

Implementation of The Citizen Services Information System RW 016 Kapuk West Jakarta City

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Abstract: The advent of e-government in Indonesia, initiated by the Presidential Instruction in 2003, has paved the way for the digital transformation of governmental services at both national and regional levels. This research focuses on the utilization of this transformation by Rukun Warga (RW) 16, Kapuk Village, West Jakarta, demonstrating a shift towards digital-based administration in local governance. The study aims to facilitate more efficient and effective communication and information dissemination between the RW.16 administrative body and its residents. The deployment of the proposed application is expected to streamline public service processes by providing residents with comprehensive access to various public services information specific to RW.16. Furthermore, the application empowers residents to submit letters, express their aspirations, and report environmental issues directly to the RW.16 management, thereby enabling prompt resolution of these concerns. The application's development adhered to the System Development Life Cycle (SDLC) using the waterfall methodology, ensuring a structured and sequential approach. The backend database is built on MySQL, while the front-end interfaces are developed using HTML and PHP, supported by the Laravel framework. This study highlights the potential of e-government initiatives in enhancing public service delivery and community engagement.

Keywords: E-Government; Information Systems; Public Service; Waterfall Methodology.

1. Introduction

The Covid-19 pandemic, beginning in 2019, has instigated significant changes in societal life. With the surge in daily case numbers, restrictions on individual mobility became essential to curb virus spread. This situation necessitated a shift towards digital technology to ensure the continuation of everyday activities. The use of online applications skyrocketed by 442%, particularly for education, work, and health consultations [1]. In response to the pandemic, the high-paced lifestyle and routine of communities demanded quick, accurate, and efficient administrative services [2]. Government institutions were challenged to promptly introduce digital technology-based services to meet these evolving demands. The adoption of digital technology is beneficial not only for the public but also for streamlining service times and reducing government expenditure. Indonesia ranks 77th in the implementation of Electronic-Based Government System (SPBE) [3], indicating an urgent need to enhance government digitalization, especially in public services.

The complexity of the issues faced by the Jakarta Provincial Government, particularly in population services at the neighborhood (RT) and community (RW) levels, is influenced by the heterogeneity of conditions [4]. RW, not a formal administrative division but a community-formed institution, plays a crucial role in facilitating local services, including information dissemination, administrative tasks, community harmony, and local security [5]. A fundamental step in

community development is the observation phase to understand the economic, social, and cultural context of a region [6]. RW 16 in Kapuk Village faces several challenges in its service delivery, including slow processing of certificates, difficulty in addressing residents' complaints, and a lack of platforms for residents to voice their aspirations. The existing information dissemination methods to residents are not fully effective, often leading to delays in community activities. Therefore, this study proposes the development of a system to provide comprehensive information regarding RW.16 services and assist in administrative management for RW 16 residents. This introduction sets the stage for exploring the development and implementation of a digital information system at RW 16, aiming to address these challenges and enhance community service efficiency.

2. Research Method

2.1. Design Methodology

The System Development Life Cycle (SDLC) Waterfall Model was utilized as the primary methodology for this project. This model represents a systematic and sequential approach in software development, encompassing several stages including system planning, system analysis, system design, system implementation, and system maintenance [7].

1) Requirements Analysis

In this initial phase, extensive information gathering was undertaken to define the system's requirements through interviews, observations, and literature studies. Detailed interviews were conducted with the chairperson and administrators of RW 016 to gather insights on general services, administrative services for residents, environmental conditions, and prevalent service issues in RW 016, Kapuk Village, West Jakarta [8]. Observational studies were also conducted to assess the existing resident service processes in RW 016.

2) System Design

The design of the system was carried out using Figma for creating the user interface. The process design utilized Unified Modeling Language (UML) methods, including Use Case Diagram, Activity Diagram, and Sequence Diagram. The database design was represented through Entity Relational Database (ERD), Class Diagram, and table specifications [9].

3) Implementation System

During this phase, the database was constructed following the planned schema, and the application was developed based on the system design. This stage also included thorough testing and refinement of the application [10][18].

4) System Testing

System testing was conducted to verify the program's functionality. The testing methodologies employed were Blackbox testing and User Acceptance Testing (UAT) [11][19].

5) Maintenance

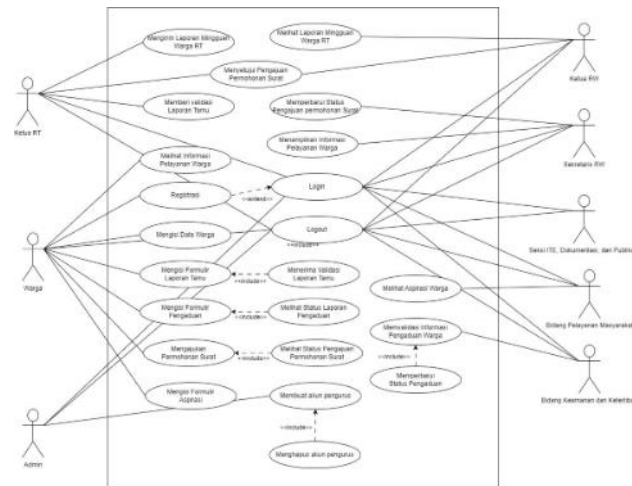
The maintenance phase is critical to ensure the application functions effectively over time and adapts to evolving needs [12].

2.2. System Design

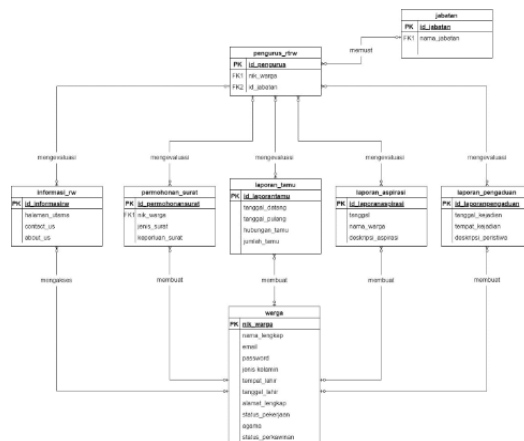
The system's design process was elaborated using Unified Modeling Language (UML) methods such as Use Case Diagram, Activity Diagram, and Sequence Diagram. The database design was comprehensively detailed with Entity Relational Database (ERD), Class Diagram, and table specifications [13].

2.3. Use Case Diagram

The Use Case Diagram is instrumental in modeling the functional units/services of the system for users, illustrating the interactions between the system and its actors. The roles involved in the RW.16 Community Service Application system are varied, including Admin, RW Chairperson, RW Secretary, ITE, Documentation and Publication Division, RW Service Division, RW Security Division, RT Chairperson, and Residents, each with specific responsibilities [14].



The Entity Relationship Diagram (ERD) is a visual representation that shows the information created, stored, and utilized by the system. It elucidates how individual pieces of information within the system are organized and interrelated [15]. The ERD aids in creating a structured and orderly database system.



The programming languages HTML and CSS were used for the application's development, with MySQL serving as the database. The development tools included Sublime Text for text editing and XAMPP as the local server [16].

The application system for RW.16 Kelurahan Kapuk's Community Service was developed using HTML and PHP programming languages, incorporating the Laravel framework. MySQL was chosen for database storage. The design process of the application was visualized using Usecase Diagrams and Entity Relationship Diagrams to effectively represent the system's functionality and data relationships. Before accessing the web system, users must be registered within the system. The registration process involves residents inputting necessary data on the Registration page. This process is illustrated in a series of images, starting from Figure 3.a to 3.e, showcasing the step-by-step registration interface.

(a) Registrasi

Form for user registration with fields: Nama Lengkap, NIK, No. Telepon, Alamat Email, Alamat Lengkap, Pekerjaan, Password, and Ulangi Password. Includes DAFTAR and BATAL buttons.

(b) Login

Form for user login with fields: Masukan Email and Masukan Password. Includes a Lupa Password? link, a Login button, and a link to Daftar for new users.

(c) Form Pengajuan Surat

Form for submitting a letter request with fields: NIK, Nama Lengkap, Alamat Lengkap, Jenis Surat, and Keperluan Surat. Includes a KIRIM button.

(d) Form Aspirasi Warga

Form for submitting a resident aspiration with fields: Tanggal, Nama Lengkap, Alamat Lengkap, and Deskripsi Aspirasi. Includes a KIRIM button.

(e) Form Laporan Pengaduan Warga

Form for submitting a resident complaint report with fields: Tanggal Kejadian, Nama Pelaku, Tempat Kejadian, and Deskripsi Kejadian. Includes a KIRIM button.

Figure 3. Application Interface

For system access, residents enter their registered email and password on the Login page. This interface is depicted in Figure 3.b, showing the fields and layout for user login. Residents have the ability to submit letter requests online using a dedicated form within the application. This form, shown in Figure 3.c, allows residents to enter necessary details for their letter requests. To facilitate the submission of aspirations or suggestions, the application includes an Aspiration Form for residents. This feature, illustrated in Figure 3.d, enables residents to communicate their aspirations directly through the application. For lodging complaints, residents can use the online Complaint Report Form. This form, displayed in Figure 3.e, allows residents to detail their complaints for submission through the application.

3.2 Discussion

The implementation of the Community Service Application in RW.16 Kelurahan Kapuk represents a pivotal advancement in the digitalization of local governance and public service delivery. This application developed using a combination of HTML, PHP, and the Laravel framework, exemplifies how digital tools can streamline administrative processes and enhance community engagement. Its user-friendly interface, illustrated through various forms for registration, service requests, and feedback (Figures 3.a to 3.e), simplifies public service access, aligning with the increasing reliance on technology highlighted during the Covid-19 pandemic [1]. However, the deployment of this digital solution has not been without challenges. The varying levels of technological literacy among residents, coupled with unequal access to digital devices, poses a significant barrier to the universal adoption of the application. Addressing this requires targeted community education and the development of more accessible versions of the application, such as mobile compatibility or simpler interfaces. Additionally, the protection of user data remains a critical concern, necessitating robust data security measures and privacy protocols to maintain resident trust. Looking forward, the scalability of this

application to other RWs and its potential integration into broader e-government initiatives present exciting opportunities. Such expansion and integration would facilitate a more cohesive and efficient framework for public service delivery across different levels of governance. Nevertheless, this requires careful customization to meet the diverse needs of various communities. Ongoing improvements based on user feedback and advancements in technology will be crucial in ensuring the application's continued relevance and effectiveness in improving local governance. The case of RW.16 serves as a valuable model for exploring the benefits and challenges of introducing digital solutions in public administration at the local level.

4. Related Work

In the realm of public service enhancement, it is evident from various research studies that the development of information systems plays a pivotal role in improving government service quality for citizens. A study conducted by Meliana and Fajriah (2019) proposed the utilization of the Naïve Bayes method in designing a public service information system about Citizenship 05, Cengkareng Timur. This method was applied to the selection of inadequate SKTM (Not Available Certificate) certificates, thereby enabling more effective and efficient public services and SKTM provision [16]. Furthermore, research conducted by Dermawan, Aknuranda, and Putra (2019) also underscores the significance of information system development for handling citizen complaints in a web-based environment. The objective of this research was to enhance the quality of village government services in addressing citizen grievances. The results demonstrated the successful implementation of an information system that streamlined the management of citizen data and improved services for residents [17]. Additionally, a study by Anraeni, Hasanuddin, Belluano, and Fadhiel (2020), focusing on population administration systems in Pucak Village, Maros Regency, further exemplifies the importance of information systems in augmenting public service delivery. This research revealed that the development of an information system had effectively improved the quality of population administration services in the village [18]. Across these diverse studies, various system development methodologies were employed, including prototype methods, object-oriented approaches, and even Extreme Programming (XP) [19][20][21][22]. However, the overarching goal remains consistent: to enhance the efficiency, effectiveness, and quality of public service delivery to the community.

5. Conclusion

In conclusion, the overall system process, spanning design, development, and testing, has yielded significant outcomes. The implementation of an information system for Citizen Services in RW.16, Kapuk Village, has markedly improved the efficiency of delivering information to residents. The adoption of the Software Development Life Cycle (SDLC) with a waterfall approach has lent structure to the RW.16 Citizen Services application's design, providing a clear developmental direction. Notably, residents now can report complaints and express their aspirations to RW Administrators online through the RW.16 Citizen Services Application. This online platform facilitates the seamless receipt of reports from RT Chairmen by the RW Chairman, streamlining the evaluation of RT Chairmen's performance. Additionally, residents can conveniently submit requests for documents online via the RW.16 Citizen Services Application, resulting in tangible savings of energy, costs, and time.

References

- [1] Setiawan, A., 2021. Membenahi Tata Kelola Sampah Nasional. Indonesia. Go. Id Portal Informasi Indonesia.
- [2] Oktapriandi, S., 2016. Perancangan Sistem Kependudukan Online Menggunakan Model System Development Life Cycle. *JUPITER (Jurnal Penelitian Ilmu dan Teknik Komputer)*, 8(2), pp.35-44. DOI: <https://doi.org/10.5281/zenodo.3427233>.
- [3] MENPANRB, 2022. Indonesia Naik 11 Peringkat Hasil Survei e-Government PBB, Kementerian Pendayagunaan Aparatur Negara dan Reformasi Birokrasi - Republik Indonesia, Jakarta.
- [4] Fahmi, W.N.R. and Kristiana, T., 2021. PERANCANGAN APLIKASI SISTEM SURAT MENYURAT RUKUN WARGA RW 06 PESANGGRAHAN BERBASIS WEB: Aplikasi Administrasi Rt/Rw. *Reputasi: Jurnal Rekayasa Perangkat Lunak*, 2(2), pp.92-101. DOI: <https://doi.org/10.31294/reputasi.v2i2.859>.
- [5] Mulyawan, B., Trisnawarman, D. and Rusdi, Z., 2014. Sistem Informasi Administrasi Kependudukan RT/RW Studi Kasus: RW 24 Kel. Bojong Nangka. In *Seminar Nasional Hasil Penerapan Penelitian Dan Pengabdian Masyarakat (SNHP3M)* (pp. 1-10).

- [6] Rusdi, Z. and Danarto, A., 2012. PEMBERDAYAAN MASYARAKAT JUWANA MELALUI PERAN DESAIN KOMUNIKASI VISUAL DAN TEKNOLOGI INFORMASI. *Prosiding SNaPP: Sosial, Ekonomi dan Humaniora*, 3(1), pp.411-418.
- [7] Bassil, Y., 2012. A simulation model for the waterfall software development life cycle. *arXiv preprint arXiv:1205.6904*. DOI: <https://doi.org/10.48550/arXiv.1205.6904>.
- [8] Langer, A.M. and Langer, A.M., 2008. System development life cycle (SDLC). *Analysis and Design of Information Systems: Third Edition*, pp.10-20.
- [9] Radack, S., 2009. *The system development life cycle (sdlc)* (No. ITL Bulletin April 2009 (Withdrawn)). National Institute of Standards and Technology.
- [10] Grance, T., Hash, J. and Stevens, M., 2004. *Security considerations in the information system development life cycle*. US Department of Commerce, Technology Administration, National Institute of Standards and Technology.
- [11] Tuteja, M. and Dubey, G., 2012. A research study on importance of testing and quality assurance in software development life cycle (SDLC) models. *International Journal of Soft Computing and Engineering (IJSCE)*, 2(3), pp.251-257.
- [12] Medvidovic, N., Rosenblum, D.S., Redmiles, D.F. and Robbins, J.E., 2002. Modeling software architectures in the unified modeling language. *ACM Transactions on Software Engineering and Methodology (TOSEM)*, 11(1), pp.2-57.
- [13] Case, B., Use Case Diagram. *Glossary Diagram Details Tabs, Diagram Details Tabs Diagram Name, Property Fields For Diagram Diagram Property Fields, Property Fields For Diagram Discriminator*.
- [14] Amran, N., Mohamed, H. and Bahry, F.D.S., 2018. Developing human resource training management (HRTM) conceptual model using entity relationship diagram (ERD). *International Journal of Academic Research in Business and Social Sciences*, 8(12), pp.1444-1459.
- [15] Kumari, P. and Nandal, R., 2017. A Research Paper OnWebsite Development Optimization Using Xampp/PHP. *International Journal of Advanced Research in Computer Science*, 8(5).
- [16] Meliana, M. and Fajriah, R., 2019. Perancangan Sistem Informasi Pelayanan Publik Pada Rukun Warga 05 Cengkareng Timur Dengan Penerapan Metode Naïve Bayes. DOI: <https://doi.org/10.33322/petir.v12i1.418>.
- [17] Dermawan, M.I., Aknuranda, I. and Putra, W.H.N., 2019. Pengembangan Sistem Informasi Penanganan Keluhan Warga Desa Berbasis Web (Studi Kasus Pemerintah Desa Suwayuwo). *Jurnal Pengembangan Teknologi Informasi Dan Ilmu Komputer*, 3(2), pp.1557-1566.
- [18] Anraeni, S., Hasanuddin, T., Belluano, P.L.L. and Fadhiel, M., 2020. Sistem Informasi Pelayanan Administrasi Kependudukan Desa Pucak, Kecamatan Tompobulu, Kabupaten Maros. *Jurnal Ilmiah Ilmu Komputer Fakultas Ilmu Komputer Universitas Al Asyariah Mandar*, 6(2), pp.50-54.
- [19] Fauji, A., Ghifari, A. and Ristiawan, R., 2021, October. Implementasi Sistem Informasi Warga Berbasis Web Menggunakan Opensid Di Desa Cigoong Utara, Kecamatan Cikulur, Kabupaten Lebak. In *National Conference on Applied Business, Education, & Technology (NCABET)* (Vol. 1, No. 1, pp. 228-233). DOI: <https://doi.org/10.46306/ncabet.v1i1.19>.
- [20] Juliastuti, D., Triayudi, A. and Mardiani, E., 2023. Sistem Informasi Pengelolaan E-Billing Warga di Lingkungan RW 001 Kelurahan Rawajati Kecamatan Pancoran dengan menggunakan Framework CodeIgniter. *Jurnal JTik (Jurnal Teknologi Informasi dan Komunikasi)*, 7(2), pp.243-254. DOI: <https://doi.org/10.35870/jtik.v7i2.720>.
- [21] Firmansyah, Y., Maulana, R. and Fatin, N., 2020. Sistem Informasi Pengaduan Warga Berbasis Website. *Jurnal Cendikia*, 19(1), pp.397-404.

- [22] Subari, A., Winarno, H. and Manan, S., 2021. Implementasi Sistem Informasi Warga Berbasis Web Menggunakan Opensid Di Desa Kangkung, Kecamatan Mranggen, Kabupaten Demak. *Jurnal Pengabdian Vokasi*, 2(1), pp.34-37.
- [23] Septiani, N.A. and Habibie, F.Y., 2022. Penggunaan Metode Extreme Programming Pada Perancangan Sistem Informasi Pelayanan Publik. *Jurnal Sistem Komputer dan Informatika (JSON)*, 3(3), pp.341-349. DOI: <http://dx.doi.org/10.30865/json.v3i3.3931>.