



Figure 2.

Since the beginning of the information revolution, *e-government* concepts have been adopted by many governments worldwide. Early design concepts such as Customer Relationship Management (CRM) and Total Quality Management (TQM) were drawn from commercial business applications and applied to government agencies. The World Bank (2014) defines *e-government* as “analogous to e-commerce, which allows business to transact with each other efficiently (B2B) and brings customers closer to businesses (B2C), *e-government* aims to make the interaction between government and citizens (G2C), government and business enterprises (G2B), and inter-agency relationships (G2G) more friendly, convenient, transparent, and inexpensive.” Electronic government can be understood as a means to better serve citizens through economical and efficient devices and services.

Governance is the legal obligation of duly-elected government entities to exercise authority over citizens within their jurisdictions, such as police power, policy-making, goal setting, performance management and regulation. UNESCO (2011) defines *e-governance* as “the public sector’s use of information and communication technologies with the aim of improving information and service delivery, encouraging citizen participation in the decision-making process and making government more accountable, transparent and effective.” *E-governance* differs from standard governmental decision-making by engaging citizens in a wider range of governing processes through the extended use of information and communication technologies (ICTs). The difference between *e-government* and *e-governance* is that “*e-government* refers to the usage of ICT as tools that will allow the State to communicate with its citizens, and the States’ agencies between them. [E]-governance refers to ICTs used in order to boost the active participation of the citizens in the political procedures of their

country, giving a channel to ‘hear their voice’ in a dynamic process of continuous feedback” (Obi, 2007: 29). In an external environment where ICTs are restructuring nearly every aspect of a society, government must enter the electronic world complying with the rules and principles of *e-governance* to electronically execute its functions.

With the rapid deployment of ICTs, more and more words have added a prefix “e”, such as e-mail, e-government, which generally refers to ICTs applied to deliver a particular function. Digital governance differs substantially from electronic governance.

2 DIGITAL GOVERNANCE

Digital governance is an objective or a further result evolving from government’s progress towards implementation of *e-governance*. Electronic governance is the preliminary stage of combining government functions with electronic devices so that citizens are better able to increase both the depth and breadth of contacts with government agencies electronically. Digital governance should “provide government services that don’t simply fit within a read-only paradigm of interactions between citizens, government officials and government sources of information, but to allow a paradigm that achieves more interactive, process-oriented dissemination and viewing of government information” (McIver and Elmagarmid, 2002: 10). Therefore, digital governance plays a greater role in designing a strategic framework in which a more citizen-centered public service can be ensured and more democratic government-citizen relationships will emerge.

Digital governance is the networked extension of ICT relationships to include faster access to the web, mobile service delivery, teleconferencing, and multi-channel information technology to achieve higher levels of two-way communication. It encourages the use of Google+, Skype, Face Time and other two-way direct communications to facilitate the co-production and delivery of government services between citizens, business partners and public employees (Milakovich, 2010). Digital governance combined with the Internet and social networking apps has the potential to transform the basic nature of public service and government-citizen relationships.

3 FACTORS ENCOURAGING DIGITAL GOVERNANCE AND SOCIAL NETWORKING

Traditional public agencies are governed by hierarchical, linear, top-down communication styles maintaining distance between citizens and public officials. Citizens only receive services between 9 AM and 5 PM, when most are working. Darrel West pointed out nearly a decade ago that IT has the potential “to substantially redistribute power, functional responsibilities, and control within and across federal agencies and between the public and private sectors” (West, 2005: 5). Digital technologies are transforming public agencies into flatter and nonlinear citizen-centric organizations fostering more interactive relationships with affected citizens using network-based systems and database-driven analytics software. New types of organizations are seeking to delegate decision-making to socio-algorithmic forms of power that have the capacity to predict, govern and activate learners' capacities and subjectivities (Williamson, 2014: 12) Digital technologies are also accessible 24/7, capable of enhancing communication by overcoming distances in both time and space—encouraging bureaucrats to work collaboratively with citizens.

In addition, digital technologies can promote participatory democracy for larger numbers of citizens. E-democracy can also be defined as the use of ICTs and strategies by democratic actors (e.g. government, elected officials, the media, political organizations, citizens/voters) within governance processes of local communities, nations and on the international stage (Milakovich, 2010). E-democracy can and should be measured by the level of e-participation, because levels of citizen's participation in political and governance processes are an effective measure of participatory democracy (Klofstad, 2011). This includes applications of new social networking websites such as Linked-In, Facebook and Twitter. Online applications and social networking websites have the further potential to contribute to even more extensive development of e-participation.

Social networking applications enable more individuals and groups to participate in a greater variety of online political activities, such as acquiring and sharing political information, discussing political issues in online forums and engaging in political campaigns. In addition, some

countries already allow their citizens to vote online. In a recent paper, Alvarez, Levin, Trechsel, and Vassil, introduced a new type of web application: Voting Advice Applications (VAAs), which can be used to “match voters to the party or candidate representing their optimal choice, based on information provided by the individual and parties, and an algorithm used to compute issue distances; VAAs subsequently offer “voting advice” consisting of a list of candidates ranked in terms of their distance to the user” (Alvarez, *et.al.*, 2012: 1). VAAs have been developed for elections taking place in individual countries as well as for region-wide European Union elections. However, VAA users are more likely to be younger, higher educated, and have higher income levels. VAAs are more likely to affect the choices of those who have not yet developed strong partisan attachments, as well as individuals with lower levels of education (Vassil 2011).

The importance of social networking in promoting political activities is widely recognized, if not yet well understood. There is a growing assortment of social networking websites which are used as often for “info-tainment” as they are for connectivity and communication. What is distinct about social networking websites, as compared to other types of media and Internet services, is that they can establish online relationships based on existing social networks, clustered around groups of people who already know each other (Boyd, 2008). Therefore, social networking websites can be powerful tools for reinforcing and promoting users' existing political views. Social media may also serve as alternative service delivery networks for cash-strapped government agencies.

Prior to the invention and widespread use of Internet-enabled new media devices such as mobile cellular smart phones, iPads, and Global Information Systems (GIS), access to big datasets and broadband applications were only available to a limited number of experts and institutions. The Internet facilitates collaborative applications by simultaneously acting as a low-cost worldwide broadcasting network, a platform for information dissemination and propaganda, and a medium for interaction among individuals and groups via computers, laptops, mobile phones—without regard for geographic boundaries or time zones. Social networking applications have broadened the base for sharing ideas and political partisanship with others. For instance, Facebook pages are used mainly for businesses, individuals, organizations and brands to

share their stories and connect with other like-minded groups or persons. The main function of the page is the feed or the "wall," where users can publish messages, share links, and tag photos. Parviainen, Poutanen, Laaksonen, and Rekola (2012), measured activity and friendship connections on *Facebook*, and analyzed candidate supporters' political behavior during the Finnish presidential elections. In 2011, they found that Internet penetration had reached 89% of the total population. Moreover, 47% of Finns registered with a social networking service, and 49% searched for information on political parties or candidates online (Parviainen, *et al.*, 2012). This study implies that activity on political pages is linked to the connectedness of the users generating the content. These findings better explain why online civil society and digital town squares have become new arenas for political competition (Newsom and Dickey, 2013).

The predictive results and future implications of this apparent ICT trend could be utilized to understand and possibly predict patterns of political activity on social media. Moreover, ICTs are capable of creating closer links between government officials and citizens because both groups can more easily participate through multiple channels.

Citizen participation is at the very foundation of democracy in the United States and other Western Democracies. According to Florini "information is the lifeblood of both democracies and markets" (2002: 3). Digital governance strategies facilitated by ICTs and social networking sites have made it easier for citizens to search public records from government websites, discuss political issues in an internet forum, and scrutinize government actions through retrieval of records from databases. ICTs can also broaden access so that more citizens are better able to participate in democratic processes, especially for excluded groups, such as the poor, disabled and handicapped. The participatory model been reinvigorated in recent years by the Obama administration's Open Government (2012) and ConnectED (2013) initiatives encouraging citizens' input in governance and technologically-based learning. Digital technologies increase opportunities to go beyond traditional forms of citizen participation such as debating issues, seeking information, and voting online. The increasing pervasiveness of digital social media in the last decade has also dissolved many past technical barriers preventing widespread and sustained citizen involvement in actually co-producing and co-

delivering public services. Pioneering initiatives, in turn, are also thawing cultural barriers between public administrator professionals to collaboratively engage in co-designing public services with non-expert citizens.

Higher levels of e-participation may bring deeper levels of knowledge about political processes and encourage participatory democracy. For those with access to ICTs, e-collaboration can help citizens become more personally informed and better capable of checking and balancing decision-making processes. In this way, government becomes increasingly transparent. E-participation enables citizens' voices to be heard more clearly and frequently, which encourages willingness to engage into decision-making process, and enhances greater certainty about individual political efficacy. Since the early 1980s, academics have recognized that aspirations for citizen participation in government should go beyond merely contributing to policy formulation processes; it should extend to the delivery of public service programs as well (Whitaker, 1980). Recognition that the delivery of services could include citizen participation is reflected in the long history of citizen involvement as interns, jurors and volunteer firefighters, self-management of community centers, and neighborhood watch programs. The newly recognized techno-enhanced phenomenon of co-delivery is increasingly being adopted in the private sector in many ways, including the use of online banking, ATM machines and self-service gas stations. Many of the routine functions of government could similarly be converted to mobile service delivery.

4 DIGITALLY ENHANCED CO-PRODUCTION OF SERVICES

Since the late 1990s, advances in technology have allowed more governments to apply new approaches to more actively engage citizens in the design, delivery and co-production of public services. An early trend was the creation of self-service opportunities for citizens to find information or complete a service transaction online, including availability of Congressional issue briefs, payment of bills or drivers' license renewals. In the most recent rendition of this concept, two-way information and communication technologies such as live chat sites are being used to complete complex

licensing and registration transactions online. Wired public officials are available via two-way video to assist citizens in the co-delivery of services and by helping to complete transactions with government agencies without having to wait in line during office hours.

The IBM Center for Business and Government highlighted three different types of co-delivery initiatives that can increase citizen engagement, each offering different roles and opportunities for citizens to engage in public services: co-design, co-production, and co-delivery of public services (Kannan and Chang, 2013).

- Co-design initiatives. These allow citizens to participate in the development of a new policies or services. Initiatives are typically time-bound and involve citizens either individually or as a group. For example, the development of the Obama administration's Open Government policy in 2009 engaged citizens via an open electronic platform where citizens could be actively involved in the drafting of policy guidance.
- Co-production initiatives. Involves citizens—as individuals or in groups—in creating a service to be used by others. These can involve either short-term or long-term participation. For example, the Youth Court of Washington, D.C. engages first-time, non-violent offenders to serve as a jury and try other offenders as a teaching tool to reduce the chances of recidivism. Similarly, the U.S. Patent and Trademark Office engages individual outside experts in the patent application examination process to speed patent issuance (Simone-Novack, 2009). In contrast, the Library of Congress engages large groups of citizens via crowdsourcing to classify and categorize content and facilitate appropriate information retrieval for all users.
- Co-delivery initiatives. Also involves citizens—as individuals or in groups—in delivering a service to others. It can be premised on either short-term, transaction based or longer-term relationships. The United Kingdom has been a pioneer in co-delivery of health and mental health programs, including family intervention programs and community support programs (Kannan and Chang: 2013).

Despite these advances, traditional bureaucratic systems still present barriers to expanding the use of collaboration, co-delivery and pro-active

approaches. Among them: 1) public administrators' distrust of non-professional citizens' 2) government officials' fear of loss of control; and 3) lack of seed funding (Bovaird and Loeffler, 2012). However, a clearer understanding of different engagement strategies and their value and potential limitations can help lower some of these barriers, especially in cases where government leaders are willing to pilot the adoption of these new operating approaches. Chief among the obstacles to further expansion is the realization that it is generally easier to apply technological innovation than it is to make the administrative and political changes necessary for its implementation and utilization. Technology has important objective capacities, but it also influences employee behavior, organizational structures, social interactions, and institutional responsiveness. Plainly, the skills necessary for meaningful use of ICTs may be more constraining than access to the technology (Mossberger, Tolbert, and Stansbury, 2003).

5 FACTORS LIMITING ICTS' ADOPTION IN FEDERAL, STATE, AND LOCAL AGENCIES

Despite electoral successes and promises of reform, public administrators (the much maligned 'action' side of government) often lack the capacity, competence and motivation to breakthrough ingrained administrative processes. Without systematic reforms of current structures of government bureaucracy and additional training in the use of human capital, government workforces may not be up to the challenge of creating the tech-savvy workforce envisioned and funded by Obama administration. The pace of change is also affected by an agency's political willingness to change. Political motivation is typically guided by administrative-legislative relationships.

Digital technologies have been used in the past two American presidential election cycles to encourage otherwise non-involved but tech-savvy voters to participate in elections by direct contact with like-minded friends and information sharing with the candidates (Milakovich, 2010). Federal agencies have encouraged similar changes to deliver public services, but have just begun to use ICTs to achieve them. What factors limit adoption in federal, state

and local agencies? Heeks and Bhatnagar (1999) suggested that there are several barriers to successful technological implementation: technical, people, management, process, cultural, structural, strategic, political and environmental. More recently, Goldfinch (2007) identified four implementation problems: over-enthusiasm, unrealistic assumptions about organizational control, lack of valid performance indicators and benchmarks, and lack of public accountability through inappropriate contracting out of technology.

Darrell West posed the question, what drives the speed and breadth of technological change? He pointed out the pace and breadth of change is affected by factors such as “the nature of work routines within bureaucratic agencies and the degree to which the organization is open to change” (2005:12). Bureaucrats are notoriously suspicious of change and often choose to slowdown the dissemination of new technology by resisting standardization and rational innovation.

Public administration may have to reassess the classic theory of incrementalism. First proposed by Charles A. Lindblom 55 years ago, it has become the operating manual of how most public agencies should make decisions (Lindblom, 1959). Incrementalism is a model of decision making through the use of limited successive comparisons focusing on simplifying choices and ‘muddling through’ rather than maximizing outcomes. In sharp contrast, most new technological applications require changes in the status quo and more precise decision-making methodologies. Bureaucrats may be forced to streamline data collection processes, change internal structures, and re-organize external relationships among organizations.

The decision to fully adopt a complex ICT social networking project requires governments to make a long-term commitment rather than a series of successive incremental allocations. Frequent elections, changes in office-holders, lack of expertise, and shifts in political priorities and budgetary preferences work against a consistent focus and momentum to complete ICTs projects.

6 ACCESS, DATA ANALYSIS AND COLLABORATION

Nearly all governments are under severe short-term budgetary and fiscal pressures brought on by revenue constraints resulting from weakness in the

economy. This has also widened the gap between citizens with access to digital technology and those without (Dijk, 2005). The digital divide affects 62 million Americans and reflects economic inequality between groups, broadly construed, in terms of access to, use of, or knowledge of ICTs. Knowledge of computers and Internet use are divided along demographic and socioeconomic lines, with younger, more affluent and better educated citizens more likely to enjoy the benefits of connectivity. Thus, factors such as age, illiteracy and poverty become barriers to receptivity of digital technologies. Unless and until this knowledge barrier is eliminated, there is a significant risk that those most in need services may become those least able to access them in a new world of technological discrimination.

Similarly, within an organization, there is also a digital divide among human assets, which results from differences in employees’ ages, education backgrounds, and cultural diversity. Generational differences within workforces may lead to conflict, frustration, and poor morale for some workers, while at the same time those very differences could inspire increased creativity and productivity for others. For example, younger New Millennial workers prefer to use email to contact colleagues, while more senior Baby Boomers still use telephones to contact others. Highly educated technological experts hired by public agencies bring technological reform into organizations, but others with basic educational experience have to accept re-training in order to adapt to new digital systems.

Emerging globalization trends and the openness of the Internet bring together elites from all over the world into organized activities. The emergence of global elites which control nearly one-half the world’s wealth lessens the potential for democratizing political processes (Hindman, 2009). Furthermore, different languages, value systems, and uneven awareness of the importance of digital technologies could further hinder progress. Organizations converting to the digital governance model must take cultural diversity into consideration. Developing a common platform equipped with a uniform language for interaction, clarifying organizational cultures, and accommodating differences, increases the probability that organizations will reduce digital divides resulted from poverty and cultural diversity.

Collaborative strategies among diverse public agencies are vital in successfully moving from

bureaucracy-driven to data-driven strategies. Performance management strategies can and should be used to reinforce core performance values (e.g. cost reduction, efficiency, results-measurement, satisfying external customers, and teamwork) and make necessary program adjustments (Milakovich and Gordon, 2013). Governments generally fall behind the private sector in managing performance because they rely on “lagging indicators” and obsolete data collection centers to evaluate agency performance. To help improve agency effectiveness, managers need real-time data. Governments at all levels need to rely more on continuous data review, which allows them to perceive problems immediately and take actions in time to prevent them from becoming unmanageable (Milakovich, 2012b). However, few public administrators, and ever fewer elected officials, have access to statistical skills and relevant case examples necessary to fully utilize information available from burgeoning cloud-based mega-databases. Additional expertise is needed to implement advanced data collection and analysis.

Public organizations of all types may be overwhelmed by the vast amounts of different types of data requiring real-time processing. They need to build the capability for analyzing more and different kinds of data in order to take advantage of the big data opportunity. Moreover, the timeliness of processing unstructured sources is also an important factor. Coping with mega data effectively requires performing data mining in real time rather than after it has been collected and stored (Milakovich, 2012b). This may require contracting with outside expertise, specialists in concentrating multiple data points into decision-able analysis. Collaboration with the private sector is also more common, with businesses entering into myriad new arrangements, contracts, partnerships and cooperative agreements with providers where risks and rewards are shared and the focus of both parties is less on partisanship than on delivery of improved results. Unlike outsourcing models of the past, digital governance strategies are designed to achieve genuine collaborative partnerships that go beyond merely installing information technology—rather they encompass all activities necessary to provide needed assets and services.

In government, efforts such as these are too often viewed as crisis interventions rather than comprehensive collaborative performance management strategies. Bretschneider (1990) partly explains why nurturing genuine collaborative

partnerships is a challenge for government: the authority of the public organization derives in part from legal and constitutional arrangements embedded with traditional checks and balances causing greater interdependence across organizational boundaries. Greater interdependence leads to higher levels of oversight rather than collaboration. In addition, a more cooperative relationship among business entities results from the fact that private firms are driven by the overarching goal of maximizing profits. Public organizations are not profit-driven and frequently have multiple, complex, and sometimes competing or conflicting organizational goals (Thomas & Jajodia, 2004). This pronounced difference between private and public sectors also makes it harder to initiate, organize, and apply an enterprise-wide ICTs projects.

Despite numerous efforts to enhance communication and collaboration among governments at all levels, public agencies have relied principally on single sources of data which are no longer sufficient to cope with the increasingly complicated problems. Linkages between different data sets are occurring and will continue in the future. This helps to increase interoperability between agencies at different levels. Traditional bureaucratic concepts of data ownership are being challenged and new models drawn from multiple data pools are being established. With the help of ICTs, public service is no longer wedded to older models of citizen-official interaction. Interactions can be customized based on citizens’ needs and preferences (Ho, 2002). Electronic sharing of data among agencies is improved in the name of preventing counter-terrorism and protecting homeland security, and lessons learned from these applications are being transferred to other governmental functions. Several states and local governments have converted traditional bureaucracy-centered systems to newer citizen-centered, cloud-enhanced and networked governance.

7 FEDERAL, STATE AND LOCAL BENCHMARKS

Among the obstacles to data-ready cloud computing is reconciling the customer service model with rigid federal and state cost-allocation rules for funding IT systems that operate social services, transportation, public safety and health care. In recent years, a growing number of U.S. states as well as numerous

localities have moved their data systems and applications from expensive regional data centers into the information technology cloud. Texas signed a series of multiyear data center service contracts, outsourcing the state's massive data management needs. Minnesota finished moving almost 40,000 workers in more than 70 state agencies to Microsoft's cloud-based software program for email services and collaboration tools. Colorado has moved its 26,000 member workforce to Google's suite of office applications. *My Maine Connection*, created by the Maine Department of Health and Human Services in partnership with the state's e-government portal provider, Maine Information Network, provides a one-stop portal for citizens to determine eligibility and apply for Maine's food, medical and temporary families and child-care assistance programs. This service can also work on mobile devices. The program "telemedicine" in Alaska ensures citizens' accesses to quality health care by overcoming the extreme climate, state's geographic factors, and the lack of infrastructures in remote areas. This tele-health system allows providers in local village clinics to collect patient information into an electronic case and to transmit the case to medical specialist as remote location via a secure network.

Government-initiated citizen participation efforts have begun to evolve beyond listening and responding to complaints. Newer applications are aimed at efforts at greater engagement, such as the use of e-petitions, GPS systems and citizen reporting of street-level service problems (Lipsky, 1980). Mobile telephone cameras enable citizens to provide real-time feedback to public authorities responsible for crime control, fire prevention, and public safety. Many federal and some state and local agencies are pioneering new initiatives as well, such as the "citizen archivist" role at the National Archives and Records Administration in Washington, where citizens can help digitize the Archive's paper records, identify ancestors in old photographs, and transcribe handwritten Civil War diaries.

New York City has transformed software from reactive systems responding to problems as they occur to proactive systems which enable officials to integrate databases, discover and address problems before they happen. Residents may contact either 911 or 311 or submit photos or videos via smart phones to a call-center to record their complaint. Bicyclists can summon police directly by taking pictures of motorists blocking bike lanes. New York City uses comprehensive metrics collected from

both citizens and public officials to measure just about everything, from emergency assistance calls to bike paths; from tree plantings to detailed, agency-specific indicators. In addition, the New York Fire Department utilizes big data to help predict where fires will occur by cataloguing over 60 factors that make fires more likely to occur, such as average neighborhood income, the age of the building, and whether or not the buildings have electrical issues. Fire inspections are then prioritized based on "risk scores" generated by an algorithm (Dwoskin, 2014). The Information Security Cloud of New York City uses real-time analytic data to identify and analyze malware on site.

The City of Los Angeles and the software development company CGI implemented a web-based Financial Management System across 42 city departments, replacing the city's three aging legacy systems and seven other redundant systems. Its benefits such as dashboard analytics, reporting and tracking, real-time budgetary information, "E-approvals," and automated past-due billing processes improve the city's cash flow. Nevada County, California, using "community of interest", a way of grouping departments with related mission for broad-based analysis of technology needs and solutions, transitioned its technological governance from one centered on the perceived needs of individual departments to one integrating technological needs across the entire enterprise.

8 TOWARDS A COLLABORATIVE DIGITAL FUTURE

As the pace of technological applications quickens at all levels of government, more individuals and organizations are likely to experience both the benefits as well as the risks inherent in mega data collection. Indeed, as suggested earlier in this paper, internet technology may be transforming the nature of government itself, but not necessarily in positive ways. Public accountability is a primary concern not always shared by private data gathering and information storage companies. Under some circumstances, populations are seen as disaggregated sets of sub-populations with different risk profiles rather than a single unified social body. Extraordinary measures must be taken to protect the integrity, privacy and security of data collection and storage.

Whether or not a collaborative approach will be accepted by government to improve service quality initiatives is still an open question, one without a simple yes or no answer. Change-oriented governments and support organizations must adopt new methods of training to accommodate the needs of multiple groups and interests in order to encourage collaboration and enhance performance and productivity. Digital divides within organizations and among the most vulnerable citizens must be overcome. How these inequalities are dealt with, how skills are learned—and how they can be applied to various functions at different levels of government—will determine how case study evidence is used to equalize access to the Internet, enhance political connectivity and promote better customer service based on improved data collection, analysis and collaboration.

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