

### Summary

The research literature published in journals, conference proceedings and formal reports between 1994 and 2008 presents a modest number, but a wide range, of internationally-oriented digital government studies. The work addresses many specific topics that fall into several general types with different patterns of authorship, sponsorship, methodology, and geographic coverage.

### Overview of the method and framework

The literature review covered English-language sources published in print and online between 1994 and 2008. Sources included EndNotes® files compiled by faculty and students at the University of Washington, InfoWorld, and traditional library databases, as well as the proceedings of selected conferences and the publication Web sites of major organizations that conduct or sponsor international DG research.

We reviewed the literature with an expectation that the growing prominence of global social, political, and economic issues has influenced the extent to which DG research takes a more global view. We analyzed the literature in two ways: first by using citations and abstracts to select 276 publications with an apparently international focus, and second, by reading and analyzing approximately 20 percent of the articles to discern the broad trends and to understand more about topics and problems addressed, countries studied, methods used, and findings and results reported.

We started with a broad definition of **digital government**: the use of information and technology to support and improve public policies and government operations, engage citizens, and provide comprehensive and timely government services. Accordingly, we define **digital government research** as attempts to illuminate and explain this phenomenon by focusing on the intersection of computer and information sciences, social and behavioral sciences, and government challenges and needs. In order to distinguish between digital government research generally and **international digital government research** specifically, we looked for research that was explicitly international in nature, “. . . investigating questions brought up by considering government from an inter-national perspective” and the questions which come about because of differences among countries (National Science Foundation White Paper, 2004).

We then applied these definitions to six research categories that encompass various elements of international work: comparative studies, benchmark studies, fundamental issues, regional studies, best practice studies, and transnational studies. These categories are not strictly bounded and some articles fit two or more categories. However, for simplicity, we assigned each article to the category that best fit its topic and method.

**Comparative studies** seek universal theories and transferable practices by studying a defined topic in a variety of cultural settings, using consistent designs and methods, with explicit points of comparison and evaluation. Some comparative studies are conducted simultaneously in multiple countries, others test or apply a framework first developed in one country to others. Some topics that have been explored by comparative methods include freedom of expression, personal privacy protection, and methods of collaboration across the public and private sectors for delivering services to citizens.

**Benchmarking studies** rate or rank different countries on externally observable characteristics of their digital or e-government programs. The UN E-Government Readiness Reports are a well-known example in which all nations are ranked on selected indicators of their readiness to engage in certain aspects of e-government. Rating criteria include Internet penetration and the availability of transactional and interactive services. Social inclusion factors cover topics such as provision for online consultation with citizens and availability of services in multiple languages.

**Fundamental issue studies** usually focus on major trends and themes associated with cross-cutting developments in technology, governance, societal needs, or government and political reform. These studies try to increase our understanding of wide-spread, if not universal, issues such as public accountability, access to information, or government’s role in the emerging virtual world. These studies, while fundamental to digital government research in general, are framed in the context of an international system.

**Regional studies** usually focus on major trends and themes associated with cross-cutting developments in technology, governance, societal needs, or government and political reform to address the particular or unique needs of different regions of the world.

**In best practice studies** investigators evaluate existing approaches or develop new models to meet particular

needs that appear to be exemplary and worthy of, and feasible for, replication in other countries. These are sometimes tied to award programs to give them visibility as well as to databases of good practices, expert advice, and support for transferring effective solutions to common problems.

**Transnational studies** look at an issue or problem that involves either planned or unexpected interaction among two or more countries. Empirical transnational studies are quite challenging because they generally require two or more research sponsors in different countries to jointly approve and fund the work. Consequently, most studies of this kind are conceptual. Topics include such issues as personal identity, drug trafficking, border control, and migration.

## Broad patterns and trends

The penetration of new themes into journals, conferences, and organizations sponsoring and conducting research is often a baseline indicator of the exposure and development of a research area. Some conclusions can be drawn by examining the broad patterns and trends reflected in journal coverage, growth in the number of publications per year, and the topics or problems being studied.

## Volume and diversity of publications

Overall, we found 276 articles in 40 journals, proceedings of thirteen conferences, and the Web sites of twelve research-oriented organizations and their major divisions (these organizations are profiled in the next section). Table 1 and Figure 1 present the distribution of articles across the six categories described above. Comparative studies comprised about one-third of the articles found for the years we examined, and benchmarks one-quarter. Fundamental issues and regional studies made up another quarter. Best practice and transnational studies represented much smaller portions of the total (nine percent and seven percent respectively). The 40 journals included a mixture of public policy and management, information systems and management, as well as dedicated e-government or digital government journals. International digital government research is being published in an increasing number of journals. Through 2005, this work appeared in 31 peer-reviewed journals; by 2008, the number had increased to 40 such outlets. Appendices C, D, and E present the complete list of conferences, journals, and publications reviewed.

**Table 1. Number of publications by research category**

Research Category	N	Percent of total
Comparative	87	32
Benchmark	72	26
Fundamental issues	32	12
Regional issues	42	15
Best practice	24	8
Transnational	20	7
Total	276	100

**Figure 1. Percentage of research by category**

Figure 2 depicts a generally upward trend in the total number of internationally-oriented publications per year from 1994 through 2005. From 2001 to 2005, the number of articles increased substantially marking an upward trend of published international digital government research. 2004 and 2005 produced the largest number of publications on issues specific to international digital government subjects and were also the two years that demonstrated the greatest diversity of research types. This expansion in types, as well as the absolute number of publications, dropped well below the 2005 level in 2006, 2007, and 2008. In 2008, fewer benchmark studies, regional and transnational studies were found. There is no obvious single explanation for this change, but several reasons are worth considering. First, it is possible that the drop has less to do with a decline in interest in international work than with an increase in rigor leading to fewer, but higher quality publications. For example, benchmark studies have come under increasing scrutiny and criticism, which may explain some of the drop in that type of study. Second, since so much of this work has emanated from Europe (where the majority of regional and

transnational studies were conducted previously), a hiatus and later re-definition of e-government research funding by the European Commission during 2006-08 may be reflected in fewer publications that fit this category of research. Third, our review covered only English-language publications. It may be that more scholars are publishing in other languages that our study did not address.

### Figure 2. Representation of research categories over time

#### Geographic coverage

Figure 3 below shows the rough geographic coverage of the various research categories. The cross-hatch represents a higher concentration of articles focusing in the area and light grey represents one or two articles published. Benchmark studies provide by far the widest geographic coverage. They have global reach and often collect data on nearly 200 countries. Comparative studies are concentrated on the member states of the European Union, or tend to compare highly developed countries in Europe, North America, and the Pacific Rim. A small number of studies compare (in various combinations) countries in South America, Russia, East Africa, and the Gulf states. Research on regional issues is concentrated in Europe, but we also found articles that addressed Africa, South America, the Gulf States, and the Pacific Rim. In terms of focus on transnational issues, most reflect Pan-European topics but there is also some transnational work focused on the Caribbean, Latin America, and the United States and Canada.

#### Patterns associated with different types of researchers

Large international organizations tend to produce benchmark studies and make those findings available on their organization Web sites. Most publications are free, but some charge a fee for access to the underlying data.

Some international organizations, such as the Organization for Economic Cooperation and Development (OECD), conduct comparative studies, but most studies of this type appear to be carried out by private industry, non-profit research groups, and individual scholars who publish their findings in journal articles or conference proceedings.

Best practice work is done by scholars who publish mostly in conference proceedings. The World Bank and OECD also have best practice orientations as does the EC, which offers an online **eGovernment Good Practice Framework** Web site (e.practice). OECD studies of this kind use a peer review method and a common analytical framework by which countries can evaluate their e-government policies.

Fundamental issues studies were represented mostly in peer-reviewed journal articles. In addition, intergovernmental organizations such as the World Bank produce some papers in this vein. Regional and transnational studies were predominantly published as conference papers, and journal articles by individual scholars.

#### Overview of publications by research category

In order to develop a preliminary understanding of the international digital government research literature, we randomly selected approximately 20 percent of the publications in each category. These articles or reports were read and evaluated by a member of our research team who summarized the main characteristics looking at the topic or problem, theory and method used, and findings or lessons learned. Summaries and brief abstracts of illustrative papers are highlighted in the discussion below.

#### Benchmark studies

International digital government benchmark studies are well established and widely disseminated. The value of the benchmark study is its breadth of coverage. The purpose of a benchmark is to compare the state of practice around the globe, within a particular region or within a group of countries sharing similar characteristics, such as level of economic development. These studies are often lengthy and costly, but they can produce an extensive collection of research data. Benchmark studies have been published over consecutive years starting in 2001. Most annual or consecutive benchmark initiatives collect data with the goal of creating datasets for longitudinal analysis of issues over time, although year to year changes in method and data definitions can make this difficult.

International benchmarking of digital government development is a derivative of efforts to benchmark broader

development of information and communication technologies or the information society. Benchmarking studies generally use large scale surveys of Internet use in all sectors but often include a digital government section, although some benchmarks look only at digital government topics. Broader information society topics include areas such as penetration of ICTs, access to and use of the Internet in society in general, and digital divide issues. Topics specific to digital government focus on government online services (including access and usage), quality (including readability, security, and accessibility), maturity (addressing one stop shopping and transaction structure such as credit card use or digital signatures), and penetration (such as how many applications are available on line). In addition, studies benchmark citizen demands, preferences, and perceptions. Some focus on government information dissemination, government communication channels (i.e., email, comment forms, participatory venues), and the transparency of government Web sites including such questions of how much information is provided about transactions and processes.

Benchmarks serve several purposes including providing trend analysis,, best practices identification, and reusable data. The target audience is usually policy makers and decision makers who need to understand global trends or wish to evaluate progress with respect to many different issues. Among the benchmarks we sampled , these broad trends included Internet penetration, connectivity, and productivity.

A variety of methodologies were present in the sample of benchmarks reviewed. A mixture of Web site evaluations, secondary data evaluation, and interviews were used. Many benchmark studies collect data from national or municipal Web sites or use information published from government reports about their Web sites. Secondary data from other survey sources like General Population Surveys are used to supplement data sets, as are interviews with government officials and information technology workers. Accenture, for example, interviewed 143 senior executives in 22 countries, and the SIBIS project conducted telephone interviews with more than 3,000 people responsible for IT functions across multiple sectors in EU member states.

Large intergovernmental entities such as the United Nations, the World Bank, and the International Telecommunications Union publish consecutive series. Government entities have also financed benchmark studies conducted by universities or private enterprises. The Cyberspace Policy Research Group (CyPRG), with funding from the US National Science Foundation, collected data on organizational transparency, openness, and effectiveness in 192 governments across the globe.

Private businesses, such as Accenture, have conducted consecutive benchmarking studies as has the Taubman Center for Public Policy at Brown University, which has published benchmark studies on Web site effectiveness in 198 countries since 2001. Similar efforts have taken place in Europe where the SIBIS (Statistical Indicators Benchmarking the Information Society) project initiated in the Information Society Programme (ISP) of the European Commission contributed to several benchmarks prepared by RAND Europe between 2001 and 2003.

Several groups have created their own indices. The CyPRG team developed a methodology to measure organizational transformation, interactivity and organizational openness called Website Attribute Evaluation System (WEAS) (Cyberspace Policy Research Group, 2006). The World Economic Forum uses the Networked Readiness Index (NRI) developed by INSEAD to measure the receptiveness of the environment to ICTs, readiness of stakeholders (including citizens, businesses, and government) and usage by stakeholders (World Economic Forum, 2007). The E-governance Institute created what they call the Rutgers-SKKU E-Governance Performance Index, which uses 98 measures over five core areas including security and privacy, usability, content, services, and citizen participation (E-governance Institute, 2006). Unlike most other benchmarking studies, this set of studies focuses at the municipal level of government.

The UNDERSTAND project employs a regional benchmarking strategy. The acronym stands for “European regions UNDER way towards STANDard indicators for benchmarking the information society.” The study covers ten European regions using a set of common themes related to citizens, business, government, and technology.

Benchmarks use different standards and definitions, and therefore, comparing benchmark findings to each other has resulted in discrepancies in the overall conclusions. Ojo et al (2005) examined three different benchmark series in an attempt to create common indicators to resolve the disparity between rankings arising from the use of different indicators and weighting schemes. They concluded that three core indicators – 1) mature online presence with transactional services, 2) support for citizens' engagement in consultation and decision making, and 3) access to infrastructure – should be weighted more heavily than other criteria to more clearly show the difference between countries. They also propose a “target e-ready state,” which would serve to normalize the results and increase the reliability of year-to-year comparisons. Janssen, Rotthier, and Snijkers (2004) examined

18 different international benchmarking studies on e-government or the information society and found variations in the scope and definition of e-government and in the type of measurement criteria used (finding output and environmental measures to be used most extensively). Several other authors also provide a review of benchmarking strategies or review the validity and value of e-government benchmark comparisons (Salem, 2007; Bannister, 2007; Germanakos, 2006; Janssen, 2004, 2003) generally criticizing their ability to meaningfully compare e-government development across the world.

### Comparative studies

Comparative studies represented the largest proportion of the articles we found as well as the earliest, dating back to 1994. Comparative studies cover a range of topic areas including policy, implementation, management, impact evaluations, and democracy. More specifically, these topics were represented in publications about the supply and demand of services, integration of information or services, exploring digital government integration frameworks, implementing e-government, e-commerce, e-democracy, e-participation, or enabling access to information. Comparative studies usually operate at either the national or municipal level. Most of the articles in our sample were comparisons among developed countries, with one or two articles each year focusing on developing countries.

Comparative studies serve several purposes. Of the articles we sampled, two main areas emerged – (1) a strong emphasis on reviewing different countries' practices or models, and (2) research that challenges or extends existing frameworks to understand how contextual factors such as culture, national political structure, and social norms are important. More rigorous testing of theories in order to develop more robust models is steadily emerging.

Most comparative work, especially studies associated with "reviewing practices or models" relied on Web site searches of the various countries studied. These articles tend to find that practices and models vary across countries for a variety of reasons, mostly cultural. For example, one publication reviewed the public information access models found in different countries and organizations (Fariselli, Bojic, & Culver-Hopper, 2004), while another reviewed the use of the Internet as an administrative reform tool, examining how countries publish information on the Web as a means of accountability (Wong & Welch, 2004). Adlert & Henman (2005) published a comparative study of OECD countries and their various patterns of computerization impacts and e-government in one policy area, social security. They concluded that differences among countries show that social factors are important in shaping the technologies and their use.

Gascó and Roy (2006) assessed the similarities and differences in two sub-national jurisdictions known for implementing aggressive e-government strategies. Using case studies of Catalonia, Spain and Ontario, Canada, the research examines the impact of service delivery, democracy, and federalism (or inter-governmental dynamics) on e-government development. Gascó and Roy concluded that the evolution of e-government is likely to vary by tradition, contemporary structures, and across various levels of government.

Some comparative studies extend the breadth or application of existing frameworks. Some of the frameworks examined included e-government implementation strategies, technical frameworks for interoperability, and digital divide frameworks. Chen et al. (2006) argued that most frameworks are created by researchers examining developed nations. They created a model that takes into consideration the factors needed for successful implementation in developing countries and illustrate that model through cases studies comparing the US to China. As early as 1994, Lally introduced a Technology-Environmental Fit (TEF) model that emphasizes that the characteristics of an emerging technology are modified by the political, economic, and social contexts of a country, particularly the country's industrial policy and cultural environment.

Some comparative studies seek to test theories. For example, Wong and Welch (2004) interrogated different perspectives on the effect e-government has had on governmental accountability. In a similar vein, Meijer (2007) examined political accountability in two countries, the US and the Netherlands, concluding that bureaucratic agencies are converging in their behavior, but political actors are not.

Bolívar et al. (2006) examined whether country-specific contextual factors impact the degree of transparency adopted by government financial agencies around the world. The Department of Finance Web sites (or equivalent) of 12 countries were examined and countries were grouped according to three approaches – Anglo-Saxon, South American, and Continental European public administration – the results indicate that the way different countries use the Web for financial disclosure is influenced by their administrative cultures.

### Fundamental issues studies

Fundamental issues studies generally focus on governance and strategy issues, success and failure factors, research reviews, evaluations, and development of explanatory models and frameworks. Some articles brought to the fore universal topics that are salient in many countries such as e-voting, transparency, and e-procurement.

In 2001, Heeks examined the success and failure factors of e-government projects analyzing a set of international case studies. One major conclusion was that the context of development is important, and that the transfer of e-government systems or techniques from one country to the next will be problematic because of a 'country context gap' (p. 169). Davison, Wagner, and Ma (2005) developed a transition model for moving from government to e-government using literature on the practice of e-government, strategic alignment frameworks, and maturity models for technology adoption. They offered support for the model through cases of e-government worldwide.

Schwartz and Deane (2003) drew from experiences in countries such as Korea, India, Estonia, Philippines, Mexico, and Chile and their various responses to liberalizing telecommunication policies. The authors argued that access to an information infrastructure and the development of legal and regulatory frameworks are key to e-government success in any country. Yang and Rho (2007) explored how national characteristics account for differences among countries in the level of e-government services worldwide. Dutton and Peltu (2007) created an analytic framework to examine the embedded issues of Internet governance as it concerns national governments and their roles in policy and practice.

### Regional studies

Regional studies often compare one region to another or to a larger comparative body. European regional issues are well represented in the articles we found in this group. They tend to address three broad areas: integration of online services, legal and policy infrastructure issues including e-governance, and strategies for e-government. Several articles in 2007 and 2008 examined the future of e-government as a European development strategy (Wimmer, 2007; van der Duin & Huijboom, 2008). European regional issues are heavily dominated by the goals of the European Commission (EC). For example, Kubicek (2005) reports on research funded by the IST (Information Society Technologies) project PRISMA (Providing Innovative Service Models and Assessment) in the EC. The article highlights the push from the EC for the use of ICTs to provide greater citizen participation in the political decision-making process. Some regional studies provided a review of initiatives going on in the region which could be considered comparative or best practices.

Other regions investigated include Africa and South America. Basu (2004), for example, compares e-government regional issues of developing countries in light of the issues and strategies pursued by developed countries. Ojo et al (2006) proposes an e-voting framework for developing countries and evaluates the feasibility of its adoption based on the analysis of global e-readiness data.

### Best practice studies

Best practice research (also called good practice and current practice research) varied widely in breadth of topics and methods for collecting the data. According to Eglene (2000), "[c]onducting current and best practices research is critical to developing a full understanding of a problem and all of its components from multiple and varied perspectives. In its simplest terms, research into current practice is an organized attempt to learn from the experience of others" (p. 1). The best practice articles in our review provided descriptive "snapshots" of how countries or municipalities around the globe are realizing digital government. In the sample articles, we found many descriptive case stories, but not structured best practice research such as standardized comparisons or evaluations of competing or alternative approaches.

In our review, best practice articles fell into several categories, mainly organizational and technical topics, e-governance, online participation, and reviews to ensure better democracy. Organizational and technical topics included describing ways to enhance digital government capability, create better municipal services, promote strategies for successful e-government implementation, or measure the impact of e-government. Brown (2002) reported the conclusions of the G-8 2000 summit and examined the nine initiatives outlined by the task force to help developing countries achieve e-readiness. The study argued that six cultural factors including policy discourse, legal issues, democratization, diversity factors, communication, and trust impact the ability of developing countries to build capacity. Lee, Tan, and Trimi (2005) presented a historical review of best practices

concentrating on policy vehicles that have been driving the development of digital government in general and mobile government in particular.

### Transnational studies

We found several different kinds of transnational studies. Some transnational work focused on two or more countries working together to solve a shared problem. Other work investigated how the actions or issues of one country impacted another country. However, the majority of transnational research publications focused on pan-European issues that address the unification goals of the European Commission or report on projects commissioned by the EC in response to particular European objectives. The most frequently addressed European transnational issues focused on the technical side of interoperability and often involved a prototype or development project in addition to more traditional research.

For example, Sagri and Tiscornia (2004) reported on an EC-funded project that aimed to increase access to low cost regulatory information and to address a 2003 EC Directive (part of its Action Plan for an Information Society) on the exploitation of public sector information aimed at establishing a set of common rules for semantic interoperability including legal and technical frameworks. They examined the state of the art in projects devoted to semantic interoperability and argued that open access to public sector information is an important policy, technical, and management issue in European countries today. Another article by Adam, Werth, and Zangl (2003) examined the EU's main strategic goal of creating a "borderless Europe" – implying a set of integrated administrative practices and online services. Similarly, Peristeras et al (2007) examined issues related to modeling cross-border public services.

Other transnational research was embodied in studies of how actions or issues in one country can affect others. For example, one study examined the influence US security policy has on Canada's security policy post 9/11 (Roy, 2005). Some transnational studies consider the technical, social, or political issues facing governments that are jointly affected by the same problem or need, such as the drug trade in the Caribbean; the topic of a US National Science Foundation grant awarded to investigators at the University of Florida to study transnational digital government in cooperation with the Organization of American States (OAS) and cooperating universities. Zheng (2007) looked at the issues of US and Chinese information policy development and practices on three multinational companies (Yahoo, Microsoft and Google) that work in a global regulatory environment.