, especially in the case of information technology adoption where multiple applications and systems elements exist.

Government adoption of information technology has been prompted by push and pull forces. In 2002, Congress set forth the e-Government Act of 2002. The Act establishes the purpose and parameters of implementing e-government into the federal organization. In the findings of the Act, Congress specifically sites the push factors of technology in motivating the adoption of e-government practices. “The use of computers and the Internet is rapidly transforming societal interactions and the relationships among citizens, private businesses, and the Government (PL 107-347).” They elaborate by recognizing that use of information technologies has been unevenly spread among agencies with no centralizing force to coordinate use efforts. Their justification for the Act was to introduce a centralizing force and to push government adaptation to the business practices being adopted at a rapid rate in the for-profit world.

In recognition of the need for coordinated efforts for adoption and of the value in implementing new information systems into government, Congress and the President

passed the Act into law. The purpose of the Act or Public Law 107-347, was “to enhance the management and promotion of electronic Government services and processes...” The primary provisions of the law were:

- 1) To provide effective leadership of Federal Government efforts to develop and promote electronic Government services and processes by establishing an Administrator of a new Office of Electronic Government within the Office of Management and Budget.
- 2) To promote use of the Internet and other information technologies to provide increased opportunities for citizen participation in Government.
- 3) To promote interagency collaboration in providing electronic Government services, where this collaboration would improve the service to citizens by integrating related functions, and in the use of internal electronic Government processes, where this collaboration would improve the efficiency and effectiveness of the processes.
- 4) To improve the ability of the Government to achieve agency missions and program performance goals.
- 5) To promote the use of the Internet and emerging technologies within and across Government agencies to provide citizen-centric Government information and services.
- 6) To reduce costs and burdens for businesses and other Government entities.
- 7) To promote better informed decision making by policy makers.
- 8) To promote access to high quality Government information and services across multiple channels.
- 9) To make the Federal Government more transparent and accountable.
- 10) To transform agency operations by utilizing, where appropriate, best practices from public and private sector organizations.
- 11) To provide enhanced access to Government information and services in a manner consistent with laws regarding protection of personal privacy, national security, records retention, access for persons with disabilities, and other relevant laws (PL 107-347 2002).

The 72 page legislative document outlaying the E-Government Act contains the details and timelines for implementing the Act. The Act establishes the personnel responsible for carrying out the Act and sets up a system of Chief Information Officers for individual agencies as well as a budget for implementation. The document is a practical outlay of

instructions for moving the business aspects of government into an online format. The essential component of the Act is the direction for agencies and contractors to incorporate Enterprise information systems into the federal government. Enterprise systems are large databases that include web fronting so that citizens or government employees can input data and export reports of information. The database, pictured below in Figure 3.1, is a relational one that has the capacity to store and relate data tables across operation aspects of an organization. That is, multiple components, such as the Manufacturing Resource Planning (MRP) and Supply Chain Management (SCM) and other components depicted in the large circle of the diagram, can input data into a large database. Once the data is input, it is possible for an operator of the database to combine data input from multiple components to create a multiple component data report.

Figure 3.1 Enterprise Database Conceptual Diagram



Source: Image Source: Enterprise Resource Planning System Solution: <http://erpsystemsolution.com/>. Retrieved April 4, 2011.

It is also possible for multiple organizations to make inputs into and pull outputs from the Enterprise system, but the data relationship is strictly an input-output operation as the

arrows in the diagram display. There are not opportunities for wiki-like collaboration with or development of data through social media tools as there are with interactive data management systems. The Enterprise system is business system with looped transactions that do not invite participation outside of input and export of data and reports.

Eight of the 11 provisions of the Act deal directly with placing the business of government into an online format. Only three; 1) providing increased opportunities for citizen participation, 2) promoting better informed decision making by policy makers, and 3) making the federal government more transparent and accountable deal with engaging citizens in the e-government process. And, of those three only increasing opportunities for citizen participation, hints at introducing technology for the purpose of interaction between government and citizens. The majority of the law sets forth the processes and standards for moving the services of the government into an online format. Government agencies and implementing new information systems to change the business practices of agencies are the target and the focus of the law.

In contrast, the Transparency and Open Government Directive, issued on January 21, 2009 at the beginning of the Obama administration contains three provisions. Those provisions relate to transparency, participation, and collaboration. The provisions follow:

- 1) Government should be transparent. Transparency promotes accountability and provides information for citizens about what their Government is doing.
- 2) Government should be participatory. Public engagement enhances the Government's effectiveness and improves the quality of its decisions.
- 3) Government should be collaborative. Collaboration actively engages Americans in the work of their Government (Obama 2009).

These provisions are slightly different than those in the Open Government Progress Report to the American People, issued by the Executive Office of the President in December 2009. The stated provisions in the progress report follow:

- 1) Transparency. Government should provide citizens with information about what their government is doing so that government can be held accountable.
- 2) Participation. Government should actively solicit expertise from outside Washington so that it makes policies with the benefit of the best information.
- 3) Collaboration. Government officials should work together with one another and with citizens as part of doing their job of solving national problems (EOTP 2009).

The language of the directive is not specific to the business of government, but places the citizen and the citizen-government relationship as the center of focus.

Specifically mentioned in the directive is the use of innovative technology to support activities and direction to the newly created Chief Technology Officer and the associated personnel in the Office of Management and Budget, which houses the Chief Information Officer. The 2002 e-Government Act established an Office of E-Government and a Chief Information Officer for the Federal government that would serve out of the Office of Management and Budget. However, it was not until March 5, 2009 that the first Chief Information Officer of the United States, Vivek Kundra, was appointed by President Barack Obama. Prior to Vivek Kundra's appointment, the title was Administrator of the Office of Electronic Government and Information Technology, and Mark Forman and Karen Evans served in the position.

Tom Gavin, Office of Management and Budget deputy associate director for strategic planning and communications, responded to a question about the formal adoption of the

title Federal Chief Information Officer versus e-Government Czar (as the title was informally known under Mark Forman and Karen Evans) “The position is not just e-government services. We're trying to change the dynamic, to interact with the public sector, and not just make sure information is available electronically. Fundamentally, we're looking at how technology serves the American people (Chabrow 2009).”

The Open Government Directive established the position of Chief Technology Officer and two deputies to the Chief Information Officer in the Office of Science and Technology Policy. Additionally, each Agency has an officer in charge of Open Government. That officer is typically accompanied by one to two assistants. The officer in charge of Open Government, in addition to the role of leading the Open Government office, typically holds the title Deputy Chief Information Officer for the given agency. The organizational structure implemented to support the Directive explicitly coupled technology development and citizen engagement efforts. This express coupling of technology development and citizen engagement at the executive and agency levels had not occurred previously.

The Chief Technology Officer for the federal government was tasked with working with agencies to develop innovative technologies in support of the directive and to report progress back to the Executive within 120 days of the Directive’s issuance. After the 120 day period, agencies reported to the Office of Management and Budget and to the Chief Technology Officer in the Office of Science and Technology Policy. After consultation among the agencies and offices, the implementation documentation was published—in tandem with the Open Government report to the American people. During this time, agencies began work addressing the implementation of the directive.

In the formal implementation documentation, published by Peter Orszag, the Director of the Office of Management and Budget, on December 8, 2009, several provisions require meeting specific information technology goals. The first of the requirements is the responsibility of each agency to develop the policy infrastructure necessary to embed the principles of Open Government into the agency culture. These policies are left to the discretion of the agency for the specific purpose of individualized acculturation. For some agencies, like the National Aeronautics and Space Administration, Open Government and the technology development associated with Open Government was perceived as an opportunity to innovate. Employees quickly developed several initiatives to promote and perpetuate transparency, participation and collaboration and produced a 108 page plan in which they outlined only their best practices. They fully embraced the concept and quickly embedded it into their agency. The Central Intelligence Agency produced a two page plan and stated the tension between open government and the mission of the agency was fairly irreconcilable. Policy development for Open Government was left to the discretion of the agencies, which affects the development and use of interactive Internet technologies.

Each agency was required to develop an Open Government website. On this website all activities associated with open government are located. This includes all planning and reporting activities as well as links to projects and assessments of open government activities, along with contact information and methods of communication with the agency. For the planning process, the open government websites at several agencies also included an interactive public participation tool, IdeaScale. The IdeaScale tool was used to solicit ideas, comments, and votes for different aspects of the agency open government

plan. The outcomes were incorporated into the plans and are now housed on some of the Open Government websites. All federal agencies have an Open Government Plan as specified by President Barack Obama in his Open Government Directive. Links to each agency Open Government website are included in the Supplemental.

In addition to policies and the Open Government website, each agency was required to build a timeline for their Open Government activities. It was suggested that this timeline not only incorporate activities associated with Open Government, but the dates for the development of new technologies or processes associated with Open Government. In this, there is seemingly some effort to have an observable account not only of the fulfilling of the directive, but to observe the growth of the agency culture around the directive activities. Several of the calendars were quite complicated and even interactive—incorporating the new technologies desired by the administration. The timeline's appear in the agency Open Government plan and on the associated agency website.

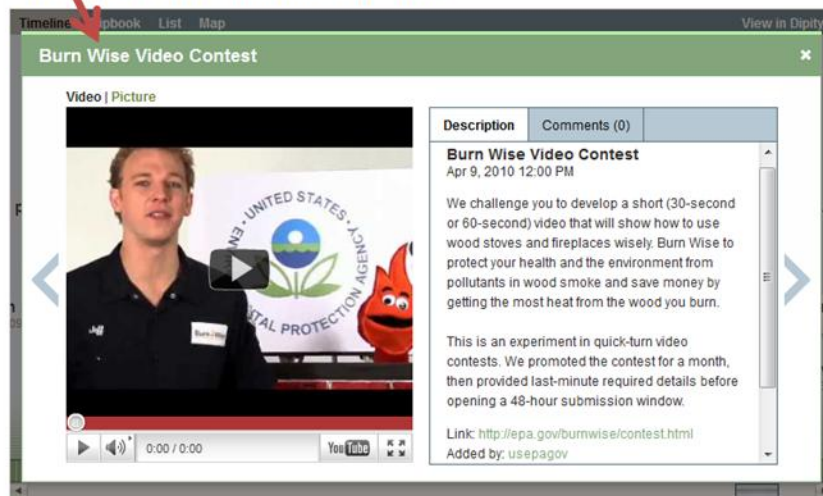
Following is an example of the timeline for the Open Government efforts of the Environmental Protection Agency. The timeline is interactive. If a user clicks on event, the event will open in a new window, a description along with video where possible and opportunity to comment on or embed the event on a social networking site exists for all events and milestones on the Environmental Protection Agency's timeline. For this particular example, the event is a collaboration activity designed by the agency to communicate safe burning technique. Citizens were challenged to create a video of the importance of safe burning techniques and practices for using woodstoves and fireplaces

safely. A competition was held for the best video. Citizens and agency staff voted on the videos. The winner's video was featured in the calendar as well as on the site.

Figure 3.2 Environmental Protection Agency Open Government Timeline



EPA Open Government Timeline



Source: Environmental Protection Agency Open Government Timeline:
<http://www.epa.gov/open/timeline.html>. Last retrieved on October 13, 2010.

According to the implementation documentation of the directive, all agencies would conform to the new guidelines related to complying with the Freedom of Information Act, eventually posting data about compliance with the Act to the data dashboard developed by the Department of Justice at FOIA.gov. The FOIA.gov dashboard essentially provides a portal where data and information about requests, requests met or rejected, and compliance with the Act are posted for all agencies. Previously, each agency posted information related to the Freedom of Information Act on their individual websites. If an individual or organization desired information about multiple agencies' compliance with the Act, he or she or the organization would have to visit the website of each individual agency and compile data across agencies. Consolidation of the data makes access to them easier for those external to the government. In addition, the dashboard makes it easier for the government to assess its own progress as the need for culling data from individual agencies no longer exists. FOIA.gov was launched on March 18, 2011.

Each agency was also required to comply with posting data and information related to economic recovery and monies allocated to each agency and how those dollars were distributed for recovery efforts on the Recovery.gov dashboard. Similar dashboards and information centers, where consolidated data by agency is posted to report progress and spending to the American people and for use in the government's assessment of itself, were posted on data.gov, USASpending.gov, USA.gov, the IT dashboard, and Regulations.gov. An icon was added to each agency's Open Government site to connect open government efforts with each of the information dashboards or reporting sites.

Following is a graphic of an example icon:

Figure 3.3 Example of Open Government Link Set



USA.gov is a site where links and information about many of the technological improvements associated with Open Government, as well as historical improvements and opportunities are located. On the site is a list of blogs associated with each agency, a social media directory, links to apps.gov or applications developed for mobile and other devices that connect citizens to real time government information are housed, challenge.gov or competitive opportunities to assist in solving needs of agencies—often with a monetary reward are posted, cloud services, and connections to emerging technologies among other things are consolidated. USA.gov is an electronic warehouse of opportunities and developments in the information systems of government. All open government sites link to and report through USA.gov. The site was not developed in association with the Open Government Directive, but is included in the consolidation and communications efforts of the Directive.

Regulations.gov is a central repository for regulations reporting and events. Agencies report the regulatory activities, public commentary periods, and scheduling through regulations.gov. Citizens can search for specific legislation, comments on legislation, rulings on legislation, and read and submit comments. Also on the site are rankings for the regulations receiving the most comments and rankings of the top agencies based on comments posted through the site.

USASpending.gov was initiated by legislation in 2006, the Federal Funding Accountability and Transparency Act, sponsored by Obama and Coburn. The Act served to post to the public budget and allocation data produced and maintained by the Office of Management and Budget and requires that all entities and organizations receiving funding from the federal government disclose that funding on an Office of Management Budget website. The Act prompted an unprecedented partnership between the nonprofit watchdog organization Office of Management and Budget Watch, and the Office of Management and Budget to produce the website USASpending.gov. The USASpending site was built collaboratively using the same technology as the OMB Watch site and offers many of the same capacities and services.

Users of the FedSpending and USASpending sites can sort and filter budget data, access data updates, build widgets to connect data from the sites to an individual Web site, and build and use application programming interfaces that allow users to define data comparisons and characteristics so that users may build data projects that fit their interests and needs. Users are able to observe and use data in a manner defined by them.

The Open Government Directive makes it mandatory for each agency to post their budget and budget allocation data to USASpending.

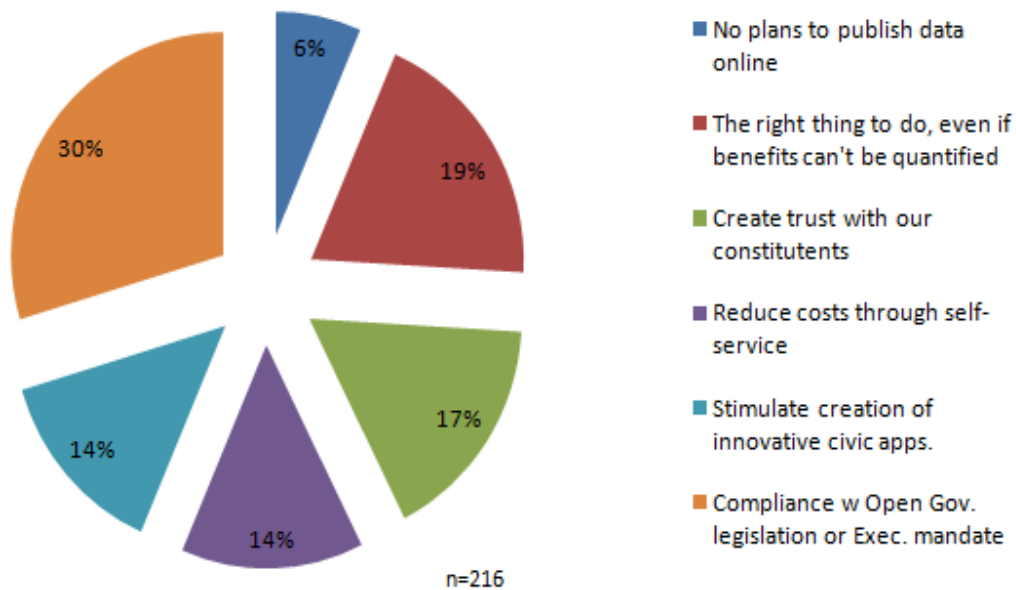
By rule of the Open Government Directive, each agency was required to post at least three high quality data sets to data.gov. Provisions for defining and reviewing data to meet the standards of high quality are included in the Directive. For the most part, a high quality data set is one in which the data has been through a quality control process, that is the data has clear collection rules, has been reviewed by multiple parties, and is deemed of high quality by data reviewers. Data.gov is a centralized repository for high quality data produced by agencies. It was launched in 2009 and more than 120,000 data sets from across the federal government were housed in the database upon launch. The Open Government directive served to push for more data sets to be included in data.gov and to ensure that all agencies participated in data.gov. Data.gov is considered the flagship launch of the Obama administration's Open Government efforts.

In addition to providing data to the public and to other agencies through a central data warehouse, the developers of data.gov also created visualization tools to accompany data. The purpose of the tools was to make it easier for citizens and for agencies to sort and compare and deal with the large amounts of data. In addition to access to data and tools to manage the data, users of the site have the ability to communicate data sets and tools desired for addition to the site. Both citizens and federal government employees can develop and add tools and applications for the data. These data sets, tools, and applications are considered by the operators of data.gov and published when approved. A secondary addition to the data.gov website was the IT dashboard. Agencies report all

spending associated with information technology maintenance and improvements through the IT dashboard site, which is connected to data.gov.

A study completed by Socrata, a non-partisan research group found that the Open Government Directive was the driving force in agency publication of data. As depicted in Figure 3.4, of the 216 government respondents to the survey, approximately 65 cited the Directive as the primary motivation in data publication. Second to the directive was a feeling of data publication as “the right thing to do.” Feeling that data publication was the right thing to do was followed by innovation and cost saving purposes.

Figure 3.4 Motivation for Data Publication



Graph source: Socrata Open Government Data Benchmark Study, Version 1 (2010). <http://benchmarkstudy.socrata.com/d/u3gu-c84y>. Last retrieved April 1, 2011.

The primary drive of the Open Government directive is the documentation and consolidation of data into dashboard or other consolidation spaces. As the Socrata study suggests, publication is motivated largely from an external force, the Open Government Directive, and is justified internally through a desire to serve and work with the public and to stimulate innovation. The business purpose, the reduction of cost, is fourth to compliance with a mandate and more civic motivations.

In addition to consolidation, it is expected that agencies will build tools to help citizens sort, visualize, and manage the data and application to access the data from multiple devices. These more interactive inclusions with the data separate the pure transactional purpose from data and data management. They also lend themselves to the participation collaboration points of the directive. Participation and collaboration are far less defined in the directive than transparency and data efforts. The provisions on the directive mainly state that agencies must devise methods and opportunities for citizens to interact with government. It is strongly suggested within the Directive that this engagement be provided in an online format and that it involve some method for sharing ideas, comments, feedback, and innovative practices. And for collaboration, it is suggested that agencies self-define opportunities and incentive for collaboration efforts between agencies, agency partners, and with the public.

In addition to transparency, each agency is tasked with developing a Flagship initiative and to provide the public with appropriate dates and a timeline with clearly defined milestones for progress. The Flagship initiative must involve a technology development that promotes transparency, participation, collaboration, or a combination of the three. The Directive does suggest that each agency include defined measurement metrics and

plans for sustainability of their Flagship initiative. However, no guidance is provided to agencies as suggestion for how to develop measurement metrics or sustainability efforts. These items are left to the agency's to define in terms of agency missions and goals. All agencies have developed and executed Flagship Initiatives as included in the Open Government Directive.

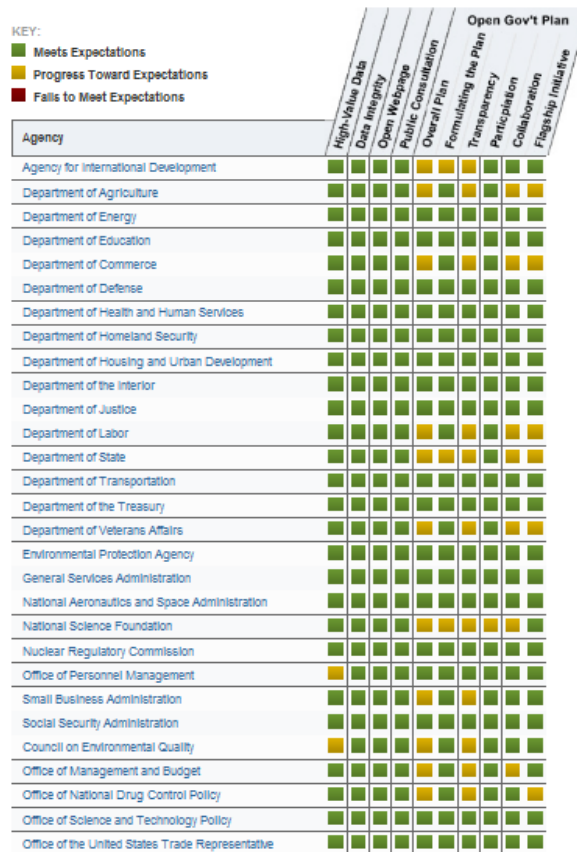
A "stoplight" evaluation system, where agencies rank themselves as green for fully in compliance with the Open Government Directive, yellow for nearly in compliance, and red for not in compliance with the Directive, was developed by the Office of Management and Budget for Open Government plans. Most agencies have undergone two self-evaluations. According to these self-evaluations, all agencies are successful in implementing Open Government initiatives (i.e. all "green"). For most, this means that they are meeting the expectations of data.gov and submitting high quality data sets for public access through the data.gov portal. All agencies also meet the recovery.gov and USASpending reporting standards. Each has produced an Open Government plan and has developed an Open Government web page on their website. In meeting these requirements, agencies are meeting the most basic of the transparency goals set forth in the Open Government Directive. All major agencies also use some form of social media, like Facebook or Twitter, to engage with the public. Most agencies have also launched a webinar series that offer relevant information related to their agency mission or that addresses current needs and "hot topics" or items in the news. The questions for applying the self-evaluation are in the Supplemental.

The outcomes for all agencies of the self-evaluation completed in April of 2010, after public input was incorporated into the initial Open Government plan for each agency and

after each agency had reviewed and edited an initial draft of their Open Government were consolidated. The consolidated “stoplight” evaluation appears in the following graphic, Figure 3.5. For the self-evaluations, the color interpretations are:

- Red – plan does not satisfy the requirement
- Yellow – plan partially satisfies the requirement
- Green – plan fully satisfies the requirement
- N/A - not applicable because agency does not engage in that activity or area

Figure 3.5 Open Government Plan Self Evaluation



The Open Government Initiative Scorecard: <http://www.whitehouse.gov/open/around>. Last Retrieved on September 29, 2010.

All agencies, save the Office of Personnel Management and the Council on Environmental Quality report that they have produced three high-value data sets and posted them to data.gov. The Office of Personnel Management and the Council on Environmental Quality show that they are making progress toward the goal (i.e. “yellow”) but have not yet identified or loaded the three high-value data sets into the data.gov portal. All agencies report that they have included the public in deliberating and defining their Open Government plan. The majority of the agencies listed used the interactive Internet tool IdeaScale to collect ideas, comments, and votes on ideas and comments from the public about their Open Government plan. Eleven of the 29 agencies report that their plan is not yet fully complete (i.e. “yellow”). A yellow light on the Open Government plan indicates that the agency plan is missing a key element, for example an indication of the policies that will be set for the agency when adopting open government or no mention of a possible technology that will be used in a given agency initiative. To get a “green,” all elements must have been in place by April 7, 2010.

All agencies that report a “green,” or all complete on their plan, also report “green” on every aspect of their Open Government planning efforts. Agencies reporting “yellow,” or not fully complete in their planning efforts, vary on their successes with implementing transparency, participation, and collaboration as dictated in the Open Government directive. For agencies that report a “yellow” status within their plan, they report transparency as the area of most concern in planning. For the planning efforts, transparency is associated with the most reporting and posting efforts.

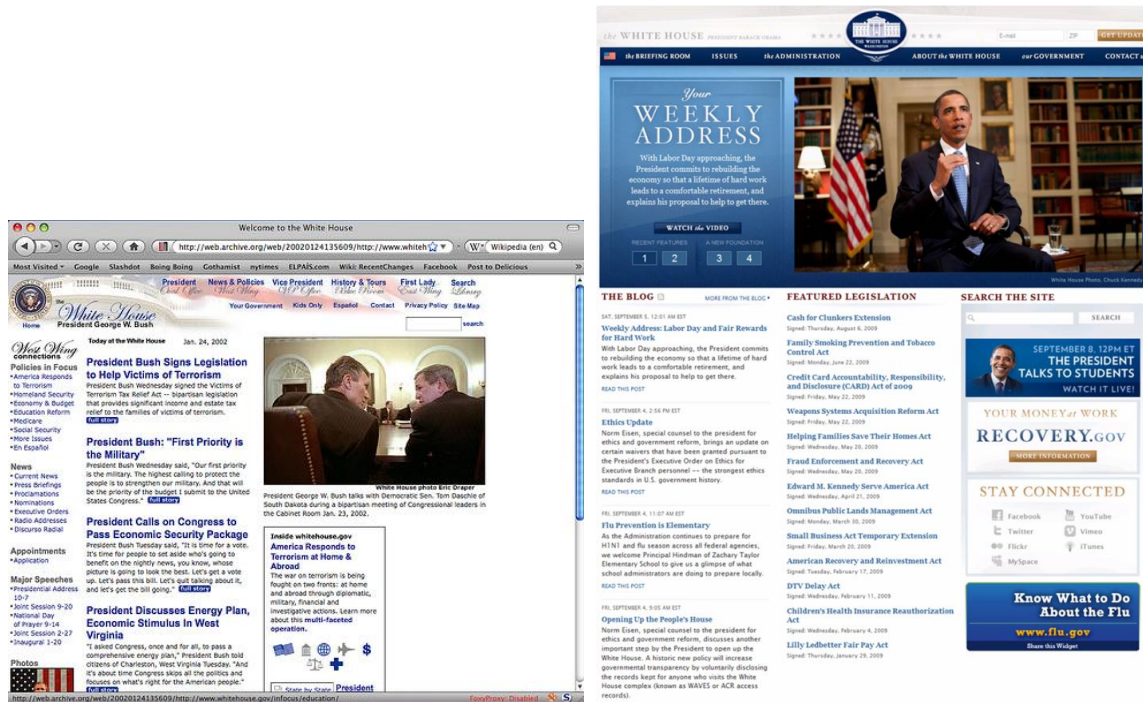
THE TECHNOLOGIES

To understand the technologies developed in association with the Open Government Directive—the largest and most clear call for incorporation of new developments in government information systems since the 2002 E-Government Act—an assessment of the technologies developed was conducted. Each of the Open Government plans was examined for the technologies present in the plan. To document the analysis, a large database of the plans and the technologies was developed. The database compiled contains the agency name, the name of the technology or plan for technology development, a link to the web space containing the technology, a description of the basic functionality of the technology, description tags for the technology, the classification of the technology as related to transparency or participation or collaboration, the classification of the project as flagship or not, contact information for the personnel responsible for the agency Open Government directive, links to the agency Open Government sites, and other relevant information.

The Open Government Directive prompted the development of more than 360 new information technology endeavors at 33 major federal agencies. Of the projects developed, 171 are associated with transparency efforts, 174 are associated with participation efforts, and 107 are associated with collaboration efforts. Some of the projects overlap into two or more different areas. Explored herein are the technologies, their development, and indicators for their sustainability.

The focus is the directive was to build technologies that would make government more transparent, more participatory, and more collaborative. These qualities differ from the E-Government Act in that the E-Government Act was instituted to move the business transactions of government online. Examples of the differences in purpose can be seen on the pages of the White House from 2002 and 2009, depicted in Figure 3.6, when the legislation and directive for the different systems were instituted.

Figure 3.6 White House Circa 2002 and 2008



White House Circa 2002: <http://www.flickr.com/photos/fmsparis/3214726247/in/photostream/>.
 White House: <http://www.whitehouse.gov/>.

The 2002 White House was essentially a news page where stories about the activities of government were posted. There were links to each executive government agency as well as a sign-up for email updates of the activities of the White House. There were additional

links to speeches, photos, news, and policies under consideration. The site was strictly for static information exchange.

The 2009 White House features a blog of real-time updates; the ability for real-time connections through Twitter, Facebook, and other social networking sites; connections to data portals to monitor the spending and economic recovery related activities; live coverage of events; as well as stored videos of events; legislation under consideration; and connections to information that has geo specific data for local flu epidemics as well as tools to assist in dealing with flu outbreaks. Connected to the flu.gov site is a widget that will place a link to the geo data and flu resource center to any website. The web site is comprised of real-time data that has multiple points of connection, the ability to localize, and the ability to access and manage data. It involves more transparency and more participation than the static 2002 web page.

Recognition that technology, like that on the 2009 White House website, could be more useful when governing prompted the Open Government directive. The Directive motivated adoption of technology by agencies.

Transparency

Of the Open Government projects that involve new interactive Internet technologies, 171 of those projects involve transparency as an element. Transparency efforts make up the largest portion of Open Government initiatives and are mostly seen in data sharing and Dashboard activities wherein data is combined with tool and visualization catalogues,

like data.gov, Centers for Disease Control Community Health data, FDATrack, RegInfo.gov, or the Department of Justice's newest launch FOIA.gov. Each of these dashboards offers citizens the opportunity to engage with data, build visualizations and comparative data projects, and provide feedback—and sometimes engage in discussions with—the parent agency.

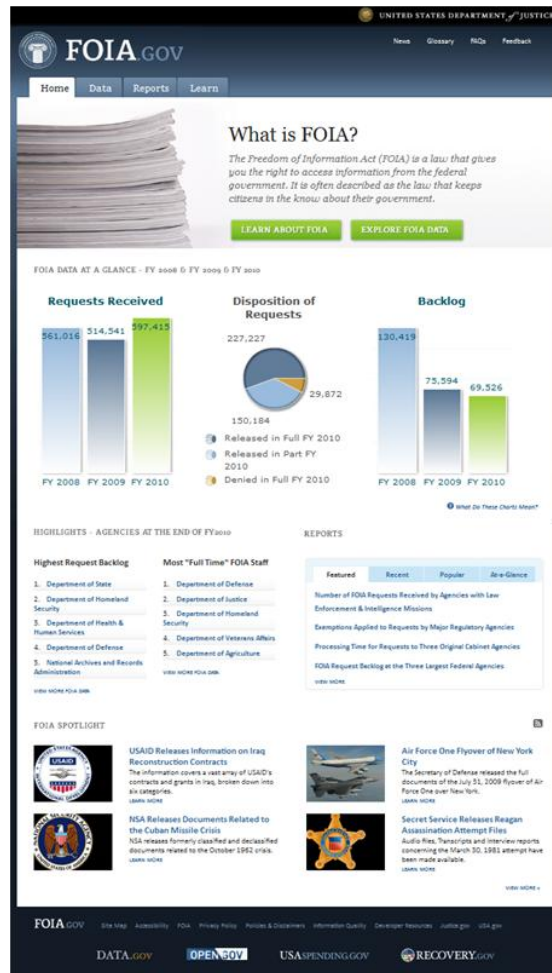
Data portals take on two primary forms. The first form is a consolidated structure that offers citizens and organizations access to data that is collected across agencies. This data can be specific to a requirement of the agency, like reporting regulatory action in which the agency is currently engaging or reporting on spending, or it can be data that is specific to agency operations that is consolidated with other data that is specific to other government agencies, like that found in data.gov. The second portal form is one in which citizens can obtain data about services that are provided by the federal government but that are also local to them. Often these portals also contain general trend data, like that associated with health or small businesses, along with the ability for the citizen to pull out data specific to his or her condition or location.

An example of a data portal that houses consolidated data related to a reporting requirement of all agencies and that is associated with the transparency initiative of the Open Government Directive is FOIA.gov, pictured in Figure 3.7. The purpose of FOIA.gov is to present a consolidated format that outlays the requests, responses to, and status of activity related to the Freedom of Information Act, to which all agencies are required to comply. FOIA.gov provides basic information about the history of freedom of information in the United States as well as historical data for requests for information and agency compliance with the Act. Users can search and mine data for requests,

exemptions, appeals, processing time, fee waivers, administration, backlog, consultations, and comparisons for fiscal years 2010, 2009, 2008, and other years as available.

Additionally, the site presents interactive visualizations with which citizens can create comparative charts and graphs of compliance data over time. The site also provides written and video instruction for how to request information through that falls under the Freedom of Information Act purview. Following is a picture of the front page of the FOIA.gov data portal.

Figure 3.7 FOIA.gov Opening Page



Source: Department of Justice, FOIA.gov: <http://www.foia.gov/>

The FOIA.gov site also offers citizens the ability to mine agency and historical data by agency, sub-agency, and year. Users can search the data using multiple options for agency, year, and reporting element (requests, exemptions, appeals, etc.). A report is generated based on the data requested by the user. The user can take the information provided in the report and generate charts and graphs for the information requested in his or her data mining venture. On the site, there are options for basic reports and more advanced reports depending on the level of depth desired by the user. Following, in Figure 3.8, is a graphic of the data mining interface of FOIA.gov:

Figure 3.8 FOIA.gov Data Mining Interface

The screenshot displays the FOIA.gov Data Mining Interface. At the top, it features the FOIA.gov logo and navigation links for Home, Data, Reports, and Learn. The main section is titled "CREATE REPORT" and provides instructions on how to explore FOIA data. Below this, there are three selection areas: "SELECT REPORT" (with options like Requests, Exemptions, Appeals, etc.), "SELECT AGENCY" (with dropdown menus for Department of State, Department of Defense, and Department of Education), and "SELECT FISCAL YEAR" (with radio buttons for FY 2010, FY 2009, FY 2008, and All Available Years). A "GENERATE REPORT" button is located to the right of these options.

Below the selection area, a bar chart titled "FOIA Requests Received, Processed and Pending" compares data for State 2010, DoD 2010, and ED 2010. The chart shows four categories: Number of Requests Pending as of Start of Fiscal Year, Number of Requests Received in Fiscal Year, Number of Requests Processed in Fiscal Year, and Number of Requests Pending as of End of Fiscal Year. The ED 2010 data shows significantly higher values in the 'Received' and 'Processed' categories compared to the other two groups.

Below the chart, there is a table of results for the "United States Department of State in 2010", "Department of Defense in 2010", and "Department of Education in 2010". The table for the Department of Education in 2010 is detailed below:

Component	Number of Requests Pending as of Start of Fiscal Year	Number of Requests Received in Fiscal Year	Number of Requests Processed in Fiscal Year	Number of Requests Pending as of End of Fiscal Year
FSA	68	234	263	39
IES	2	53	48	7
OQFO	4	7	6	5
OQFO-CAM	6	41	45	2
OQFO-FSS	1	1	1	1
OQIO	2	6	3	5
OCO	1	3	0	4
OCR	4	87	84	7
DELA	3	8	6	5
OESE	24	57	77	4
OGC	8	3	1	10
OIG	6	46	50	2
OII	19	45	53	11
OLCA	5	0	4	1
OM	3	14	14	3

Source: Department of Justice FOIA.gov Data: <http://www.foia.gov/data.html>

In the FOIA.gov data mining interface, the user can create reports by agency or comparison reports. Graphs and charts can be developed based on the level of information chosen by the user. Additionally, the raw numbers appear in a data table. This data table, the report, and the data visualizations can be exported into a raw file that the user can download. There is also a printing interface that allows the user to print the report information and graphics directly from FOIA.gov. The portal offers multiple interactive functionalities for the user.

The second type of portal that is more service and user focused is exemplified well in the HealthCare.gov site developed by the Department of Health and Human Services. The portal is depicted in Figure 3.9.

Figure 3.9 HealthCare.gov

Health care is getting better. So is HealthCare.gov. Where you see [this helpful](#) add your comments to help us improve.

HealthCare.gov Blog | Newsroom | Implementation Center

Take health care into your own hands Home | Email Updates | Glossary | Font Size | En Español

Find Insurance Options Learn About Prevention Compare Care Quality Understand the Law Information for You

Explore your coverage and pricing options
Find out which private insurance plans, public programs and community services are available to you.
Pick Your State

Your Health Care, Explained
Families with Children
Individuals
People with Disabilities
Seniors
Young Adults
Employers

BETTER CARE, LOWER COSTS
The Partnership for Patients: Better Care, Lower Costs is a new public-private partnership that will save lives, prevent injuries to millions of Americans, and improve patient outcomes. It will also save billions of dollars that will help put the nation on the path toward a more sustainable health care system.
Learn more about the Partnership for Patients.
See a list of organizations that have joined the Partnership.

5 Things to Know
1. **WOMEN AND THE AFFORDABLE CARE ACT:** What benefits of the new law apply especially to women?
2. **HEALTH INSURANCE EXCHANGES:** What are health insurance Exchanges, and when do they launch?
3. **PRE-EXISTING CONDITION INSURANCE PLAN:** How do I know if I qualify and apply for insurance under this new program?
4. **SMALL BUSINESS TAX CREDITS:** Which small businesses qualify for health insurance tax credits, and how do I know if my business qualifies?
5. **SENIORS AND MEDICARE RECIPIENTS:** What actions are being taken under the Affordable Care Act to strengthen Medicare?

HealthCare Notes
A Blog about the Affordable Care Act and You
Building a Partnership for Patients
By Don Berwick, Administrator, Centers for Medicare & Medicaid Services
Today, HHS announced the launch of the Partnership for Patients: Better Care, Lower Costs, a new public-private partnership that will help improve the quality, safety and affordability of health care for all Americans.... Continue Reading →
Closing the Gaps in Health Disparities
By Dr. Garth Graham, Deputy Assistant Secretary for Minority Health
Consumer Protections: Applying New Protections to Your H...
By Karen Pollitz, Director for Consumer Support, Center for Consumer Information and Insurance Oversight
Consumer Protections: Patient's Bill of Rights
By Karen Pollitz, Director for Consumer Support, CCIIO
Read All Blogs

Take a video tour of HealthCare.gov!

Home **HealthCare.gov** A federal government Website managed by the U.S. Department of Health & Human Services
200 Independence Avenue, S.W. - Washington, D.C. 20201

Accessibility
Privacy Policy
Disclaimers
Viewers & Players
WhiteHouse.gov
USA.gov
GobiernoUSA.gov

Take Action
Find Insurance Options
Get Prevention Tips
Compare Care Quality
Understand the Law

Information For You
Families & Children
Individuals
People with Disabilities
Seniors
Young Adults
Employers

Resources
Newsroom
Implementation Center
Glossary

Stay Connected
Email Updates
twitter
facebook
YouTube
View all Widgets and Badges

Source: Health and Human Services HealthCare.gov: <http://www.healthcare.gov/>

Through the portal, individuals can gather information specific to particular audience; families, individuals, people with disabilities, seniors, young adults and employers. That information can be sorted by state or by service. Information in the site relates to insurance, hospital and other care facilities and services, disease and illness prevention, as well as general health care and health care laws. Additionally, users can enter comparative spaces to compare local hospital serves and average costs of services at local hospitals. They can also compare dialysis, nursing, and home health care options as part of the comparative capacities available on the site. Educational services, through video and tutorials have been incorporated into the site to assist users in understanding how to maximize the functionalities of the site. Data for the site is provided by local state and partner agencies. The HealthCare.gov site acts as a consolidation and comparative data center for users.

Participation

Of the Open Government projects that involve new interactive Internet technologies, 174 of those projects involve participation as an element. Citizens participate with the government when they want to augment a service or when they seek basic information sharing opportunities. Citizens and employees are especially active in initiatives like the National Archives Docs Teach, and Justice's That's Not Cool violence prevention resource center. One of the most successful participation Open Government projects was citizen participation in idea generation through the IdeaScale tool, where thousands of ideas were generated and several were adopted for use in Open Government planning. Agencies, like the Department of Defense, The General Services Administration, and

NASA directly tie the citizen ideas garnered during the public comment phase of the plan process to their plan. They included summaries of the ideas and plans for executing the resultant projects at their agency.

Participation occurs in three primary ways through new interactive Internet technologies. The first is method of participation is personal interaction with data that is individualized to the user. In participation sites that foster personal interaction with data and services of the government, a platform where the user can enter data about themselves is available. Based on the information provided, the user is presented with data and information that suits them or fits the issue about which they are seeking information. An example of a space that allows for personal interaction through new technology is the MyPyramid site developed by the Department of Agriculture. Following, in Figure 3.10, is a picture of the front web page of the MyPyramid site:

Figure 3.10 MyPyramid.gov

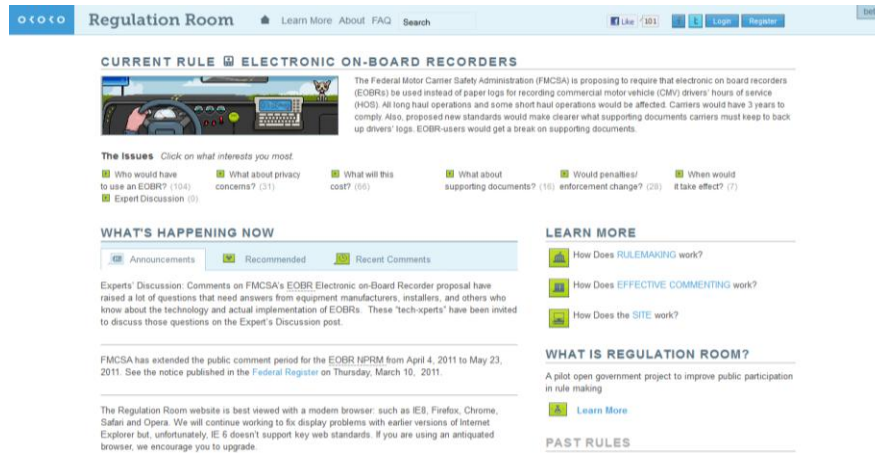


Department of Agriculture, My Pyramid: <http://www.mypyramid.gov/>

Through the site users can enter basic information about height, weight, activity level, and other personal attributes. The site returns a caloric and food suggestion set that match the attributes presented by the user. The user is also presented with basic information about eating properly, exercise, and a healthy lifestyle. The site also offers online assistance and guides for determining healthy foods, along with weight loss and diet and exercise analysis services. In addition to these functionalities, users are offered podcasts and videos related to health and exercise. There is also an interactive space for planning and charting meals, exercises, and health activities. Users can explore and connect with local health and diet services. Data related to larger demographics and general health is also provided through the site. The purpose of the information and activity provided through the site is to assist the user in making personal decision for conducting his or her individual life.

The second form of participation through new interactive Internet technologies is through a portal that allows for citizen interaction with regulation or ideation that affects the course of government. To assist in developing regulations or participating in ideation, a space where users enter ideas, comments, and rankings for ideas and comments is typically provided by the agency seeking participation. Also offered on the site is information and research that supports, refutes, or educates participant about the issue or regulation in question. Typically, the status of the issue and important dates for deliberation and argumentation, as well as status updated will be provided through the web space. The Department of Transportation developed Regulation Room where they engage citizens in making the rules of the road for the United States. Following, in Figure 3.11, is a picture of the opening page of the Transportation Regulation Room.

Figure 3.11 Department of Transportation Regulation Room



Department of Transportation Regulation Room: <http://regulationroom.org/>

Through the site, users can follow current legislation and comments on that legislation. There is a process for informal comment making and a process for formal comment making. There is also space for users to rank ideas and comments and for the agency to respond to citizen ideas and comments. There is a space for users to click through to what interests them most about the regulation pending and to post documents and support materials to the space for consideration by the agency. The purpose of participation sites that allow users the ability to develop ideas around and suggestions for regulations and policies is to engage citizens in charting the path of government.

Collaboration

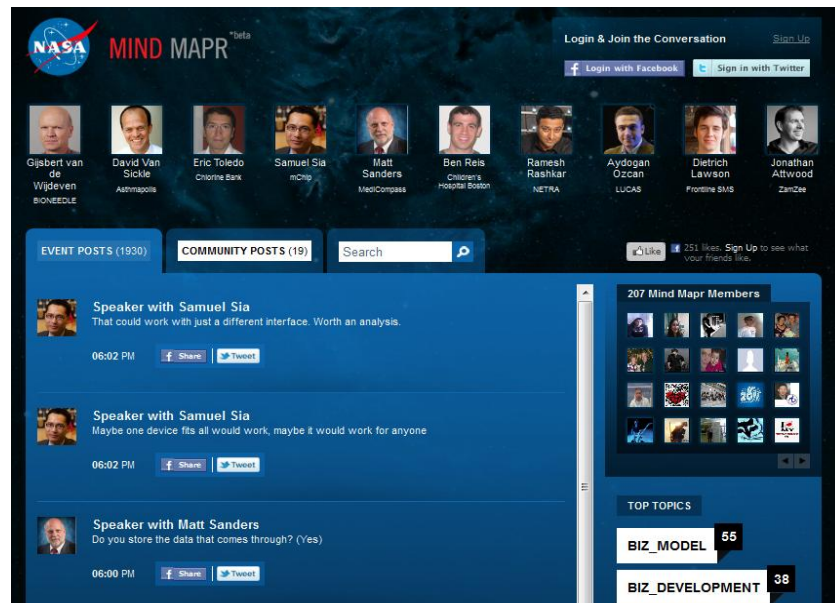
Of the Open Government projects that involve new interactive Internet technologies, 107 of those projects involve collaboration as an element. Collaboration efforts comprise the

smallest portion of open Government projects, but often have the most participation and results. Citizens collaborate best with the government when they feel that they have a genuine contribution to make that is often related to their personal expertise.

Contribution based on personal expertise is the precise intent of collaboration efforts outlined in the Open Government directive. Examples of collaboration associated with Open Government are the National Aeronautics and Space Administration's Citizen Scientist, the Veteran's Administration VAI2 challenge innovation initiative, or efforts like the Department of State's Global Pulse and the Executive Office of the President's GreenGov, which not only bring together citizens, but bring together non-traditional government partners.

The purpose of collaborative technologies is to engage citizens and users in using their individual knowledge and expertise to contribute to a body of knowledge, to develop ideas to address issues, and to assist agencies in reaching agency missions and goals. Collaboration tools range from wikis, like ExpertNet where experts convene to discuss policy issues with representatives from the White House, contribution spaces like the Citizen Scientist project where individuals help map mars and the solar system, and those like MindMpr where experts convene to develop plans for issues facing the science industry. Depicted in Figure 3.12 is the home page for the MindMpr project.

Figure 3.12 MindMapr



National Aeronautics and Space Museum: <http://mindmapr.nasa.gov/>

On the MindMapr site, citizens and experts engage in discussions related to topics posed. Topics are posted that relate from issues like business models and opportunities to technology and marketing to space travel and chemistry. Speakers post events, thoughts, research, and media related to the topics. These feeds are simulcast in social media sites like Facebook and twitter and feedback loops across the government and social media sites. Companies and the government can adopt the ideas and research. They can also pursue topics with contributors and create knowledge communities for information and knowledge exchange. The purpose of the collaboration sites is to convene and leverage expertise around a topic to push an issue forward, to develop ideas, and to create a body of knowledge for bettering or solving an issue or topic.

The newest form of collaboration space is a challenge space. In the challenge space, the government posts needs to the public that can be met by the public. Citizens and organizations compete for incentives offered by the government for those who meet and win the challenge. These challenges can be as simple as video competitions for the best public service announcements, to ideas for new business process, to actual products. Incentives range from publication and distribution of videos, to idea adoption with award certification for submission of the idea chosen, to monetary incentives. An example of an interactive collaboration space is V Ai2, developed by the Department of Veterans Affairs. A graphic of the front page of the site follows in Figure 3.13:

Figure 3.13 VAi2

UNITED STATES
DEPARTMENT OF VETERANS AFFAIRS

Search All VA Web Pages
Search
Open Advanced Search

Home Veteran Services Business About VA Media Room Locations Contact Us Related Links

VAi2 US DEPARTMENT OF VETERANS AFFAIRS
INNOVATION INITIATIVE

About
Funded Innovations
Open Competitions
News
Resources
Contact Us

Second Industry Innovation Competition
VA announces new Industry Competition with up to \$100M in awards. Private companies, entrepreneurs, universities and non-profits are encouraged to participate. This year, participants will submit short concept papers for a preliminary review. The deadline for submission is April 15, 2011. [Audio, slides and Q&A](#) from the webinar on February 23 are available as a resource.
[Learn more](#) | [Press release](#) | [Blog](#)

New Challenges Released for 2011 VAi2 Competition
Secretary Shinseki Announces 2010 Innovation Awards
Veterans Health Wireless Innovation Challenge
National Entrepreneurship Week
President Obama Calls on Industry for VA Innovations

INDUSTRY INNOVATION COMPETITION 2011

OPEN FOR INNOVATIONS

Welcome **2011 Industry Innovations Competition**

Welcome to VAi2, the flagship Open Government initiative for the Department of Veterans Affairs – a 300,000 person organization with a \$125 billion budget focused on one thing: serving Veterans. VAi2 creates opportunities for the Department to test new ideas from VA employees, academia, and the private sector. The focus of our work is improving access, quality, cost, and satisfaction throughout the Department.

VAi2 pursues this goal in three ways: employee competitions, industry competitions, and special projects. This design allows us to tap two rich sources of innovation - our workforce and private industry – while remaining flexible to new opportunities.

Follow us here on the web, on [Facebook](#) and on [Twitter](#) to get the latest news on new competitions, project awards, and special projects.

INDUSTRY INNOVATION COMPETITION 2011
[LEARN MORE](#)

COMPETITION COUNTDOWN
Concept Papers Due April 15, 2011, Noon EDT

CONNECT WITH US [f](#) [t](#)

SERVING THOSE WHO SERVED

Department of Veteran Affairs, VAi2: <http://www.va.gov/vai2/>

Through the site, users can search for competitions and submission opportunities as well as rules and methods for submitting projects and bids. They can view past winners and access information useful to them in the competition process. They can also view videos and slide presentations for each challenge and for past challenges and submit research related to challenges. And, they can compete to win projects posted to the site. The goal of the challenge sites is to leverage knowledge and talents of citizens, academics, industry, and organizations to help achieve agency missions.

The competition interface is being widely adopted in government. This adoption is largely due to the draw of uncommon audiences and the auction-like prize and pricing-like strategies. Where the government would usually have to post a bid and evaluate contractor proposals that would come from a traditional set of contractors who are trained to look for bid posts and how to bid, the government can now post in a central and transparent space where voting and ranking is completed by multiple parties on projects from a wide variety of organizations and individuals. With online collaboration spaces, the process is open to more audiences and transparently competitive.

Problems exist with some of the collaboration efforts. As can be seen in the MindMpr graphic, the only scientists that seem to be participating as scientific experts for the government are male scientists. Female users exist in the user pool, but none are considered experts and very few post events or information to the site. Additionally, like a work space, a high level of attention is required for the collaboration. Real-time posting of discussions, ideas, best practices, and follow-through is critical to project achievement and sustainability. These issues are not specific to collaboration that occurs online, they are traditional problems of engagement. However, strategies to deal with the

problems have not yet been identified, largely because evaluation of collaboration efforts does not yet exist.

Benefits for interactive Internet collaboration spaces also exist that do not necessarily exist in physical world collaboration. In an online presence, there is an opportunity for non-traditional partners to participate in collaboration efforts. These partners are both citizens and agency partnerships. An online forum allows citizens to contribute to a project from anywhere in the world at any time. And, because an online presence is not location specific, multiple agencies can host the project and use the results. Seemingly the only limiting factors to partnerships in collaboration are bandwidth and time.

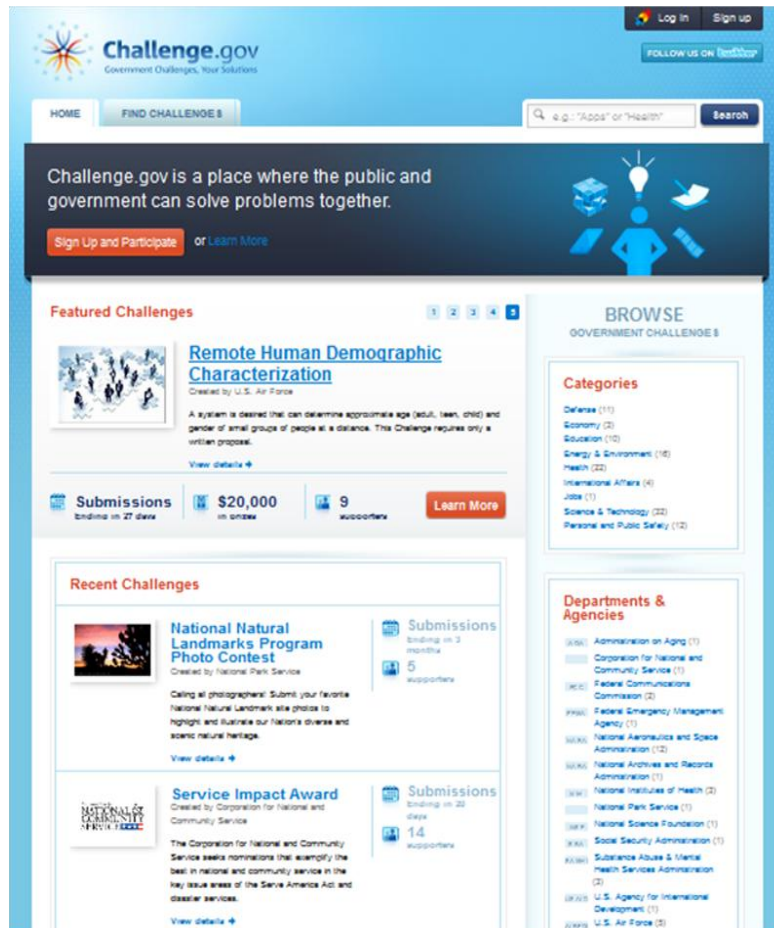
FLAGSHIP

Each agency was required to develop a “flagship” initiative. This flagship initiative was the technological launch of the Open Government directive for each agency. The initiative must have incorporated one of the three aspects of Open Government, transparency, collaboration, participation and must have involved the implementation of a new interactive Internet technology. This initiative was meant to be the hallmark of each agency that would lead the agency forward into open government and into new technology adoption. Each agency was required to couple an evaluation plan and a plan for sustainability of their flagship initiative into the agency Open Government plan. The flagship initiative is the only portion of the Open Government directive to specifically require metrics for evaluation.

INNOVATION

An example of an innovation in government that have occurred in association with the Open Government directive and that incorporates the ideas of collaboration and participation and that cut across all agencies are Challenge.gov. Challenge.gov, depicted in Figure 3.14, is a portal for agencies to post issues or problems they face and to crowdsource solutions to the problems or issues. Through the Challenge.gov platform, agencies post a problem or issue that the agency faces. They can offer a monetary award for the person or company that poses a solution that gets chosen for solving the issue. They can also offer a reward as a payment to solve the issue once a given solution has been chosen. Once a “solver” has posted a solution, the public and agency employees can discuss the solution, clarify the solution, and ultimately vote on the solution. However, the choice of solution is left solely to a panel of judges that can be comprised from the agency or the agency and its partners. The solution is posted on the agency website and the monetary or other award is given to the “solver.”

Figure 3.14 Challenge.gov



Challenge.gov: <http://challenge.gov/>

DISCUSSION

The tie between the Open Government Directive and technology development lies in the practical execution of agency mission in tandem with open government initiatives. This tie is strengthened with input from the public and concrete ways for citizens to interact

with the technology products of open government. This observation bears true for the more than 360 initiatives associated with the Open Government Directive. While the executive prompted the adoption of technologies, those that personalize it to agency and agency mission and those that find use for the technology to help achieve agency goals are the most successful at adopting Open Government and at adopting new interactive Internet technologies.

Although technology adoption can be a slow process, few agencies already show facility with multiple technologies. The National Aeronautics and Space Administration has displayed many successes in implementing new technologies associated with the Open Government initiatives. They have several Citizen Scientists type projects that attract people of all ages and help to reach the objectives of the National Aeronautics and Space Administration. They have developed a Participatory Exploration Office where all of the participatory activities of the agency are housed.¹¹ One of the citizen favorite projects is the Be A Martian Project where citizens experience Mars by improving maps, taking part in research tasks, and count craters—all of which assists Mars scientists in documenting Mars.¹² A project on the horizon is the Moon Work Project¹³. The project is a competition for researchers and students to develop new space and exploration technologies. They also developed NASAConnect, a portal for citizen collaboration opportunities.¹⁴ The National Aeronautics and Space Administration projects are really

¹¹ National Aeronautics and Space Administration Participatory Exploration Office: <http://www.nasa.gov/open/plan/peo.html>.

¹² National Aeronautics and Space Administration Be A Martian Project: <http://beamartian.jpl.nasa.gov/welcome>.

¹³ National Aeronautics and Space Administration Moon Walk Project: <http://moontasks.larc.nasa.gov/>.

¹⁴ National Aeronautics and Space Administration NASAConnect: <http://www.nasa.gov/connect/>.

geared toward citizens helping to achieve the science and engineering mission of National Aeronautics and Space Administration.

Additionally, in their Open Government plan, they include ground breaking technologies. They have initiatives to institute cloud based computing as part of their Nebula project (NASA 2010). Nebula will house scientific data and information that will be stored in the “cloud.” Storage in the cloud allows the data to be accessed from multiple devices in multiple formats and to be moved and shipped with simple password access. Because data and information are not located in a physical platform, they can be accessed by multiple users from anywhere on any device in the world. This accessibility opens up potential for new collaborations and new uses for data.

To accompany Nebula, the National Aeronautics and Space Administration has also developed a researcher network and an Innovation Pavilion. They partnered with InnoCentive to issue challenges to the public and the private sector to work with them and with fellow agencies, including the National Labs, to develop solutions to complex scientific problems. The Air Force and the Wright Brothers Institute are using a similar process for air based defense systems. Together, data access and incentives along with new interactive Internet technologies, open partnerships across uncommon and non-traditional actors that help improve the government and contribute to achieving agency missions, create a smarter community, and a better society.

A primary driver in establishing the E-Government Act of 2002 was the idea that electronic systems would break down the barriers between agencies and resolve some of the “silos” of government bureaucracy. Projects like Nebula and the Innovation Pavilion

are examples, not only of barrier break down between agencies, but between agencies and the public. Other open government projects are built around building new citizen and non-tradition partnerships. Spurring non-traditional governmental and non-governmental partnerships, the Department of State developed Apps4Africa.¹⁵

Apps4Africa combines the Department of State, iHub (technologists, technology funders, and the hacker community), Appfrica Labs, and the Social Development Network to solicit ideas for applications that will address development in African countries. The site has an interactive idea space, a wiki, and a blog. Ideas are gathered via a set of competitions. Winners are chosen and subsequently supported by partner agencies. These projects are geared building non-traditional government, citizen, and public-private partner ships using interactive technologies to achieve more global goals.

Additionally, efforts to break down barriers between agencies have occurred as well. The only cross-agency portals that were developed around the E-government act of 2002 were the Geodata portal and later the USA.gov portal. The Geodata portal is populated by geographic data submitted by agencies related to various sites of concern for the agency. Data for government sites from all agencies is compiled and organized in the Geodata portal. It is a source of geographical data for agencies as well as the public. USA.gov is a consolidation of services offered by the federal government. It is a directory of sorts for both citizens and fellow agencies. More than six portals for activities, regulations, data, and legislation have been developed in association with the Open Government directive. The General Services Administration has also developed an internal portal for the various agencies to access various technologies and information for using those

¹⁵ Department of State Apps4Africa: <http://apps4africa.org/>.

technologies, with the examples are sometime best case practices and the Open Government Playbook where guides and contacts for agencies are housed.¹⁶ Portals allow government agencies access to data about themselves and about other agencies in a quick and easy format.

While most of the Open Government projects highlighted deal with external facing interactive technologies, there are technologies that are internal facing and assistive to employees in achieving daily tasks or in providing feedback and ideas on how to improve the federal workers experience and build efficiencies in government. Early examples of internal facing technologies include Intellipedia and Diplopedia. Diplopedia is a wiki that connects the Department of State with affiliates and partner agencies to develop a base of knowledge from which to operate and communicate.¹⁷ Intellipedia is a wiki used by multiple national and international security agencies to exchange information across agencies. Both are internal wikis used by agencies to achieve agency mission goals.

With Open Government, the Corporation for National and Community Service developed My AmeriCorps. My AmeriCorps is a web space for AmeriCorps members to offer feedback on their service experiences and to access resources to help them complete their membership years.¹⁸ The Department of Education developed OpenEd, a resources center and dashboard for hiring teachers and other education sector employees.¹⁹ And the

¹⁶ General Services Administration Open Government Playbook:

<https://opengovdirective.pbworks.com/w/page/1832552/FrontPage>

¹⁷ Department of State About Diplopedia: <http://www.state.gov/m/irm/ediplomacy/115847.htm>.

¹⁸ Corporation for National and Community Service My AmeriCorps:

<https://my.americorps.gov/mp/login.do>.

¹⁹ Department of Education OpenEd: <http://www.ed.gov/open/plan/opened-employment-hiring-solutions-dashboard>

Department of Agriculture created a Services and Benefits resource center that includes forms, feedback spaces, and links to benefits and services of the department.²⁰ Several agencies have internal wikis and use other technologies to help them achieve the daily tasks of their agency.

The least successful projects are those, like blogs and data dumps, that offer little opportunity for interaction. The response to blogs is best when they are accompanied by resource centers and the response is best to data dumps when they are accompanied by useful tools, like calculators, visual aids, comparative tools, and discussion communities. The most successful projects are those that offer the opportunity for interaction, like the OpenIdeas where an idea solicitation is set forth and people can discuss, promote and demote ideas, and projects that promote competition--especially competition that feeds into a larger goal/agency mission. These observations hold for internal government users and for citizen and other users.

Geographic Information System applications are especially useful in garnering citizen support to assist with disasters and with local problems. The Geodata portal is really important in this respect. In times of disaster or major need, citizens will post both data and commentary to assist with the problem. And they will post and interact with the geo data until the problem is addressed. Some of them will then create smaller communities that update the data sets created for the disaster and then assist other communities when a problem hits another locality. The government, specifically the geodata.gov data acts as

²⁰ Department of Agriculture Services and Benefits: <http://www.dm.usda.gov/benefits.htm>

a backbone for these efforts. In this respect, raw data dumps are really useful to citizen and government service provision.

One drawback to the Open Government system is that while there are repositories for things like blogs and data, there are no real repositories for participation and collaboration opportunities. A suggestion would be that a social media and collaboration "directory" be developed to point citizens in direction for participation. Additionally, several of the Open Government initiatives and the agency open.gov sites are not actually connected to the larger agency site. So, a citizen or participant would have to be looking for the Open Government initiatives in order to find them as they are not necessarily linked on an agency's main page. Agencies are required to have the Open Government page and plan, but it isn't necessarily connected to all of the agency main pages. Some of them are also not linked back to the White House Open Government page. Proper links would serve in accessibility for Open Government efforts.

Additionally, in the next phase of Open Government, each agency might consider developing value metrics and parameters for their projects. They might ask what value these tools provide to their agency and to the public. Most agencies track use, but not value.

By and large, agencies have heard the Open Government call and have worked with citizens to produce plans, projects, and products that promote transparency, participation, and collaboration in ways that add practicality to ideals. While there is still work to be done, the question of continued development and sustainability remains.

SUSTAINABILITY

Neither ideals nor technology are sustainable until the culture around them adopts them as essential to its core. Built into the directions for establishing Open Government in agencies is the provision to create policies to support the development of a culture of open government. Part of these policies entail making a direct link between the activities assigned by the directive and the missions of the agency. This linkage makes the activities of the directive part of the logical processes of work. Another part involves tying the activities and values of open government to the strategic planning and long term goals of the agency so that the activities and values are embedded into the systemic operations of the agency. And finally, in order for the democratic values of the directive to become the values of the agency, a direct tie between value sets must be perpetuated throughout the agency.

To be sustainable, a technological system must have the proper base components—hard and software. It must also include proper long and short term budgeting, as well as a vision and strategic plan for growth, evolution, and maturation of the hardware, software, and system. For interactive systems, concessions must also be made for bandwidth, access to the Internet, connection speeds, and multiple access devices. Planning must include proper maintenance and culling of web pages and interactive tools.

In the E-Government Act of 2002, Bush laid out specific systems requirements with a five-year budget strategy and multi-year timelines for technology implementation (Bush 2002). While he did not include specific hard or softwares, he did include systems requirements for the hard and softwares chosen by agencies. Along with multi-agency

technical and strategy teams, Bush also set up offices responsible for monitoring the growth and development of e-government systems. In addition, he called for a series of reporting mechanisms to determine the progress of agency adoption of technology. And he delineated access and deployment requirements that considered the functions and needs of individual agencies. Agencies took it upon themselves to determine their method of incorporation of planning for the Open Government Directive and for new technologies.

The Open Government Directive did not set systems requirements or any long-term budget strategies to support technology development (Orszag 2009). The only specific systems requirement was the use of the IdeaScale tool for collecting public input on individual agency Open Government plans. Outside of this particular tool, no outlines were set for increased broadband or access mechanisms or resources for developing those mechanisms. Equally, no software requirements were set forth in the Directive. And, no system of evaluation or long-term timeline was suggested to agencies. A gesture toward sustainability was included in the Open Government Directive in the call to include the ideals of Open Government in the agency policy planning process—though no specifics were outlined with that call.

In their Open Government plan, the Department of Health and Human Services connects the activities of the agency to the activities of open government (see Figure 3.15). They break out both short and long term tasks that will be achieved in association with the goals of the agency and in association with the goals of the Open Government directive. While they do not tie open government and strategic activities to technology use or

development directly in their goal statement, they do tie information and interactivity which are the core values of the technologies associated with open government.

Figure 3.15 Department of Health and Human Services Open Government Plan

How Open Government Supports Our Strategic Goals

(3 votes, average 3 out of 5 stars) [Rate it!](#)

HHS sees Open Government explicitly as a means by which HHS will become more successful in how well we deliver on our mission of improving the health and well-being of the United States.

The Open Government Plan directly supports the major work of the Department, including its highest priority activities and high priority performance goals. On May 6, 2010, Secretary Sebelius announced HHS's key strategic initiatives and key inter-agency collaborations going forward (see <http://www.hhs.gov/secretary/about/secretarialstrategicinitiatives2010.pdf>):

- Transformation of health care
- Implementation of the Recovery Act
- Promotion of early childhood health and development
- Prevention and reduction of tobacco use
- Protection of the health and safety of Americans in public health emergencies
- Acceleration of the process of scientific discovery to improve patient care
- Implementation of a 21st century food safety system
- Ensuring program integrity and responsible stewardship
- Reduction of teen and unintended pregnancy
- Supporting the National HIV/AIDS strategy
- Improving global health
- Fostering open government

The inclusion of Open Government as a key Secretarial priority for HHS will accelerate implementation of the initiatives described in this plan and provide major visibility for Open Government across HHS and to its stakeholders. Subsequent achievements in the Open Government plan will be featured in measures and milestones described in performance reports on the strategic initiatives. One of our goals is to have more than 100 ideas and comments from the public in addressing Open Government activities.

In addition, the concept of Open Government is being incorporated into a draft HHS's Strategic Plan 2010-2015 which will soon be published through our Open Government website at hhs.gov/open for public comment. Once the new strategic plan's goals and objectives have been identified, they will inform proposals for new transparency, participation, and collaboration initiatives.

The central objective of Open Government at HHS is to advance the ability of the department to deliver on its mission through the power of transparency, participation, and collaboration. Optimizing how well we disseminate vital government information to the public, foster the use of that information, and engage citizens, health care providers, human service providers, non-profit organizations, businesses, state, local, and tribal governments, researchers, the media, advocacy organizations, and others outside HHS in the work of advancing these goals will be vital to achieving them. In fact, it's hard to imagine how we'll achieve maximum success with respect to our goals without doing so.

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[<< Previous](#) [Leadership, Governance, and Culture Change](#) [Next >>](#)

A federal government Website managed by the U.S. Department of Health & Human Services - 200 Independence Avenue, S.W. - Washington, D.C. 20201


Health and Human Services Open Government Plan: <http://www.hhs.gov/open/plan/opengovernmentplan/change/supportstrategic.html>. Last retrieved April 5, 2011.

Additionally, agencies like the Social Security Administration and the Environmental Protection Agency tie the Open Government Directive and their agency Open Government activities to their agency strategic plans. The Environmental Protection

Agency incorporates a streamlined structure and interactive timeline for the combined strategic goals on their website where citizens can offer input and where the agency can report back on their progress at achieving their goals. The Social Security Agency aligns strategic agency outcomes with outcomes of open government, depicted in Figure 3.16. They use alignment of goals as a method for incorporating open government into their daily activities. Additionally, nearly all of the outcomes of the goals involve some form of information technology use or development.

Figure 3.16 Social Security Agency Strategic Plan

Chart 4 — Examples of alignment between open government initiatives and agency strategic goals



Examples of Alignment between Open Government Initiatives and Agency Strategic Plan				
	ASP Goal 1: eliminate our hearings backlog and prevent its recurrence	ASP Goal 2: Improve the speed and quality of the disability process	ASP Goal 3: Improve our retiree and other core services	ASP Goal 4: preserve the public's trust in our programs
OG Goal I: increase transparency	Hearings datasets posted on Data.gov	Post disability data on Data.gov	Post additional program datasets on Data.gov	Enhance our FOIA program to further ensure a "presumption of openness".
OG Goal II: expand participation and collaboration	Appointed rep suite of services developed with reps; ASP collaborative tool will provide public with opportunity to provide input for goals and strategies for all issues, including hearings	Compassionate allowances, Health Information Technology, project with MIT	Focus groups, usability testing, electronic town hall meetings	OG portal, Post OG names, public meetings posted, OG scores posted; ASP collaborative tool will provide public with opportunity to provide input for goals and strategies for all issues and programs

Social Security Administration Open Government Plan: <http://www.ssa.gov/open/story-2010-06-24-open-government-plan.html>. Last retrieved September 28, 2010.

In their Open Government plan, the Department of Agriculture directly links technology to their activities associated with the Open Government directive. In their strategic plan,

they list explicitly transparency, participation, and collaboration and tie them to the values of the agency. The values of Open Government comprise three of their seven core values. Not only are the agency and open government values tied, but the open government values are listed with the initiatives associated with technology. Additionally, the values are displayed in an iconic figure that is meant as a motivational and cultural statement of the organization. They also tie technology to their core agency development in that it is an explicit part of their values statement.

These value statements are generally placed in central office locations, offering employees and the public a constant visual reminder of the connection between agency value and open government. And in the case of the Department of Agriculture, as seen in Figure 3.17, a visual tie to technology between values of the agency and open government. Citizens can immediately identify the core values and the structure of the agency around those core values. In fact, Open Government makes up the core of their agency values logo.

Figure 3.17 Department of Agriculture Agency Values



Department of Agriculture Open Government Plan:
<http://www.usda.gov/open/Blog.nsf/archive?openview&title=Plan&type=cat&cat=Plan&sort=I>. Last retrieved March 15, 2011.

The most sustainable open government efforts are those that connect projects to agency mission and the goals of the directive and that involve citizens in achieving both open government goals and agency mission at least partially through the project. In addition, sustainable success is found in those initiatives that connect real world applications to open government goals and long-term strategic visioning.

In addition to incorporating new technology development and the democratic values associated with new technology development into strategic planning, it is also important to note that there is some level of technology championing that must occur to sustain technology adoption. The “program to encourage innovative solutions to enhance electronic Government services and processes” and “Title II: Federal Management and Promotion of Electronic Government Services” portions of the E-Government Act of 2002 incorporated measures for exploration and experimentation with technologies as well as sharing sessions among information technology staff so that technology would be incorporated into agencies quickly, but also so that agencies would be motivated to explore the uses and potentials of information technologies in meeting their agency goals.

However, outside of incorporating technology to achieve service and agency goals, technology adoption has involved some championing by specific individuals in the legislature and in the presidency. That championing has also involved the use of democratic language, or words that are associated with good governance and democracy to call for exploration and adoption. Coburn and Obama, in the Federal Funding Accountability and Transparency Act specifically involve concepts of transparency as part of good governance to frame their arguments for the creation of USASpending. In the Transparency and Open Government Act, Obama uses the core values of democracy, transparency and participation, as well as a core value of emerging technologies, collaboration, to call for new technology development.

For Obama, technology has always been at the forefront of his politics and at the forefront of his governance strategy. In his political campaigns, he effectively used his website to garner funds, as well as organize grassroots campaign efforts, distribute

campaign materials, and build policy communities for policy discussions about his political platform. He incorporated technology development in his works as senator, through calling for the consolidated USASpending site and others, and as President. He has continually been a champion for incorporating new information technologies, particularly interactive Internet technologies into governance.

Champions in technology development are important as justification for adopting technology often relate to value. The value of new technologies in the early stages of adoption is not always immediately apparent. The disruption caused by adoption and the “kinks” associated with adoption can frustrate users and those implementing systems. Champions help in allaying fears and in inspiring the cultural change necessary for technology adoption and use. They also bring about co-champions and followers who assist in implementation and in funding or fighting for funding—which is a primary component of sustainability.

The 2002 E-Government Act established a fund to support transitioning the daily activities of government online. The purpose of the fund was not necessarily to cover the investments that agencies would make in digitizing agency processes, but for projects associated with moving the business of government online. Historically the fund has come under criticism because it wasn’t necessarily seen as essential to the digitization process and at times has been viewed as for more experimental purposes. Some of the technologies that have been developed in tandem with the Open Government directive, including data.gov, USASpending.gov, and Apps.gov are being considered for cuts in the current budget.

Leslie Phillips, a spokeswoman for the Senate Homeland Security and Governmental Affairs Committee, of which Joseph Lieberman, co-author with Obama of the bill that spawned USASpending.gov and committee chairman, was quoted in defense of new information technologies, "Economic conditions demand wise budget decisions, but cutting money from multiple federal IT programs is penny-wise and pound foolish. Programs that modernize technology ultimately improve management and save taxpayers billions of dollars. Transparency and e-government programs encourage public participation in government. Small investments in IT modernization can reap enormous rewards, which is why Senator Lieberman opposes the proposed cuts to the e-gov fund and the administration's IT reform efforts (Miller 2011)." Without champions for the technologies, sustainability remains a question.

INNOVATION VERSUS DEMOCRACY

The story of open government is as much, if not more, about innovation as it is about democracy. While the transparency and participation ideals set forth in the directive relate directly to democracy, arguably collaboration has as much to do with democracy as emerging business practices associated with new interactive Internet technologies.

Additionally, the Open Government outcomes to date relate far more, and are written and talked about far more, to innovation than to the enhancement of democracy.

In the first months of the initiative, the Obama administration published an innovations gallery where they highlighted the innovations associated with the Open Government directive. While these innovations were published in association with the values stated in

the directive, the discussion is more about the use of technology than achieving a goal of transparency, participation, or collaboration.

In a recent blog post, Aneesh Chopra and Chris Vein, the Chief and Deputy Chief Technology Officers, write about the business innovations spurred from the Open Government directive. They cite the development of private companies Socrata, a social data management and visualization company, and InfoChimps, a data sorting and posting tool, external to the government as successes of Open Government innovation (Chopra and Vein 2011). In another article, Chopra sites Open Government as the base for StartUp America, an entrepreneurial and growth acceleration plan for businesses. In yet another set of articles, Vivek Kundra, Chief Information Officer of the federal government, and Chris Lu, Assistant to the President and Cabinet Secretary, talk about Open Government in terms of customer service value and building a more efficient and effective government. In fact, of the articles written and issued on the White House Open Government blog in 2011 about the Open Government directive, only one does not relate the innovation outcomes of Open Government.

The discussion around the successes of Open Government is largely related to successes in the private sector and increases in the effectiveness and efficiencies of government. The directive is seemingly moving toward not necessarily being about fostering innovation to support democratic values, but fostering technology development to spur innovation. The move raises questions. Are the values associated with democracy, transparency, participation, collaboration the spur for technological adoption or are the values of capitalism, innovation and growth, the spur for technological adoption? Is it coincidental that participation, collaboration, transparency happen to be democratic

values that the government can espouse that are both democratic and capitalistic? If we look at the foundational documents associated with open Government, they are meant to promote transparency and participation, core values of democracy. However, the outcomes of the directive are talked about in terms of innovation and are being linked with private sector growth and public sector tightening.

And new developments in government also seem to suggest a move away from technology adopted in efforts to espouse and advance democratic values. On March 11, 2011, Barack Obama established the Office of Good Government²¹. The Good Governance Office is a portal for government review and is filed under ethics on the White House homepage. Technological inclusions are made within the site, but they are secondary to the idea of citizens' ability to review government activity. They are tools for sorting data. Open Government is linked to Good Government, but there is no overt connect between Open Government and Good Government.

The separation of Open Government and new interactive technologies may rest upon a recognition of new technology development as a source of innovation—much needed innovation in a suffering economy—and possibly associated with several articles assessing the value of the transparency products. Data reviewers at the General Accounting Office, the Sunlight Foundation, Office of Management and Budget Watch, Information Week, and Wired have all found flaws in reporting of Freedom of Information Act compliance and in posting of budget allocations. In a series of articles, they put into question the transparency of Obama's transparency in his transparency

²¹ <http://www.whitehouse.gov/goodgovernment/>

initiatives (GAO, Kravets, Montalbano, Rosen-Amy 2011). If the focus of the Directive becomes technology and innovation, then the actual data may not be a primary concern.

It is important to note that the majority of current innovations rest on the relationship between the government and its data management practices. The foundations of this relationship lie in the establishment of data practices stemming from the E-Government Act of 2002. The Act spurred the development of internal business practices achieved through technology that was developed to support transactional processes. The mindset associated with e-government is that of data transaction within the government and between government and citizens. The legislation and culture of e-government revolves around enhancing and developing practices to better the business relationship of government and citizens through information technology.

Obama essentially issued a directive with no clear metrics for evaluation to guide agency understanding of prioritization for adoption. He placed democratic values of transparency, participation, and collaboration at the center of the adoption of new technology and engagement practices for federal workers. Part of the nature of technology push is that the technology developments are nascent. There is no clear understanding of the impacts or value of the tools in the business, non-profit, international, or domestic world. The technology is not yet well enough established to understand the full benefits or costs. In this, innovation becomes an organic occurrence as agencies develop technologies, but those technologies were adopted by clear effort of the executive.

With the introduction of Open Government, the relationship is changing or expanding from enhancing the more internal business systems of government to enhancing the more external citizen government relationship through new information systems. For the most part, the context of the directive and its organizational provisions are to enhance the external aspects of government, data for the purposes of transparency for citizens, collaboration and participation with citizens. The focus of development of information systems and the inclusion of interactive technologies into government is developing the external citizen to government relationship and suggests changing or expanding the organizational structure to include citizens as a part of the daily operations of government.

It is too early to understand the impacts of the shift or expansion from information systems as developing the internal business practices of government to the more external citizen participation in the everyday activities of government. However, it is possible to note that while the facing of the systems is changing or adding a new dimension, the government and government services are at the center of the system. That is, while there are opportunities for citizens to extract and use data and for them to add to the expertise of government and for them to offer ideas and comments on some of the activities of government, the feedback loop is to the government body. And the government body decides ultimately, what to do with that feedback and information. Thus, while a bigger network is created, the government is at the center of that network and is the locus of power.

It appears in language that increases in democracy are driving the Open Government movement, but it also appears that there is no value structure to assess increases in

democracy or democratic outcomes associated with the Open Government directive.

Equally, there is no structure to account for the technologies developed, the usefulness of those technologies or any efficiencies that might be associated with those technologies. It may be that development of technology has reached a point where strategic direction is necessary to achieve both democratic and business goals through the use of interactive Internet technologies.

It is fair to say that any president serving in the early and mid-2000s would have had to consider e-government. The technology's existence in the market and displayed business value was too strong for any leader or leadership body to ignore. In addition, the method of introduction, a great push into technological revolution by Congress and by President was necessary for systemic and consistent adoption of the technology at the time. It also fair to say that had any president other than Obama been elected in 2008, the focus on incorporating interactive Internet technologies into government would not have been as strong and may not have existed at all. Certainly, no other President would have introduced new technology development through Open Government as his or her first act of governance.

However, by not having an overwhelming push into the newest technological revolution and by not including value metrics for performance and by couching technological efforts in democratic language, sustainability of Open Government and new technology is placed solely on the shoulders of agencies. After Obama leaves office, there is no guarantee that the next administration will push Open Government or will support the recourses necessary to perpetuate new interactive Internet technologies. It may be that a demand pull by the citizens and by government workers will force the next president to sustain,

even develop, new interactive technologies. But, with no real estimation of value and no champion for the effort, new interactive Internet technological advancement in government is at jeopardy of the chopping block at the next budget war.

SUPPLIMENTAL 3.1 OPEN GOVERNMENT SITE BY AGENCY

Agency	Open Government Site
Agency for International Development	http://www.usaid.gov/open/
Corporation for National and Community Service	http://www.nationalservice.gov/home/open/index.asp
Council on Environmental Quality	http://www.whitehouse.gov/open/around/eop/ceq
Department of Agriculture	http://usda.gov/open
Department of Commerce	http://open.commerce.gov/
Department of Defense	http://open.dodlive.mil/
Department of Education	http://www2.ed.gov/about/open.html
Department of Energy	http://energy.gov/open/
Department of Health and Human Services	http://www.hhs.gov/open/
Department of Homeland Security	http://www.dhs.gov/xabout/open-government.shtm
Department of Housing and Urban Development	http://portal.hud.gov/portal/page/portal/HUD/open
Department of Justice	http://www.justice.gov/open/
Department of Labor	http://www.dol.gov/open/
Department of State	http://www.state.gov/open/
Department of the Interior	http://www.doi.gov/open/
Department of the Treasury	http://www.treasury.gov/open/
Department of Transportation	http://www.dot.gov/open/
Department of Veterans Affairs	http://www4.va.gov/open/
Environmental Protection Agency	http://epa.gov/open/
General Services Administration	http://www.gsa.gov/portal/content/105340
National Aeronautics and Space Administration	http://www.nasa.gov/open/
National Archives and Records Administration	http://www.archives.gov/open/
National Science Foundation	http://nsf.gov/open/
Nuclear Regulatory Commission	http://www.nrc.gov/public-involve/open.html http://www.whitehouse.gov/omb/blog/10/04/07/OMB-and-Open-Government/
Office of Management and Budget	
Office of National Drug Control Policy	http://www.whitehouse.gov/open/around/eop/ondcp
Office of Personnel Management	http://opm.gov/open/
Office of Science and Technology Policy	http://www.whitehouse.gov/open/around/eop/ostp

Office of the US Trade
Representative
Small Business Administration
Social Security Administration

<http://www.whitehouse.gov/open/around/eop/ustr>

<http://sba.gov/open/>

<http://www.ssa.gov/open/>

SUPPLEMENTAL 3.2 OPEN GOVERNMENT PLAN BY AGENCY

Agency	Open Government Plan
USAID	http://www.usaid.gov/open/USAIDOpenGovernmentPlan2010-04-07.pdf
CNCS	http://www.nationalservice.gov/pdf/10_0626_open_government_plan.pdf
CEQ	http://www.whitehouse.gov/sites/default/files/microsites/100407-ceq-opengov-plan.pdf
DOA	http://usda.gov/open/Blog.nsf/dx/USDA_Open_Government_Plan_Version1_1.pdf/\$file/USDA_Open_Government_Plan_Version1_1.pdf
DOC	http://open.commerce.gov/sites/default/files/DOC%20Open%20Government%20Plan%20v%201%201%20Final.pdf
DOD	http://open.dodlive.mil/files/2010/06/DoD-Open-Gov-Plan-v1-1.pdf
DOEd	http://www.ed.gov/sites/default/files/opengov-plan.pdf
DOE	http://energy.gov/open/documents/FINAL_DOE_OGPVer1-2b_07July2010.pdf
HHS	http://energy.gov/open/documents/FINAL_DOE_OGPVer1-2b_07July2010.pdf
DHS	http://www.dhs.gov/xlibrary/assets/dhs_open_government_plan.pdf
HUD	http://portal.hud.gov/portal/page/portal/HUD/open/plan/og-plan-v1.1.pdf
DO	http://www.justice.gov/open/doj-open-government-plan.pdf
DOL	http://www.dol.gov/open/OGDplan.pdf
DOS	http://www.state.gov/documents/organization/139811.pdf
DOI	http://www.doi.gov/open/loader.cfm?csModule=security/getfile&PageID=28151
Treasury	http://www.treasury.gov/open/docs/open_government_plan.pdf
DOT	http://www.dot.gov/open/pdf/DOT_Open_Gov_Plan_V1.2_06252010.pdf
VA	http://www4.va.gov/OPEN/docs/open_govt_plan.pdf
EPA	http://www.epa.gov/open/EPAOpenGovernmentPlan_11.pdf
GSA	http://www.gsa.gov/graphics/admin/OpenGovPlan_v_1_1.pdf
NASA	http://www.nasa.gov/pdf/440945main_NASA%20Open%20Government%20Plan.pdf
NARA	http://www.archives.gov/open/Open%20Government%20Plan%20-%20Version%201.1.pdf
NSF	http://www.nsf.gov/pubs/2010/nsf10049/nsf10049.pdf
NRC	http://www.nrc.gov/public-involve/open/philosophy/nrc-open-gov-plan.pdf
OMB	http://www.whitehouse.gov/open/around/eop/omb/plan
ONDCP	http://www.whitehouse.gov/open/around/eop/ondcp/plan
OPM	http://opm.gov/open/includes/OPM%20Open%20Government%20Plan_v1.2_062510.pdf
OSTP	http://www.whitehouse.gov/open/around/eop/ostp/plan
OTR	http://www.whitehouse.gov/open/around/eop/ustr/plan
SBA	http://sba.gov/idc/groups/public/documents/sba_homepage/sba_open_gov_plan.html
SSA	http://www.ssa.gov/open/10-617OGP.pdf

SUPPLEMENTAL 3.3 OPEN GOVERNMENT AGENCY SELF-EVALUATION CHECK LIST

Open Government Plan Evaluation Criteria

Directions

The enclosed list of 30 criteria is drawn directly from the text of the Open Government Directive. Please return this form to the White House Open Government team at opengov@ostp.gov by 5 pm on Friday, April 23rd. To complete the self-evaluation form, please indicate a response to each of the criteria as follows:

- Red (R) – plan does not satisfy the requirement
- Yellow (Y) – plan partially satisfies the requirement
- Green (G) – plan fully satisfies the requirement
- N/A - not applicable because agency does not engage in that activity or area

Please include any explanatory comments on the last page.

Optional: If you wish, please provide the page range for the relevant section of the plan that is the basis for your answer to each question.

Formulating the Plan in the Open

- 1.) Was multidisciplinary collaboration involved in formulating the plan?
- 2.) Was public consultation involved in crafting the plan?
- 3.) Was the plan published in an open format, online, on time and on the open government page and with raw data?
- 4.) Is there a plan for continued public engagement as part of the review and modification of the open government plan?

Transparency Strategic Action Plan

- 5.) Does the plan contain a strategic action plan that inventories agency high-value information currently available for download?
- 6.) Is there a plan to foster the public's use of this information to increase public knowledge and promote public scrutiny of agency services?
- 7.) Does the action plan identify high value information not yet available and establish a reasonable timeline for publication online in open formats with specific target dates?

8.) For agencies providing public information in electronic format: Is there a plan for timely publication of underlying data for public information maintained in electronic format?

9.) Does the plan identify key audiences for information and their needs, and the agency endeavors to publish high-value information for each of those audiences in the most accessible forms and formats?

10.) Is there a plan to demarcate educational material as free for re-use?

11.) Does the plan detail compliance with transparency initiative guidance, and where gaps exist, detailed steps the agency is taking and the timing to meet the requirements for each initiative:

- Data.gov
- eRulemaking
- IT Dashboard
- Recovery.gov
- USAspending.gov

12.) Are there details of proposed actions (with clear milestones) to inform the public of significant actions and business of the agency (e.g. agency public meetings, briefings, press conferences, town halls)?

13.) Does the plan address existing record management requirements by providing:

- Website link
- Identifying and scheduling all electronic records
- Timely transfer of all permanently valuable records to the National Archives

14.) Does the plan address FOIA by providing:

- Website link?
- Staffing, organizational structure, and process for responding to FOIA requests?
- Assessment of capacity to analyze, coordinate and respond to requests in a timely manner?
- If there is a significant FOIA backlog, details on how the agency will reduce the backlog by 10% each year?

15.) Does the plan address congressional requests by providing a:

- Website link?
- Staffing, organizational structure, and process for responding to Congressional requests?

16.) Does the plan address declassification, if applicable by providing a:

- Website link?
- Where the public can learn about declassification programs, accessing declassified materials, and provide input about what types of information should be prioritized for declassification?

Participation

17.) Does the plan explain how the agency will improve participation, including steps the agency will take to revise its current practices to increase opportunities for public participation in and feedback on the agency's core mission activities (including proposed changes to internal management and administrative policies to improve participation)?

18.) Does the plan describe and provide links to websites for the public to engage in existing participatory processes?

19.) Are there proposals for new feedback mechanisms (including innovative tools and practices for public engagement)?

Collaboration

Does the plan list steps the agency will take to revise its current practices to further collaboration:

20.) With other Federal and non-Federal government agencies? Including the use of technology platforms to this end?

21.) With the public? Including the use of technology platforms?

22.) With non-profit and private entities? Including technology platforms?

23.) Are there links to websites that describe existing collaboration efforts of the agency?

24.) Does the plan describe the Innovative methods (e.g. prizes and collaborations) to increase collaboration with the private sector, non-profit, and academic communities?

Flagship Initiative

- 25.) Does the plan include at least one specific flagship engagement?
- 26.) Does the description provide an overview of the initiative: how it addresses one or more of the three openness principles and how it aims to improve agency operations?
- 27.) Does it identify external partners for collaboration (if appropriate)?
- 28.) Is there a plan for public participation in contributing innovative ideas to the flagship?
- 29.) Does the description explain how the improvements to transparency, participation and/or collaboration will be measured?
- 30.) Does the flagship include a description of sustainability and room for improvement?

**SUPPLEMENTAL 3.4 OPEN GOVERNMENT INNOVATIONS QUALITATIVE DATABASE
VARIABLE DESCRIPTION**

Open Government Innovations Qualitative Database Variable Description	
Variable Name	Variable Description
Agency	Name of United States federal agency responsible for specified Open Government plan
Open Government Link	Link to specific agency Open Government plan
Project/Initiative Name	Name of individual initiatives or projects outlined and associated with specific Open Government plan
Project/Initiative Link	Link to individual initiatives or projects outlined and associated with specific Open Government plan
Project/Initiative Start Date	The date/expected date that the individual initiative or project was launched by the agency
Project/Initiative Status	The status (operational, in process, complete, ongoing) of the individual project/initiative
Functionality/Purpose of Project/Initiative	The given function or purpose of the individual project/initiative (ex. idea sourcing, blog, data tracking, wiki, collaboration, video, application, education, report gathering, competition, data, news, etc.)
Government Partner Agencies	A list of the government agencies partnering with the specific agency to achieve the individual project/initiative
Non-Government Partner Agencies	A list of the non-government agencies partnering with the specific agency to achieve the individual project/initiative
Business Partner Agencies	A list of the business agencies partnering with the specific agency to achieve the individual project/initiative
Citizen Partners	A binary indication (yes, no) of the direct involvement of citizens in achieving the individual project/initiative

Flagship Initiative	A binary indication (yes, no) of the status of the individual project/initiative as the age Open Government Flagship project/initiative
Internal/External	An indicator for whether or not the primary audience for the individual project/initiative is meant for internal agency users or external agency participants
Transparency/Participation/Collaboration/Innovation	An indication of the primary Open Government goal (transparency, participation, collaboration, or innovation) addressed by the individual project/initiative
Project/Initiative Uses IdeaScale	A binary indication (yes, no) of the use of the IdeaScale tool within the individual project/initiative
Temporal/Permanent Website Addition	An indication (temporary, permanent) of the longevity of the addition of the individual project/initiative to the specific agency website
Open Government Webpage linked to Agency Webpage	A binary indication (yes, no) of the linking of the Open Government plan on the landing page of the specific agency
Self-Evaluation Complete	A binary indication (yes, no) of the specific agency's completion of the Office of Management and Budget produced self-evaluation of the individual agency Open Government plan
Open Government plan Incorporated into Strategic Plan	A binary indication (yes, no) of the inclusion of Open Government in the strategic plan of the specific agency
Open Government plan Related to Strategic Plan	A binary indication (yes, no) of the inclusion of the mention of the incorporation of Open Government in the specific agency strategic plan
Strategic Plan Dates	Applicable dates (timespan) of the specific agency strategic plan
Open Government plan Incorporated into Annual Report	A binary indication (yes, no) of the inclusion of Open Government in the annual report of the specific agency
Annual Report Date	Date the specific agency produced their annual report

Project/Initiative cost	The budget allocated (if listed) for the individual project/initiative
Tag 1	A one word description of the individual project/initiative
Tag 2	A one word description of the individual project/initiative
Tag 3	A one word description of the individual project/initiative
Contact Name	The name of the contact provided as responsible for the Open Government Initiative for the specific agency
Contact Title	The employment title of the individual contact provided as responsible for the Open Government Initiative for the specific agency
Contact Email	The email address of the individual contact provided as responsible for the Open Government Initiative for the specific agency

Chapter 4: Of Starfish and Spiders, The Architecture of Interaction

INTRODUCTION

As research in the previous chapter indicates, implementation and development of interactive Internet technologies in government has occurred largely because of structured efforts, primarily through the Open Government Directive, to promote adoption of these technologies. Researched in this chapter are changes in the architectural structure and in the ecology of government websites incorporating interactive Internet technologies.

OVERVIEW

Provided within the chapter is an analysis of the Internet architecture that is associated with transactional and interactive web spaces. A hypothesis of research is that the transactional and interactive architectures will differ. To test the hypothesis an Internet mapping tool was applied to transactional web spaces and interactive web spaces associated with transparency, participation, and collaboration dictated in the Open Government directive. Findings indicate that transactional and interactive web spaces are different.

A secondary purpose of the chapter is to observe more in depth the interactive technologies currently being adopted by the government and to understand any organizational or democratic outcomes associated with those technologies. Findings

indicate that it is too early to guess at the structure of government that will emerge, but that some of the technologies have more success at meeting the goals for transparency, participation, and collaboration set forth in the Open Government directive.

THE STARFISH AND THE SPIDER

In *Emergence*, Steven Johnson opens his book with a story of ant colonization (Johnson 2001, 29-31). He visits a friend in Palo Alto who studies behavioral ecology. The subject of her current study is the behavior of harvester ants in association with their environment. As he observes the harvester ants in their enclosure, he notes that if he taps on the glass of the case, the harvester ants secret away the queen to an enclosure deep within the colony. Equally, he notes that the ants have placed the garbage heap for their colony as far outside the colony as possible and they have placed their cemetery as far as possible from the garbage heap and from the colony. He also notes that the ants do not exhibit any of these behaviors at the behest of the queen. Rather, they exhibit these behaviors because they are biologically programmed to do so.

The queen serves the function of producing eggs and larvae for the colony. It is in the ants' biological self-interest to protect their life source. Thus, they protect her and keep her well-fed so that young will be produced to replace the dead. However, the duties associated with her status as 'queen' do not extend to organizing the colony or directing the behaviors of the worker ants. The decisions to house the garbage heap and the cemetery away from each other and away from the colony are innate organizing rules of the ants. The moniker and endowment 'queen' is human invention. In reality if the

queen did not exist, the ants' behavior would not change—outside of searching for a new source of eggs and larvae production in addition to their daily duties of foraging for food and executing the processes necessary to sustain the colony. In effect, the ants colonize around a resource set and autonomously carry out the tasks of the colony.

In their book, *The Starfish and the Spider: The Unstoppable Power of Leaderless Organizations*, Brafman and Beckstrom apply the ant analogy to historical organizations of people. They describe two leadership forms, the spider and the starfish. The spider is a form in which many members make up the legs, body, head, and web. Organizations that are spider like take a long time to form and each component builds on the next, like an intertwined hierarchical organization. The drawback to spider organizations is that if you cut a part of the web or a part of the spider body, the organization is seriously damaged and may not be able to recover. The spider organization is much like the organizations that run under more hierarchical command and control structures associated with the transactional world. The starfish is an organization that has a central nervous system, but when cut develops a new central nervous system that survives beyond the original body (Brafman and Beckstrom 2006). The starfish organization is resilient and self-organized and is leaderless outside of electric pulses that result from each nerve action. Organizations that are considered networked are much more like starfish than spiders.

The organizational starfish or spider structure rests on the architecture of the colony. The architecture of the ant colony arises from behaviors that are innate. The architecture of the spider's web arises from purposeful design. The architecture of interactive Internet technologies and its relationship to the larger organization and whether it will add to the

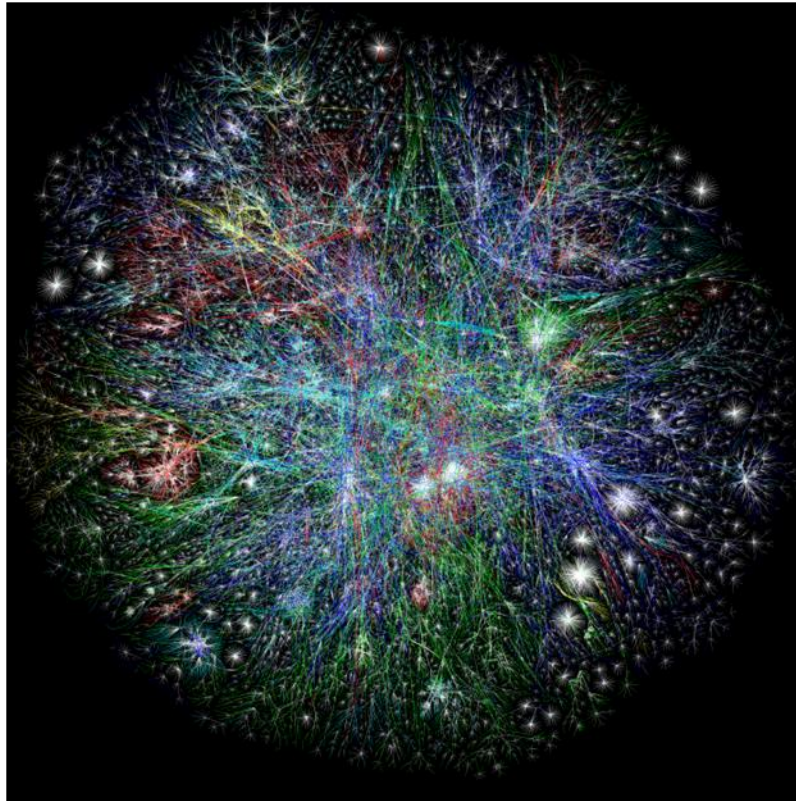
web or contribute to the colony is not yet known. Popular myth suggests that as more interactive technologies are introduced, that organizational structures will flatten and government will become networked—a self-organized body to meet service needs. But, as Barabasi points out in his book, *Linked*, organizations, especially organizations as complex as government organizations have a strict architecture to which they must abide (Barabasi 2003, 7).

THE ARCHITECTURE OF INTERACTION

In his book, *Linked*, Albert-Laszlo Barabasi notes that it wasn't until the birth of the Internet that we have been able to observe collective human behavior in such a large scale (Barabasi 2003, 227). With the Internet, we can explore the fundamental links in the architecture of humanity that hold communities, governments, cultures, and societies together. We can also understand the changing shape of that architecture given new links and new technologies. As Barabasi notes, while complex organizations are strictly structured, those structures do change and the networks within the structure take on different forms with different functions (Barabasi 2003, 229).

Following in Figure 4.1 is a map of the Internet. Depicted in the map are the extent and network path of various organizations (detailed in the key). For this chapter, small maps of new interactive technologies will lend understanding of the larger Internet map of the information systems of government. The primary quandary from research is to understand if emerging interactive technologies of i-government differ architecturally from the transactional technologies of e-government.

Figure 4.1 Opte Map of the Internet



net, ca, us com, org mil, gov, edu
jp, cn, tw, au de, uk, it, pl, fr br, kr, nl unknown

Opte Map of the Internet: <http://www.opte.org/maps/>

The architecture of the Internet is built by and is a reflection of human interaction in a non-physical space where ideas flow and knowledge is exchanged. Within that space, natural structures appear, networks, hierarchies, and linked by function and by use. The goal of this chapter is to explore the functionalities and attributes of new interactive Internet technologies in government and to understand the architectures that underpin them.

MAPPING THE INTERACTIVE INTERNET ARCHITECTURE

It is a hypothesis of this research that the basic architectures of transactional web spaces differs from interactive web spaces. As the graphs included in analysis show, transactional spaces do differ from interactive spaces. To understand the architecture of transactional and interactive spaces, a web architecture analysis tool was chosen. The tool used to map the underlying architecture of the web spaces included in analysis was developed by Marcel Salathe. Dr. Salathe directs a research group in the Department of Biology at the Center for Infectious Disease Dynamics at Pennsylvania State University and developed the mapping tool for the purpose of allowing users to view web pages as graphs. Viewing a graph of a web page allows users to understand the components included in a web space. Components include text pages, divider pages, pages with tables that allow for inputs, pages with static tables and forms, pages that are images, pages that include the base code for the web site, and miscellaneous pages. The mapping tool is based on code developed by Traer Physics at Princeton University. Links to and the source code for the mapping tool are included in the Supplemental.

To deploy the mapping tool, a user accesses and enters a web address into the mapping interface. The mapping tool accesses the web space associated with the address entered into the interface. The mapping tool executes a reader code that reads the coding of the web space and that parses web pages into critical elements, like tables, links, and text based on the specific web page coding. As the reader identifies the type of page presented to it, a color is assigned to match the code. For example, if the reader identifies

that the web page is a table, it assigns the color red to the page. That page is represented in the resultant graph with a red dot. Each page in the web space is assigned a color representing the function of the page and linked appropriately, as dictated by the web space code, in a final graph. The final graph is a spider-like web indicating the components of the web space.

DECODING THE COLORS OF THE INTERNET ARCHITECTURE MAPS

Blue: for links (the A coding tag) to external web pages

Red: for tables (TABLE, TR and TD coding tags) that allow for inputs

Green: for the DIV coding tag that separates major pages within a web site

Violet: for image (the IMG coding tag) pages within a website

Yellow: for forms (FORM, INPUT, TEXTAREA, SELECT and OPTION coding tags)

Orange: for linebreaks and blockquotes (BR, P, and BLOCKQUOTE coding tags)

Black: the HTML tag, the root node

Gray: all other coding tags

To test the tool, a random series of thirty agency websites that included transactional and interactive web spaces was chosen. After testing, it was observed that transactional pages include tables and forms for the input of numerical and text data. Resultant graphs are therefore comprised of more red and yellow dots. Interactive pages involve more links and more divided pages. The links are to external partner pages and to hosted conversation or video space. The divider pages separate participation and collaboration activity from the primary web space. Thus, the graphs of more interactive web spaces have more blue and green dots. Following are select examples of the architecture maps of transactional and interactive web spaces.

THE TRANSACTIONAL WEB

The majority of the technology implementation that is associated with the E-Government Act of 2002 involves some form of transaction. In its most simple form, the technology involved the establishment of a website where people could gain access to basic information about the purpose, activities, and events associated with a given government agency. In its more complex form, the technology involved some exchange of information. This exchange of information typically involved some input of information for the purpose of executing a form to apply for services, apply for a license, or pay a fine.

The Social Security Administration website, depicted in Figure 4.2, involves several examples of the transactional web. For the purposes of exploring the functionalities and architecture of the transactional web, the Apply for Benefits portion of the site was chosen. While the example is from the current website, it exemplifies what would have existed in 2002 and does not involve any new interactive Internet technologies. A picture of the opening page for the Apply for Benefits portion of the website appears below:

Figure 4.2 Transactional Internet Space Apply for Benefits



Social Security Administration, Apply for Benefits <http://www.socialsecurity.gov/pgm/getservices-apply.htm>

The opening page of the Apply for Benefits section of the Social Security Administration is a series of navigational links directing various audiences to the appropriate online application form. As can be seen in the titles of the navigational links to the various application pages, the Social Security Administration serves users of all ages. These services are direct in that the online application for benefits initiates the benefits receipt process. If using the online form, there is no need to visit a representative or government office. The website provides the transaction space for services. This ability to obtain services via an inline format was the intent of the 2002 E-Government Act.

Over time, the number of services offered has increased, but very little has changed in the functionality of the online transaction process. The process for the website is a form

exterior that citizens fill out with the data requested. The form is backed by a database that houses the data once entered. The data are accessible to government agents once entered and submitted by the citizens. The government agent processes the data and executes the benefits transaction once analyzed and the citizen is deemed appropriate for benefits receipt. The online process differs only from the paper process in that the citizen enters the data directly into the database instead of writing it on paper, sending it to the government agent and the agent entering the data into the database. The online process is a simple transaction of data.

It should be noted that accessibility measures have been built into the benefits application website. Measures have been taken to provide users with varied text sizes for ease in reading. And, as their Flagship initiative for the Open Government directive, the Social Security Administration developed the Apply for Benefits site in Spanish, opening online services to a wider audience. While these measures to improve the services of the site increase usability, they do not change the transactional nature of the website. An example form from the application for benefits site follows in Figure 4.3:

Figure 4.3 Social Security Administration Apply for Benefits Interface

Welcome to the Social Security Benefit Application

Form Approved: OMB No. 0980-0618 Expires 01/31/2013

Thank you for using our online Retirement/Medicare application.

Before you begin...

Before you start applying for benefits, you should read [Using This Application](#) in order to understand the information and documents that may be needed.

You may also want to review:

- [When To Start Receiving Retirement Benefits](#)
- [Instructions for Blind or Visually Impaired Users](#)
- [Other Ways To Apply](#)
- [Medicare - For people Within 3 Months of Age 65 or Older](#)
- [Extra Help With Medicare Prescription Drug Plan Costs](#)
- [Internet Security Policy](#)
- [Website Policies & Other Important Information](#)
- [Social Security Accessibility Policy](#)

We estimate that it will take between 10 and 30 minutes to read the instructions, gather the facts, and answer the questions, but this will depend on the number of questions you need to answer. The average time is approximately 15 minutes. For more information about estimates, go to the [Paperwork Reduction Act](#).

Before you start your application, we recommend that you get an estimate of your retirement will help you to answer some of the questions on the application. You may want to print or save estimate to refer to during your application.

If you want to finish an application that you already started:

To Start The Application Process...

Please select one of the following. Tell us information about the person completing this application.

I am applying for myself.

I am helping someone who wants to apply for benefits and is with me.

I am helping someone who is not with me, and therefore cannot sign the application at time.

Blind or visually impaired applicants can use the [Internet Special Notices Option](#) page to receive notices from Social Security.

Please select one:

I am not blind or visually impaired; or, I am not applying for myself.

I have visited the Internet Special Notices Option page.

[Privacy Act Statement](#)

I have read the Privacy Act Statement.

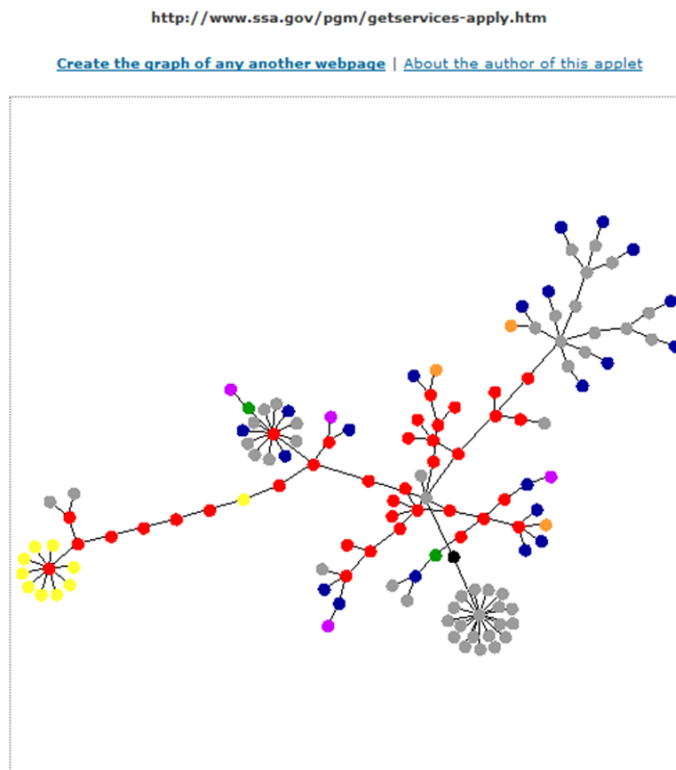
Social Security Administration Benefits Application: <https://secure.ssa.gov/apps6z/iClaim/rib>

On the left face (from the citizen perspective) of the web site are informational links that connect to information related to benefits summaries, the application process, and policies of the Social Security Administration and the federal government. On the right is the initiating application for benefits. There are two buttons that connect to forms additional to the website. The button “Estimate my Benefits” takes the applicant to an external form where the applicant enters information to determine the current status of benefits. The second button takes the applicant to the benefits application. If the applicant finishes the form on the right facing side of the website, they are directed to another form. Eventually, the applicant fills the forms necessary to complete the application for benefits.

The data collected with the preliminary benefits form is data that directs the citizen to the next appropriate form in the chain of forms. Depicted below is a map of the transactional “Apply for Benefits” website of the Social Security Administration.

In Figure 4.4 below, the informational links can be seen as blue dots. The transactional spaces, the tables that house the information submitted through the forms, appear as red dots on the graph. The grey dots represent miscellaneous space. The yellow dots represent forms that appear when data entry is complete. And, the violet dots represent images in the web space.

Figure 4.4 Social Security Administration Transactional Architecture Map



Social Security Administration Apply for Benefits Internet architecture map:
<http://www.ssa.gov/pgm/getservices-apply.htm>. Created February 9, 2011.

The top right hand corner of the diagram represents the informational links found on the Apply for Benefits website. The links take the user to basic information about benefits, policies of the organization, and application information. The red dots represent the forms in the web space. Collected in these forms is information and data necessary to process the benefits application transaction. The yellow dots represent the final forms submitted to the organization and which the citizen can print. Overall, the transactional web space is comprised mostly of red dots that represent tables where data is entered to complete the transaction process.

The transactional web space differs significantly from those that involve interactive Internet technologies. Where the transactional space is comprised mostly of tables for input, or red dots, and forms, or yellow dots, interactive space is comprised of links and images, which are found in the interactive space.

THE INTERACTIVE WEB

The interactive web differs from the transactional web in that it involves accessing and working with information in a single web space, offering feedback or ideas on data and information present in a web space, and contributing to the development of the elements within the web space. Architecturally, developers must build spaces for forums and spaces where connections to data and information as well as partner spaces are present. This development means that there are fewer tables where data is entered to be translated into forms and more divisions to separate out conversation and interactive spaces, along with more links within the website architecture.

Built into each aspect of the technologies associated with the Open Government directive is some form of interaction. For the technologies associated with transparency, the primary interactive components are the ability to download data, the ability to suggest data sets, and the ability to rank and visualize data. Some of the transparency sites have also developed interactive data communities where citizens, organizations, and agencies can hold conversation about the data and where developers can work to create tools to help manage the data. The technology associated with participation sites typically involves the ability to offer ideas and feedback on a given set of policies, to work with an interactive tool, or a wiki-like space for development of documents or data sets. The technology associated with collaboration varies widely, but often involves agencies posting a need and citizens responding to the need. At times, those meeting those needs can be achieved in one space. Citizens, organizations, and agency participants log into a work space and work within it as an employee would. Other times, the spaces involve the ability to sort and rank and respond to challenges. And, others involve micro blogging and other communication activities.

Because the basic functions of transactional spaces and interactive spaces are different, it is hypothesized that the architectures of the websites will differ. Indeed, as the following examples, broken out by components related to the Open Government directive, show that the basic architectures are different.

Transparency

Transparency efforts comprise the majority of technology developments associated with the open government directive. For the most part, they involve posting new data sets and developing data portals for consolidated government data from across agencies. The purpose of these portals is to provide easy access to data and information to citizens, organizations, and agencies from across agencies in one location so that they can easily retrieve that data and review the progress of agencies and hold them accountable.

A large portion of the technology involved includes web fronting of a library of data that is collected across agencies. Behind the web fronting are links to the data, which is submitted by agencies and housed on their servers, accessible through the links to the portal. For many of the portals instituted since 2009, technical elements that allow users to rank the quality of data and to request and even add new data sets have been added to the portal. Additionally, many of the new data portals offer tools to assist in managing and visualizing the data and they offer data user communities to discuss and apply the data in different scenarios and situations.

The transparency site chosen for exploration is the Open Government flagship Data.gov. Data.gov was the Obama administrations first effort at open government. The underlying motivation for the site was that open government rests upon a foundation of transparency. A large component of transparency is provision of data. Equally, data is a major component of policy making and can play a role in innovation, which are additional components to transparency for open government. Provision of data serves three primary purposes. The first purpose open data serves is the ability for citizens to access data

about the government to hold the government accountable. The second is to provide access to data so that citizens can use the data to understand and assist in making better policy decisions for the country. A third purpose in provision relates to the development of business and business products that are underpinned by the data available through data.gov. A fourth motivation for providing consolidated data through a portal is so that agencies have access to data about other agencies. This access provides an opportunity for government to understand itself better and possibly become more efficient by eliminating the duplication of data gathering and production efforts.

The data.gov site contains two primary types of data, agency specific data and geodata which are geographical data submitted by all agencies. In addition to providing data through data.gov, the Obama administration also provides tools to assist citizens in managing and visualizing data. These tools are developed by internal government agencies as well as citizen developers who provide the tools to the site at no charge. The primary purpose of the tools is to offer users of the data.gov data the ability to compare and contrast data, to visualize data, to add a programming interface to an existing website that will allow for the data on data.gov to be posted to the external website, and to develop chart, graphs, and other elements that make the data more usable. In addition to data tools, developers have also created applications that make it possible for data to be accessed from data.gov on mobile devices. This ability to connect to data via a mobile device allows the data to be taken out into the field or applied to services like mapping and weather applications.

Since its inception 379,943 raw and geospatial datasets have been added to the site, 943 applications have been developed by the government to assist citizens in managing and

visualizing the data, 236 applications have been developed by citizens to use and visualize the data, 44 mobile applications to access the data in multiple locations through a mobile device have been created. More than 170 agencies and sub-agencies have submitted data to the data.gov site and provided nearly 260 data contacts to citizens for data. The complete number of tools and data sets submitted to the data.gov portal by agency is included in the Supplemental. The private sector has built 236 new applications using the data on the data.gov website. Other states and nations have adopted the open data concept, 15 other nations have established open data sites, and 29 states, 11 cities, and one Native American tribe have also adopted open data initiatives.²²

The data.gov website is comprised of a web front for links to pages that contain links to data and data tools at various agencies. Additionally, included in the website are links to various spaces that allow the user to join a community of data users, join a developer community to develop applications and mobile applications for the data.gov site, and links to site information metrics. There is also a space for feedback to the site owners and to site developers. For the most part, data is not housed in the data.gov portal. The portal simply acts as a convening web space for data and data tools. A picture of the site follows in Figure 4.5:

²² <http://www.data.gov/>, retrieved April 3, 2011

Figure 4.5 Interactive Transparency Site Data.gov



Data.gov: <http://www.data.gov/>

Hits represent the number of times a visitor lands on a certain page within a website. In the approximate six months that data.gov was live in 2009, the website received 37,614,101 hits. In its first full live year, 2010, Data.gov received more than three times the number of hits than in 2009 for a total of 123,350,557 hits. In 2010, these hits were made by more than two million discrete visitors, or people who click into and search the site. Following in Table 4.1 are the number of visitors by month to the data.gov website in the year 2010.

Table 4.1 Data.gov Monthly Visitor Statistics 2010

January	237,704
February	193,025
March	200,886
April	174,955
May	210,285
June	159,656
July	146,795
August	146,069
September	146,380
October	162,384
November	166,265
December	138,773

The site consistently receives approximately 150,000 visitors per month, with most of the traffic occurring in January and May with the spring receiving the most traffic of the seasons. The government is not allowed to add cookies to their websites. Thus, unless a user signs into a government site, information about users is not collected.

As part of the fulfillment of the Open Government directive, agencies are required to post at least three high-quality data sets to data.gov. A high-quality data set is one that has been subjected to strict quality controls and been reviewed by multiple people within an agency to ensure correctness and accuracy of the data. From May 2009 through December 2009, data.gov received approximately 900 suggested datasets from the public. A select group of representatives from each federal agency reviewed the suggested datasets from the public. Their responses fell into four categories; data already published, actionable, potentially actionable, not actionable. Of the data recommended by the

public, 16 percent were already published on Data.gov, 26 percent of the suggestions will be published in the near future, 36 percent of the suggestions could be published at a later date, and the remaining 22 percent of the suggestions could be published due primarily to security, privacy, or technology constraints.

The largest data sets in the database are associated with the Census, the majority portion of the Department of Commerce data, data collected for the National Oceanic and Atmospheric Administration or weather data, also part of the Department of Commerce data, and the data to support the geodata portal, which is associated with the Department of the Interior. Following is an example of the data page that a user would see if he or she entered the data catalogue to access data. Technically, the web page is a basic web page with text and links to data files. The text on the page is a basic description of the data, including source, date, keyword descriptions, and information about downloading. The links are to agencies and to the data itself. Also included on the page is the capability for voting to rank the quality of the data. Users may enter a login site through the page and vote on the quality of data.

Figure 4.6 Data.gov Data Interface

DATA.GOV
EMPOWERING PEOPLE

Search our catalogs..

HOME DATA TOOLS COMMUNITY METRICS OPEN DATA SITES GALLERY WHAT'S NEW

1987 Toxics Release Inventory data for All US States and Territories

DATASET SUMMARY

Agency	Environmental Protection Agency
Sub-Agency/Organization	
Category	Geography and Environment
Date Released	08/12/2010
Date Updated	08/12/2010
Time Period	Calendar Year 1987
Frequency	Annual
Description	Toxics Release Inventory Data. The Toxics Release Inventory (TRI) is a publicly available EPA database that contains information on toxic chemical releases and waste management activities reported annually by facilities in certain industries as well as federal facilities.

DATASET RATINGS

	Current	Your Rating
Overall	★★★★★ (2 votes)	★★★★★
Data Utility	★★★★★ (2 votes)	★★★★★
Usefulness	★★★★★ (2 votes)	★★★★★
Ease of Access	★★★★★ (2 votes)	★★★★★

Visit the Comment on Dataset forum in Data.gov Communities to post or view comment.

(Privacy Policy)

DATASET METRICS

Number of Downloads	2,025
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DATASET INFORMATION

Data.gov Data Category Type	Raw Data Catalog
Specialized Data Category Designation	Administrative
Keywords	TRI, TRI Data, TRI Reporting, Toxic, Toxics, Toxics Release, Toxics Release, Toxic Release Inventory, Toxics Release Inventory, Chemical, Chemicals, Chemical Release, Chemical Pollution, EPCRA, EPCRA 313, section 313, TRI State Data, Hazardous, Right to Know, Form R, Form A, pollution prevention, waste management, source reduction, community, community right to know, toxic chemical release inventory, toxic chemicals release inventory, facility, facilities, TRI Preliminary Data, 2009, TRI 2009 Data, TRI Report, industry, industries, PBT, NAICS
Unique ID	3183

CONTRIBUTING AGENCY INFORMATION

Citation	http://www.epa.gov/tri/tridata/current_data/basic/TRI_1987_US_v09.csv
Agency Program Page	http://www.epa.gov/tri/
Agency Data Series Page	http://www.epa.gov/tri/tridata/current_data/index.html

DATASET COVERAGE

Unit of Analysis	A single TRI chemical released or managed by a qualifying facility
Granularity	Longitude/Latitude
Geographic Coverage	All US States and Territories

DATA DESCRIPTION

Collection Mode	paper, computer/web
Data Collection Instrument	For paper submissions http://www.epa.gov/tri/report/rfity2009rfi121709.pdf , For computer/web submissions through CDX at http://cdx.epa.gov/warning.asp
Data Dictionary/Variable List	http://www.epa.gov/tri/tridata/current_data/basic/TRI_Basic_Data_File_Format_v09.pdf

ADDITIONAL DATASET DOCUMENTATION

Technical Documentation	http://www.epa.gov/tri/tridata/current_data/basic/TRI_Basic_Data_File_Format_v09.pdf
Additional Metadata	http://www.epa.gov/tri/tridata/current_data/index.html

DOWNLOAD INFORMATION

XML	CSV/TXT
XL B	KML/KMZ
Shapefile	Maps
PDF	PDF

Cannot find data you are looking for? Suggest other datasets!

Search the FOIA libraries across the government here:

Downloads represent the number of times a user clicks on the "XML" or "CSV" links in the Raw Data Catalogs to download datasets or tools in the Tool Catalog on the data.gov website. The total number of downloads in 2010 was 1,337,352. Following in Table 4.2 are the number of downloads by month from the data.gov website in the year 2010.

Table 4.2 Data.gov Monthly Downloads 2010

January	126,637
February	92,389
March	110,941
April	103,392
May	143,362
June	108,731
July	76,106
August	70,614
September	143,697
October	139,928
November	109,249
December	112,306

According to the data.gov website, over the history of data.gov, the majority of visitors download data related to geography and the environment. Second to geography and environment are data set downloads that are related to the general category of finance.²³ Of the geography and environment downloads, the primary data set downloaded deals with earthquakes and was most downloaded in March of 2011, just after the earthquake in Japan. Second to the earthquake data set, the top downloaded data set of all time is a

²³ Data.gov metrics, downloads by category:
<http://www.data.gov/metric/visitorstats/monthlyredirectbydatacategory>.

data set that deals with loans and grants that are administered overseas. The United States Greenbook, or grants and loans overseas, has been downloaded more than 50,000 times. The top health data sets, which compose the second largest category of downloads, downloaded deal with product recalls and data related to the food pyramid.²⁴ Outside of general notes about the number of times downloaded, no other details about the downloaded data sets are available.

Newly added sections to the data.gov web space include data communities. Within the communities are blogs, Twitter and Really Simple Syndication feeds, forums, information links, and access to specific groups of data and data tools of interest to the specific data community. These community pages also include items like links to partner site, specific calculators and visualizations of the data prepared by members of the community. They also include links to collaboration spaces, like Challenge.gov and comments spaces like IdeaScale. Membership to the communities is required for users that would like to contribute data and information and who would like to post comments, blogs, and tools. Members come from across government agencies, the public, and partner organizations. Members can request that various functionalities and data sets be added to the community as available. The owners of data.gov work with the community to make it as usable and complete as the users desire. There are currently five major data.gov data communities, Health, Open Data, Restore the Gulf, Law and Semantic Web. There are a number of communities specifically associated with the geodata portal of the data.gov site as well. Following is the front page of the Health Community.

²⁴ Data.gov metrics, top data sets for all time downloaded:
<http://www.data.gov/metric/visitorstats/top10datasetreport/MostdownloadedAllTime>

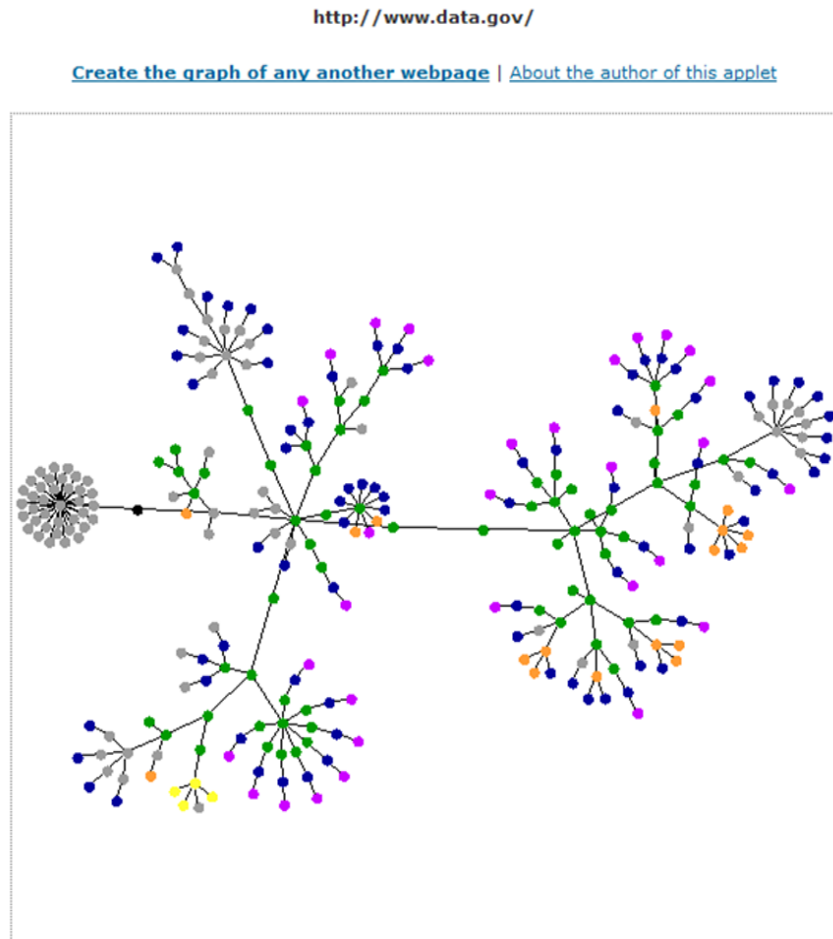
Figure 4.7 Data.gov Health Data Community



Data.gov Health Community: <http://www.data.gov/communities/health>

The data.gov web space is constantly under construction and growing. Following in Figure 4.8 is a map of the main web space. As can be seen in the map, the major components of the web space, flow from the central coding node, the black node surrounded by grey dots.

Figure 4.8 Data.gov Architecture Map



The map of the interactive data web space differs significantly from the transactional benefits application space. Where the transactional map is filled with red and yellow dots, indicating tables and forms, the data.gov web space map is filled with green and blue dots, indicating page breaks and links. The green dots are page separations from the content of the major page, or the web front for data, to the data catalogue, tool catalogue, community spaces, applications, and metrics and gallery spaces. The yellow dots in the

bottom left corner are a feedback section to the website to request new data additions to the web space. To suggest new data sets, users must fill out and submit a form to the data.gov owners. The large, flower like web just above and to the right of the concentrated yellow dots, with green, blue, then purple dots is a gallery of featured data sets and events associated with data.gov. The purple dots are images of the projects. When clicked, the image opens a link to the data or event. The webs at the top of the map on the extreme left and the extreme right with blue dots at the end are links to the community space which lead the user to a new interactive web space. The majority of the rest of the space are links to data, tools, and data sets.

The interactive space is larger and is more connected to other spaces than more limited transactional space. It is also filled with images, and links to more interactive spaces where the transactional space links were to information sources. The forms associated with the transactional space were the end product of the space whereas in the transactional space, the forms are to communicate additions to the web space. These communications are responded to and, when appropriate, more links to data are made available. There are also several more varieties of page associated with the interactive space. And, while data is static, there are interactive voting components on each data page. Overall, the transaction map and the interactive map are different.

Transparency efforts have received the majority of the attention of the Open Government efforts, but they have also received criticism. Criticism falls in two primary areas. Firstly, the quality of data has come under scrutiny by both watchdog and government oversight agencies. The second form of criticism is that the data provided are not actually used in policy decisions or outcomes. Data quality is something if which the

government is aware and tried to address through the collection and now requirement of agencies to post their data quality standards to agency web sites. The second criticism that data provision does not contribute to policy decisions or outcomes is an interesting subject for further research.

Internally, the government has adopted what is becoming known as a social data strategy. Launched in March 2011, was a social data site to which government agencies have access through a company called Socrata.²⁵ Through Socrata, agencies can upload new data sets, “mash” or combine data across agencies, parse data for more individualized needs, and create a dialogue or wiki around given data sets and mash ups. Socrata also incorporates social graphs. Social graphs are interactive graphs that can be manipulated by components. Working off of the same base graph or visual, different users can add or subtract points of data from a set to create a visualization that is specific to their needs. Currently the tool is only available to federal employees. In the future, it may open to the partner agencies and the public. This will add more interactive capabilities to the data pages and change the architecture map significantly.

Participation

For e-government and i-government, the primary purpose of participation efforts is to involve the citizenry in the decision making process of government. Efforts at citizen participation in government through an online format have historically been the most studied and most contentious area of interest in the digitization of government. Early

²⁵ The internal Data.gov Socrata interface: <http://www.socrata.com/datagov/>.

studies viewed e-democracy, as participation efforts made possible over the Internet are more commonly known, as a utopian cornucopia of opportunity for citizens to participate in government. It was hypothesized that the ability to engage with government via an online format would free citizens of the location and time parameters associated with public meetings and formal comment processes. It was expected that citizens would turn out in record numbers to offer opinions and thoughts and debate on issues and policies facing the government. Government officials worried about the overwhelming input that could be provided in online formats and the ability of their staff to sort and process the influx of information. Talks about the opportunity for a more direct democracy ensued and a world opportunity for new democracy—never materialized—was envisioned.

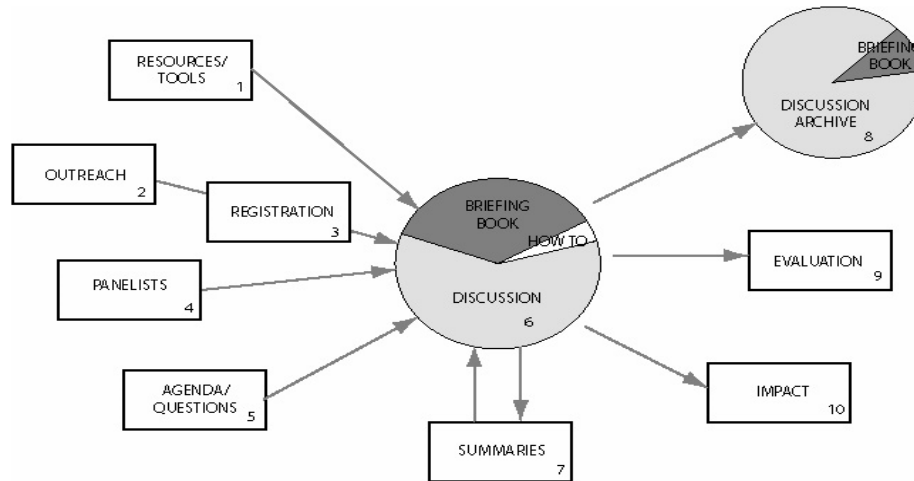
Debates on e-democracy and citizen participation with government through the Internet have raged for the last ten years. And, recent research suggests that while there is more participation, participation as defined by citizens offering input and comments on active legislation via an online format, that participation has not diversified the portion of the population that participated prior to the introduction of online formats (Hindman 2008). And, with the advent of i-government, a major question has been raised as to whether participation associated with e-democracy is simply carrying out the transactional tasks of government and citizenship online or whether there is actual citizen participation in policy making. Since the beginning of the efforts to digitize government, it has been recognized that methods for including citizens in the policy making process must be made.

The E-Government Act of 2002 called for the establishment of electronic dockets for rulemaking (PL107-347 2002, 18). In the act, the primary requirement was that agencies

post information and dates related to important rulemaking events for their agency in an online format. The Office of Management and Budget developed the idea for regulations.gov. In its nascent form, regulations.gov would act as a portal for regulation current in the legislative docket for all agencies. Citizens would have the ability to search for and comment on rules being made as they were in deliberation. Citizen comments would be submitted to the rule makers and ostensibly considered during debate (OMB Watch 2002).

In the following diagram (Figure 4.9), an outline of participation expected in the initial regulations.gov site appears. On the original regulations.gov site, it was expected that agencies would post data and information about regulations including the agenda for speakers, the questions presented to speakers, and any other relevant research and information about the legislation being considered. Citizens could then submit comments through a comment box provided on the website to the agency involved in the rule making. The agency would compile the statements submitted and post them back on the website and to the legislators. Eventually, as the legislative proceedings occurred, a full history of the legislation would be documented through the web space.

Figure 4.9 Regulations.gov Concept Map



(Carlitz and Gunn 2002). Model of online rule-making: http://www.info-ren.org/publications/giq_2002/giq_2002.html

As can be seen in the diagram, participation is a matter of inputs and outputs that do not involve circular or web shaped interactions, but one-way transactions. The process is participatory in that citizens can submit comments, but that comment submission is still very much a transaction of information. The comment form is more open ended and less structured than the question forms that a citizen would submit to apply for benefits or apply for some other service, but it is still the form submission, transaction process. New technologies allow for real-time document augmentation and revision as well as real-time discussion and even video conferencing to obtain citizen comments on regulations and rules being made. The interactive process is more web-like and even circular in nature when a real-time web based communication technology, like video-conferencing or live-chatting is present.

Regulations.gov was initiated by the 2002 E-Government Act. In its first phase, it was a transactional web space like that outlined in the diagram. Citizens could enter the website and choose a series of links that were to basic information about the legislation as well as dates and times for hearings associated with the legislation. Itineraries and some testimony were also posted to the site. Citizens could submit comments through an online comment form. That form was accepted by the government, monitored to ensure that the content was appropriately oriented toward the legislation and not simply random or inappropriate commentary, and consolidated into a content summary that was published to the public record.

With the implementation of new interactive Internet technologies, the regulations.gov site has expanded to include new forms of citizen participation. As can be observed in the following picture, in Figure 4.10, of the current regulations.gov web space, citizens are still able to locate legislation, speakers, itineraries, important dates and rule details.

Figure 4.10 Regulations.gov

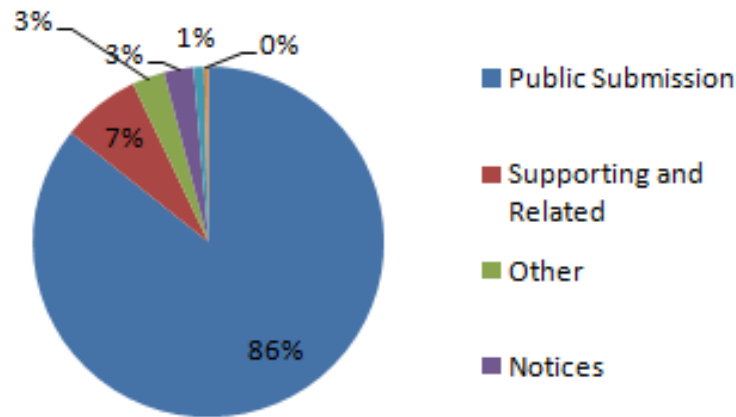


Regulations.gov: <http://www.regulations.gov/#!home>.

Citizens can also upload documents and research, as well as rank and participate in forums related to given pieces of legislation. In the last year, approximately 8,000 regulations were proposed by some 300 federal agencies. In response to those proposals, citizens submitted nearly 150,000 documents in support of or refuting the findings of legislation²⁶. The documents submitted by agencies comprise only 14% of documents submitted in support of the regulation. The following chart, in Figure 4.11, depicts the number of documents submitted by citizens as compared to other sources.

²⁶ Regulations.gov: <http://www.regulations.gov/#!home>.

Figure 4.11 Documents Submitted by Citizens to Regulations.gov



Data compiled from regulations.gov: <http://www.regulations.gov/#!home>

In addition to documents, citizens submitted more than 150,000 comments on proposed regulations. Recently, regulations.gov implemented a new tool entitled “Exchange.” With the exchange tool, citizens can propose ideas and comments on legislation, as well as rank and upload supporting documents for regulation formation. Additionally, agencies can post questions related to potential regulations and citizens can respond to the questions, comment on responses, and rank responses submitted for the questions. A depiction of the Exchange page follows in Figure 4.12:

Figure 4.12 Regulations.gov Exchange



Regulations.gov Exchange Site: <http://www.regulations.gov/exchange/>

The second topic proposed for discussion on the regulations.gov site relates to best practices for electronic dockets. In Figure 4.13, there is an example page of responses for the question proposed on the Exchange site:

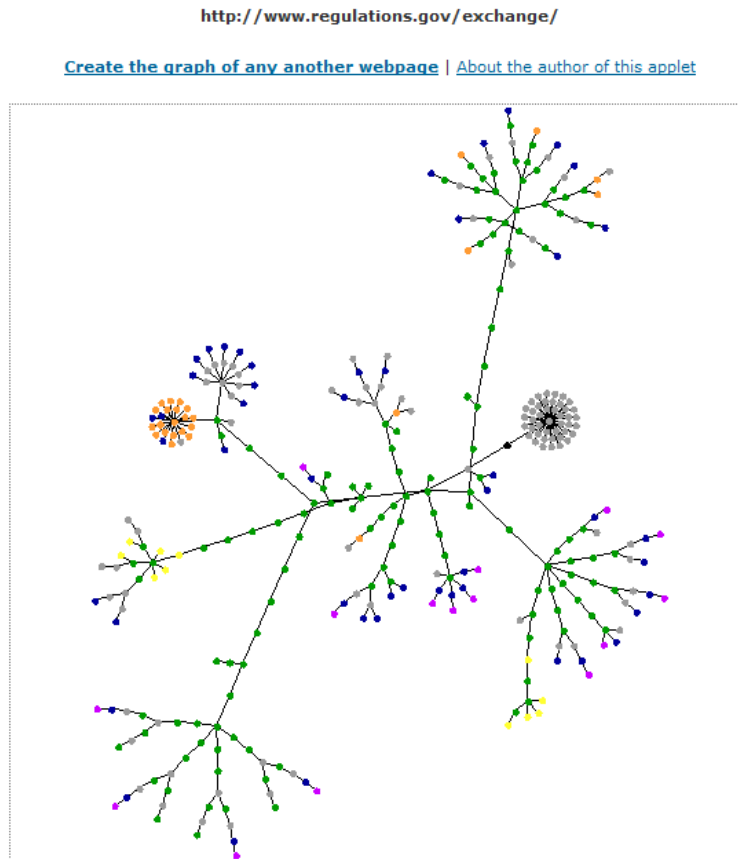
Figure 4.13 Regulations.gov Exchange Discussions Interface



Regulations.gov Exchange Discussion Space: <http://www.regulations.gov/exchange/topic/exchange>

On the site, citizens and agency partners can respond to questions, vote on responses to questions and comment on their own responses and the responses of others. They can also connect to related topics and to basic information about the topic. When and if the topic goes into a possible regulation, citizens can also comment on any resultant regulatory change. In Figure 4.14 is a map of the architecture behind the regulations.gov exchange site:

Figure 4.14 Regulations.gov Architecture Map



Responses to the question are broken out by category in the web space. Categories relate to top ideas submitted, as ranked by citizen, or ideas on which agencies would like to collect specific responses. Each category of responses is represented by a green dot on the architecture map. Behind the green dots can be thousands of comments and rankings of comments, submitted by citizens. The blue dots represent links to information and links to other exchange areas that are related to the topic being discussed in the given web space. While the documents submitted by citizens through the exchange space are analyzed for inclusion with the regulation, none of the comments or ideas on the pages

are official. An agency can choose to include or adopt ideas and comments at will. However, citizens can also submit formal comments through the exchange web space. The yellow dots represent official comment forms.

As with the interactive transparency site, the interactive participation site differs significantly from the transactional space. No red dots representing tables appear in the participation space. Additionally, as with the interactive transparency space, the interactive participation space is larger and more connected than the transaction space. However, the variation of page type for the participation space is not as great as with the transparency space. While varied components are present, they are not present in as large a number as the transparency space. This lack of variation is largely due to the singular focus on comment and idea generation, rather than a more multifunctional space that offers data, interaction, and galleries of products.

One of the categories of participation activities involves concerned citizens more directly in the policy making process. These projects are typically time limited and built around an agenda or event where citizens, agencies, and agency partners convene to discuss and address a problem or issue. In both i-government and e-government, these types of small concentrated efforts focused on policy making are the least used and seemingly most difficult to administer. It seems that these policy making activities are often more effective and more appropriate in a physical format where the government interacts directly with the citizens involved. However, there are examples of successful participation events that are accomplished using new interactive Internet tools.

Global Pulse

An example of an Open Government agency flagship event that deals with policy making and participation is the United States Agency for International Development event Global Pulse. Global Pulse was a project that occurred over a three day period with a variety of constituents. The purpose of the event was to engage multiple audiences in identifying the largest problems for development. Participants were tasked with identifying the worst challenges and assigned the responsibility of helping to build plans to address development problems and allocate resources of partner agencies. Global Pulse recorded that 10,127 participants representing 172 countries and territories registered for the event. Fifty-seven percent of the registrants were from outside of the U.S.; 47 percent were under 35; 51 percent were female and 49 were percent male (USAID 2010).

Participants registered for the event using an online form. Once registered, participants were assigned to one of ten content areas. These content areas were identified through interviews with development experts from around the world prior to the event. Within the web front were icons that lead participants to discussion space associated with each content area where multiple participants could discuss the topic at hand. In addition to the forums were webcasts or chats where educational broadcasts and guest speakers could present information pertinent to discussion. The web space acted as a neutral space for multiple parties from around the world to convene and discuss problems and solutions to problems facing the developing world. A graphic of the Global Pulse interface follows:

Figure 4.15 Global Pulse

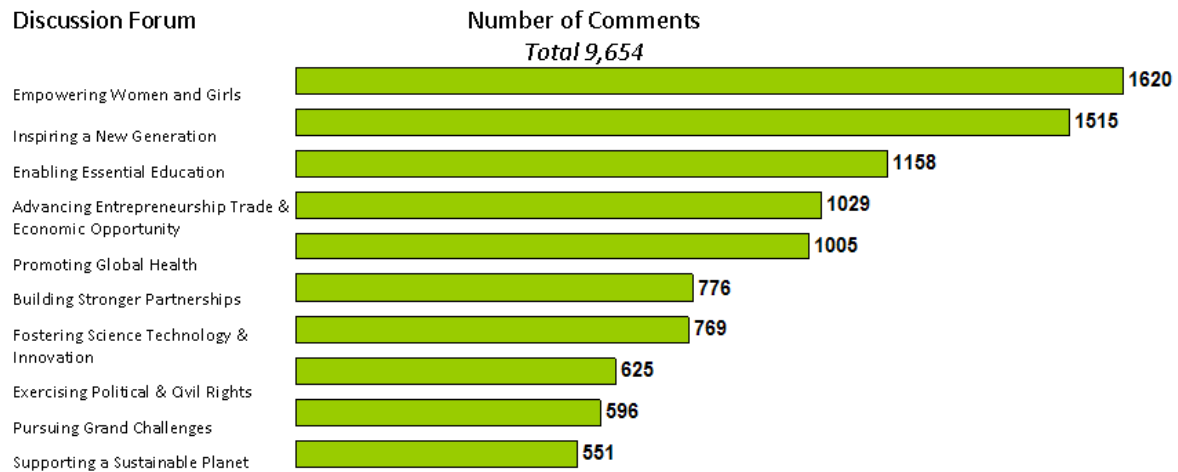


United States Agency for International Development Global Pulse: <http://www.globalpulse2010.gov/partners.html>. It should be noted that the graphic included was captured one year after the event. When the interactive space was live, icons to enter discussion forums appeared for people to discuss ideas.

The space was connected to twitter and Facebook social media tools. So, participants could talk to their contacts and communicate back to the forum any information garnered through the social networking tools. Additionally, a twitter feed of the event was posted as the events happened from the event organizers and an event Facebook page was set up so that whoever visited and “liked” the Global Pulse page could follow the events. On the web space, participants submitted comments and discussion points into online forums. A stream for comment and idea submission was open for the full 72 hours of the event. As Figure 4.16 below shows, nearly 10,000 comments were collected around the ten content areas. Empowering women and girls and inspiring a new generation were the

two topics seen as most in need of addressing in the developing world. Second were education and job and business skills.

Figure 4.16 Global Pulse Discussion Outcomes



(USAID 2010). Number of comments submitted related to top issues facing development.

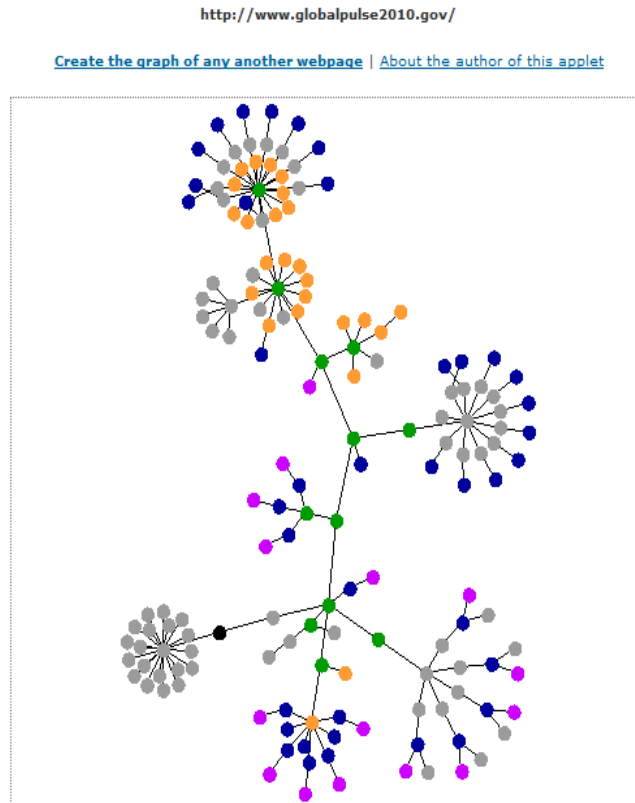
For each content area, solutions to the issues or problems were formulated. As the solutions were formulated, key insights about the problem, along with the solutions or ideas for solutions were posted to participants. Participants were encouraged to work with local partner agencies and the other participants of the project to implement the solutions. Equally, as part of the project, local hosts for outcome related activities were identified. Participants could also connect with these partner agencies to volunteer for and work with the organizations that stepped forward as partners in the process.

Global Pulse 2010 received support from a large number of organizational partners including Action Aid, Aga Khan Foundation, American University Kogod School of

Business , Babson College, Business Fights Poverty, CSR Wire, Devex, DAI, Georgetown University, IBM's Corporate Citizenship and Corporate Affairs, InterAction, International Center for Research on Women, International Republic Institute, Link TV, National Democratic Institute for International Affairs, National Endowment for Democracy, One Economy, TED.com, and Women Thrive Worldwide (USAID 2010). They also had a large circle of governmental partnerships including the Departments of Agriculture, Education, Health and Human Services, Commerce, and State.

The architecture map of the Global Pulse event was derived a year after the space was actively used for Global Pulse. However, some key observations are possible. Figure 4.17 houses the Global Pulse architecture map:

Figure 4.17 Global Pulse Architecture Map



Like the previous interactive spaces, the Global Pulse interactive participation space differs from the benefits application transactional space. The interactive space is more varied than the transactional space and is separated by sections that would have housed the conversations had the space been live when mapped. The green dots on the space would have opened into discussion forums and the blue dots representing links are links to partner agencies. Some of the violet dots represent graphic stills of videos used in the event. The orange dots represent content relevant to discussion that was provided to participants. All portions of the event were documented. On the site now, are the

outcomes of the event. Participants can check in and note progress with their partner agency.

A collaborative project that is just beginning that has the potential to increase participation in government is ExpertNet. ExpertNet highlights both the problems with the current participation efforts and the successes of current participation efforts. ExpertNet was explored in December of 2010 and January 2011. ExpertNet is a wiki designed for agencies to pose questions related to policy issues or pressing concerns of the agency. For example, an agency may pose a question about the importance of small business in economic growth and development. Experts from academia, government, the private sector, and the citizenry have the opportunity to provide high level research, practical cases and experiences, and ideas about the role of small businesses in economic growth and development. These research and these ideas and experiences are discussed, added to, and edited until a set of information, data, and practical knowledge is accumulated around the issue or problem. Then that information is used to develop and support policy solutions. ExpertNet is in the pilot stages and it is not yet known if it will be implemented across the federal government.

However, in concept, ExpertNet embodies the spirit of democratic participation and the crowdsourcing possibilities associated with new interactive Internet technologies. It also offers a unique participatory architecture. Along with the wiki is an application programming interface (API). Through the programming interface, users can connect the wiki to sites other than the original host—typically the government agency seeking the solution or assistance with a question or problem. Thus, if a university or non-profit organization, corporation, or user group wished to connect the wiki to their organization

directly, they simply have to drop the interface into their webpage. By dropping the interface into their website, they create a direct link to the site, expanding the reach of the site and connecting their site into an architecture that supports participation.

It is expected that as more interactive technologies are incorporated into websites that differing architectures will emerge. Certainly the two architectures presented herein differ from one another. Those differences derive both from the functionalities built into the web spaces and the method of participation. The regulations.gov site is primarily a communications channel that is continuous and which has a history of evolution from a transactional site to an interactive site. The Global Pulse site was a temporal event that involved a constant, high rate of activity for a brief period of time. Both involve conversations, but the Global Pulse project also incorporated video and text applications. The upcoming technologies with application interfaces and large scale wiki activities offer even more potentials for new participatory architectures.

Collaboration

The concept of collaboration as Obama introduced it in the Open Government directive, relates to the idea that citizens use their personal skills and education to assist government in its everyday operations. It also incorporates the idea that agencies develop internal mechanisms for collaboration to achieve projects in a more effective, more efficient manner while having access to the best and brightest ideas within agencies and across agencies. Collaboration, as included in the directive has both democratic value and business value. Collaboration is both an opportunity for citizens to volunteer their

expertise and an opportunity for government to benefit from the service of citizens. And an opportunity for government to develop the human and social capital of agencies by taking advantage of the opportunity to collaborate as afforded by new interactive Internet tools. Volunteerism is a tradition sacred to democracy. And collaboration is a revered trademark of the opportunities provided by new interactive Internet technologies.

Collaboration, as contextualized in the Open Government directive, has not previously appeared in e-government efforts. It is a concept almost exclusively related to i-government and the business values associated with new interactive Internet technologies. It is also the primary focus of innovation efforts associated with new information technology implementation and development in government.

Internally, two examples of internal collaboration mechanisms included Intellipedia and Diplopedia. Both Intellipedia and Diplopedia are wikis. The purpose of the wikis is to give space to multiple partners and multiple agencies to discuss, expand, and clarify information that is discovered by individual employees of partner agencies. The goal of the wikis is to provide a space to consolidate and communicate essential information that crosses traditional agency boundaries. Wikis are also used in public and government collaboration spaces.

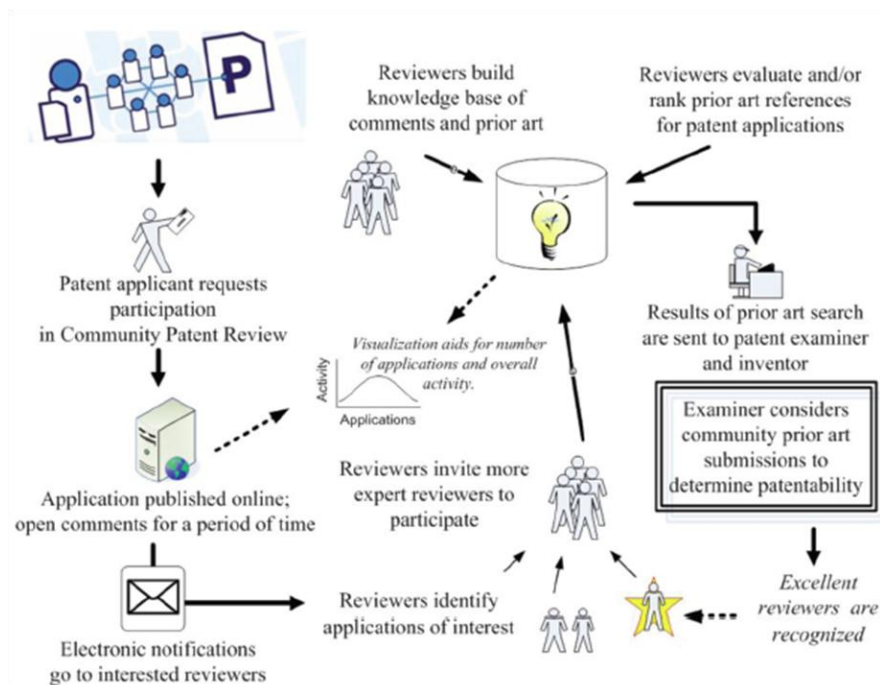
Externally, Peer to Patent²⁷ exemplifies public-private-citizen collaboration through a wiki space. Peer to Patent, which is written about extensively in Beth Noveck's book *Wiki Government: How Technology Can Make Government Better, Democracy Stronger*,

²⁷ Peer to Patent web space: <http://www.peertopatent.org/>.

and Citizens More Powerful, is a project of the United States Patent and Trademark Office. It began as a partnership between the Patent and Trademark Office and New York Law School's Center for Patent Innovations. The objective of the project is to assist the Patent and Trademark Office in identifying information that is useful in assessing patents that are pending with the Office. The idea is that citizens working in the field in which the patents are relevant may have access to information and “prior art” or existing projects that are closely associated with, related to, or possibly the same as a project with an active patent application.

A process map for Peer-to-Patent appears in Figure 4.18:

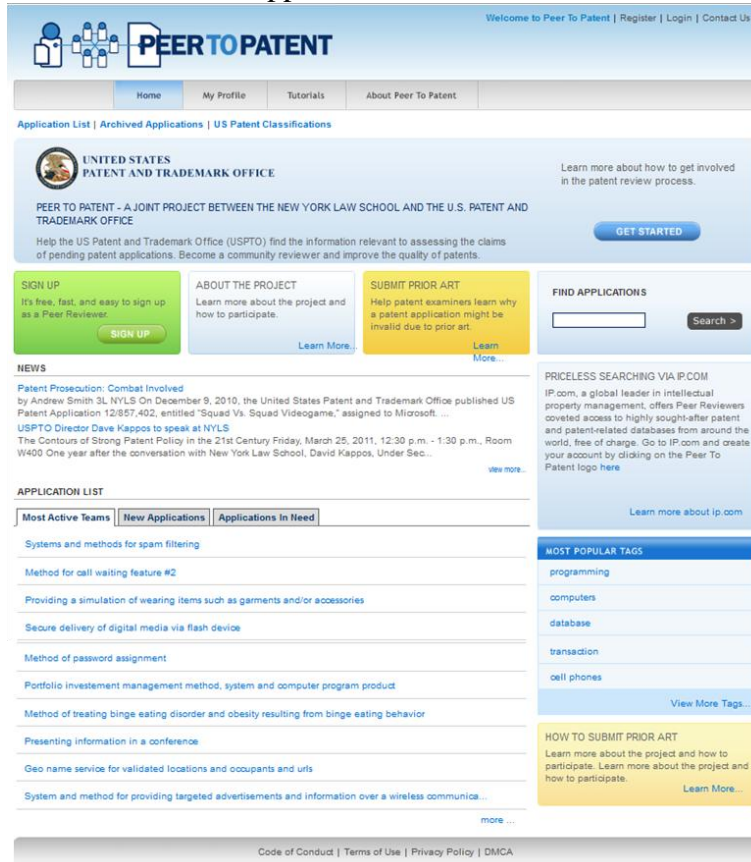
Figure 4.18 Peer-to-Patent Process Map



Peer-to-Patent: <http://www.peertopatent.org/>

Through a collaborative project space, patent applicants voluntarily submit projects to the Patent and Trade Office Peer-to-Patent project. Notification that a patent has been submitted is sent to potential citizen reviewers. For the most part, these reviewers are experts in the field who have been identified by the Peer-to-Patent team, or who have heard about the Peer-to-Patent project and volunteered to be a reviewer. Primarily, they are scientists and technologists who wish to participate in the patent process. The reviewers have a certain amount of time to invite fellow reviewers, review and comment upon the patent application, and to submit information and images to fellow reviewers and to the government for consideration. Reviewers can post comments, research, and any images or “prior art” for others to view within the collaborative space. Ultimately, after discussion and review, the research and information and a summary discussion are given to the government for decision. Patents that are applied for through the Peer-to-Patent project are eligible for a 20-year monopoly patent on a product if approved (Allen et al. 2008).

Figure 4.19 Peer-to-Patent Patent Application Wiki Interface

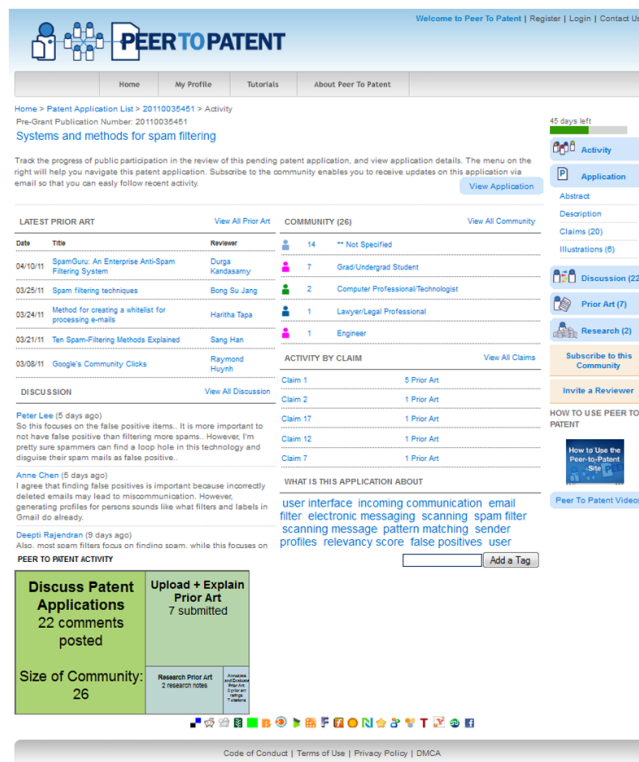


Peer-to-Patent: <http://www.peertopatent.org/>

The motivation in developing Peer-to-Patent was a recognition that the patent system was beleaguered by too many patent applications. The government could not keep up with the number of applications submitted, nearly half a million applications backlogged for a given year (Noveck 2005). By inviting citizens and fellow scientists and technologists into the patent process, the time to process patent applications has significantly decreased (Allen et al. 2008). In the first year of the pilot, nearly 300 patents were reviewed (Allen et al. 2008). According to their website, Peer-to-Patent is on target for evaluating 1000

patents in 2011. The Peer-to-Patent project is funded by partner agencies Article One Partners, General Electric, Hewlett Packard, IBM, Microsoft, Open Innovation Network, and Red Hat (Allen et al. 2008). Australia, Japan, Korea, and the United Kingdom have all adopted models similar to Peer-to-Patent to process their patent applications.

Figure 4.19 Peer-to-Patent Input Interface



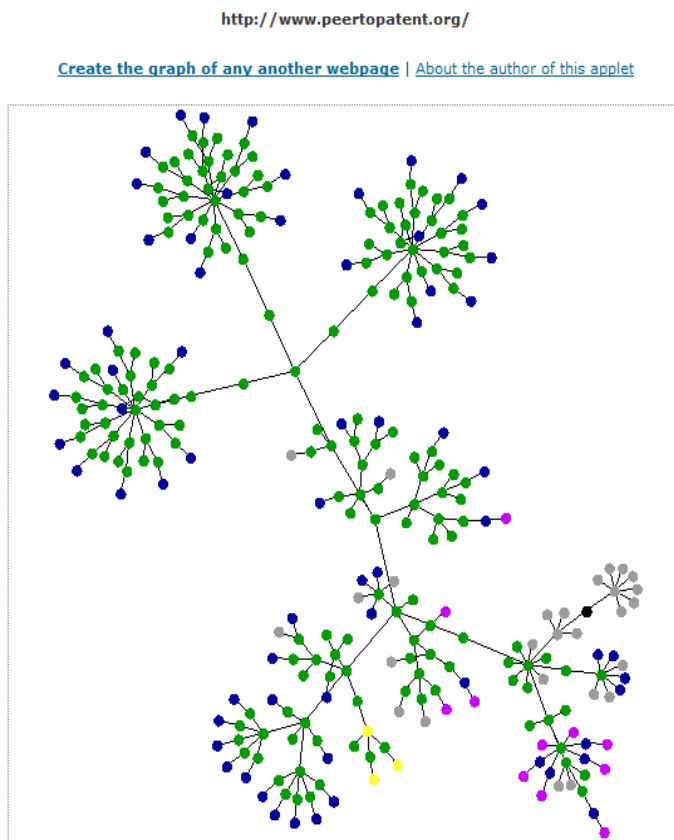
Peer-to-Patent Input: <http://www.peertopatent.org/patent/20110035451/activity>

Peer-to-Patent was one of the first citizen-private-public collaboration efforts adopted by the federal government. While several of the attributes of the project are unique to Peer-to-Patent, the conceptual model has guided the development of collaboration efforts for the federal government. Collaboration projects are centered around leveraging the

expertise of citizens and applying that expertise to address or solve an issue faced by government or to assist in achieving an agency mission. The technology involved allows for wiki-like conversations or contributions to an interactive Internet space, along with posting of documents, pictures, sometimes video, and other links. Several projects also involve industry partners to support the development of the project technology and to assist in funding the project.

The architectural map for the Peer-to-Patent project is located in Figure 4.20:

Figure 4.20 Peer-to-Patent Architecture Map



As the previous interactive Internet spaces, the interactive collaboration space differs from that of the transactional space. No tables exist in the collaborative space. Each green dot represents a break off for a project associated with Peer-to-Patent where discussions are held and where research and prior art is submitted for review by peers of the project. In each break is a page of activity associated with individual patents. The blue dots represent external links to information, contacts, research, and discussion off of the main page for the patent review page. The space is a continuum of interaction among peers and development of knowledge around patents pending.

TRANSACTIONAL VERSUS INTERACTIVE WEB SPACE

All of the architectural maps of the interactive technologies differ from the architectural maps of the transactional technology. These differences occur primarily due to new methods of participation and new methods of data acquisition and use. Users of interactive technology have more power to contribute to and extend the network and the architectures of government and the technologies of government that were not offered in the transactional world. Those new opportunities lie in more ways to discuss, debate, develop ideas, explore and manage data, and to incorporate individual expertise into government.

For each of the efforts, transparency, participation, collaboration, multiple partners and developers are involved in evolving the site and the content of the web space. This participation and these partnerships exist in a different way than they exist in the transactional space. In the transnational web space, agencies might share technologies.

When agencies share technologies in the federal government, they typically adopt similar software. For example, one agency might choose to use Microsoft Word for their word processing software, another agency could make that choice as well and the technology would then be a shared technology. There is no interaction among agencies or with industry or citizen partners past the point of original software implementation. However, with interactive tools, while the base software may be the same, typically multiple uses of the software also exist. This ability to use software in multiple ways to involve more than one participant at a time allows for more partnerships and development of information exchange and knowledge generation practices.

New relationships with data are also present with interactive technologies. In the transactional space, for data that is not classified or personal data, it is possible to share data across agencies by providing login or other access from one agency to the next agency. But, it is not possible to access general data about an organization or to compare data from multiple organizations in one space, as is possible in places like data.gov and FOIA.gov. In interactive space, data exchange is effortless and expanding as functionalities like social data strategies are implemented into interactive spaces. New partnerships and new ways to exchange data should knock down some of the silos thought to be present in command and control systems, like the government and like those still associated with transactional e-government. While the effects cannot yet fully be known, early indicators of new agency partnerships, like the seven government agencies that were part of the Global Pulse initiative, and new industry partnerships, like those inspired by Challenge.gov and Peer-to Patent, are appearing.

There are drawbacks to interactive technologies. While they offer new ways to convene and manifest in new architectures, they can also suffer the problem of small worlds and weak links. It could be that the participants in new interactive technologies are the same participants that are active in the physical world or that interactive technologies have simply allowed for ease of communication among existing groups. Accessibility for disabled and economically or technologically disadvantaged, including the elderly—a high benefits, high votes, low tech population. Buchanan also notes that as links are made across agencies and partners, a collapsing nodes situation might arise.

Architecturally, when the links underneath a web space become very complex, a collapsing structure begins to emerge where the coding architect, to conserve web space and to not develop dangling links will cull the code to cut back the links to a manageable structure. Users will engage in the same behaviors because they can only manage so many sources of information. They will naturally begin to use a set of known links and rely solely on those links. Additionally, if the links are not culled, it can lead to dangling links that are unused or disabled. When users encounter links to nowhere or inaccurate links, they lose trust in the web space as it is perceived to be unmaintained.

The same idea of collapsing and dangling links exists in users of the information systems. Users will naturally congregate around one idea or another. They will also tend to congregate around a group of leaders or thought processes that they can understand or with which they agree. This congress around people or ideas creates exclusionary patterns in participation behaviors or small worlds or small communities of expertise and practice. The promotion or practice of an exclusive group of experts or an exclusive thought circle can turn people away and erode trust in the organization. The processes or

collaborative democracy and interactive web space must be carefully maintained to provide opportunities for action and inclusion.

In the vein of Steven Johnson's thoughts on emergence, with the implementation of interactive Internet tools, the government becomes the food source around which slime mold coalesces, the colony of the ants. It becomes a convening source for communities that are somewhat self-organized, but it is also tasked with actively growing and promoting those communities to increase access and participation by providing the architectural platform and trusted data and information. It is the organizational cross between the starfish and the spider.

SUPPLEMENTAL 4.1 CODE FOR THE ARCHITECTURE MAPPING TOOL

Here's the sourcecode for [this applet](#).
Made by Marcel Salathe
www.aharef.info site

Credits: [Processing](#), [Traer Physics](#), [HTMLParser](#).

Important: This code can only be used in [Processing](#)

```
import traer.physics.*;
import traer.animation.*;
import java.util.Iterator;
import java.util.ArrayList;
import java.util.HashMap;
import processing.net.*;
import org.htmlparser.*;
import org.htmlparser.util.*;
import org.htmlparser.filters.*;
import org.htmlparser.nodes.*;

int totalNumberOfNodes = 0;
ArrayList elements = new ArrayList();
ArrayList parents = new ArrayList();
int nodesAdded = 0;
int maxDegree = 0;
HashMap particleNodeLookup = new HashMap();
HashMap particleInfoLookup = new HashMap();
ParticleSystem physics;
Smoother3D centroid;

private String urlPath =
"http://www.aharef.info/static/htmlgraph/getDataFromURL.php?URL=";
private String content;

float NODE_SIZE = 30;
float EDGE_LENGTH = 50;
float EDGE_STRENGTH = 0.2;
float SPACER_STRENGTH = 2000;
```

```

final String GRAY = "155,155,155";
final String BLUE = "0,0,155";
final String ORANGE = "255,155,51";
final String YELLOW = "255,255,51";
final String RED = "255,0,0";
final String GREEN = "0,155,0";
final String VIOLET = "204,0,255";
final String BLACK = "0,0,0";

void setup() {
  size(750, 750);
  String urlFromForm = param("urlFromForm");
  urlPath += urlFromForm;
  smooth();
  framerate(24);
  strokeWeight(2);
  ellipseMode(CENTER);
  physics = new ParticleSystem( 0, 0.25 );
  centroid = new Smoother3D( 0.0, 0.0, 1.0,0.8 );
  initialize();
  this.getDataFromClient();
}

void getDataFromClient() {
  try {
    org.htmlparser.Parser ps = new org.htmlparser.Parser ();
    ps.setURL(urlPath);
    OrFilter orf = new OrFilter();
    NodeFilter[] nfls = new NodeFilter[1];
    nfls[0] = new TagNameFilter("html");
    orf.setPredicates(nfls);
    NodeList nList = ps.parse(orf);
    Node node = nList.elementAt (0);
    this.parseTree(node);
    EDGE_STRENGTH = (1.0 / maxDegree) * 5;
    if (EDGE_STRENGTH > 0.2) EDGE_STRENGTH = 0.2;
  }
  catch (Exception e) {
    e.printStackTrace();
  }
}

void initialize() {

```



```

    physics.clear();
}

void parseTree(Node node) {
    int degree = 0;
    if (node == null) return;
    String nodeText = node.getText();
    if (node instanceof TagNode && !((TagNode)node).isEndTag()) {
        //println(((TagNode)node).getTagName());
        totalNumberOfNodes++;
        elements.add(node);
        parents.add(((TagNode)node).getParent());
    }
    NodeList children = node.getChildren();
    if (children == null) return;
    SimpleNodeIterator iter = children.elements();
    while(iter.hasMoreNodes()) {
        Node child = iter.nextNode();
        if (child instanceof TagNode && !((TagNode)child).isEndTag()) degree++;
        parseTree(child);
    }
    if (degree > maxDegree) maxDegree = degree;
}

```

```

Particle addNode(Particle q) {
    Particle p = physics.makeParticle();
    if (q == null) return p;
    addSpacersToNode( p, q );
    makeEdgeBetween( p, q );
    float randomX = (float)((Math.random() * 0.5) + 0.5);
    if (Math.random() < 0.5) randomX *= -1;
    float randomY = (float)((Math.random() * 0.5) + 0.5);
    if (Math.random() < 0.5) randomY *= -1;
    p.moveTo( q.position().x() + randomX, q.position().y() + randomY, 0 );
    return p;
}

```

```

void draw() {
    //uncomment this if you want your network saved as pdfs
    //beginRecord(PDF, "frameimage-####.pdf");
    if (nodesAdded < totalNumberOfNodes) {

```

```

    this.addNodesToGraph();
  }
  else {
    if (EDGE_STRENGTH < 0.05) EDGE_STRENGTH += 0.0001;
  }
  physics.tick( 1.0 );
  if (physics.numberOfParticles() > 1) {
    updateCentroid();
  }
  centroid.tick();
  background(255);
  translate(width/2, height/2);
  scale(centroid.z());
  translate( -centroid.x(), -centroid.y() );
  drawNetwork();
  //uncomment this if you want your network saved as pdfs
  //endRecord();
}

void addNodesToGraph() {
  Particle newParticle;
  TagNode tagNodeToAdd = (TagNode)elements.get(nodesAdded);
  Node parentNode = (Node)parents.get(nodesAdded);
  if (parentNode == null) {
    // this is the html element
    newParticle = addNode(null);
  }
  else {
    Particle parentParticle = (Particle)particleNodeLookup.get(parentNode);
    newParticle = addNode(parentParticle);
  }
  particleNodeLookup.put(tagNodeToAdd,newParticle);
  String nodeColor = GRAY;
  if (tagNodeToAdd.getTagName().equalsIgnoreCase("a")) nodeColor = BLUE;
  else if (tagNodeToAdd.getTagName().equalsIgnoreCase("div")) nodeColor = GREEN;
  else if (tagNodeToAdd.getTagName().equalsIgnoreCase("html")) nodeColor =
BLACK;
  else if (tagNodeToAdd.getTagName().equalsIgnoreCase("tr")) nodeColor = RED;
  else if (tagNodeToAdd.getTagName().equalsIgnoreCase("td")) nodeColor = RED;
  else if (tagNodeToAdd.getTagName().equalsIgnoreCase("table")) nodeColor = RED;
  else if (tagNodeToAdd.getTagName().equalsIgnoreCase("br")) nodeColor =
ORANGE;
  else if (tagNodeToAdd.getTagName().equalsIgnoreCase("p")) nodeColor = ORANGE;

```

```

    else if (tagNodeToAdd.getTagName().equalsIgnoreCase("blockquote")) nodeColor =
ORANGE;
    else if (tagNodeToAdd.getTagName().equalsIgnoreCase("img")) nodeColor =
VIOLET;
    else if (tagNodeToAdd.getTagName().equalsIgnoreCase("form")) nodeColor =
YELLOW;
    else if (tagNodeToAdd.getTagName().equalsIgnoreCase("input")) nodeColor =
YELLOW;
    else if (tagNodeToAdd.getTagName().equalsIgnoreCase("textarea")) nodeColor =
YELLOW;
    else if (tagNodeToAdd.getTagName().equalsIgnoreCase("select")) nodeColor =
YELLOW;
    else if (tagNodeToAdd.getTagName().equalsIgnoreCase("option")) nodeColor =
YELLOW;
    particleInfoLookup.put(new Particle,nodeColor);
    nodesAdded++;
    //println(nodesAdded + " of " + totalNumberOfNodes + " (" +
tagNodeToAdd.getTagName() + ")");
}

```

```

void drawNetwork() {
    // draw edges
    stroke( 0 );
    beginShape( LINES );
    for ( int i = 0; i < physics.numberOfSprings(); ++i ){
        Spring e = physics.getSpring( i );
        Particle a = e.getOneEnd();
        Particle b = e.getTheOtherEnd();
        vertex( a.position().x(), a.position().y() );
        vertex( b.position().x(), b.position().y() );
    }
    endShape();
    // draw vertices
    noStroke();
    for ( int i = 0; i < physics.numberOfParticles(); ++i ) {
        Particle v = physics.getParticle(i);
        String info = (String)(particleInfoLookup.get(v));
        if (info != null) {
            String[] infos = info.split(",");
            fill(Integer.parseInt(infos[0]),Integer.parseInt(infos[1]),Integer.parseInt(infos[2]));
        }
        else {
            fill(155);
        }
    }
}

```

```

    }
    ellipse( v.position().x(), v.position().y(), NODE_SIZE, NODE_SIZE );
}

}

void updateCentroid() {
    float
        xMax = Float.NEGATIVE_INFINITY,
        xMin = Float.POSITIVE_INFINITY,
        yMin = Float.POSITIVE_INFINITY,
        yMax = Float.NEGATIVE_INFINITY;

    for (int i = 0; i < physics.numberOfParticles(); ++i) {
        Particle p = physics.getParticle(i);
        xMax = max(xMax, p.position().x());
        xMin = min(xMin, p.position().x());
        yMin = min(yMin, p.position().y());
        yMax = max(yMax, p.position().y());
    }
    float deltaX = xMax-xMin;
    float deltaY = yMax-yMin;
    if ( deltaY > deltaX ) {
        centroid.setTarget(xMin + 0.5*deltaX, yMin + 0.5*deltaY, height/(deltaY+50));
    }
    else {
        centroid.setTarget(xMin + 0.5*deltaX, yMin + 0.5*deltaY, width/(deltaX+50));
    }
}

void addSpacersToNode( Particle p, Particle r ) {
    for ( int i = 0; i < physics.numberOfParticles(); ++i ) {
        Particle q = physics.getParticle(i);
        if (p != q && p != r) {
            physics.makeAttraction(p, q, -SPACER_STRENGTH, 20);
        }
    }
}

void makeEdgeBetween(Particle a, Particle b) {
    physics.makeSpring( a, b, EDGE_STRENGTH, EDGE_STRENGTH,
EDGE_LENGTH );
}

```

SUPPLIMENTAL 4.2 DATA.GOV DATA CONTRIBUTIONS BY AGENCY

Agency Name	Raw Datasets	High-Value Raw Datasets	Geodata
Department of Agriculture	98	17	1
Department of Commerce	92	80	259,978
Department of Defense	28	26	0
Department of Education	11	3	0
Department of Energy	90	18	0
Department of Health and Human Services	97	22	0
Department of Homeland Security	54	12	0
Department of Housing and Urban Development	11	5	0
Department of the Interior	197	13	115,931
Department of Justice	115	45	0
Department of Labor	53	14	0
Department of State	36	31	0
Department of Transportation	3	3	0
Department of the Treasury	91	9	0
Department of Veterans Affairs	103	78	1
Environmental Protection Agency	1,540	1,404	257
General Services Administration	64	26	0
National Aeronautics and Space Administration	3	3	512
National Science Foundation	41	2	0
Nuclear Regulatory Commission	24	23	0
Office of Personnel Management	44	30	0
Small Business Administration	3	2	0
Social Security Administration	28	26	0
US Agency for International Development	4	3	0
Broadcasting Board of Governors	4	3	0
Commodity Futures Trading Commission	3	3	0
Corporation for National and Community Service	4	4	0
Election Assistance Commission	3	3	0
Export-Import Bank of the US	23	22	0

Executive Office of the President	124	11	0
Federal Communications Commission	8	0	0
Federal Deposit Insurance Corporation	3	3	0
Federal Election Commission	4	0	0
Federal Housing Finance Agency	6	6	0
Federal Reserve Board	4	2	0
Institute of Museum and Library Services	21	3	0
Merit Systems Protection Board	3	3	0
Millennium Challenge Corporation	3	3	0
National Archives and Records Administration	29	6	0
National Capital Planning Commission	4	4	0
National Endowment for the Arts	1	1	0
National Endowment for the Humanities	6	5	0
National Labor Relations Board	51	1	0
National Transportation Safety Board	14	12	0
Occupational Safety and Health Review Commission	3	0	0
Office of Navajo and Hopi Indian Relocation	4	3	0
Overseas Private Investment Corporation	3	3	0
Pension Benefit Guaranty Corporation	3	3	0
Railroad Retirement Board	5	3	0
Securities and Exchange Commission	9	4	0
Selective Service System	9	0	0
Tennessee Valley Authority	46	0	0
US Equal Employment Opportunity Commission	37	17	0
US International Trade Commission	2	2	0
US Office of the Special Counsel	3	3	0

SUPPLEMENTAL 4.3 DATA.GOV DATA TOOL CONTRIBUTIONS BY AGENCY

Agency Name	Tools	High-Value Tools
Department of Agriculture	32	5
Department of Commerce	190	91
Department of Defense	252	61
Department of Education	53	11
Department of Energy	28	5
Department of Health and Human Services	114	24
Department of Homeland Security	3	1
Department of Housing and Urban Development	12	3
Department of the Interior	11	0
Department of Justice	12	5
Department of Labor	9	4
Department of State	9	4
Department of Transportation	48	0
Department of the Treasury	12	2
Department of Veterans Affairs	5	2
Environmental Protection Agency	55	20
General Services Administration	27	17
National Aeronautics and Space Administration	21	5
National Science Foundation	3	1
Nuclear Regulatory Commission	1	1
Office of Personnel Management	1	0
Small Business Administration	2	1
US Agency for International Development	5	0
Broadcasting Board of Governors	2	0
Court Services and Offender Supervision Agency	1	1
Executive Office of the President	9	0
Federal Communications Commission	3	0
Federal Reserve Board	1	1
National Archives and Records Administration	1	0
National Capital Planning Commission	1	1
National Transportation Safety Board	8	0
Securities and Exchange Commission	12	3
US Consumer Product Safety Commission	6	0
US International Trade Commission	1	1

Chapter 5: Ideas that Scale?? The Value of Interactive Internet Technologies

INTRODUCTION

As findings in previous chapters indicate, federal agencies have endeavored to make legal, organizational, and architectural changes necessary to support the adoption of new interactive technologies. Questions explored in chapter five relate to determining the value of investment in those interactive technologies. Value is not a concept on which agencies agree and which is not prescribed by the Open Government Directive. But it is essential in justifying the demand for implementation and in accounting for the financial investment in new technologies. This chapter contains three approaches to understanding the value of interactive Internet tools. The first approach includes viewing the quality of the information commodity as determined by users as a method for understanding value. The second approach involves a quantitative assessment of the relationship between the change in customer service satisfaction score and the use of an interactive Internet tool that focused on participation. Lastly, measures and concepts of value that exist in Open Government plans are explored. Ultimately, recommendations for the development of interactive Internet tools are made that will hopefully guide the construction of value metrics for tools and systems incorporated into government agencies.

OVERVIEW

As introduced in chapter two, Eppler discusses the importance of quality of information presented on government websites (Eppler 2007). He argues that information quality is

paramount to ensure usability and trust in government websites. He claims that if citizens find do not find government websites useful, clear, and informative, they will not use the websites and they will lose trust in the government. He determines that this breaking of trust will increase costs for both government and citizens. He suggests that agencies employ metrics to assess the quality of information that exists within a web space so that agencies can monitor usefulness and quality of the information they provide. As part of e-government efforts, agencies developed a customer service survey that is administered on the agency website as users move through the pages of the web space. However, while questions on the survey relate to the usability of sites, they do not relate to information quality. As part of the i-government infrastructure, feedback mechanisms for information quality have been implanted on sites like Data.gov. For certain interactive tools, citizens can rank the quality of the information by information or data set within a given agency or dashboard web space by using a five-star system. Explored in this chapter is the use of data ranking systems as applied on Data.gov as a measure of value for new interactive Internet tools.

Also explored is the value of interactive tools that promote participation. The Open Government Directive established by the Obama Administration in January 2009, ordered agencies to develop innovative methods to promote transparency, collaboration, and participation with citizens. Many of the efforts agencies made toward achieving the mandates of the directive involved incorporating interactive Internet technologies into agency websites. Twenty-three federal agencies adopted a specific citizen and employee ideation tool developed by IdeaScale. Through the IdeaScale tool, citizens and employees of agencies were able to submit ideas and comments on ideas submitted, as well as vote up or down ideas and comments submitted regarding agency plans for

implementing the Open Government Directive through individual agency Open Government websites. The ideation tool was used for a six week period to garner citizen and employee ideas, comments, and votes related to Open Government and the Open Government plans put forth by agencies.

Questioned within this chapter is the value of the implementation of the IdeaScale tool as a component of the incorporation of interactive Internet tools into governance. Findings sought relate both to value to customers, citizens, and value to agencies. Analyzed within this chapter is the relationship between customer service specific to government and federal agency websites in particular and the implementation of the IdeaScale tool. The estimation of customer service is derived from the assessment completed for the American Customer Satisfaction Index compiled by ForeSee Results (ACSI 2010). Data includes customer service scores for years 2009 and 2010 for all agencies evaluated by ForeSee that both did and did not use the IdeaScale tool. Employed in analysis is a differencing model to relate the difference in customer service score from 2009 to 2010 to the use of the IdeaScale tool for those using the tool and those not using the interactive tool. Additionally noted is the inclusion or implementation of the ideas generated using the IdeaScale tool in the execution of the Open Government plans in the first year following the Open Government Directive. Findings from the quantitative model suggest that the ability to participate and collaborate via an online tool like the IdeaScale tool adds value to governance efforts and specifically to engaging with government through interactive Internet tools.

Also included in the chapter is a brief qualitative analysis of the measurement and valuation mechanisms developed by agencies in their Open Government plan. While no

systematic effort was suggested in the directive for agencies to use in evaluating interactive Internet tools, the directive did stipulate that agencies develop measurement metrics for their Flagship initiatives. Equally, of their own accord, some agencies included a discussion of the value of open government in terms of the information tools they plan to employ in their Open Government efforts. An overview of these discussions is included to shed some light on how agencies begin the measurement and value conversation. Drawn from analysis are conclusions that relate to agency incorporation of interactive Internet tools into agency websites to promote transparency, participation, and collaboration.

THE QUALITY OF INFORMATION

Eppler suggests that the value of information systems and interactive tools is in the quality of the information provided within those systems and through those tools (Eppler 2007). There are several mechanisms for understanding the value of information, but the one chosen by the Obama administration for the Open Government directive was that of a ranking system for data, information, and products of ideation processes. To understand the use of ranking systems and the communication of any value that the use of those ranking systems might suggest, an assessment of a ranking tool that was applied to the data of all federal agencies as they submitted the data sets required in the directive to data.gov was executed. Ranking data for all high-value data sets was extracted from data.gov and analyzed for patterns in citizen assessment of data quality.

When the Open Government Directive was introduced, Obama tasked each agency with submitting three new, previously unpublished “high value” data sets to Data.gov.

Publishing of high-value data served two primary purposes; 1) to provide a measure of government accountability to citizens, and 2) to provide trusted data sets to support the decision and innovation purposes of citizens. Focus was placed, not only on the provision of data, but the provision of tools with which to use the data—visualize, build comparative data sets, post to different web spaces, etc. And, measures were taken to include an interactive component for citizen request for data sets, citizen submission of data sets, and citizen development of data tools.

In the implementing documentation, a high value data set was defined as follows: “High-value information is information that can be used to increase agency accountability and responsiveness; improve public knowledge of the agency and its operations; further the core mission of the agency; create economic opportunity; or respond to need and demand as identified through public consultation (Orszag 2009).” Each agency was required to describe how they had identified the data sets submitted as being high-value and post this description to their website along with links to the data in the data.gov portal. In addition to the directive to produce three new, high-value data sets on data.gov, Obama also called for the incorporation of ranking systems into data.gov so that the public could rank the quality and usability of the data.

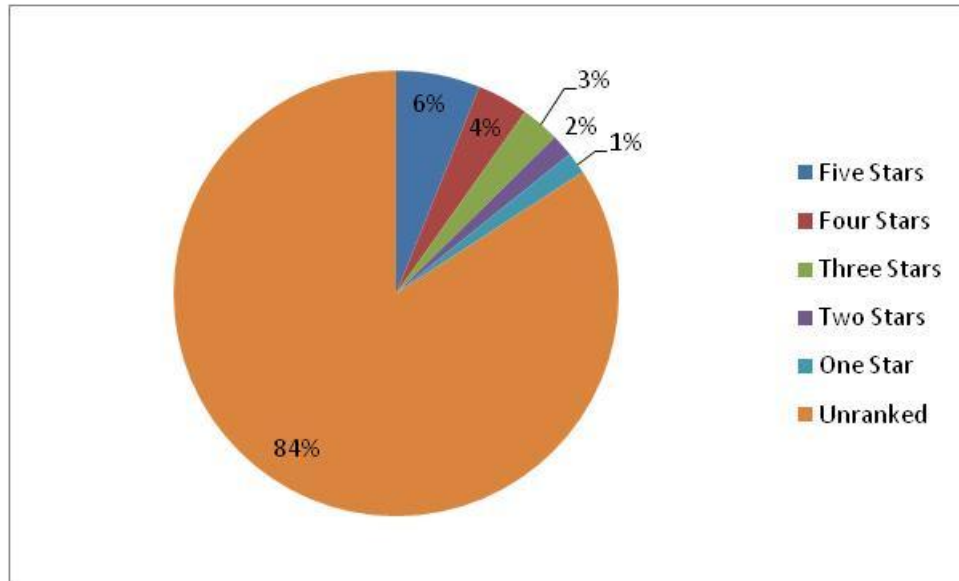
This coupling of a ranking system for data and the ability of citizens to comment on and suggest data sets for inclusion in data.gov were efforts to gain public trust in the data and provide a mechanism for feedback and participation in the development of the data.gov portal. Agencies, overwhelmingly, responded to the call for data set inclusion in

data.gov. Most agencies were able to immediately identify and post at least one high value data set and the full three came shortly after the first. Only the Central Intelligence Agency and some of the smaller agencies with limited or sensitive data were slower to respond to the call for data. In part, the provision of data was an easier task than others called for in the directive. But, it is a part that agencies took seriously and around which agencies constructed a value conversation.

Agency data sets were ranked by citizens using a five-star ranking system where five stars indicates a data set of high quality and a one star rank indicates a data set of low quality. In addition to a given rank, citizens can also vote for the ranking. So, an agency data set can get a five star ranking that is supported by a certain number of votes. This voting in support of a given ranking for a data set indicates agreement with a ranking. A data set can also be voted down. When rankings and votes are tabulated, an average ranking is submitted for the data set.

Every agency submitted at least three high quality data sets to data.gov and at least one data set from each agency was evaluated by the public. The total number of data sets ranked was 509 out of 3,216, or 16 percent of all data sets, that agencies submitted as high-value data sets. The average number of high-value data sets submitted by agency was 64 data sets. On average, citizens ranked ten data sets per agency. For the most part, agencies perform well when evaluated by citizens. In Figure 5.1, there is a chart of the percentage of data sets ranked by ranking of citizens.

Figure 5.1 Percentage of Ranked Data.gov Data



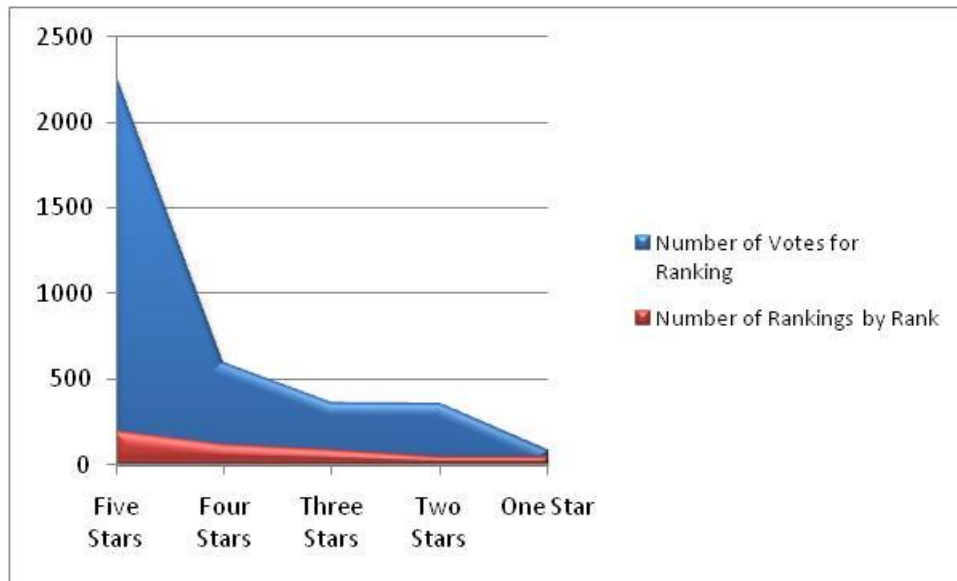
Source: Author's calculations derived from data described in Supplemental 5.6

As Figure 5.1 shows, if a data set was ranked, it tended to be ranked on the higher end of the scale. Six percent of the ranked data sets received five star rankings, four percent received four star rankings, three percent received three star rankings, two percent received two star rankings, and one percent received one star rankings. Eighty-four percent of the data was unranked. However, it should be noted that data.gov is a relatively new project and that it is expected that as people discover and use it, a higher percentage of rankings of data sets will occur for the data—especially as agencies see value in the feedback citizens provide.

As an example of the agency response, in their Open Government Plan, the Department of Homeland Security Chief Information Officer Richard Spires recognizes the dual value of public input in the data provision process, “By asking the public what information would be useful, we’re able to prioritize the posting of datasets to maximize public value (DHS 2010).” The first three high-value data sets published by the Department of Homeland Security all dealt with the Federal Emergency Management Administration, specifically to disaster and hazards mitigation and to the funding of emergency services. The disaster and hazards mitigation data sets each received five star rankings for the sets. The Department uploaded a total of 54 data sets into data.gov. The average ranking for these data sets is 3.8 stars out of five, which was on par with the average for all data sets.

The accumulated rankings by citizens of selected data sets submitted by all agencies to data.gov are depicted in Figure 5.2.

Figure 5.2 Data.gov Accumulated Citizen Rankings of Agency Data



Source: Author’s calculations derived from data described in Supplemental 5.6

Of the, 509 data sets that were ranked, 196 received five-star rankings, and 120 received four-star rankings. Of the 196 data sets that received five-star rankings, those data sets also received 2,296 votes in favor of that ranking. Of the 120 data sets that received four star rankings, those data sets also received 603 votes in favor of those rankings. In the following table is the total number of data sets that received a given star ranking. Also included is the number of votes for that ranking.

Table 5.1 Data.gov Data Rankings

	Five Stars	Four Stars	Three Stars	Two Stars	One Star
Number of Rankings	196	120	90	52	51
Number of Votes for Ranking	2,296	603	368	634	91

The average ranking of data sets that were ranked was 3.6 out of five stars. The weighted average of agencies was 3.7 out of five stars. The data set that was ranked most often was “The 2008 Combined Federal Campaign Detailed Results by Local Campaigns” data set, which is published by the Office of Personnel Management. The data set contains information on donor contributions through the 2008 Combined Federal Campaign by local campaign. Data includes information on the number of donors, campaign costs, payroll deduction contributions, and recipient organizations. The data set received a five star-rankings and a total of 1,460 votes in support of that five-star rankings. Overall, the Office of Personnel Management is the highest ranked agency for data submission. A total of 29 of 44 data sets submitted by the Office of Personnel management received five star rankings.

The Environmental Protection Agency ranks as the second highest ranked agency overall with 22 of the 47 data sets submitted receiving five star votes on their data and those 22 five-star rankings received 90 votes. Most of the ranked data sets relate to the release of toxins and to environmental quality. Following the Environmental Protection Agency is the Department of Interior. Nineteen of the data sets submitted by the Department of the

Interior received five-star rankings and those five star rankings received 48 votes. The Department of Interior houses a large amount of geo data, among other data sets.

The Department of Health and Human Services received the most one-star votes on their data sets. Six of the 97 data sets submitted were ranked as one-star quality with a total of 18 votes for those star rankings. Second to the Department of Health and Human Services was the Executive Office of the President. Six of the data sets published by the White House received one-star rankings with a total of 8 votes for those one-star rankings. However, the lowest ranked by portion contributed to the overall ranking of data sets were the National Endowment for the Arts and the Tennessee Valley Authority. The National Endowment for the arts submitted one data set to data.gov and that one data set was ranked with a one star ranking. The Tennessee Valley Authority submitted two data sets to data.gov and both were given one star rankings.

The Department of Defense and the National Archives and Records Administration have the most variation of rankings and data submitted. In the following table are the percent share of rankings by ranking for the Department of Defense and the National Archives and Records Administration:

Table 5.2 Percent of Ranking Share by Rank						
	Five Star	Four Star	Three Star	Two Star	One Star	Total Ranked
Department of Defense	0.21	0.04	0.11	0.04	0.11	0.50
National Archives and Records Administration	0.28	0.07	0.07	0.00	0.03	0.55

The Department of Defense uploaded 28 data sets to data.gov. Of those 28 data sets, 50 percent of data was ranked. Twenty-one percent of data received five star rankings while 11 percent received three star and 11 percent received one star, and four percent received four star and four percent received two star rankings. The average ranking for the Department of Defense was 3.43 stars for all sets submitted that were ranked. The National Archives and Records is similarly varied in ranking. They submitted 29 data sets to data.gov. Twenty-eight percent of those data sets were ranked with five stars, seven percent received four stars and seven percent received three star rankings. Three percent of data sets were awarded one star rankings. The overall average for the National Archives and Records Administration was 4.2 out of five stars. While there is no correlation between ranking and number of data sets submitted, these two agencies had higher levels of variation in ranking of data than most agencies.

Seven of the fifty different organizations submitting data to data.gov received rankings for all data sets submitted by the agencies. Those seven agencies include the Department of Transportation, the Federal Deposit Insurance Corporation, the National Aeronautics and Space Administration, the National Endowment for the Arts, the Pension Benefit Guaranty Corporation, the Small Business Administration, and the United States International Trade Commission. Each of these seven agencies submitted an average of three data sets. On average, citizens gave the data sets produced by the agencies a 3.78 star ranking. A list of all rankings and the relative weight of the rankings in the average ranking by agency appears in Supplemental 5.1.

While agencies receive rankings and those rankings indicate that most data sets fair well when ranked, there is actually very little that ranking tells agencies about how to develop new data sets or how to make data useful to citizens. Some of this information will be communicated to agencies through comment systems and through the development of data communities and communities of practice. In addition, consistent collection of downloads by dataset and agency reported to agencies and the public, as well as tracking of programming interfaces that connect with data on data.gov—none of which is not currently a feature of data.gov—may also provide insight into the usability and value of data. Certainly, as the concept of information quality as a method for determining value is considered, new tools for feedback and interaction in the development process must be sought for all interactive information and data systems.

In some states and in other countries, efforts are being made to quantify the value of “open data” movements, as efforts like data.gov are more commonly known. An example of the quantitative value in open data efforts is found in the Apps for Democracy data challenge. Apps for Democracy challenged data developers to design interactive Internet applications that were based on government data, like an application that would allow citizens to access geo data and map potholes in their neighborhood and communicate the locations of those potholes for repair by the city. Apps for Democracy offered awards for the best applications built upon data supplied by the district government. In thirty days, at a cost of \$50,000 in awards, participants developed 47 applications that would have cost \$2.6 million if developed internally by the District of Columbia (UN 2010, 18). Not all data and information platforms can be quantified in terms of products developed, but the quantification of the value of data certainly assists in the justification of investment in new technologies.

And it should be noted that data.gov, like most new interactive Internet technologies in government, has only recently been launched and that it is considered in beta form. On May 3, 2011, the United States government began a transition of data.gov from an interactive data site to a social data site. With social data, a user can access data, localize it, and map it to find local services. Citizens can share it via mobile and tablet devices, as well as connect to it with an interactive interface that allows for instant visualization and mining of data from any device. Citizens can submit data and connect data from multiple data sets to develop new data sets. Data communities can connect online simultaneously to work collaboratively on data sets and with information. It expands the application development platform by allowing user defined experiences with data. In the face of social data and information, governments must not only track quality but usability as both will become increasingly important.

Eppler might suggest that the methods of collecting information about information quality take the form of focus groups and surveys. Certainly, those are fine options. But with social media, these focus groups and surveys, because of the online nature of interaction, would occur in an online, real-time format that allows users to see a fairly quick response. If they do not occur in this manner where participants understand the monitoring and measurement tools and outcomes, citizens may use the social aspect of the forums to create pressure groups and become destructive of community projects and data streams. Ground rules and response forums will become paramount in maintaining quality and managing the social data and information experience.

QUANTITATIVE EVALUATION

Incorporated into the Open Government Directive issued by the Obama administration in January of 2009 was a requirement that agencies collect input from the public in the development of individual agency creation of their open government plans (Obama 2009). To fulfill the requirement of public involvement in the development of the plans, the Office of Management and Budget asked the General Services Administration to identify an online tool that could be used to solicit and collect citizen input easily and quickly and over a short timeframe to meet the tight deadlines presented in the Directive. The General Services Administration researched tools that could be implemented on agency websites that would allow for input by employees and citizens and that would incorporate some sort of ranking and commentary system for the ideas presented (GSA 2010). Requirements of the tool were that the tool be easy to learn to use, easy to use, and simple to implement in individual agency websites. It was also important that the tool have the capacity to be used by multiple agencies in a way that allowed for personalization of the appearance of the tool by the agency but that was consistent in use capabilities across agencies.

During the latter part of 2009, the General Services Administration identified, modified, and came to agreement on terms with IdeaScale. They also trained employees at each major federal agency to implement and execute the Idea Scale tool, and provided technical and training support throughout the IdeaScale execution process. The cost of the IdeaScale tool to the General Services Administration was less than \$10,000, which they did not pass on to the agencies. The cost of the tool to agencies was zero. Ultimately, the tool was made available to 26 of the major federal agencies (GSA 2010).

Some agencies were eliminated from eligibility to use the tool due to agency restrictions or agency choice. For example, the Central Intelligence agency did not opt to employ the IdeaScale tool and notes in their Open Government plan that because of the nature of their agency, finding the balance between open government and the secret nature of the agency poses difficulties to citizen engagement with the agency (CIA 2010). In an effort to strike this balance, they did not use the IdeaScale tool. Rather, they collected input on their Open Government plan via email, facsimile, and mail. However, most agencies opted to use the tool. The unit of analysis for this research is the agency. Data were collected and reported at the agency level.

Experimental Design

During a six week period from February 9 through March 19, 2010, the IdeaScale tool was implemented and the public ideation process was conducted with the IdeaScale tool. Agencies participated in using or not using the IdeaScale tool in a non-random manner that lead to a quasi experiment. That quasi experiment lent itself to the research design and data collected for this analysis. For this research, agencies that used the IdeaScale tool were assigned a one or a zero based on their participation on not. Thus, if an agency used the tool, they were assigned a one and if an agency chose not to use the tool, they were assigned a zero.

A model of the research design follows:

$$\text{NR: } 0_1 \times 0_2, \text{ user} = 1$$

$$\text{NR: } 0_1 \quad 0_2, \text{ non-user} = 0$$

Nineteen of the 23 agencies using the IdeaScale tool also reported customer services scores for both 2009 and 2010. Those customer service scores were derived from the survey completed by ForeSee Results for the American Customer Service Index. The American Customer Service Index reported scores for an additional nine agencies that did not use the Idea Scale tool. Included in the sample are data related to agencies that did and did not use the IdeaScale tool and that reported scores for customer service in years 2009 and 2010. The agencies that used the IdeaScale tool can be considered a “treated” group while the agencies that did not use the tool are the control group. Explored in analysis are the differences in “treatment effects” between the treatment and control group. The treatment effects of interest in this analysis are any returns to customer service and utility derived from tool use.

The goal of the quantitative analysis is to understand what the returns of use of the interactive Internet tool is to the customer service valuation of each major governmental agency in the United States. This goal is accomplished through the observation of individual agency tool use behaviors associated with use and non-use of the IdeaScale tool. Because the tool was only in use a brief time and because the technologies are in the early stages of implementation and development, at best, a slightly discernable statistical signal of effects is expected for analysis. However, even an understanding of a positive

or negative impact of the tool might prove useful when developing value metrics for assessing the effects of interactive Internet tools.

Data

For the model in this analysis, the dependent variable is CS Change, the change in customer service score from 2009 to 2010. The independent or explanatory variable included in analysis is the presence or not of the IdeaScale tool.

Table 5.3 Variables Included in Analysis	
Variable Name	Variable Description
CS Change	The difference between the 2009 and 2010 customer service scores
IdeaScale	A binary variable where one equals the use of the IdeaScale tool by a given agency and zero equates to an agency not using the IdeaScale tool

Customer Service Score

The customer service scores reported by ForeSee Results are compiled from surveys taken throughout the year on individual government agency websites (ACSI 2010). Agency surveys incorporate questions related to customer satisfaction related to individual agency websites. Surveys are administered through pop-up windows that appear on agency web pages when a user enters the agency website. Upon pop-up, users

are asked if they would like to opt into the survey. If a user opts in, ForeSee electronically follows the user as he or she uses the website and administers a survey as the user exits the agency web space. While the primary survey questions are consistent across agencies, agencies can personalize certain questions on the survey. An example of a survey administered by ForeSee for a government agency may be found in the Supplemental.

Results collected from the survey are gathered by ForeSee and then associated with specific page categories associated with parameters defined by the American Customer Service Index. Those categories relate to the function of the page and include e-commerce and transaction, news and information, portal and main site, and jobs and careers. For this analysis, where agencies had more than one score due to categorization, results were combined and averaged to compile a composite score for each agency. Additionally, results collected are reported quarterly. For this analysis, results were compiled across quarters for the year to derive annual customer service score.

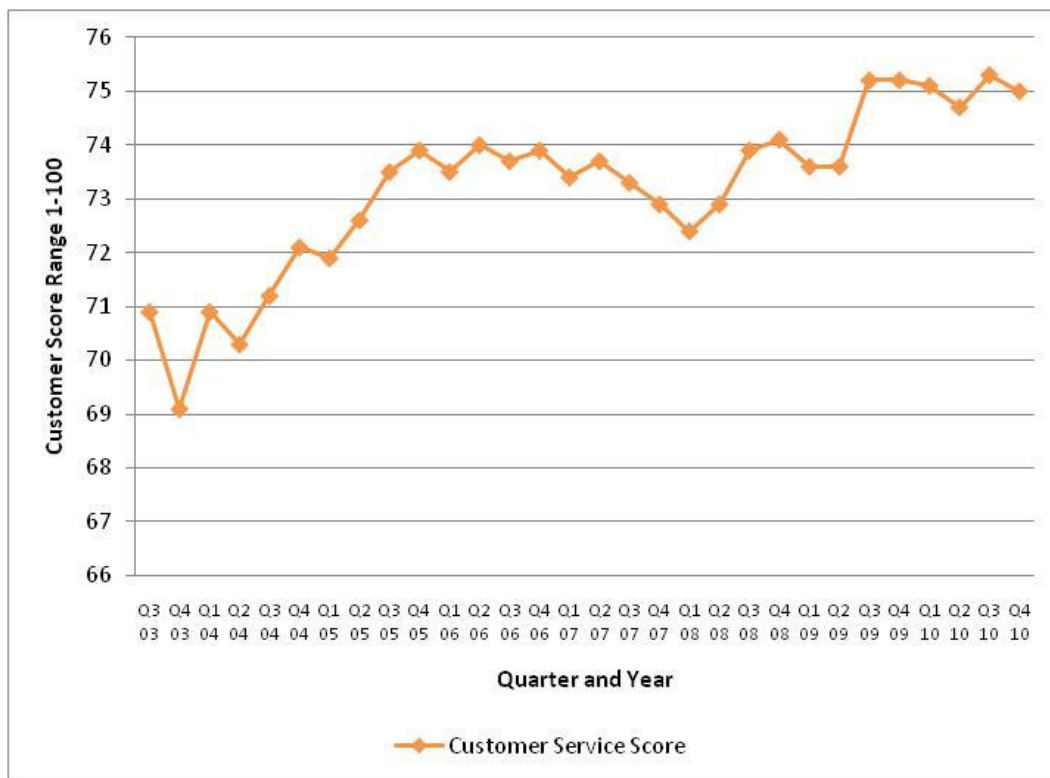
The dependent variable used in analysis, CS Change, is the difference in annual customer service score between years 2009 and 2010. Customer service scores for all agencies included in analysis are in the Supplemental.

Historically, the average change in aggregate customer service score per year from 2003, when select, mostly non-defense related agencies began collecting customer service input on their web spaces, to 2010 is a 0.21 point increase in score for all federal agencies.

There is an overall upward trend in aggregate customer service score with a few notable downward flows. The most noticeable downward spike occurred in the second quarter of

2007 and ran through the second quarter of 2008. During this time, the government implemented the customer service measures for several large departments including the Departments of Defense and Homeland Security, and measures for the satisfaction of applicants for disability and other benefits from the Social Security Administration and the Department of Veterans Affairs. With the inclusion of these agencies in measurement of customer service satisfaction, all major agencies were represented in tracking customer service satisfaction score. In Figure 5.3, the aggregate customer service score is charted by quarter and year.

Figure 5.3 Aggregate Federal Agency Customer Service Score by Quarter and Year



Source: Author's Calculation using ForeSee Data: <http://www.foreseeresults.com/>

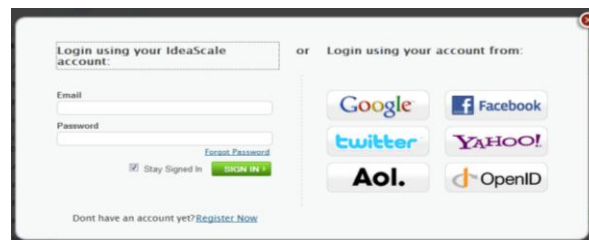
President Obama took office and introduced the Open Government Directive in the first quarter of 2009. From the first to the second quarters of 2009, customer service score remains constant. A bump in customer service score might be expected upon the Open Government announcement. However, it was not until the third and fourth quarters of 2009 that the agencies began to post information about their open government initiatives on their web pages. In the third quarter of 2009, as agencies posted more information about Open Government and began to incorporate some multi-media and interactive tools in the web space, aggregate customer service scores rose by 1.6 points. This 1.6 point increase in score is the single largest increase in customer service score since the second quarter of 2004 where there is a 1.8 point increase and decrease between the third quarter of 2003 and first quarter of 2004.

The trend of higher customer service scores flows through the end of 2009 and into the beginning of 2010. The change in aggregate customer service score stays fairly constant from quarter three of 2009 through quarter two of 2010 when the IdeaScale tool was introduced. It is not until the third quarter of 2003 when the results of the IdeaScale projects are published and implemented that there is a bump in customer service score. In the third quarter, the aggregate customer service score increases by 0.6 points. This increase in aggregate customer service score is the second largest increase in customer service score since the third quarter of 2008 when there was a one point increase in aggregate customer service score. The results of participation seemingly garner the highest increases in customer service score.

IdeaScale

IdeaScale is an interactive Internet tool designed to collect input around a certain topic or question for discussion. The topic for discussion or question is chosen by the site administrator and posed via the Internet through the IdeaScale interface. Users log in with an email and password. Each user is uniquely identified and all use is logged for each user. Depicted in Figure 5.4 is the login interface. Note that activity on IdeaScale can be logged into from associated sites and that activity on IdeaScale can be communicated back through those sites. Each IdeaScale ideation interface also links to Facebook and Twitter.

Figure 5.4 IdeaScale Login



Source: IdeaScale <http://ideascale.com/>

Along with submitting ideas related to the topic, users can comment on ideas, and vote ideas up or down based on their personal opinion of preference and priority of an individual idea. Each idea must contain a title and text describing the idea. Additionally, users may add tags to classify or categorize the idea submitted. Figure 5.5 shows the ideation interface.

Figure 5.5 IdeaScale Submit Your Idea

The image shows a web form titled "Submit your Idea". It has a light blue background and a dark border. At the top right, there is a red "X" icon. The form contains the following elements: a "Title*" field with a character count of "64 characters left"; a "Description*" field; a "Category*" dropdown menu currently showing "User Interface"; a "Your Email*" field; a "Submit" button; and the IdeaScale logo with the tagline "where ideas come to life". There is also a small asterisk note: "*Required fields".

Source: IdeaScale <http://ideascale.com/>

The category marker allows site administrators to break out ideas by predefined categories related to the primary discussion topic or question posed. Users can categorize their idea according to the preset categories defined by site administrators. As seen in the graphic below, users can vote up or down, as well as comment on ideas of themselves and others. The purpose of the voting function is to promote sorting of ideas through the user based priorities. After ideas, comments, and votes are collected, results are reported to agencies and site administrators in the form of Excel files. The Excel files contain agency or site administrator name, idea title, idea text, text, comments text, votes up, votes down, net votes, raw number of comments, time accessed, status of user, and username of user.

For the Open Government directive, IdeaScale was implemented to garner citizen input related to Open Government plans. The IdeaScale tool was posted in tandem with the

agency Open Government plan on each individual agency's open page—which is a web page dedicated to individual agency open government activities, required by the directive. Ideas were collected for each agency's Open Government plan around five topic categories; transparency, participation, collaboration, innovation, site help, and open comments. Transparency, participation, collaboration, and innovation categories relate directly to ideals outset in the Open Government directive. Site help refers to questions about the site and about using the IdeaScale tool. Open ideas allows users to submit random or unrelated or other ideas. Users were able to submit ideas, idea tags, comments, and votes for each of the topic areas. Users were comprised of members of the public as well as federal government employees. The site was monitored by agency staff for appropriate use and any help needs.

In Figure 5.6 is a graphic depicting the IdeaScale interface for the National Aeronautics and Space Administration Open Government plan.

Figure 5.6 National Aeronautics and Space Administration IdeaScale Interface

The screenshot displays the OpenNASA IdeaScale interface. At the top, there is a header with the NASA logo, the text "OpenNASA SHARE YOUR IDEAS", and the OpenGov logo. Below the header, there is a search bar and a "Skip to content" link. The main content area features a call to action: "SHARE. DISCUSS. VOTE." and "Give us your comments on our Open Government Plan." This is followed by a list of bullet points: "Improve the availability and quality of information", "Work better with others inside & outside the government", and "Be more efficient & innovative". There are also buttons for "Submit New Idea" and "Discuss & Vote on Ideas".

On the left side, there is a "Categories" section with "All Ideas" selected. Below this, there are five numbered categories: 1. Transparency, 2. Participation, 3. Collaboration, 4. Innovation, and 5. Help Us Improve This Dialog Site. There is also a "Social Web" section with a "Like" button and a "Usage statistics" section showing "420 ideas posted", "868 comments", "8099 votes", and "1372 users".

The "Browse Popular Ideas" section on the right lists several ideas with their respective vote counts and submission dates:

- Space Solar Power Conference**: 199 votes, 71 comments, submitted by karen.enea 1 year ago.
- Allow NASA employees 10-20% each week for innovative projects**: 144 votes, 13 comments, submitted by Beth Beck 1 year ago.
- NASApedia - The Collaborative Knowledge Base**: 123 votes, 15 comments, submitted by Jon Venille 1 year ago.
- Open source design/problem solving**: 100 votes, 14 comments, submitted by jbrautwin 1 year ago.
- Free availability, when possible, of software, data, and papers.**: 98 votes, 8 comments, submitted by martin.hegadis 1 year ago.
- Recognize people for space outreach excellence**: 80 votes, 2 comments, submitted by Jen Scher 1 year ago.
- Do this more: Use a Tool like this to solicit Ideas internally**: 80 votes, 3 comments, submitted by Becca Gillespie 1 year ago.
- NASA TV-Public Content**: 1 agree, submitted by [unintelligible] 1 year ago.

Source: Open NASA: <https://opennasa.ideascale.com/>

After each agency completed the IdeaScale process, the parent IdeaScale company compiled an Excel spreadsheet for each agency that detailed the participation for each individual agency. Within the spreadsheet were data for the number of unique participants, the full text of ideas received, the full text of comments received, the number of votes total, the number of votes “up” for an idea, the number of votes “down” for an idea, and other participation details. For this research, each of those individual sheets was consolidated and a master database of comments, votes, and participation was developed.

Ultimately, for the projects included in analysis and over the six weeks of IdeaScale availability, 6,279 ideas, 30,784 comments, and 374,313 net votes were submitted by 22,768 unique users. Of the ideas submitted, 2,171 were related to transparency, 1,159 were related to participation, 577 were related to collaboration, 473 were related innovation, 81 were related to site help, 1,569 were open comments, and 249 were uncategorized ideas. Below is a depiction of the top 150 words used, weighted by number of times used, in the ideas submitted through IdeaScale for the following agencies: Departments of Commerce, Defense, Interior, Justice, Labor, State, Transportation, Treasury, the Environmental Protection Agency, General Service Administration, National Aeronautics and Space Administration, Office of Personnel Management, Social Security Administration, and the Veterans Administration.

information about strategic planning and goals for diplomacy. The Social Security Administration received many comments on access to health and benefits data by citizens and by employees and requests for tools for using data to help in service provision, along with recommendations for how to involve citizens more in the agency communications process. For almost every agency, there was a request for more access and for more online venues through which to provide feedback and have a conversation with the individual agency. Equally, there were also ideas submitted for how citizens could be involved and how citizens wanted to be involved in the ideation process and in connecting their web space or organization to data provided by agencies. Overall, the communications were fairly two-way with requests and ideas floating to the surface frequently. And, users were fairly good at self-moderating the discussions, promoting ideas and comments of substance and voting down ideas that turned into rants or lectures.

As a side note, the National Aeronautics and Space Administration is commonly viewed as an early adopter in the open government initiative and in adoption of new technologies. This view may be the cause for the number of ideas that contained the word “NASA.” Several participants made reference to the National Aeronautics and Space Administration using agency practices as examples to follow, as well as commenting about the agency’s successes to other agencies. However, the National Aeronautics and Space Administration was not the largest recipient of ideas. The agency that received the most ideas was the Social Security Administration. They received a total of 4,205 ideas and participation from more than 14,000 citizens. The National Aeronautics and Space Administration ranked second for the number of ideas generated, 420 ideas, and third for the number of unique participants with 1,365 participants. A

table of IdeaScale participation, ideas generated, comments generated, and votes is in Supplemental 5.3.

For the agencies using the IdeaScale tool, most record choosing between three and 11 ideas submitted through the IdeaScale tool on which to follow through in their open government activities. The following agencies are included in analysis.

Table 5.4 Agencies Included in Analysis	
Central Intelligence Agency	International Trade Commission
Department of Commerce	National Archives and Records Administration
Department of Defense	National Aeronautics and Space Administration
Department of Interior	National Institute for Standards and Technology
Department of Justice	Nuclear Regulatory Commission
Department of Labor	Office of Personnel Management
Department of State	Pension Benefit Guarantee Corporation
Department of Transportation	Small Business Administration
Environmental Protection Agency	Social Security Administration
Federal Deposit and Insurance Corporation	Department of Treasury
Government Accountability Office	Department of Agriculture
General Services Administration	Veterans Administration
Health and Human Services	Executive Office of the White House

Descriptive Statistics

Outlined in the table below are the descriptive statistics for the variables included in analysis. Reported for each variable is the number of observations, the mean, the standard deviation from the mean, the minimum and maximum value of each variable.

Variable	Observations	Mean	Standard Deviation	Minimum	Maximum
CS Change	26	0.855	2.503	-5.71	9.16
IdeaScale	26	0.731	0.452	0	1

For the dependent variable CS Change, or the change in customer service from 2009 to 2010, scores are reported for all 26 agencies included in analysis. The average change in customer scores from 2009 to 2010 for agencies was 0.855 points with a maximum change in score of 9.16 points reported for the United States International Trade Commission and a minimum of -5.71 points reported for the Department of Interior. The standard deviation for the change in customer service was 2.5 points.

For the variable IdeaScale, or the binary variable indicating use or not of the IdeaScale tool by an individual agency, information is reported for all 26 agencies included in analysis. The average number of agencies using the IdeaScale tool was 0.73, or nearly 70 percent of agencies in the data set. The average number of ideas submitted to agencies

was 241.5 ideas with a maximum number of 4,205 ideas submitted to agencies using the IdeaScale tool and a minimum of zero, representing those agencies not using the IdeaScale tool. The standard deviation for the number of ideas submitted was 814.95 ideas. For those agencies using the IdeaScale tool, the minimum number of 30 ideas submitted was to the National Archives and Records Administration. The maximum number of 4,205 was submitted to the Social Security Administration.

Model and Outcomes

For analysis, a difference in difference model is used to discern any benefit to agencies of implementing an interactive Internet tool related to participation. For this model, CS Change is used as the dependent variable and IdeaScale as the independent variable of interest. The goal of modeling is to discover any change in customer service that may be related to the use of the interactive Internet tool IdeaScale by federal agencies.

The Difference in Difference Model

The difference in difference model is typically used when outcomes for two groups may be observed over two time periods. In the first time period, no member of the group receives an intervention or treatment. In the second time period, one portion of the group receives a treatment and one portion does not. After the conclusion of the second time period, the average gain in the group that was not treated is subtracted from the group that received treatment. The differences between the groups are considered the treatment effect, or the gains received by those receiving treatment.

Because the same group units from which the average effects are observed over time, permanent or time sensitive biases are understood to be controlled. For this analysis, changes in customer service score as related to use or not of the IdeaScale tool are examined.

The difference in difference model:

$$\Delta CSChange_{i2} = \beta_2 + \delta_1 IdeaScale_{i2} + \Delta\mu_{i2}$$

where

$$\hat{\delta} = \overline{\Delta IdeaScale_{treat}} - \overline{\Delta IdeaScale_{control}}$$

(Wooldridge 2002)

The dependent variable for analysis is a calculation of the change in customer service score and is related to the use or not use of the IdeaScale tool. If the IdeaScale tool is perceived as valuable, it is expected that those agencies using the IdeaScale tool will receive an increase in customer service score.

For the initial model, all 26 agencies are included in estimation. The results of modeling are included in the table below.

Table 5.6 DID Change in Customer Service Score from 2009-2010 with Outliers

	Coefficient	Standard Error	P-value
IdeaScale	-0.382	1.127	0.738
Constant	1.134	0.963	0.25

As the model constant coefficient suggests, overall customer services scores rose by an approximate, statistically insignificant one point among agencies. However, according to the model output, implementing the IdeaScale tool has a negative 0.4 point reduction effect. With a p-value of 0.74, that negative customer service effect is insignificant. This negative outcome is unexpected as the research hypothesis was that implementing the IdeaScale tool would produce a positive and significant effect on customer service.

Among the data are two extreme outliers, the United States International Trade Commission and the Department of Interior. The United States International Trade Commission did not use the IdeaScale tool to collect comments on their Open Government Plan. For the 2009-2010 year, customer service score rose 9.16 points. The Department of Interior did use the IdeaScale tool and their customer service score decreased by 5.71 points. The change in customer service score for both agencies is in the third deviation or more from the mean. These changes in customer service score are unexpected as a more participatory web space is seemingly a more valuable web space, which should translate to a higher customer service score. It is assumed that the increase and decrease in customer service score is due to some exogenous factor other than the incorporation of interactive Internet tools. Extremes on both sides of the data distort the statistical signal in modeling. To retain a clearer statistical signal, the two outliers were removed from modeling.

Following are the descriptive statistics of the data without outliers present.

Table 5.7 Descriptive Statistics for Data without Outliers

Variable	Observations	Mean	Standard Deviation	Minimum	Maximum
CS Change	24	0.782	1.39	-1.46	4.42
IdeaScale	24	0.75	0.442	0	1

When the outliers are removed from modeling, 24 agencies are present in the data. The average change in customer service score from 2009 to 2010 is a 0.782 point average increase in customer service score across all agencies. The difference in the average customer service score from the data with outliers and the data without outliers is approximately 0.07 points. However, the difference in standard deviation between the data with and without outliers is nearly 1.2 points—from 2.53 points to 1.39 points. The modeling results differ greatly as well. Results from modeling follow in the table.

Table 5.8 DID Change in Customer Service Score from 2009-2010 without Outliers

	Coefficient	Standard Error	P-value
IdeaScale	1.315	0.608	0.042
Constant	-0.203	0.527	0.703

When separating the effects between those agencies that used the IdeaScale tool versus those that did after removing the outliers, modeling results indicate that overall customer service decreased by a statistically insignificant 0.2 points. However, among those agencies using the IdeaScale tool, customer service rose by 1.32 points or a total of 1.112 points, at nearly 96 percent level of confidence, a statistically significant increase.

Because the model is a model of a population, a positive statistical signal is clear. The R-squared value on the model is 0.1753, which is not high. However, for a tool that was implemented for 12.5 percent of the year calculated for customer service, the impact is discernable. There is a statistically significant increase in customer service score from 2009 to 2010 for those agencies that used the IdeaScale tool.

Quantitative Modeling Conclusions

The primary relationship of concern for the difference in difference model was between any increases in customer service score and those agencies using the IdeaScale tool. The goal of analysis was to discover if the IdeaScale tool had any effect on customer service score. Throughout each of the models included in analysis, the IdeaScale tool had a positive and sometimes significant role in explaining the increase in customer service for those agencies that used the IdeaScale tool.

From a policy perspective, if the government leadership values and wishes to see interactive Internet tools employed, they must communicate the value to customers to agencies and agencies must see a benefit for developing and using the technologies outside of a perceived mandate. An increase in customer service is indeed a value to agencies. However, agencies should also be prompted to explore varied tools and determine which have the best outcomes for their individual agency in meeting the service provision goals of the agency in addition to providing value to customers. Only when agencies have adopted the tools based on internal motivations and to suit their service aims will the tools be sustainable.

THE VALUE CONVERSATION

Determining the value of new interactive Internet tools in government was not prescribed in the directive, nor has the administration put forth any evaluation rubrics or mechanisms for agencies to report successes and failures with the technologies or with their Open Government initiatives. In the directive, the only inclusions of value related to the flagship initiative. Agencies were tasked with defining a method for evaluating their flagship efforts. Those measures were as varied as the projects, and by in large, have not been reported formally. However, they are the only substantive indicators for how agencies have begun the value conversation around the implementation of new interactive Internet technologies in agencies.

To gain an understanding of how agencies have begun to think about the value of interactive Internet technologies, an examination of the value conversation that occurs within the agency Open Government plan was conducted. In exploration of the value conversation, agencies used multiple methods of analysis and identified multiple beneficiaries in analysis. Most agencies talked about value in at least one of the following ways, 1) as a cost reduction mechanism, 2) as a genitor of increased participation, 3) as a mechanism for time reduction in completing tasks, 4) as a promoter of collaboration, or 5) as an instrument in value creation. Most agencies identified at least one of the following as the primary beneficiary, 1) the public, 2) partner agencies, 3) project participants, or 4) themselves.

Some agencies identify the real cost or energy savings as a mechanism for valuation. For example, the National Technical Information Service at the Department of Commerce will measure the effect of increased exposure via Data.gov by comparing information related to future publication ordering information to existing baseline data. They identify value in reducing the numbers of orders to the agency and the associated cost reductions for the agency. For most who hold the conversation about value in cost reduction, there is not an current data on tracking of these costs or any reporting of any costs actually reduced. However, most who do identify cost reduction as a measure of value can sight in particular the cost that will be reduced. Therefore, measurement of cost and reporting is possible.

Some agencies construct the value conversation around the direct benefits the organization will receive through the use of new technologies. Benefits to organizations are mostly cited in terms of reduced time to completion of a project, reduced costs, interaction with the public and with fellow agencies and employees, and with several agency specific benefits. The Department of Treasury published an entire set of benefits expected to be received by the organization from developing new technologies and participating in the Open Government Directive in their plan. In Table 5.8 is an excerpt of a selected few of that conversation:

Table 5.9 Department of Treasury Open Government New Technology Benefits Statement

Bureau	Initiative	Description	Benefits
Departmental Offices Office of the Chief Information Officer	Wiki pilot for Paperwork Reduction Act information collection	Engage public participation via a wiki with the IRS information collection 1545-0056, <i>Application for Recognition of Exemption under Section 501(c)(3) of the Internal Revenue Code</i> . Public comments for information collections via the Federal Register process are minimal to none.	<ul style="list-style-type: none"> • More collaborative and participatory process • Reduce paperwork burden hours • Reduce cost of publishing Federal Register notices • Reduce cost of producing and distributing the form
Internal Revenue Service	Federal Student Aid (FSA) Datashare	Supports the simplification of the Department of Education’s online Free Application for Federal Student Aid (FAFSA) process by providing applicants with 14 IRS data elements needed to complete the FSA forms.	<ul style="list-style-type: none"> • Improve accuracy • Reduce applicant burden • Reduce program costs
Bureau of Public	“Kids” web site	Plan to launch a web	

Debt		site for 6th to 12th graders to educate them on BPD, the role of borrowing to fund the federal government, and saving and investing with Treasury securities.	<ul style="list-style-type: none"> • Educate the public in fun and interactive ways
Source: Information excerpted and extracted from Department of Treasury Open Government Plan (Treasure 2010).			

The Department of Treasury expects to see returns in lowered costs, in time savings, in better systems structures, and in increased participation of partners and the public, along with opportunities to educate the public in new and innovative ways. While they do not include specific tracking and measurement inventories for capturing the value explicitly, by identifying the benefits to the organization, they do provide a baseline from which to construct quantitative and qualitative evaluations of value.

Reciprocally, while some agencies view the benefit to them in terms of direct benefits, the Council for Environmental Quality views the Open Government movement as a method for building the values of their organization into other agencies and into the larger national consciousness. They comment on the difficulty in how to measure the effects of their Flagship initiative, GreenGov, in terms of open government and in terms of using the initiative to successfully perpetuate the idea of sustainability:

Measuring the success of the GreenGov program in reaching its broader goal of fundamentally and holistically incorporating the goal of sustainability into Federal operations is not easy to capture. It requires a

determination of difficult-to-answer questions: How effective is the Sustainability Executive Order at introducing “sustainability” as a value in Federal Government decision making? Do Federal employees grasp the environmental, economic, and social ramifications of government actions? Is government investment in the built environment, contractor community, and product procurement contributing to the growth of the clean energy economy? Are the collaborative, transparency, and participative mechanisms in the Executive Order functioning to effectively tap into a widely-dispersed set of best practices of sustainable operations (CEQ 2010)?

The Council for Environmental Quality interpreted the introduction of new technology not simply as a compliance with a directive to use new technologies, but as an opportunity to leverage those technologies and the parameters of Open Government to add their values to the government as a whole. This addition of their values to the value structure of other agencies not only benefits their agencies, but all of government. However, as the Council notes, it is very difficult to measure the values of one agency within another.

And, still other agencies identify value in terms of the benefit to the end consumer. When the end consumer is the value target, the conversation typically involves aspects of lower transaction costs, increased opportunities to participate with the agency or the benefits of data provision. The Department of Defense recognizes multiple beneficiaries and that value will be different for different audiences. Following is an excerpt of the measurement statement in the Department of Defense Open Government plan:

Table 5.10 Department of Defense Open Government Benefits by Audience

Audience	Benefit
General Public	<p>The general public of American citizens and taxpayers are the fundamental core intended audience for our Data.gov contributions and Open Government efforts as a whole. While soliciting input and requests directly from citizens, we also plan to proactively release datasets on topics of major interest in the news and to the public. These are the types of datasets we would also highlight on our Open Government Web site to make them even more readily available. Additionally, we have a range of information publicly available on Web sites in a variety of formats which can be leveraged by Data.gov.</p>
Media	<p>In terms of their ability to analyze and utilize complex data, the media audience often represents a middle point between a casual citizen user and scientific or technical experts with specific and advanced interests. The media is often more interested in detailed versions or analyses of the same high-profile data popular with the general public.</p>
Scientific, Academic and Business Communities	<p>Given the vast Defense infrastructure and budgetary resources devoted to technical, scientific and medical research, it is likely non-Department of Defense entities may have interest in and find new value in access to some of the data underlying these efforts. For example, access to detailed (anonymized) medical study data could be of benefit to medical and pharmaceutical researchers and clean energy work undertaken in the military could help stimulate new ideas in the commercial sector. These potential users also are likely to have the capability to utilize large and complex datasets with more nuances than users without the same level of subject expertise (DOD 2010).</p>

Valuation of technologies and data and information are different for each audience. For the general public, it's the provision of raw data and tools to deal with that data. For the media, it's the provision of consolidated analysis for reporting. For scientists, engineers, and professional communities, it's raw data for experimentation and exploration. To measure value to multiple audiences, not only would various rubrics or measurement tools be necessary, it is likely that in person interviews and focus groups would prove useful. It might also be advisable to create a feedback mechanism when providing an interactive Internet tool that is appropriate for multiple audiences so that general and targeted measurements could be made and general and targeted adjustments could follow measurement. However, measurement in relation to multiple audiences is possible and probably most likely as the projects and tools using interactive Internet technologies are not typically specific to one group of constituents.

At the conclusion of Global Pulse, the organizers published a value statement: "Global Pulse 2010 provided an opportunity to voice opinions, share ideas, and create innovative solutions to social issues facing the global community within the fields of science and technology, entrepreneurship, and human development. This was a unique opportunity to influence a global conversation that built partnerships across borders, strengthened understanding among cultures, and identified innovative solutions to the most pressing social issues of our time." They continue, in their evaluation document, "A clear message from Global Pulse 2010 is that the international development community and its constituents valued the event because it enabled everyone to collaborate and share ideas that can inspire individuals and organizations to act (USAID 2010)."

As the quotes clearly indicate, the value identified for the event was the ability to participate and deliberate with multiple partners and with individuals doing a wide spectrum of global development work. As measures of value, event organizers report on the nature of the participants, from what country and what organization each participant originated, general demographics of participants, and the number of ideas and comments generated for each area of concern for the project. In raw form, organizers measured who participated and the level of participation.

However, they did not build follow-up or funding mechanisms to support action plans, idea and project execution, and any outcomes measures. Equally, they did not develop an interactive Internet technology to continue the conversation or where participants could convene on a regular basis to report problems or progress, nor have they held a follow-up event. In short, they did not consider sustainability of the technology or of the project once the project was implemented. In fact, none of the plans deal with the sustainability of their projects or with their plans for how to use technology to leverage any project outcomes.

For Open Government to be successful and for agencies to continue the technology implementation and development process, the value conversation requires direction and shape with clear definition of benefits, recipients, and sustainability measures. It may also require a common language for evaluation. Setting forth parameters like transparency, participation, collaboration, and innovation is a vague call at best. Some direction on words to use for evaluation and measurement ideas must be set forth from a governing body for the agencies. Measuring the parameters of open government and the use and impact of the technologies called for to execute those ideals across agencies and

dealing with multiple constituents will be a challenge. But, it is a necessary challenge if technology implementation and open government are to succeed.

THE VALUE CONSTRUCT IN SUM

Theory suggests that the value of i-government and interactive technologies lies in the quality of information provided. However, very few measures of information quality exist for the data and information provided and used in tandem with new interactive Internet technologies. The value constructs that are present consist mostly of ranking systems that the public and partners can use to rank data, information, ideation outcomes, and ideation comments. By in large, these ranking systems are used for a very small portion of the data and information that is published. When they are used, the limited rankings available suggest that data and information will be ranked fairly well.

Continued efforts to incorporate data and information quality objectives for new technologies and within agencies along with continued efforts to include opportunities for feedback on that data and information quality are essential components of shifting to i-government.

In addition to information quality is actual valuation by customers. The current signal is that there is value in interactive Internet tools when they are implemented on agency websites. What is not known is the nature of that value or how to increase the use of interactive tools and participation with agencies through these interactive tools. One mechanism for understanding the value of interactive tools in agency website might include a simple addition of a few questions on the ForeSee survey. Through some

targeted questions on the survey, agencies could 1) alert customers taking the general survey that the tools exist—should they not have encountered them in their visit to the agency website, and 2) derive the explicit value of new technologies as captured through survey.

As agencies begin to construct the value conversation around their flagship initiatives, as mandated in the Open Government directive, and around justifying the implementation of more interactive Internet tools in their web space themes of the value conversation have begun to emerge. Those themes relate to reduced transaction and access costs, increased opportunities to participate, time reduction for completing tasks, a mechanism for collaboration, and as an instrument for innovation. Most agencies identified at least one multiple beneficiaries of their projects including the public, partner agencies, project participants, and themselves.

In addition to those themes is a vocabulary of value that is different from the vocabulary of e-government. That vocabulary consists of words like value implementation, collaboration, education, usability, innovation, information quality, and customer service. For two of those phrases, information quality and customer service, we have mechanisms for understanding the value construct and established systems for getting at the value of the systems and the technologies. For a third, participation, we have a system of counting that has been accepted as appropriate when measuring participation—though it fails to account for quality of participation and any sustainability of participation. For the rest of the words, we have no value parameters and no clear definition of the value construct.

If we understand Open Government to be a culture change, a culture change that prompts the use of new technologies, we can perhaps view successes at Open Government with the execution and use of new interactive Internet technologies. We then must provide for measures of value under the ideological and cultural language set forth in the open government directive and build measures of value for the technologies. Without measures of value, agencies cannot see clearly value delineation or a path for development. Without value constructs, none of these efforts at culture change or technology adoption will be successful without an evaluation structure to guide future implementation and development.

SUPPLEMENTAL 5.1 AVERAGE RANKING AND RANKING WEIGHT OF DATA IN DATA.GOV BY AGENCY

Agency	Average Ranking of Data	Relative Weight in Average Ranking
BBG	2	0.011788
CFTC	4	0.007859
CIA		0
CNS	4.333333	0.02554
DHS	3.8	0.111984
DOA	4.1	0.1611
DOC	3.45	0.13556
DOD	3.428571	0.094303
DOE	4.166667	0.196464
DOI	3.787234	0.349705
DOJ	3.133333	0.092338
DOL	3.6	0.176817
DOS	3.833333	0.045187
DOT	4.333333	0.02554
EAC	5	0.019646
ED	3.375	0.053045
EEOC	5	0.02947
EPA	4.042553	0.373281
FHFA	4	0.007859
EXIM	5	0.039293
FCC	3.25	0.02554
FDIC	4.666667	0.027505
FRB	5	0.009823
GAO		0
GSA	4.047619	0.166994
HHS	2.823529	0.094303
HUD	3	0.035363
IMLS	3.4	0.033399
MSPB	1.5	0.005894
NARA	4.230769	0.108055
NASA	2.333333	0.013752
NEA	1	0.001965
NLRB	2.5	0.019646
NIST		0

NRC	4.461538	0.113949
NSF	2	0.015717
NTSB	4.230769	0.108055
OPIC	5	0.009823
OPM	4.870968	0.29666
PBGC	4.666667	0.027505
RRB	2	0.003929
SBA	3.333333	0.019646
SEC	4.333333	0.02554
SSA	3.411765	0.113949
Treasury	2.5	0.098232
TVA	1	0.003929
USAID	4.666667	0.027505
USITC	4.5	0.017682
VA	3.333333	0.235756
WH	2.75	0.086444

SUPPLEMENTAL 5.2 EXAMPLE OF THE FORESEE CUSTOMER SERVICE SURVEY



Customer Satisfaction Survey

Thank you for visiting the **Department of Homeland Security**. You've been randomly chosen to take part in a brief survey about our site to let us know what we're doing well and where we can improve.

This survey is designed to gather feedback about the DHS.gov website; however, at the end of the survey there is an opportunity to leave feedback about the Department of Homeland Security in general.

All input you provide is strictly confidential. No personal information is being collected. Your participation is greatly appreciated.

Required questions are denoted by an *

*On a scale 1-10 (1=Poor-10=Excellent)

- 1: *Please rate the **number of clicks to get where you want** on this site.
- 2: *Please rate the **organization of search results** on this site.
- 3: *Please rate how well the **search results help you decide what to select**.
- 4: *Please rate how **quickly pages load** on this site.
- 5: *Please rate the **consistency of speed from page to page** on this site.
- 6: *Please rate how **thoroughly** this website **discloses information** about what this agency is doing.
- 7: *Please rate how **quickly agency information is made available** on this website.
- 8: *Please rate how well information about this agency's actions **can be accessed by the public** on this website.

- 9: *What is your **overall satisfaction** with this site? 1=Very Dissatisfied, Very Satisfied=10
- 10: *How well does this site **meet your expectations**? 1=Falls Short, Exceeds=10
- 11: *How does this site **compare to your idea of an ideal website**? 1=Not Very Close, Very Close=10
- 12: *How likely are you to **return to this site**? 1=Very Unlikely, Very Likely=10
- 13: *How likely are you to **recommend this site to someone else**? 1=Very Unlikely, Very Likely=10
- 14: *How likely are you to use this site as your **primary resource** for homeland security information? 1=Very Unlikely, Very Likely=10
- 15: *How likely are you to **express your thoughts or ideas to this agency** in the next 90 days? 1=Very Unlikely, Very Likely=10
- 16: *How satisfied are you with the Department of Homeland Security overall? 1=Very Dissatisfied, Very Satisfied=10
- 17: *I can count on this agency to **act in my best interests**. 1=Strongly Disagree, Strongly Agree=10
- 18: *I consider this agency to be **trustworthy**. 1=Strongly Disagree, Strongly Agree=10
- 19: *This agency can be trusted to **do what is right**. 1=Strongly Disagree, Strongly Agree=10
- 20: *What is your primary purpose for visiting this site today?
- Seeking a job
 - Student or academic research
 - Travel related
 - Security or law enforcement
 - Doing business with DHS
 - Immigration matters
 - Disaster preparedness
 - I work for DHS

Other, please specify

Other, please specify

21: *Were you able to complete your task?

Yes

No

21.1: Why were you unable to complete your task?

22: If you could make **one improvement** to this site, what would it be?

Thank you for your time in completing this survey. Your input is very valuable and will help us improve your web experience.

SUPPLEMENTAL 5.3 FORESEE CUSTOMER SERVICE SCORES FOR 2009 AND 2010 FOR AGENCIES INCLUDED IN ANALYSIS

Agency	2009 Composite Score	2010 Composite Score	Change in Customer Service
CIA	81.54954256	80.08994129	-1.459601276
DOC	72.63879907	74.96678062	2.327981548
DOD	74.83253824	75.77788562	0.945347375
DOI	76.17333679	70.46012624	-5.713210552
DOJ	76.80725673	78.85439006	2.047133331
DOL	73.69664107	73.29792906	-0.398712017
DOS	70.84932132	72.62594938	1.776628055
DOT	73.07319175	72.53659238	-0.53659937
EPA	67.85724346	69.00257217	1.145328708
FDIC	72.34177748	71.58132231	-0.760455165
GAO	73.74545395	75.60273267	1.857278723
GSA	74.60908799	79.02839673	4.41930874
HHS	77.79254119	77.82465226	0.032111072
ITC	60.75370444	69.91138098	9.157676533
NARA	69.4845143	71.28857218	1.804057881
NASA	81.99202946	83.08146929	1.089439832
NIST	73.07125824	72.57990926	-0.491348985
NRC	71.67735799	71.5463781	-0.130979889
OPM	73.38283115	75.102337	1.719505842
PBGC	77.64576798	77.14328063	-0.502487353
SBA	72.47715048	74.29563151	1.818481027
SSA	80.68049438	80.7906312	0.110136822
Treasury	71.08707483	71.80734213	0.720267298
USDA	68.61087851	70.61198917	2.001110663
VA	73.49468487	72.14437192	-1.350312951
WH	68.4266354	69.01589338	0.589257977

SUPPLEMENTAL 5.4 IDEASCALE USE BY AGENCY

Agency	IdeaScale	IS Ideas	IS		
			Comments	IS Votes	IS Users
CIA	0	0	0	0	0
DOA	1	159	289	539	1443
DOC	1	38	80	351	166
DOD	1	123	238	1387	427
DOI	1	91	299	2347	472
DOJ	1	66	299	1351	363
DOL	0	0	0	0	0
DOS	1	53	67	674	368
DOT	1	121	175	1701	762
EPA	1	345	440	4157	1142
FDIC	0	0	0	0	0
GAO	0	0	0	0	0
GSA	1	74	132	446	256
HHS	0	0	0	0	0
ITC	0	0	0	0	0
NARA	1	30	34	351	122
NASA	1	420	868	8099	1365
NIST	0	0	0	0	0
NRC	1	51	30	283	113
OPM	1	57	84	308	194
PBGC	1	136	147	1410	508
SBA	1	32	50	230	141
SSA	1	4205	27000	347000	14000
Treasury	1	54	71	279	143
VA	1	186	448	3126	595
WH	1	38	33	274	188

SUPPLIMENTAL 5.5 CUSTOMER SERVICE SCORE BY QUARTER AND YEAR

Quarter and Year	Score
Q3 03	70.9
Q4 03	69.1
Q1 04	70.9
Q2 04	70.3
Q3 04	71.2
Q4 04	72.1
Q1 05	71.9
Q2 05	72.6
Q3 05	73.5
Q4 05	73.9
Q1 06	73.5
Q2 06	74
Q3 06	73.7
Q4 06	73.9
Q1 07	73.4
Q2 07	73.7
Q3 07	73.3
Q4 07	72.9
Q1 08	72.4
Q2 08	72.9
Q3 08	73.9
Q4 08	74.1
Q1 09	73.6
Q2 09	73.6
Q3 09	75.2
Q4 09	75.2
Q1 10	75.1
Q2 10	74.7
Q3 10	75.3
Q4 10	75

SUPPLIMENTAL 5.6 TABLE OF ALL VARIABLES COLLECTED FOR MODELING

Variable Name	Variable Description
2010 CS Score	An aggregated estimation of customer service as derived from the ASCI Customer Service Survey for 2010
2009 CS Score	An aggregated estimation of customer service as derived from the ASCI Customer Service Survey for 2009
CS Change	The difference between the 2009 and 2010 customer service scores
IdeaScale	A binary variable where one equals the use of the IdeaScale tool by a given agency and zero equates to an agency not using the IdeaScale tool
IS Ideas	The number of ideas submitted to a given agency via the IdeaScale tool
IS Comments	The number of comments related to the ideas submitted via the IdeaScale tool for a given agency
IS Votes	The number of votes, positive and negative, related to the ideas submitted via the IdeaScale tool for a given agency
IS Users	The number of unique users, as determined by log in information, of the IdeaScale tool for a given agency
FB Like	The number of "likes" on Facebook received by the IdeaScale discussion for a given agency
Twitter	The number of micro-blogs submitted via Twitter about the IdeaScale discussion for a given agency
Transparency	The number of ideas submitted to a given agency via the IdeaScale tool that relate to agency or government transparency as outlined in the agency's Open Government Plan

Participation	The number of ideas submitted to a given agency via the IdeaScale tool that relate to civic participation as outlined in the agency's Open Government Plan
Collaboration	The number of ideas submitted to a given agency via the IdeaScale tool that relate to agency, government, business, and civic collaboration as outlined in the agency's Open Government Plan
Innovation	The number of ideas submitted to a given agency via the IdeaScale tool that relate to agency or government innovation as outlined in the agency's Open Government Plan
Site Help	The number of ideas submitted to a given agency via the IdeaScale tool that relate to site help for the IdeaScale tool
Open Comments	The number of open comments submitted to a given agency via the IdeaScale tool
Idea Coll Time	The duration of time that the IdeaScale tool was open for use
OG Plan Score	A numerical scoring of each Agency's Open Government Plan by an external agency
DataGov Data	The number of data sets loaded into data.gov by agency
DataGov Tools	The number of data tools developed for and loaded into data.gov by agency
DataGov Rankings	Citizen ranking from one to five of the quality of data sets by set on data.gov
DataGov Ranking Votes	Number of votes individual citizen rankings of data sets received on data.gov
DataGov Ranking Percent	The percentage of data by agency that received a certain ranking on data.gov
DataGov Ranking Average	The average ranking of data ranked by agency on data.gov
NumEmp	The number of employees by federal agency
Employee Age: Minus 20 to 34, 35 to 54, 55 to 65+	The number of employees within a given age range as noted in employment paper work by agency

Employee Race: White, Hispanic, Asian, African American, Other Race	Number of employees of a given race as denoted in employment paper work by agency
Number of Years of Service of Employees: 4 Years or Less, 5-19 Years, 20-35+ Years	Number of employees serving a given length of time at a given federal agency
Job Classification of Employees: Blue Collar, Professional, Administrative, Technical, Clerical, Other White Collar	Number of employees within a given job class by agency as defined by the Office of Personnel Management
Wage Range of Employees: 39,999 and Less, 40,000 to 49,999, 50,000 to 59,999, 60,000 to 69,999, 70,000 to 79,999, 80,000 to 89,999, 90,000 to 99,999, 100,000 to 109,999, 110,000 to 119,999, 120,000 to 129,999, 130,000+	Number of employees within a certain salary range by agency as defined by the Office of Personnel Management

Chapter Six: Nexus Rising

Essential themes that run throughout research are the similarities and differences between e-government and i-government, the questions of the legal and architectural differences between the two and whether we are moving from a state of e-government to i-government. The exploration of those themes offers insight into an emerging organizational form. That form provides the foundation from which new information policies will be derived and executed and offers a vision of the modern bureaucracy and new concepts of democracy.

SYSTEMATIC THEMES

In essence, e-government is grounded in systems that are transactional in nature, in both the relationship with the citizen and in the function of the system. In e-government, citizens are considered customers and are the recipients of services online. Participation is an equally transactional experience where commentary and letters may be exchanged, but not one in which deliberation or discussion occurs. The value of e-government is in increased access to government for citizens, in lowered transaction costs for government and citizens, and in increased efficiencies and effectiveness for the government organization. The vocabulary around and actions of e-government are primarily geared toward meeting the purely informational, transactional and service objectives of government.

E-government information systems are geared toward accommodating transactions. The information systems may have different web facing across agencies of government, but they have the same background functionality. They are systems where information can be published in a public way, and which may front a database behind the web space. That database is an input-output system where data is entered and stored and where output forms and products, like licenses, tax processes, and benefits estimations can be generated. The Internet architecture underpinning e-government is comprised of limited web spaces that house information, input-output tables, and execution forms. E-government was implemented in government as a systematic business practice across all agencies.

I-government differs from e-government in that it is based on the interaction of citizens and government to contribute to a process or data or information set or to develop something new. It is far more concerned with the flow of data and information among government and citizens than the transactional function of service provision. Its architecture is broad and expansive and includes varied nodes that house spaces for conversations, real-time collaboration, opportunities to develop and manipulate data. These systems provide new platforms for innovation in government and between government and the private sector. They also provide a new platform for carrying on the policy conversation and a foundation for new partnerships in executing that policy framework. The vocabulary and actions around i-government include the concepts of open data and open government, interaction, transparency, and collaboration. I-government's implementation was couched in democratic-speak with the ability of agencies to interpret the command for implementation in methods specific to the agency. Its value is not yet known but a new vocabulary for value is developing.

A tension exists at several levels of e-government and i-government. That tension, from the organizational perspective, is the balance of a strong infrastructure that is consistent across agencies and the inclusion of new, varied technologies that are different across agencies. Agencies must balance the development of strong infrastructure systems while adding new functionalities and tools that allow for interaction. And government leadership must strive to build as much consistency as possible throughout the agencies of government so that service and quality gaps do not appear among agencies. Added to this tension is the responsibility of agencies and government leadership to promote participation of citizens in government as part of democratic action. With new interactive Internet technologies, new opportunities and new forms of organization and democracy are possible. These new forms of organization and democracy add more complexity to the government structure and have new implications for democracy.

THE AGENCY OF AGENCIES

The power of a Weberian command and control bureaucratic structure where agencies depend on hierarchical systems to hand down orders and understand the expectation that they will follow orders allows for uniform action that can be called for and enforced across government agencies. In a federated bureaucracy, where agencies are subject to bureaucratic decisions but where agencies have some level of agency, this power is relied upon to systematize and standardize information systems and technology efforts. The beauty of bureaucratic command and control power is that agencies respond to it and,

though sometimes grudgingly and slowly, adopt systems and practices demanded by the commander.

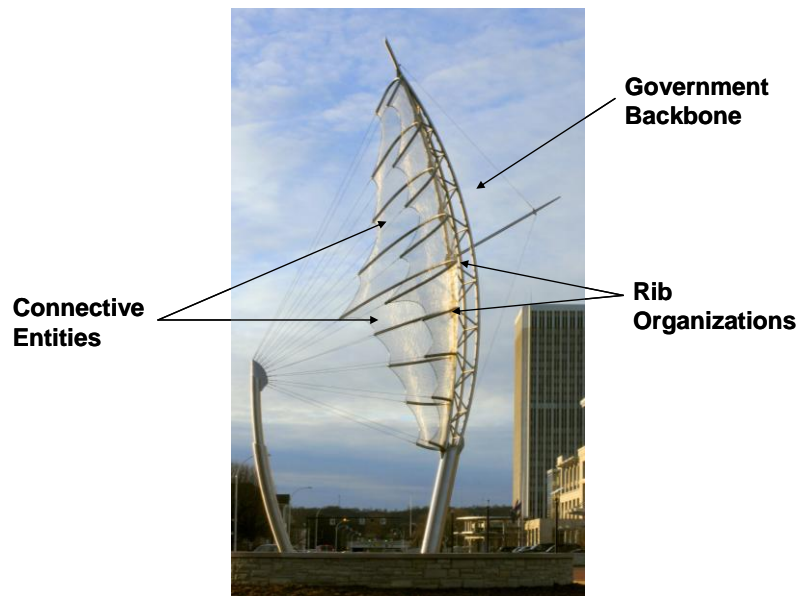
Equally, the network structure that is inherent in information systems promotes interaction and the decentralization of power from the bureaucracy. With new interactive information technologies—especially as implemented as tools of open government, democracy, and innovation—these networks become larger and incorporate more levels of partnership and engagement with citizens and the private sector. But these networks, by function and the physics of linking architecture, rely upon a backbone of trusted data and information. If data and information are not trusted, if the proper feedback loops and tools are not provided to assist in data and information management, and if there is no reflection of the citizen voice in the evolution of information and data and systems, then there will be no interaction with the new systems. Citizens, employees, and partner agencies will drift away from the government and to another source of information and data and tools to use and evolve information and data.

THE NEXUS

The foundation of trusted information and data that the government provides is essential to new interactive systems. It is the backbone of interaction, the core of the web. The network relies on the command and control structure to provide demands for consistent information technology development and for the production of trusted data and information. Only when commands and controls are executed can the net work. As the net works, citizens and partners have more opportunity to engage in participatory

activities, in collaborative activities, and in activities that will spur innovation. As new interactive information systems emerge, the government organization becomes a nexus.

Figure 6.1 Government as Nexus



Source: "Nexus" by Erika Strecker and Tony Higdon, Kentucky Arts Council, http://artscouncil.ky.gov/Press_Images/Nexus_day.jpg

At its center, this structure is founded upon a backbone of governmental data and methods for accessing that data provided by the government (a trusted source). The backbone is supported by rib organizations (government departments, non-profits, and businesses) that access and distribute data provided by the government through information tools and standards developed by the government for the purpose of information sharing and collaboration. Connecting and supporting among, between, and around the ribs and backbone are individual entities sharing information, collaborating,

developing new ideas, information, and tools that are linked to the source. This organizational structure is less vertical than the hierarchical structure underpinning e-governance and is more horizontal in nature. The governmental organization form that emerges with i-government is a Nexus.

The Nexus places the government at the center of the Industrial Age and the Information Age, it is both centralized and decentralized, and is predicated on the idea that the government be the backbone supporting information production, dissemination, and provider of tools to access and use data to inform the public and the policy process. The government is supported by rib organizations—both internal and external to the government—that access and distribute data among citizens to encourage citizen participation in and education about the governmental process. Citizens connect with both the backbone and the ribs to engage in the governance process. In the Nexus, value is generated internally to the government in the form of increased collaboration and externally in the form of greater public participation in the democratic process. But it also has returns in higher valuation of government agencies, in increased quality of data and information, and in real dollar value through the products of innovation.

THE NEXUS AND I-GOVERNMENT LINK

Within the nexus organization and as part of i-government, the roles of citizens and partners change. The concept of citizen expands to include democratic collaboration. Participation is traditionally thought of as citizens engaging with government to assist in the democratic decision making process. With a shift to i-government, the concept of

participation conceptually differs from the traditional interpretation. Collaborative participation is a hybrid of volunteerism and government engagement. In collaborative democracy, citizens use their education, skills, and talents to make a direct contribution to the everyday work of government. Citizens are involved in constructing data sets, reviewing the products of government, executing the processes of government, and contributing information to assist in service provision. This idea of collaborative democracy departs from the idea of citizen as input process into decision making and more as citizen as connective tissue, providing essential information and skills for the processes of government.

Additionally partnerships in government look different as well. In i-government, agencies partner with non-traditional organizations and private businesses to help develop new technologies and to execute policy development projects, develop software and tools for data manipulation, provide collaboration venues, and provide collaborative data and information. Non-traditional organizations are actively involved in the project execution process—at times with no monetary compensation. In tandem with the traditional contracting mechanism, a new system of challenges where projects and bids for projects are essentially “auctioned off” in a competition type venue allows for new entrants into government markets and for outsourcing of non-essential government projects. The incorporation of the idea of citizen as developer has also opened up new paths for innovation and for the development of new businesses. These new partnerships add informal infrastructure to government that benefits both industry and government.

These new forms of democracy and partnership contribute to the idea of the government as a platform for innovation. The government as innovation platform for industry is a

new concept that arises from increased interaction through technology. It is a concept that has borne fruit in the private and non-profit sectors as new businesses have developed with the provision of data and information in new formats. In the future, more systems that promote the development of open software and cloud services for government data and information will allow for new data and information sharing mechanisms as well as new software and tool development options. The benefits of open source software are reductions in software costs. The benefits of cloud services are reduction in costs of data storage and the ability to consolidate data center. Both have privacy and security concerns. But, in tandem with interactive tools offer a multitude of opportunities for innovation for citizens and the private sector.

The primary architectural and democratic drawbacks to the nexus and i-government structures include collapsing nodes and the development of small worlds. As more participants are included in open government efforts, there is the potential for participants to suffer the problems of dangling links where they become part of a loosely strung community or disbanding community that does not properly conclude the interaction, or become entangled in links that are not properly culled, and leaves participants dangling alone in the web. This dangling reduces trust and causes resentment for participants that feel excluded. Additionally, as more links are added to the network structure, there is a tendency for nodes to form and links to collapse. This collapsing of links results in consolidated information that can be biased or simply not complete. Some collapsing is healthy as too many links leads to information chaos, but over culling can force an opinion and belief that is not in keeping with government as a trusted source of information. In addition to proper link management is the necessity to eliminate small worlds and ensure methods for access and outreach to uncommon and diverse groups of

participants. The small world phenomenon creates exclusionary participation patterns that are just as serious as the digital divide.

Perhaps more serious than current network and participation problems are the problems related to lack of measurement and sustainability efforts. With e-government, the value was clear in the reduction of transaction costs and increased levels of service through multiple venues for service provision. For i-government, there is no clear valuation strategy, understanding of the beneficiaries, or even a clear vocabulary from which to build evaluation metrics and measurement tools. Without understanding the value, it is difficult to justify the investment in new technologies. It is also difficult to sustain the technologies if they seem like simply a pet project necessary to be considered for meeting the dictates of a directive but not essential in providing a service to the agency or assisting the agency in executing a goal. It is only through explicit identification of value and standardization of measurement that new technologies will be fully adopted by organizations.

In addition to measurement issues, some thought must be given to the privacy and security infrastructures of the nexus form. With new partners, with new citizen engagement and with the increased sharing of data and information comes increased opportunity for inappropriate behaviors—coding and people—in the system. Rules for participation, along with considerations for maintaining some protection of identity data protect participants. Collaborative democracy must have clear limits and boundaries. There may be a new series of copyrights and intellectual property rights that arise with i-government. The laws for open source and collaborative creation have strong histories, but may have new interpretations in the democratic and collaborative government space.

Over time, a set of guides and rules might be considered. Creation of limits and boundaries assure the trust-worthiness of data and protect the citizens and companies as they participate.

POLICY AND GOVERNANCE IMPLICATIONS AND STRATEGY

As my research shows, clear differences between e-government and i-government exist. Legislatively, e-government and i-government differ. Where both e-government and i-government were established via a command and control structure, the commands and controls of the structure differed significantly. The commands and controls of e-government were far more directed toward establishing information systems across government in a systematic way as to increase the efficiencies and effectiveness of government while lowering transaction costs for government and citizens. The primary concern for establishing systems was service provision to achieve the mission of the individual agency at a lowered cost and with greater ease for citizens. The initiating legislation came from the President and Congress in joint effort to enhance government. Very little concern was paid to the individual culture of agencies or perpetuating an ideology to support technology adoption. The command and control structure was strong with budgetary and reporting expectations for the agencies.

For i-government, the initiating documentation came in the form of a presidential directive that was not supported by accompanying Congressional legislation. The institution of new technologies was couched in Open Government and democratic ideology. Very few specific strategic steps for implementation of new technologies were

included in the directive, and the directive did not hold any specific value constructs outside of enhancing democracy and governance, which are nebulous concepts at best. Agencies were prompted to adopt and develop new interactive information systems and to create policies to promote a culture of openness, but that adoption and policy infrastructure occurred at the agency level and at the discretion of the agency. And, while an office and individual agency positions were created to coordinate and support adoption and policy infrastructure, no standardization efforts were set in place. Agencies were spurred to be innovative, rather than prescribe to a set of practices. The command and control structure appeared more in the directive to act, but the dictates of action were far fewer and less systematic than for e-government.

Implementation of both the E-government Act and the Open Government Directive resulted in changes to the information systems of government. Those changes occurred both at the operations level and at the architectural level of information systems. The E-government act resulted in whole scale, systematic adoption of information systems across every agency of government. This adoption added transactional functionalities to web spaces where data and information could not only be presented, but collected as well. Architecturally, data collection tables and forms began to appear, along with basic text pages. Agencies added photos and links to news stories. Some linking to resource centers and to documents was also added to the web space. Web spaces became interactive in that citizens could transact in both data and communications forms with the government.

With the introduction of interactive technologies, web spaces exploded. Not only did the web spaces become physically larger, conversation spaces, ranking spaces, voting spaces,

increased imaging including data visualization and multi-media spaces were added to web spaces. The linking of web pages to and from government agency site has grown exponentially. The level of data and information presented, included, and even exchanged in web spaces has also increased exponentially. Citizens can interact with agencies, suggesting data and information that should be present, submitting data and information for inclusion, helping to develop applications and other tools to deal with data and information. They are able to assist the government in developing ideas for government and able to assist the government in executing the missions of agencies by offering their own professional skills for use on behalf of the government.

However, given the very uneven adoption of technology across agencies and the unclear evidence of explicit value constructs, the argument cannot be made that i-government has been fully established. At best, an evolution toward i-government has begun. It should be noted that that evolution is largely due to the vision of a President who understands implicitly the value of interactive technologies. And, that that vision has resulted in information technologies and processes that will prove extremely valuable to citizens and to agencies and that have spurred new developments in business. It must be further noted that the idea to implement these technologies through the concept of Open Government was fairly brilliant. One of the most difficult hurdles of new technology adoption is the culture change process. By combining an element of acculturation with new technology development, Obama offered the what and the why for new technology development in a way that if agencies rejected or resisted it, they seemed un-democratic and non-innovative. However, it is very rare that fuzzy concepts of democracy and innovation are given carte blanche budgets for development.

If new information technologies are to be sustained in the organizations of government, real value constructs should be developed for the technologies. Obama and agencies should separate new interactive technology tools from Open Government. Obama should follow in the footsteps of Bush and set forth coordinated legislation with Congress to establish requirements for interactive qualities for information systems and a budget around which new technologies will be developed. To support a separation, the value conversation to justify the use of the interactive tools must be developed. For those where the value is unclear or unknown, a value argument must be created based on the justification of use in public law. Use Open Government only as an acculturation effort; 1) so that agencies do not externalize the use of new interactive technologies to fulfilling a certain requirement of government, and 2) so that the incorporation, use, and development of new information tools is not viewed as part of a political stance of a party or individual. Promote the use and adoption to fulfill agency missions so that they internalize and develop the tools in a way that is sustainable for the agency that is separate from a government directive and separate from politics. Promote and monitor interactive systems as part of complete information systems and require through congressional and presidential directives.

For structures that are comprised of elements that are both self-organized and hierarchical, like democratic government in which the people who are mostly self-organized in that each individual acts out their own preferences and self-interested behaviors in the context of the larger community but who are also bound to certain social orders, a balance must be struck between command and control and network. For organizations that rely on command and control structures for standardization and to provide the back bone of trusted data and information, but that are networked by

expanding information systems, a balance must be struck between the command and control and the web. The tools of i-government offer the means; increased transparency, participation, and collaboration offer the method; and, the Nexus is the form. As governments move forward with interactive technologies, they create a new bureaucratic form and innovation in democracy.

Given the means, method, and form of information government, the policy vision for information government has two purposes: 1) To develop new information and knowledge management practices within government as are necessary in the emerging information economy; and 2) To develop new governance practices as will be allowed by new technology. Specific policy recommendations to reach that vision include:

- Develop the identity of government as knowledge broker so that the government becomes the central entity for trusted and valued information to support business, governance, and government work.
- De-couple open government and new technology to allow for growth of each as individual entities and to allow for the development and use of new technologies to leverage the information and knowledge provided by the government and for new technologies to be treated as investments and not as fodder for the political cycles.
- Develop value constructs that are clear and consistent across agencies that assess the usefulness of new interactive Internet technologies so that justification for the technology can be maintained and so that a method of awareness of the lifecycle of the new technologies may be constructed to support proper strategic planning.
- Develop bi-lateral support for new technology development with new legislation. Use the innovative capacities of new technology, the new partnerships seen between business and government, the value of information, and the increases in customer service

satisfaction as a factual basis for the justification of budget allocations for the implementation of new interactive Internet technologies.

- Develop outreach and culling practices to maintain the functionality, usability, awareness of and trust in the information provided by the government.
- Recognize existing and develop new vocabulary around organizational structure, role as knowledge broker and convener to reflect the role of government as Nexus.

MANAGEMENT IMPLICATIONS

The management structure set forth in the Clinger-Cohen Act of 1996 established the position of Chief Information Officer for each individual agency. These information officers were primarily responsible for providing leadership and oversight of agency information technology efforts and spending. The oversight dealt mostly with ensuring that agencies implemented the Enterprise Information Architecture that had been adopted as the choice of a common framework for information technology within the federal government. Enterprise architecture is a technology framing model meant to promote common functionality and reduce redundancy of information systems. Some of the functions of enterprise architecture are to implement common business processes, employee roles, software applications and computer systems within and across agencies. For the most part, while best practices were observed and an effort to follow best practices was made and while some common technologies were promoted across agencies, the Chief Information Officers focused on implementing systems within their individual organizations.

In the 2002 E-Government Act, a centralizing office for the different Chief Information Officers was established along with an Office of E-Government in the Office of Management and Budget. As part of his (and later her) responsibilities, the E-Government Tsar became responsible for coordinating Enterprise systems across agencies to standardize information systems and systems components of the federal government. As part of the efforts a council of Chief Information Officers was formalized and several sub-offices responsible for the implementation of information systems developed. An example of these sub-offices include the Networking and Information Technology Research and Development Program, which includes multiple agency representatives and is responsible for technology development and the distribution of some research and development funds for technology development. Another example includes

When Obama established the Open Government Directive, he re-directed the Tsar-system to a system of Chief Technology Officer and Chief Information Officer. These officers are responsible for coordinating the information technology efforts across the federal government. They work with agency Chief Information and Technology officers as well as with a set of sub-organizations. An additional set of sub-organizations arose with the creation of Open Government. An example of an organization includes the Federal Ideation Community of Practice, a cross-agency advisory group that focuses on the development of ideation tools, like the IdeaScale tool, across federal agencies.

For i-government, the management structure must retain some of the hierarchical nature of the command and control structure, but there is space for some of the more networked aspects of organization. As part of a management structure, building a formal leadership

chain for partner agencies and citizen groups that could act as conduits between formal and informal groups may prove useful in cross-pollination of ideas, best practices, technologies, and development. Giving some formal power to this kind of group to run experiments with technology adoption and to recommend certain policies and budgetary actions might also allow for quicker dissemination of best practices and better uses of technology. In essence, a move toward an informal and formal management structure that is a series of nodes from multiple levels of organization that connect different levels of networks and that operate with distributed command and control points.

CONTRIBUTIONS TO LITERATURE

As outlined in the literature review, a significant body of literature already exists that focuses on e-government and the successes and failures of government in implementing information systems to increase transaction power and reduce the costs of service provision for the government as well as promote citizen participation with government. Associated with that e-government literature is a set of literature in which the organization of government is the unit of focus as a house of those information systems and as a recipient of the structures of information systems. The research herein contributes to this body of literature by suggesting a new organizational form that is associated with i-government and the incorporation of interactive Internet tools in government. The government organization form developed in this research is that of a nexus.

The second major contribution to literature, and one that contributes to the nascent understandings of the emerging form of government as a nexus, is the assessment of the impending shift from e-government to i-government. Offered in my research is an analysis of the shift from the transactional systems of e-government to the interactive systems of i-government. As part of that analysis, both the legal and architectural infrastructures of i-government are assessed. Conclusions of research indicate that this shift to i-government and the nature of the behaviors of organization in both power protecting and the role as backbone provider of data and information in i-government interacting with the network structure of information systems is more reflective of an organizational structure of government that is a nexus. In the nexus, the government rests at the core of interaction between new partners and new forms of democracy.

The third major contribution to literature is a series of data sets that had not previously existed. For my research, three major, original data sets were developed. The first is a qualitative data set derived from the assessment of all of the Open Government plans. That data set includes links to all of the Open Government plans; a description of the technology and projects of each agency within their Open Government plan; links to the projects; a description of the functionality of the technology; descriptive tags for the projects; the classification of transparency, collaboration, participation for each project; the classification of “flagship” project, contact name and information for the Open Government activates at each agency, and the inclusion of ideas generated during the IdeaScale process in the plans. Portions of the qualitative database have been published to the public through the Executive Office of the President of the United States.

The second database is the IdeaScale data set. That database includes a binary variable indicating whether a given agency used the IdeaScale tool or not, the number of users of the IdeaScale tool for each agency, the number of ideas, comments, and votes (raw votes, votes up, and votes down) submitted to each agency through IdeaScale, as well as the number of Facebook “Likes” and Twitter “tweets” of IdeaScale projects. Also included are the number of ideas submitted broken out by category—transparency, participation, collaboration, innovation, site help, and open comments—for each agency. Additionally created was a compilation of the complete text all of the ideas, comments, and votes submitted through IdeaScale for all participating agencies.

The third major data set developed for research that is a contribution to the literature is the data.gov data set. The data.gov data set includes the number of data sets published by each agency, the number of tools sets produced by each agency, the rankings of the data sets for each agency broken out by ranking category, and the averages and portions of data ranked for each agency.

FUTURE RESEARCH

The Value Proposition

Right now the cost structure of the implementation of interactive Internet tools in government is such that the costs are embedded within existing employee positions and products of the Federal government. Identifying the costs of the technology, the personnel, and the benefit of the costs and benefits of the ideas generated and products of collaboration would make an ideal follow on study to research. As noted earlier, projects like data.gov have value in that they provide the data platform from which companies can develop useful products. But very little is known about the costs, benefits, and value of interactive Internet tools.

In addition, the movement toward challenges, where individuals and companies compete to fulfill challenges set forth by the government for monetary and other prizes provides a unique aspect of contracting and service acquisition to government and the public. As previously noted, Apps for Democracy featured a contest with awards for the best applications built upon data supplied by the district government. In thirty days, at a cost of \$50,000 in awards, participants developed 47 applications that would have cost \$2.6 million if developed internally by the District of Columbia (UN 2010, 18). Insight into the actual cost savings and money generated by these projects would be interesting to explore.

Open Data and International Comparison

Governments throughout the globe are implementing interactive Internet technologies into government services and government. Primarily, this implementation of interactive tools has occurred through Open Data movements. Open data movements are much like the data.gov experiment in the United States. On their website data.gov lists 16 countries—Australia, Canada, Denmark, Estonia, Hong Kong, Ireland, Italy, Moldova, New Zealand, Finland, Germany, Greece, Norway, Spain, Timor-Leste, and the United Kingdom—that have adopted open data. This implementation stems largely from recognition over the past decade that there is a positive association between a nation's gross domestic product and the openness of government agency websites (LaPorte and Demchak 2001). Countries that rank high in economic and political indicators, like transparency and freedom, also have the largest commitments to technology development and are perceived as stronger (Norris 2001).

In addition, West notes that government web spaces that provide information with external links, multi-media features, and that incorporate new technologies to assist in accessing and managing information and services boosts productivity and public sector performance (West 2005). An interesting future study would involve a comparative analysis of the implementation structures, the data and information presented, the ideas of quality and value within, and the participation and outcomes of open data movements.

Communities of Practice and Democratic Outcomes

An interesting follow-on project to this dissertation would be an exploration of the communities of practice that converge around interactive Internet projects. Specifically interesting are the decision outcomes of these communities and the translation of these decisions to policies or practices set forth by the government. A case study approach where agencies and projects like the Executive Office of the President's ExpertNet, the U.S. Patent and Trade Office Peer-to-Patent project, and the USAID Global Pulse project could be observed for any outcomes related to decisions or policies. Understanding the decision and policy outcomes of these types of communities of practice and the technologies they use to deliberate and decide policy questions, as well as the sustainability measures incorporated into the process would be informative when considering interactive Internet tools and participation through them as part of the policy making process.

Innovation versus Democratization

By in large, the Obama administration has begun to separate the concepts of open government and new technology development. Discussion of new technologies occurs within the context of open government, but nearly all of the references are to innovation and the platform for innovation that open data provides. Obama has separated out the more democratic qualities of the Open Government directive and developed a new office of Good Government, which appears under the ethics portion of the White House web space. But, the combination of open government and new technology development has constructed a concept of new technology development and open government as

innovation and innovation as part of democracy. An assessment of the interaction of the two concepts in terms of new technologies and any outcomes observed from combination of the concepts would be an entertaining contribution to technology adoption and political theory.

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