

Regulation of E-Government Development in Manado City

Carlo Adrin Gerungan¹, Marthin Luther Lambonan², Mario A Gerungan³

^{1,2,3}Faculty of Law, Sam Ratulangi University, Manado, Indonesia

Article Info

Article history:

Received 2025-12-14

Revised 2026-01-05

Accepted 2026-01-13

Keywords:

Digital Governance

E-Government

Public Service

Regulation

Smart City

ABSTRACT

This study aims to analyze the regulatory framework governing the development of E-Government in Manado City. By combining a normative juridical approach with an empirical approach, the research provides a comprehensive understanding of both the legal basis and practical implementation of digital-based governance. The normative juridical approach examines the regulations that serve as the foundation for E-Government administration, while the empirical approach observes their application in practice. Data were collected in Manado City over two months through interviews, observations, and analysis of secondary sources, including official documents and relevant literature. Qualitative descriptive analysis, involving data reduction, presentation, and conclusion drawing, was used to process the information. The findings indicate that E-Government in Manado City has advanced through the integration of various digital services to enhance public service quality. However, implementation remains suboptimal due to technical limitations in certain applications and gaps in human resource competencies. From a regulatory standpoint, the Manado City Government has established a solid legal foundation through Mayor Regulation Number 10 of 2018 and Mayor Regulation Number 31 of 2022, which guide the development and implementation of the Electronic-Based Government System. The study highlights that the effectiveness of E-Government depends on continuous support, including capacity building for human resources, strengthened digital infrastructure, enhanced cybersecurity, and periodic regulatory updates. Sustained efforts in these areas are essential to achieving modern, efficient, and responsive governance that effectively serves the community's needs.

This is an open-access article under the [CC BY-SA](#) license.



Corresponding Author:

Carlo Adrin Gerungan

Sam Ratulangi University

Email: carlogerungan@unsrat.ac.id

1. INTRODUCTION

World civilization today is characterized by the rapid advancement of information technology and the flow of globalization that permeates almost all aspects of life, hallmarks of the Industrial Revolution 4.0 era [1]. One of the main drivers of globalization is the development of information technology, which enables people to connect without

geographical boundaries, making the world appear borderless [2]. The information age emerged after the pre-historical, agrarian, and industrial eras and is marked by the advent of digital technology, which has created convergence among Information Technology, Multimedia, and Telecommunications (Information, Media, and Communication Technology) [3]. This development has given rise to a new space, cyberspace, where social, economic, and governmental interactions take place digitally [4].

In the context of governance, E-Government introduces a new approach to realizing good governance and strengthening the relationship between the government and the public as recipients of public services. In addition, E-Government serves as an important instrument for monitoring the performance of government programs and the utilization of regional resources. Several countries, such as India, Pakistan, the Philippines, Chile, and various developed nations, have demonstrated success in reducing practices of corruption, collusion, and nepotism through the implementation of E-Government systems [5].

The use of Information and Communication Technology (ICT) in government administration and public services, known as E-Government (E-Gov), began to develop in the late 1990s [6]. The implementation of E-Gov has become an urgent necessity for every public service-providing institution, including local governments, given its significant role in improving service quality and supporting Good Corporate Governance practices. The legal foundations reinforcing this include Presidential Instruction Number 5 of 2003 on the National Policy and Strategy for E-Government Development, Law Number 14 of 2008 on Public Information Disclosure, and Law Number 30 of 2014 on Government Administration [7], [8], [9].

The use of E-Government in Manado City has been ongoing since 2008; however, its development was intensified only during the 2010–2013 period. Although various public service applications have been introduced and the Smart Command Center Program began operating in 2017 to enhance transparency and responsiveness, the implementation of E-Government in Manado City still faces several challenges. The main problems lie in the mismatch between the rapid pace of technological development and the readiness of regulations, human resource capacity, and inter-agency system integration. This condition is consistent with the findings of various international studies, which indicate that the success of E-Government is determined not only by technology but also by regulatory readiness, organizational culture, public digital literacy, and cross-sectoral coordination [10], [11]. Therefore, the need for comprehensive, adaptive regulations is crucial to ensure that E-Government use in Manado City operates optimally.

Previous studies indicate that challenges in E-Government implementation are a global phenomenon, particularly in developing countries. Research by Carter and Bélanger [12] emphasizes that factors such as trust, technological accessibility, and institutional support are key determinants of successful adoption of digital government services. Meanwhile, [13] finds that limitations in human resources and a lack of inter-agency coordination are often the main obstacles to E-Government implementation at the local level. In the Southeast Asian context, research by [14] highlights that unsynchronized policies and regulations are among the factors contributing to the low effectiveness of digital services in

local government. These findings suggest that the challenges faced by Manado City are not isolated but reflect common patterns among local governments in developing countries.

Although extensive research on E-Government exists, a significant gap remains in studies examining local regulations as a key factor in E-Government implementation. Most existing research focuses on technological aspects, user acceptance, or service quality. However, studies that specifically analyze how local legal instruments shape the direction of E-Government development remain very limited, particularly in the context of municipal governments in Eastern Indonesia. Moreover, there is still a lack of research that thoroughly elaborates on how local regulations, such as Manado Mayor Regulation Number 10 of 2018 and Mayor Regulation Number 31 of 2022, contribute to the effectiveness of digital service implementation at the city level.

Based on this gap, this study offers a novel comprehensive analysis of E-Government regulation in Manado City through normative, juridical, and empirical approaches. This research not only examines the legal foundations governing the use of ICT in public administration but also links them to the real conditions of E-Government implementation, including the effectiveness of the Smart Command Center Program. This approach makes a new contribution to the E-Government literature, particularly by highlighting the role of local regulations in determining the direction and success of digital government service implementation. By focusing on the context of Manado City, this study also offers new insights into the challenges and opportunities for E-Government development in growing cities that are striving to adapt to the demands of the digital era. The purpose of this study is to analyze the regulatory framework related to the development of E-Government in Manado City.

2. METHOD

This study employs a normative juridical approach combined with an empirical approach. The normative juridical approach is used to examine various regulations governing the development and utilization of E-Government in Manado City, including Manado Mayor Regulation Number 10 of 2018 on Manado Smart City and Mayor Regulation Number 31 of 2022 on the Electronic-Based Government System. This approach aims to understand the legal foundations, policy directions, and normative bases that underpin the implementation of digital-based governance. Meanwhile, the empirical approach is applied to examine how these regulations are implemented in practice, identify technical obstacles, assess the readiness of human resources, and evaluate the effectiveness of digital public services such as the Cerdas Command Center.

The research was conducted in Manado City, a region that has been developing E-Government since 2008, accelerating its development during the 2010–2013 period and continuing to do so to the present. Data collection was carried out over two months, from September to November 2025. Manado City was selected for its strong commitment to information technology in public service delivery, making it relevant for analysis from both regulatory and implementation perspectives.

The research data consist of primary and secondary data. Primary data were obtained through interviews with parties directly involved in the management of E-Government,

particularly the Manado City Office of Communication and Informatics and the managers of the Cerdas Command Center. In addition, field observations were conducted to examine the operation of ongoing digital services directly. Secondary data were collected from official government documents, laws and regulations, books, scientific journals, and various references relevant to E-Government, information technology, and public services.

Data collection techniques included documentation reviews of regulations and supporting documents, semi-structured interviews to obtain in-depth information on the implementation of E-Government, and direct observation of available digital services. All collected data were analyzed using qualitative descriptive analysis techniques. The analysis was carried out through data reduction, systematic presentation of data, and conclusion drawing to illustrate how local government regulations are applied in the development of E-Government and the factors influencing its success.

This research method is expected to provide a comprehensive understanding of the relationship between policies, regulations, and the implementation of E-Government in Manado City, while also revealing constraints and opportunities that can serve as a basis for future policy improvements.

3. RESULTS AND DISCUSSION

3.1 Result

Regulation of E-Government Development

The findings of this study indicate that the development of e-government in Manado City requires a strong, well-directed regulatory framework, particularly to promote the implementation of effective, efficient, and public service-oriented electronic governance. Formulating a master plan for e-government development is a strategic step that must be undertaken to ensure that information technology is optimized to provide reliable, trustworthy, and easily accessible services to all segments of society.

The research findings confirm that e-government implementation generally encompasses four models of relationships, namely Government to Citizen (G2C), Government to Business (G2B), Government to Government (G2G), and Government to Employee (G2E). Regarding G2E, this study finds that electronic devices for government employees play an important role in improving internal bureaucratic efficiency by providing access to information, protecting employee rights, facilitating training, and simplifying processes. This model not only supports more transparent human resource governance but also encourages the enhancement of human resource quality through access to e-learning and knowledge-sharing platforms.

In addition, the study shows that e-government development is also directed toward strengthening government procurement systems and establishing technology-based media centers, thereby increasing the business sector's involvement in reinforcing telecommunications and information technology. This approach aligns with the growing demand for transparency and public accountability in the modernization of local government administration.

From the perspective of e-government development stages, the findings confirm that Manado City is progressing through the stages described by Gil-Garcia and Martinez-

Moyano, from interactive presence to fully integrated presence. This process includes enhancing the capacity of public service portals, strengthening vertical and horizontal integration among government agencies, and restructuring bureaucratic systems and processes to realize integrated services through a one-stop service mechanism. The analysis demonstrates that service integration, both across levels of government and across sectors, is a key success factor in achieving comprehensive e-government effectiveness.

The study also identifies several significant advantages of e-government implementation. In terms of efficiency, e-government can reduce operational costs, accelerate administrative processes, and facilitate data exchange among government agencies. From the perspective of public service quality, e-government enables the design of user-centered services, allowing citizens to access services without needing to understand complex bureaucratic structures. Furthermore, e-government supports the achievement of specific policy objectives, such as increasing public participation, education, training, and environmental policy initiatives through information-sharing mechanisms.

Moreover, the implementation of e-government makes a substantial contribution to economic policy objectives, including reducing corruption, enhancing transparency and public trust, and improving budget efficiency. E-government also supports the sustainability of bureaucratic reform through transparency and data-driven decision-making. At the social level, the study finds that e-government plays a crucial role in building public trust in government by improving access to information, strengthening accountability, and encouraging citizen involvement in policymaking processes.

Overall, this study concludes that the regulatory framework for e-government development in Manado City is on the right track; however, it requires further strengthening in terms of service integration, enhancement of human resource competencies, and consistency in policy updates to ensure that digital government transformation can achieve a fully integrated level (totally integrated presence) and deliver maximum benefits to the public and other stakeholders.

The Manado City Government, through the Office of Communication and Informatics (Diskominfo), has developed various electronic-based service innovations as part of e-government implementation. A total of 13 digital applications and platforms have been launched to facilitate public access to information, enable the submission of complaints, and promote faster, more efficient, and interactive engagement between citizens and the government. Prominent G2C applications include siTasya (a community monitoring service based on CCTV), QLUE Manado (a public complaint service), and Pantau Pangan (a platform providing daily food price information from the two main markets in Manado City).

The study also finds that e-government implementation in Manado City is strengthened through the Cerdas Command Center Program, which operates under local regulations such as Regional Regulation Number 8 of 2016 on the ICT Master Plan and the Mayor's Instruction Number 49/D.09/Kominfo/344/2017 concerning ICT-based server and network management. This program serves as a central hub for government data and information coordination and as a benchmark for the effectiveness of digital-based public service delivery.

Furthermore, Manado Mayor Regulation Number 31 of 2022 comprehensively regulates the Architecture of the Electronic-Based Government System (SPBE), which is designed for five years with periodic evaluation mechanisms. The SPBE roadmap covers governance, management, services, infrastructure, applications, security, and information technology audits. The Office of Communication and Informatics formulates it with reference to the National SPBE Roadmap, the Government SPBE Architecture, and the Regional Medium-Term Development Plan (RPJMD), and consults relevant ministries to ensure alignment with national policies.

In conclusion, this study finds that the regulation and implementation of e-government in Manado City have been systematically directed through a clear policy framework, the development of public service applications, and the strengthening of SPBE infrastructure and governance. This reflects the local government's strong commitment to providing public services that are more modern, transparent, and responsive to community needs.

3.2 Discussion

Regulation of E-Government Development

The development of the legal framework in Indonesia indicates that the transformation of governance toward a more open and responsive system cannot be separated from advances in information and communication technology (ICT) [15]. Legal modernization through regulations such as the Electronic Information and Transactions Law (ITE Law) and its amendments, the Public Information Disclosure Law, the Public Service Law, and several other regulations has become an important foundation in ensuring that public needs for access to information and public services can be effectively facilitated through digital systems [16]. These regulations not only govern information governance but also promote efficiency, transparency, and accountability in public administration [17].

This dynamic demonstrates that ICT is not merely a supporting tool, but rather a strategic infrastructure that serves as a key pillar in achieving modern public service delivery [18]. Presidential Instructions related to telematics and e-government development, as well as the establishment of the National ICT Council, provide clear policy direction for the government to continuously integrate digital innovation into public service provision [19]. Nevertheless, ongoing regulatory changes indicate that the government is still seeking the most effective and adaptive ICT governance model to address societal needs and future challenges [20].

Furthermore, analysis of the social context indicates that e-government implementation must also take inclusivity into account [21]. Vulnerable groups, such as the elderly, often face limitations in accessing digital services due to low levels of technological literacy [22]. Demographic trends indicating a growing elderly population require the design of more user-friendly electronic services to prevent information access gaps [23]. Efforts to develop adaptive service designs are therefore essential to ensure that the digitalization of public services does not hinder certain groups from exercising their rights [24].

On the other hand, cybersecurity challenges represent a critical issue in e-government implementation [25]. Increasingly complex cyberattacks necessitate the strengthening of

security systems to protect public data, particularly as digital identity systems and national databases become integral components of government administration [26]. Without adequate protection, government digitalization may instead create new vulnerabilities that threaten state governance [27].

In the context of Manado City, the local government has anticipated these challenges by developing the Manado Smart City initiative through Mayor Regulation Number 10 of 2018. This policy serves as a strategic step toward integrating all ICT potential to realize a modern city that is efficient, transparent, and oriented toward public service delivery [27]. The smart city concept is not limited to the provision of service applications but also involves reshaping the governance paradigm toward clean, responsive administration that supports the characteristics of an urban society that is tolerant and environmentally conscious [28].

Furthermore, the Manado City Government has strengthened its digital implementation framework through Mayor Regulation Number 31 of 2022 concerning the Electronic-Based Government System (SPBE). This regulation governs the fundamental elements of SPBE, including architecture, roadmaps, business processes, data and information, applications, infrastructure, security, and services. Such comprehensive regulation reflects the seriousness of the local government in preparing systematic, measurable, and sustainable government digitalization. The implementation of e-government in Manado is also reflected in the development of various applications that provide direct public services. These applications represent the practical application of policies through the direct provision of services and implementation of programs [29]. Thus, applications are not merely digital tools but policy instruments that bring the government closer to citizens while also serving as indicators of public service effectiveness [30].

Overall, this analysis shows that regulation, technology, and public needs are closely interconnected in shaping a robust e-government ecosystem. The Manado City Government has taken progressive steps by strengthening regulatory aspects, developing public service applications, advancing the smart city initiative, and aligning local policies with the national SPBE framework. However, successful implementation continues to require attention to cybersecurity, user inclusivity, human resource readiness, and consistency in policy updates. Through a holistic approach, e-government can become a strategic instrument in realizing modern governance that is transparent, efficient, and responsive to societal needs.

4. CONCLUSION

This study concludes that the implementation of E-Government in Manado City has demonstrated significant progress through the integration of various digital services to improve the quality of public service delivery. The use of digital technology offers substantial opportunities for the city government to deliver services faster, more transparently, and more efficiently. However, the implementation of E-Government has not yet been fully optimal. This is due to the persistence of technical issues in several applications and limitations in human resources that have not yet fully mastered information technology. These conditions underscore that infrastructure readiness and human resource capacity are key areas that need strengthening.

From a regulatory perspective, the Manado City Government has established an adequate legal foundation through Manado Mayor Regulation Number 10 of 2018 concerning Manado Smart City and Manado Mayor Regulation Number 31 of 2022 concerning the Electronic-Based Government System (SPBE). These regulations provide clear direction for the development and utilization of E-Government, while also serving as legal instruments that ensure protection in the delivery of digital services. The existence of the Cerdas Command Center Program further strengthens digital government initiatives by functioning as a central hub for information coordination and technology-based service control.

Nevertheless, given the rapid pace of technological development, existing regulations need to be continuously updated and adjusted to remain relevant and provide adequate legal protection. This study emphasizes that the success of E-Government in Manado City requires synergy among improvements in human resource quality, enhancements in digital infrastructure, strengthening of security systems, and continuous regulatory adjustments. Through these measures, Manado City has the potential to achieve modern, effective governance that is increasingly responsive to community needs.

ACKNOWLEDGEMENTS

The author expresses sincere gratitude to the Manado City Government, particularly the Office of Communication and Informatics, for providing the data and information required for this research. Appreciation is also extended to the supervisors, colleagues, and family members for their support, guidance, and motivation throughout the completion of this study. It is hoped that this work will contribute positively to the development of E-Government in Manado City.

REFERENCES

- [1] D. M. A. Mansur, *Cyber law: aspek hukum teknologi informasi*. Tiga Serangkai, 2005. Accessed: Dec. 11, 2025. [Online]. Available: https://books.google.com/books?hl=id&lr=&id=Z9nD_s1CLhUC&oi=fnd&pg=PP25&dq=Didik+M.+Arief+Mansyur+dan+Elisatris+Gultom,+Cyber+Law+Aspek+Hukum+Teknologi+Informasi&ots=tPtQNrGvDg&sig=bSt2-aH4FKcTpm_rk291QulcFxQ
- [2] T. L. Friedman, *The World Is Flat: The Globalized World In The Twenty-First Century*. London: Penguin Books, 2006.
- [3] E. Makarim, 'Pengantar hukum telematika: Suatu kompilasi kajian', 2006.
- [4] J. Kneale, 'The virtual realities of technology and fiction: Reading William Gibson's cyberspace', in *Virtual Geographies*, Routledge, 1999.
- [5] D. C. Shim and T. H. Eom, 'E-Government and Anti-Corruption: Empirical Analysis of International Data', *Int. J. Public Adm.*, vol. 31, no. 3, pp. 298–316, Feb. 2008, doi: 10.1080/01900690701590553.
- [6] Å. Grönlund and T. A. Horan, 'Introducing e-gov: history, definitions, and issues', *Commun. Assoc. Inf. Syst.*, vol. 15, no. 1, p. 39, 2005.
- [7] Pemerintah Republik Indonesia, *Undang-undang (UU) Nomor 6 Tahun 2023 tentang Penetapan Peraturan Pemerintah Pengganti Undang-Undang Nomor 2 Tahun 2022 tentang Cipta Kerja menjadi Undang-Undang*. 2023.
- [8] Pemerintah Republik Indonesia, *Undang-undang (UU) Nomor 14 Tahun 2008 tentang Keterbukaan Informasi Publik*. 2008.
- [9] Pemerintah Republik Indonesia, *Instruksi Presiden (Inpres) Nomor 3 Tahun 2003 tentang Kebijakan dan Strategi Nasional Pengembangan E-Government*. 2003.
- [10] F. T. Alorini and A. A. Alkhalifah, 'Exploring Artificial Intelligence Adoption for E-Government: A Systematic Literature Review', *IEEE Access*, vol. 13, pp. 175686–175703, 2025, doi: 10.1109/ACCESS.2025.3618778.

- [11] L. Alcaide-Muñoz, M. P. Rodríguez-Bolívar, M. J. Cobo, and E. Herrera-Viedma, 'Analysing the scientific evolution of e-Government using a science mapping approach', *Gov. Inf. Q.*, vol. 34, no. 3, pp. 545–555, 2017.
- [12] L. Carter and F. Bélanger, 'The utilization of e-government services: citizen trust, innovation and acceptance factors*', *Inf. Syst. J.*, vol. 15, no. 1, pp. 5–25, Jan. 2005, doi: 10.1111/j.1365-2575.2005.00183.x.
- [13] O. Al Mahroqi, 'Factors influencing citizen's adoption of e-Government services in Saudi Arabia', p. 1547602 Bytes, 2024, doi: 10.25439/RMT.27575805.
- [14] L. Kompella, 'E-Governance systems as socio-technical transitions using multi-level perspective with case studies', *Technol. Forecast. Soc. Change*, vol. 123, pp. 80–94, Oct. 2017, doi: 10.1016/j.techfore.2017.06.024.
- [15] M. S. J. Sangaji and J. Irianto, 'Transformasi Inovasi Pelayanan Publik menuju Pemerintahan Digital Public Service Innovation Transformation towards Digital Government', 2025, Accessed: Dec. 12, 2025. [Online]. Available: <https://e-journal.unair.ac.id/JAP/article/download/72708/33253>
- [16] Z. Zainudin, 'The Urgency of Reforming Indonesian Civil Law in the Digital Era', *J. Tana Mana*, vol. 6, no. 2, pp. 187–193, Aug. 2025, doi: 10.33648/jtm.v6i2.1051.
- [17] M. E. Lestari, 'Transformasi Sumber-Sumber Hukum dalam Sistem Hukum Indonesia di Era Sains dan Teknologi', *J. Sci. Technol. Alpha*, vol. 1, no. 4, pp. 111–116, Oct. 2025, doi: 10.70716/alpha.v1i4.306.
- [18] P. A. Maisarah, F. Fonna, and R. Firdaus, 'Peran Kritis Sistem Informasi Manajemen Dalam Mewujudkan E-Government Yang Responsif, Transparan, Dan Berkelanjutan Di Indonesia', *J. Keuang. Dan Manaj. Terap.*, vol. 6, no. 3, Aug. 2025, Accessed: Dec. 12, 2025. [Online]. Available: <https://ejournals.com/ojs/index.php/jkmt/article/view/2901>
- [19] S. A. Hutabarat et al., *CYBER-LAW: Quo Vadis Regulasi UU ITE dalam Revolusi Industri 4.0 Menuju Era Society 5.0*. PT. Sonpedia Publishing Indonesia, 2023. Accessed: Dec. 12, 2025. [Online]. Available: https://books.google.com/books?hl=id&lr=&id=Ir_MEAAAQBAJ&oi=fnd&pg=PR1&dq=Instruksi+Presiden+terkait+Telematika+dan+pengembangan+e-government,+serta+pembentukan+Dewan+TIK+Nasional,+memberikan+arah+kebijakan+yang+tegas+bagi+pemerintah+untuk+terus+mengintegrasikan+inovasi+digital+dalam+penyelenggaraan+layanan+publik.&ots=CMCfYCSmxH&sig=FKibTnb3bqpTLWN9dJ9pdQnilPY
- [20] F. E. Susilawati, R. Yanti, and E. Erni, 'Transformasi Digital Pemerintah (Studi Kasus: Implementasi e-Government dan Hambatannya)', *J. Soc. Soc.*, vol. 3, no. 2, pp. 80–94, 2023.
- [21] E. E. Supriyanto, 'Kebijakan Inovasi Teknologi Informasi (IT) Melalui Program Elektronik Government dalam Meningkatkan Kualitas Pelayanan Publik di Indonesia', *J. Ilmu Pemerintah. Kaji. Ilmu Pemerintah. Dan Polit. Drh.*, vol. 1, no. 1, pp. 141–161, Apr. 2016, doi: 10.24905/jip.1.1.2016.141-161.
- [22] R. R. Badii and N. Nurdin, 'Implementasi kebijakan e-government dalam pelayanan publik di Dinas Kependudukan dan Pencatatan Sipil Kabupaten Dogiyai Provinsi Papua Tengah', other, INSTITUT PEMERINTAH DALAM NEGERI, 2025. Accessed: Dec. 12, 2025. [Online]. Available: <http://eprints.ipdn.ac.id/24006/>
- [23] I. Cahyani, 'User Experience Pelayanan Publik Berbasis E-Government Melalui Inovasi Identitas Kependudukan Digital Kota Ambon', *Trajectories Public Adm.*, vol. 2, no. 3, pp. 234–249, Sept. 2025, doi: 10.52423/tpa.v2i3.79.
- [24] D. Mulyadi and Rosilawati, 'Melacak Penerapan E-Government dalam Memperkuat Aspek Transparansi dalam Tata Kelola Pemerintahan Daerah', *J. Res. Cent. Digit. Democr.*, vol. 1, no. 1, pp. 39–47, Feb. 2025.
- [25] M. R. M. Redha, D. A. Sumarno, and A. Alimudin, 'Transformasi Digital Layanan Publik di Kota Batam: Tantangan dan Peluang Menuju Tata Kelola Berkelanjutan', *Dialekt. Publik*, vol. 9, no. 1, pp. 11–18, Sept. 2025, doi: 10.33884/dialektikapublik.v9i1.10766.
- [26] Y. Andriyan, A. M. Rajab, A. C. Pamungkas, S. Muhamad, and R. Rahakratat, 'Transformasi E-Government Menuju Good Governance di Pemerintah Kabupaten Sorong', *Samakta J. Pengabd. Kpd. Masy.*, vol. 1, no. 2, pp. 24–35, July 2024, doi: 10.61142/samakta.v1i2.127.
- [27] D. Andriani, A. Haris, and Sumardi, 'Strategi Keamanan Transaksi Elektronik dalam Pelayanan Publik Berbasis E-Government', *PENA BANGSA Bisnis Dan Tata Kelola Publik Adapt.*, vol. 1, no. 2, pp. 134–147, Dec. 2025, doi: 10.69616/pb.v1i2.563.
- [28] R. S. Maesaroh, 'Tantangan Keamanan Siber dan Implikasinya terhadap Hukum Kenegaraan: Tinjauan atas Peran Negara dalam Menjamin Ketahanan Digital', *Staatsrecht J. Huk. Kenegaraan Dan Polit. Islam*, vol. 4, no. 2, pp. 255–274, 2024, doi: 10.14421/3n8bxw79.

- [29] S. Tommy and M. I. P. Nasution, 'Evaluasi Manajemen Risiko Keamanan Siber Pada Infrastruktur Digital Pemerintah: Studi Kasus Pusat Data Nasional (PDN)', *J. Manaj. Ekon. Dan Bisnis*, vol. 4, no. 1, pp. 1–26, June 2025, doi: 10.61715/jmeb.v4i1.104.
 - [30] S. Kuntoro and G. Suseno, 'Obstacles and Solutions in the Digitalization of Public Services in Developing Countries: Hambatan dan Solusi dalam Digitalisasi Layanan Publik di Negara Berkembang', *Al-Mahkamah J. Huk. Polit. Dan Pemerintah.*, vol. 1, no. 1, pp. 31–48, May 2024.
-