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## Utilization of Digitalization and Technology for Teacher Certification Document Services at the Department of Education and Culture of Konawe Regency

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### **Abstract**

*Teacher certification document services are an essential component of educational administration and teacher professionalism development. Conventional document management that relies on physical files, informal communication, and manual verification may cause service delays, document duplication, data inconsistency, and limited transparency of service status. This paper aims to analyze the utilization of digitalization and technology to improve the effectiveness of teacher certification document services at the Department of Education and Culture of Konawe Regency. This study applies a descriptive qualitative approach based on literature review, regulatory analysis, and service process mapping. The findings indicate that digitalization through electronic document management, teacher databases, monitoring dashboards, digital helpdesks, electronic notifications, digital archives, and gradual integration with national education platforms can accelerate document submission, validation, tracking, and reporting. Digitalization also strengthens accountability, efficiency, data security, and teacher satisfaction as service users. Nevertheless, successful implementation requires human resource readiness, network infrastructure, standard operating procedures, digital leadership, technological literacy, and compliance with personal data protection principles. This article proposes an integrated electronic document service model for teacher certification that is relevant to local governments and supports fast, transparent, adaptive, and sustainable public services.*

## 1. Introduction

Digital transformation across all sectors has become an inevitable phenomenon [1]. Likewise, in public services, digital transformation has emerged as a strategic necessity in response to the increasing demands of society. Through digitalization, expectations for services that are faster, more accessible, transparent, and accountable can be effectively addressed. In the education sector, digitalization is not limited to technology-enhanced learning; it also encompasses the governance of educational administration, including teacher certification document management services. Effective document management supports the smooth implementation of teacher professional recognition processes, the organization of educator data, and the fulfillment of teachers' administrative rights.

Law Number 14 of 2005 concerning Teachers and Lecturers recognizes teachers as professional personnel who perform a strategic role in improving the quality of national education. Teachers are regarded as the primary actors in enhancing educational quality. The Law further emphasizes that teacher certification serves as an essential mechanism to ensure that teachers possess the qualifications, competencies, and professional commitment required by prevailing laws and regulations [2].

As professional development policies continue to evolve in response to changing educational needs, the teacher certification system has also undergone continuous adjustments. The Regulation of the Minister of Education, Culture, Research, and Technology Number 19 of 2024 concerning Teacher Professional Education governs participant requirements, program implementation, human resources, quality assurance, as well as the monitoring and evaluation of Teacher Professional Education [3]. Consequently, local governments, through their education offices, are required to establish administrative governance systems that are orderly, responsive, and capable of adapting to regulatory changes.

At the local government level, particularly in Konawe Regency, the Department of Education and Culture plays a crucial role in facilitating teachers by providing information, coordination, document validation, and administrative assistance throughout the teacher certification process. Nevertheless, in practice, document management services continue to encounter several challenges, including incomplete documentation, inconsistent document formats, delays in verification, data entry errors, limited archival capacity, and the absence of an integrated service-tracking system that enables teachers to monitor the status of their applications conveniently.

Digitalization and technological innovation provide effective solutions to these challenges. Through the implementation of electronic document management systems (e-document systems), teacher databases, monitoring dashboards, digital helpdesk services, and electronic archives, document administration can be managed in a more systematic and efficient manner. This transformation is consistent with Indonesia's Electronic-Based Government System (SPBE) policy framework as stipulated in Presidential Regulation Number 95 of 2018, the National SPBE Architecture established under Presidential Regulation Number 132 of 2022, and the acceleration of digital transformation and integrated national digital services as mandated by Presidential Regulation Number 82 of 2023 [4], [5], [6].

Based on the foregoing background, this article examines the utilization of digitalization and technology in teacher certification document management services at the Department of Education and Culture of Konawe Regency. The discussion focuses on identifying problems associated with conventional administrative services, exploring the application of digital technologies, proposing an appropriate digital service model, identifying enabling and inhibiting factors, and formulating practical implementation strategies for local governments.

### 1.1 Research Questions

1. What are the general characteristics of teacher certification document management services that are still conducted manually or semi-manually?
2. How can digitalization and technological innovation improve the quality of teacher certification document management services?

3. What factors facilitate and hinder the implementation of digitalized teacher certification document management services within local government institutions?
4. What digital service model is appropriate for implementation at the Department of Education and Culture of Konawe Regency?

## 1.2 Objectives of the Study

1. To describe the urgency of digitalization in teacher certification document management services.
2. To analyze forms of technological utilization applicable to teacher certification document management processes.
3. To identify the enabling and constraining factors affecting the implementation of digital services within the context of local government
4. To formulate an integrated, transparent, secure, and sustainable electronic document management (e-document) service model for teacher certification.

## 1.3 Literature Review

### 1.3.1 Digitalization of Public Services

The digitalization of public services refers to the transformation of service governance from conventional manual systems to electronic systems that enable work processes to become faster, more efficient, well-documented, and easier to monitor [7]. Digitalization is not merely the adoption of digital applications; it also encompasses changes in organizational culture, business process improvement, strengthened data management, and the provision of user-oriented public services.

Within the Indonesian government context, the Electronic-Based Government System (SPBE) serves as the principal framework for public administration through the utilization of information and communication technology. Presidential Regulation Number 95 of 2018 defines SPBE as the implementation of government administration through information and communication technology to provide services for SPBE users [4]. Consequently, teacher certification document management services can be positioned as an integral component of the broader agenda for the digital transformation of educational administrative services under the SPBE framework [8].

### 1.3.2 Teacher Certification and Teacher Professional Education

Teacher certification is closely associated with the recognition of teachers' professional status. Certification cannot be separated from efforts to improve teacher competencies, academic qualifications, and the overall quality of education. As professional educators, teachers are expected to possess pedagogical, personal, social, and professional competencies [9], [10]. Consequently, the administrative management of certification documents constitutes an essential stage that must be conducted systematically because it is directly related to data validity and participant eligibility.

The Regulation of the Minister of Education, Culture, Research, and Technology Number 19 of 2024 concerning Teacher Professional Education (PPG) serves as the primary legal reference for the implementation of Teacher Professional Education programs. This regulation emphasizes participant requirements, program implementation, human resource management, quality assurance, and monitoring and evaluation mechanisms [3]. Therefore, local governments should ensure that administrative services supporting the certification process are implemented in accordance with the principles of data accuracy, procedural certainty, and document traceability.

Furthermore, teacher certification is closely linked to teachers' professional rights and welfare. Consequently, teachers increasingly expect administrative services that are simple, efficient, and user-friendly. In this regard, the adoption of digital technology and digitalization represents one of the most practical and

appropriate solutions for meeting these expectations.

#### *1.3.4 Technology in Educational Administration*

Technology plays a significant role in educational administration by facilitating teacher data management, document verification, service monitoring, electronic archiving, notification systems, and automated reporting [11]. Within teacher certification services, technology integrates three primary interests: teachers' need for transparent and accessible services, education office personnel's need for efficient administrative processes, and institutional requirements for accurate, reliable, and accountable data management.

The effectiveness of technological implementation largely depends on data integration. In the education sector, this integration can be gradually achieved through synchronization with nationally established teacher databases while maintaining compliance with institutional authority, data security, and the principle of data minimization. Through such integration, digitalization does not create additional administrative burdens but instead simplifies processes that were previously repetitive, fragmented, and inefficient.

#### *1.3.5 Information Security and Personal Data Protection*

The digitalization of teacher certification document management involves the processing of teachers' personal information, including personal identities, national identification numbers, employment records, educational histories, certificates, and other supporting documents. Therefore, digital services must be designed in accordance with information security principles and personal data protection standards. Law Number 27 of 2022 concerning Personal Data Protection establishes regulations governing categories of personal data, the rights of data subjects, the responsibilities of data controllers, and the principles of personal data processing [12].

Within the context of electronic document management services (e-document services), personal data protection may be implemented through role-based access control, authenticated institutional user accounts, encryption or secure storage mechanisms, system activity logging, informed consent for data processing, and document retention policies. These measures are essential to ensure that digital transformation is not only efficient and effective but also secure and trustworthy for teachers as service users.

## **2. Research Method**

This article adopts a descriptive qualitative approach using a conceptual review and service process mapping as its primary research design. This approach was selected because the primary objective of the study is to formulate a digitalized teacher certification document management model that is relevant and applicable to the Department of Education and Culture of Konawe Regency.

The sources of information include literature on public service digitalization, regulations concerning teachers and teacher certification, SPBE policies, government digital transformation policies, and personal data protection regulations. In addition, this article employs service process mapping to identify document management stages, potential service problems, system requirements, and feasible forms of digital intervention.

The analysis was conducted through four sequential stages. First, problems associated with conventional manual services were identified. Second, these problems were linked to appropriate technological solutions. Third, an electronic document (e-document) service model for teacher certification was developed. Finally, a phased implementation strategy was formulated by considering the conditions of local government institutions, human resource readiness, technological infrastructure, and data security requirements.

Since this article is conceptual and descriptive in nature, empirical statistical data—such as the number of participating teachers, service completion time, the number of revised documents, and user satisfaction indices—have not yet been employed as a basis for generalization. These empirical indicators may be incorporated into future studies to quantitatively evaluate or empirically validate the proposed service model.

### 3. Results And Discussion

#### 3.1 Current Condition of Manual Teacher Certification Document Management Services

Manual teacher certification document management services generally encounter several challenges. First, physical documents require considerable storage space and are vulnerable to loss, damage, or misplacement. Second, teachers are often required to visit the Department of Education office in person or repeatedly coordinate through their respective schools, resulting in additional time and financial costs. Third, the verification process relies heavily on manual inspection by administrative staff, making it susceptible to service backlogs and processing delays. Fourth, teachers frequently have no direct access to monitor the status of their submitted documents in real time.

Another common issue is the inconsistency of information across supporting documents. For example, discrepancies may occur in teachers' names, identification numbers, employment status, educational history, or school information. Without a digital validation system, correcting these inconsistencies requires repeated communication between teachers and administrative officers, which is often poorly documented. Such conditions reduce administrative efficiency and create uncertainty for teachers throughout the certification process.

Within the context of Konawe Regency, service delivery is further influenced by the geographical distribution of schools, variations in teachers' digital literacy, the availability of internet connectivity, and the limited technological infrastructure in certain educational institutions. Therefore, digitalization should not be perceived as an immediate replacement for conventional manual services. Instead, it should be implemented as a gradual transformation process that takes into account users' digital readiness and the organizational capacity of the Department of Education and Culture.

*Table 1. Mapping of Problems in Manual Services and Proposed Digital Solutions*

| Service Stage                 | Problems in the Manual Process                                                           | Proposed Digital Solution                                                            | Expected Impact                                                                  |
|-------------------------------|------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|----------------------------------------------------------------------------------|
| Dissemination of requirements | Information is distributed through personal messages and inconsistent documents          | Official information portal, digital guidelines, and standardized document templates | Teachers receive a single, clear, accurate, and up-to-date source of information |
| Document submission           | Physical documents accumulate, are susceptible to loss, and require in-person submission | Online forms and electronic document (e-document) upload system                      | Faster, more efficient, and cost-effective document submission                   |
| Completeness verification     | Manual checklist process is time-consuming                                               | Automated checklist based on document categories                                     | Preliminary errors can be minimized before formal verification                   |
| Data validation               | Inconsistencies across supporting documents                                              | Integrated teacher database with cross-document validation                           | Improved data accuracy and consistency                                           |
| Status tracking               | Teachers must directly contact administrative officers for updates                       | Monitoring dashboard and electronic notification system                              | Greater transparency and service certainty                                       |
| Archiving and reporting       | Manual compilation and difficulty retrieving archived documents                          | Digital repository and automated reporting system                                    | Faster reporting, systematic archiving, and easier auditing                      |

#### 3.2 Forms of Digitalization and Technology Utilization

The digitalization of teacher certification document management services can begin with relatively simple technologies and progressively evolve into a fully integrated digital service ecosystem [13]. During the initial stage, the Department of Education may utilize digital forms, structured cloud-based document storage,

protected spreadsheets, and official communication channels. This phase is essential for fostering digital working habits and reducing dependence on paper-based documentation.

At the intermediate stage, the Department can develop an electronic document management (e-document) system that enables teachers to upload certification documents, receive electronic acknowledgements of submission, obtain revision notes, and monitor the processing status of their applications. Administrative officers can use the same system to verify documents, provide comments, update processing status, and automatically generate service reports. Consequently, communication between teachers and administrative personnel becomes more transparent, traceable, and systematically documented.

At the advanced stage, digital services should be directed toward comprehensive data integration, executive dashboards, digital archive management, and service analytics. Executive dashboards may present key performance indicators such as the number of submitted applications, validated documents, documents requiring revision, average processing time, and the geographical distribution of participating schools. These data enable evidence-based decision-making, allowing the Department to identify schools requiring additional assistance and to map service constraints across different regions [14], [15].

*Table 2. Main Components of the Teacher Certification Electronic Document Management (E-Document) System*

| <b>Component</b>     | <b>Primary Function</b>                                                                 | <b>Users</b>                                        | <b>Implementation Notes</b>                                                                                                                                       |
|----------------------|-----------------------------------------------------------------------------------------|-----------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Service Portal       | Provides information, schedules, requirements, and service guidelines                   | Teachers, school operators, administrative officers | Should be easily accessible and use clear, user-friendly language                                                                                                 |
| User Accounts        | Manages access privileges for teachers, school operators, verifiers, and administrators | All system users                                    | Should implement role-based access control                                                                                                                        |
| Document Upload      | Enables digital submission of required certification documents                          | Teachers and school operators                       | File formats and maximum file sizes should be standardized                                                                                                        |
| Automated Checklist  | Verifies document completeness before formal verification                               | Teachers and administrative officers                | Does not replace substantive verification conducted by authorized personnel                                                                                       |
| Monitoring Dashboard | Displays the current status of document processing                                      | Teachers, administrative officers, and management   | Status indicators should remain simple, such as <i>Submitted</i> , <i>Under Verification</i> , <i>Revision Required</i> , <i>Validated</i> , and <i>Completed</i> |
| Digital Helpdesk     | Provides consultation, document correction, and complaint-handling services             | Teachers and administrative officers                | Each inquiry should receive a tracking ticket to ensure service traceability                                                                                      |
| Digital Archive      | Stores validated documents and verification history                                     | Administrative officers                             | Requires document retention policies and robust data security measures                                                                                            |
| Automated Reports    | Generates service performance reports                                                   | Management and system administrators                | Performance indicators should support                                                                                                                             |

|  |                               |  |                                        |
|--|-------------------------------|--|----------------------------------------|
|  | for monitoring and evaluation |  | continuous service quality improvement |
|--|-------------------------------|--|----------------------------------------|

### 3.3 Integrated Digital Service Model for Teacher Certification Document Management

The model proposed in this study is an Integrated Digital Teacher Certification Document Management System. This model positions teachers as the primary service users, school operators as technical facilitators, departmental officers as document verifiers, and departmental leaders as data-driven decision-makers. The model is built upon five fundamental principles: accessibility, procedural certainty, service transparency, data security, and continuous evaluation.

The service workflow begins with user registration or authentication, followed by the completion of basic personal information, document submission, completeness validation, document verification by authorized officers, provision of revision feedback where necessary, confirmation of document validity, digital archiving, and service reporting. Each stage should generate a digital audit trail to ensure that every administrative process is traceable, transparent, and fully accountable.

*Table 3. Conceptual Workflow of the Teacher Certification Electronic Document Management(E-Document) Service*

| No. | Service Stage                   | Function                                                                                                                         |
|-----|---------------------------------|----------------------------------------------------------------------------------------------------------------------------------|
| 1   | Information and Registration    | Teachers receive service guidelines, schedules, and access credentials.                                                          |
| 2   | Document Upload                 | Teachers or school operators upload the required certification documents.                                                        |
| 3   | Initial Validation              | The system automatically verifies document completeness, format, and category.                                                   |
| 4   | Officer Verification            | Departmental officers examine the accuracy, authenticity, and validity of submitted documents.                                   |
| 5   | Document Revision               | Teachers receive revision notes if submitted documents do not satisfy the required standards.                                    |
| 6   | Validation Approval             | Documents meeting all administrative requirements are officially validated.                                                      |
| 7   | Digital Archiving and Reporting | Validated documents are securely archived, while service data are automatically compiled for monitoring and evaluation purposes. |

### 3.4 The Impact of Digitalization on Service Quality

The digitalization of teacher certification document management services has significant potential to enhance service quality across multiple dimensions. From an efficiency perspective, digital systems reduce the need for face-to-face interactions, accelerate document submission processes, and simplify administrative data compilation. Consequently, both teachers and administrative personnel can perform their respective responsibilities more efficiently while minimizing unnecessary administrative burdens.

From the perspective of transparency, teachers are able to monitor the progress of their certification documents in real time without repeatedly contacting departmental officers. This transparency reduces uncertainty throughout the certification process while strengthening users' trust in public service delivery [16].

Regarding accountability, every change in document status, verification record, and revision history is automatically stored as a digital audit trail. Such records improve institutional accountability and facilitate internal monitoring, supervision, and external auditing.

From the standpoint of data accuracy, digitalization minimizes data-entry errors and document duplication.

The system can be configured to automatically reject documents that fail to comply with required formats or remain incomplete before entering the formal verification stage. Consequently, verification officers are able to focus on substantive document assessment rather than routine administrative corrections.

Finally, with respect to user satisfaction, teachers benefit from greater procedural certainty, predictable processing times, and more accessible service information. This improvement is particularly important because unclear administrative procedures frequently generate dissatisfaction and negatively influence public perceptions of organizational performance.

At the institutional level, digitalization also strengthens evidence-based decision-making. The Department of Education can identify recurring document-related issues, determine which schools require additional technical assistance, and analyze peak service periods. Such information provides a valuable basis for improving socialization programs, enhancing school operator training, and continuously refining Standard Operating Procedures (SOPs).

### **3.5 Supporting Factors for Implementation**

The successful implementation of digital teacher certification document management services depends on several supporting factors. First, leadership commitment is essential. Departmental leaders play a strategic role in directing organizational change through policy formulation, resource allocation, SOP development, and continuous supervision [17]. Digital transformation requires strong institutional commitment rather than merely technological investment. Second, the availability of school operators serves as a crucial bridge between teachers and the Department of Education. School operators provide technical assistance for teachers who are unfamiliar with digital document submission procedures, thereby improving service accessibility and reducing operational barriers.

Third, existing national education information systems can serve as valuable references for organizing teacher data, provided that system integration is implemented in accordance with institutional authority and personal data protection regulations. Fourth, teachers' increasing expectations for fast, transparent, and reliable services constitute a significant driver of technology acceptance. As public expectations continue to evolve, digital service innovation becomes increasingly necessary. Finally, the Indonesian Government's policies regarding the Electronic-Based Government System (SPBE) and national digital transformation provide a strong legal and institutional foundation for local governments to develop and expand electronic public services.

### **3.6 Challenges to Implementation**

Despite its considerable benefits, implementing digitalization also presents several challenges. The first challenge concerns the uneven distribution of digital literacy among teachers. Differences in technological competencies may hinder teachers' ability to upload documents, understand file format requirements, or effectively navigate digital service platforms [18]. A second challenge relates to internet connectivity. Limited network infrastructure in several regions of Konawe Regency may reduce accessibility to online services and impede the effectiveness of digital implementation. Additional constraints include limited technological infrastructure, insufficient digital storage capacity, and varying levels of technical expertise among administrative personnel responsible for operating and maintaining the system.

Another significant challenge is organizational resistance to change. Both administrative officers and service users who have long depended on conventional manual procedures may require time to adapt to digital work processes [19]. Therefore, digital transformation should be accompanied by systematic training programs, continuous technical assistance, practical user guidelines, and responsive helpdesk services. From the perspective of information security, the potential risk of data breaches must be mitigated through robust access-control policies, secure information systems, and strict compliance with Indonesia's Personal Data Protection regulations. Ensuring information security is fundamental to maintaining public trust in digital government services.

### 3.7 Implementation Strategy in Konawe Regency (Beginning)

The implementation of digital transformation in Konawe Regency should be conducted gradually to ensure alignment with the availability of organizational resources and institutional readiness [20]. The first phase focuses on basic digitalization, including the provision of online forms, standardized document templates, structured digital storage systems, and electronic data recapitulation. This stage requires relatively modest financial investment while establishing the organizational foundation for a sustainable digital working culture.

The second phase involves the development of Standard Operating Procedures (SOPs) for digital services. These SOPs should clearly define service workflows, document requirements, service standards, task allocation, verification procedures, complaint-handling mechanisms, data security policies, and evaluation procedures. Well-designed SOPs ensure that service delivery is institutionalized and standardized rather than relying on individual personnel, thereby strengthening organizational consistency and long-term service sustainability.

### 3.7 Implementation Strategy in Konawe Regency (Continued)

The third phase focuses on strengthening human resource capacity. Teachers, school operators, and departmental personnel should receive comprehensive training covering system operation, standardized file naming conventions, document scanning procedures, data validation techniques, account security, and ethical principles of data management. Building digital competencies among all stakeholders is essential for ensuring the effective and sustainable implementation of the proposed digital service system.

The fourth phase involves the development of a more comprehensive Integrated Electronic Document Management (E-Document) System, supported by executive monitoring dashboards and automated reporting features. Such integration enables real-time monitoring of service performance while improving administrative efficiency and managerial decision-making.

The fifth phase consists of continuous evaluation through user satisfaction surveys and systematic analysis of key service performance indicators. Continuous assessment enables the Department of Education and Culture to identify operational challenges, measure service effectiveness, and implement evidence-based improvements as part of an ongoing quality assurance process.

*Table 4. Roadmap for the Implementation of Digital Teacher Certification Document Management Services*

| <b>Implementation Phase</b> | <b>Primary Focus</b>                                                                                                                         | <b>Expected Output</b>                                                              | <b>Success Indicators</b>                                                                                  |
|-----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|
| <b>Short-Term</b>           | Basic digitalization through online forms, standardized document templates, digital folders, and electronic data recapitulation              | Initial electronic document (e-document) system utilizing simple digital tools      | Certification documents are submitted digitally, and document formats become more standardized             |
| <b>Medium-Term</b>          | Development of Standard Operating Procedures (SOPs), operator training, official digital helpdesk services, and a basic monitoring dashboard | Standardized digital service procedures and an operational service-status dashboard | Document processing status can be monitored, and verification time becomes more predictable and manageable |
| <b>Long-Term</b>            | Development of an integrated application, digital archive management, service analytics, and continuous evaluation                           | Fully integrated teacher certification electronic document management platform      | Automated reporting, systematic digital archiving, enhanced data security, and increased user satisfaction |

### 3.8 Novelty and Contribution of the Study

The principal novelty of this study lies in the formulation of an Integrated Digital Teacher Certification Document Management Service Model specifically designed for the context of local government administration. Previous discussions on educational digitalization have predominantly emphasized digital learning and instructional technologies. In contrast, this study identifies teacher certification administration as a strategic domain for advancing digital transformation within public service delivery in the education sector.

From a practical perspective, this study provides a comprehensive service framework that may serve as a reference for the Department of Education and Culture of Konawe Regency in developing Standard Operating Procedures (SOPs), establishing an integrated electronic document management system, strengthening human resource capacity, and improving service monitoring and evaluation mechanisms.

Academically, this research contributes to the growing body of knowledge on digital governance by extending its application to regional educational administration. The proposed model enriches scholarly discussions concerning the integration of digital transformation strategies into educational management and local public administration.

*Table 5. Evaluation Indicators for the Teacher Certification E-Document Service*

| <b>Dimension</b>        | <b>Indicator</b>                                                               | <b>Data Source</b>                         | <b>Evaluation Frequency</b> |
|-------------------------|--------------------------------------------------------------------------------|--------------------------------------------|-----------------------------|
| Efficiency              | Average document verification processing time                                  | System logs and service summary reports    | Monthly                     |
| Accuracy                | Percentage of documents requiring revision                                     | Verifier records                           | Monthly                     |
| Transparency            | Percentage of teachers able to monitor the status of their submitted documents | System dashboard                           | Quarterly                   |
| User Satisfaction       | Teacher satisfaction survey score                                              | Digital questionnaire                      | Semi-annually               |
| Data Security           | Number of unauthorized access incidents or data loss cases                     | Administrator reports                      | Quarterly                   |
| Human Resource Capacity | Number of teachers/operators participating in training programs                | Attendance lists and training certificates | Semi-annually               |

The findings of this study generate several practical implications for improving teacher certification administrative services:

- The Department of Education should establish standardized digital service procedures that clearly define service workflows, document requirements, processing timelines, and complaint-handling mechanisms.
- A secure, well-organized, and easily searchable digital document repository should be developed to support efficient document management and long-term archival purposes.
- Teachers and school operators should receive continuous training to ensure their ability to prepare and submit digital documents in accordance with established technical standards and administrative requirements.
- Departmental leaders should utilize executive dashboard data as a primary source of information for monitoring service performance, evaluating operational effectiveness, and supporting evidence-based decision-making.

- Every digital service platform should strictly implement personal data protection principles, including role-based access control, activity logging, information security mechanisms, and compliance with applicable data protection regulations.

### 3.10 Limitations and Directions for Future Research

This study has several limitations. First, it does not employ empirical data obtained directly from service users, such as average document processing time, the number of problematic submissions, teacher satisfaction levels, or system performance evaluation results. Consequently, the conclusions presented in this article remain conceptual and recommendatory rather than empirically validated.

Future research may adopt case study, survey, or program evaluation approaches to examine the implementation of digital teacher certification document management systems in greater depth. Comparative studies assessing service performance before and after digital transformation would also provide valuable empirical evidence regarding the effectiveness of digital service innovation.

Furthermore, quantitative research may investigate the influence of digitalized administrative services on key performance variables, including service efficiency, data accuracy, service transparency, user satisfaction, and organizational performance. Such empirical investigations would strengthen the evidence base for digital governance practices within educational administration.

## 4. Conclusion

Digitalization and technological innovation play a strategic role in improving the quality of teacher certification document management services at the Department of Education and Culture of Konawe Regency. Through the implementation of an electronic document management (e-document) system, monitoring dashboards, digital helpdesk services, electronic archives, and automated reporting, the processes of document submission, validation, tracking, and reporting can be performed more efficiently, transparently, accountably, and systematically.

The success of digitalization depends not only on the availability of technological applications but also on organizational readiness. Key factors that should be considered include digital leadership, staff competencies, teachers' digital literacy, infrastructure availability, standardized service operating procedures (SOPs), data integration, and personal data protection. Digital transformation implemented without sound governance may create new challenges, including data security vulnerabilities, system duplication, and limited accessibility for service users.

The integrated teacher certification electronic document management (e-document) service model proposed in this article provides a practical foundation for the development of educational administrative services in Konawe Regency. A phased implementation strategy—beginning with basic digitalization, followed by the standardization of SOPs, human resource capacity building, application development, and continuous evaluation—will assist the Department in establishing administrative services that are adaptive to regulatory changes and responsive to teachers' needs. Ultimately, digitalization contributes not only to strengthening teacher professionalism but also to enhancing the governance and quality of public services in the education sector.

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