

Readiness of the Bureaucratic Apparatus and Its Influence on Services for Online-Based Socio-Economic Community Development Programs in Tebing Tinggi City

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ABSTRACT

Online-based bureaucratic services have become a strategic instrument for improving the accessibility, speed, transparency, and accountability of local government services. In Tebing Tinggi City, digital service initiatives have been introduced by several public institutions, yet their success depends on the readiness of the bureaucratic apparatus responsible for operating and maintaining these systems. This study examines the level of apparatus readiness and analyzes its influence on socio-economic community development program services. A quantitative approach was employed through descriptive and explanatory analysis. Data were collected using questionnaires administered to 253 government officials involved in public service delivery. Apparatus readiness was assessed through understanding or insight, technology mastery, mental development, moral development, formal education, informal education, and material incentives. The findings show that apparatus readiness is generally within the moderate to high category. Regression analysis confirms that readiness variables simultaneously have a significant effect on socio-economic development service performance. Partially, technology mastery, moral development, and material incentives exert significant positive effects, whereas understanding or insight, mental development, and formal education do not show significant partial effects. The study highlights the need to strengthen digital competence, ethical commitment, and performance-based incentive systems to improve online public service delivery and support urban socio-economic development programs.

Keywords: bureaucratic readiness, material incentives, online public services, socio-economic development, technology mastery

1. Introduction

Municipal governments occupy a strategic position in the delivery of public services because they operate closest to citizens and directly respond to daily administrative, social, and development needs. In the Indonesian decentralization system, Law No. 23 of 2014 emphasizes the authority and responsibility of local governments in managing public affairs and providing services to the community [1]. This condition places city, sub-district, and village-level administrations as important actors in strengthening bureaucratic performance and supporting urban community development. Nevertheless, public service delivery at the local level continues to face various challenges, including administrative complexity, uneven institutional capacity, limited human resources, and the need to adapt to digital transformation.

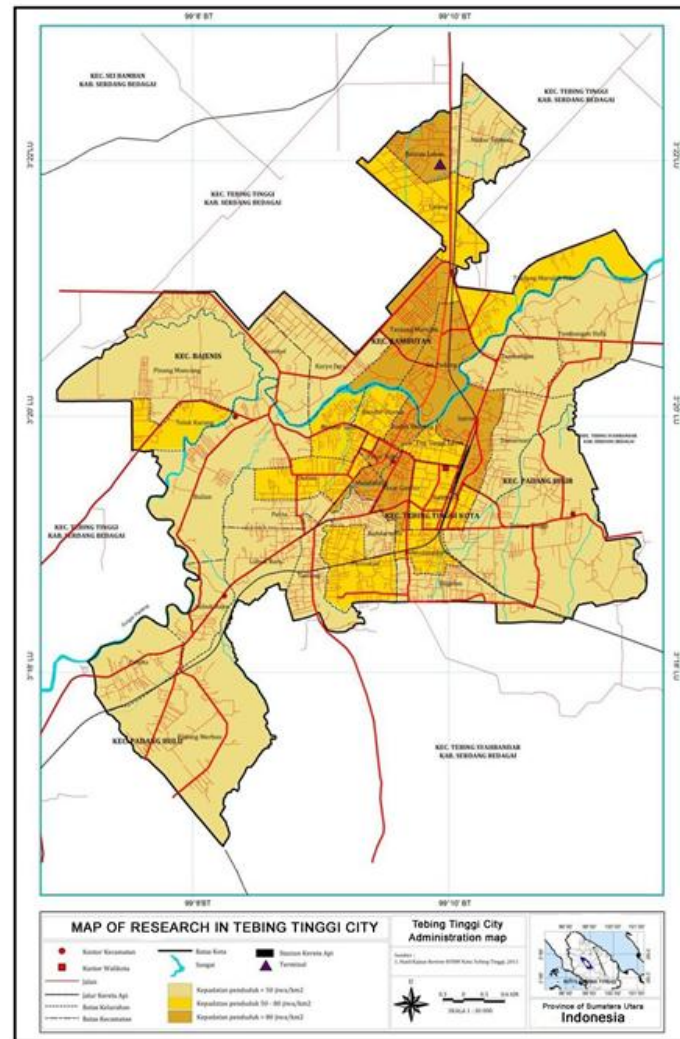
The development of online-based bureaucratic services has become one of the approaches used by local governments to improve service accessibility, efficiency, transparency, and responsiveness. In Tebing Tinggi City, several government agencies and Regional Apparatus Organizations have begun to adopt online service mechanisms as part of their public service reform. However, the implementation of these services has not yet been fully optimal across all service units. The availability of digital platforms alone does not automatically guarantee effective service delivery, because the success of online-based bureaucracy also depends on the readiness of the apparatus who operate, manage, and sustain the system.

Apparatus readiness is therefore a central issue in evaluating the effectiveness of online-based public services. Readiness is not limited to technical ability, but also includes understanding of digital service procedures, mastery of information technology, mental and moral preparedness, educational background, informal learning experience, and the availability of appropriate material incentives. These dimensions are important because the bureaucratic apparatus acts as the main executor of service transformation. Without adequate readiness, online-based service systems may become merely administrative tools rather than instruments for improving the quality of public service and accelerating socio-economic development.

In the context of Tebing Tinggi City, online-based bureaucratic services are expected to contribute to the acceleration of urban development, particularly in supporting socio-economic community development programs. As one of the urban areas in North Sumatra Province, Tebing Tinggi has the potential to become a local model for digital-based public service innovation. However, policy formulation in this area requires empirical evidence regarding the extent to which the bureaucratic apparatus is prepared to implement online services and how such readiness affects service outcomes. For this reason, this study aims to analyze the readiness of the apparatus in implementing online-based government bureaucratic services and to examine the influence of readiness factors on socio-economic community development program services in Tebing Tinggi City.

2. Method

This research was conducted in Tebing Tinggi City, North Sumatra Province, Indonesia. The study focused on the implementation of online-based bureaucratic service systems within the local government environment. The research was carried out during the period of 2021–2022. Methodologically, this study employed a quantitative approach using descriptive and explanatory research designs. The descriptive approach was used to portray the condition of apparatus readiness in detail, while the explanatory approach was applied to examine the relationship between apparatus readiness variables and socio-economic community development program services [2][3].



The population of this study consisted of government officials in Tebing Tinggi City who were directly or indirectly involved in bureaucratic service delivery. Based on data from the Tebing Tinggi City Government in 2019, the total population was 2,769 officials. Since it was not practical to involve the entire population, a sample was selected to represent the population. In line with sampling principles, a sample refers to a smaller part of the population that is used to provide information about the larger population [4]. The sample size was determined using the Slovin formula with an error tolerance of 6% [5][6], as shown below:

$$n = \frac{N}{1 + Nd^2} \quad (1)$$

(1)

Information:

n = Sample size

N = Population

d = Precision level or error tolerance, namely 6% or 0.06; therefore, $d^2 = 0.0036$

Using this formula, the number of respondents required for this study was 253 government officials. The respondents were selected using probability sampling, which provides every member of the population with an equal opportunity to be chosen as part of the sample [7].

The study used quantitative data supported by qualitative information. Quantitative data were obtained mainly from questionnaire responses, while qualitative information was used to enrich the interpretation of the

findings. In general, qualitative data refer to descriptive information that explains meaning, context, or categories, whereas quantitative data refer to numerical information that can be processed using statistical or mathematical procedures [8][9]. Primary data were collected from questionnaires distributed to government apparatus in Tebing Tinggi City. Secondary data were obtained from relevant government offices, institutional documents, journals, books, and other sources related to online-based bureaucratic services and socio-economic development programs.

Data collection was conducted through structured interviews using a questionnaire instrument. The questionnaire was designed to measure respondents' perceptions of apparatus readiness and socio-economic development service performance. Each response was scored using a five-point scale. A score of 5 represented "strongly agree," "very good," or "very high." A score of 4 represented "agree," "good," or "high." A score of 3 represented "moderately agree," "fairly good," or "moderately high." A score of 2 represented "disagree," "poor," or "low." A score of 1 represented "strongly disagree," "very poor," or "very low." Before hypothesis testing was conducted, the questionnaire was first examined through instrument testing, including validity and reliability tests. In addition, classical assumption testing, including normality testing, was conducted to ensure the appropriateness of the statistical analysis [10][11].

Analysis of Apparatus Readiness Level

The level of apparatus readiness in implementing online-based bureaucratic services was analyzed using quantitative descriptive analysis. The readiness indicators were converted into scores to classify the level of readiness. This scoring technique was used to measure each indicator based on predetermined parameters. Each parameter was given equal weight so that the total score could be calculated by summing the values of all indicators. This approach follows the principle of similarity judgment, in which comparable parameters are assessed using the same measurement basis [12].

The readiness level of the online-based bureaucratic service apparatus was divided into five categories, ranging from very low or very unprepared to very high or highly ready. The classification was based on the total acceptance score interval, as presented in Table 1.

Table 1. Online-based government bureaucratic service apparatus readiness class

No	Readiness Category	Score Interval
1	Very Low/Very Unprepared	253-455
2	Low/Not Ready	456-657
3	Moderate/Not Ready	658-860
4	High/Ready	861-1062
5	Very High/Highly Ready	1063-1265

Analysis of the Effect of Apparatus Readiness on Socio-Economic Development Programs

To examine the effect of apparatus readiness on socio-economic community development program services in Tebing Tinggi City, this study used multiple linear regression analysis. The independent variables consisted of understanding or insight, technology mastery, mental development, apparatus moral development, formal education, informal education, and material incentives. The dependent variable was the socio-economic community development program service. The regression model used in this study is presented as follows:

$$Y = \alpha_0 + \alpha_1 X_1 + \alpha_2 X_2 + \alpha_3 X_3 + \alpha_4 X_4 + \alpha_5 X_5 + \alpha_6 X_6 + e \quad (2)$$

Information :

Information:

Y = Socio-Economic Development Program

α_0 = Constant

α_i = Regression coefficient of each independent variable
 X_1 = Understanding / insight
 X_2 = Technology mastery
 X_3 = Mental coaching
 X_4 = Apparatus moral development
 X_5 = Formal education
 X_6 = Informal education
 X_7 = Material incentives
 e = Error term

Through this model, the study assessed both the simultaneous and partial effects of apparatus readiness variables on socio-economic community development program services. The regression results were then interpreted to determine which readiness factors had the strongest contribution to the effectiveness of online-based bureaucratic service implementation in Tebing Tinggi City.

Before presenting the empirical results, it is important to clarify the conceptual basis of the study. The analysis of apparatus readiness in online-based bureaucratic services is closely related to the concepts of bureaucracy, public service, service systems, information systems, and the use of information technology in government administration. These concepts provide the foundation for understanding how government apparatus, as the main actors in public service delivery, influence the effectiveness of digital bureaucratic services and their contribution to socio-economic community development programs. Bureaucracy is commonly understood as an organized administrative structure through which public authority is exercised and public affairs are managed. Epistemologically, the term bureaucracy is derived from the word “bureau,” referring to an office or desk, and “kratia” or “cratein,” referring to rule or government. In its early meaning, bureaucracy described a systematic pattern of work conducted through offices and administrative procedures. In modern public administration, bureaucracy has become an essential institutional mechanism for managing complex, continuous, and large-scale public affairs. Because public needs are increasingly diverse and administrative responsibilities continue to expand, an effective bureaucracy is required to ensure that government functions can be carried out in an orderly, accountable, and efficient manner. In this context, the actors who perform administrative and service functions within government institutions are referred to as bureaucratic apparatus or bureaucrats [13].

Public service is closely related to the responsibility of government institutions to respond to the needs of citizens. Service may be understood as an effort to assist, prepare, facilitate, or manage something needed by other people. In administrative practice, service is not merely a technical activity, but also a relationship between service providers and service users, in which public satisfaction depends on the ability of the provider to meet expectations, standards, and needs [14]. Services are also characterized as activities offered by organizations or individuals to users, generally intangible and not resulting in ownership of a physical product [15]. Therefore, the quality of public service is determined not only by the availability of facilities, but also by responsiveness, reliability, accessibility, and the capacity of public officials to deliver services properly.

In the Indonesian public administration framework, public services may be grouped into three major forms. The first form is administrative service, which produces official documents required by citizens, such as identity cards, birth certificates, death certificates, driving licenses, vehicle registration documents, building permits, passports, and land ownership certificates. The second form is goods-related service, which provides public goods or public utilities, such as electricity, clean water, and telecommunication networks. The third form is service-based public function, which refers to direct services needed by the community, including education, health care, transportation, postal services, and other public facilities. These categories show that public service covers a broad range of government responsibilities and therefore requires a bureaucratic system that is reliable, integrated, and responsive to community needs.

An efficient bureaucracy cannot be separated from a well-designed service system. Within an organization, a system functions as a mechanism for coordinating, controlling, and integrating activities so that institutional

goals can be achieved. A system consists of various interconnected components, both physical and non-physical, that work together in a coordinated manner to achieve a specific purpose [16]. In relation to public administration, an information system plays an important role because it connects different sub-systems and processes data into information that is useful for decision-making, coordination, and service delivery [16]. Thus, the quality of bureaucratic service depends not only on individual apparatus capacity, but also on the effectiveness of the system that supports administrative work.

The development of information technology has significantly changed the way public services are organized and delivered. Information technology enables data, messages, and administrative information to be transmitted more quickly, distributed more widely, and stored for a longer period of time [17]. In government service systems, technology is used to process data so that the information produced is accurate, relevant, and timely. This information can then be communicated through various media, including telephone, short message services, television, internet platforms, e-mail, websites, portals, blogs, and video streaming services [18]. Through these instruments, public institutions are able to reduce administrative barriers, simplify service procedures, and improve the accessibility of information for citizens.

The application of information technology in government administration provides several important benefits. First, it can strengthen transparency because public information becomes more accessible and government communication becomes more open. This openness may reduce suspicion between the government and the public by allowing citizens to obtain information directly. Second, information technology can encourage public participation because communication between citizens and government institutions becomes faster and more flexible. Third, digital technology can improve efficiency by accelerating service processes, facilitating the flow of information, shortening administrative procedures, and reducing unnecessary bureaucratic layers [18]. Therefore, the integration of information technology into bureaucratic service systems is an important foundation for improving the quality of online-based public services and supporting socio-economic development programs.

3. Result and Discussion

Apparatus Readiness in Online-Based Bureaucratic Service

According to Mayor Regulation No. 39 of 2017 concerning the Utilization of Information and Communication Technology within the Tebing Tinggi City Government, online-based bureaucratic service refers to the process of transmitting, receiving, and managing data or information electronically through communication media. In this context, information exchange between the Tebing Tinggi City Government and the public may include various forms of administrative and public service content, such as official news, announcements, public information, socialization materials, documents, correspondence, licensing access, and other service-related data. The scope of these services continues to develop in line with the increasing administrative needs of the community and the growing demand for more accessible public services.

The descriptive analysis in this study was carried out by examining the minimum value, maximum value, mean score, and standard deviation of each research variable. These descriptive statistics provide an initial overview of the readiness condition of the bureaucratic apparatus in implementing online-based government services in Tebing Tinggi City. The results of the descriptive statistical analysis are presented in Table 2.

Table 2. Descriptive statistics of research results

Variable	mean	Std. Deviation	N
Community Socio-Economic Development Services/Programs	3.6736	0.73489	253
Understanding/Insight	3.5753	0.85665	253
Technology Mastery	3.5914	0.82400	253
Mental Development	3.0605	0.96935	253

Variable	mean	Std. Deviation	N
Moral Development	3.4960	1.06343	253
Formal education	4.0081	0.75383	253
Material Incentive	3.6532	0.88563	253

As shown in Table 2, the average scores of the apparatus readiness variables are generally between 3 and 4. This indicates that the readiness of the bureaucratic apparatus in Tebing Tinggi City is positioned at a moderate to high level. Among the observed dimensions, formal education obtained the highest mean score, reaching approximately 4.00. This result suggests that most bureaucratic personnel involved in public service delivery have an educational background ranging from diploma to undergraduate level. In contrast, mental development recorded the lowest mean score, at 3.0605, indicating that this aspect still requires greater institutional attention. Overall, none of the readiness dimensions reached the “very high” category, which means that improvement is still needed before the apparatus can be considered fully prepared to support online-based bureaucratic services.

Public services in Tebing Tinggi City are implemented by various Regional Apparatus Organizations, known as OPD, together with Regional Technical Service Units or UPTD, according to their respective institutional duties and service sectors. Referring to the Decree of the Mayor of Tebing Tinggi No. 28 of 2016 concerning the Organization of Regional Apparatus in Tebing Tinggi City, the local government structure includes the Regional Secretariat, the Secretariat of the Regional House of Representatives, the Inspectorate, 18 service offices, three regional agencies, and five sub-districts. These institutions form the administrative framework through which public services are delivered to the community. In general, several OPDs have begun to implement online-based service mechanisms, either independently through their own platforms or in cooperation with the agency responsible for communication and information technology management.

The Regional Secretariat of Tebing Tinggi City has introduced online-based service access mainly through the availability of its official website, <https://setda.tebingtinggikota.go.id>. However, the service function remains limited because the website primarily provides announcement features, and several sections have not yet been updated with current content. The Secretariat of the Regional House of Representatives has also developed online service features related to information dissemination, public announcements, and the collection of community aspirations. Meanwhile, BAPPEDA has adopted online-based bureaucratic services mainly in the form of information sharing, announcements, and correspondence services.

The Communication and Information Office plays a more direct role in supporting the digital service ecosystem of Tebing Tinggi City. Its website contains public information, news, and links to 17 service standards available within the office. These standards cover several stages of service delivery, from data access to public service procedures. However, the completeness of the service content still needs improvement because some digital service components have not yet been fully developed or updated. This condition shows that the institutional commitment to digital service transformation already exists, but the technical and content-management aspects still require further strengthening.

The Population and Civil Registry Office has shown more advanced progress in the implementation of online-based public services. Through the concept of digital population and civil registration services, this office provides several digital service features, including public reporting services, public service information systems, population administration services such as birth certificates, identity cards, and family cards, as well as access to public health-related systems such as Sikermas. Nevertheless, some online service content remains incomplete, indicating that service digitalization has not yet been implemented comprehensively. In the education sector, online-based services are also available through application-based systems related to public education, such as e-education services and new student admission registration or PPDB, although the institutional web domain is not yet fully independent.

The findings indicate that efforts to establish online-based service systems have been initiated across various government institutions in Tebing Tinggi City. However, the degree of implementation differs among agencies. Some institutions have moved beyond basic information provision, while others still use websites mainly as one-way communication channels. The availability of websites and digital platforms does not necessarily indicate full digital transformation, especially when service content is incomplete, not regularly updated, or not yet integrated into interactive public service mechanisms. Therefore, stronger policy direction, institutional commitment, technical capacity, and apparatus readiness are required to ensure that online-based bureaucratic services can function effectively and provide real benefits for the community.

The development of online-based service systems has also been initiated by other offices, agencies, and working units within the Tebing Tinggi City Government. This indicates that the commitment to adopting digital public services has begun to spread across local government institutions. However, the level of seriousness and consistency in completing the transition from conventional services to fully online-based services remains uneven. Although digital platforms are generally available in many agencies, several websites still contain incomplete service information and have not yet functioned as fully integrated public service channels, as illustrated in Figure 2. Therefore, stronger policy direction, institutional commitment, and continuous support from the mayor, government leaders, and public service apparatus are required to ensure that digital service transformation can be implemented more effectively.

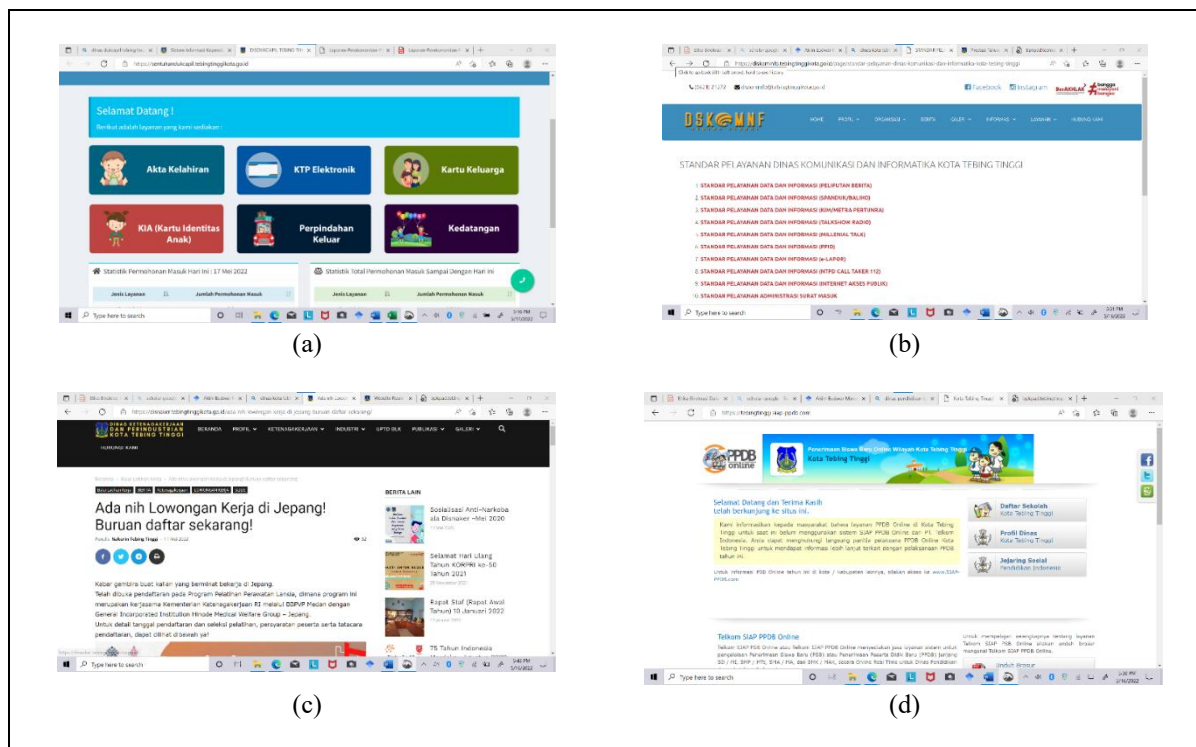


Figure 2. Some examples of the appearance of the OPD website, agencies, and units at the Tebing Tinggi City Government

Based on field observations, interviews with informants, and searches conducted through the official websites of the Tebing Tinggi City Government, Regional Apparatus Organizations, agencies, and work units, most government institutions in Tebing Tinggi City already have website-based service facilities. However, the majority of these websites still function mainly as one-way communication media from the government apparatus to the public. Some of the information provided is useful for the community, such as announcements on new student registration, job vacancies, employee recruitment, and other public notices. Nevertheless, much of the available content still focuses on institutional news, ceremonial activities, and reports on achievements by OPDs, agencies, and units within the Tebing Tinggi City Government. This condition shows that the existing digital platforms have not yet been fully optimized as interactive and service-oriented public administration instruments.

The limited optimization of information technology-based public services is not only found in Tebing Tinggi City. Similar conditions have also been reported in several other districts and cities in Indonesia. In the case of Palu City, previous research found that although the local government had implemented e-government in accordance with Presidential Instruction No. 3 of 2003, the results were still considered unsatisfactory. The implementation was viewed as lacking seriousness, and the intended community beneficiaries had not been fully reached, particularly in relation to improving service quality in each service-based SKPD. One of the main causes of this weak implementation was the absence of comprehensive e-government development planning [19]. This comparison indicates that digital service development requires not only technological infrastructure, but also careful planning, institutional readiness, and consistent implementation.

A similar issue was also identified in Merauke Regency. Research on e-government-based public services in the region showed that the development of electronic public service systems had not yet operated optimally. Several inhibiting factors were identified, including limited regulatory support, insufficient public socialization, weak human resource capacity, and inadequate infrastructure. Geographical constraints and the mindset of communities who were still more familiar and comfortable with manual service procedures also became obstacles to the implementation of electronic-based public services [20]. These findings are relevant to the case of Tebing Tinggi City because they demonstrate that the success of digital public services depends on the interaction between institutional support, apparatus capacity, infrastructure readiness, and public acceptance.

At the village level, the implementation of the Android-based ReadyManda application in Lubuk Raya Village, Tebing Tinggi City, provides an example that online-based bureaucratic services can be developed successfully when supported by appropriate regulatory and technical arrangements. However, the experience also suggests that success at the village level cannot automatically be replicated at a broader administrative scale without considering other institutional and behavioral factors. When online-based services are expanded to the sub-district or city level, challenges may emerge from organizational culture, apparatus mentality, coordination mechanisms, and the willingness of service providers to adapt to new service procedures. Since online services reduce direct face-to-face interaction between apparatus and citizens, they may also reduce opportunities for informal or transactional bureaucratic practices. For this reason, cultural and ethical readiness should be considered an important part of the digital transformation of public services.

The Effect of Online-Based Government Service Bureaucratic Apparatus Readiness on Socio-Economic Development Program Services

The effect of bureaucratic apparatus readiness on socio-economic community development program services in Tebing Tinggi City was analyzed using multiple linear regression. The regression result shows that the coefficient of determination, or R^2 , is 0.552, as presented in Table 3. This means that the readiness variables included in the model are able to explain 55.2% of the variation in socio-economic development program service performance. The remaining 44.8% is influenced by other factors that were not included in this study. These other factors may include institutional leadership, budget support, service infrastructure, inter-agency coordination, public digital literacy, and the quality of digital service platforms.

Table 3. Model summary of test results

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.743a	.552	.541	.49779

a. Predictors: (Constant), Material Incentives, Formal Education, Mental Development, Understanding/Insight, Technology Mastery, Moral Development

The R^2 value indicates that apparatus readiness has a substantial contribution to the performance of online-based socio-economic development services. In other words, the readiness of government apparatus in terms of understanding, technological competence, mental and moral development, education, and incentives is

closely related to the effectiveness of service delivery. However, because almost half of the variation is still explained by factors outside the model, future studies should consider adding other variables that may influence digital public service performance, particularly organizational commitment, leadership support, digital infrastructure quality, and community readiness to use online services.

The ANOVA results indicate that the regression model used in this study is statistically acceptable for explaining the relationship between apparatus readiness and Community Socio-Economic Development Services/Programs. As shown in Table 4, the model produces an F-value of 49.553 with a significance value of 0.000. Since this significance value is lower than 0.05, the independent variables jointly have a significant effect on the dependent variable. This means that material incentives, formal education, mental development, understanding/insight, technology mastery, and moral development, when considered together, contribute meaningfully to the performance of online-based socio-economic development services in Tebing Tinggi City.

Table 4. F Test ANOVA results

	Model	Sum of Squares	df	Mean Square	F	Sig.
1	Regression	73.675	6	12,279	49,553	.000b
	Residual	59,719	241	.248		
	Total	133,394	247			

a. Dependent Variable: Community Socio-Economic Development Services/Programs

b. Predictors: (Constant), Material Incentives, Formal Education, Mental Development, Understanding/Insights, Technology Mastery, Moral Development

These findings show that the readiness of bureaucratic apparatus should not be viewed as a single technical matter, but as a combination of several institutional and individual capacities. Online-based public service delivery requires officials who understand service procedures, are able to use digital technology, demonstrate ethical behavior, and receive adequate organizational support. Therefore, the significant simultaneous effect found in this model suggests that the improvement of online-based services in Tebing Tinggi City depends on the integrated strengthening of human resources, work motivation, and bureaucratic professionalism.

The positive direction of the regression model also indicates that higher apparatus readiness is associated with better service performance. In practical terms, when government officials are more prepared to operate online service systems, respond to administrative needs, and manage service information properly, socio-economic development programs can be delivered more effectively. This result is consistent with the principle that public service is one of the main foundations of people-oriented governance. Public administration must be directed toward democratic, transparent, accountable, and responsible service delivery. As stated in [21], the quality of public service depends not only on formal rules, but also on mutual understanding between government officials and citizens in implementing public service obligations.

The partial regression results provide a more specific explanation of which readiness factors have the strongest contribution to the dependent variable. As presented in Table 5, not all independent variables have a statistically significant effect. Technology mastery, moral development, and material incentives are significant at the 95% confidence level. Meanwhile, understanding/insight, mental development, and formal education do not show significant partial effects in this model. This distinction is important because it shows that general knowledge and educational background alone are not sufficient to improve online-based service performance unless they are supported by practical digital competence, ethical commitment, and adequate.

Table 5. Partial test results of each estimator variable (t-test)

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	.755	.194		3.889	.000
Understanding/Insight	.016	.054	.019	.302	.763
Technology Mastery*	.273	.057	.306	4.825	.000
Mental Development	.046	.052	.060	.872	.384
Moral Development*	.097	.047	.141	2.076	.039
Formal education	.084	.051	.086	1.638	.103
Material Incentive*	.292	.045	.351	6.496	.000

a. Dependent Variable: Community Socio-Economic Development Services/Programs

*) Significant at 95% confidence level

Technology mastery has a positive and significant effect on Community Socio-Economic Development Services/Programs, with a regression coefficient of 0.273 and a significance value of 0.000. This result confirms that digital competence is a key requirement in online-based bureaucratic services. Apparatus who are able to operate digital platforms, process electronic data, and respond to service requests through online mechanisms are more likely to support efficient and responsive public service delivery. In the context of Tebing Tinggi City, this finding implies that technical training, digital literacy improvement, and continuous assistance in the use of service applications should become priorities in strengthening bureaucratic readiness.

Moral development also has a positive and significant effect, with a regression coefficient of 0.097 and a significance value of 0.039. This result indicates that ethical awareness and integrity remain important even when services are delivered through digital systems. Online services may reduce direct interaction between officials and citizens, but they do not eliminate the need for responsibility, discipline, honesty, and commitment to public interest. Therefore, digital transformation in government should not only focus on infrastructure and applications, but also on the moral quality of the apparatus who manage and operate the system.

Material incentives show the strongest significant contribution among the tested variables, with a regression coefficient of 0.292, a standardized beta value of 0.351, and a significance value of 0.000. This finding suggests that incentive support can influence the motivation and performance of public officials in implementing online-based service systems. A fair and transparent incentive mechanism may encourage apparatus to work more consistently, respond more quickly to public needs, and maintain service quality. However, incentive policies should be linked to measurable performance indicators so that they strengthen professionalism rather than merely function as additional compensation.

In contrast, understanding/insight, mental development, and formal education do not have significant partial effects. Understanding/insight has a significance value of 0.763, mental development has a significance value of 0.384, and formal education has a significance value of 0.103. These results do not necessarily mean that the three variables are irrelevant. Rather, their influence may be indirect or may require support from other factors before affecting service performance. Formal education, for example, may provide a general intellectual foundation, but it does not automatically ensure the ability to manage online public services. Similarly, understanding and mental development may need to be translated into practical skills, work discipline, and institutional behavior before they can produce measurable improvements.

Overall, the regression results suggest that improving online-based socio-economic development services in Tebing Tinggi City requires a focused strategy. The local government should prioritize strengthening apparatus technology mastery, reinforcing moral and ethical development, and designing incentive systems that are fair, transparent, and performance-oriented. At the same time, non-significant variables should not be ignored, but should be integrated into broader capacity-building programs. By combining technical competence, ethical

responsibility, and institutional support, online-based bureaucratic services can become more effective instruments for improving community socio-economic development programs.

Technology Mastery

Technology mastery is an essential dimension of bureaucratic apparatus readiness in the implementation of online-based public services. In a digital service environment, government officials are not only expected to understand administrative procedures, but also to be able to operate technological systems, manage electronic data, and respond to public needs through digital platforms. The availability of technology will not automatically improve service quality unless it is supported by apparatus who have sufficient competence to use it effectively. In this regard, technological facilities are important because they can accelerate work processes, reduce service time, increase the productivity of goods and services, support accuracy in service outputs, create a more comfortable service environment, and increase satisfaction for both service providers and service users [22].

The role of information and communication technology is particularly important in Indonesia because the country has an archipelagic geographical structure. Public service delivery across different regions requires communication systems that can overcome distance, administrative fragmentation, and uneven access to government offices. For this reason, the use of information and communication technology can help government institutions expand service coverage and improve the speed of bureaucratic response [23]. The rapid development of information technology has also made digital systems more accessible, efficient, and attractive for public service delivery. As administrative workloads increase, government institutions are required to adopt ICT-based service mechanisms that can support efficiency, productivity, and transparency [24].

In the context of bureaucratic performance, e-government should be understood as more than the use of websites or digital applications. It is a public service policy instrument that allows the government to collect, process, and respond to citizens' needs across broader administrative spaces. Through e-government, public aspirations and service requests can be communicated without being limited by physical distance or office-based procedures. If implemented properly, digital government can improve the quality of public services by making them faster, more transparent, and more responsive to the community. Therefore, technological innovation is needed to strengthen the role of bureaucracy and improve the outputs of public service institutions [25]. Several studies have shown that technology-based innovation has been widely adopted in Indonesian public service institutions. At the city and agency levels, digital innovation has been used to improve service quality, simplify administrative procedures, and expand public access. Examples include service innovation strategies at the Surabaya City Land Office II [26], the implementation of e-government in service-based SKPDs in Palu City [19], and innovation initiatives developed by the Integrated Licensing and Investment Service Agency of Bogor City [27]. These studies indicate that technology can become an important instrument for reforming bureaucratic services when it is supported by institutional readiness and clear service objectives.

Digital public service innovation has also been found at the village and sectoral levels. The implementation of the e-Kiosk program in Kebraon Village, Surabaya City, demonstrates how information technology can be used to support public service access at the local level [28]. In the security sector, communication and technology-based innovation has been applied through the "online kentongan" service for reporting public order and security disturbances at the Jember Police [29]. Other examples include the modernization of public services through e-government in Denpasar City and the implementation of the Ogan Lopian application by the Communication and Information Office of Purwakarta Regency [30]. These cases show that online-based bureaucratic services can be developed in various institutional contexts, but their effectiveness depends on the technological capacity of the apparatus, the quality of service design, and the consistency of implementation.

Overall, the findings of this study support the view that technology mastery is a key factor in improving online-based socio-economic development services. Government apparatus who are able to use digital platforms effectively can provide faster, more accurate, and more accessible services to the community. However,

technology mastery should not be treated as a one-time technical skill. It must be developed continuously through training, mentoring, system familiarization, and institutional support. In Tebing Tinggi City, strengthening the technological competence of bureaucratic apparatus is therefore necessary to ensure that online-based public services function not only as digital displays, but as practical instruments for improving community service delivery and supporting socio-economic development programs.

Moral Development

Moral development is an important aspect of bureaucratic readiness because public service is not only determined by administrative procedures and technological capacity, but also by the ethical quality of the apparatus who deliver the service. In the context of Indonesian public administration, morality remains one of the critical issues affecting the quality of public service [21]. Ethics provides a normative foundation for distinguishing appropriate and inappropriate conduct in bureaucratic practice. Since the final output of bureaucracy is public service, ethical behavior becomes a key element in shaping public trust, service satisfaction, and institutional credibility. In this study, moral development was found to have a positive and significant effect on Community Socio-Economic Development Services/Programs in Tebing Tinggi City. This indicates that apparatus who demonstrate integrity, responsibility, discipline, and commitment to public interest are more likely to support better online-based service performance.

The importance of moral development in public service is also supported by previous research. A study conducted in Manado City found that the professionalism of public service apparatus at the Malalayang Sub-District Office had not reached an optimal level because bureaucratic ethical values were not fully understood, internalized, and practiced by the apparatus [31]. The study showed that bureaucratic ethics had a positive and significant relationship with public service professionalism. This finding is relevant to the present study because online-based services still require ethical responsibility, even though the interaction between apparatus and citizens may occur through digital platforms rather than face-to-face mechanisms.

Similar evidence was also found in Bitung City. Potolau's research showed that bureaucratic ethics influenced the quality of public services both directly and indirectly. The study also indicated that employee performance contributed to service quality, and that bureaucratic ethics and employee performance together affected the overall quality of public service [32]. This confirms that moral development should not be treated as a supplementary issue, but as an integral part of bureaucratic performance. In online-based service systems, ethical conduct is reflected in accuracy, transparency, responsiveness, fairness, and the willingness of officials to serve citizens without discriminatory or transactional behavior.

Although many studies emphasize the relevance of morality and ethics in public service, ethical problems in bureaucracy are often difficult to identify and resolve. Bisri and Asmoro explained that one of the fundamental challenges in Indonesian public service lies in the ethical dimension, particularly because violations of morality are not always easy to trace, prove, or sanction [33]. In some cases, public service users may be reluctant to report unethical behavior because exposing misconduct is still considered socially sensitive. As a result, ethical violations may remain hidden within everyday bureaucratic practices. This situation shows that strengthening moral development requires more than formal rules; it also requires institutional culture, supervision, ethical leadership, and continuous internalization of public service values. In relation to online-based bureaucratic services in Tebing Tinggi City, moral development becomes increasingly important because digital systems can reduce direct interaction but cannot automatically eliminate unethical practices. Technology may improve transparency and reduce opportunities for informal transactions, yet the effectiveness of the system still depends on the integrity of the apparatus who manage data, process applications, respond to complaints, and provide service information. Therefore, moral development should be integrated into bureaucratic capacity-building programs through ethics training, performance supervision, public service standards, and institutional mechanisms that encourage accountability. Strengthening this dimension can help ensure that online-based services are not only faster and more efficient, but also fair, trustworthy, and oriented toward the needs of the community.

Material incentives

Material incentives are an important factor in bureaucratic service performance because they are closely related to work motivation, employee welfare, and institutional discipline. In public service institutions, inadequate incentive systems may create vulnerability to unethical behavior, especially when the workload and responsibility of the apparatus are not balanced with fair compensation. In the Indonesian bureaucratic context, one of the persistent problems in public service delivery is the emergence of corrupt practices and illegal levies. These practices may occur when officials misuse their authority, position, or administrative access for personal benefit. They may also be influenced by individual character, weak self-control, economic pressure, organizational culture, limited human resources, and inadequate supervision from superiors [34]. The existence of illegal levies and other forms of transactional behavior indicates that public service reform cannot rely only on procedural improvement or digital technology. It also requires a fair and accountable incentive structure. Material incentives should be designed to support better performance, not merely as additional income. In this regard, local governments need to consider incentive mechanisms that are linked to measurable achievement, service quality, discipline, responsiveness, and integrity. Such incentives may take the form of direct financial rewards, performance-based allowances, achievement credit systems, socio-economic security, or other forms of compensation that are distributed through a transparent and equitable mechanism.

In the implementation of online-based bureaucratic services, material incentives become increasingly relevant because digital service transformation often requires additional skills, adaptation, and responsibility from the apparatus. Officials are expected to operate digital platforms, manage electronic data, respond to online service requests, and maintain service accuracy. Without adequate support, the transition to online-based services may be perceived as an additional administrative burden. Therefore, incentives can function as an institutional instrument to encourage commitment, reduce resistance to change, and strengthen accountability in the implementation of digital public services.

From a leadership perspective, the reform of bureaucratic services requires a shift away from transactional practices that are based on informal exchanges or personal interests. Transformational leadership emphasizes the ability of leaders to inspire subordinates, communicate organizational vision, and encourage employees to perform beyond minimum expectations [35]. This leadership orientation is important in public service reform because it directs apparatus toward shared institutional goals rather than narrow individual interests. In contrast, transactional leadership focuses more on task completion, reward systems, and punishment mechanisms as tools to influence employee behavior [36]. According to [37], transactional leadership is built on an exchange relationship in which performance is connected to rewards or sanctions. In bureaucratic reform, both perspectives may be relevant, but incentive systems should be managed within a transparent framework so that they support professionalism rather than reinforce transactional service behavior. The condition of online-based bureaucratic service implementation in Tebing Tinggi City shows that further improvement is still needed. Digital public service development should no longer be treated as an optional program, but as a necessary response to the demand for faster, more transparent, and more efficient services in the era of digital governance. The issuance of Presidential Regulation of the Republic of Indonesia Number 95 of 2018 concerning the Electronic-Based Government System provides a policy foundation for local governments to integrate information and communication technology into public service delivery. For Tebing Tinggi City, this regulation should encourage stronger commitment to develop integrated online-based services across government institutions.

The findings of this study show that material incentives have a significant positive effect on Community Socio-Economic Development Services/Programs. This means that better incentive support is associated with better service performance. However, incentives should be accompanied by clear performance indicators, ethical supervision, and institutional accountability. If incentive policies are implemented without transparency, they may create new administrative problems. Conversely, when they are managed fairly and linked to service improvement, incentives can strengthen motivation, reduce opportunities for informal transactions, and encourage apparatus to support online-based public service reform. Therefore, the Tebing Tinggi City Government needs to strengthen the development of online-based bureaucratic services through two

complementary approaches. First, it must improve digital infrastructure, service applications, and institutional coordination. Second, it must provide fair incentive systems that encourage apparatus to work professionally, ethically, and responsively. By combining digital transformation with appropriate material incentives, online-based public services can become more effective instruments for supporting socio-economic community development programs in Tebing Tinggi City.

4. Conclusion

This study concludes that the readiness of the bureaucratic apparatus in implementing online-based government services in Tebing Tinggi City is generally at a moderate to high level, with average scores ranging from 3 to 4. The readiness dimensions examined in this study include understanding or insight, technology mastery, mental development, moral development, formal education, informal education, and material incentives. These findings indicate that the apparatus already has a basic level of preparedness to support digital public service delivery, although several aspects still require further strengthening to achieve optimal service performance.

The results also show that apparatus readiness, when examined simultaneously, has a significant effect on Community Socio-Economic Development Services/Programs. This means that the quality of online-based bureaucratic services is influenced by the combined capacity, motivation, ethical orientation, and institutional preparedness of government officials. Therefore, improving online public services cannot rely only on the availability of digital platforms, but must also be supported by competent and responsible apparatus.

Partially, technology mastery, moral development, and material incentives have a significant positive effect on socio-economic development program services. These three factors should therefore become priority areas for policy improvement. Strengthening digital competence can help apparatus operate online service systems more effectively. Moral development can reinforce integrity, responsibility, and public trust. Meanwhile, fair and performance-based material incentives can improve motivation and service commitment. Future service reform in Tebing Tinggi City should integrate technological improvement, ethical bureaucratic development, and transparent incentive mechanisms to support more effective online-based public services.

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6. Conflict of Interest

The authors declare that there is no conflict of interest related to the publication of this article.

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