1 Introduction
The Rise of Digital Governance

The rise of digital governance is fundamentally powered by the new capabilities introduced by advances in information and communication technologies (ICTs) such as social networking platforms and services, smart phones/devices, internet of things (IoT), big data, and artificial intelligence. Citizens and governments around the world are witnessing an unprecedented level of connectedness, user involvement, mobility, usability, and personal computing power. The confluence of citizens' increasing demand to interact with government via a growing array of digital channels and governments' efforts to provide citizen-centric online services raises challenges to 21st-century public managers. The question is no longer whether we will engage in digital governance or not; the challenge is how modern public managers can best create public values via the implementation of strategic digital governance initiatives. Public managers need to first understand the context of digital governance as the initial step in addressing that challenge.

Transformational Development: Web 1.0, Web 2.0 (Social Networking Platforms), and Web 3.0 and Other Emerging Technologies

The rapid growth of the internet in the 1990s ushered in Web 1.0 to make information and service available to anyone with internet access. Participation on the internet has moved from the privilege of the few to a vast majority of populations in the developed world and a majority of the population in the developing world. In the United States, internet use among adults rose from 14 percent in 1995 to 72 percent by the end of 2005. This is a change from a one-in-six minority to a leading majority of 72 percent within a decade. The decade of 2005 to 2015 has continued to see a steady increase from 72 percent to 87 percent.[1] Since 2008, China has become the country with the biggest internet population with a total number of 384 million internet users reported in 2009.[2] By the end of 2010, the number climbed to 457 million according to statistics from the China Internet Network Information Center (CNNIC).[3] Within five years,

China has added another 200 million-plus internet users to reach 688 million internet users by the end of 2015 (CNNIC 2016). That is twice the total U.S. population. Globally, internet use has risen from less than 1 percent of the world population (0.4 percent) in 1995 to 14.7 percent in 2005. That constitutes an increase of 30 times in a decade. The second decade of 2006–15 has witnessed a move from 15 percent to close to half of the world population (47.5 percent).[4]

Starting in the latter part of the first decade in the new millennium, there has been a significant shift from Web 1.0 to Web 2.0, particularly marked by the growth of Facebook. Facebook, as the premium social networking site serving the United States and the world (with the exception of China), has seen exponential growth since 2006. In the United States alone, the number of active Facebook users jumped from approximately ten million in 2007 (*The Economist* 2010, 5) to 168 million in 2012,[5] which is more than a ten-fold increase in a five-year period. In 2016, the number has continued to climb to 191 million and has been projected to experience slight annual increases to 2021.[6] Facebook has reached the vast majority of the population in the United States with a total population of approximately 320 million in 2015 as estimated by the U.S. Census Bureau.[7]

The number of registered Facebook users outside the United States exceeded those in the United States as early as 2007 (*The Economist* 2010, 5) and became five times as large as the number of active users in the United States in 2012 based on information from a Facebook press release (Facebook 2012) and online statistics on users in other countries.[8] The count of active Facebook users passed the one billion mark as of September 2012 (Facebook 2012). In 2015, the number of active Facebook users exceeded 1.5 billion, which is close to five times the U.S. population (*The Economist* 2016a).

The social networking platforms in China have also experienced a phenomenal growth. The exclusion of Facebook from China warrants a separate discussion. According to the report from the CNNIC (CNNIC 2012), the number of registered users for social networking sites reached 244 million (more than all the Facebook users in the United States at the time) by the end of 2011. The number of Chinese users on social networking sites grew by 60 million from 2009 to 2011 (CNNIC 2012). More recently, the development and growth of WeChat, since its birth in 2011, have introduced two important features into social network sites: mobile dominant and all-inclusive service platforms. WeChat has grown from zero to over 700 million active users in less than five years. More impressive is its ability to offer all-inclusive features including advertising, e-commerce, digital content, online-to-offline services, and finance (*The Economist* 2016b, 50).

User-generated content is a main feature introduced in Web 2.0 that barely existed in the Web 1.0 world. In Web 1.0, web content was created by staff members of the organizations behind the official websites. News items, pictures, and documents were posted by the organization.

The growth of Web 2.0 has allowed users to generate and post comments on a blog or a Facebook page. Moreover, peer reviews and rankings have also become popular with products and services such as those seen at Amazon. com, Yelp.com, Angie's List, and various travel websites. In the realm of forming online communities, the Web 2.0 era has offered many free or low-cost tools for individuals to organize and promote awareness of shared concerns. This increasingly user-driven online participation has profound implications for digital governance where the scope, speed, and nature of citizen participation have changed significantly.

Interactivity is another defining feature of Web 2.0. Our social and professional interactions have reached a new level of interactivity given the convenience and pervasiveness of social media as well as smart mobile devices. Facebook users have generated 1.13 trillion "Likes," stamps of approval on online posts of others, since the launch of this feature in February 2009 (Facebook 2012). Users can get Facebook updates through e-mails that are available on their phones. The acquisitions of Instagram in 2012 and WhatsApp in 2014 further expanded Facebook's capability to perform as a social network platform that allows a single sign-on for an array of services and integrated user experiences (*The Economist* 2016a). There are newer possibilities for people to interact with one another through an integrated slew of media (texts, instant messages, photos, videos, etc).

Two of the newer possibilities for interaction are Twitter and LinkedIn. Twitter—with over 100 million active users reported in 2012[9]—can promote interactivity even more instantaneously because Twitter feeds are usually real-time responses to events. The spread of tweets usually follows a subscribed network of interested people who interact with one another. Twitter saw a 300 percent increase over a three-year period, with approximately 300 million active users in 2015.[10] People are increasingly connected professionally with networking sites such as LinkedIn. At the beginning of 2012, LinkedIn had over 150 million registered users.[11] Within a four-year period, the number of active users has doubled to 350 million based on a press release by LinkedIn in 2016 (LinkedIn 2016). Professionals tend to enjoy the ability to search for and connect with their colleagues, with the social network sites providing both connection recommendations and the ability to mobilize a network of professionals. Some people have coined this phenomenon as "hyper-connectivity." For more avid users of social media, the challenge is to keep up with the increasing speed and flow of information and growing expectations for social connectivity.

Both the amount of user-generated content and the level of interactivity are further fueled by the availability of smart mobile devices with a network or internet connection. The abilities of a smart phone to generate a post, take a picture, and shoot a video have continued to be improved. People with smart phones can easily make Facebook posts and upload pictures.

Moreover, the ability to share among friends in the same social circle and colleagues belonging to the same professional network has also increased dramatically with the ease of use of social/professional networking sites. An individual can interact with hundreds or thousands of people via Twitter feeds and Facebook posts. Mobility further feeds into interactivity. As of September 2012, Facebook had 600 million mobile users out of one billion active registered users (Facebook 2012). That accounted for 60 percent of active users. By the end of 2015, the number of active monthly mobile users had exceeded 1.4 billion, accounting for over 90 percent of all active Facebook users.[12] That is a 30 percent increase over (approximately) a three-year period.

The unprecedented growth of smart phone ownership rate among adults in the United States and around the globe created a device platform to enable innovative social networking platforms and shared economy services. In mid-2012, nearly 45 percent of American adults owned a smart phone based on information published by the Pew Internet and American Life Project.[13] The number climbed to 65 percent in 2015, a 20 percent increase in about three years.[14] Around the globe, half of the adult population owned a smart phone in 2015 (*The Economist* 2015). By 2020, it is estimated that approximately 80 percent of adults will have a smart phone (supercomputer) (*The Economist* 2015). Moreover, the growth of an ecosystem of applications as well as services geared toward mobile smart devices will continue to grow. For instance, Uber, as an example of shared economy, relies heavily on the availability and connectivity of smart phones.

Web 3.0 and emerging ICTs will continue to push the envelope of possibilities. One defining feature of Web 3.0 is a growing use of wireless access and networks. The fourth generation wireless network is capable of transmitting 1 gigabyte per second. The fifth generation wireless network will be ten times faster, reaching 10 gigabytes per second (*The Economist* 2016c). Coupled with the high penetration rate of smart phones, the development of the fifth generation wireless network will create an environment of mobile-first to mobile-only ways of accessing information and services. Another defining feature of Web 3.0 is the web as database. The combination of more machine-readable data available on the web with more sophisticated algorithms to process information will make the web into a database. In addition, Web 3.0 will have a growing impact on the IoT. As more and more devices are connected via the internet, Web 3.0 will continue to traffic from smart devices automatically sending information to provide service.

Emerging ICTs will continue to add value to business intelligence, personalization of service, efficiency, and decision-making. The growth of big data, along with big data analytics, is able to provide enhanced business intelligence that draws data from Web 1.0, social networking websites, and semantic web to understand the needs of clients and stakeholders.

The development and utilization of apps on smart phones with their growing penetration rate is likely to reach a new level of personalized service. Technologies for data visualization and augmented reality will increasingly aid in learning, situational awareness, and decision-making. Artificial intelligence powered by supercomputers and developments in machine learning have the potential to leverage big data to power personalized service and transform business processes. Although the specific technologies will likely evolve with new innovations, the values and supporting functionalities are likely to be enduring.

The evolution from Web 1.0 and Web 2.0 (social networking platforms) to Web 3.0 with other emerging technologies gives rise to a growing portfolio of information technologies rather than a replacement of the old with the new. The shift from Web 1.0 to Web 2.0 has not diminished the importance of websites and supporting databases and information systems in providing online information and services. Conventional websites with Web 1.0 features and backend databases are still the mainstay, as they provide a valuable service. People can find information about products, services, and basic contact information. Such websites do not require a high level of interactivity; the keys are availability and usability. These websites are also valuable in terms of online transactions, such as purchasing products and services online, powered by large information systems and databases. Despite this, semantic web (sometimes also called Web 3.0) is emerging. It is the concept of the web as databases, in which the computational power of modern software programs and algorithms can answer your questions with credible sources of information rather than giving you a large number of hits on documents for you to sift through. The emerging technologies on big data analytics and visualization all build on the quality and amount of data collected via Web 1.0 and Web 2.0 (social media platforms).

The adoption of ICTs by governments typically follows the trajectory of the private sector with a cautionary period of observation for innovative ICTs to become mature, stable, and cost-effective. After a decade of rapid growth in internet technologies and e-commerce, local governments in the United States have reached an 83 percent website adoption rate based on the International City/County Management Association (ICMA) 2000 e-government survey (Norris, Fletcher, and Holden 2001). The adoption rate continued to rise in the early 2000s to 91 percent by the end of 2004 (ICMA 2004). Although the rise in website adoption was significant in the late 1990s and early 2000s, the growth in the adoption of online transaction services and more sophisticated informational and transaction services had been relatively slow (Norris and Moon 2005). In 2011, the website adoption rate reached 97 percent. Nonetheless, the progression in more advanced features and the intensity and scope of utilizing these features have been more limited and incremental in nature (Norris and Reddick 2013).

Governments in the United States have gradually adapted to the growing utilization of Web 2.0 tools. The Open Government Initiative emphasizes collaboration and participation as two of its three pillars. The IdeaScale Project is a collaborative project between government and citizens with citizen-generated and ranked policy ideas on a government-hosted website with Web 2.0 features such as posts, comments, and votes. "Challenges and Prizes" programs solicit citizens' and organizations' input on policy challenges, which allows direct participation and collaboration among these individuals and organizations. State governments also have embedded social media features on their websites, such as a Facebook presence, Twitter feeds, and more. At the local level, 67 percent of local government has a social media presence based on a 2011 ICMA national survey of local governments in the United States (ICMA 2011). Facebook was the main social media of choice for those U.S. local governments responding to the survey. Moreover, at the federal level, major U.S. agencies all have a strong social media presence to advance their public service mission—including science exploration, education, transportation, human services, and public health (Mergel 2013). All these efforts reflect a growing recognition that governments need to engage citizens online where they meet (i.e. social media platforms) and adopt a more citizen-centric communication and service model—as characterized in Chang and Kannan (2008) and Goldsmith and Crawford (2014) and exemplified in the e-participation cases documented by Leighninger (2011) as well as in the social media examples mentioned in Zavattaro and Bryer (2016).

Governments around the world have also moved to a more connected governance model. Connections are between organizational and individual members in all sectors of society, including the public (government), nonprofit, and private sector, though emphasis has been placed more on citizens. The United Nations' 2008 E-Government Report captured the notion of connected governance to highlight e-participation as a way to strengthen connections between government and citizens via online channels. The e-rulemaking in the United States allows citizens to comment on a proposed piece of regulation electronically, which allows e-policymaking. The exponential growth in the use of microblog and social networking services (i.e. WeChat) by Chinese governments and public officials in recent years also signifies a move to a more connected governance model.[15] Another example of online connected governance is the Korean e-people portal. This award-winning portal allows a one-stop portal for citizens to register complaints with government, encompassing all relevant central and local government offices.[16]

Moreover, the overall conclusion of the United Nations' 2012 E-Government Report further underscores the need to transform public governance via ICT to promote synergy and coordination among tiers and units of governance structures for "inclusive sustainable development" (United Nations 2012). These findings direct our attention to the synergy

and connections needed while interacting with citizens, non-profits, and businesses in the public sector. Integration of government units and systems is required to move to the highest level of e-government (Chen and Hsieh 2009). An example of such integration at the local level is the use of citizen service information systems, known as 311 systems in the United States, as the number to call for all citizen-related services. This 311 system requires the integration of various city departments, or even independently-elected commissions, to integrate their service information and business systems. The integration of healthcare services as seen in England's National Health Service is an example of a highly integrated information system for healthcare.

The United Nations' 2016 E-Government Survey highlights major trends in the use of ICTs by government (United Nations 2016). The use of social media and social networking services has continued to grow and, in some areas, has become the dominant channel of communication between government and citizens. The increasing use of smart phone and mobile devices has introduced many opportunities for government to provide citizen-centric and personalized information and services. In addition, the growth of open data and collaborative governance ushered in a new level of participatory governance. Overall, there is a heightened level of pursuit of public values such as inclusiveness, transparency, and accountability (United Nations 2016).

Digital Governance for Creating Public Values

The overall goal of digital governance is the creation of public values; one such overarching value is sustainability. The United Nations' E-Government Survey reports have articulated the important role that e-government plays in supporting sustainability (United Nations 2012). More specifically, e-government needs to bridge digital divide to provide digital opportunities for vulnerable populations to promote sustainable development. In addition, e-government needs to promote participatory governance as well as prioritize the value of transparency and accountability to foster sustainable good public governance (United Nations 2016).

Inclusiveness is also an important public value, which embodies the notion of social equity (Moore 1995). Inclusiveness deserves special attention in digital governance due to the inherent challenge of digital divide. Such a divide exists both in the general population—between those who have the technology and skills and those who do not—and in various units of governments between those who possess and utilize technologies and those who do not. Digital divide has multiple dimensions, including education, skills, culture, etc. (Mossberger, Tolbert, and Stansbury 2003). The advances of Web 2.0 and smart mobile devices have introduced new types of digital divide between those who can access and utilize these sites and devices vs. those who cannot. Promoting digital inclusiveness needs to

address various forms and sources of digital divide. In addition, this value of inclusiveness is a distinctively public social value (Friedland and Gross 2010). Government is designed to serve everyone. In contrast, businesses are driven primarily by profit and by serving their selected customer base.

Additionally, accountability is another important public value. A broad notion of accountability includes efficient and effective use of public resources to advance the welfare of the public. Government can be accountable to citizens for the taxes collected by realizing efficiency gain as the result of introducing e-government functions that shorten the time and effort to obtain government information and services. Effectiveness in addressing complex public problems via the use of ICTs is also about advancing public accountability. Moreover, transparency is an important aspect of accountability (Koppell 2005). Citizens and other stakeholders need to be informed about government operations before they can hold government accountable for those actions.

The advances of ICTs offer opportunities for government to realize sustainability, inclusiveness, and accountability. At the community level, utilization of geographic information systems can aid in understanding the impact of various development proposals on the economy, public finance, transportation, public safety, and the environment. Analytics also shed light on complex interactions between various systems and trade-offs between competing policy objectives. Inclusiveness can be accomplished by the combination of providing broadband access to disadvantaged communities and offering training to bridge the skill gap. Moreover, increasingly user-friendly, powerful, and connected mobile devices can empower a human agent to include all members of a society. E-government is about promoting accountability in managing public resources via the use of ICTs. Online tax filing, online citizen service information systems, online license renewal, among other capabilities, are efforts to provide efficient and effective public services. Making budget and government performance information accessible online is one of many ways to provide virtual accountability to the public.

Digital Governance

Definition of Digital Governance

Digital governance is the use of ICTs to promote public values via government-led initiatives inside government as well as external collaboration among key stakeholders in the public. Defining digital governance in this way emphasizes inclusivity in the ICTs deployed. A more conventional definition of e-government tends to focus only on the internet and websites. The growth of cellular phones and mobile devices allows for interactions and transactions, such as text alerts, without the need for internet access (Bryer and Zavattaro 2011). These technologies also include

location-based services and intelligent transportation systems beyond information searches and transactions with governments on their official websites.

Next, this definition places its primary focus on the creation of public values via collaboration. This notion first brings strategic focus to the creation of public values and return on investment. At the same time, utilization of collaborative methods reflects the reality that public services are increasingly produced and delivered via partnerships between organizations in public, private, and non-profit sectors. The participatory and collaborative features of Web 2.0 technologies facilitate such cross-boundary collaboration.

More importantly, this definition captures the central role played by public administrators/managers. The "government-led" notion of digital governance places public administrators/managers at the center of digital governance efforts. This perspective distinguishes itself from a focus on political campaigns utilizing ICTs that places political activities by political parties and election campaigns at the center. The notion of government-led conveys the ultimate responsibility of government to be accountable and is also broad enough to embrace a range of types of production and delivery of public services with collaborators from other governments, businesses, and organizations.

Dimensions of Digital Governance

Digital governance encompasses multiple dimensions that concern public managers/administrators: public values, mode of activities, role of government, and technology. The discussion later builds on the literature on e-government and e-governance. These dimensions of digital governance can best be understood by distinguishing the traditional notion of e-government and digital governance in the era of Web 2.0 and beyond. These distinctions should be treated as a matter of emphasis.

The core values of digital governance include efficiency and effectiveness as well as transparency, sustainability, and inclusiveness. For example, efficiency in service provision, such as electronic filing of tax returns that interfaces directly with citizens, is a core value promoted by e-government. Digital governance extends the list of core values to transparency, which further promotes citizen participation in generating and evaluating policy ideas. The list of core values also includes sustainability and inclusiveness, both of which play more central roles in digital governance than in a conventional notion of e-government.

The primary emphasis in digital governance, as compared to e-government, with regard to activities is integration and interaction. The integration emphasized by digital governance is vertical and horizontal integration in the public sector and across various sectors. In the public sector, digital integration involves inter-agency cooperation in the same governmental

unit (such as citizen service information systems) and inter-governmental collaboration across units at multiple levels of government (such as in the area of emergency management). Such integration happens inside government and takes a government-as-a-whole approach (Chen and Hsieh 2009). In addition, digital governance places increasing emphasis on solving public issues by means of intersectoral interactions that involve governments, non-profit (professional) organizations, and businesses. Interaction between government and citizens via online civic engagement is another feature of interactivity embodied in digital governance.

Digital governance ushers in a shift in the role of government in public service production and delivery from a government-centric role to one more invested in partnership or intersectoral collaboration. This trend is consistent with a society that has seen a gradual shift to increased utilization of businesses and non-profit organizations for service production and delivery (i.e. Gray et al. 2003; Milward and Provan 2000). Advances of ICTs make such collaborative networks increasingly easy to coordinate (Bryson, Crosby, and Stone 2015). The traditional notion of e-government puts government at the center of production and delivery of information and services online. A modern notion of digital governance introduces collaborative enterprises that bring government, businesses, non-profit organizations, and citizens together. This emphasis on collaboration and shared ownership is consistent with the need for engaging organizations and individuals from all sectors of a society to solve increasingly complex public problems. For instance, the development of technical data standards for standard business reporting in Australia has needed support from a host of sectors: businesses, professional organizations, and various government agencies. This collaborative consortium helped determine the data standards and how the standards are to be implemented, which, of course, benefits the entire economy (Chen 2010).

The technological emphasis of digital governance is the combination of telecommunication networks, smart mobile devices and applications, cloud computing, Web 2.0 technologies, and future internet. The share of the internet economy will continue to grow in the G-20 countries in the next few years, with three billion people (half of the total population) forecast to be online by 2016, according to the Boston Consulting Group (*Harvard Business Review* 2012). The growing capacity of telecommunications, especially wireless, has offered many opportunities for digital governance (*The Economist* 2016c). This increased capacity provides more and more residents with access to wireless digital networks via phones and/or other mobile devices in various countries, which makes digital communication an increasingly important part of interactions and public governance. For instance, residents of a community can report a neighborhood problem directly from their phones with location information attached for ease of reference.

Cloud computing represents a move from in-house provision of information technology (IT) services to ICT (software applications, web-hosting,

databases, e-mails, data analytics) as a service accessible in the cloud anytime and anywhere given an internet connection. The move to cloud computing calls for attention to managing IT resources outside a government agency and the implications of IT outsourcing for privacy and security. Web 2.0 technologies such as social networking, wikis, and "mash-ups" underscore the increasingly cross-sector, integrated, collaborative mode of digital governance. Social media allows for a high level of interactivity, not only between government and citizens, but also among citizens and with other non-governmental organizations. Another feature of Web 2.0 is the emphasis on user-generated content and leverage of collective knowledge. Advances in internet and other digital technologies will continue to enable digital governance. For instance, the developments in semantic web (Web 3.0) offer additional integration and interoperability of data on specific topics, also known as the web of things. The growth in big data and data analytics will also help bring tools to citizens to monitor government actions and for government to provide citizen-centric government information and services.

Managing Digital Governance

The mission of this book is to provide managers of public services with a conceptual framework for making informed digital governance decisions. Digital governance is a critical issue facing 21st-century governments and public service organizations around the world. We have witnessed recent rapid developments in Web 2.0 social networking technologies and growth in the adoption and use of mobile devices among an array of ICTs for public service and engagement with individuals and organizations in all sectors of a society. Although a number of edited volumes currently provide surveys of technological developments and e-government applications, few have offered an issue-focused, coherent framework for improving the management of digital governance. Publication on e-government and e-governance has grown steadily; however, it may be difficult for a reader to distill concrete knowledge to inform practice from these research articles or chapters. The coherent framework proposed in this book integrates research insights from a diverse body of literature and provides an integrated view of digital governance to aid in formulating a comprehensive strategy and in generating and implementing actionable recommendations.

This management framework of digital governance is grounded in a socio-technical perspective that puts IT deployment in a societal context. Garson (2006) has presented four theories on the relationship between IT and society: namely, technological determinism theory, reinforcement theory, socio-technical theory, and system theory. The empirical evidence has suggested the relevance of a socio-technical perspective that emphasizes the interactions between socio-organizational context and technology rather than one that emphasizes the domination of one over the other.

The deployment of ICTs should be framed in the dynamics of these inter-actions rather than developed in isolation from organizational, institutional, and political contexts (Fountain 2001; Ahn and Bretschneider 2011).

More specifically, this book's management framework is based on the notion that management actions matter in advancing digital governance. This notion is built on the technology enactment theory proposed by Fountain (2001), which underscores the active role played by organizations and decision-makers in deciding which technology to deploy and which objectives to achieve with that technology. This management framework also builds on the findings of the broad digital governance literature on digital divide and opportunities (i.e. Helsper 2012; Mossberger, Tolbert, and Stansbury 2003), open government and e-participation (i.e. Evans and Campos 2013; Fishenden and Thompson 2013), information and know-ledge management (i.e. Dawes 2010; Dawes, Cresswell, and Pardo 2009), e-government outsourcing and integration (i.e. Young 2007; Chen and Perry 2003; Scholl and Klischewski 2007), IT innovation management and leadership (i.e. Ahn and Bretschneider 2011; Ho and Ni 2004; Moon and Norris 2005), strategic and performance management (i.e. Yu and Janssen 2010; Dufner, Holley, and Reed 2003; Desouza 2015), and man-agement capacity-building (i.e. Ganapati and Reddick 2016; Melitski 2003).

Moreover, this framework draws from the theory and practice of digital governance in the United States as well as in countries around the world. This book's perspective, although grounded in the experience of the United States as one of the leaders in the field of digital governance, is global in nature. Special attention has been paid to Asia and Europe. For instance, a discussion of China is included to aid the understanding of major developmental forces in digital governance, given that it has the largest internet population in the world coupled with large and dynamic social networking platforms and services. The Republic of Korea, as the top ranked e-government country according to the United Nations' e-government surveys (United Nations 2010, 2012, 2014), also offers innovative digital governance practices. In addition, the experiences of European countries are informative in advancing digital governance, par-ticularly in the area of democratic participation, protecting personal data, and using ICTs to foster innovations in communities (United Nations 2016).

The issue-based approach to the management of digital governance adopted by this book is flexible to keep pace with rapid technological development. The core issues remain relatively stable while the technol-ogies are evolving. For instance, the challenge of digital divide is about digital inclusion via bridging not only the divide in technology but also in skills and orientation. Since this is the case, a digital inclusion management strategy should at least have both technology and training components. Similarly, the tension between information access/utilization and personal privacy is an enduring issue, and a management approach focusing on an enduring issue is likely to provide guiding principles that will be relevant to

new technologies. For instance, a risk management approach has been the mainstay for managing digital security. These issue-based management approaches and guiding principles will remain relevant for an extended period of time and be effective in managing a growing portfolio of ICTs developed in different eras.

In sum, this book offers management strategies that advance digital governance. Public administrators/managers can develop an overarching strategy that cuts across various issue areas such as digital inclusion, cyber infrastructure, integration, and open government. At the same time, they will gain the flexibility to focus directly on each issue area, as the book offers management strategies and practices for each of them. Moreover, this book incorporates an understanding of the larger political, institutional, and organizational contexts that public managers operate in while creating public values in digital governance. This management-focused approach is sustainable because even the newest technological innovations can be evaluated and placed in their issue-specific decision-making context.

Organization and Plan

This book focuses on the core issues that public administrators face when using ICTs to produce and deliver public service and to facilitate public governance. These issues include digital inclusion and opportunities, digital open government, information and knowledge management, citizen-centric ICT services, digital privacy and security, performance management of ICT, and ICT management capacity-building to address these issues. The organization of the book follows these core issues.

The next chapter, Chapter 2, provides a digital governance management framework that identifies and illustrates the main components. This framework integrates technical and institutional considerations (digital inclusion and digital infrastructure) with the objectives and strategies for creating public values. It also provides an overarching strategy for effectively addressing various digital governance issues and building long-term capacity to fully realize the potential of digital governance.

Chapter 3 discusses strategies for assessing and improving digital inclusion and opportunities. Such assessment includes studying the demographics of online vs. off-line populations as well as the factors determining the use of e-government. Public managers first need to know the degree of digital inclusion and the various factors affecting inclusion before formulating strategies for digital governance. This chapter then presents various strategies for digital inclusion and opportunities to bridge digital divide and enhance digital opportunities.

The focus of Chapter 4 is open government in the digital age. This chapter presents the main components of open government: transparency, participation, and collaboration. It also introduces pertinent institutions supporting open government, including laws, regulations, and policy

memorandums. More importantly, this chapter presents recent developments in open government and the open-data movement and proposes a management strategy for realizing public values embodied in open government.

Chapter 5 is on citizen-centric electronic services with a focus on cross-boundary collaboration and integration via ICTs. Providing citizen-centric electronic services constitutes an important goal of digital governance. This chapter outlines and discusses management issues facing the provision of citizen-centric electronic services, including integration of government information systems and sharing of data that bring agency-specific services together to serve individual citizens. Moreover, true citizen-centric electronic services require management strategies to work across levels of governments as well as across sectors (public, private, and non-profit) in the increasingly networked form of public services.

Chapter 6 addresses the challenge of managing information and knowledge for digital governance. This chapter begins with an introduction of the main concepts as well as policies and principles of information and knowledge management. It then focuses on knowledge management for digital governance with regard to processes and management principles. Against the backdrop of recent developments in big data and data analytics, this chapter concludes with overarching leadership and management strategies to further advance information and knowledge management for digital governance.

Chapter 7 introduces the issues and challenges associated with digital privacy and digital security. This chapter focuses on the laws and regulations that govern the protection of digital privacy and digital security. Moreover, it offers a management strategy for protecting digital privacy with the combination of institutional and technical solutions. For digital security, this chapter outlines a comprehensive risk management approach with various components for risk minimization.

Performance management of ICTs is the focus of Chapter 8. This chapter describes human, technological, and financial resources that need to be invested in so as to improve performance. The discipline of project and program management, especially with agile methodology, provides the structure and processes for successful development and implementation of digital governance projects. Moreover, this chapter offers a digital governance performance management strategy. This strategy embodies the principles of being stakeholder-focused, strategically aligned, data and outcome driven, user-centric, and agile.

Chapter 9 provides a list of core management competencies for digital governance and strategies for developing them. Building relevant management capacities is critical for succeeding in implementing the issue-based management framework proposed in this book. This chapter also outlines a strategy for building relevant management capacities such as strategic IT planning, development and implementation of technical

standards, evaluation of digital governance projects, cross-boundary collaboration, civic engagement, risk management, etc. The focus is on building the capacity to provide systems and processes for successful digital governance implementation.

The concluding chapter, Chapter 10, summarizes the main points of the book and highlights the unique challenges and opportunities of 21st-century digital governance. Challenges lie in public managers' ability to keep pace with the advent of Web 2.0, Web 3.0, and mobile devices and to serve an increasingly online and diverse group of stakeholders as well as maintain traditional channels of communication because governments serve everyone, including those who do not have access to technology and/or the internet. At the same time, opportunities for managers delivering high-impact digital governance abound. High-quality, personalized citizen-centric services are possible with the integration of disparate sources of government information and utilization of emerging technologies to create value for citizens. Engagement with citizens and other stakeholders (businesses, non-profits, civil groups) provides governments with opportunities to collaborate with them to solve complex public service problems.

Notes

1 The source of statistics is the Pew Internet and American Life Project. More details are available on www.pewinternet.org/data-trend/internet-use/internet-use-over-time/, accessed September 2, 2016.
2 The statistics are based on the number available in an article published by the Pew Internet and American Life Project, www.pewresearch.org/fact-tank/2013/12/02/china-has-more-internet-users-than-any-other-country/, accessed September 2, 2016.
3 More details, see cnnic.com.cn/IDR/BasicData/, accessed September 1, 2016.
4 More details, see www.internetworldstats.com/emarketing.htm, accessed September 2, 2015.
5 Source of data: www.socialbakers.com/facebook-statistics/, accessed July 20, 2012.
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14 For more details, visit www.pewinternet.org/2015/04/01/us-smartphone-use-in-2015/, last accessed July 29, 2016.
15 In China, the number of microblogs surpassed the 50,000 mark by the end of 2011, with the growth in 2011 alone exceeding 25,000 (Chinese Academy of Governance 2012).
16 For details, visit www.epeople.go.kr/jsp/user/on/eng/whatsnew.jsp, accessed July 20, 2014.

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