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Digital transformation in public services: Challenges of state administrative law in the era of 5.0

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Abstract

Digital transformation in public services offers increased efficiency, transparency, and accessibility, but also presents significant challenges in the context of State Administrative Law. Digital transformation in public services has become an urgent need in the Society 5.0 era, yet the implementation of Digital Public Infrastructure (DPI) in Indonesia still faces various structural and regulatory challenges. These challenges include regulatory adjustments to new technologies, uneven digital infrastructure, cybersecurity issues, and changes in organizational culture in government agencies. In addition, the issue of interoperability between government agency systems and the financing required for digital technologies is also a major concern. The protection of personal data and upholding the principle of good governance are important aspects that must be maintained in the digital administration process. This study aims to examine digital transformation in public services and the challenges of state administration in the 5.0 era. The methods used are literature study and normative analysis of legislation and government policies. With effective collaboration between the government, the private sector, and the community, it is hoped that these challenges can be overcome, so that digital transformation can provide optimal benefits for public services.

Keywords

Digital Transformation, Public Services, Implications, State Administrative Law Challenges

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Introduction

Digital transformation in government management has become crucial in the era of Society 5.0, an idea first proposed by the Japanese government. Society 5.0 seeks to integrate advanced technologies such as the Internet of Things (IoT), artificial intelligence (AI), and big data into all aspects of social life to achieve a balance between economic growth and the resolution of social issues [1].

In the era of rapid globalization, digital technology has become an essential element in almost all aspects of human life, including public services. Public services encompass all forms of activities carried out by the government or other public organizations to fulfill

the basic needs and rights of citizens in areas such as education, health, security, transportation, and administration [2]. These services are designed to simplify processes and enhance societal welfare by ensuring equal, effective, transparent, and accountable access. Public services involve direct interactions between the government and the community as well as the efficient management of resources and information to improve the quality of life for all members of society [3].

Despite the many benefits of digital transformation, several key challenges remain. First, the significant digital divide persists, with unequal access to technology and digital services across different social groups [4]. Second, citizen engagement in governance remains limited, resulting in low levels of public participation in decision-making processes that directly affect their lives [5]. Third, while digital technology can enhance transparency, its improper implementation may lead to new issues such as data privacy concerns and unequal access to technological benefits [6].

The integration of digital transformation into public services—referring to the use of information and communication technologies across operational and service aspects—has had a profound impact on the efficiency and effectiveness of government services. This transformation not only revolutionizes the way public services are delivered but also necessitates fundamental changes in the framework of state administrative law [7].

In many countries, the adoption of digital technologies in public services has contributed to greater transparency, accountability, and citizen participation. This is reflected in the development of e-government, smart cities, and other technological initiatives aimed at improving the quality of public services. Moreover, the application of information technology in bureaucratic processes has been a significant step toward improving accessibility and transparency in state administration [8]. Such legal reforms are intended to strengthen public trust in government and ensure that governance is carried out effectively and in accordance with the law. However, digital transformation also introduces new legal challenges that must be addressed [9].

One of the major implications of this transformation is the need to adapt state administrative law to keep pace with technological advancements. Existing regulations are often too rigid to accommodate the rapid evolution of technology, creating a gap between the legal framework and real-world practices. In addition, issues such as data protection, cybersecurity, and disparities in technological access between developed and underdeveloped regions present crucial challenges requiring careful consideration [10].

Data privacy has become increasingly significant as the amount of personal data processed by governments through digital platforms continues to grow. Misuse or leakage of such information could result in severe legal and social consequences. Cybersecurity is also critical, given the growing threats to government data and essential infrastructure. Furthermore, the digital divide—stemming from unequal

access to and proficiency with technology—demands solutions that are not only technologically advanced but also inclusive and equitable [11].

In Indonesia, digital evolution in public services has become a major government priority, as reflected in initiatives such as data management programs, the Electronic-Based Government System (Sistem Pemerintahan Berbasis Elektronik/SPBE), and the implementation of the electronic ID card (e-KTP). Nevertheless, numerous legal issues remain to be resolved to ensure that all citizens can fully benefit from digital transformation [12].

This research is essential in providing a deeper understanding of how digitalization can be leveraged to address issues such as digital inequality and limited public participation, as well as to improve transparency in governance. Moreover, the study offers practical insights for policymakers on how to implement advanced technologies effectively in order to build an inclusive Society 5.0. The findings are therefore not only academically valuable but also practically significant for improving public policy and governance.

This study contributes new innovations, including a comprehensive approach that combines literature review and case study analysis to provide a holistic picture of digitalization in governance. It also emphasizes the need for adaptive and inclusive policies to ensure that all segments of society benefit from Society 5.0. Furthermore, it highlights the importance of collaboration among government, the private sector, and society in the digitalization process—an essential element often overlooked in previous studies.

The urgency of this research lies in the need to address the digital divide and guarantee that digitalization remains accessible to all segments of society. Enhancing transparency and public participation is also crucial for building a more responsive and accountable government, which is particularly relevant in today's context of globalization and digitalization.

Method

This study adopts a normative legal research method, which is commonly referred to as doctrinal research. In this approach, law is conceptualized as what is written in statutes and regulations (law in books), and the analysis is directed toward examining its application and relevance within the context of digital transformation in public administration. The statutory approach is used to analyze legal provisions governing administrative law, digital governance, and the integration of technology in public services.

The data used in this research consist entirely of secondary data. These include primary legal materials such as legislation, government regulations, and official documents related to public administration and digitalization. Secondary legal materials, such as books, scholarly journals, and academic writings on e-government, administrative law, and digital transformation, are also utilized to provide theoretical and analytical

perspectives. Furthermore, tertiary legal materials, including legal dictionaries, reports, and credible online references, are employed to support and clarify the discussion.

The process of data collection relies on library research, which involves identifying, reviewing, and analyzing relevant legal documents and scholarly works. The data are then analyzed qualitatively, focusing on descriptive and normative interpretation rather than quantitative measurement. Through this qualitative analysis, the research aims to identify legal gaps, evaluate the adequacy of current legal frameworks, and formulate recommendations for adapting administrative law to address the challenges posed by digital transformation in public governance.

Results and Discussion

Implications of Digital Transformation in Public Services for State Administrative Law

The digital transformation of the public service sector has brought significant impacts on state administrative law. One of its most notable effects is the improvement of efficiency and effectiveness in state administration. With the implementation of digital technologies, many bureaucratic processes have become faster, more transparent, and less vulnerable to corruption. For instance, the use of e-governance enables public services to be conducted online, thereby reducing waiting times and lowering the costs typically associated with in-person services [13].

In addition to efficiency, digital transformation contributes to enhanced government accountability. Digital systems support more accurate and transparent recording and monitoring of administrative activities. Integrated and easily accessible data provide greater opportunities for both internal and external oversight. Accordingly, administrative regulations may need to be revised to ensure that supervisory procedures and mechanisms function properly, thereby producing more accountable governance [14].

Transparency is another crucial aspect of this transformation. Through digitalization, information regarding policies, procedures, and public services has become more accessible to citizens. This facilitates greater public participation in governance and strengthens existing oversight mechanisms. Consequently, revisions to state administrative law are necessary to guarantee the right to information access while ensuring proper data protection. One emerging challenge is the need for strong legal safeguards for personal data and information security. The digital shift has heightened risks to citizens' sensitive data if not accompanied by appropriate regulations. Therefore, state administrative law must establish a robust framework for protecting personal data, including rules on data collection, storage, usage, and distribution, along with strict measures to prevent and address data breaches and cyberattacks [15].

In the area of public service delivery, digital transformation affects the interaction between government and citizens. Meetings that previously required physical presence can now be conducted online, bridging geographic gaps and reducing bureaucratic barriers. However, this also implies that state administrative law must revisit service criteria and citizens' rights in the digital sphere, ensuring that equitable access to services is maintained for all social groups [16].

Digital transformation also demands new skill sets within the bureaucracy. Civil servants and public officials must undergo continuous training and education to adapt to technological advancements. As such, administrative regulations may need to be updated to include provisions supporting capacity building and technical proficiency among government personnel. This ensures that they can utilize new technologies effectively while upholding expected service standards [17].

Another critical issue is the potential for digital inequality. Not all individuals have equal access to, or the skills to utilize, digital technologies. The government must ensure that digital transformation does not exacerbate social inequality. State administrative law may therefore need to be adjusted to incorporate inclusive digital policies and provide additional support for underserved communities, including training programs and adequate technological infrastructure [18].

Digital transformation also affects the legislative and judicial branches. The adoption of technology enables policy-making and law enforcement processes to become more participatory, efficient, and timely. Changes in administrative law are thus required to accommodate digital processes within legislative and judicial functions, including the recognition of electronic documents, digital signatures, and the use of online platforms for discussions and decision-making [19].

The use of advanced technologies such as artificial intelligence (AI) in public services further creates legal implications. AI can improve service standards through more efficient and accurate data analysis. Nevertheless, its application must be clearly regulated within administrative law to prevent misuse and ensure accountability. Clear provisions are required to determine responsibility, address potential biases, and guarantee that decisions made by AI systems remain legally accountable [20].

Overall, the digital transformation of the public sector has had a profound impact on how governments perform their functions and deliver services to citizens. To maximize the benefits and mitigate potential risks, state administrative law must be comprehensively reformed and adapted in line with technological advancements. This includes ensuring efficiency, accountability, transparency, data protection, and digital inclusivity, while upholding fundamental rights and the core principles of good governance.

Challenges in the Implementation of Digital Transformation in Public Services for State Administrative Law

Digital transformation in public services is a complex process that presents numerous challenges, particularly within the scope of State Administrative Law. One of the most significant challenges is the incompatibility between existing regulations and technological advancements. Many legal frameworks are outdated and fail to align with the rapid development of digital technologies, which often obstructs the adoption of new innovations in public administration [21].

Another pressing issue is the lack of adequate digital infrastructure. Many regions, particularly remote areas, still lack sufficient internet access. This infrastructural gap hinders the implementation of digital technologies in public services and creates unequal access to government services for citizens living in such areas [22].

Cybersecurity risks also pose a major concern in the digitalization of public administration. The introduction of digital technologies in governance exposes systems to cyberattacks that may compromise citizens' personal data and disrupt public facilities. Therefore, strict policies and robust security measures are required to safeguard governmental digital systems against such threats.

Digitalization additionally demands a shift in organizational culture within government institutions. Civil servants accustomed to traditional, manual methods may struggle to adapt to new technologies. Continuous training programs are therefore essential to ensure that public officials can utilize digital tools effectively and appreciate their added value in improving the quality of public services.

Interoperability among government agencies represents another significant challenge. Digital systems developed by one institution are often incompatible with those of others, complicating data and information exchange. The absence of standardized technical frameworks makes it increasingly difficult to achieve the level of system integration necessary for coordinated public service delivery [23].

Financing digital transformation also remains a considerable challenge. Implementing digital technologies in public services requires substantial investment in infrastructure, maintenance, and ongoing development. Some regions may lack sufficient funding to support these efforts, necessitating assistance from the central government or partnerships with the private sector [24].

From the perspective of State Administrative Law, transparency and accountability in public services must remain paramount. Digital transformation should ensure that administrative processes remain auditable and subject to oversight, thereby preventing maladministration or abuse of power. Digital systems must be designed to uphold the principles of good governance [25].

Another critical challenge is ensuring the protection of citizens' personal data. The digital collection and processing of personal information significantly increase the risk

of privacy violations if clear regulations are not in place. The government must therefore guarantee the strict enforcement of data protection regulations to maintain public trust [26].

Overall, these challenges require strong collaboration among various stakeholders, including the government, the private sector, and civil society. Innovative ideas and flexible policies are essential to overcoming these obstacles and ensuring that digital transformation in public services proceeds effectively, ultimately delivering tangible benefits to society.

Digital Transformation in Government Governance of South Korea and Singapore

1. South Korea

South Korea ranked first in the United Nations e-Government survey in 2010 and has since become a global leader in e-government for over a decade, securing first place in the E-Participation Index (EPI) and third place in the E-Government Development Index (EGDI) of the 2018 UN e-Government Survey [27]. The country's digital governance transformation is closely tied to presidential leadership in driving innovation and transitioning towards digital governance [28].

South Korea introduced the Digital New Deal policy, aiming to invest significantly in digital infrastructure and advanced technologies such as Artificial Intelligence (AI) and 5G networks. Smart city projects, exemplified by Songdo City, demonstrate improvements in energy efficiency and carbon reduction by integrating the Internet of Things (IoT) into urban management. The Government 24 platform consolidates a wide array of public services into a single portal, thereby enhancing accessibility and convenience for citizens.

Another key innovation is the MyData system, which empowers users to proactively make decisions regarding the sharing and transfer of their data [29]. This initiative is envisioned to evolve into a Personal Health Record (PHR) system, offering user-centered management and utilization of personal health data. Additionally, AI and big data applications have accelerated administrative processes and enhanced the accuracy of decision-making, with AI being used to analyze large-scale data to better align government responses with citizens' needs [30], [31].

2. Singapore

Singapore's e-government model has successfully integrated various services for the convenience of its citizens. The 2-citizen portal alone has saved approximately USD 14.5 million annually. Singapore's success in overcoming challenges such as shifting bureaucratic mindsets, unclear e-government objectives, lack of technical expertise and funding, and digital divide issues stems from strong leadership that established clear strategic action plans, centralized funding and infrastructure, and committed efforts to bridge disparities [32].

Innovations include e-Filing systems designed to enhance public trust in e-government implementation [33]. Through its Smart Nation initiative, Singapore has implemented pioneering projects such as the National Digital Identity (SingPass), which provides secure access to over 200 government services [34]. The GovTech Agency has also developed applications and platforms to improve efficiency and transparency in public services.

During the COVID-19 crisis, Singapore's use of AI in the TraceTogether application demonstrated how technology can be leveraged for rapid public health responses. IoT is widely utilized in transport management and public service delivery to improve efficiency and convenience. Furthermore, digital technologies have expanded opportunities for citizen engagement in decision-making through mobile applications and digital platforms. Overall, Singapore's digital transformation has enhanced both transparency in public services and opportunities for citizens to engage in digital participation.

Enhancing Public Participation and Transparency: Opportunities and Challenges

Research indicates that the integration of digital technologies in governance significantly boosts citizen participation and transparency. In Estonia, for instance, the e-Residency program and e-Government services enable both citizens and non-citizens to interact with government systems online, facilitating not only easier access to services but also stronger democratic engagement, including digital voting. Similarly, South Korea's Government 24 platform simplifies access to public services, encouraging more active citizen involvement in governance. In Singapore, initiatives like Smart Nation and TraceTogether illustrate how technology can be mobilized for rapid crisis response while enhancing transparency in emergency management.

Nevertheless, these advances introduce new challenges, particularly concerning data privacy and the digital divide. The adoption of advanced technologies such as AI, IoT, and big data requires large-scale data collection and analysis, raising concerns over data privacy and potential misuse [35]. While Estonia's blockchain system offers strong data protection, questions remain regarding the misuse or unauthorized access of personal data. In South Korea and Singapore, the reliance on digital technologies reveals disparities in access between urban and rural areas, with rural regions often lagging behind. Addressing this digital divide is essential to ensure equal opportunities for all citizens, and initiatives such as digital literacy programs and technological subsidies are necessary to mitigate inequities.

The Digital Divide Theory supports these findings, highlighting that unequal access to technology may exacerbate existing social inequalities. Additionally, resistance to adopting new technologies by government employees or citizens accustomed to traditional systems poses further obstacles.

Another critical challenge is the rising threat of cybersecurity risks. Governments must continuously upgrade their data protection mechanisms to guard against cyberattacks. The high financial costs of implementing advanced technologies also present barriers, particularly for states with limited budgets. Moreover, rigid regulations that fail to adapt to evolving technologies may slow down the pace of digitalization, underscoring the need for flexible and innovation-friendly policies.

Conclusion

This study highlights the importance of adopting digital transformation in governance to realize a more inclusive Society 5.0. The use of modern technologies such as Artificial Intelligence (AI), the Internet of Things (IoT), and big data in countries like Estonia, South Korea, and Singapore demonstrates that digital technology can enhance efficiency, transparency, and citizen participation in governmental affairs. Nevertheless, challenges remain regarding personal data protection and unequal access to technology, which must be addressed through flexible and equitable policies. Governments must establish robust regulations to safeguard citizens' privacy and information security. To overcome inequalities in access, it is crucial to ensure that all segments of society—including vulnerable groups—benefit from equal technological opportunities through digital literacy programs and financial support. In addition, governments should encourage broader public participation in decision-making processes via accessible and user-friendly digital platforms. This requires collaboration with the private sector and civil society organizations to develop innovative technologies tailored to the needs of citizens. Digital transformation in public services provides significant benefits while also presenting complex challenges, particularly in the context of administrative law. The integration of digital technologies can improve efficiency, transparency, and accessibility in delivering services. However, this shift also demands legal frameworks that align with technological advancements. Currently, many existing regulations remain outdated and hinder innovation, necessitating reform. Further challenges include disparities in digital infrastructure access, cybersecurity threats, and the need for changes in bureaucratic work culture. Moreover, interoperability among government digital systems is vital to ensure integrated public service delivery. Substantial investment is also required for the development and maintenance of digital infrastructure. From a legal perspective, transparency and accountability in digital administration must be safeguarded to uphold the principles of good governance, while protecting citizens' personal data is essential to maintain public trust. In conclusion, with strong collaboration between government, the private sector, and civil society, the challenges of digital transformation can be effectively addressed. Consequently, digital transformation in public services has the potential to proceed smoothly and deliver maximum benefits for all stakeholders.

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