

Enhancing Digital Government: A Roadmap for Standardization, Coordination, and Collaboration

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Abstract: Digital government has become a global trend in recent years, with countries and regions around the world utilizing digital technology to transform their organizational structure and production methods. However, the development of digital government is not without its challenges. Key issues are the lack of standardization and coordination in technical organization, which adversely affects the development of digital government. To address this issue, this paper recommends establishing a corresponding standard technical organization that will coordinate the work of digital government. This organization will ensure that the development of digital government standardization work is consistent, effective, and up-to-date with the latest technology advances. In addition to improving standardization and coordination, this paper also emphasizes the importance of collaboration between different technical committees across industry management, public services, market supervision, and digital government-related standards organizations. By ensuring that business connections are orderly and effective, a joint force can be formed for digital government construction. Furthermore, a mechanism for evaluating and verifying digital government standards will be established to guarantee their successful implementation. The paper also highlights the importance of ensuring that the development of important standards is done well. This requires a comprehensive understanding of the needs of different stakeholders, including citizens, businesses, and government agencies. It also requires a commitment to continue to improve and innovation, as digital technology continues to evolve at a rapid pace. Overall, this paper provides a roadmap for enhancing digital government through standardization, coordination, and collaboration. By following these recommendations, governments can ensure that their digital government initiatives are effective, efficient, and responsive to the needs of their citizens and businesses.

Keywords: Digital Government; Standardization; Coordination; Collaboration; Technical Organization.

1. Background of Digital Government

1.1. Global Competition

Digital reform is a process that utilizes digital technology as a foundation to transform the organizational structure and production methods of an entity [1]. The government's digital reform initiatives have a significant impact, not only on the government but on the community at large, particularly in the era of globalization and digitalization. Various countries and regions, such as Europe and the United States, have already begun exploring digital government construction [2]. For instance, the European Union introduced relevant policies since 2003, focusing on open data acquisition, which has led to an increase in transparency and accountability [3]. The British digital government policies emphasize providing public services electronically and narrowing the digital divide, which ensures that people living in rural areas have access to the same services as those in urban areas. In Japan, digital government construction prioritizes infrastructure construction, personnel training, administrative reform, and solving social problems through digitization. Meanwhile, South Korea focuses on building e-government, integrating public data, and expanding data openness. Its short-term goal is to take advantage of the next generation of network technology and create a more efficient and effective government [4].

As of 2022, the Chinese government's Comprehensive Deepening Reform Committee stressed the importance of using digital technology to transform its functions and provided clear guidelines for necessary business and technical

objectives for digital government construction [5]. With information technology continuing to develop rapidly, global digital government construction serves as a reference, and China's unique circumstances demand even higher standards for digital government construction. Enhancing the construction of digital government is crucial for improving administrative efficiency, optimizing resource allocation, promoting innovation and development, and, most importantly, enhancing international competitiveness [6]. In the future, increased collaboration between governments and the private sector could lead to even more transformative digital reforms, ushering in a new era of innovation and progress. For example, digital reform can help reduce the environmental impact of government activities, create new jobs in the tech industry, and improve public services through better data analysis [7]. Furthermore, digital government construction can enable the government to better respond to crises, such as natural disasters or pandemics, by quickly disseminating information and coordinating resources. Thus, it is essential to continue to invest in digital government construction to maximize its benefits and create a more efficient and responsive government for the future [8].

1.2. Standardization

Standardization is an essential factor that plays a crucial role in building a digital government that is efficient, reliable, and transparent. It encompasses a wide range of norms, guidelines, and practices that are essential for managing resources, platforms, data, applications, and evaluation [9]. By establishing a common framework for digital government, standardization ensures consistency, interoperability, and

quality of services. In a digital government, standardization work is wide-ranging and important. Without it, there would be inconsistencies in the services provided by different agencies, making it more challenging to implement effective governance. Standardization allows for a more streamlined process, promoting the use of uniform systems, and reducing the potential for errors in the delivery of services [10].

As the implementation of digital government and the "decentralization, regulation, and service" reform continue to progress, new approaches and technologies are being developed and utilized to enhance the effectiveness and efficiency of public services [11]. These initiatives include "one trip maximum," which AIMS to Reduce the number of bucrator Steps required for citizens to accessed public service, "One Thing at a Time," Which Promotes the Simplification of PR. OceDures, "Cross-Provincial Collaboration," Which Streangthens Cooperation Between Regions, and "Comprehensive Supervision," " which ensures that all government services are delivered with a high level of quality [12].

In the modern era, digital government has taken on a broader meaning as technology, business, and data are integrated to improve coordination across levels, regions, and systems. The development of digital government requires not only the use of advanced technologies but also the establishment of comprehensive systems and mechanisms to ensure that all stakeholders can benefit from it fully [13].

This includes the development of digital infrastructure such as high-speed networks, cloud computing, and big data analytics, as well as the implementation of digital governance frameworks such as data privacy, cybersecurity, and digital ethics. These frameworks are essential to ensure that the digital government operates in a safe, secure, and ethical manner [14]. So, the standardization is a critical component of digital government that ensures the quality, consistency, and interoperability of services. The ongoing development of digital government requires a comprehensive approach that leverages advanced technologies, establishes robust government ance frameworks, promotes collaboration among stakeholders, and ensures the safety and security of citizens' data. By doing so, digital government can achieve its goal of providing efficient, reliable, and transparent services to its citizens and businesses [15].

2. China's Digital Government Standardization Development

China's digital government initiative began in 2002 with the issuance of the "Guiding Opinions of the National Information Leading Group on China's E-government Construction". The initiative has gone through three phases: e-government (2002–2016), "Internet + government services" (2016-2022), and digital government (2022-present). The standardization work for the digital government can also be divided into three stages [16].

2.1. E-government Stage

In recent years, the emergence of new technologies has revolutionized the way governments operate, communicate and provide services to their citizens. As a result, e-government has become increasingly important for countries worldwide, and standardization has become an essential factor for its success [17].

In January 2002, the "E-government Standardization

General Group" (469-dzzw) was established in Beijing by the former State Council Information Work Office and the National Standardization Management Committee. The group aimed to standardize e-government and improve its effectiveness [18]. To achieve this, they created the "E-Government Standard System" and "E-Government Standardization Guidelines". These documents explained the importance of standardizing e-government and the benefits it could bring, outlined the organizational structure and working ideas for standardizing e -government, and provided a management method for e-government standardization projects [19].

During this time, the group developed over 30 key standards supporting the e-government intranet and extranet based on the first phase of the national e-government standard system construction project. These standards offered strong guidance for the basic construction of e-government, ens the time consistency and efficiency in processes [20]. Currently, the focus of standardization efforts in national digital government is on fundamental e-government initiatives. These initiatives include government online projects and the integration and sharing of government information resources. National standards have been released to support these initiatives actives, such as those pertaining to the overall design of e-government systems, basic terminology, the format of electronic official documents, and the directory and exchange system for government information resources. These standards are essential to ensure a smooth and efficient operation of e-government initiatives and guarantee the public's Satisfaction with the provided services [21].

Moreover, the standardization of e-government initiatives also helps to promote transparency, accountability, and accessibility in government operations. By establishing standards for e-government, governments can ensure that their services are accessible to all citizens, regardless of their location or ability to access technology. Additionally, standardization ensures that data is collected and processed accurately and efficiently, allowing governments to make better decisions and improve services. As technology continues to evolve, it is essential to keep e-government standards updated and relevant to meet the evolving needs of society. Governments must continue to collaborate and work towards standardization efforts to ensure the success of e-government initiatives and provide efficient and effective services to their citizens [22].

2.2. Internet + Government Service Stage

Between 2016 and 2018, the Chinese government introduced a series of guidelines and plans aimed at accelerating the integration of internet technology with government services. This move was part of a larger strategy to establish a national online government platform, improve the technology Nical system, and standardize the overall framework, data, application, operation, security, and management [23]. The ultimate goal was to unify the standards, interconnect the various government service platforms across regions and departments, and enable data sharing and business collaboration.

The government's efforts to standardize digital government construction have been closely tied to the implementation of "Internet + government services" since 2016. At present, the national-level digital government standardization work is characterized by overall coordination and accelerated integration [24]. This can be summarized as the gradual

standardization of management and the gradual refinement of business.

In terms of management, a standardized coordination mechanism was defined, and a standard system was gradually established. This involved establishing a national online government platform and integrating various government service platforms across regions and departments [25]. The government coordination attested efforts to improve technical systems, data management, security, and overall framework. These efforts have also involved the standardization of various aspects of the system, including data, security, and management. In terms of business, the government has enriched single-point applications like electronic certificates and unified identity authentication one by one [25]. This has involved the construction of seven major components with their related standard subsystems. The government's efforts to standardize digital government construction have been extensive and multifaceted, with a focus on establishing a unified and coordinated national platform [26].

In 2020, several Chinese government agencies jointly released the "Guidelines for the Construction of the National E-Government Standard System." The document outlines the objectives of the Central Cyberspace Affairs Commission to establish a unified coordination mechanism for telecommunications government affairs and to standardize construction management [27]. The current e-government affairs standard system has already been established, and the document proposes the standard subsystems of government data open sharing, public data resources development and utilization, electronic documents, and "Internet + government affairs". s and the overall system are interdependent and coordinated with one another [28]. Moving forward, the government will continue to refine and improve these systems, with the ultimate goal of enhancing data sharing, collaboration, and efficiency across all levels of government. The government's efforts to streamline and standardize digital government construction have been extensive, and they continue to prioritize the implementation of "Internet + government services" to enhance the overall efficiency and effectiveness of government services [29].

2.3. Digital Government Stage

In recent years, China has been making great strides in its efforts to modernize its government systems by harnessing the power of digital technology. The country has recognized that it needs to keep up with the rapidly changing global landscape, and that digital transformation is key to achieving its goal of becoming a leading global power. One of the most significant initiatives in this direction has been the creation of "digital government standardization"[30].

This initiative was born out of the "National Standardization Development Outline" released in 2021. The document emphasized the importance of standardizing administrative management, social governance, and digital society. The Chinese government recognized that standardization was essential to promote interoperability between different systems, and to create a more efficient and effective government [31]. Building on this foundation, the State Council released the "Guiding Opinions on Strengthening the Construction of Digital Government" in June 2022. These guidelines set out specific tasks related to standardization, emphasizing the importance of reform leadership and overall coordination in the digital government standardization work. The work will require systematic

planning and continuous improvement, including the advancement of technology, business, and data integration [32]. During the process of transforming government functions, China's digital government standardization work will prioritize standardization between laws and regulations and information technology. The ultimate goal is to meet the needs of the digital society, digital economy, and digital government through continuous improvement and the provision of high-quality standards [33].

Looking ahead to 2023, the China Electronics Standardization Institute will lead the development of a digital government standard framework. This framework will create key standards that drive the digital government standardization reform [34]. The framework and accompanying standards will help to ensure that digital government standardization practices are implemented consistently across the country [11]. By doing so, the government hopes to improve the efficiency and effectiveness of administrative services, promote information sharing, and ultimately provide better services to the public. As part of the digital government standardization work, China is also investing heavily in the development and implementation of emerging technologies such as blockchain, artificial intelligence, and the Internet of Things [1]. These technologies have the potential to transform government services by improving efficiency, reducing costs, and enhancing transparency. In particular, blockchain technology is being used to improve the management of public information, while artificial intelligence is being used to analyze data and provide personalized services [35].

Overall, China's digital government standardization work represents a major step forward in modernizing the country's government systems [4]. By harnessing the power of digital technology and implementing high-quality standards, the government hopes to provide better services to the public, promote economic growth, and enhance overall social stability. The successful implementation of these initiatives will not only benefit China, but will also serve as a model for other countries looking to modernize their government systems [36].

3. The State of Digital Government Standardization

3.1. National Standard

Digital government is an essential aspect of modern governance, and standardization is crucial to its success. The Technical Committee (TC28) for National Information Technology Standardization, Technical Committee (TC594) for National Administration and Service Standardization, Technical Committee (TC260) for National Information Security Standardization, and National Electronic Business Standardization Technical Committee (TC83) are some of the organizations responsible for standardizing digital government in the country [37].

Together with domestic technical organizations, they have created 119 national standards that set the benchmark for various aspects of digital government. These standards cover a wide range of areas, mainly focusing on basic general standards, such as terminology, evaluation, and reference models, as well as key support such as data fusion, common support platforms, and cross-system interactions. Additionally, standards for technology and platforms, security system frameworks, and information security guidelines have

also been established [15]. The emergency business and application standards have also been included in the creation of these national standards. For instance, personal health information codes and the basic requirements of the national integrated government service platform One Netcom Office have been released. Furthermore, efforts have been made to ensure that these standards are up-to-date and relevant, with relevant organizations compiling and releasing 101 national standards to date [8]. The implementation of these national standards has become a crucial technical foundation for digital government planning, construction, and evaluation in various areas. They have played a normative role by setting the benchmark for various aspects of digital government, ensuring that the systems and services are reliable and efficient. This, in turn, has fostered public trust in digital government services, which is essential for their long-term success [38].

However, the standardization of digital government is an ongoing process, and the government should continue to invest in it. This investment should focus on ensuring that these standards remain up-to-date and relevant, with emerging technologies being taken into account [12]. Additionally, there should be a concerted effort to ensure that these standards are widely implemented at all levels of government. This will ensure that digital government services are accessible to all citizens, regardless of their location or socio-economic status [19]. Therefore, the standardization of digital government is crucial for ensuring that these services are reliable and efficient. The efforts made by relevant organizations, together with the government's investment in this area, have played a vital role in fostering public trust in digital government services. The government should continue to invest in this area, ensuring that these services remain accessible, reliable, and efficient for all citizens [39].

3.2. Industry Standard

With the growing trend of digitization, governments worldwide are adopting digital means to provide efficient and effective services to their citizens. Digital government, also known as e-government, has become the new norm as it brings various benefits, including increased transparency, better accountability, and reduced costs. To achieve this, governments must employ digital government and e-government standards that align with the unique needs of various industries [40].

Currently, there are 14 active digital government and e-government standards that apply to various industries, including transportation, communication, surveying and mapping, public security, archives, civil affairs, and water conservation. The use of these standards ensures that the government informatization process is efficient and effective. It is worth noting that most industries have established their own standards for data governance and utilization related to government informationization [22]. These industry standards are closely linked to digital government's five major functions, which include public services, administrative management, legal supervision, and digital regulation. For instance, public security and market supervision standards are closely linked to digital government's functions of public services, administrative management, and digital regulation [21]. Land management and justice standards are closely linked to digital government's functions of legal supervision and digital regulation. Finally, civil affairs and medicine standards are

closely linked to digital government's functions of public services and digital regulation [41].

As technology advances, digital government and e-government standards also need to evolve to keep up with the latest trends and best practices. The development of these standards should be an ongoing process to ensure that they are relevant and up to date. Governments must collaborate with relevant stakeholders from various industries to develop these standards in an inclusive and participatory manner [8]. This will ensure that the standards are tailored to meet the unique needs of each industry and are aligned with the government's overall objective of providing efficient and efficient services to citizens [42].

Additionally, the use of digital government and e-government standards is not only limited to efficient service delivery but can also be used to address various social challenges. For instance, digital government can be employed to enhance disaster management, reduce poverty, and improve healthcare delivery [33]. The use of digital government and e-government standards in addressing these challenges will facilitate the achievement of the United Nations Sustainable Development Goals. So, the digital government and e-government standards play a crucial role in the government informationization process [1]. The development of these standards should be an ongoing process, and there is a need for collaboration between the government and relevant stakeholders to ensure that the standards are Tailored to meet the unique needs of each industry [12]. Through this collaboration, the government will be able to achieve its goal of providing efficient and effective services to citizens while also addressing societal challenges and achieving the United Nations Sustainable Development Goals [43].

3.3. Regional Standards

The digital revolution in China has been nothing short of remarkable in recent years, with the government focusing on developing digital infrastructure across the country. One of the critical aspects of this development is digital government construction, which involves building systems and processes that enable citizens to access government services digitally. To achieve this, the Chinese government has recognized the need for standardization in digital government construction and is taking proactive steps to address the issue [33]. By 2022, 16 provinces, regions, and municipalities in China will establish standardization work organizations that will develop local regulations for digital government construction in their administrative areas. This move is in response to the central government's push for high-level promotion and top-level design [40].

The creation of these organizations is a significant development as it will help standardize digital government construction across the country. It will ensure that all regions adhere to a set of common standards and best practices. This, in turn, will help improve the quality and efficiency of digital government services provided to citizens [41]. The standardization work organizations will be responsible for developing regulations that cover a broad range of topics related to digital government construction [12]. These topics will include infrastructure implementation, project management, evaluation, supervision, and quality management of digital government systems [41].

In addition to the standardization work organizations, various local technical organizations responsible for

standardization at the provincial and municipal levels have already issued a total of 708 standards [12]. The standards cover a broad range of topics related to digital government construction, ensuring that all regions adhere to common standards [26]. It's worth noting that some regions have taken a unique approach to standardization that reflects their local circumstances and experiences with digital government construction [37]. This is a positive development as it shows that the government understands the need to adapt to local conditions while still adhering to national standards. Various organizations, including major associations, societies, and industry alliances, are actively investigating digital government-related standards. Currently, there are 62 national and local standards that have been released or are being researched [5]. The national government service platform, the national "Internet + Supervision" system, and the National Credit Information Sharing Platform are all being developed in-depth with the "Twelve Golds [42]."

The collaboration between nations, industry, and local standards has resulted in the release of 92 engineering standards. These standards form a coordinated and supportive standard ecosystem [9]. It's clear that China is making significant strides towards standardizing digital government construction across the country, and this is a positive development that bodes well for the future [15]. So, the standardization of digital government construction is critical to ensure that the country's digital infrastructure is robust and efficient. With the establishment of standardization work organizations, China is taking a proactive step towards achieving this goal continues to develop and expand its digital government services, it's essential that it does so in a manner that adheres to common standards and best practices [13]. The creation of a coordinated and supportive standard ecosystem will help achieve this goal and ensure that the country's digital government services are of the highest quality.

4. Discussion

The development of digital government standards is a critical aspect of public service delivery in the modern era [24]. Governments worldwide are adopting digital technologies to provide services to their citizens effectively, efficiently, and securely. However, the establishment of comprehensive digital government standards have been a challenge due to various factors [37].

One of the main challenges is the lack of coordination and unification among various technical committees responsible for digital government standards. This has led to the proliferation of local and engineering standards that are often inconsistent with each other, resulting in a considerable waste of resources [12]. A Robust technical organization dedicated to standardization and revision work should be established to address this challenge [10]. This organization should coordinate and unify the various technical committees to ensure that the development of digital government standards is comprehensive, effective, and consistent across different sectors. Another challenge is the inadequate supervision of publicity effects and limited updates of digital government standards. Although numerous organizations are involved in standardizing digital government, there is no national-level technical organization dedicated to standardization and revision work [41]. As a result, the development of digital government standards lacks the necessary insight and updates, which may hinder the effective implementation of digital government projects across different sectors [10].

In addition to these challenges, there is a lack of key standards for government affairs applications. The current standards primarily focus on guiding the development of digital government from a technical standpoint, including top-level design, government data, and basic support [41]. However, there is a lack of key standards for government affairs applications, which may lead to inconsistency and confusion in the implementation of digital government projects across different sectors [10].

Furthermore, the prevalence of advanced technologies such as artificial intelligence, blockchain, edge computing, and large-scale models has made it difficult to establish appropriate national standards for digital government promptly [16]. The delay in establishing appropriate national Standards for digital government may hinder the effective implementation of digital government projects and limit the potential benefits of digital technologies in public services delivery [13].

To address these challenges, it is crucial to establish a robust technical organization dedicated to standardization and revision work, coordinate and unify the various technical committees, and ensure the development of comprehensive and effective digital government standards. ms for publishing and implementing these standards, as well as tools for verifying their effectiveness, should also be improved to meet the practical needs of users [23].

Moreover, in the era of digital transformation, governments need to focus on innovation and development in the digital space. They should collaborate with industry players, academia, and other stakeholders to identify emerging trends and technologies that can enhance the delivery of public services [29]. Governments should also invest in research and development to stay ahead of the curve in the digital space.

Governments should also focus on capacity building to ensure that their workforce has the necessary skills and knowledge to leverage digital technologies effectively. This can include training programs, workshops, and seminars that focus on the latest digital technologies and their application in public service delivery [12]. In conclusion, the establishment of comprehensive digital government standards is critical to ensuring effective, efficient, and secure delivery of public services in the modern era. Governments worldwide face various challenges in establishing these standards, including the lack of coordination and unification among various technical committees, inadequate supervision of publicity effects and limited updates of digital government standards, and a lack of key standards for government affairs applications [28]. To address these challenges, governments should establish a robust technical organization dedicated to standardization and revision work, invest in research and development, focus on capacity building, and collaborate with industry players, academia, and other stakeholders to enhance innovation and development in the digital space [15].

Based on the existing research results, this study proposes a comprehensive set of recommendations aimed at enhancing the construction of digital government. The digital world is constantly evolving, and the government must keep up with the latest technological advances to provide efficient and effective services to its citizens. This requires a coordinated effort to standardize technical organizations, improve coordination mechanisms, and develop important standards.

The first step towards enhancing the construction of digital government is to improve the standardization of technical organization. Currently, there is an absence of a national-level

standardization technical organization, which adversely affects the development of digital government. To address this issue, the study recommends establishing a corresponding standard technical organization that will coordinate the work of digital government. This organization will ensure that the development of digital government standardization work is consistent, effective, and up-to-date with the latest technology advances.

The second goal is to improve the standard coordination mechanism. This can be done by enhancing the liaison mechanism of cross-field professional standardization technical committees and strengthening horizontal coordination between technical committees across industry management, public services, market supervision, and digital government-related standards organizations. By ensuring that business connections are orderly and effective, a joint force can be formed for digital government construction. In addition to this, a mechanism for evaluating and verifying digital government standards will be established to guarantee their successful implementation.

Furthermore, it is important to ensure that the development of important standards is done well. This can be achieved by conducting research on digital government-related standards, covering topics such as framework systems, data governance, data element applications, cross-domain business collaboration, performance evaluation, and new technology applications. The goal is to create a comprehensive service model for government data sharing and business collaboration, ultimately helping to promote high-quality development in digital government construction. In addition to these recommendations, the study suggests the need for a comprehensive approach that involves all stakeholders. This includes government agencies, private sector players, academia, and civil society organizations. By working together, these stakeholders can share best practices, exchange ideas, and develop innovative solutions that will contribute to the development of digital government.

Overall, the study provides a roadmap for enhancing the construction of digital government. By implementing these recommendations, the government can improve its services, increase transparency, and promote citizen participation. The digital world is constantly evolving, and it is essential for the government to adapt and keep up with the latest technological advances. By doing so, the government can improve the lives of its citizens and make a positive impact on society.

5. Conclusion

The advancement of digital technology has revolutionized the way we live and work, and the government sector is no exception. Digital government has become a crucial aspect of modern governance, which is not only the result of technology and digitalization but also an essential way to transform government processes and create an efficient market and public administration. The use of digital technologies in government operations can lead to significant benefits, such as increased efficiency, cost savings, and improved customer service. However, to reap these benefits, it is essential to standardize digital government processes and ensure that they are in line with the best practices and international standards.

The standardization process in digital government involves the development of common frameworks, guidelines, and protocols for managing and implementing digital services and solutions. By reviewing the process of standardizing digital

government and analyzing current issues, it is clear that standardization is not just a reflection of the digital government process, but also a critical tool to address problems in digital government development. It enables governments to identify gaps in their digital infrastructure and services, streamline their processes, and ensure that they are consistently delivering high-quality services to the public.

Effective standardization can also lead to improved transparency and accountability in government operations. By establishing common standards and protocols for data management and sharing, governments can ensure that they are collecting and using data in an ethical and secure manner. This, in turn, can increase citizen trust and participation in the governance process, as they can be assured that their data is being handled with care and that the government is working towards their best interests.

In conclusion, the standardization of digital government is a critical tool for improving the overall construction and operational level of digital government and contributing to high-quality development. It is essential to continue efforts towards standardization, ensuring that digital government evolves sustainably and meets the needs of the people in the most effective way possible. By doing so, we can unlock the full potential of digital technologies and transform the way governments serve their citizens.

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