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From Manual to Digital: The Evolution of E-Service Models in Public Administration

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Abstract

This study aims to develop an adaptive e-service-based public service model in North Cimahi District. Utilizing a multi-methodological approach, primarily the Soft System Methodology (SSM), the research encompasses document studies, surveys, interviews, and focus group discussions. The findings indicate that the implemented e-services significantly enhance service effectiveness but still need optimal efficiency or sufficient user and operator confidence. A proposed model emphasizes the acceleration of e-service development compatible with smartphones, fostering user independence and active public participation. Additionally, integrating various service applications, including electronic signature systems, is necessary to enhance data security. This integration is expected to reduce direct face-to-face interactions, improving ethical behavior and professionalism among service providers and increasing efficiency for the community and the government. Limitations include comprehensive public engagement and full integration of service applications. Practical implications suggest that e-services can streamline administrative processes and improve public trust in government institutions. Socially, the model promotes inclusivity and transparency in public service delivery. The originality of this study lies in its application of SSM to develop a responsive e-service model tailored to community needs in the context of local government services.

Keywords:

e-service; soft system methodology (SSM); public service model; North Cimahi District

Introduction

The transformation of public services from traditional, manual approaches to modern digital models represents a pivotal evolution in governmental administration worldwide. This shift reflects the global movement toward e-governance and the increasing expectation from citizens for efficient, transparent, and accessible public services. In Indonesia, like many other countries, the adaptation of e-service models in local governance is seen as a crucial step towards modernization and better alignment with the digital era. Particularly in North Cimahi District, there has been a concerted effort to transition towards digital solutions that cater to the needs of its residents, utilizing various technological advancements to streamline administrative processes and enhance service delivery (Mustainah Mappatoba, 2023).

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Despite the positive strides made, several challenges continue to impede the effectiveness and efficiency of these digital public service models. While e-services have improved some aspects of service delivery, issues related to user confidence, system reliability, and data security remain significant. Furthermore, the current digital services are not fully optimized for mobile platforms, limiting accessibility for a substantial portion of the population who primarily rely on smartphones. There is also a need for better integration of service applications, particularly for processes that require electronic signatures, to ensure seamless and secure transactions. Addressing these gaps is critical to realizing the full potential of e-services and improving the overall public administration landscape in North Cimahi District (Uyen Nguyen et al., 2024).

Research conducted in Nigeria on e-service quality and customer satisfaction emphasizes the importance of accessibility and user-centric design in improving public perception of e-services. These insights are particularly relevant to the North Cimahi context, where implementing user-friendly platforms that cater to the district's lower levels of digital literacy is essential for enhancing overall e-service delivery. By addressing these key issues, the proposed localized model for North Cimahi District could offer a sustainable framework that improves both public service efficiency and user engagement.

Literature Review

The academic discourse on e-service models in public administration highlights several frameworks and methodologies aimed at enhancing the functionality and accessibility of these services. One widely recognized approach is the Soft System Methodology (SSM), which offers a structured yet flexible framework for addressing complex, real-world problems, particularly in organizational and governmental settings. SSM emphasizes the importance of understanding stakeholder perspectives and engaging users in the development process, thereby ensuring that the resulting systems are more responsive to the community's needs. Studies have shown that e-service implementations are often met with resistance due to concerns about data privacy, system complexity, and the lack of digital literacy among users. Consequently, an integrative, user-centered approach that addresses these concerns is necessary for successful e-service adoption in public sectors (Kari & Mshelia, 2023).

The purpose of this study is to design and validate an adaptive e-service model that enhances the effectiveness, efficiency, and accessibility of public services in North Cimahi District. Through a user-centered, SSM-based approach, the study aims to address current limitations in digital service delivery and establish a sustainable framework that encourages active public participation and increases trust in governmental institutions. By the end of this research, it is expected that a comprehensive e-service model will be developed, offering a scalable solution

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that can be adapted to other regions and potentially serving as a foundation for further advancements in e-governance in Indonesia (Widianto et al., 2024).

The Regency / City Regional Government, in carrying out government affairs, is then assisted by a regional apparatus formed based on regional regulations in the context of implementing basic services and administrative services to the community, including the Sub-district apparatus, which the Kelurahan assists as a Sub-district apparatus. Since the enactment of PP Number 18 of 2016 concerning Regional Apparatus, there has been a change in the structure of the regional apparatus in the Regency / City; Kelurahan is no longer a regional apparatus but is part of the Sub-district apparatus (Ilieva et al., 2024).

The concept of e-government emerged from the World Bank's concerns about global political, economic, social, and cultural issues in the early 2000s. By the mid-90s, the United Kingdom and the United States began implementing information technology in the public sector. However, due to limited technological infrastructure at the time, these initiatives were costly and difficult to replicate in other parts of the world. It was only in the early 2000s when the use of the Internet became widespread that demand for e-government in the public sector intensified, starting with the banking sector. Based on the results of the JFK School of Government study and research, there are 3 elements of success, namely Support, Capacity, and Value. These three elements of success can be explained in the following Table 1:

Table 1.

Elements of E-Government Success

No.	Element	Explanation & Stages	
1.	Support	This element is placed first because it plays a crucial role. The concept and implementation of e-government are expected to be the desire of public officials who have authority. E-government is expected not only to follow trends but must become a political will so that various principles, initiatives, and developments of e-government can run smoothly and without obstacles.	1. The agreement on the stages of implementing e-government is the key to achieving the country's vision and mission through governance and making it a priority. 2. Optimize resources owned at each level of government for the implementation of e-government. 3. Developing and developing infrastructure and superstructures to support the implementation of e-Government. Making clear regulations and appointing institutions/agencies responsible for the implementation of e-Government. 4. Full, continuous, and continuous socialization of all elements involved, including internal and external stakeholders. Moreover, conducting sympathetic campaigns with residents so that e-government can be accepted.
2.	Capacity	How does the local government show its empowerment and ability to realize	1. Sufficient allocation and availability of budget resources.

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No.	Element	Explanation & Stages
		electronic-based governance (e-government), which is not just a dream but implementable? 2. The allocation and availability of infrastructure and information technology are 50% of the key to the success of implementing e-government. 3. Preparing qualified, competent, and expert human resources so that e-government can run according to the expectations and needs of citizens.
3.	Value	The government must be precise in choosing the priority of the type of e-government application needed by the community so that the value (benefits) can be obtained and felt by citizens significantly.

Table 1 describes the application of e-government or the current term, namely digital government in governance, which is a policy that certainly requires stages of implementation. The value element can be referred to as the benefits of e-government from the perspective of service recipients/the community because the policy of implementing e-government is not only seen as a tool to achieve effectiveness and efficiency from the government's side as a service provider but effectiveness and efficiency must also be enjoyed by the community in reaching public services (Pananrangi et al., 2023). The use of the term electronic must be understood as the latest technology, namely information technology, that in real-time is seen as able to increase effectiveness and efficiency today.

Table 2.

Public Value of *E-Government* from the Perspective of Application Domain

e-Administration	e-service	e-Citizens and e-Society
- Improve Administration - Open Government (OG) Capabilities - Improved Ethical Behaviour and Professionalism	- Improve Public Service - Open Government (OG) Capabilities - Improved Ethical Behavior and Professionalism - Improved trust and confidence in government	- Improve Social value and wellbeing - Open Government (OG) Capabilities - Improved trust and confidence in government

Table 2 explains that each characteristic is not grouped separately as a whole, but several characteristics intersect each other. The Development of the digital world and the Internet, especially after the COVID-19 pandemic, has formed a new culture and habits in society, including in Indonesia as one of the countries affected by the COVID-19 Pandemic is quite significant and has a relatively long period, which is approximately 2 years (2019 to 2022). The public sector, including government agencies, is certainly also required to meet the needs of the community for public services, especially administrative services. The service system through counters and direct interaction, as well as the consecration of service spaces that are crowded with queues, is no longer relevant to be applied in the era of digital society or the Industrial Revolution 4.0 or

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citizens 5.0 where automation and the application of the Internet are mandatory by law (Kari & Mshelia, 2023; Phuyal, 2024).

The application of an electronic-based government system (e-government) through e-service is no longer limited to applying services to computers or computer networks. More than that, public services must be able to provide services to the public that are more transparent and informative, have service options that are participatory and by the wishes of the community, and provide effectiveness and cost efficiency for the community and the government. Public services must also be able to recapitulate input from the public on the desired form of service as a form of implementation of New Public Services where the public has the freedom to choose the desired service and influence public service policies.

Table 3.

E-service in Public Value of Government: Characteristics and Indicators

Characteristic		Indicators	
1.	Improve public services,	1.	Delivery of services to the community/citizens.
		2.	Improving the quality and quantity of public services.
		3.	Offer inclusive public services.
		4.	Provision of citizen-centered services.
		5.	Empowerment of transparency, participation, and cooperation in the implementation of public services.
2.	Open Government Capabilities	1.	More open government and increased transparency of public institutions.
		2.	Improvement of communication and collaboration programs in the public sector.
		3.	Increasing public control and influence over government actions and policies.
		4.	Increased frequency and intensity of direct participation in decision-making.
		5.	Increased innovation.
3.	Improved ethical behavior and professionalism,	1.	Maintenance of basic beliefs and constitutional rights.
		2.	Use public funds wisely.
		3.	Facilitation of democratic will.
		4.	Demand good information for decision-making.
		5.	Creation of durable and competent institutional capacity.
4.	Value-added trust and confidence in public institutions (Government).	1.	Ensuring adequate public information and citizen privacy.
		2.	Healthier management of public institutions, the economy, and resources.
		3.	Increased transparency and engagement.
		4.	The people have greater control over government decisions and actions.
		5.	Adequate access to government services.

Source: Processed by Authors Researcher, 2023

Through this theoretical and normative framework, the framework of thought of the Public Service Model in North Cimahi District based on *E-service* can be described in Figure 2 as follows:

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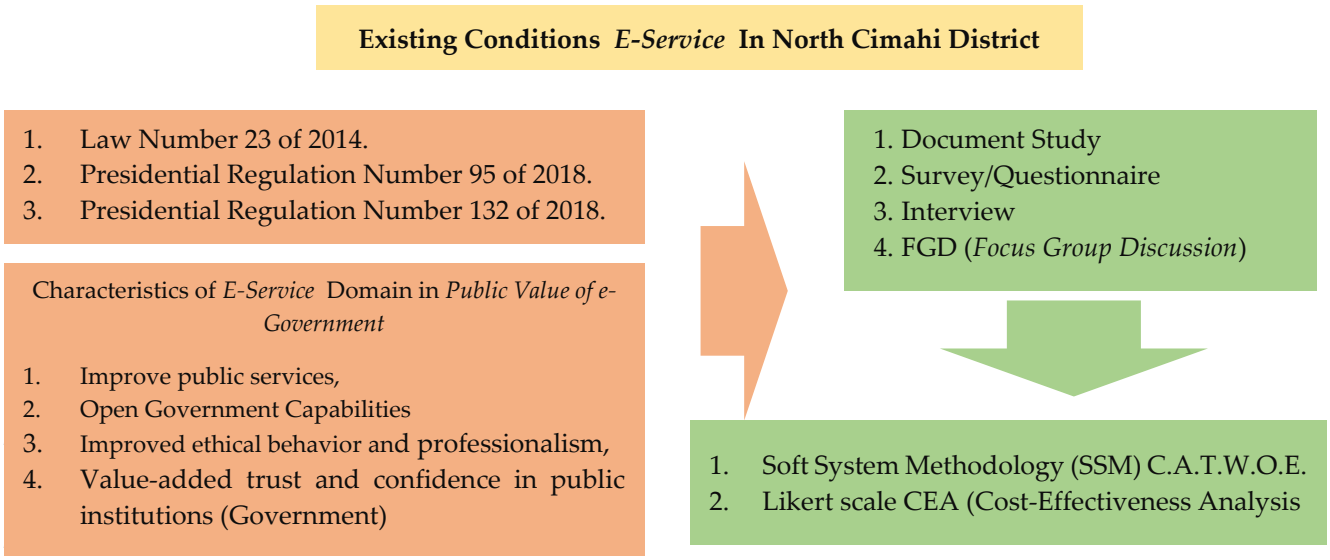
Figure 2.

Thinking Framework Public Service Model in North Cimahi District by E-Service



Methods

This study was structured as a multi-phase research project, designed to evaluate, adapt, and propose an e-service model that addresses the unique needs of public administration in North Cimahi District. The research adopted a multi-methodological approach, combining qualitative and quantitative methods to ensure a holistic view of the issues at hand. The primary framework guiding this study was the Soft System Methodology (SSM), a qualitative research approach that is particularly suited for complex, unstructured problems, commonly found in public service contexts. SSM was selected due to its adaptability and its focus on stakeholder engagement, which is critical in the development of public service models that aim to be inclusive and community-centered (Zhang & Kaur, 2024). The first phase involved an extensive review of relevant literature, government policies, and existing e-service models in Indonesia and comparable settings. Key documents such as Law Number 23 of 2014, Presidential Regulation Number 95 of 2018, and Presidential Regulation Number 132 of 2018 provided foundational insights. Additionally, previous studies on e-service models, including case studies from the Jogja Smart Service (JSS) and international examples, helped in identifying common challenges and effective strategies that could inform the North Cimahi model. Following the document study, surveys were conducted with both the users of public services and the providers (local government employees) in North Cimahi District (Pananrangi et al., 2023).

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A structured questionnaire was developed for the survey, comprising multiple-choice and Likert scale questions. The questionnaire focused on areas such as service accessibility, user confidence, system reliability, and data security. It was distributed both digitally and in-person to ensure wide participation. For the interviews, an interview guide was crafted to ensure consistency across sessions. This guide included open-ended questions tailored to each type of participant, with questions designed to uncover deeper insights into the operational and experiential aspects of current e-services. SSM was applied to analyze the qualitative data from interviews and FGDs, particularly using its CATWOE (Customers, Actors, Transformation process, Worldview, Owner, and Environmental constraints) framework. This framework helped in identifying stakeholder needs, defining desired changes, and understanding constraints within the local government context. Each element of CATWOE was addressed, helping to structure the analysis around key factors that influence e-service implementation in North Cimahi. The survey data were processed using descriptive statistics to summarize key metrics of user satisfaction and service effectiveness (Iong & Phillips, 2023).

By analyzing survey responses and interview data, the research team identified specific areas where existing services fell short in terms of efficiency and accessibility. The SSM's CATWOE framework allowed the researchers to explore possible transformations within these areas, focusing on changes that would lead to a more efficient e-service model. Insights from the interviews and FGDs were instrumental in understanding the psychological and social barriers that hinder user confidence in e-services. The content analysis of these discussions highlighted the importance of data security, transparent communication, and responsive support as key factors in building trust (Mustainah Mappatoba, 2023).

This comprehensive methodology ensured that the proposed e-service model was both practical and aligned with the needs of North Cimahi District's residents. By integrating quantitative data with qualitative insights, and through the application of SSM, the study aimed to deliver a model that addresses real-world challenges in public administration. The combination of document analysis, surveys, interviews, and FGDs provided a robust foundation for understanding and responding to the complex dynamics of digital transformation in local government services (Ilieva et al., 2024).

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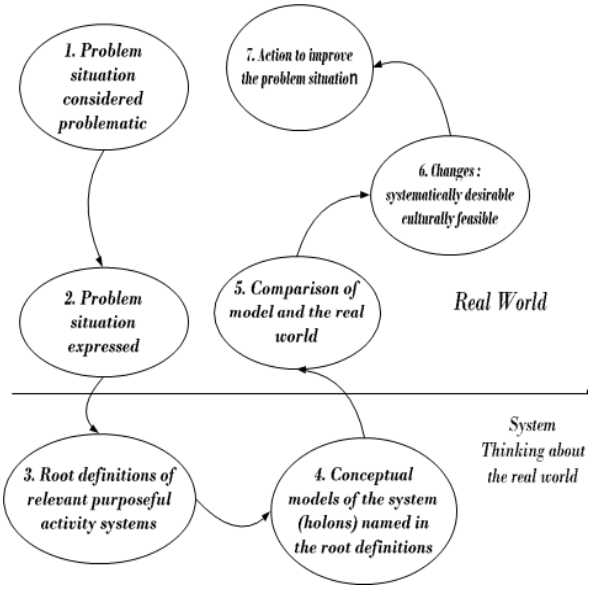
Figure 3.

Soft System Methodology Stages



To formulate the basic definition of the problem, Chekland used the acronym CATWOE (Customers, Actors, Transformation process, World View, Owners, Environmental Constraints). (1) Customers are parties who will be affected by profits or losses from efforts to handle problems. (2) Actors are parties who take on the role of implementers of problem-solving/handling activities. (3) Transformation of the expected effort/process converts the input into the expected output. (4) A worldview is the understanding of various parties about the deep meaning of the problem situation. (5) Owners and stakeholders who have the authority to stop or continue the process or activities of the organization. The combination of data collection with SSM is arranged in the following Table 4:

Table 4.

Brief Description Steps of Combination Data Collection and Research Instruments with Soft System Methodology (SSM)

SSM Stages/Steps	Description	Linkage to Data Collection Techniques
Understand unstructured problem conditions	Collect information related to problems through primary and secondary data, interviews, and questionnaires. The results of the information collection will explain and describe the problems and *the gap* between ideal conditions and existing conditions.	Surveys, FGDs, Interviews, and document studies
Explain the problem situation	Systematically explain ideas and understand the situation • Identify respondents (problem owners or problem solvers). • Identify the roles and behaviors expected of those involved.	FGD and interviews

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	• Analyze differences in strengths (experience, roles, knowledge, positions, access, control of resources).	
Formulating basic definitions	• A structured explanation or description of the system and system activities in the organization being studied, what the system aims for, how to achieve the goals through existing systems, and how the system supports long-term goals. • Describe the relationship of problems using C. A. T. W. O. E, i.e., identification and analysis of individual positions in a more specific system.	Document studies and interviews
Developing conceptual models	Logically extrapolating a conceptual model of each root problem to show each operational activity of the process outlined at the basic definition stage by creating a diagram construction that depicts the boundaries of the system and the interdependencies between activities.	FGD and interviews
Comparing models to reality	Compare the results of the study with the real world, and the conceptual model is fed with the relevant system by creating a comparison table that shows: • systematically the important differences between the real world and the model world, • problems to ask further about the people involved, • possible plans of action to change the situation, • Design changes must be made to the model.	FGD and interviews

Table 4 provides a more detailed analysis; I can break down the key stages and steps described in your table and link them to possible data collection techniques. Let us dive into the content based on the "SSM Stages/Steps," "Description," and "Linkage to Data Collection Techniques" provided. The idea is to get a wider view of the problem by understanding it in its raw, unorganized form. Often used to gather broad information from a large population to understand general patterns or opinions. It is useful to gather a more in-depth understanding of perceptions by discussing the issues in a group setting. Systematically explaining the problem by identifying core ideas and understanding the situation from different viewpoints.

Results and Discussion

The study focused on analyzing the effectiveness and challenges of the current e-service model in North Cimahi District, to develop an adaptive and integrated system. The findings are presented with the core objectives: improving service efficiency, enhancing accessibility, fostering public trust, and increasing user independence. The survey results indicated that the

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current e-service infrastructure has successfully addressed some efficiency concerns but falls short in terms of accessibility and comprehensive functionality. The data revealed that while digital services reduced the time required for processing requests, many users found accessing the services through desktop-only interfaces limiting. Specifically, over 60% of respondents highlighted a preference for mobile-compatible platforms, with mobile-based access being more convenient and aligned with their daily technology use.

Qualitative feedback from interviews and focus group discussions (FGDs) also underscored the importance of mobile optimization. Respondents described challenges in accessing e-services due to limited infrastructure in certain areas, which compounded the digital divide. Interviewees from rural zones of North Cimahi particularly emphasized that the lack of accessible digital interfaces posed significant barriers to utilizing government services efficiently. Building user trust in e-services emerged as a crucial component in ensuring successful adoption. Analysis from the interviews highlighted issues related to data security, transparency, and the responsiveness of the support system (Hadi et al., 2020).

FGDs further emphasized the role of transparency in fostering trust. Participants suggested that implementing a visible log of actions (showing step-by-step transaction statuses) and a reliable customer support feature could reassure users and enhance transparency. Moreover, the lack of integration with electronic signature systems also surfaced as a challenge, as users perceived the absence of such a feature as an indication of limited service sophistication and reliability. The study aimed to promote a model that supports user independence and active participation. Survey data indicated that around 40% of users felt overly reliant on intermediaries to complete online transactions, highlighting the need for a more user-friendly and self-sufficient system (Dzemydienė et al., 2024).

The identified need for mobile optimization aligns with global trends in digital transformation within public administration. The preference for mobile access echoes findings from other studies on e-services, such as the Jogja Smart Service (JSS) in Yogyakarta, where mobile platforms improved accessibility and user satisfaction. Adopting a mobile-optimized, user-friendly interface would be an essential upgrade to meet the district's objectives of inclusivity and widespread access. To address infrastructure limitations, particularly in rural areas, a phased rollout approach can be considered (Aslinda, 2023). This approach would prioritize resource allocation to regions where users have limited access to desktops, thereby maximizing the model's outreach and impact. Furthermore, a hybrid model that combines both desktop and mobile interfaces could provide flexibility for users in diverse technological settings.

The findings suggest that user confidence in digital services largely depends on perceived data security and transparency measures. The integration of security protocols such as electronic

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signatures and secure, encrypted transactions could enhance user trust and mitigate privacy concerns. Additionally, adopting open-data policies and transparent workflows, as suggested in interviews and FGDs, could serve to reassure users about the safety of their interactions with government services. The proposed approach aligns with theories in e-governance that highlight transparency and data protection as pillars of effective digital governance. By addressing these aspects, North Cimahi District's model could set a benchmark for trust-centric public service models in local governance, potentially increasing engagement levels and user satisfaction.

User independence emerged as a key focus, with many respondents expressing a need for self-guided resources and interactive tools. Empowering users to navigate e-services independently reflects broader trends in e-government where user-centric design aims to reduce reliance on intermediaries. Implementing tutorials, FAQs, and chatbot-assisted interactions can contribute to achieving this goal. Moreover, creating feedback loops for users to provide suggestions and report issues directly within the platform would facilitate continuous improvement and encourage public participation. Such an approach is consistent with the Soft System Methodology's (SSM) emphasis on stakeholder engagement, ensuring the platform evolves with the community's changing needs.

The findings highlight that integrating various e-service functions under a single, cohesive platform could significantly enhance user experience and operational efficiency. This recommendation is supported by cost-effectiveness analysis, which suggests that consolidating services would not only simplify processes for users but also reduce administrative costs in the long run. By providing a unified platform, the district can eliminate redundancies and improve cross-service functionality, allowing users to complete multiple tasks within the same ecosystem. Similar integration strategies have proven successful in other regional e-governance initiatives, as they allow for seamless data transfer and easier access across different public services. Implementing such an integrated model could thus position North Cimahi District as a pioneer in efficient, user-friendly public administration, creating a replicable model for other regions.

The Soft System Methodology (SSM) provided a valuable framework for understanding and addressing the complex challenges identified in North Cimahi's e-service model. Through its structured yet flexible approach, SSM enabled a holistic analysis of stakeholder needs, system deficiencies, and potential improvements. By applying CATWOE (Customers, Actors, Transformation, Worldview, Owners, and Environmental Constraints) to assess the model's limitations, the study successfully identified areas requiring transformation and practical strategies for achieving the desired outcomes. SSM's emphasis on stakeholder involvement supported the study's aim of developing a community-centered e-service model. By engaging both users and providers in the research process, the study was able to incorporate diverse

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perspectives, ensuring that the proposed solutions are not only feasible but also widely accepted within the community.

Future studies could further explore the long-term impact of such integrated e-service models on public trust, satisfaction, and operational efficiency. Additionally, further research could analyze how emerging technologies, such as artificial intelligence and blockchain, can be incorporated into public service models to enhance security, transparency, and efficiency even further.

Table 5.

Number and Percentage of Population in Cimahi City by Education Level

NO.	Kecamatan	Tingkat Pendidikan																				Jumlah
		Tidak/ Belum Sekolah		Belum Tamat SD/ Sederajat		SD/ Sederajat		SMP/ Sederajat		SMA/ Sederajat		D1 dan D2		D3		D4 & S1		S2		S3		
		Jml	%	Jml	%	Jml	%	Jml	%	Jml	%	Jml	%	Jml	%	Jml	%	Jml	%	Jml	%	
1	Cimahi Selatan	48.852	20,47	21.264	8,91	28.870	12,10	41.421	17,36	73.048	30,61	1.920	0,80	7.097	2,97	14.787	6,20	1.245	0,52	138	0,06	238.642
2	Cimahi Tengah	28.569	17,54	14.760	9,06	14.309	8,79	24.905	15,29	59.900	36,78	1.888	1,16	5.691	3,49	11.624	7,14	1.115	0,68	88	0,05	162.849
3	Cimahi Utara	32.486	19,18	15.727	9,29	23.804	14,06	23.232	13,72	46.067	27,20	2.116	1,25	6.658	3,93	16.538	9,77	2.388	1,41	322	0,19	169.338

Source: Data on 2023 Cimahi City Population Aggregate Book, processed by 2024 Researcher

Table 5 describes education, especially at the university level, and shows that the people of North Cimahi are more ready to accept the transformation of electronic-based public services compared to the people of other sub-districts in Cimahi City, thus making North Cimahi Sub-district a pioneer of e-service implementation in Cimahi City in 2017, driven by the desire of the community. This condition is quite understandable, considering the ability of community technology accessibility is directly proportional to the level of community education in a region. The higher the education of the community, the higher the mastery of information technology, especially at the university level. Through data obtained at the research locus, namely through the Head of Sub. General and Personnel Section of the Secretariat in July 2023, the condition of Human Resources in North Cimahi Sub-district has 127 employees, consisting of 58 civil servants, and 69 non-civil servants, with the structure illustrated as follows:

Table 6.

Number of Employees Based on Position Level

No.	Position	Number of employees	
	Struktural Esselon III	2	people
	Struktural Esselon IV	27	people
	Civil Servant Implementer	29	people
	Non-PNS	69	people
Sum		**127**	**people**

Source: Sub. General and Personnel Division, 2023

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Table 6 through data obtained at the research locus, namely through the Head of the General and Personnel Subdivision of the Secretariat in July 2023, the condition of Human Resources in North Cimahi District has 127 employees, consisting of 58 Civil Servants, 69 non-civil Servants. The largest segment is likely represented by Non-PNS employees (non-permanent staff), which indicates that a significant portion of the workforce might consist of temporary or contractual employees. The next largest categories are Civil Servant Implementers and Structural Esselon IV, suggesting that the operational and middle-management roles are well-staffed. Structural Esselon III, a higher managerial role, has the smallest proportion, indicating that there are fewer people in senior leadership positions.

The dominance of roles such as Civil Servant Implementer and Non-PNS suggests a workforce primarily focused on execution and day-to-day operations. This implies a potential emphasis on service delivery and routine tasks rather than strategic planning and decision-making. There are fewer employees in higher-ranking managerial roles (Esselon III and IV), which is typical in hierarchical organizations. This suggests a pyramid-shaped structure, where a smaller number of leaders oversee a larger base of operational staff. If non-PNS (non-permanent staff) forms a significant portion of the workforce, it could indicate a reliance on temporary or contract-based employees.

Table 7.

Number of Employees in North Cimahi District, Cimahi City Based on Education Level

No.	Education Level	Number of Employees		
		PNS	Non PNS	PNS+ non PNS
1.	S2	15	1	16
2.	S1/D4	21	18	39
3.	D3	3	3	6
4.	D1/D2	0	0	0
5.	SMA	16	35	51
6.	SD-SMP	3	12	15
Sum		**58**	**69**	**127**

Source: Sub. General and Personnel Division in 2023

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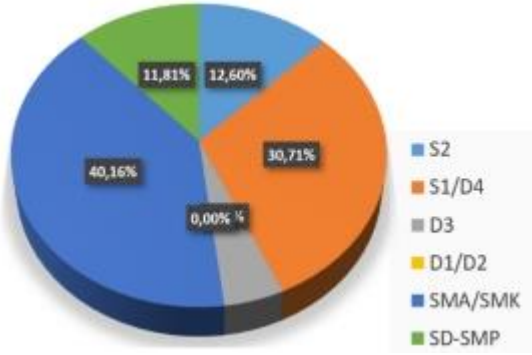
Figure 4.

Employees in North Cimahi District, Cimahi City Based on Education Level



Source: Sub. General and Personnel Division in 2023

Table 7 and Figure 4 provide meaningful insights into the number of employees in North Cimahi District. Based on education level, we typically analyze how employees' educational qualifications are distributed. High concentration of employees with high school diplomas or equivalent: This might suggest that the district primarily employs individuals for administrative or operational roles that do not require higher education qualifications. This could indicate that the district values employees with a well-rounded general education, likely placing them in roles that require more cognitive or decision-making skills (Ilieva et al., 2024). A lower proportion of highly educated staff might imply a lack of advanced expertise or specialized skills in the workforce, particularly in strategic planning, leadership, or technical innovation.

The performance achievements of the Regional Apparatus can be measured by how well the realization or achievement of the performance indicators of programs or activities is then used as the main performance indicator (KPI) of the organization. For sub-district agencies in the Cimahi City Regional Government itself, the Main Performance Indicators are contained in the Decree of the Mayor of Cimahi Number: 060/Kep.1449-Org/2019 concerning Main Performance Indicators in the Cimahi City Regional Government in 2019-2022. The main performance indicators of North Cimahi District can be seen from the achievements of the Community Satisfaction Index (IKM).

Table 8.

Community Satisfaction Index (IKM) 2021 to 2023 (Semester I)

YEAR	TARGET	ACHIEVEMENTS
2018	85	82,97
2019	85	90,91
2020	90	90,91
2021	91	91,76
2022	91	91,02
2023 (Semester I)	91	90,47

Source: Strategic Plan of Changes 2018-2022, LKIP Cimahi Utara 2022, SMM SMM Report 1 of 2023

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Table 8 shows the service Performance of North Cimahi District as a Key Performance Indicator (IKU). The achievement of the North Cimahi District Community Satisfaction Survey itself is among the highest in Cimahi City, reaching 91.76 in 2021 and increasing to 91.02 in 2022. In the first semester of 2023, there was a decrease, namely at 90.47 Service Performance in North Cimahi District was certainly greatly influenced by the application of information technology, namely through the SAPAKAT Online application which still uses the intranet network, and increased to the implementation of LAPAKAMI in September 2023 which already uses the internet network so that it can be accessed by the public directly anywhere anytime through web services or web-based applications through PC devices or Laptop. With the limited resources owned, North Cimahi Sub-district hopes that there will be improvements after the implementation of LAPAKAMI by Diskominfo in October 2023. The quality of service today must be able to adapt to the development of the Industrial Revolution 4.0 through the implementation of electronic-based services (e-service) (Iong & Phillips, 2023; et al., 2024).

In December 2017, SAPAKAT online was launched, which is the first form of e-service in the Cimahi Utara Sub-district. SAPAKAT online is a web-service-based application through an intranet network. Through SAPAKAT online, the hope is that the community only needs to come to the Kelurahan to take care of services. Although it is very significant in providing satisfaction to the community in North Cimahi Sub-district, and being a pilot project for e-service implementation at the sub-district level, SAPAKAT online is still considered not adaptive to technological developments, especially in the era of Industrial Revolution 4.0 which even allows people to directly access services at home or anywhere (Taufiqurokhman et al., 2024). Figure 5 The support aspect in the development of e-government through e-service is also a major factor that is quite influential in the development of e-government in government agencies.

Figure 5.

Display of SAPAKAT Online Application in Kecamatan Cimahi Utara

Source: Public Service Section of North Cimahi Sub-district, 2022

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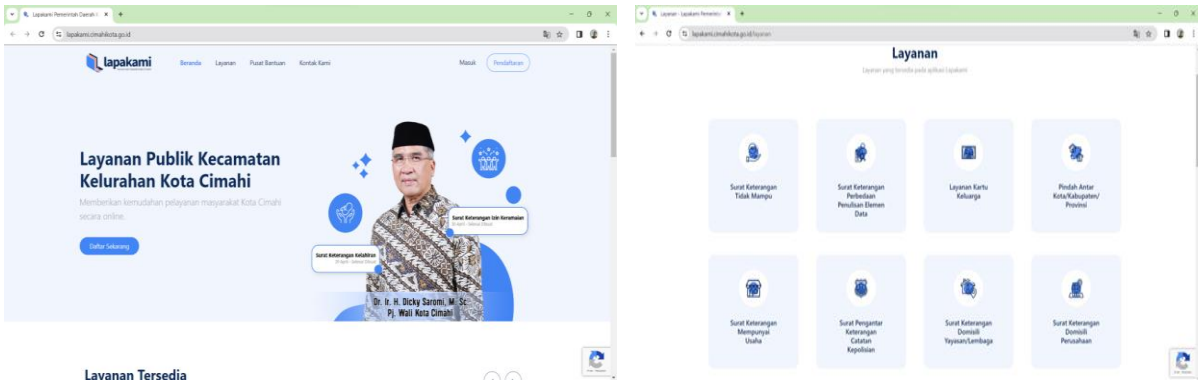
The LAPAKAMI application is web-based and can be accessed via the Internet, allowing the public to choose the type of service, input their service data, attach service files electronically, and obtain service products in soft files with electronic signatures. In addition to being effective and efficient for the community, LAPAKAMI is also expected to cut operational costs that must be incurred by sub-districts and villages for paper shopping (paperless) and because it has been strengthened by Figure 6 the legal basis for implementing Electronic Signatures, LAPAKAMI allows authorized officials to sign files anywhere at any time so that service times can be faster.

Figure 6.

LAPAKAMI Application Display



Source: DISKOMINFO Cimahi City, 2024

In addition to administrative service applications, the North Cimahi Sub-district also has a website, limit.cimahikota.go.id, as a means of electronic information for citizens. Information that can be obtained through the North Cimahi Sub-district website includes brief profile of the Sub-district and Kelurahan, service requirements (KTP service, KK, Company Domicile Certificate, Foundation Domicile Certificate, Letter of Introduction to Move Abroad, PBG Information, SKTM, Certificate of Change of Resident Data, Certificate of Change of Resident Data, Legalisation of KK and KTP, Certificate of Same Person, Letter of Introduction to Move Abroad, Certificate of Settlement, Birth Certificate, Certificate /Legalisation of Heirs, Land Services, Certificate / Family Dependents, Unmarried Certificate, Business Certificate, Micro Business Permit through OSS, Crowd Permit, Self Clean Certificate, Police Record Certificate, Hajj Domicile Certificate, Certificate of Extension of Foundation Operational Permit, Letter of Recommendation for Construction/Renovation of Mosque, Letter of Recommendation for Community Activities.

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Table 9.

Types of *e-service-based* services in North Cimahi District

No.	Type Of Service	E-Service Application
I.	1. Andon Wedding 2. Don't Own a House Yet 3. Unmarried 4. Self-Cleaning 5. Domisili Ibadah Haji 6. Crowd Permit 7. Widow/Widower's Statement 8. Death Certificate 9. KTP Population in Process 10. Business Certificate 11. Introduction to SKCK 12. SKTM to School 13. SKTM to PLN 14. SKTM to Court 15. Company domicile 16. Domicemics of the Police 17. Domisili Lembaga 18. SKTM to the Hospital	lapakami Pemerintah Daerah Kota Cimahi Public Service of Cimahin City Village District (LAPAKAMI) Operator Regional Apparatus : District, DISKOMINFO
II.	1. Transfer Letter Between RT, RW, Kelurahan, City and Province 2. Letter of Arrival from Outside the Region to Cimahi 3. Birth Certificate Making Certificate 4. Making a Child Identity Card (KIA) 5. Correction of Name, Address, Place of Birth Data on Family Card 6. Damaged, Lost, and Altered ID Card Printing 7. Print Family Cards	DILANDA CITA (Digitalisasi Layanan Dokumen Adminduk Cimahi Kota) Digitalisasi Layanan Dokumen Adminduk Cimahi Kota (DILANDA-CITA) Perangkat Daerah Operator : Kecamatan, DISDUKCASIP
III.	1. Business License (NIB) 2. Building Permit	OSS KEMENTERIAN INVESTASI/BKPM Electronically Integrated Business Licensing System - Online Single Submission (OSS) Operator Regional Apparatus : DPMPTSP
IV.	1. Information Services	 https://cimut.cimahikota.go.id/ Operator Regional Apparatus : District, DISKOMINFO

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Figure 7.

Website of Cimahi Utara Sub-district

Source : cimut.cimahikota.go.id

Figure 7 The fundamental difference between the online SAPAKAT application and LAPAKAMI is that LAPAKAMI can be widely accessed on the internet by both the public who will access the service and the operator who processes the report, allowing direct public participation in the service process. This condition will certainly create efficiency and convenience for both the community and service officers. Unlike the online SAPAKAT which can only be used by operators/officers on the intranet network (internal office network). The presence of LAPAKAMI is a big step for the implementation of e-service in Cimahi City, especially at the sub-district and village levels.

Based on the results of the survey conducted to residents of North Cimahi Sub-district and 4 urban villages, the survey results can be described as follows: (1) 42.5% strongly agree that respondents get all service information in North Cimahi Sub-district through e-services (website/Sapakat/Lapakami), while 56.2% agree and 1.4% strongly disagree; (2) 49.3% strongly agreed that respondents received quality services and the process was fast, while 50.7% agreed; (3) 31.5% of respondents strongly agreed that through e-service in North Cimahi Sub-district there are services for disabilities, 589% of respondents agreed while 8.2% of respondents stated that they did not know, 1.4% disagreed; (4) 29.2% of respondents strongly agreed that through e-service in North Cimahi Sub-district, respondents can provide input, suggestions and complaints for service improvement, 69.9% of respondents agreed while 5.6% of respondents stated that they did not know, 1.4% disagreed; (5) 29.2% of respondents strongly agreed that through e-service in North Cimahi Sub-district, respondents can see information about requirements, processes, costs and service progress, 52.8% of respondents agreed while 16.7% of respondents stated that they did not know, 1.4% disagreed; (6) 35.6% of respondents strongly agreed that through e-service in North Cimahi Sub-district, respondents can fill in service forms

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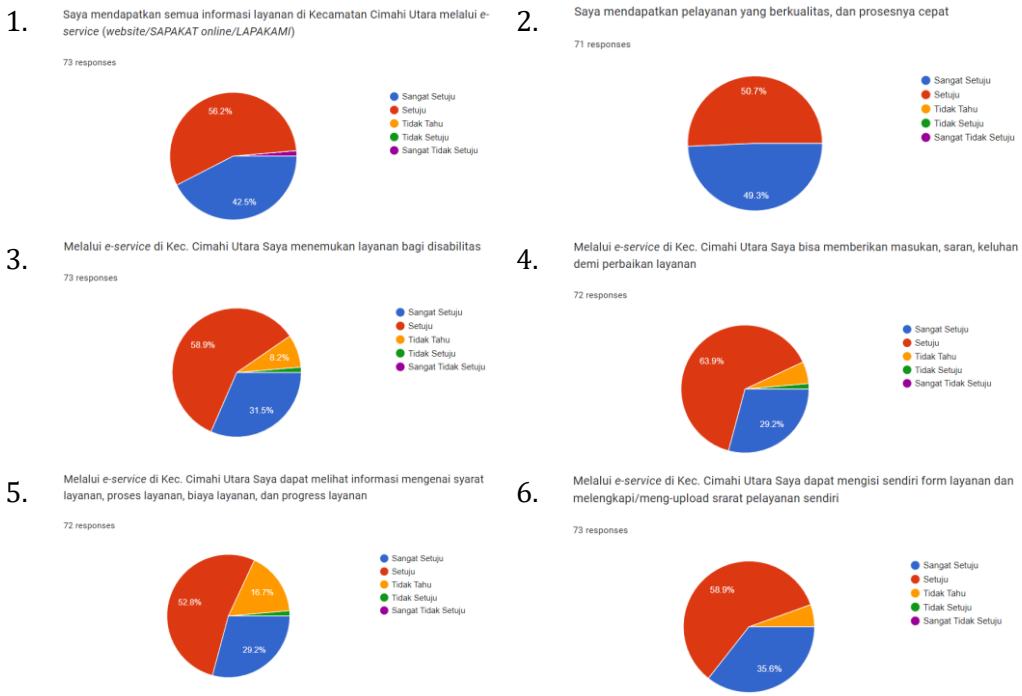
and complete/aploud service requirements independently, 58.9% of respondents agreed while 5.6% of respondents stated that they did not know.

Figure 8.

Survey Results on Improve Public Services in North Cimahi District



Source: Processed by Researchers, 2023

From Figure 8 the survey answers above if averaged that the improvement of public services through e-service in North Cimahi District in fulfilling indicators of the characteristics of Improved public services 36.2% stated strongly agree, 57.9% agreed while 6.02% answered don't know and only 1% of respondents answered disagree.

Based on the survey results of Open Government capabilities characteristics, the survey results of e-service in North Cimahi Sub-district can be described as follows: (1) 30.6% of respondents strongly agreed that through e-service in North Cimahi Sub-district, respondents can access information about the performance of local government agencies, especially North Cimahi Sub-district, 52.8% of respondents agreed, while 15.3% of respondents did not know, 1.4% disagreed; (2) 28.8% of respondents strongly agreed that through e-service in North Cimahi Sub-district, respondents can interact, communicate and provide input/suggestions to the local government in this case North Cimahi Sub-district, 63% of respondents stated that they agreed while 6.8% of respondents stated that they did not know and 14% of respondents stated that they disagreed; (3) 27.4% of respondents strongly agreed that through e-service in North Cimahi Sub-district, respondents found a menu to provide input and criticism of the services provided by North Cimahi Sub-district, 65.8% of respondents agreed while 5.5% of respondents stated that

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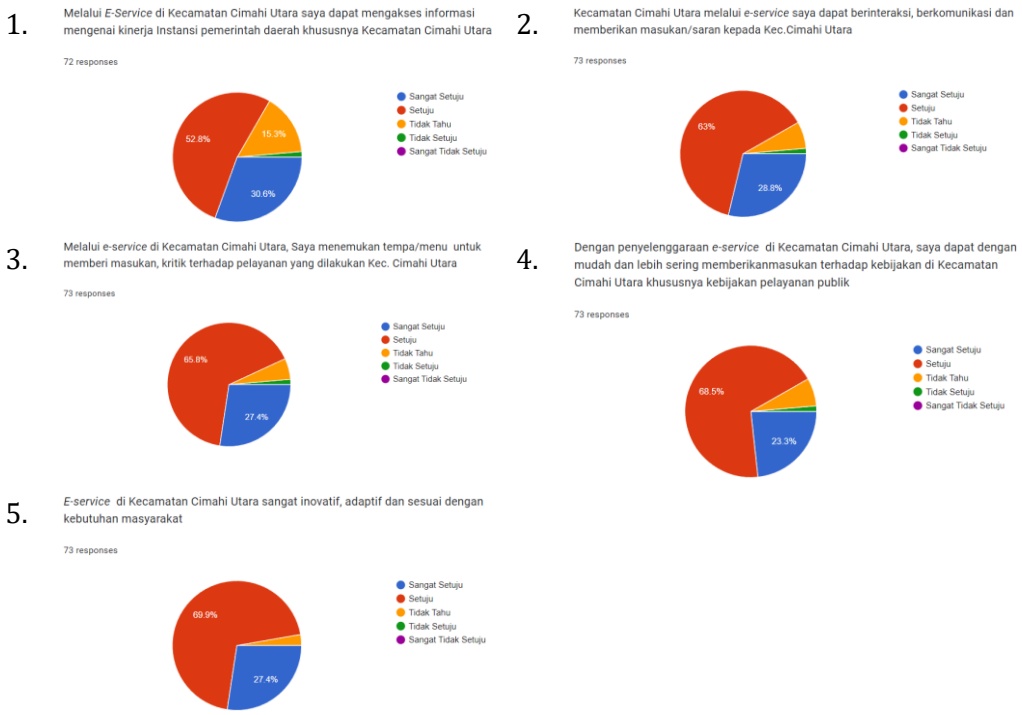
they did not know and 1.4% of respondents stated that they disagreed; (4) 23.3% of respondents strongly agreed that with the implementation of e-service in North Cimahi Sub-district, respondents can easily and more often provide input on policies in North Cimahi Sub-district, especially public service policies, 68.5% of respondents agreed while 6.8% of respondents stated that they did not know and 14% of respondents stated that they disagreed. 5; (5) 27.4% of respondents strongly agreed that e-service in North Cimahi Sub-district is very innovative, adaptive and according to the needs of the community, 69.9% of respondents agreed while 2.7% of respondents stated that they did not know;

Figure 9.

Survey Results on Open Government Capabilities in North Cimahi District



Source: Processed by Researchers, 2023

The root definition of a relevant purposeful activity system is the 3rd stage in SSM. At this stage, the analysis moves from existing conditions in the real world to system thinking. From the previous modeling through rich pictures, a brief definition was then carried out, which was then used as the root definition. To carry out the system thinking process through the Soft System Methodology, CATWOE (Customers, Actors, Transformation, Owners, Environmental) analysis is used. The results of the CATWOE analysis obtained on the results of the survey of citizens, officials who perform public service duties, operators, and the Head of the Communication and Information Service, which is the leading sector in the implementation of the e-service policy in the Cimahi City Regional Government, the following data was obtained:

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Table 10.

CATWOE Analysis for E-service-based Public Service Model in North Cimahi District

Customers	Who benefits from the transformation process of the public service model in North Cimahi District based on e-service?	Residents/communities of North Cimahi District: All Employees in North Cimahi District
Actors	Who is involved in the process of transforming the public service model in North Cimahi District based on e-service?	Head of the Sub-district Public Service Section, North Cimahi Sub-district, Village Secretary, Operator Village Head, Admin and E-Government Team of Cimahi City Diskominfo
Transformation	What changes do you want to occur in the public service implementation system in North Cimahi District?	Public services in North Cimahi District based on e-service are more optimal according to the ideal criteria of e-service.
Worldview	What is the big picture of the expected changes from the implementation of e-service-based public services in North Cimahi District? What is the far-reaching impact of this issue?	E-service-based public services are more effective, efficient, transparent, easy to use, and integrated with various data provider applications and public services needed by the residents of North Cimahi District.
Owner	Who has the authority to implement e-service-based public services in North Cimahi District?	Mayor of Cimahi, Head of the Cimahi City Communication and Information Service
Environment	What environmental factors can hinder the problem-solving that is being studied in the implementation of public services in North Cimahi District?	There is no legal basis for the latest Mayor Regulation on SPBE

Source: Processed by researchers 2024

Explanation of Table 9 that customers in e-service-based public services in North Cimahi District are certainly residents of the community in North Cimahi District. The transformation of e-service in the ideal direction and according to good criteria will certainly bring convenience and satisfaction to the community for services in North Cimahi District. The actors who played a role in this transformation process were the Head of the Sub-district Public Service Section, the North Cimahi Sub-district Head, the Village Secretary, the Operator Village Head, the Admin, and the Cimahi City Diskominfo E-Government Team. The Head of the Public Service Section is an official who is authorized to carry out electronic signatures in the e-service process at the North Cimahi District level under the Sub-District; the Head of the Public Service Section is also the Technical Implementation Officer for e-service operational activities in the Sub-district and Urban Village who has a role in providing input to the Sub-district Head in the preparation of the Annual Work Plan for Service Activities in the Sub-district and Urban Village (Abudaqa et al., 2023).

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Conclusions

The research underscores the transformative potential of an adaptive e-service model tailored to local needs within the North Cimahi District. By leveraging the Soft System Methodology (SSM) and incorporating user feedback through various qualitative and quantitative techniques, this study has developed a nuanced understanding of the challenges and opportunities in digital public service delivery. This study's main findings emphasize the importance of mobile accessibility, security measures, transparency, user independence, and service integration. By focusing on these areas, the research offers a pathway to enhanced public service efficiency and accessibility, addressing specific community needs in North Cimahi. The integration of SSM allowed the study to contextualize these findings within the perspectives of different stakeholders, ensuring that the resulting model is grounded in real user experiences and expectations.

A significant portion of users highlighted the need for mobile-accessible platforms. The findings emphasize that mobile optimization is crucial for increasing reach and inclusivity, particularly in areas with limited desktop infrastructure. This supports a broader transition to mobile-friendly digital governance that resonates with similar successful models, such as the Jogja Smart Service (JSS). Ensuring data security and transparency emerged as key to user trust and, subsequently, to increased e-service adoption. These findings validate prior research on the necessity of privacy protections in digital services. Implementing electronic signatures and secure, transparent workflows can significantly enhance user confidence, ensuring that digital government services remain trustworthy.

The research findings provide actionable insights for improving digital public services in North Cimahi District and beyond. Policymakers and public service administrators can draw from the study's recommendations on mobile optimization, security enhancements, integrated platforms, and user engagement mechanisms to improve their e-service delivery. Implementing mobile-friendly versions of e-services would increase accessibility, especially in regions where mobile devices are the primary means of internet access. A hybrid system that combines desktop and mobile access would be ideal, catering to diverse user needs.

In summary, this research has developed a comprehensive e-service model that addresses North Cimahi District's unique needs, combining mobile accessibility, security, user independence, and system integration. This model, grounded in SSM, offers a practical and replicable approach to digital transformation in public administration. By advancing a user-centered and community-oriented digital service platform, the study contributes to the broader field of e-governance, providing a template for other municipalities seeking to implement

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adaptive, accessible, and transparent public services. The recommendations and findings underscore the importance of a localized approach to e-governance, aligning technology with community needs to build a resilient, inclusive, and efficient public administration framework.

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