The Evolution of Internal IT Applications and E-government Studies in the Public Administration Discipline: Research Themes and Methods

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What is This?
The Evolution of Internal IT Applications and e-Government Studies in Public Administration: Research Themes and Methods

M. Jae Moon¹, Jooho Lee², and Chul-Young Roh³

Abstract
This study reviews research themes and methods used in information technology (IT) in government and e-government research. Although IT/e-government studies (including inward aspects of IT applications in government and e-government studies) continue to increase, they are not comprehensively understood as a subfield within public administration. Based on Rosenbloom’s three competing approaches to public administration (managerial, political, and legal), we investigated the major research themes of IT/e-government studies in public administration. We analyzed 248 IT/e-government articles published in six major public administration journals from 1965 to 2010 to examine IT/e-government research trends in terms of research themes and methods.

Keywords
e-government, IT applications in government, public administration

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Introduction

Over the past five decades, various issues surrounding information technology (IT) utilization in public organizations have been globally discussed among scholars and practitioners of public administration. The early development and application of IT led to enhanced efficiency and effectiveness by enabling governments to store, process, and manage public data. Recent developments in Internet technologies have diversified and improved the provisions of public services at the local, state, and federal levels.

IT in government can be differentiated from e-government. IT in government refers to inward applications (back-office applications) of IT in government organizations for various routine operations or functions. As D. F. Norris (2010) pointed out, e-government is the outward applications of IT for various operations and functions, including G2C (government to citizens), G2B (government to business), and G2G (government to government). E-government is often defined as a provision of government information and services 24/7/365 via the Internet and beyond space and time (Moon, 2002; Moon & Norris, 2005; D. F. Norris, 2003, 2010; D. F. Norris & Moon, 2005).1 Acknowledging the differences in IT in government and e-government (hereinafter IT/e-government), we will examine and analyze the two subjects separately though the term e-government is sometimes used more broadly.

With the growing utilization of IT in the public sector, various practices and implications of IT have been discussed and examined by scholars in public administration through individual research projects. However, public administration scholars have given limited attention to actually linking various issues surrounding IT utilization in government organizations to the discipline of public administration at the macro level. The majority of e-government studies deal with the specific aspects of IT applications in the public sector (such as practical applications and performance) or they examine theoretical and normative discussions on prospects and concerns related to e-government.

The purpose of this study is to review and understand the evolution of studies on IT applications for improvement of internal administration (IT in government studies) and the provision of external public services through Internet (e-government studies) in public administration. In particular, we elucidate what themes and methods have been applied to IT/e-government studies as well as how those studies are connected to the traditional approach of public administration. We argue that IT/e-government studies are part of the public administration field rather than a separate area with fundamental differences from traditional public administration research. Many believe
that the nature of IT/e-government studies is different due to interest in new technologies as well as emphasis on new developments and opportunities available to public institutions and the public. We also argue that the study of IT/e-government has evolved into a subarea of public administration because extensive research has been accumulated and shared by many students of public administration.

We categorized various IT/e-government studies according to their research theme and adopted three primary approaches to public administration that include the political, managerial, and legal approaches proposed by Rosenbloom. This categorization will help us understand the nature of IT/e-government studies as a subarea of public administration. This will help us understand the locus (political, managerial, and legal) and the focus in terms of the various values that IT/e-government studies examine. We also surveyed various research methods adopted in IT/e-government studies to see which research methods are preferred. To examine the research themes and methods in the IT/e-government study, we reviewed six major academic journals in the public administration discipline between 1965 and 2010.

Managerial, Political, and Legal Approaches to the Study of Public Administration

Reflecting on the three branches of government (legislature, judiciary, and executive), Rosenbloom (1983) argued that the study of public administration is located at the intersection of three competing approaches that include political, managerial, and legal approaches. Rosenbloom’s three competing approaches to public administration have been adopted as a useful framework by a number of scholars for various studies on the phenomena surrounding the enterprise of government (B. Brown & Stillman, 1985), contemporary public administration approaches (Lan & Anders, 2000), drug testing policy (Knowles & Riccucci, 2001), and the assessment of health care programs in the public sector (Reed & Meyer, 2004).

Table 1 shows that each approach emphasizes distinct values and perspectives on public administration.

Originating with the 19th-century civil service reform and the scientific management revolution in the early 20th century, the managerial approach to public administration highlights apolitical administration to pursue more efficient, more effective, and more legitimate governments. To pursue managerial values such as effectiveness, efficiency, and economy, early scholars
(Gulick & Urwick, 1937; White, 1926; Wilson, 1887) in public administration asserted the separation of administration from politics. They also emphasized the importance of the principles of administration (Gulick, 1937) and scientific management (Taylor, 1912) in operating government-like business firms. Weber’s (1922) bureaucratic structure was also highly regarded because it was considered the most efficient organizational form that maximized managerial values and administrative rationality through specialization, hierarchical structure, and impersonalization. Criticizing the separation of public administration from politics, some scholars, such as Appleby (1945), began to stress the relationship between public administration and politics, particularly after The New Deal and World War II.

Emphasizing the political nature of public administration, namely, administrators who deal with conflicting interests among stakeholders and practical discretionary decisions in policy-making and implementation processes, the political approach emphasizes representativeness, responsiveness, and the accountability of administrative agencies to the public and elected officials. The executive branch is structured to reflect the conflicting values and interests of different groups in a pluralistic society; in addition, it is organized to pursue multiple goals based on the interests of different groups.

With an emphasis on constitutional law, administrative law, and the emerging judicialization (Rosenbloom, 1983; Rosenbloom, Carroll, & Carroll, 2000) of public administration, the legal approach focuses on legal values such as procedural due process and individual rights (e.g., privacy and equal access to government information). The legal approach suggests that the legal principle of adversary procedure and the role of independent regulatory authorities protect individual legal rights against illegal administrative actions. This approach emphasizes the fact that core functions of the administrative branch should be performed through an incremental decision-making process to protect the legal rights of individuals within and outside of public

| Table 1. Three Approaches to Public Administration. |
|---------------------------------|----------------|----------------|
| **Managerial approach**        | **Political approach** | **Legal approach** |
| Origin                         | The New deal    | Administrative law |
| Civil service reform           | World War II    | Judicialization   |
| Scientific management         |                 | Constitutional law |
| Movement                       |                 |                   |
| Value                          | Representativeness | Procedural due Process |
| Effectiveness                  | Responsiveness  | Individual right  |
| Efficiency                     | Accountability  | Equity            |
| Economy                        |                 |                   |

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organizations. To better understand the individual case involving legal conflicts, this approach often refers to specific individual cases rather than generalized scientific methods.

Managerial, Political, and Legal Approaches to IT/e-Government Studies

Governments actively adopted IT in the mid-1950s with the development of the first computer for military purposes during World War II. For the past 50 years, the speed of technological changes in the IT area has accelerated. Until the early 1980s, the mainframe computer was a dominant technology and was managed exclusively by an IT department. The primary role of the IT department was to automate an existing operation process by replacing manual work with computer data processing to improve the efficiency of routine operations (e.g., payroll systems). Between the 1980s and mid-1990s, microcomputers (e.g., minicomputer and personal computer) with more capable computing technologies (e.g., central processing unit, data storage) were available at an affordable price. This increased the diffusion of microcomputers in the public sector.

Various applications of public management information systems (PMIS) such as decision support systems and transaction systems have been applied to provide higher quality information to public managers; in addition to the development of minicomputers, and telecommunication network technologies (e.g., Local Area Network), developed in the early 1990s have also helped. Network technologies were initially developed to support the organizational capacity needed to transmit voluminous data among remote computers at a higher speed. In the mid-1990s, Internet technology originally developed to support the internal purposes of limited military activities (e.g., secure and effective information sharing from remote areas) exploded with the tight alignment of computer and communication technologies. Internet technologies became the backbone of the evolution in e-government in that they improved internal business processes, enhanced service quality, enlarged channels for citizen participation, and allowed for the dissemination of government information in an easier and less expensive way.

Managerial Approach to IT/e-Government Studies

The managerial approach to IT/e-government studies in public administration addresses the possibility of achieving various managerial values
through IT applications. This approach involves an appreciation for the effect of IT substitution on human labor in organizations (Olikowski & Iacono, 2001). Early studies (Kraemer & King, 1980; Simon, 1965) argued that electronic data processing (storage, retrieval, and comparison) and office automation in public organizations would substitute or replace human labor because IT performs better in routine administrative work. However, empirical studies on the effect of IT have shown mixed findings. Although some (Pinsonneault & Kraemer, 1997, 2002) found a positive relationship between computer use and labor saving, others (Heintze & Bretschneider, 2000) discovered that public managers did not perceive a positive effect of IT use on restructuring.

It has been argued that e-government programs supported by Internet technologies provide public services (dissemination of public information, financial and service transactions, and public participation) in an improved and more efficient way (Cohen & Eimicke, 2001; Milward & Snyder, 1996). For example, Milward and Snyder (1996) examined the role of e-government applications in enhancing government responsiveness to citizens because e-government links the citizens to government services by decreasing or eliminating the need for service recipients to interact with public employees. Cohen and Eimicke (2001) also found that e-government services are often delivered more cost-effectively than those delivered in-person. IT has also been viewed as a means of improving information processes (Cleveland, 1985; Danziger, 1977; Olikowski & Iacono, 2001; Pandey & Bretschneider, 1997; Wittmer & Bretschneider, 1993). Some specific topics discussed in the managerial approach to IT/e-government studies include the effects of IT on centralized versus decentralized decision-making authority, red tape, organizational processes (organizational learning and strategic management), and public service delivery mechanisms.

**Centralization Versus Decentralization**

The organizational use of IT changes the nature of vertical and horizontal information processing. Some researchers (Leavitt & Whisler, 1958; Pinsonneault & Kraemer, 1993; Robey, 1981; Whisler, 1970) argue that IT strengthens centralized decision making by facilitating vertical information flow from the bottom within a hierarchical structure, whereas others (Blau, Falbe, McKinley, & Tracy, 1976; Drucker, 1993; Gauch, 1991; Meyer, 1968; Senge, 1999) maintain that IT leads to decentralized decision-making authority by allowing lower-level employees to control information processing more efficiently and effectively. Another view proposed that IT facilitates
information processing beyond the wall of horizontal divisions by permitting them to transmit and share information through computerized information systems (Hammer, 1990; Hoos, 1966; Mahler & Regan, 2002; Miranda & Saunders, 1995; Quinn, 1976).

**Red Tape and Strategic Management**

Some researchers (Pandey & Bretschneider, 1997; Peled, 2001) have focused on the effect of IT on structural characteristics such as red tape in public organizations. In their studies, IT has not been found to be a means of ameliorating the level of red tape (Pandey & Bretschneider, 1997), but rather it has been argued that IT deteriorates the degree of red tape through the increase of rules (Peled, 2001). However, some studies (Fountain, 2001; Moon & Bretschneider, 2002) found that IT-enabled organizational changes have been constrained, or facilitated, by current organizational characteristics and institutional arrangements. For example, although executives of county governments have the perception that red tape is an inhibitor of IT innovativeness (Yu & Bretschneider, 1998), red tape plays a facilitating role by stimulating organizational IT innovation and the adoption of new IT as a solution for red tape (Moon & Bretschneider, 2002).

To maximize the utility of IT for the creation, storage, manipulation, and transmission of information in public organizations, scholars have suggested the strategic use of IT for effective information management through strategic planning (Bajjaly, 1998, 1999; Holley, Dufner, & Reed, 2002). These include strategic management (Caudle, 1990; G. Lee & Perry, 2002), integrated information infrastructure frameworks (Hendrick, 1994), and the evaluation of information systems (Newcomer & Caudle, 1991).

**Improvement of Public Services**

The adoption of IT by the government is considered a tool to improve organizational performance and productivity. Individuals can better perform in the workplace with IT because IT helps store, analyze, calculate, and process information more efficiently. The relationship between IT and performance has largely focused on the performance of internal management functions, such as decision making, effective communication, and operational performance. This is due to the lack of clear parameters for performance in public organizations. Scholars have found that government computer use leads to efficient planning (Simon, 1973), budgeting (Danziger, 1977), law enforcement (Brown & Brudney, 2003; Danziger & Kraemer, 1985; Nunn, 2001),
and operational activities such as Geographic Information System (GIS) (M. M. Brown, O’Toole, & Brudney, 1998; Ventura, 1995). The use of IT in public organizations is also believed to be an improvement in the quality of managerial and operational decision making because IT applications such as database systems (Tien & McClure, 1986), decision support systems (McGowan & Lombardo, 1986; Teasley & Harrell, 1996), and executive support systems (Berry, Berry, & Foster, 1998; Watson & Carte, 2000) allow accurate data filing as well as speedy data processing, retrieval, and transmission (Dutton & Kraemer, 1978; Simon, 1973). In addition to internal performance, students in public administration have found that IT has contributed to the external performance improvement of public organizations by effectively serving the public in cities (Danziger, 1979) and by increasing the economic productivity of the state (G. Lee & Perry, 2002). Recently, governments have made considerable efforts to deploy e-government applications that provide high-quality services to citizens (e.g., online vehicle registration renewal and online tax filing), businesses (e.g., professional license renewal or online procurement bidding), and their employees (e.g., online retirement management) through their websites (Ho, 2002; West, 2004).

Political Approach to IT/e-Government Studies

The political approach to the use of IT in the public sector particularly addresses representation of collective interests, accountability of the bureaucracy to external political authorities, and public demands. From apolitical perspective, IT is not merely a managerial resource to achieve cost-efficient operations, effective decision making, optimum performance, and a high quality of service delivery.

Representation of Political Interests

IT is viewed as a political tool to realize collective interests by obtaining, maintaining, and enlarging organizational resources or to represent collective interests (Cleveland, 1985; Downs, 1967; J. Lee, 2008; Rocheleau, 1999). Some early studies suggest that computer-based information systems lead to an improved representation of the interests of internal and external groups in federal agencies (Laudon, 1974; Overman & Simanton, 1986) and local governments (Danziger & Dutton, 1977; Downs, 1967; Dutton & Danziger, 1982). Other studies (Bellamy, 2000; Kraemer & Dedrick, 1997; Kraemer & King, 1986) have found that rather than promoting a wider representation of collective interests, computerization reinforces current power structures in
local governments because IT-savvy personnel and senior managers tend to take advantage of IT adoption and utilization as an opportunity to increase their control over organizational functions. Empirical studies (Dutton & Kraemer, 1978; Kraemer & King, 1986; Perry & Kraemer, 1979) demonstrated that the shift of power to senior management has been accelerated by the adoption of computers in government. Based on the analysis of the reengineering of the British criminal justice system, Bellamy (2000) showed that information systems embedded in electronic networks have revealed that the domains of powerful groups take advantage of important political resources to control its form, specification, and interpretation.

**Promotion of Political Accountability to Political Authorities**

IT can be used as a tool to increase political accountability to external political authorities by facilitating interactions with the external political authorities. IT is often used by government agencies to catalyze external communication with outside political authorities (Bozeman & Bretschneider, 1986; Bugler & Bretschneider, 1993; Haque, 2001). For example, Bozeman and Bretschneider (1986) argued that PMIS should be evaluated according to the extent of how PMIS responds to external requests for data because public organizations are obligated to respond to the higher level government. Studying democratic implications for the application of GIS in the public sector, Haque (2001) argued that democratic responsibility is far more important than managerial responsibility.

**Promotion of Bureaucratic Accountability to Citizens**

Early studies on the governmental use of IT focused on its role in enhancing bureaucratic responsiveness to the public by providing better information (Bozeman & Bretschneider, 1986; Northrop, Kraemer, Dunkle, & King, 1990). Northrop et al. (1990) found that computer use in local governments made it easier to supply requested information to citizens because computer utilization increases the availability of information. Many studies (Kakabadse, Korac-Kakabadse, & Kouzmin, 2003; Kamarck & Nye, 1999; D. F. Norris, 2003; West, 2004) considered the prospect of Internet technologies to promote government responsiveness and accountability by providing more online services and channels for citizen participation in the policy decision-making processes. In particular, Internet technologies are thought to promote citizen participation through government websites (Kim & Lee, in press; La Porte, Demchak, & de Jong, 2002; Musso, Weare, &
Hale, 2000; Stowers, 1999; West, 2004), electronic voting (Moynihan, 2004), and community networks (Dumont & Candle, 2005; Dutton, Wyer, & O’Connell, 1993). This is because these technologies lower the physical and economic barriers to search, retrieve, and access government information, as well as the ability to interact with civil servants and elected officials (Thomas & Streib, 2003; West, 2004).

**Legal Approach to IT/e-Government Studies**

Although the legal perspective envisions IT as a tool for enhancing the legal rights of the individual (e.g., access to government information), some public administration students have expressed concern about the inappropriate use of IT to infringe on individual rights (e.g., privacy). IT studies from the legal perspective have shown that the design of information systems that provide government services must comply with the Constitution and any other legal requirements (Duncan, 1999; Heckman & Roetter, 1999; Kraemer & King, 1987). Legal questions concerning IT use in public organizations fall into categories such as procedural due process, equity (equal access), and privacy.

**Promotion of Procedural Due Process**

Procedural due process seeks fundamental fairness when the government takes action that will harm the life, liberty, or property interests of an individual (Rosenbloom, Kravchuk, & Clerkin, 2009). In particular, this procedural right emphasizes that the individual is entitled to receive information (e.g., official notice or administrative hearing) about government actions when their interests are likely to be injured by governmental denial, cutoff, and reduction of benefits (e.g., welfare, social security, or public employment; Rosenbloom et al., 2009). To provide the individuals with the right information at the right time, it is important for government to keep track of public records. More elaborate due process enables government to reduce errors while processing personal records; however, this process can lead to increased costs for the government. It is imperative for government organizations to be equipped with the capability to process individual records with few errors and at a low cost.

Compared with human intervention, IT applications (e.g., databases) allow government to process personal records more accurately and at a lower cost. By implementing effective record management that uses IT applications, governments can provide a specific individual with accurate
and timely information before taking action. For these reasons, the principle of due process has been emphasized in the design of PMIS (Laudon, 1986), implementing administrative operations using IT (Heckman & Roetter, 1999), and measuring the performance of PMIS (Bozeman & Bretschneider, 1986). Recently, as transactions between citizens and government (e.g., student loan applications at a state university) have become automated through e-government applications, the procedure is usually programmed, standardized, and formalized by PMIS analysts and software designers. As a result, they often take over the discretionary power of street-level bureaucracies while implementing welfare services and enforcing laws (Bovens & Zouridis, 2002). e-Government applications process individual cases with less care when the due process procedure, embedded in the application, becomes excessively rigid. Bovens and Zouridis (2002) pointed out that citizen-to-government transactions through e-government applications can be a Constitutional risk because they reduce the responsiveness of public administration and undermine the legitimacy of governance.

**Promotion of Equal Access to Government Information**

Because there is a growing demand for public employees with computer capabilities, early studies (Davies & Dipner, 1992; Ladner, 1989) on equal access to government information have focused on public employees with disabilities. In addition, the right of a citizen to access government information has been highlighted because this step is critical for citizens before they make an informed decision while transacting with the government (Duncan, 1999; Haque, 2001). However, barriers such as geographic distance, business hours, and travel costs often inhibit citizens from accessing government information.

Recently, e-government advocates (e.g., Gore, 1993, 1997) claim that when citizens are connected to the Internet, e-government promotes equal access to government information because information dissemination through e-government websites provide easier and ubiquitous access to government information. Despite the potential of e-government, scholars point out that equal access to government information is limited because of the digital divide (Loader, 1998; P. Norris, 2001) and the lack of consideration for citizens with disabilities (West, 2004). For example, West (2004) found that state e-governments do not provide enough channels for the disabled to access government websites, thereby reducing the scope of access. In addition, although Internet technologies have promised to enhance citizen access to government information, intellectual rights (e.g., copyright)
have also been discussed from the legal perspective when more government services and information are digitalized and distributed to citizens through government websites. This concern stems from the fact that government websites allow citizens to easily access digitized information, print it, and send it to other people without the permission of the original author (Stowers, 1996).

**Privacy**

Although governments continue to use advanced IT applications (e.g., Public Key Infrastructure and Electronic Authentication) to enhance privacy, the protection of citizen privacy has been a primary concern since governments began using IT applications. While providing services to the public and carrying out various functions, governments collect and use a wide range of personal information about their citizens (e.g., law enforcement records or driver’s license data). As governments continue to use IT applications to collect, retain, and manage personal data about their citizens, scholars in public administration (Bozeman & Bretschneider, 1986) have emphasized the responsibility of the government to protect citizen information while designing, developing, and implementing PMIS. Considering that government is a monopoly service provider and the public cannot refuse to deal with the government, individuals must provide the information requested for inclusion in PMIS; however, citizens can refuse to provide their information to private firms that do not respect their privacy. Recently, through government websites, the government has further expanded its collection of public information by allowing individual citizens and private firms to register for government services, obtain and file government forms, apply for employment, comment on public policy issues, and engage in online participation programs. With this increased use of Internet technologies in government-to-citizen interactions, it is even more important to ensure that government agencies that collect personal information from citizens adopt and maintain adequate privacy practices (Duncan, 1999). In addition, when governments manage public employees, the surveillance and monitoring of employee actions and communications using IT applications has been highlighted as a serious threat to individual rights. This infringes on the right to the presumption of innocence that places the burden of proof on the state to prove their case (Clarke, 1994; Cozzetto & Pedeliski, 1997; Greenlaw & Prundeanu, 1997; Prysby & Prysby, 1999).
Data Collection and Coding Method

Data Collection

This study collected data from all published articles in six major peer-reviewed PA journals to examine what themes and methods have been used to study IT/e-government issues of PA. These journals were Public Administration Review (PAR), Administration & Society (A&S), Public Performance & Management Review (PPMR), Journal of Public Administration Research and Theory (JPART), American Review of Public Administration (ARPA), and Public Administration Quarterly (PAQ). These journals were chosen as a sample frame because they have been identified as representative outlets of public administration and management studies (Forrester & Watson, 1994). With the exception of PAR, all of the articles in each journal (from the first volume to the most recent volume of 2010) have been examined. We first examined the title and abstract of each article to identify whether it is IT/e-government article. When the title or abstract of an article included IT/e-government keywords (e.g., “computer,” “technology,” “information technology,” “data processing,” or “e-government”), we identified as an IT/e-government publication. While selecting IT/e-government articles, some pieces such as editorials and book reviews were excluded because they were not research-based articles.

For analytical purposes, “IT/e-government articles” were divided into “IT in government” and “e-government” research. An article was coded as “IT in government” if it primarily focused on the internal aspects of IT use in government. Likewise, an article was coded as “e-government” if it mainly discussed external aspects of IT uses that included G2C, G2B, and G2G (e.g., online service delivery, communication, and citizen participation through government websites). In addition, three phases of IT development have been used to explain how IT/e-government studies have been conducted. Although it is hard to distinguish each phase, we divided the three phases of IT development in terms of the role of IT in the organizations (Applegate, McFarlan, & McKenney, 1996; Earl, 1989; Laudon & Laudon, 2002; Zuboff, 1988). In general, the role of IT has expanded from internal purposes (e.g., automatic accounting and payroll operation) to external purposes (e.g., information and financial transaction with outside organizations or citizens). The ultimate end users of IT have also expanded from the government bureaucrats (such as the IT department and non-IT department) to the nonbureaucrats (such as ordinary people and business firms). Before the early 1980s, IT was mainly used for internal operations, and was managed by centralized IT departments.
(Phase I, 1965-1979). Between the 1980s and the mid-1990s, IT was managed by both IT and non-IT bureaucrats for internal management (Phase II, 1980-1995). Since the mid-1990s, IT has been used by citizens as well as government bureaucrats for external service delivery and internal management (Phase III, 1996-2010).

After examining all the articles published in six PA journals over 40 years, we found a total of 7,375 articles and identified a total of 248 IT/e-government pieces (3.4%).

Table 2 shows the general trend of the published IT/e-government articles in PA journals. In particular, 1.8% of the literature in Phase I was IT/e-government and this number jumped to 4.0% in Phase II, but slightly decreased to 3.6% in Phase III. This result implies that although IT has advanced in a revolutionary way, scholarly interests in IT/e-government issues in PA have evolved in a slow but steady fashion.

**Coding Method**

Once a certain study was identified as an IT/e-government article, we carefully distinguished whether the article focuses on inward aspect of IT applications (IT in government) or on provision of government information/service online 24/7/365 (e-government). We then examined the three distinct approaches, as well as their values and research methods. We categorized an article as managerial if the author discussed managerial values (such as efficiency) and if they viewed IT as a means of substituting human labor, altering organizational information processing, and communication or improving performance. We also included an article in the managerial category if the major concern of the author was to understand how the potential of IT could be effectively realized or if the article focused on the effect of organizational and management factors.

To distinguish the three managerial values, we applied the notion of input, output, and outcome. The definition of economy is somewhat different from that of efficiency (Simon, 1947/1997, p. 259; Waldo, 1947/1984, p. 201). Economy often refers to how less input is used to produce a certain level of output, whereas efficiency refers to how more output is produced with a certain level of input. For the analytical purpose, “economy” was coded when the primary research interest of the author(s) is the relationship between IT applications (e.g., computer, PMIS, and the Internet) and input costs (e.g., the effect of IT in government/e-government applications on administrative/operation costs and transaction costs between government and government as well as between governments and citizens).
Table 2. IT/e-Government Articles Published in Six Journals of PA.

<table>
<thead>
<tr>
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<th>PAR</th>
<th>A&amp;S</th>
<th>PPMR</th>
<th>JPART</th>
<th>ARPA</th>
<th>PAQ</th>
<th>SUM (%)</th>
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<tr>
<td>Phase III</td>
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<tr>
<td>IT</td>
<td>14/1,185 (1.2%)</td>
<td>5/520 (0.96%)</td>
<td>15/468 (3.1%)</td>
<td>9/465 (1.9%)</td>
<td>12/378 (3.2%)</td>
<td>4/278 (1.4%)</td>
<td>59/3,304 (1.8%)</td>
</tr>
<tr>
<td>e-Government</td>
<td>23/1,185 (1.9%)</td>
<td>9/520 (1.7%)</td>
<td>8/465 (1.7%)</td>
<td>7/465 (1.5%)</td>
<td>9/378 (2.4%)</td>
<td>4/278 (1.4%)</td>
<td>60/3,304 (1.8%)</td>
</tr>
<tr>
<td>Sum</td>
<td>37/1,185 (3.1%)</td>
<td>14/520 (2.7%)</td>
<td>23/468 (4.8%)</td>
<td>16/465 (3.4%)</td>
<td>21/378 (5.6%)</td>
<td>8/278 (2.9%)</td>
<td>119/3,304 (3.6%)</td>
</tr>
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<td>Phase II&lt;sup&gt;b&lt;/sup&gt; (1980-1995)</td>
<td>43/1,017 (4.2%)</td>
<td>2/356 (0.6%)</td>
<td>45/355 (12.7%)</td>
<td>0/102 (0%)</td>
<td>5/255 (2.0%)</td>
<td>6/412 (1.5%)</td>
<td>101/2,497 (4.0%)</td>
</tr>
<tr>
<td>Phase I&lt;sup&gt;a&lt;/sup&gt; (1965-1979)</td>
<td>20/990 (2.0%)</td>
<td>3/227 (1.3%)</td>
<td>1/83 (1.2%)</td>
<td>NA</td>
<td>3/190 (1.6%)</td>
<td>1/84 (1.2%)</td>
<td>28/1,574 (1.8%)</td>
</tr>
<tr>
<td>SUM (%)</td>
<td>100/3,192 (3.1%)</td>
<td>19/1,103 (1.7%)</td>
<td>69/916 (7.5%)</td>
<td>16/567 (2.8%)</td>
<td>29/823 (3.5%)</td>
<td>15/774 (1.9%)</td>
<td>248/7,375 (3.4%)</td>
</tr>
</tbody>
</table>

<sup>a</sup>Phase I begins from 1965 because we found the first IT-related articles appeared in 1965 at PAR (Laning, 1965; Price & Mulvihill, 1965).

<sup>b</sup>Phase III begins with the article published in 1996 at JPART because it first used the term “electronic government” (Milward & Snyder, 1996).
“Efficiency” was referred when the key research interest was the relationship between IT in government/e-government applications and the output of government activities or between organizational and management variables along with the output quality of IT/e-government use. Examples include the effect of IT/e-government applications on decision making (e.g., planning, information accuracy) and the effect of IT applications on organizational structure (e.g., red tape).

Effectiveness is a matter of outcome. Although the differences between output and outcome are not clear, outcome can be thought of as the result of an activity, whereas output is the activity of individuals or organizations. Outcome is closely related to organizational goals that are considered to be value, and output is largely associated with means that consist of factors. Following this definition, “effectiveness” was coded when the primary research interest focuses on the relationship between IT applications and the outcome or quality of government activities.

An IT/e-government article was included in the political category if it mainly focused on political values such as representation and if the authors considered IT as a tool for acquiring and maintaining power, representing collective interests, holding bureaucratic accountability to other external authorities, or responding to external demands. “Representativeness” was coded when the author(s)’s primary research focus was the extent to which collective interests of internal and external stakeholders of public organizations are served through the process of the adoption, implementation, and utilization of IT applications. Examples included the effect of IT applications on collective interests (e.g., power structure) of elected and appointed bureaucrats and the effect of internal and external stakeholder interests on the adoption, implementation, and utilization of IT/e-government applications.

The concept of accountability and responsiveness is often interchangeable in public administration literature (Mulgan, 2000; Romzek & Dubnick, 1987). In this study, accountability is defined as the idea of answerability, being able to account to some authority for the reasoning behind individual actions (Mulgan, 2000; Romzek & Dubnick, 1987). Based on this definition, “accountability” was coded when the key research interest is the role of IT/e-government applications in the relationship between nonelected officials and elected officials as well as the effect of IT applications on the relationship between elected officials and citizens.

In this research, responsiveness refers to the aim of making governments accord with the preference or interests of the public (Ostrom, 1975). Compared with accountability, the notion of responsiveness is more focused on the relationship between nonelected officials or the government itself and
the public. The notion of responsiveness emphasizes that nonelected public officials must be directly approachable and accommodating to citizens and less concerned with following set procedures or complying with the instructions of their bureaucratic superiors. Although core features of accountability imply rights of scrutiny and possible sanction, the notion of responsiveness does not imply accountability but more a general political imperative to provide better service to the public (Mulgan, 2000). “Responsiveness” was coded when it mainly focuses on the role of IT/e-government applications in the relationship between government agency (or nonelected officials) and the citizen and business. Examples included the effect of IT/e-government applications on citizen participation and communication with citizens and the effect of IT/e-government applications to the perceptions of citizens (e.g., trust).

An article was included in the legal category if the major focus was the implication of IT/e-government in terms of individual rights such as privacy. “Equality” was referred to when its main interest lay in the implication of IT/e-government use for individual equal protection rights such as access to government information. “Privacy” was coded when it primarily concerned the government management of personal information collected through IT/e-government applications. Procedural due process was defined as “the value of fundamental fairness requiring procedures designed to protect individuals from malicious, arbitrary, erroneous, capricious, or unconstitutional deprivation of life, liberty, or property by the government” (Rosenbloom et al., 2009). Applying this definition, “procedural due process” was coded when it focused on the use of IT/e-government applications and its potential threat to the principle of procedural due process.

Although some authors took a stance from the managerial, political, or legal perspective, others did not adopt a single perspective, but rather framed their argument using more than one. Articles with more than one perspective were listed under two or more categories; however, it should be noted that we categorized the articles based on the dominant perspective because some articles discussed IT-related issues without providing clear categories. IT/e-government articles with no clear perspective have been coded as “not available (NA).”

To identify the research method used in the study of IT/e-government issues in PA, we coded the major research method of each article in terms of normative statements, surveys, case studies, and experimental and content analyses. Such research methods have been identified as major research methods in doctoral dissertations and research in PA (Lan & Anders, 2000; Perry & Kraemer, 1986). Whereas some articles have been used in multiple
research methods, however, other articles have not used any specific research method. Both methods were counted for studies that adopted multiple methods or treated as “NA” if the study did not adopt any particular method.

Valid and reliable measures of concepts (e.g., accountability) are very critical as this study relies on content analysis to code IT/e-government articles. To avoid this construct validity and reliability problem, cross coding was conducted by two doctoral students who specialize in IT research in public administration. For cross coding, we randomly selected 30 out of 180 IT/e-government articles (16.7%). Two students coded 30 IT/e-government articles (15 for each doctoral student) in terms of three distinct approaches, values, and research methods. To assess intercoder reliability, we adopted the most widely used “percent agreement” method.

Findings and Discussion

Before discussing the results of coding in terms of research themes and methods, the trends of IT/e-government studies in Table 2 merit attention. With regard to the outlets of IT/e-government articles, two PA journals (PAR and PPMR) were a primary outlet in Phase II. Out of 101 IT/e-government articles, 43 (42.6%) and 45 (44.6%) articles appeared in both PAR and PPMR, respectively. Of the 101 IT/e-government articles published in Phase II, a total of 88 (87.1%) appeared in both PAR and PPMR. The reason is partly because PAR and PPMR issued special volumes that focused on IT/e-government studies in 1986 and 1985, respectively. Out of 101 articles, only 2 (2.0%), 5 (5.0%), and 6 (5.9%) IT/e-government pieces were published in A&S, ARPA, and PAQ, respectively, in Phase II. By contrast, IT/e-government articles appeared at diverse outlets in Phase III. Of 119 articles, 37 (31.1%), 14 (11.8%), 23 (19.3%), 16 (13.4%), 21 (17.6%), and 8 (6.7%) IT/e-government articles appeared in PAR, A&S, PPMR, JPART, ARPA, and PAQ, respectively. There were about the same number of articles on the inward aspects of IT applications in government (59 articles) and on e-government, the outward aspects of IT applications (60 articles). However, there is variation among journals (e.g., more e-government articles were found in PAR an A&S and vice versa in PPMR and JPART).

Given the diversity of viewpoints and target audiences of PA journals, the recent appearance of IT/e-government articles in diverse PA journals reflects the expansion of academic and practical interests in IT/e-government issues. In particular, e-government as outward aspects of IT applications has appeared to be a great development in Phase III while the inward applications of IT remain important.
In Table 3, we identified 239 IT/e-government articles out of 248 by excluding 9 pieces that were not relevant to this research. Nine articles were excluded because they were not clearly associated with one of the three main approaches. They include 7 articles discussing IT curriculum (e.g., M. M. Brown & Brudney, 1998), 1 review article (Rocheleau, 2000), and 1 e-government prospect article (D. F. Norris, 2010).

Table 3 shows that IT/e-government articles with a managerial perspective dominated IT research for several decades. Out of 239 articles, we found 190 (71.7%) that dealt with IT issues from a managerial perspective. Students of PA have mainly considered IT as a tool to improve the efficiency, economy,
and effectiveness of government operation. In particular, most IT-related studies involved the managerial perspective in Phase II (79.3%). This result shows a pattern similar to those found in previous research on general PA studies (Lan & Anders, 2000). The political and legal implications of IT use in government have also been discussed, even though students of PA have paid relatively less attention to these approaches. However, our results indicate that a scholarly perspective toward IT phenomena in regard to public administration has increasingly shifted from the managerial to the political approach in Phase III. While 84 (81.5%) articles with the managerial perspective were found in Phase II, 83 (61.5%) articles were found in Phase III and represent a 20% decline. This sharp decline is mainly caused by a great proportional increase in the political approach taken by the articles published in Phase III. For example, there were more articles adopting a political approach than those that adopted a managerial approach. As a result, the number and percentage of articles with a political perspective shifted from 15 (14.6%) in Phase II to 47 (34.8%) in Phase III, nearly a 20% increase. However, unlike the dynamics of managerial and political interests in IT studies, few studies have examined IT phenomena in public administration from a legal perspective in the past 40 years, though the proportion of e-government studies with a legal approach continues to increase. In particular, e-government articles in Phase III seem to devote increased attention to a legal approach, and its proportion increased to 5.4% while that of the articles on inward IT applications in government was 1.6%.

How do we interpret this change? Before pre-Internet technologies (mostly Phases I and II), public organizations were the primary end users of IT. From the end-user point of view, public organizations might be more interested in achieving managerial values (such as efficiency) through the utilization of IT. During Phases I and II, IT studies regarding public administration have focused on the relationship between the characteristics of public organizations, or public bureaucrats as the end user, as well as the environment and managerial values. However, since the adoption of Internet technologies by the government in the mid-1990s (Phase III), nongovernment entities (such as ordinary people and private firms) have become end users of Internet technologies. Citizens and private firms might be more interested in how government promotes political values (such as responsiveness and accountability) through the utilization of Internet technologies. Scholars in public administration have focused on the citizens, private firms, and nonprivate organizations as end users of such technologies. In particular, e-government studies have focused on how government takes advantage of Internet technologies to promote political values (such as responsiveness and accountability) through
effective government information dissemination, service delivery to citizens, and the facilitation of citizen participation. In addition, the political perspective has been utilized to understand the dynamic process of IT adoption and diffusion as many failed cases have been observed while designing, developing, and implementing PMIS.

**Managerial, Political, and Legal Values**

Although IT/e-government articles take the same perspective, they have focused on different values. Table 4 shows that PA scholars have mainly emphasized effectiveness (38.4%, 109 out of 239) among managerial values over several decades. The emphasis on effectiveness has continually increased from Phase I (30%, 9 out of 28) to Phase III (66%, 66 out of 116). Meanwhile, the efficiency value was dominant in Phase II (43.6%, 48 out of 95); however, scholarly attention to this value decreased in Phase III (14.6%, 21 out of 116). This change reflects the fact that scholars in PA have placed more emphasis on either the effect of IT on the outcomes of government activities (e.g., public program outcomes and economic development) or the impact of organizational and managerial factors on the quality of IT services and utilization (e.g., IT services within an organization or e-government service).

In terms of political values, scholars have paid somewhat more attention to the role of IT utilization in representing collective interests instead of responsiveness or accountability. In particular, representativeness was the dominant political value in Phase I (13.3%) and Phase II (10.9%); however, both responsiveness (15.3%, 22 out of 116) and accountability (10.4%, 15 out of 116) values have received more attention in Phase III. Scholars have paid more attention to the potential role of IT in promoting accountability within and among governments and in enhancing responsiveness between government and citizens, private firms, and nonprofit organizations as Internet technologies (such as government websites) are considered new channels of service delivery and interaction. However, various legal values (e.g., equal access) have not been widely discussed among PA scholars who have published IT/e-government articles in major PA journals over several decades.

**Research Method**

Table 5 shows that there was no dominant research method for IT/e-government studies; however, this research found that normative descriptions (32.1%)
Table 4. Values of Each Approach.

<table>
<thead>
<tr>
<th></th>
<th>Managerial approach</th>
<th>Political approach</th>
<th>Legal approach</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ECN</td>
<td>EFC</td>
<td>EFT</td>
</tr>
<tr>
<td>Phase III</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IT</td>
<td>1(1) (1.5%)</td>
<td>17(4) (26.2%)</td>
<td>37(6) (57.0%)</td>
</tr>
<tr>
<td>e-Government</td>
<td>1(0) (1.3%)</td>
<td>4(2) (5.1%)</td>
<td>29(14) (36.7%)</td>
</tr>
<tr>
<td>Sum</td>
<td>2(1) (1.4%)</td>
<td>21(6) (14.6%)</td>
<td>66(20) (45.8%)</td>
</tr>
<tr>
<td>Phase II</td>
<td>9(2) (8.2%)</td>
<td>48(10) (43.6%)</td>
<td>34(9) (30.9%)</td>
</tr>
<tr>
<td>Phase I</td>
<td>3(1) (10%)</td>
<td>12(2) (40%)</td>
<td>9(0) (30%)</td>
</tr>
<tr>
<td>SUM (%)</td>
<td>14(4) (4.9%)</td>
<td>81(18) (28.5%)</td>
<td>109(29) (38.4%)</td>
</tr>
</tbody>
</table>

Note: ECN = economy (e.g., the effects of IT applications on administrative costs, and transaction costs); EFC = efficiency (e.g., the effects of IT applications on organization structure, and decision making); EFT = effectiveness (e.g., the effects of IT applications on service delivery, or the effects of organizational factors on the outcomes of IT utilization or services); RPS = representativeness (e.g., the relationships between IT applications and collective interests); RSP = responsiveness (e.g., the effects of IT applications on the citizen participation); ACT = accountability (e.g., the effects of IT applications on the elected officials’ control and communications within organization, or the effects of IT applications on organizational communication with external authorities); EQU = equality (e.g., citizen’s access to government information); PRV = privacy; PDP = procedural due process. In the last column, 90 is the number of each value counted twice because 45 articles have two values (e.g., economy and efficiency). Thus, the number of values (284) is equal to the total number of articles (239) plus the number of articles with two values (45).

<sup>a</sup>In the last column, 16 in the parentheses is the number of each value counted twice because 8 articles have two values (e.g., economy and efficiency). Thus, the number of values (65) is equal to the total number of articles (57) plus the number of articles with two values (8).

<sup>b</sup>In the last column, 40 in the parentheses is the number of each value counted twice because 20 articles have two values (e.g., economy and efficiency). Thus, the number of values (79) is equal to the total number of articles (59) plus the number of articles with two values (20).
### Table 5. Research Methods.

<table>
<thead>
<tr>
<th></th>
<th>Normative</th>
<th>Survey</th>
<th>Case study</th>
<th>Experimental design</th>
<th>Content analysis</th>
<th>Legal analysis</th>
<th>Sum</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Phase III</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IT</td>
<td>10(0) (16.7%)</td>
<td>33(2) (55%)</td>
<td>14(3) (23.3%)</td>
<td>1(0) (23.3%)</td>
<td>1(0) (1.7%)</td>
<td>1(1) (1.7%)</td>
<td>60(6)/57&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>e-Government</td>
<td>8(1) (12.9%)</td>
<td>28(1) (45.1%)</td>
<td>16(0) (25.8%)</td>
<td>1(1) (1.6%)</td>
<td>9(3) (14.5%)</td>
<td>0(0) (0%)</td>
<td>62(6)/59&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>Sum</td>
<td>18(1) (14.8%)</td>
<td>61(3) (50%)</td>
<td>30(3) (24.6%)</td>
<td>2(1) (1.6%)</td>
<td>10(3) (8.2%)</td>
<td>1(1) (0.8%)</td>
<td>122(12)/116</td>
</tr>
<tr>
<td><strong>Phase II</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>45(1) (46.9%)</td>
<td>23(0) (24.0%)</td>
<td>25(1) (26.0%)</td>
<td>3(0) (3.1%)</td>
<td>0(0) (0%)</td>
<td>0(0) (0%)</td>
<td>96(2)/95</td>
<td></td>
</tr>
<tr>
<td><strong>Phase I</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16(0) (57.1%)</td>
<td>9(0) (32.1%)</td>
<td>3(0) (10.7%)</td>
<td>0(0) (0%)</td>
<td>0(0) (0%)</td>
<td>0(0) (0%)</td>
<td>28/28</td>
<td></td>
</tr>
<tr>
<td><strong>Sum (%)</strong></td>
<td>79(2) (32.1%)</td>
<td>93(3) (37.8%)</td>
<td>58(4) (23.6%)</td>
<td>5(1) (2.0%)</td>
<td>10(3) (4.1%)</td>
<td>1(1) (0.4%)</td>
<td>246(14)/239</td>
</tr>
</tbody>
</table>

Note: The total number of sample articles used for research method category is 239. In the last column, 14 in the parentheses indicates the number of research methods counted twice because 7 articles adopted two research methods (e.g., survey and content analysis). Thus, the total number of research methods (246) is equal to the total number of articles (239) plus the number of articles with two methods (7).

<sup>a</sup>The total of 57 IT articles in Phase III is used for research method category. In the last column, 6 in the parentheses indicates the number of research methods counted twice because 3 articles adopted two research methods (e.g., survey and content analysis). Thus, the total number of research methods (60) is equal to the total number of articles (57) plus the number of articles with two methods (3).

<sup>b</sup>The total of 59 e-government articles in Phase III is used for research method category. In the last column, 6 in the parentheses indicates the number of research methods counted twice because 3 articles adopted two research methods (e.g., survey and content analysis). Thus, the total number of research methods (62) is equal to the total number of articles (59) plus the number of articles with two methods (3).
and survey methods (37.8%) were frequently used to conduct IT/e-government research. Although normative descriptions were primarily adopted in Phase I (57.14%), the survey method was found to be the most popular method in Phase III (50%). There is no distinctive difference in terms of methods between studies on inward IT applications in government and those of e-government. This implies that scholars in PA have suggested normative ways of utilizing IT in the early stage of IT development (Phase I), while empirical efforts have been widely adopted to accumulate knowledge about dynamics surrounding IT use in the government (Phases II and III). In this regard, the use of the case-study method has increased consistently because this method allows PA scholars to better understand the dynamics surrounding IT adoption and its use in public organizations. Of note is that unlike methods applied in Phases I and II, methods applied in Phase III adopted content analysis to conduct IT/e-government research. This is because government websites were studied as the government adopted them to perform government activities (e.g., information dissemination and financial transactions). However, experimental and legal analysis also comprised a small portion of total IT/e-government studies.

Conclusion

This study identified major research themes and methods applied to broadly define e-government studies (including research on IT/e-government topics in public administration). Based on Rosenbloom’s approach to public administration, this study analyzed e-government articles published in six major PA journals and demonstrated that e-government studies have continued to increase in volume as well as in methodological diversity and rigor. This study found several interesting patterns in e-government studies: (a) an increase in the number and proportion of IT/e-government studies in public administration journals; (b) the dominance of the managerial approach in IT/e-government studies, with the legal approach receiving the least attention; (c) an increase in the political approach and a decrease in the managerial approach after the 1990s; (d) a dominant interest in effectiveness among managerial values and representativeness among political values; (e) increased interest in responsiveness and accountability in recent studies; and (f) slow, but growing interest in equity and privacy in legal values.

IT/e-government studies have adopted various research methods to deliver quality research. In the past, the normative approach and survey research were dominant research methods. The proportion of normative and
descriptive research has decreased, whereas survey research has sharply increased to 50% of the published works in public administration journals. Case studies are also a well-used research method in IT/e-government studies because selected cases with particular IT/e-government features are often closely examined to offer policy lessons and implications.

IT/e-government studies will continue to evolve from relatively simple IT/e-government applications for internal processes to provision of public services to citizens and businesses. The evolution of IT/e-government studies also reflects the continued development of IT devices and networks. Since these information and communication technologies have evolved, the term e-government has changed to m-government (mobile government) and u-government (ubiquitous government). Future studies need to reflect these changes and review the research focus as well as how the methods of IT/e-government studies form and transform.

Declaration of Conflicting Interests

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Notes

1. e-Government is often defined as applications of Internet technologies in providing governmental information and service online 24/7/365 (D. F. Norris, 2003; D. F. Norris & Moon, 2005). But we use e-government with a broadly defined term that include the narrow definition but also on the inward applications and utilization of ICTs in the public sector to achieve diverse public values including efficiency, effectiveness, timeliness, and so on.

of Southern Review of Public Administration appeared in 1977, and it has been continued by Public Administration Quarterly since 1983.

3. A list of IT/e-government articles examined in this study is available on request.

References


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