



Enhancing Public Service Innovation through E Government: The Case of QR Code Based Complaint System in Bandung Fuel Stations

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Abstract

The purpose of this study is to examine the implementation of a QR Code based complaint system as part of e government innovation in public service delivery, with a specific focus on fuel stations (SPBU) in Bandung, Indonesia. The policy, initiated by the Directorate of Metrology, aims to improve transparency and responsiveness in legal metrology services by enabling consumers to submit complaints digitally. This study employs a qualitative descriptive method using in depth interviews, field observations, and document analysis. The research framework is grounded in Van Meter and Van Horn's model of policy implementation, which considers variables such as policy standards, resources, communication, implementing agency characteristics, external conditions, and implementer disposition. The findings reveal that while the policy is clearly defined at the central level, its implementation at the operational level is constrained by limited resources, weak inter agency coordination, and low public awareness. Additionally, SPBU operators exhibit mixed levels of engagement, largely due to a lack of formal training and absence of enforcement mechanisms. Despite these challenges, the study identifies opportunities to enhance the system through institutional support, continuous monitoring, and citizen engagement strategies. The implications of this research underscore the importance of integrating technological innovation with strong governance practices, and highlight the need for further research on digital complaint systems in other public service sectors.

Keywords: e government, QR Code, public complaints, digital innovation, legal metrology, policy implementation

1. Introduction

In the last two decades, the digital revolution has profoundly reshaped the structure of public administration and citizen engagement globally. Governments are increasingly embracing digital innovations, not only to enhance service delivery efficiency but also to foster greater transparency, accountability, and citizen participation (I. Farida, 2021). One of the critical frameworks underpinning this transformation is e government, which leverages information and communication technologies (ICTs) to modernize bureaucratic operations and public service systems (Gijón et al., 2025). In Indonesia, the institutionalization of e government was initiated through policies such as Presidential Instruction No. 3/2003 and further strengthened by Presidential Regulation No. 95/2018 on the Electronic Based Government System (SPBE). These initiatives represent strategic efforts to realign government services with the dynamics of digital governance (Eduardo Junio Andaya et al., 2025).

Among the key pillars of digital governance is the use of complaint mechanisms that enable citizens to report and monitor public services (Sharmin, 2025). The Indonesian Ministry of Trade, through its Directorate of Metrology, has introduced an innovative complaint mechanism using QR Codes placed at public fuel filling stations (SPBU) in Bandung. This initiative seeks to streamline public complaints about metrological compliance, particularly in relation to accurate fuel measurements a core aspect of consumer protection and legal metrology (UU No. 2/1981). While QR Code technology is widely recognized for its accessibility and low cost deployment (Atheequlla et al., 2024), its implementation in the context of public complaint services poses unique challenges, particularly in terms of public awareness, system transparency, and inter institutional coordination.

Information	Amount	Presentation
Number of gas stations in Bandung City	117	100%
Gas stations that have installed QR Codes	57	48,7%
Gas stations that have not installed QR Codes	60	51,3%

Table 1. QR Code Complaint System Installation at SPBUs in Bandung
Source: Direktorat of Metrology Archives (2024)

Type of Complaint	Presentation
Relevant (According to the authority of the Directorate of Metrology)	66%
Irrelevant (e.g. queues, gas station service)	34%

Table 2. Complaint Relevance Analysis
Source: Direktorat of Metrology Archives (2024)

From the data, despite the promise of such digital innovations, preliminary findings suggest a significant implementation gap. Only 48.7% of SPBUs in Bandung have installed QR Code based complaint systems, and among these, a large proportion of complaints received (34%) are unrelated to the mandate of the Directorate of Metrology. These indicators reveal a misalignment between policy goals and actual public understanding or usage. Furthermore, the absence of a feedback mechanism, inadequate ICT infrastructure, and limited human resource capacity have hindered the policy's effectiveness (Kementerian Perdagangan, 2023).

This study aims to critically assess the implementation of the QR Code based complaint policy by the Directorate of Metrology within the broader framework of e government. The research focuses on understanding how the policy has been enacted at SPBUs in Bandung and identifying the supporting and inhibiting factors that influence its effectiveness. Guided by the Van Meter and Van Horn (1975) policy implementation model which emphasizes variables such as policy standards, resources, communication, implementer characteristics, socio political conditions, and implementer disposition this study provides a comprehensive evaluation of both internal and external factors affecting the policy outcomes.

The main objective of this paper is to contribute to the discourse on public service innovation in developing countries by exploring how simple yet scalable digital technologies like QR Codes can be integrated into complaint handling systems. Furthermore, the research seeks to identify the institutional gaps and design recommendations to enhance policy effectiveness. A qualitative, descriptive research design is employed, involving semi structured interviews with key stakeholders government officials, SPBU operators, and citizens as well as observational and documentary analysis.

This study addresses a critical gap in the literature: although substantial research has explored e government and digital complaint systems in general (Vita Aprilina et al., 2025), few have focused on their practical implementation in the domain of legal metrology or consumer protection at the fuel retail level. By investigating a specific and underexamined policy case, this research offers both theoretical and practical insights into how digital tools can improve accountability and citizen engagement in public services.

2. Methods

This study employed a qualitative research approach with a descriptive design, aimed at providing a detailed and in depth understanding of the implementation of the QR Code based complaint service policy in public fuel stations (SPBU) within Bandung City. The choice of a qualitative approach was based on the need to explore contextual, organizational, and behavioral dimensions of policy implementation that cannot be adequately captured through quantitative measures alone (Mantula et al., 2024) The study was guided by the Van Meter and Van Horn (1975) policy implementation model, which provides a holistic framework by examining six variables that affect the implementation of public policy: (1) policy standards and objectives, (2) resources, (3) inter organizational communication and enforcement activities, (4) characteristics of implementing agencies, (5) socio economic and political conditions, and (6) disposition of the implementers. This model was selected because it integrates both internal administrative factors and external

environmental factors, which are essential in evaluating technology based public service innovations such as e government systems.

The research was conducted in Bandung City, West Java, Indonesia, focusing on the QR Code complaint system implemented at SPBU (fuel stations) under the supervision of the Directorate of Metrology, Ministry of Trade. The QR Code system was intended to facilitate real time consumer complaints concerning measurement inaccuracies (metrological violations) in fuel transactions, thus enhancing legal metrology enforcement and public participation.

The target population in this study included: Government officials from the Directorate of Metrology and its local units; SPBU managers and staff involved in the implementation; Service users (citizens/consumers), particularly those who had interacted with or were potential users of the QR Code complaint system. Purposive sampling was used to select information rich participants who have direct experience or responsibility in the implementation of the QR Code based complaint system. A total of 15 informants were interviewed, consisting of: 5 officials from the Directorate of Metrology; 5 SPBU operators or managers; 5 citizens, including online transport drivers and regular consumers.

Data were collected using the following methods. In depth semi structured interviews with key stakeholders to explore their perspectives, experiences, and challenges related to the QR Code system. Besides, the direct observation method was applied at selected SPBU locations to assess the visibility, functionality, and user interaction with the QR Code complaint facilities. In addition, document analysis of internal reports, implementation guidelines, complaint records, and relevant policy documents issued by the Directorate of Metrology. Interview guides were designed based on the variables of the Van Meter and Van Horn model. The last method is observational checklists and document review templates, which were also developed to ensure consistency and rigor in data collection.

Data analysis followed the Miles and Huberman (1994) model, consisting of: first, data reduction that condensing and organizing raw data based on emerging themes and coding schemes. Second is data display that presenting data visually in matrices and tables to identify patterns and relationships. The last is conclusion drawing and verification which interpreting findings in relation to the research objectives and theoretical framework.

Thematic coding was conducted manually and cross validated to ensure inter coder reliability. Triangulation was used to enhance credibility, combining insights from interviews, observations, and documents. Member checking was performed with selected participants to validate the interpretations of their responses.

To ensure validity, multiple strategies were employed triangulation of data sources and methods; prolonged engagement in the field to gain contextual understanding; and peer debriefing and feedback from academic supervisors. Reliability was strengthened through consistent use of protocols during interviews and documentation, as well as careful transcription and coding procedures. Ethical clearance and informed consent were obtained prior to data collection.

3. Results and Discussion

3.1 Results

This section presents the findings from field data, organized and analyzed based on the six dimensions of the Van Meter and Van Horn (1975) policy implementation model. The analysis addresses the core research questions related to the effectiveness of QR Code based complaint service implementation in Bandung fuel stations and identifies enabling as well as inhibiting factors. Table 1 summarizes key implementation findings across six variables:

Variables	Findings	Status	Interpretation
Policy Standards and Objectives	The objectives of the QR Code policy are clear at the central level (Directorate of Metrology), but not uniformly understood at the SPBU level. Many SPBU operators are unaware of the technical and operational purposes.	Partially Met	Lack of public understanding limited the achievement of intended outcomes.
Resources	No dedicated budget, limited trained personnel (1/17 staff trained), and inadequate ICT tools.	Not Met	Resource deficits significantly hindered service effectiveness.

Variables	Findings	Status	Interpretation
Inter org. Communication	Communication between the central office and local implementers is irregular. Monitoring is conducted only once every few months. There is no systematic follow up process.	Not Met	Created confusion and implementation gaps across different fuel stations.
Characteristics of Implementers	SPBUs act more as passive implementers. There is no institutional incentive or formal training provided to the operators.	Partially Met	Attitudes were positive, but skill gaps reduced overall performance.
Socio Economic and Political	Public awareness of the QR Code system is low. Many consumers do not recognize the purpose of the sticker. There is no significant political opposition, but public trust is fragile.	Partially Met	Socio demographic challenges constrained adoption and use of QR services.
Disposition of Implementers	Some SPBU operators show a positive attitude toward consumer protection but lack motivation due to unclear enforcement and absence of feedback.	Partially Met	Commitment was high, but tools to deliver results were insufficient.

Table 3. Summary of QR Code Complaint Service Implementation Analysis Based on Van Meter and Van Horn Model

Source: Field interviews, observations, and document analysis (2025)

3.2 Discussion

The research findings indicate that the implementation of the QR Code based complaint system in Bandung SPBUs faces significant challenges. While the policy objectives are well articulated at the central level, their transmission to the implementers is inadequate. This echoes Van Meter and Van Horn's argument that clarity of policy standards must be supported by effective communication and organizational alignment.

The resource constraints, especially in terms of human capital and infrastructure, are a primary barrier to implementation. As shown in prior studies (e.g., (Latupeirissa et al., 2024)), resource limitations are a recurring theme in the implementation of digital public services in Indonesia, particularly at the regional level.

Weak inter organizational communication between the Directorate of Metrology and the fuel stations results in inconsistent implementation. Monitoring visits are sporadic, and there is no established reporting mechanism. This condition undermines the responsiveness and accountability mechanisms expected in e government frameworks (Ilieva et al., 2024). The institutional characteristics of SPBUs further illustrate the lack of ownership in policy execution. Most operators view the QR Code sticker merely as a regulatory formality rather than a tool for consumer engagement. This supports the hypothesis that lack of training and incentive mechanisms weakens implementer commitment.

From the perspective of social and political conditions, the findings highlight a significant gap in public knowledge. The QR Code stickers are often ignored or misunderstood by consumers, indicating the need for broader public awareness campaigns. Without active public participation, digital complaint mechanisms fail to deliver the intended accountability (Vita Aprilina et al., 2025). Finally, the implementers' disposition plays a mixed role. While some SPBU managers are willing to support consumer protection goals, they are hindered by unclear policy guidance and absence of measurable impact. Their commitment remains tentative and dependent on stronger top down support.

Overall, the results suggest that the QR Code based complaint policy is only partially effective in achieving its intended goals. It requires stronger institutional support, consistent communication, community outreach, and adaptive capacity at the operational level to be fully functional. These findings confirm that public service innovation through e government is not solely a matter of technological deployment but depends heavily on governance quality, stakeholder alignment, and local capacity.

4. Conclusion

This study set out to examine the implementation of a QR Code based complaint system introduced by the Directorate of Metrology at public fuel stations (SPBUs) in Bandung, within the framework of e government and public service innovation. Drawing on the Van Meter and Van Horn implementation model, the research explored how various factors ranging from policy clarity and resource availability to communication practices and implementer disposition affect the effectiveness of this digital policy initiative.

The findings indicate that while the policy is well intentioned and aligned with broader goals of digital governance and consumer protection, its implementation at the operational level is significantly limited. Many SPBU operators lack a full understanding of the policy's objectives, and public awareness of the complaint mechanism remains low. Key barriers include insufficient human and financial resources, poor inter agency communication, and a lack of monitoring and evaluation structures. Furthermore, there is no clear feedback loop to ensure that citizen complaints result in meaningful action, which undermines trust and reduces public engagement.

Despite these challenges, the study also reveals a degree of readiness and positive disposition among certain implementers and stakeholders. This suggests that with the right institutional support such as training, consistent monitoring, clearer communication channels, and public outreach the QR Code system has the potential to enhance transparency, responsiveness, and citizen participation in service delivery. The implications of this research are twofold. First, it highlights the importance of not only adopting technological solutions in public administration but also addressing the institutional and human factors that determine their success. Second, it suggests that future policies in e government should be accompanied by comprehensive implementation planning that includes capacity building at the local level and mechanisms for citizen feedback and participation.

For future research, this study recommends a comparative investigation of similar digital complaint mechanisms across different cities or sectors to generate broader insights into best practices and contextual challenges. It would also be valuable to explore the user experience dimension in greater depth, particularly how citizens interact with digital tools and how their trust in public institutions evolves through such systems. In sum, the QR Code based complaint system represents a promising step toward more responsive and innovative public service delivery in Indonesia, but its success ultimately hinges on the strength of its implementation and the willingness of institutions to learn and adapt.

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