Preface

This volume brings together a wide range of research on the past, present, and future of the international trend toward greater and greater use of information technology in the public sector. Rather than survey the content of these research contributions, which are adequately described in their respective abstracts, it seems better to devote this preface to considering the broad context of public sector information systems. Toward that end, what follows discusses three over-arching questions which arise time and again in this literature: (1) How and whether the vast international investments in e-government now occurring are justified in terms of the economic development and related advances for which e-government is purportedly a critical part of the infrastructure; (2) How and whether information technology will be a force for centralizing government, for decentralization, or for some synergistic new combination of trends affecting the powers that be; and (3) How and whether the unprecedented levels of participation potentially enabled by the Internet age will translate into political participation and social capital, energizing social development on a global scale.

E-GOVERNMENT AS INVESTMENT IN ECONOMIC DEVELOPMENT

Investment in information technology in the private sector and in e-government in the public sector is often seen as the path to economic expansion. From promotion of federal e-government by the National Performance Review in the 1990s to promote community-wide area networks at the local level in the 2000s, the e-government business model has been promoted as a critical economic development policy in the United States.

The argument that economic development would be promoted has led a number of communities to find ways to establish wide-area networks for their downtowns or even for their entire jurisdictions, sometimes free for citizens. Cities with WiFi initiatives in 2006 included: Anaheim, CA; Arlington, VA; Minneapolis, MN; Pasadena, CA; Philadelphia; Portland, OR; San Francisco; and Tempe, AZ. This was just one aspect of the worldwide movement toward “smart communities,” which integrate information technology throughout civic infrastructure.

The same economic development logic has been promoted on a state basis also. In December 2006, Virginia Governor Timothy M. Kaine announced he would submit a $1.6 million budget amendment to extend broadband capacity on the state’s eastern shore, additional to the $1.4 million already appropriated. Kaine said, “Providing access to reliable, high speed broadband is an essential public investment, attracting high tech industries and strengthening economic development.”

In this context it is something of a contrast to note that in the first five years of existence of the Bush administration’s e-government agenda, Congress funded only $13 million of the original $100 million goal. Over the same period, Congress became increasingly skeptical of the value of e-government fund
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In this context it is something of a contrast to note that in the first five years of existence of the Bush administration’s e-government agenda, Congress funded only $13 million of the original $100 million goal. Over the same period, Congress became increasingly skeptical of the value of e-government funding. The Congressional appropriations committees instituted some of the most restrictive language to date in their FY 2007 appropriations. As a result, almost all of the 25 showcase “Quicksilver” e-government initiatives announced by the Bush administration in 2001 have been delayed or affected by the low level of budgeting, forcing the devotion of the FY 2008 budget not to new initiatives but to trying to finish ones started long ago.

While the Office of Management and Budget (OMB) looks at the problem as one of educating ignorant members of Congress to get them “on board,” Congress tends to see the problem as one of OMB’s seeming inability to document the value of e-government investments. The American e-government funding model of pass-the-hat agency self-funding combined with user fees is rationalized as one which creates federal departmental “ownership” of e-government projects, but while few if any departments speak against the OMB/Bush administration strategy, it is clearly a strategy which has not forged the
sort of strong political alliances among stakeholders which underpin Congressional funding of other programs which get higher priority.

Congress has never fully bought into the e-government program and support for it is weak on the hill. In the FY 2006, appropriations bill for transportation, treasury, housing and urban development, judiciary and other related agencies, Congress required that the OMB justify e-government expenditures and request renewal funds. As a result, in January 2006, the Office of Management and Budget submitted the mandated report to Congress, justifying the cost of the 25 e-government and five line of business consolidation projects—all of which would cost over $192 million in FY 2006—squeezed from existing agency budgets. In essence, in lean budgetary times, the OMB was forcing agencies to spend on non-priority items which Congress had not specifically appropriated money for, such as forcing the National Park Service to spend $1.5 million on e-government when the NPS was scrimping for basic park operations. OMB’s contrary view was that its e-government guidance was simply helping agencies be efficient in getting the biggest bang for the buck.

All of this is to suggest one thing: public investment in information technology is controversial. It is at once a great hope, perhaps the great hope, for economic and governmental transformation, and it is an endeavor where cost over-runs, delayed implementation, and outright failure are commonplace. If the nature of public information systems was better understood, success would be more likely and political support more forthcoming. The purpose of this handbook of research on the nature of public information systems seeks to make a small contribution to that much-needed understanding.

INFORMATION TECHNOLOGY, CENTRALIZATION, AND DECENTRALIZATION

While advocates of the virtual state have often cited the advantages of networks over hierarchy in flexibly adapting to change, assembling and re-assembling to meet one or another ad hoc challenge, studies of actual organizational response to emergencies, such as the World Trade Tower bombing of 2001, strongly suggest that network effectiveness depends on pre-existing social capital and trust expressed through pre-existing strong networks. Organizational hierarchies play a critical role both in building an organizational culture oriented toward use of networks for coordinated response, and in building the networks themselves prior to and in the absence of emergency demands. That is, the hierarchy vs. networks dichotomy is false. Rather, the two exist in synergy in effective organizations.

Perhaps the leading example of centralization in recent years has been the push of the OMB to replace departmental IT systems with enterprise-wide lines of business systems in financial management, human resource management, and many other areas. For FY 2008, the OMB instructed departments that their budget proposals would have to demonstrate implementation of the administration’s lines of business consolidation initiative. At the state level, consolidation and centralization is approached with almost religious zeal. Major recent IT consolidation efforts have occurred in California, Michigan, and New York, for example.

Some IT analysts and leaders have argued that centralization trends amount to over-centralization and urge a pendulum swing in the opposite direction. A chief executive of the Gartner Group, a leading IT consulting firm, for instance, recently argued that CIOs needed to relinquish some control and responsibilities to end users, that the centralized concentration of IT funding ironically leaves little for the original goal of business transformation or for needed investment in human aspects of IT. With re-centralization, end users again face the frustration of dealing with rigid central IT departments and turn to alternatives such as new consumer Internet, communications, and database technologies outside CIO control.
An interesting illustration occurred when the U.S. military implemented MCS2 (electronically networked maneuver control systems) in the Gulf War. An expected result was centralization of information in the hands of top-ranking officers. What was less expected was an increase in micromanagement, with many commanders unwilling to use new information systems to unleash the abilities of lower-level staff to make decisions. The desire not to relinquish decision-making power made available by centralization arising from information systems implementation, reinforced and enhanced existing bureaucratic structures in spite of the vision of some that these systems would allow flexible, informed, decentralized decision-making in the field.

Control systems can be programmed to reflect the political priorities of those in power. As systems design is not normally covered in the press, this comes to light only occasionally, but the practice is routine. A recent example was the attempt of the Bush administration to embed anti-union features in the proposed merit-based personnel system of the Defense Department’s National Security Personnel System (NSPS), and in a similar human resources system of the Department of Homeland Security. Anti-labor aspects of both were ruled illegal in federal court decisions in 2006 and 2005 respectively. The NSPS software system was found, for instance, to fail to ensure that employees could bargain collectively, did not provide for congressionally-required third-party review of labor relations decisions, and did not provide a fair appeals process for employees. Normally, however, embedding political controls in ostensibly neutral software goes unchallenged and unnoticed by the public at large. Even in the NSPS case, the Department of Defense did not accept the court ruling, but continued development of the system even as it was contested in the courts.

There is evidence that Internet access does indeed improve the ability of citizens to interact with their government, though most use at that time is information-seeking rather than undertaking actual participatory transactions. Empirical analysis of the 2000 presidential elections has revealed that the Internet did show promise of bringing new individuals into the political process. Numerous writers have speculated that the age of the Internet would lead to a more participatory citizenry, whose experiences in electronic participation would build social capital and energize social, political, and economic development of all types.

In traditional forms of political participation, community participation in politics has been found to correlate with socio-economic status, being older, and having lived in the community longer. Data do not show this to be the case for online political participants. Contrary to the predictions of social capital theory, recent findings show that engagement in non-political, social groups in the community is not correlated with online political participation.

We may well ask if online communities destined to play a major political role in the future. Again, empirical case studies related to this question lead to the conclusion that although public administration literature has cited the importance of online communities as a vehicle for the delivery of public goods, actual experiences suggest cybercommunities tend to have weak governance structures, undermining accountability and legitimacy.

This two-volume set is separated into six sections: (1) e-government and e-commerce, (2) privacy, access, ethics, and theory, (3) security and protection, (4) system design and data processing, (5) project management and IT evaluation, and (6) selected readings. Each chapter within these sections is separated into seven segments: (1) an introduction providing the historical perspective of the subject matter
a background providing discussions supporting the author’s view as well as the views of others, (3) a segment devoted to the primary information regarding the subject matter, (4) a future trends segment providing future and emerging trends in the field of research and insight into the future of the topic from the perspective of published research as well as future research opportunities within the domain of the topic, (5) a conclusion, providing discussion for the overall coverage of the topic, (6) as well as a future research directions segment that acts as a supplement, discussing the managerial and more technical aspects of the subject matter, (7) a references and further reading section, and (8) concluding is a complete list of terms and definitions for readers to familiarize themselves with the subject matter’s terminology.

The first section, titled “E-Government and E-Commerce,” covers the rise of e-government and its series of stages, from one way information dissemination to two-way interactions to two-way transactions, culminating in cross-agency integration of e-services. The transition from the first to second stage has not proved a difficult obstacle for most jurisdictions, which implement interactions such as feedback forms and e-mail. However, the transition to stage 3, the interaction stage, has proved more difficult. Although many examples of e-transactions exist (e.g., paying taxes online), mass adoption of e-transactions by the public has proved illusive. Even more difficult has been overcoming department-centric business of government models and replacing them with integrated cross-agency models. The chapters within this section examine these issues as well as others that exemplify the progressive movement toward electronic government which while problematic, still is in the process of fulfilling its potential.

The second section, titled “Privacy, Access, Ethics, and Theory,” covers the potential of Internet technology to bring about democratic transparency in the way government conducts its business. However, even a transparent government must support individual privacy rights. Privacy is a growing issue because people have good reason to believe that data collected on them for one purpose may be appropriated and used for altogether different purposes than the original ones about which they were informed. In theoretical terms, some seeking to understand these issues have turned to structuration theory, which is a variant of institutional theory growing out of the work of Anthony Giddens. Gidden held that individual actions both shape and are constrained by social structures. In addition to the structuration theory, the institutional theorist perspective, more specifically, Fountain’s theory of technology enactment, is discussed throughout the section.

The third section, titled “Security and Protection,” covers several security threats including massive data theft, cyber-terrorism, and the use of malware. In the United States, information technology security rose to first place in budget priority after the bombing of the World Trade Center and has remained a top priority to the present day. Although there are currently over 217,000 various known threats including identity theft, imposter Web sites, file sharing, this section will cover some of the most prevalent in the public sector.

The fourth section, titled “System Design and Data Processing,” delves into topics such as service oriented architectures, enterprise resource planning systems, statistical data and statistical dissemination systems, and data cube technologies, amongst many others. Enterprise resource planning systems in particular has often been the result of systems architecture planning in the U.S. and worldwide. After a checkered start in the private sector in the late 1980s and early 1990s, such systems were widely adopted in the public sector in the late 1990s and by the 2000s transition from agency-specific to enterprise-wide software was the primary reform thrust of the U.S. Office of Management and Budget as well as many states and localities. Efforts were made to unify financial, human resources, payroll, procurement and other departmental software systems into single jurisdiction-wide systems.

The fifth section, titled “Project Management and IT Evaluation,” examines the relationship between information technology and project management. Information technology frequently succeeds or fails
on the strength or weakness of project management. The United States is seeing an increase in project management due to its emphasis in the Bush administration’s FY 2007 budget. Project management is often tied to enforcing IT enterprise architecture, which reflects the IT policies at the national level and of state chief information officers at the state level. Evaluation is another topic covered within this section which is coequal in importance to project management. Project management may be more critical for short-term IT success, but in the long run the success of IT initiatives requires that they be proven to work in a cost-effective manner, hence the critical importance of evaluation.

Concluding the Handbook of Research on Public Information Technology is a “Selected Reading” section of 10 refereed journal articles for additional insight into the realm of information technology in the public sector. These articles come highly recommended and introduce innovative applications, trends and technologies within this fast growing area of information science and technology.

SUMMARY

A work much more famous than this volume could dream to be started with the phrase, “it was the best of times, it was the worst of time,” and went on to contrast two cities, one cloaked in tradition and one in revolutionary upheaval. It is interesting to note that the vision of digital cities and global communities draws on such contrasts, comparing often-hierarchical traditional patterns of work and governance with the revolutionary potential of information technology as a liberating force, perhaps not for “liberty, equality, fraternity,” but at least for participation, transparency, and empowerment. In this preface your editor has tried to suggest that empirical research can throw much-needed light on traditional and revolutionary perspectives alike. There are so many important issues attached to this subject, many explored by scholarly contributions in this volume, dealing both with pragmatic implementation and with conceptual design, that they cannot be enumerated here. What is certain, however, is something close to the heart of and bringing a smile to the lips of every academic: more research is needed! Toward this end, this volume seeks to make a small contribution.

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