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Beyond The Formal Platform: Shadow It and The Accountability Paradox in Municipal Digital Governance

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Abstract: Municipal super apps are designed to integrate public services, improve traceability, and strengthen administrative accountability, yet formal digital workflows may coexist with informal coordination when bureaucratic actors perceive official procedures as operationally cumbersome. This study examines how shadow IT emerged alongside the Lontara+ municipal super app in Makassar, Indonesia, and how informal coordination affected responsiveness, traceability, accountability, and data privacy. This research employs a qualitative case study design, utilizing five focus group discussions involving representatives from 21 municipal agencies and district-level units, as well as in-depth interviews, observations, and document analysis. Data from citizen surveys are used as contextual supplementary information—rather than as primary evidence for drawing conclusions—due to limitations in the data. The findings show that a four-stage complaint workflow encouraged personnel in several organizations to bypass or supplement the platform through WhatsApp. These workarounds accelerated field coordination but weakened correspondence between completed action and formal digital records, producing an accountability paradox in which services could be operationally resolved while remaining digitally unresolved. Informal coordination also increased privacy risks when complainant information circulated outside formal platform controls. The study argues that effective digital government requires not only front-end integration but also usable, auditable, privacy-preserving workflows capable of internalizing the coordination practices on which service delivery actually depends.

INTRODUCTION

Digital government has moved beyond the automation of isolated administrative tasks toward integrated platforms, real-time information flows, interoperable services, and digitally mediated relationships between government and citizens. This transition is commonly associated with digital-era governance, smart-government architectures, and wider institutional transformation rather than with technology adoption alone (Bellamy & Taylor, 1998; Dunleavy et al., 2006; Fountain, 2001; Gil-Garcia, 2012; West, 2005). Smart-city scholarship similarly emphasizes that technological infrastructure becomes consequential only when it is aligned with institutions, organizational practices, and human capacities (Anthopoulos, 2017; Batty, 2013; Kitchin, 2014; Meijer & Bolívar, 2016; Nam & Pardo, 2011; Scholl & Scholl, 2014).

Municipal super apps represent a particularly visible expression of this transformation. By consolidating multiple service channels into a single citizen-facing interface, they promise lower transaction costs, more transparent service status, and easier access to public administration. Yet the appearance of integration at the interface does not necessarily mean that administrative work has been integrated behind the interface. Legacy systems, organizational silos, resource constraints, formal chains of authority, and centrally controlled databases may continue to structure how public organizations actually perform their work (DiMaggio & Powell, 1983; Fountain, 2001; Heeks, 2006; Janssen & van Wijk, 2015).

This tension is theoretically important because administrative actors do not simply follow formal systems mechanically. Street-level bureaucrats exercise discretion and adapt formal procedures to operational pressures (Lipsky, 1980). Networked communication can further expand the range of informal coordination available to organizational actors (Benkler, 2006; Castells, 2010; Margetts et al., 2016). In a digital government environment, these adaptations may

occur through messaging applications and other tools that sit outside the authorized platform. Such practices are commonly described as shadow IT when organizational work is accomplished through digital tools or channels that are not fully governed by the official information system.

The implications of shadow IT are ambivalent. Informal tools can increase speed, flexibility, and problem solving, but they can also fragment records, weaken institutional memory, complicate auditability, and create information-security risks. These concerns intersect with broader public-administration debates about rule-bound authority, responsive regulation, public value, and the institutional conditions under which technology supports rather than circumvents accountable governance (Braithwaite, 2002; Hood, 1991; Keban, 2014; Moore, 1995; Prasojo, 2017; Sampford, 2002). They also intersect with critical discussions of technology, power, security, surveillance, and institutional legitimacy (Davies & O'Malley, 2004; Foucault, 1991; Giddens, 1990; Heidegger, 1977; Suchman, 1995; Zuboff, 2019).

The case examined here is Lontara+ Makassar Super Apps, a municipal digital-service platform in Makassar, Indonesia. The broader research project found that the formal complaint process involved four principal points: the citizen, the Diskominfo War Room, the relevant municipal-agency administrator, and field personnel. Several organizations considered this formal sequence cumbersome and reported using WhatsApp to accelerate coordination. In some cases, work completed through informal coordination was not fully reflected in the formal platform record, creating a divergence between operational action and digital visibility. The original research report therefore identified workflow complexity, informal WhatsApp coordination, and shadow IT among the principal barriers to digital innovation.

Indonesia's digital-government reforms provide an important institutional backdrop. National policy has progressively promoted electronic government, service integration, data protection, and integrated digital-government architecture (Republic of Indonesia, 2003, 2018, 2022, 2025). At the municipal level, these reforms intersect with local planning instruments and operational arrangements, including Makassar's regional development plan and internal Lontara+ management documentation (Diskominfo Kota Makassar, 2026; Makassar City, 2025). The resulting governance environment combines national digital mandates, municipal innovation, local administrative capacity, and everyday bureaucratic work practices.

The article also builds on collaborative-governance and collaborative-innovation scholarship. Collaborative governance emphasizes direct engagement, deliberation, shared motivation, and capacity for joint action (Ansell & Gash, 2008; Emerson et al., 2012; Osborne, 2010). Collaborative innovation extends attention from coordination to the generation and implementation of new solutions across organizational boundaries (Sørensen & Torfing, 2011). However, the present article focuses on a narrower problem: what happens when formal digital coordination is institutionally insufficient and actors construct an informal digital layer to make implementation work.

The research question is therefore: Why and how do informal coordination practices emerge alongside formal municipal digital-service workflows, and what are their implications for responsiveness, traceability, accountability, and data privacy? Three subsidiary questions guide the analysis: (1) what characteristics of the formal Lontara+ workflow encouraged municipal actors to use informal coordination channels; (2) how did WhatsApp-based coordination affect operational responsiveness and the correspondence between field action and formal platform records; and (3) what accountability, traceability, and privacy risks emerged from the coexistence of formal and informal digital coordination?

The article contributes by conceptualizing an accountability paradox of shadow IT: the same workaround that improves immediate responsiveness may weaken the visibility and auditability through which digital accountability is supposed to be achieved. It further proposes a dual-layer understanding of municipal digital governance in which formal platforms and informal digital practices interact to produce actual service outcomes. This perspective complements user-centered and co-production approaches that emphasize the importance of how public services are actually experienced and enacted rather than how formal systems are designed on paper (Arnstein, 1969; Baccarne et al., 2014; Bovaird, 2007).

This research positions technology as an integral part of social and institutional dynamics. The institutional perspective of DiMaggio and Powell (1983) is employed to explain how institutional pressures shape the adoption of technology and sustain organizational routines. Meanwhile, Castells' (2010) "network society" perspective is used to analyze how technology alters patterns of coordination and information flow between institutions, without necessarily eliminating established power relations. Together, these two perspectives provide a foundation for understanding the interplay between technological transformation, organizational practices, and the sustainability of institutional structures.Critical perspectives further caution against treating technological systems as neutral instruments detached from questions of authority, surveillance, and subject formation (Foucault, 1991; Heidegger, 1977; Zuboff, 2019).

For this article, these traditions are not treated as competing grand theories. Instead, they establish a common premise: the operation of a digital platform depends on the institutional and social arrangements through which it is enacted. Even apparently technical design choices can redistribute visibility, discretion, and responsibility. The symbolic and legitimacy dimensions of public innovation are also relevant because citizens and officials evaluate a system not only by technical performance but by whether it appears appropriate, trustworthy, and aligned with shared expectations (Bourdieu, 1986; Fraser, 2009; Habermas, 1984; Suchman, 1995).

The report's bibliography also reflects wider debates on technology and public administration, including technological adaptation, organizational change, and the human consequences of increasingly mediated administrative systems (Gehlen, 1988; Widiyanti, 2020; Zott & Amit, 2017; Žižek, 2009). Although these works differ substantially in disciplinary orientation, they reinforce the need to avoid technological determinism when analyzing digital government. The present study therefore treats the Lontara+ platform as an organizational and institutional arrangement rather than merely a software artifact.

RESEARCH METHODS

Research Design and Case Selection

The study employed a qualitative case-study design to examine the implementation of Lontara+ within its real organizational and institutional setting. The case-study approach was selected because the research problem concerned the interaction between formal digital architecture, bureaucratic routines, interorganizational coordination, and informal workarounds. The present article constitutes a focused re-analysis of the broader Lontara+ research project, concentrating on material relevant to workflow constraints, informal digital coordination, accountability, traceability, and privacy rather than reproducing the wider project's full analysis of collaborative innovation.

Lontara+ was selected because it functions as a municipal super app intended to consolidate access to multiple public services and citizen complaints. The case is analytically useful because it combines a visible citizen-facing digital platform with a complex back-end administrative environment involving multiple municipal organizations, centrally governed databases, formal performance monitoring, and informal interagency communication.

Research Chronology and Ethics

Instrument development and research preparation began in March 2026. Ethical approval was granted by Universitas Bosowa on 15 April 2026 under Approval No. 032a/1.02/DRIPM-UNIBOS/IV/2026. All participant-facing empirical activities, including the citizen survey, institutional focus group discussions, in-depth interviewing, and observations, were conducted between May and July 2026 after ethical approval had been obtained. No participant recruitment or participant-based data collection occurred during the March preparatory period.

Participants were informed about the purpose of the research and provided informed consent before data collection. Confidentiality was maintained by avoiding the disclosure of personal identifiers in this article. Because the present article addresses privacy risks in informal coordination, potentially identifying details from the underlying research record have been deliberately omitted or generalized.

Data Sources

Institutional evidence was obtained through five focus group discussion sessions conducted during the May-July 2026 empirical period. Representatives from 21 municipal agencies and district-level administrative units participated across these sessions. The figure 21 refers to represented organizations rather than the number of individual participants. The discussions examined operational experiences with Lontara+, including complaint routing, interagency coordination, interoperability, resource constraints, feedback mechanisms, and informal workarounds.

A semi-structured in-depth interview was conducted with the Person in Charge of the Lontara+ Program at the Makassar City Communication and Informatics Office (Diskominfo). The interview provided system-management perspectives on platform architecture, data-integration constraints, privacy risks, executive monitoring, and adaptation in Lontara+ Version 2.

Participatory observations were conducted at public-service points, application-use settings, and Lontara+ socialization activities. Documentary materials included relevant national regulations, Makassar planning documents, official municipal reports, SPBE materials, and public communications. These sources were used to situate operational practices within formal rules and policy expectations.

The broader project also contained a contextual citizen survey. The original survey recorded 43 entries and duplicate screening identified 38 unique respondents. Because the retained research materials do not permit independent reconstruction of all post-deduplication item-level numerators and denominators, this article does not use disputed percentages as primary evidence. Survey material is used only when a qualitative interpretation can be independently triangulated through institutional, interview, observational, or documentary evidence.

Data Analysis and Trustworthiness

Interview and FGD materials were transcribed verbatim and organized by source. Analysis proceeded through familiarization, coding, categorization, theme development, review, and refinement, following the logic of thematic analysis. The present focused analysis re-examined the broader coding structure through four categories: formal workflow complexity, informal digital workarounds, accountability and traceability, and privacy and information governance (Braun & Clarke, 2006).

Source triangulation compared evidence from municipal organizations, the Lontara+ system-management perspective, observations, and documentary material. Methodological triangulation was used to compare qualitative accounts with contextual survey evidence where appropriate. The broader study also documented member checking, maintenance of an audit trail, and peer debriefing. In this article, claims are retained only at the level supported by the available research record.

RESULTS AND DISCUSSION

Results

Formal Digital Coordination Was Structured through a Four-Stage Workflow

The formal Lontara+ complaint process operated through four principal coordination points: citizen, Diskominfo War Room, relevant municipal-agency administrator, and field personnel. The sequence created a visible administrative chain and enabled executive monitoring of complaint status. At the same time, the workflow added verification and routing steps between citizen reporting and field execution.

Institutional evidence showed that several organizations perceived the workflow as cumbersome, especially when the reported problem required rapid operational action. Five municipal organizations - the Population and Civil Registration Office, Fire and Rescue Service, Women's Empowerment and Child Protection Office, Regional Revenue Agency, and Transportation Office - were identified in the research record as criticizing the formal sequence. The issue was not the absence of a digital channel; rather, it was the mismatch between the speed

expected in operational settings and the number of formal coordination steps required by the platform.

This finding is consistent with the report's broader efficiency analysis, which showed that digital integration could simplify the citizen-facing interface while leaving administrative friction inside the bureaucracy. Resource constraints further intensified the problem. For example, the Environmental Office operated with only seven field teams, while other technical organizations reported maintenance-budget constraints. Thus, the formal workflow interacted with limited field capacity rather than operating in an administratively frictionless environment.

WhatsApp Emerged as a Parallel Operational Infrastructure

Municipal personnel responded to workflow friction by using WhatsApp for direct coordination. This practice did not represent a return to non-digital administration; instead, personnel substituted an informal digital channel for the formal digital platform. In the underlying FGD evidence, a Population and Civil Registration Office representative described the Lontara+ process as cumbersome and contrasted it with the ability to execute work directly through WhatsApp.

The practice was particularly attractive when speed was considered essential, such as emergency response or sensitive social-service cases. WhatsApp provided low-friction interpersonal communication, rapid clarification, and direct contact across organizational boundaries. In implementation terms, the workaround reflected the importance of implementer disposition and practical convenience: actors were more likely to use the channel that they perceived as producing a faster operational response.

The resulting arrangement can be described as a parallel coordination architecture. Lontara+ remained the official platform through which complaints were recorded and monitored, while WhatsApp became an operational layer through which some administrative actions were accelerated. The two systems therefore coexisted rather than one simply replacing the other.

Operational Responsiveness Improved While Digital Traceability Weakened

The principal consequence of the workaround was a divergence between performed service and recorded service. When field personnel coordinated through WhatsApp, substantive action could occur before the formal platform record was fully updated. The underlying research report explicitly notes that some transactions completed through WhatsApp were not recorded in the official Lontara+ workflow, leaving complaint status appearing unresolved.

This divergence created an accountability paradox. Informal coordination could make the bureaucracy more responsive in operational terms while simultaneously making it appear less responsive in digital terms. Citizens and supervisors reading the platform record could encounter a status that did not accurately represent what had already occurred in the field.

The problem was therefore not simply missing data. It was a break in correspondence between organizational action and institutional memory. Where the formal platform failed to capture the sequence of informal coordination, the organization lost part of the audit trail through which responsibility, timing, and completion could later be reconstructed.

Executive Monitoring Strengthened Compliance but Did Not Eliminate Workarounds

Lontara+ operated within a strong vertical monitoring environment. The Mayor's Dashboard enabled unresolved tickets to be monitored and linked organizational responsiveness to the performance evaluation of agency heads and district leaders. The research record describes this mechanism as highly effective in compelling organizations to respond to complaints.

However, executive monitoring did not eliminate informal coordination. On the contrary, strong pressure for rapid responsiveness could coexist with a formal workflow that personnel considered too slow. This combination created incentives to achieve the required service outcome through whichever communication channel was operationally effective, even when that channel sat outside the official platform.

The case therefore distinguishes digital compliance from digital institutionalization. Municipal actors could comply with executive expectations to act on complaints without fully internalizing the official platform as the sole or dominant medium through which coordination occurred.

Informal Coordination Generated Privacy and Information-Governance Risks

The risks associated with shadow IT extended beyond incomplete records. The research report documents an incident in which complainant information circulated through interagency WhatsApp coordination without adequate anonymization. The account linked the circulation of identifiable information to an alleged intimidation incident involving a complainant. This finding demonstrates how operational workarounds can become information-governance risks when personally identifiable data move beyond the controls embedded in the formal platform.

The privacy issue is especially important because complaint systems depend on citizens' willingness to disclose problems to public authorities. If reporting creates a perceived risk that personal information will circulate informally, the platform's technical accessibility may be undermined by fear, distrust, or self-censorship. Digital participation therefore depends not only on the existence of a reporting channel but on confidence that institutional safeguards travel with the information after submission.

Lontara+ Version 2 Sought to Internalize Informal Coordination

The research record indicates that Lontara+ Version 2 introduced two adaptations directly relevant to the shadow-IT problem: automatic anonymization of complainant information and an internal in-application coordination forum. These changes were designed to reduce the need for cross-agency WhatsApp coordination while preserving the speed and flexibility that had made the informal channel attractive.

The significance of this adaptation lies in the attempt to move operational practice back inside an auditable institutional environment. An in-platform coordination mechanism can, in principle, preserve interagency communication while also generating a record of who acted, when they acted, and how responsibility moved across organizational boundaries. Automatic anonymization can similarly reduce unnecessary exposure of complainant identifiers.

Table 1. Formal Workflow, Informal Workarounds, and Governance Consequences

Observed condition	Operational response	Immediate benefit	Governance consequence
Four-stage complaint workflow	Direct WhatsApp coordination	Faster clarification and dispatch	Formal workflow bypassed; incomplete audit trail
Emergency or sensitive service demands	Interpersonal messaging across agencies	Higher short-term responsiveness	Dependence on informal channels
Field action completed before formal update	Operational execution outside platform sequence	Problem resolved sooner	Platform status may remain unresolved
Personally identifiable complainant data	Information circulated in informal groups	Rapid identification and coordination	Privacy exposure and intimidation risk
Version 2 adaptation	In-app coordination and anonymization	Preserves coordination while reducing friction	Potential restoration of traceability and privacy controls

Discussion

Shadow IT as a Symptom of the Design-Actuality Gap

The Lontara+ case supports the proposition that digital-government difficulties arise when technological design is insufficiently aligned with administrative reality (Heeks, 2006). The formal workflow embedded a reasonable administrative logic: complaints should be routed, assigned, verified, executed, and documented. Yet the operational environment included emergencies, cross-agency ambiguity, resource constraints, and strong expectations for rapid response. Under these conditions, personnel developed an alternative coordination mechanism.

Shadow IT should therefore not be treated only as employee resistance or indiscipline. It can function as a diagnostic signal that formal digital arrangements have not fully absorbed the practical requirements of work. This interpretation aligns with institutional accounts in which

technologies are enacted through existing organizational structures rather than simply imposed upon them (Fountain, 2001). It also resonates with digital-era governance arguments that genuine transformation requires the reorganization of administrative processes rather than the superficial addition of electronic interfaces (Dunleavy et al., 2006).

The central managerial question is consequently not merely why employees bypassed the official system, but what features of the official system made bypassing operationally attractive. This reframing matters because prohibition alone does not remove the underlying incentive. If the formal system remains slower, more cumbersome, or less adaptive than the informal alternative, shadow IT is likely to reappear in a different form.

The Responsiveness-Traceability Trade-Off

The findings reveal a trade-off between responsiveness and traceability. WhatsApp could increase coordination speed, but the same speed was sometimes achieved by moving administrative activity outside the official record. This distinction is critical because digital accountability depends on more than whether an agency ultimately acts. It also depends on whether the sequence of action can be reconstructed, reviewed, attributed, and communicated.

Public-value theory is useful here because an apparently efficient workaround may create value for one dimension of performance while destroying value in another (Moore, 1995). Fast field action can be beneficial to citizens, but incomplete records can reduce transparency and make organizational learning more difficult. Similarly, smart-governance approaches emphasize that technological sophistication must be assessed in relation to institutional and human capacities rather than as a standalone achievement (Meijer & Bolívar, 2016; Nam & Pardo, 2011; Scholl & Scholl, 2014).

The study therefore proposes that digital-service performance should be assessed along at least two dimensions: operational responsiveness and record integrity. A platform can perform well on the first while performing poorly on the second. Evaluations that focus only on visible response speed risk overlooking whether the institutional system retains an accurate, auditable representation of what actually happened.

Digital Compliance Is Not the Same as Digital Institutionalization

The Mayor's Dashboard reveals a second paradox. Strong executive monitoring increased bureaucratic responsiveness, yet the broader research characterized the governance pattern as predominantly command-based. In collaborative-governance terms, hierarchical enforcement differs from the relational processes through which shared motivation and capacity for joint action are built (Ansell & Gash, 2008; Emerson et al., 2012). Collaborative innovation likewise depends on cross-boundary interaction rather than implementation through command alone (Sørensen & Torfing, 2011).

The Lontara+ case shows that officials may comply with performance expectations without institutionalizing the official digital workflow. They can satisfy the demand to solve a complaint while relying on communication outside the platform. The distinction suggests that digital institutionalization should be evaluated by the extent to which the formal platform becomes the ordinary medium through which work is coordinated, documented, and learned from - not merely by whether a platform exists or whether managers can monitor outcomes.

This point also connects to classic public-administration concerns about formal rules and administrative practice. Regulatory systems can shape conduct without completely determining it, and bureaucratic actors retain practical discretion in how they respond to implementation pressures (Braithwaite, 2002; Lipsky, 1980). The digital setting changes the tools through which discretion is exercised but does not eliminate discretion itself.

Privacy Turns Shadow IT into a Governance Problem

The privacy findings demonstrate that informal coordination is not merely a productivity issue. When personally identifiable complainant information moves through informal channels, formal access controls and logging can be weakened. This threatens both procedural accountability and the social legitimacy of digital participation.

Legitimacy research emphasizes that institutions depend on perceptions of appropriateness and trustworthiness (Suchman, 1995). Co-production and citizen-participation scholarship similarly shows that participation is meaningful only when citizens can engage under conditions that allow influence and confidence rather than mere symbolic inclusion (Arnstein, 1969; Bovaird, 2007). In this context, privacy by design is not an auxiliary technical feature. It is part of the institutional infrastructure required for citizens to participate without undue personal risk.

The concern also resonates with broader analyses of surveillance and information asymmetry. Digital systems increase the capacity to collect, transmit, and observe information, but the governance question is who controls that visibility and under what safeguards (Kitchin, 2014; Zuboff, 2019). The Lontara+ case demonstrates that information risk can increase not only through sophisticated centralized surveillance but through mundane informal circulation across organizational communication channels.

From Dual Digitality to Workflow Internalization

The findings support a dual-layer model of municipal digital governance. The formal layer consists of the official platform, defined workflows, dashboards, organizational assignments, and institutional controls. The informal layer consists of interpersonal coordination, messaging applications, tacit workarounds, and discretionary practices. Actual service delivery emerges from interaction between these layers.

This perspective complements network-society and smart-city scholarship by showing that digital connectedness is not synonymous with institutional integration (Castells, 2010; Meijer & Bolívar, 2016). It also complements living-lab and co-production approaches that emphasize the importance of adapting service design to actual user and stakeholder practices (Baccarne et al., 2014; Bovaird, 2007). A formal platform that ignores the coordination patterns users actually need may be technically functional but institutionally incomplete.

The relevant governance objective is therefore workflow internalization: the extent to which the speed, flexibility, and cross-boundary communication valued in informal practices can be reproduced inside the official system without sacrificing auditability, privacy, or accountability. The move toward an in-application coordination forum and anonymization in Lontara+ Version 2 can be interpreted as an effort in this direction.

Implications for Digital-Government Design and Policy

The practical implication is not that municipal governments should simply prohibit informal messaging. A prohibition strategy would treat the symptom while leaving workflow friction intact. Instead, formal digital systems should be redesigned to compete with informal channels on usability and speed while outperforming them on traceability, security, and accountability.

Reduce unnecessary routing and verification steps where administrative risk does not justify them. Provide real-time in-platform interagency communication so that staff do not need to leave the official system for clarification. Implement role-based access, automatic logging, and privacy-preserving identity controls. Link field completion directly to complaint-status updates so operational action and digital records remain synchronized. Use complaint data in planning and resource allocation so that digital reporting is connected to operational capacity. Design citizen feedback channels around actual communication behavior rather than assuming that email is universally effective.

These implications align with Indonesia's evolving digital-government policy framework, which emphasizes electronic-government integration, personal-data protection, and integrated service delivery (Republic of Indonesia, 2018, 2022, 2025). They also correspond with Makassar's local planning and platform-management context (Diskominfo Kota Makassar, 2026; Makassar City, 2025).

Limitations and Future Research

The findings should be interpreted as a bounded qualitative case rather than as population-level evidence. The citizen survey was small, non-probability based, and geographically concentrated, and some post-deduplication item-level denominators cannot be independently reconstructed from the retained materials. For that reason, the article relies primarily on qualitative institutional evidence rather than on precise survey percentages.

The article also focuses on one municipal platform during an active stage of institutional development. Lontara+ Version 2 and subsequent organizational adaptations may alter the relationship between formal and informal coordination. Future research should therefore examine shadow IT longitudinally and comparatively across municipalities, test whether in-platform coordination actually reduces informal workarounds, and investigate how accountability outcomes change when work is re-internalized into auditable systems.

CONCLUSSION

This study examined why informal digital coordination emerged alongside the formal Lontara+ municipal super-app workflow and how those practices affected responsiveness, traceability, accountability, and privacy. The findings show that WhatsApp-based coordination emerged primarily because several municipal organizations considered the formal four-stage complaint process too cumbersome for rapid operational response.

The workaround produced a distinctive accountability paradox. Informal coordination could accelerate field action while weakening the correspondence between completed work and the official digital record. As a result, services could be operationally resolved while remaining digitally unresolved. The same informal layer also created privacy risks when complainant information circulated outside formal platform controls.

The broader theoretical implication is that digital compliance should not be equated with digital institutionalization. Strong executive monitoring can compel action without ensuring that administrative work is actually performed and recorded inside the formal platform. Municipal digital governance therefore needs to be evaluated not only by the sophistication of the citizen-facing interface but by the extent to which operational coordination is internalized into usable, auditable, privacy-preserving workflows.

For practice, the appropriate response to shadow IT is not prohibition alone. Formal digital systems must offer the speed and flexibility that make informal tools attractive while simultaneously preserving traceability, information security, accountability, and organizational learning. The evolution toward in-platform coordination and anonymization provides.

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