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Technology symbolization: political mechanism of local e-government adoption and implementation[1]

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Abstract

Why did some local e-government projects start off with a bang but end with a whimper? Using the case study of an online administrative approval system in Jiangmen, China, this study explores the political mechanism behind the adoption and implementation of local e-government projects. We propose a framework for analyzing the adoption and implementation of e-government projects that encompasses three aspects: environment (political institutions); process (perceptions of information technology, power relations, and strategic interaction); and performance. The political environment shapes people's perceptions of information technology and provides motivations and constraints for relevant stakeholders. Stakeholders choose different strategies and actions based on their positions in the power structure, which finally influences the performance of the project. In this study, due to local government leaders' motivation to seek political achievement and subordinate agencies' strategic responses in the Chinese political system, the online system finally turned into a symbolic tool that did very little to improve government performance.

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Points for practitioners

• A framework is proposed for analyzing the adoption and implementation of e-government projects that encompasses three aspects: environment (political institutions); process (perceptions of information technology, power relations, and strategic interaction); and performance.
• A concept—technology symbolization—is emphasized by exploring the ways in which e-government can be used as a promotion tool for local officials.
• With the advent of the new generations of information technology, e-government practitioners cannot ignore the political environment and the impact of political institutions on information technology implementation.

Keywords
e-government, performance, political institutions, power relations, technology symbolization

Introduction

According to the United Nations, e-government refers to "the use of information and communications technology to more effectively and efficiently deliver government services to citizens and businesses."[2] The potential benefits of e-government include improved accountability, transparency, and participation, as well as increased trust in the government (Pardo and Tayi, 2007; Shim and Eom, 2008; Tolbert and Mossberger, 2006; Zhao and Xu, 2015). Internally, e-government monitors public employees' behavior and reduces the arbitrary exercise of discretion (Park and Kim, 2019). Externally, e-government increases government transparency and fosters relationships with the public (Moon, 2002; Shim and Eom, 2008; Zhao and Xu, 2015). Governments transform their image from being bureaucratic and inflexible to being customer-oriented and effective through e-government systems (Im et al., 2013; Pina et al., 2010; Tan et al., 2016; West, 2004).

Despite the potential benefits of e-government, there are many obstacles in realizing the promises of e-government (Gil-García and Pardo, 2005). Some local e-government projects "start off with a bang but end with a whimper," and place governments in a dilemma of "high input, low output" (Tan et al., 2016). According to Hansen and Nørup (2017: 851), considering the:

> huge investments and high percentage of failure in ICT [information and communication technology] innovation projects in public service organizations in recent decades, there is a need for research that explores the antecedents of how the implementation of ICT innovations can contribute to higher public sector performance.

The successes and failures of e-government projects is an under-researched topic (Wirtz and Daiser, 2018). Many scholars have argued that technological,

organizational and managerial, and institutional factors play a major role (Gil-García and Pardo, 2005; Liang et al., 2017; Puron-Cid, 2014; Savoldelli et al., 2014). However, few scholars have explored the role of political factors in the adoption and implementation of e-government projects (Ahn, 2011; Ahn and Bretschneider, 2011; Ho and Ni, 2004; Weare et al., 1999), and none of these scholars have studied it in an authoritarian context. Based on a case study of an online administrative service system in Jiangmen, China, this study explores the political mechanism behind the adoption and implementation of e-government projects. Our aim is to answer the following questions: how is information technology adopted and implemented in Chinese local e-government projects? What is the political mechanism behind it? This study also contributes to regional literature in this area and helps lay the foundation for international comparison.

Literature review

The performance of e-government projects

Researchers often evaluate e-government projects and ICT innovations by the timing of adoption; however, early adoption is not enough (Tolbert et al., 2008). The quality of the services and whether adopters continue with the latest technology in the area are more meaningful (Tolbert et al., 2008). Many scholars have argued that most e-government projects have not fulfilled their promises (Feeney and Brown, 2017; Misuraca et al., 2013; Moon, 2002). Comparing the performance of federal agency websites with that of a private sector equivalent in the US, Morgeson and Mithas (2009) suggested that e-government websites at the federal level lagged behind their e-business counterparts in basic measures of functionality and satisfaction. Moon (2002) assessed the perceptual effectiveness of municipal e-government implementation and contended that e-government had not attained any of the expected outcomes (cost savings, downsizing, etc.) that the e-government rhetoric had promised. Feeney and Brown (2017) conducted a content analysis of 500 US city websites and indicated that there remains great variation in local government websites. For example, whereas about 95% of cities posted their city council agenda, only around 20% of city websites mentioned Freedom of Information Act (FOIA), about 30% posted their employee directories, and 3% did not offer a single online service (Feeney and Brown, 2017). There is "limited evidence that the expected promises of e-government have been achieved and that e-government potential remains hypothetical," which cannot be attributed to "measurement errors or lag time" (Savoldelli et al., 2014: 64).

Factors in the adoption and implementation of e-government projects

E-government initiatives are not adopted and implemented in a vacuum. The factors that influence the adoption and implementation of e-government projects constitute one of the most discussed issues in the e-government literature.

These factors can be broadly divided into three categories: technological; organizational and managerial; and institutional (Gil-García and Pardo, 2005; Liang et al., 2017; Puron-Cid, 2014; Savoldelli et al., 2014).

Technological factors. Savoldelli et al. (2014) summarized the technological barriers to e-government adoption and implementation as including the lack of bandwidth capacity, interoperability, privacy, and security, as well as open source software and standards, in addition to high investment and maintenance costs. A series of theories have identified factors that affect an individual's intention to use information technology, such as the technology acceptance model, theory of reasoned action, theory of planned behavior, and unified theory of acceptance and use of technology. For example, the technology acceptance model hypothesized that perceived usefulness and perceived ease of use are fundamental determinants of user acceptance (Davis, 1989).

Organizational and managerial factors. According to innovation diffusion theories, the characteristics of organizational structure that are related to organizational innovativeness include centralization, complexity, formalization, interconnectedness, organizational slack, and openness (Rogers, 1962). In the field of e-government, Gil-García and Pardo (2005) contended that key organizational and managerial factors influencing e-government initiatives include: project team expertise; well-skilled and respected information technology leadership; clear and realistic goals; the identification of relevant stakeholders; end-user involvement; planning; measurable deliverables; effective communication; previous business process improvement; and adequate training. To break down organizational and managerial barriers, it is necessary to identify relevant stakeholders and encourage them to engage in the development process of e-government (Gil-García and Pardo, 2005). Resistance to change and the lack of project management capabilities have also been identified as challenges to e-government projects (Savoldelli et al., 2014). Cassell (2008: 193) found that the implementation of e-government projects is affected "in particular by information technology's place within a city's organizational structure." For example, a flat hierarchical structure facilitated communication between the information technology department and political leaders (Cassell, 2008).

Institutional factors. Drawing from multiple case studies, Fountain (2001) contended that institutions are one of the prerequisites of successful e-government efforts. The introduction of ICT "without the corresponding institutional reform only led to limited success" (Pina et al., 2010: 350). Examining the rankings of US states in terms of the development of e-government, Tolbert et al. (2008) explored the role of institutions in policy innovation and found that states that were sustained innovators were those that "had the institutional infrastructure to develop e-government, such as dedicated state legislative committees, autonomous information technology executive departments, or more institutionalized information technology management and administration" (Tolbert et al., 2008: 551–552).

It has been argued that e-government projects have been "concentrated on more technological and operational matters" (Savoldelli et al., 2014: 63); however, political factors can also have a profound influence (Ahn and Bretschneider, 2011; Ho and Ni, 2004; Meijer and Bolívar, 2016; Puron-Cid, 2014; Savoldelli et al., 2014; Weare et al., 1999). In the policy innovation and diffusion literature, Berry and Berry (1990, 1992) assessed the factors prompting states to adopt new policies. One of the factors is political, which includes the election cycle, party control, and regional diffusion (states tend to emulate nearby states). They found that politicians seek to adopt popular policies during election years, when "the accompanying electoral rewards should be at their maximum" (Berry and Berry, 1990: 406). Based on exploratory case studies, Henning (2018) identified that an enabling political environment has a positive influence on interoperability standard adoption by organizations in government information networks. Savoldelli et al. (2014: S63) conducted a bibliometric analysis and found that "political barriers are one of the main factors explaining lack of e-government adoption," including the digital divide, lack of trust and transparency, and lack of citizen participation. Strong, consistent, and active leadership plays a vital role in e-government projects (Reddick and Frank, 2007). Reporting on an e-government innovation by a local government in South Korea, Ahn and Bretschneider (2011) identified political leadership—the mayor of the local government—as the major driver of the e-government effort. From a global perspective, Lee et al. (2011: 447) contended that successful practices of developed countries in e-government are also based on "their political and civic fundamental norms—democracy, transparency, and freedom." Although several scholars have recognized the role of political factors in the adoption and implementation of e-government projects, they did not identify specific contexts, processes, and mechanisms—such as the political environment and institutions, stakeholders' perceptions of information technology, power relations, and strategic interactions among stakeholders—and thus failed to show the causal chain underlying how political factors influence the performance of technology application. Based on prior literature, we propose an integrated analytical framework focusing on the political factors of e-government project adoption and implementation that encompasses three aspects, namely, environment, process, and performance (see Figure 1).

Analytical framework

Environment: political institutions

Institutions are "the humanly devised constraints that structure political, economic, and social interactions" (North, 1991: 97). They also offer incentives for organizational activities (Jun and Weare, 2011). According to Fountain (2008: 99), "the study of institutions is central to politics and governance and hence to internet politics and e-government." She also argued that the challenge of building fully developed e-government "lies not in achieving the technical capability of creating a government on the web but rather in overcoming the entrenched organizational and political

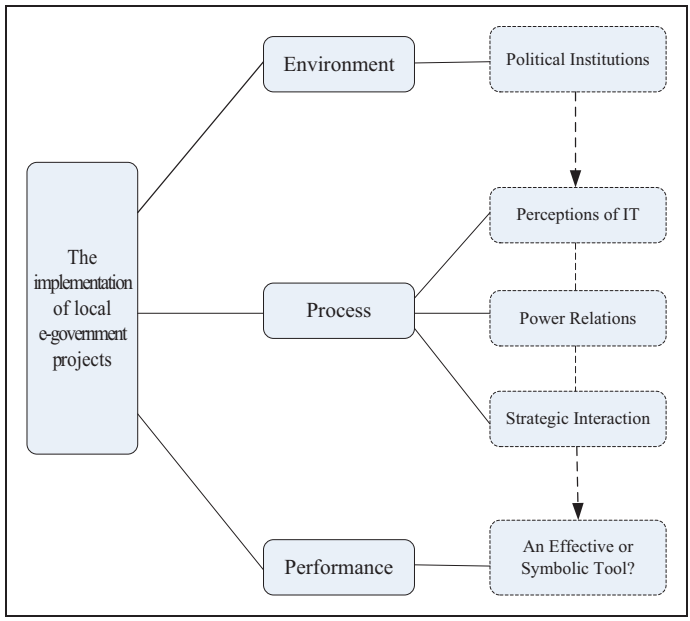

Figure 1. Analytical framework.

divisions within the state" (Fountain, 2001: 1). Ahn (2011) examined how the political environment (political competitiveness, sensitivity to political parties, citizen engagement in politics, and diversity) and government structure (form of government, allocations of decision-making authority between the chief executive officer [CEO] and local council, political responsiveness of political actors, and formal citizen participatory authority) influenced the likelihood of e-government adoption. For example, greater political competitiveness was linked with a high possibility of adoption, whereas a larger part played by political parties had a negative impact. Based on a review of the literature on smart urban governance, Meijer and Bolívar (2016: 392) contended that smart city governance is a "complex process of institutional change" and that the "political nature of appealing visions of socio-technical governance" should be acknowledged. Political institutions influence public officials' decisions, such as whether to adopt an e-government project or not, when to adopt it, and how to implement the project once it is adopted. Technology, institutions, and organizations must co-evolve (Yang, 2003).

Process: perceptions of technology, power relations, and interaction of stakeholders

Environment and institutions shape organizations' and individuals' perceptions of information technology (Fountain, 2001). Barbosa et al. (2013: 749) argued that

"e-government is socially constructed" and it is important to account for social actors and "their influences, interactions, and interests in the construction process." Wilson (1989) categorized bureaucrats into "operators," "managers," and "executives." What operators do depends on the situations they encounter, their prior experiences and personal beliefs, the expectations of their peers, the interests of their agency, and the organizational culture. The further managers are from the routine work, the more their lives are shaped not by the tasks that the operators are performing, but by the constraints placed on the agency by its political environment. Executives pursue the twin goals of maintaining agency autonomy and maintaining their political position in the larger governmental world (Wilson, 1989).

Power refers to the possibility of a person or a group influencing another person or group, and the essence of power relations is an asymmetric and unbalanced dependence or affiliation (Etzioni, 1970; Tan et al., 2016). Actors seek dominance in power relations by mastering a key skill or ability, interpreting and using the rules of the organization, and occupying a major position in the information transmission network (Crozier and Friedberg, 1980; Tan et al., 2016). Power relations reflect an unequal exchange between actors (Tan et al., 2016). The support of political leaders who have enough power resources is an important factor in decisions to adopt e-government (Ho and Ni, 2004).

Based on different perceptions of information technology, "operators," "managers," and "executives" exert their influence and implement projects in the direction they expect to follow. They take strategic actions according to their ability to control key resources and other stakeholders' possible strategies (Crozier and Friedberg, 1980; Tan et al., 2016). Using a qualitative multiple case study on the adoption of technology integration solutions (TIS) in the UK, Kamal et al. (2011) argued that stakeholders (decision-makers, management, and information technology staff) can be identified not only by their activities during the project, but also by their different perceptions of the factors around TIS adoption and the different stages of the adoption lifecycle that they participated in.

Performance: an effective or a symbolic tool?

While many e-government programs "have achieved benefits in efficiency, economy, effectiveness, and citizen satisfaction" (Yang and Rho, 2007), others have not. Modern politics is "replete with symbols, ritual, ceremony, and myth" (March and Olsen, 1984: 738). For example, chief executives may advocate and announce plans for the restructuring of public bureaucracy, as well as regularly abandon such plans (March and Olsen, 1984). According to Fichman and Kemerer (1999), the widespread adoption of innovation does not mean widespread use and implementation. There is an "assimilation gap" that arises from "a discrepancy between the knowledge and motivations of those responsible for acquisition versus those responsible for deployment and use" (Fichman and Kemerer, 1999: 255, 272). Norris and Reddick (2013) also found that local e-government has not obtained

the results that early e-government studies predicted that it would. Most local e-government projects have delivered information online, followed by a few transactions and very limited interactions between governments and the public. Based on a case study of a call center project in Seoul, Im et al. (2013: 451) suggested that the call center is "a symbolic tool that improves the image of the Seoul Metropolitan Government but does very little to actually change the way it operates." In this situation, e-government is more of "a symbolic tool rather than an effective tool, and we call this phenomenon 'technology symbolization'" (Tan et al., 2016: 16).

Methodology

A case study

To answer the research question, we conducted an in-depth case study of an e-government project in Jiangmen, China. The case-study strategy is suitable when the research involves asking "why" or "how" questions (Yin, 2003). Our objective is to identify why the e-government project was a pseudo-success and how political factors influenced the adoption and implementation of e-government. Thus, the case study is an appropriate approach.

We focused on an online administrative approval project in Jiangmen, Guangdong Province. Located in the Pearl River Delta region of China, Jiangmen is a city that had a population of 4.56 million and a gross domestic product (GDP) of 38.4 billion US dollars in 2017. Jiangmen was an early adopter of the one-stop public service model nationwide. One of the authors participated in two research projects that focused on Jiangmen's one-stop Administrative Service Center (ASC) from 2008 to 2009 and obtained considerable first-hand data.

Data collection and analysis

Data were collected through site visits and interviews with stakeholders who participated in the online administrative service system project between 2010 and 2011. To obtain an initial understanding of the project, we first conducted a preliminary interview with a leader of Jiangmen's local government. We then conducted a series of in-depth interviews with ASC and functional department managers and frontline workers. We interviewed 21 stakeholders, including four ASC managers, five functional department managers, two managers from technology companies, and ten frontline employees from different functional departments. The functional department managers were from the departments of industry and commerce (ICB), public health (PHB), quality supervision (QSB), state tax (STB), local tax (LTB), and environmental protection (EPB). Each interview lasted between 30 minutes and two hours. As the interview transcripts were compared with secondary data (including archives, annual reports, press releases, and online news), the findings could be triangulated for greater reliability (Yin, 2003).

Data were coded in accordance with the coding schema developed by all the authors (see Table 1). To ensure reliability, the data were coded by one researcher first and then double-checked by another coder. Whenever there were conflicts, researchers discussed the differences and decided on the final codes.

Validity and reliability

We employed a triangulation approach to improve validity. It included data, method, and investigator triangulation (Yin, 2003). We used multiple sources of evidence for our data, which included interviews and secondary data. To achieve investigator triangulation, the research question, interview protocols, and data-analysis methods were reviewed by government officials and experts in the fields of political science, organization management, and e-government. We developed, discussed, and modified a detailed research plan several times before actually conducting the interviews. We also documented the entire process, including the questionnaire design, interviewee selection, interview, and coding process.

Case analysis

Background: the construction of the online administrative approval system in Jiangmen

In May 1998, the Jiangmen government listed government information technology construction in its tenth five-year plan. In April 1999, Jiangmen was approved as one of the national informatization pilot cities. In the government work report of 2000, the Jiangmen government listed establishing an online administrative approval system as one of its key goals in 2001. The main objective of the project was to establish a unified local area network (LAN) platform for different functional department windows in Jiangmen's ASC (Tan et al., 2016). The approval process is shown in Figure 2.

In August 2001, the government's former deputy secretary general was appointed as the ASC director. To ensure the smooth launch and operation of the system, the government of Jiangmen City also established a working group, including the ASC director, the head of the information industry bureau, and other leaders from related agencies. In May 2001, the ASC signed a contract with Guangzhou L High-tech Company to build the system. Eight months later, on January 18, 2002, the system was officially launched. The Secretary of the Communist Party of China (CPC) Committee of Jiangmen, the Mayor of Jiangmen, the heads of different government agencies, and the major news media from Guangdong Province participated in the opening ceremony. Jiangmen's local media, *Southern Daily* and *Yangcheng Evening News*, published a series of news reports on the ceremony (Tan et al., 2016).

The launch of the Jiangmen Online Administrative Service System attracted attention from other provinces and cities. Within three months, 270 people from

Table 1. Data analysis.

Code/theme		Data (examples)	Interpretive summary
Environment	Political institutions	The centralized decision-making and pressure style implementation system: "In 2001, Jiangmen listed establishing an online administrative approval system as one of its key projects in the government work report. However, with the support of the Secretary of the CPC [Communist Party of China] Committee, it is no longer a problem. No departments dare to say 'no' to the Secretary of the CPC Committee." (Interview with director of the ASC W)	Under the influence of the centralized decision-making system, the project directly reflected the will of the leaders of Jiangmen.
Process	P1: perceptions of the online administrative approval project	"The mayor was concerned about the overall effectiveness of the project and his political achievements. However, the department manager was concerned about the department's interests such as risks and benefits, among other things. The frontline staff cared more about the accessibility of the technology rather than the project's benefit. Therefore, ranks determine thoughts." (Interview with the former deputy director Y)	To a certain degree, the construction of the online administrative approval system was an opportunity for local government leaders and ASC managers but was a threat to functional department managers and operational-level employees.
	P2: power relationship among the stakeholders	"On October 25, 2001, Q, *the Secretary of the CPC Committee* of Jiangmen, attended a meeting held by the ASC and stated that the online approval system can enhance government efficiency and transparency, and all the *functional departments* must provide full support for the project. The evaluation will also account for every department and agency's performance in the project." (Minutes of an ASC meeting in 2001)	Local government leaders are the "bosses" of functional department managers. They have the power to appoint personnel and allocate financial resources. They also need the functional department managers to implement particular policies.

(continued)

Table 1. Continued

Code/theme		Data (examples)	Interpretive summary
	P3: strategic interaction among the stakeholders	"The coordination among *different departments* in the implementation process is a tough task. However, with the support of the *Secretary of the CPC Committee*, it is no longer a problem. For *a new agency* such as us, the support from the Secretary of the CPC Committee is very encouraging." (Interview with the ASC director)	The interaction among Jiangmen leaders, the ASC director, functional department managers, and frontline employees.
Performance	An effective or symbolic tool	"However, this [the online approval system] was completely *different* from what we are doing. We have another system to process applications. Applicants usually bring *paper materials*. The online items were only a demonstration system. When people came to visit, our staff would demonstrate the process, but there was *no significant effect*." (Interview with deputy researcher from the Bureau of Land and Resource)	The system turned into a vanity project that did very little to improve government performance.

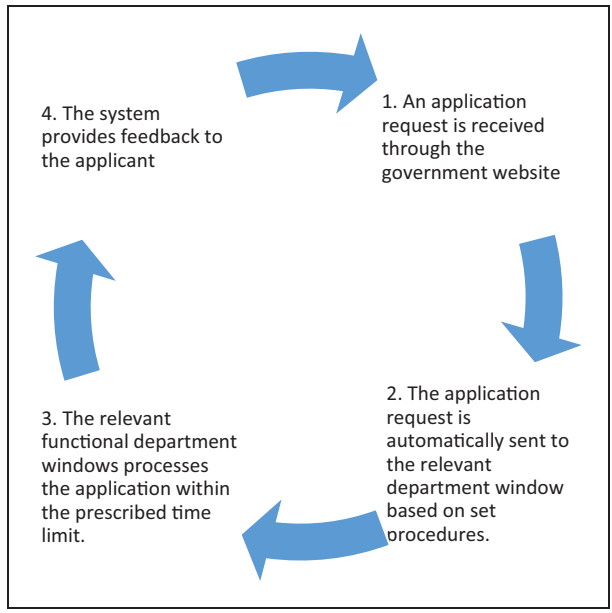

Figure 2. The approval process of the online administrative approval system.

22 cities visited the ASC. On December 3, 2003, Jiangmen's ASC was named the "Guangdong Information Demonstration Unit" by the Information Industry Department of Guangdong Province (Tan et al., 2016). However, the system was not put into real use. It was not completely connected to all the functional departments, that is, data were not shared or exchanged among the different departments. In January 2003, the ASC did not extend the contract with Guangzhou L High-tech Company, but signed a new one with Zhuhai M Company, which abandoned the strategy based on the LAN platform.

Findings

Environment: the institutional context of the online administrative approval project. Political institutions determine the distribution of resources among relevant stakeholders and either encourage or constrain organizational and individual behavior (March and Olsen, 1989). There are three types of institutions that influence the incentives and behavior of local government officials in China. The first is the centralized decision-making system. Local CPC committees and governments have the absolute power to make decisions on a city's economic and social development. The centralized decision-making system enlarges local leaders' ambitions, and they prioritize projects that can be considered their personal achievements. In this case, the e-government project directly reflected the preferences and will of the leaders of Jiangmen. In May 1998, e-government construction was listed as

one of the goals in Jiangmen's tenth five-year plan based on mayor X's proposal. In 2001, establishing an online administrative approval system was listed as one of its key projects in the government work report.

The second is the "promotion tournament" mechanism among local Chinese government officials. In China:

> fiscal decentralization and cadre personnel management are the core means by which the central government supplies local government officials with powerful incentives to compete in what can be called a tournament for fiscal revenue and economic development, the reward for which is career advancement. (Wu et al., 2013: 349)

The GDP growth rate has been significantly related to the promotion of officials in Chinese local governments (Chen et al., 2005; Li and Zhou, 2005). This strong linkage between regional economic development and the personal interests of local officials causes intense competition (Li and Zhou, 2005). In this case, e-government projects are beneficial for government efficiency and economic development, and are thus considered by most local officials as a tool for their personal promotion. Thus, e-government projects were quickly adopted by Jiangmen's local leaders.

The third is the "pressure system," which is an important feature in policy implementation in China (Rong, 2013). It manifests as a series of assessment, standard, and incentive measures to ensure that the work of lower-level government focuses on the policies of the upper-level government (Rong, 2013). Lower-level officials cannot generally refuse their superior's commands. However, lower-level officials do not always submit to their superiors' "pressure" and sometimes adopt alternative strategies (Rong, 2013). In our case, under "pressure" from the mayor and the Secretary of Jiangmen's CPC Committee, ASC and other functional departments had to implement the leadership's decisions. The Jiangmen Information Industry Bureau collaborated with various functional departments to analyze the technical feasibility of the online approval system. In May 2001, the Jiangmen ASC and Guangzhou L High-tech Company signed the project contract.

Process

Different perceptions of the online administrative approval project. In this case, the stakeholders included local government leaders, ASC and functional department managers, and frontline employees. These stakeholders had different perceptions of the online administrative approval project (see Table 2). According to Wilson's (1989) categorization, local government leaders are considered as "executives"; "managers" include both ASC and functional department managers; and "operators" are frontline employees (Tan et al., 2016). Local government leaders, such as the Secretary of the CPC Committee and the Mayor of Jiangmen, evaluated the social benefits of the project and considered the application of information technology as a reform initiative and a personal achievement. The ASC managers considered it as a means to enhance organizational efficiency and their own statuses. The functional department managers aimed to avoid a loss of power and

Table 2. Perceptions of information technology.

	Local government leaders	ASC managers	Functional department managers	Frontline employees
Level	"Executives"	"Managers"	"Managers"	"Operators"
Focus	Political returns and social benefits	Department interest and status	Department interest and risk	Personal interest and input
Perceptions	Opportunity	Opportunity	Threat	Threat

interest. For example, they were worried that data sharing among departments may lead to the redistribution of resources. Frontline employees were more concerned about the learning cost of the new information system. As one of the interviewees said:

> What the mayor [was] concerned about were the overall effectiveness of the project and his political achievement. However, the department manager's concern was the department's interests, such as risks and benefits. For the frontline employees, they cared more about the accessibility of the technology rather than the project's benefits. Therefore, ranks determine thoughts. (Interview with the former deputy director Y)

Overall, the construction of the online administrative approval system was an opportunity for local government leaders and ASC managers but was a threat for the functional department managers and frontline employees.

Power relationships among the stakeholders. In China, government departments and agencies are organized through the so-called "*tiao-kuai*" system. *Tiao* refers to the vertical lines of authority over various sectors reaching down from the ministries of the central government; *Kuai* signifies the horizontal level of authority of the provincial or local government. Both systems are mutually dependent and constraining in policy implementation. On the one hand, a local functional department operates within a relatively closed, vertical system, with specific organizational rules and technical requirements. On the other hand, the local functional department relies heavily on the local government in terms of personnel appointments and financial resources. In this case, under the influence of the *tiao-kuai* system, relevant stakeholders had a complicated power relationship (see Table 3).

First, local government leaders are the "bosses" of the ASC managers but they need the ASC managers to implement the e-government policy. Second, administrative center managers and functional department managers are at the same administrative level. The ASC managers need the functional departments' support for human resources and information. The ASC managers also report to the local government leaders on the performance of the functional department managers in

Table 3. The power relationship of the stakeholders.

	Local leaders	Center managers	Department managers	Frontline employees
Local leaders		Weak	Weak	Weak
Center managers	Strong		Strong	Weak
Department managers	Strong	Weak		Weak
Frontline employees	Weak	Weak	Strong	

Note: Strong = strong interdependent relationship; weak = weak interdependent relationship.

the process of the construction of the information technology project. Third, local government leaders are also the "bosses" of functional department managers. Local government leaders have the power of personnel appointment and resource allocation, and need functional department managers to implement specific policies. Finally, there is no direct relationship between ASC managers and frontline employees. Frontline employees come from different functional departments but ASC managers report to the functional department managers on the performance of the frontline employees (Tan et al., 2016).

Strategic interactions among stakeholders. First, the support of local government leadership was one of the most important reasons behind the "success" of the project (Tan et al., 2016). Since the beginning, the project was listed as one of the key information technology demonstration projects in Jiangmen. On October 25, 2001, the Secretary of the CPC Committee of Jiangmen attended a meeting held by the ASC and stated that "the online approval system can enhance government efficiency and transparency, and all the functional departments must provide full support for the project. The evaluation will also account for every department and agency's performance in the project" (minutes of an ASC meeting in 2001). Meanwhile, with considerable support from local government leaders, the coordination work of the ASC managers became much easier. As one of the interviewees explained:

> Our government leaders made great contributions to the construction of the project. The Secretary of the CPC and the mayor visited ASC more than once. S, the executive deputy mayor, also made great efforts and coordinated a lot of work. The management committee of the ASC was still in operation at that time. S was the director of the management committee, and committee members included two other deputy mayors, director of ASC, and functional departments' leaders. The ASC management committee held one or two meetings per year to overcome implementation resistance within a short period of time. (Interview with deputy director C of ASC)

Second, to implement the decision of the main Jiangmen leaders, the ASC managers conducted a feasibility study of the online approval systems and signed a contract with Guangzhou L High-tech Company to build the system. In the

construction process, the ASC managers established a project supervision system and held weekly meetings with Guangzhou L High-tech Company. The director of the ASC said:

> The coordination among different departments in the implementation process is a tough task. However, with the support of the Secretary of the CPC Committee, it is no longer a problem. No departments dare to say "no" to the Secretary of the CPC Committee. For a new agency such as us, the support from the Secretary of the CPC Committee is very encouraging. (Interview with the director W of ASC)

Third, to a certain degree, support from the leaders placed pressure on functional department managers and frontline staff (Tan et al., 2016). If functional department managers did not actively participate in the construction process, they did not get recognition from the leaders and lost opportunities for personal promotion. As the deputy researcher from the Bureau of Land and Resources stated, "this project was directly ordered by the Secretary and the Mayor, and there was no way we could say 'No.'" The project was not a challenge for functional department managers and frontline employees when it came to technology. It did not involve system docking or exchanging information between the internal systems of functional departments and the new online administrative service system. The project created a network outside the functional department and only needed information input by frontline employees. It did not change the approval authority and the information resource ownership of the functional departments. As one of the interviewees said:

> Looking back, the project was not that complicated. All we needed was to establish a LAN system and set a workflow for information collection and distribution. It did not change the power and information resource structure of the functional departments. The department managers also supported the project. (Interview with C, associate director of ASC).

Performance: technology symbolization. As one of the key information technology demonstration projects in Jiangmen, the online administrative approval system was political in nature. The enthusiastic support from local government leaders gave the project "legitimacy" (Tan et al., 2016). The project did not jeopardize the core interests of the functional departments. The relevant departments still enjoyed their independence and a relative monopoly of some information resources. Therefore, the functional departments accepted this project. The acceptance did not imply complete support and recognition, but limited collaboration based on interest calculations under pressure from high-ranking officials. As one of the interviewees said:

> In fact, the project was performed under a special circumstance, when Jiangmen won the title of national informatization pilot city. The CPC secretary and the mayor were trying to establish a key project to demonstrate their ability and win the recognition of

Table 4. The number of applications, accepted cases, and completed cases from March to October 2002.

Month	Applications	Accepted cases	Completed cases
Mar	84	4	1
Apr	55	8	5
May	81	11	2
Jun	40	5	3
Jul	34	4	2
Aug	36	5	2
Sep	12	5	4
Oct	40	7	3
Total	382	49	22

> higher-level leaders and the whole society. Jiangmen leaders had very strong motivations. (Interview with G, Jiangmen Planning Bureau deputy director)

In this context, the ASC and functional department managers, as well as frontline employees, had temporary interests in common: to carry out local government leaders' commands and to cover the functional defects of the system. From March to October 2002, the online approval system received 382 applications. Of these, 49 were accepted, though only 22 cases were completed (see Table 4). Additionally, the total number of completed cases in 2002 was 3680. Therefore, the online completion rate was only 0.6%. Thus, most applications were still processed offline after the launch of the system, and the system did not produce the expected effect of improving efficiency. As one of the interviewees said:

> However, this [the online approval system] was completely different from what we are doing. We have another system to process applications. Applicants usually bring paper materials. The online items were only a demonstration system. When people came to visit, our staff would demonstrate the process but there was no significant effect. (Interview with deputy researcher from the Bureau of Land and Resource)

Conclusion

Based on a case study of an online administrative approval system in Jiangmen, China, this study explored the political mechanism behind the adoption and implementation of local e-government projects. We proposed a new framework for analyzing the adoption and implementation of local e-government projects that encompasses three aspects: environment (political institutions); process (perceptions of information technology, power relations, and strategic interaction); and performance. In an e-government project, the political environment shapes people's perceptions of information technology and provides motivations and

constraints for relevant stakeholders (Jun and Weare, 2011). Stakeholders choose different strategies based on their positions in the power structure, which influences the performance of the project. In this case, under the influence of the centralized decision-making system, the "promotion tournament," and the policy implementation "pressure system" in China, local government leaders, functional department and ASC managers, and frontline employees had different perceptions of the online administrative approval system. Local government leaders aimed to show their ambition and seek political achievement by initiating an innovative e-government project. ASC managers upheld local government leaders' decisions to improve the status of ASC. When the project did not jeopardize the core interests of the functional departments, subordinate functional departments and frontline employees agreed with local government leaders on the surface, being passively involved in the construction of the project. Finally, the project turned into a symbolic tool that did very little to improve government performance (Im et al., 2013).

In this study, we first proposed an integrated framework for analyzing the process of adopting and implementing e-government projects. Second, focusing on an understudied topic in the previous literature, this study analyzed the role of political institutions, political leadership, and power relationships among relevant stakeholders in adopting and implementing e-government projects, and demonstrated the adoption process and implementation mechanisms of a Chinese e-government project from the perspective of micro-politics. Third, this study introduced the concept of "technology symbolization" and contributed to the literature on the adoption and implementation of e-government projects by exploring the ways in which e-government can be used as a promotion tool for local officials. It also confirmed that e-government projects can enhance the reputation and image of local government and secure legitimacy from the public (Pina et al., 2010; Im et al., 2013). Fourth, this study presented the adoption and implementation process of e-government projects (more broadly, innovations in government) in an authoritarian political system and provided empirical evidence for cross-country comparison.

The study also has a few limitations. The online administrative approval system was built between 2000 and 2003, and the data were collected between 2010 and 2011. However, the case is still useful and relevant, and offers an opportunity to explore the political factors influencing the implementation of e-government projects. Since political institutions are relatively stable, the validity of this study is not affected. It also provided invaluable experiences for other cities and areas (e.g. those with a similar population and GDP). Further research can track the evolution of the online administrative service system in Jiangmen or can add more cases from different levels of government, different areas of China, or even other countries.

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Notes

1. An earlier version of this article was presented at the 17th Annual International Conference on Digital Government Research (dg.o 2016) and published in the conference proceedings. The authors then carefully revised the framework and discussion based on the valuable comments and suggestions from the reviewers and audiences of dg.o 2016, and then completed the current version.
2. See: https://publicadministration.un.org/egovkb/en-us/About/UNeGovDD-Framework

References

Ahn MJ (2011) Adoption of e-communication applications in U.S. municipalities: The role of political environment, bureaucratic structure, and the nature of applications. *The American Review of Public Administration* 41: 428–452.

Ahn MJ and Bretschneider S (2011) Politics of e-government: E-government and the political control of bureaucracy. *Public Administration Review* 71: 414–424.

Barbosa AF, Pozzebon M, and Diniz EH (2013) Rethinking e-government performance assessment from a citizen perspective. *Public Administration* 91: 744–762.

Berry FS and Berry WD (1990) State lottery adoptions as policy innovations: An event history analysis. *American Political Science Review* 84: 395–415.

Berry FS and Berry WD (1992) Tax innovation in the states: Capitalizing on political opportunity. *American Journal of Political Science* 36: 715–742.

Cassell M (2008) Why governments innovate: Adoption and implementation of open source software by four European cities. *International Public Management Journal* 11: 193–213.

Chen Y, Li H, and Zhou L-A (2005) Relative performance evaluation and the turnover of provincial leaders in China. *Economics Letters* 88: 421–425.

Crozier M and Friedberg E (1980) *Actors and Systems: The Politics of Collective Action*. Chicago, IL: University of Chicago Press.

Davis FD (1989) Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Q* 13: 319–340.

Etzioni A (1970) Power as a societal force. In: Olsen ME (ed.) *Power in Societies*. New York: The MacMillan Company.
Feeney MK and Brown A (2017) Are small cities online? Content, ranking, and variation of U.S. municipal websites. *Government Information Quarterly* 34: 62–74.
Fichman RG and Kemerer CF (1999) The illusory diffusion of innovation: An examination of assimilation gaps. *Information Systems Research* 10: 255–275.
Fountain JE (2001) *Building the Virtual State: Information Technology and Institutional Change*. Washington, DC: Brookings Institution Press.
Fountain JE (2008) Bureaucratic reform and e-government in the United States: An institutional perspective. In: Chadwick A and Howard PN (eds) *The Handbook of Internet Politics*. London and New York, NY: Routledge.
Gil-García JR and Pardo TA (2005) E-government success factors: Mapping practical tools to theoretical foundations. *Government Information Quarterly* 22: 187–216.
Hansen MB and Nørup I (2017) Leading the implementation of ICT innovations. *Public Administration Review* 77: 851–860.
Henning F (2018) A theoretical framework on the determinants of organisational adoption of interoperability standards in government information networks. *Government Information Quarterly* 35: S61–S67.
Ho AT-K and Ni AY (2004) Explaining the adoption of e-government features. *The American Review of Public Administration* 34: 164–180.
Im T, Porumbescu G, and Lee H (2013) ICT as a buffer to change. *Public Performance & Management Review* 36: 436–455.
Jun K-N and Weare C (2011) Institutional motivations in the adoption of innovations: The case of e-government. *Journal of Public Administration Research and Theory* 21: 495–519.
Kamal M, Weerakkody V, and Irani Z (2011) Analyzing the role of stakeholders in the adoption of technology integration solutions in UK local government: An exploratory study. *Government Information Quarterly* 28: 200–210.
Lee C-p, Chang K and Berry FS (2011) Testing the development and diffusion of e-government and e-democracy: A global perspective. *Public Administration Review* 71: 444–454.
Li H and Zhou L-A (2005) Political turnover and economic performance: The incentive role of personnel control in China. *Journal of Public Economics* 89: 1743–1762.
Liang Y, Qi G, Wei K et al. (2017) Exploring the determinant and influence mechanism of e-government cloud adoption in government agencies in China. *Government Information Quarterly* 34: 481–495.
March JG and Olsen JP (1984) The new institutionalism: Organizational factors in political life. *The American Political Science Review* 78: 734–749.
March JG and Olsen JP (1989) *Rediscovering Institutions: The Organization Basis of Politics*. New York: Free Press.
Meijer A and Bolívar MPR (2016) Governing the smart city: A review of the literature on smart urban governance. *International Review of Administrative Sciences* 82: 392–408.
Misuraca G, Codagnone C, and Rossel P (2013) From practice to theory and back to practice: Reflexivity in measurement and evaluation for evidence-based policy making in the information society. *Government Information Quarterly* 30: S68–S82.
Moon MJ (2002) The evolution of e-government among municipalities: Rhetoric or reality? *Public Administration Review* 62: 424–433.

Morgeson FV and Mithas S (2009) Does e-government measure up to e-business? Comparing end user perceptions of U.S. federal government and e-business web sites. *Public Administration Review* 69: 740–752.
Norris DF and Reddick CG (2013) Local e-government in the United States: Transformation or incremental change? *Public Administration Review* 73: 165–175.
North DC (1991) Institutions. *Journal of Economic Perspectives* 5: 97–112.
Pardo TA and Tayi GK (2007) Interorganizational information integration: A key enabler for digital government. *Government Information Quarterly* 24: 691–715.
Park CH and Kim K (2019) E-government as an anti-corruption tool: Panel data analysis across countries. *International Review of Administrative Sciences*. Epub ahead of print 11 April 2019. DOI: 10.1177/0020852318822055.
Pina V, Torres L, and Royo S (2010) Is e-government promoting convergence towards more accountable local governments? *International Public Management Journal* 13: 350–380.
Puron-Cid G (2014) Factors for a successful adoption of budgetary transparency innovations: A questionnaire report of an open government initiative in Mexico. *Government Information Quarterly* 31(Supplement 1): S49–S62.
Reddick CG and Frank HA (2007) The perceived impacts of e-government on U.S. cities: A survey of Florida and Texas city managers. *Government Information Quarterly* 24: 576–594.
Rogers EM (1962) *Diffusion of Innovations*. New York, NY: Free Press.
Rong J (2013) Pressure system (Yalixing Tizhi Yanjiu de Huigu, in Chinese). *Comparative Economic & Social Systems* 170: 1–3.
Savoldelli A, Codagnone C, and Misuraca G (2014) Understanding the e-government paradox: Learning from literature and practice on barriers to adoption. *Government Information Quarterly* 31(Supplement 1): S63–S71.
Shim DC and Eom TH (2008) E-government and anti-corruption: Empirical analysis of international data. *International Journal of Public Administration* 31: 298–316.
Tan H, Zhao X, and Zhang N (2016) Technology symbolization: Exploring the political mechanism of IT implementation in local e-government project. In: Kim Y and Liu M (eds) *Proceedings of the 17th International Digital Government Research Conference on Digital Government Research*. Shanghai, China: ACM, pp. 12–19.
Tolbert CJ and Mossberger K (2006) The effects of e-government on trust and confidence in government. *Public Administration Review* 66: 354–369.
Tolbert CJ, Mossberger K, and McNeal R (2008) Institutions, policy innovation, and e-government in the American states. *Public Administration Review* 68: 549–563.
Weare C, Musso JA, and Hale ML (1999) Electronic democracy and the diffusion of municipal web pages in California. *Administration & Society* 31: 3–27.
West DM (2004) E-government and the transformation of service delivery and citizen attitudes. *Public Administration Review* 64: 15–27.
Wilson JQ (1989) *Bureaucracy: What Government Agencies Do and Why They Do It*. New York, NY: Basic Books.
Wirtz BW and Daiser P (2018) A meta-analysis of empirical e-government research and its future research implications. *International Review of Administrative Sciences* 84: 144–163.
Wu J, Ma L, and Yang Y (2013) Innovation In the Chinese public sector: Typology and distribution. *Public Administration* 91: 347–365.
Yang K (2003) Neoinstitutionalism and e-government: Beyond Jane Fountain. *Social Science Computer Review* 21: 432–442.

Yang K and Rho S-Y (2007) E-government for better performance: Promises, realities, and challenges. *International Journal of Public Administration* 30: 1197–1217.
Yin RK (2003) *Case Study Research: Design and Methods*. Thousand Oaks: SAGE Publications.
Zhao X and Xu HD (2015) E-government and corruption: A longitudinal analysis of countries. *International Journal of Public Administration* 38: 410–421.

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