



School Management in Integrating Data, Policies, and Administrative Services through the Role of School Operators in Pulau Maya District

Achmad Rivaie¹, Usman Radiana², Eka Ariyati³, Muhammad Asrori⁴, Agung Hartoyo⁵
^{1,2,3,4,5} Universitas Tanjungpura, Kalimantan Barat, Indonesia

ARTICLE INFO	ABSTRACT
Article history: Submitted: August 10, 2026 Final Revised: September 5, 2026 Accepted: October 09, 2026 Published: October 18, 2026	Purpose: This study examines how three schools in Pulau Maya District, Indonesia, manage the integration of educational data, policy-related administrative requirements, and administrative services through school operators, using the planning, organizing, actuating, and controlling (POAC) framework.
Keywords: Educational Data Integration; Island Schools; POAC Functions; School Management; School Operators.	Methods: A qualitative multi-site case study involved 15 purposively selected school principals, vice principals, operators, teachers, and administrative personnel from elementary, junior secondary, and senior secondary/vocational settings. The study drew on interviews, observations, and document analysis; findings were organized through open and axial coding and compared across sources and sites. Findings: School C documented administrative plans, distributed responsibilities through a formal decree, and conducted scheduled data checks. At Schools A and B, planning was more responsive to reporting deadlines and responsibilities were more concentrated on individual operators. Unreliable connectivity affected data entry and synchronization, while uneven staff training and limited contingency resources constrained routine operations. Implications. The cases point to the value of written role allocations, documented review procedures, shared technical competence, and connectivity-sensitive work arrangements. Originality: By examining POAC functions across three differently situated school levels within the same island district, the study shows how operators' adaptive work interacts with organizational support and the local infrastructure rather than treating administrative digitalization as application use alone
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INTRODUCTION

National education databases promise more consistent student records, timely administrative reporting, and better coordination between schools and education authorities. Yet an expanding number of digital applications does not automatically make school administration more integrated. In Indonesia, Dapodik, ARKAS, e-Rapor, ANBK, and SIPLah connect different administrative obligations, but their routine use still depends on staff, workflows, and access to infrastructure (Rusnati et al., 2022; Agnia et al., 2025). International evidence similarly distinguishes the availability of information and communication technologies from changes in how institutions organize their activities (Liu et al., 2025; McCarthy et al., 2023). This distinction matters because a reporting system can produce digital records while leaving responsibility, validation, and service continuity weakly coordinated.

For school operators, administrative digitalization is experienced as a sequence of interdependent tasks rather than as a single technological intervention. Updating student records, preparing financial information, supporting grade entry, and meeting system-specific deadlines require cooperation between principals, teachers, and administrative staff. Studies of educational data use show that access to data is insufficient unless professionals can interpret, trust, and act on the information produced (Michos et al., 2023; Evenstein Sigalov et al., 2026). Research on school digitalization likewise points to the importance of shared guidelines, institutional support, and time for staff collaboration (Reis-

Andersson, 2024; Durnali, 2025). The managerial question is therefore not simply whether applications are used but how responsibility for their use is organized and sustained.

Geographical constraints make the distance between policy requirements and daily administrative capacity particularly visible. Pulau Maya District in Kayong Utara Regency, West Kalimantan, includes settlements separated by waterways, and field accounts from participating schools describe uneven internet connectivity. During preliminary interviews, operators reported scheduling some Dapodik synchronization activities at night because connectivity was more reliable then, while teachers encountered difficulties with e-Rapor data entry. Such observations are consistent with international reviews identifying connectivity, resources, professional support, and local conditions as interacting obstacles in rural schools (Mustafa et al., 2024; Ahiaku et al., 2025). Research comparing rural and urban teachers further indicates that connectivity-related differences cannot be reduced to individual digital skills alone (Li, 2025; Zhao, 2024). These concerns warrant examination of the administrative arrangements through which schools respond to limited connectivity.

Planning, organizing, actuating, and controlling (POAC) offer a way to examine those arrangements as related management functions rather than isolated technical issues. Planning concerns administrative priorities, work schedules, and resource allocation; organizing concerns the division of responsibilities and decision authority. Actuating addresses the execution of data entry, coordination, and service tasks, whereas controlling concerns validation, review, and follow-up. In the original management formulation, these functions operate as a connected cycle rather than as four independent checklists (Terry & Rue, 2010). More recent accounts of school policy implementation similarly show that national digitalization agendas acquire their practical meaning through local organizational conditions and leadership decisions (Gustafsson, 2022; Wollscheid et al., 2025). Applying POAC to school operators therefore makes it possible to distinguish technical difficulties from weaknesses in coordination and accountability.

Prior scholarship has established several parts of this problem, although often in separate lines of research. Work on principals' digital leadership emphasizes vision, staff support, and organizational conditions for technology adoption (AlAjmi, 2022; Karakose et al., 2021; Asante & Novak, 2024). Qualitative and comparative studies likewise describe variation in leaders' digital readiness and their responses to organizational change (Willermark et al., 2024; Chen & Kouhsari, 2025; Awodiji & Naicker, 2024). Other studies focus on teachers' digital competence, professional learning, and agency in technology-rich environments (Heine et al., 2023; Siddiq et al., 2024; Wohlfart & Wagner, 2023). Taken together, this literature identifies leadership and human capacity as relevant conditions, but it does not by itself explain how school operators coordinate multiple administrative systems under the combined pressures of reporting deadlines and island connectivity.

A second literature stream examines digital strategy, distributed responsibility, and institutional learning. Research on school-level digital capacity associates differences in implementation with local strategy and stakeholder coordination (Çebi et al., 2026; Nagel et al., 2026), while studies of professional networks suggest that shared leadership can reduce dependence on individual actors (Ghamrawi et al., 2024; Shal et al., 2024). Evidence from Indonesia indicates continuing challenges in operator workload, administrative coordination, and data management (Nurjanah et al., 2023; Sofiana et al., 2025; Widyawati & Miyono, 2024). What remains less clearly documented in the studies reviewed here is how planning documents, role assignments, observed routines, and monitoring evidence differ across school sites in one geographically constrained district. A multi-site comparison can address that gap without assuming that experiences from three schools represent all island schools.

Accordingly, this study examines how school management integrates educational data, policy-related requirements, and administrative services through the role of school operators in Pulau Maya District using the POAC framework. It compares management practices across an elementary school (School A), a junior secondary school (School B), and a senior secondary/vocational school (School C), while identifying conditions that support or constrain implementation. Interviews, observations, and administrative documents provide complementary perspectives on routine administrative practice. The proposed contribution is an empirically grounded account of how formal management arrangements and operators' adaptive activities intersect under geographically uneven infrastructure. For practitioners, the comparison may inform locally feasible arrangements for responsibility sharing, administrative review, and technical support rather than offering a universal model of school digitalization.

The conceptual framework treats POAC as an iterative set of school management functions through which institutional actors coordinate data, administrative obligations, and related services, with enabling and inhibiting conditions shaping everyday implementation.

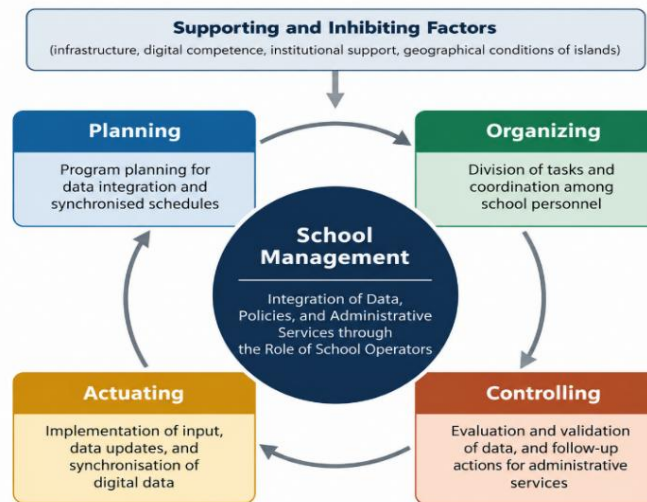


Figure 1. Conceptual Framework of School Management Based on the POAC Functions

METHOD

Research Design and Setting

A qualitative multi-site case study was used to examine how school personnel interpreted and performed digital administrative management within their ordinary institutional settings. Three public institutions in Pulau Maya District, Kayong Utara Regency, West Kalimantan, were represented as School A (elementary), School B (junior secondary), and School C (senior secondary/vocational). Their identities were anonymized because the small and interconnected local setting could make individual institutions and participants recognizable. The design supported comparison of administrative arrangements across three cases while retaining the local context of each case (Creswell & Poth, 2018). It was not intended to estimate the prevalence of practices across all schools in the district.

Participants and Data Sources

Fifteen participants were purposively selected from the three schools, comprising principals, vice principals, school operators, teachers, and administrative staff. The participants included 10 men and 5 women aged 40–55 years. Sources consisted of semi-structured in-depth interviews, participant observation, and institutional documents. The documentary material covered school planning records (RKJM, RKT, RKAS), standard operating procedures, decrees assigning administrative responsibilities (SK), meeting records, and available evidence of work with Dapodik, ARKAS, e-Rapor, SIPLah, and ANBK. Each source was used to examine planning, organizing, actuating, controlling, and the conditions affecting these functions.

Data Collection and Research Procedure

The researchers prepared the study and interview instruments, selected participating personnel through purposive sampling, and gathered information through interviews, observations, and document review. Interviews elicited accounts of administrative planning, distribution of tasks, daily use of digital systems, review arrangements, and enabling or inhibiting conditions. Observation provided information about visible work routines and infrastructure-related constraints, whereas institutional records were examined for formal plans, task allocation, and documented monitoring. Data were then organized for coding and cross-source comparison before findings were assembled into a descriptive case analysis. Figure 2 summarizes the research procedure, and Figure 3 depicts the three-site design and triangulation approach.

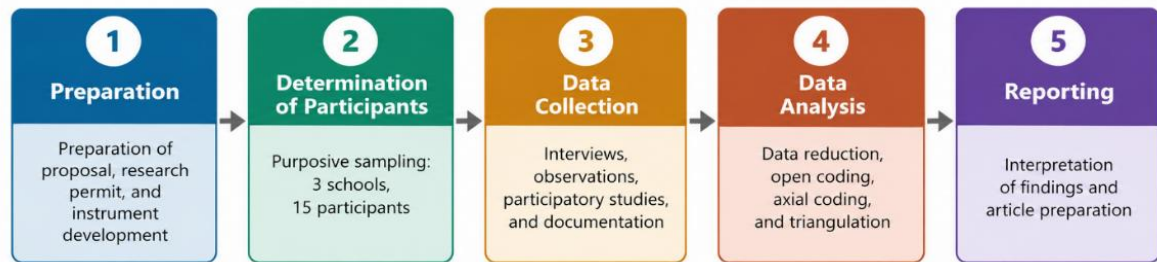


Figure 2. Research Procedure

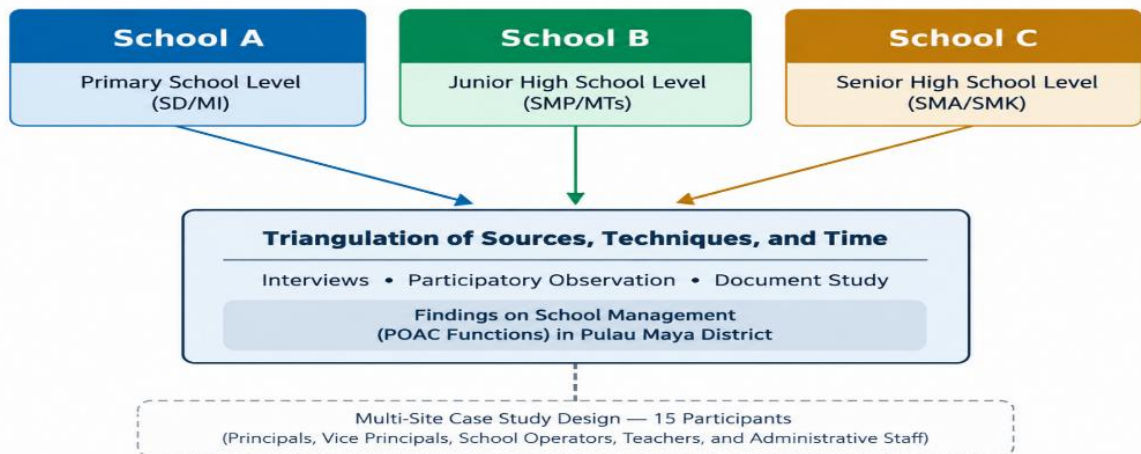


Figure 3. Multi-Site Case Study Design

Data Analysis and Trustworthiness

Interview materials and documents were prepared and read to identify meaningful administrative episodes and recurrent concerns. Open coding identified initial units of meaning, followed by axial organization of codes around the four POAC functions and a further category of enabling and inhibiting factors; the reported analysis yielded 22 initial codes and five final thematic categories. The categories were compared across interviews, observations, and institutional documents, and the resulting patterns were interpreted across the three school cases. Triangulation across sources, methods, and time, together with member checking and peer debriefing, was used to support trustworthiness (Miles et al., 2014; Braun & Clarke, 2006; Susanto et al., 2023). Because POAC structured the analysis, the final categories should be understood as theoretically organized themes rather than as wholly theory-independent discoveries.

Research Ethics

The study followed procedures for written informed consent, confidentiality, use of participant role codes (KS, WK, OP, GR, and TA), and participants' right to withdraw. The school labels A, B, and C are used consistently to protect institutional identities. Results are therefore reported as institutional and role-based summaries, rather than identifying individual respondents.

RESULTS

Interview Evidence Across POAC Functions

The 15 interviews covered the four POAC functions and contextual conditions. School C participants described a more formal approach to schedules, budgeting, role allocation, and data validation. In contrast, personnel from Schools A and B described reporting-oriented planning and concentration of application-related work on individual operators. Table 1 presents summaries of interview findings rather than verbatim interview excerpts.

Table 1. Interview Findings

No.	Aspect	Subject	Key Findings
1	Planning	Principal of School C (Senior Secondary/Vocational)	Data integration planning has been incorporated into the RKS/RKAS, along with a regular data synchronization schedule.
2	Planning	Operator of School A (Elementary)	Digital administration planning remains limited to meeting reporting deadlines, with no long-term system development plan in place.
3	Organizing	Operator of School B (Junior Secondary)	All tasks related to Dapodik, ARKAS, and e-Rapor are concentrated on a single operator without a formal division of responsibilities.
4	Organizing	Principal of School C (Senior Secondary/ Vocational)	The division of digital administrative responsibilities has been formalized through an official decree (SK), involving the vice principal and administrative staff.
5	Actuating	Operator of School A (Elementary)	Dapodik data synchronization is frequently conducted at night because internet connectivity is more stable during these hours.
6	Actuating	Teacher at School B (Junior Secondary)	Grade entry into e-Rapor is constrained by unstable internet access, resulting in reporting delays.
7	Controlling	Administrative Staff of School A (Elementary)	No written and periodic mechanism is currently in place for evaluating and reporting data-related issues.
8	Controlling	Vice Principal of School C (Senior Secondary/Vocational)	Data validation is routinely conducted each month with the operator before the data are reported to the principal.
9	Enabling and Inhibiting Factors	Operator of School B (Junior Secondary)	Internet connectivity and the geographical conditions of the island region constitute the predominant constraints, while support from the principal serves as the primary enabling factor.
10	Enabling and Inhibiting Factors	Teacher at School C (Senior Secondary/Vocational)	Limited continuous training for teachers has resulted in the operator remaining the only staff member with comprehensive mastery of the school's digital systems.

The interview evidence suggests that the schools differed most clearly in the formalization of administrative responsibility. At School C, the principal and vice principal described organizational and checking procedures involving more than one role. Accounts from Schools A and B placed stronger emphasis on operator workloads, delays, and network limitations. These differences are described as characteristics of the three studied institutions rather than as properties of their school levels in general.

Observed Administrative Practices

Observation records documented the availability of planning materials at School C, independent multi-application work by the operator at School B, and weak daytime connectivity at School A. They also described a weekly coordination arrangement at School C and an absence of observed backup connectivity or power equipment at Schools A and B. Table 2 presents the observation summaries without treating the absence of an observed item as proof that it was never available.

Table 2. Observation Findings

No.	Aspect	Location	Key Findings
1	Planning	School C (Senior Secondary/ Vocational)	The RKAS document and data synchronization schedule were displayed and accessible to administrative staff.
2	Organizing	School B (Junior Secondary)	The operator was observed working independently on several applications simultaneously, without assistance from other administrative staff.
3	Actuating	School A (Elementary)	The internet signal was observed to be weak during the daytime; consequently, data entry was postponed until the afternoon or evening.
4	Controlling	School C (Senior Secondary/ Vocational)	A weekly coordination forum involving the operator, vice principal, and principal was in place to discuss data status.
5	Enabling and Inhibiting Factors	School B (Junior Secondary) and School A (Elementary)	No backup equipment, such as generators or alternative modems, was observed to mitigate electricity and network disruptions.

Evidence From Institutional Documents

The document review identified explicit digital administration plans and an official allocation of responsibilities at School C. Equivalent formal division-of-responsibility decrees were not identified at Schools A and B, and School A lacked documentary evidence of an evaluation and follow-up mechanism. Dapodik synchronization reports were available in all three schools, although some archived records indicated delays. No documentation of external collaboration to strengthen digital infrastructure was identified among the materials examined for the three sites (Table 3).

Table 3. Document Analysis Findings

No.	Aspect	Location	Key Findings
1	Planning	School C (Senior Secondary/ Vocational)	The RKAS includes a program for strengthening the digital administration system and a budget allocation for operator training.
2	Organizing	School C (Senior Secondary/ Vocational)	An official decree (SK) specifies the division of responsibilities among operators, administrative staff, and personnel responsible for data management for each application.
3	Organizing	School A (Elementary) and School B (Junior Secondary)	No formal decree (SK) concerning the division of digital administrative responsibilities was identified; all responsibilities remain assigned to a single operator.
4	Actuating	All three schools	Dapodik synchronization report archives were available; however, some records indicated delays in data entry during several reporting periods.
5	Controlling	School A (Elementary)	No documentation of evaluation or follow-up actions related to digital administration was identified in the RKT/RKAS.
6	Enabling and Inhibiting Factors	All three schools	No documentation of collaboration with external stakeholders, such as network service providers or relevant government agencies, was identified for strengthening digital infrastructure.

Coding, Triangulation, and Cross-Source Patterns

The analytical summary in Table 4 reports 22 initial codes, subsequently organized into five overarching categories: planning, organizing, actuating, controlling, and enabling or inhibiting factors. Interview, observation, and document summaries converged most clearly on the concentration of operator tasks at Schools A and B and the more explicit planning and monitoring arrangements at School C. Member checking and peer debriefing were also conducted, with limited adjustments to theme labels. Table 4 summarizes these stages; it does not constitute a complete codebook or a quantitative measure of inter-coder agreement.

Table 4. Results of Data Reduction, Coding, and Triangulation

No.	Stage of Analysis	Analytical Focus	Key Findings
1	Data Reduction	Filtering information derived from the three data collection methods	Five major themes were identified from the interview, observation, and documentation data.
2	<i>Open Coding</i>	Developing initial codes from field narratives	Twenty-two initial codes emerged, including “single-operator workload,” “nighttime synchronization,” and “absence of SOPs.”
3	<i>Axial Coding</i>	Grouping and establishing relationships among codes	The codes were synthesized into five categories: <i>Planning, Organizing, Actuating, Controlling, and Enabling and Inhibiting Factors.</i>
4	Method Triangulation	Comparing findings across data collection methods	A high degree of consistency was found across interviews, observations, and documentation, particularly regarding differences in system maturity between School C and Schools A and B.
5	Findings Validation	<i>Member checking and peer debriefing</i>	Most informants agreed with the researchers’ interpretations; minor revisions were made to the labeling of themes related to inhibiting factors.

Enabling and Inhibiting Conditions

Principal commitment, operator initiative, and a regular coordination forum were identified as conditions supporting administrative continuity. Reported constraints included unstable connectivity, responsibilities spanning several applications, uneven opportunities for staff training, and the absence of relevant external collaboration records. Nighttime synchronization illustrates a practical adjustment made by operators, while also showing how routine service obligations could extend beyond ordinary working periods. Table 5 distinguishes these reported conditions from prescribed interventions.

Table 5. Enabling and Inhibiting Factors Affecting POAC Implementation in Pulau Maya District

No.	Category	Factor	Description of Findings
1	Enabling	Principal Commitment	Support from school principals, particularly at School C, facilitated the formulation of an official decree (SK) on the division of responsibilities and the allocation of training budgets.
2	Enabling	Individual Operator Initiative	Operators across all schools demonstrated adaptive initiatives, such as conducting data synchronization at night, although these practices were not yet supported by formal policies.
3	Enabling	Coordination Forum	The weekly coordination forum at School C functioned as a collective monitoring mechanism that strengthened data accuracy.

No.	Category	Factor	Description of Findings
4	Inhibiting	Limited Internet Connectivity	The geographical characteristics of the island region resulted in weak internet signals during the daytime at Schools A and B, hindering timely data synchronization.
5	Inhibiting	Multi-Platform Workload	Operators were required to manage Dapodik, ARKAS, e-Rapor, SIPLah, and ANBK simultaneously without a formal division of responsibilities at Schools A and B.
6	Inhibiting	Limited Continuous Training	Teachers and administrative staff had limited digital literacy, resulting in continued high dependence on a single operator.
7	Inhibiting	Absence of External Collaboration Documents	No documentation of collaboration with network service providers or relevant government agencies to strengthen digital infrastructure was identified across the three schools.

Comparison Across the Three Cases

Table 6 brings together differences across the POAC functions. School A was characterized by reactive planning, centralized responsibilities, limited daytime connectivity, and a lack of written evaluation arrangements. School B similarly relied heavily on its operator, with internet limitations affecting teachers' e-Rapor use and only incidental evaluation reported. School C combined formal plans and task allocations with scheduled coordination and validation. The comparison describes within-sample variation and cannot establish that school level itself explains the observed differences.

Table 6. Comparison of POAC Function Implementation Across Schools A, B, and C

POAC Function	School A (Elementary)	School B (Junior Secondary)	School C (Senior Secondary/Vocational)
Planning	Reactive and oriented toward reporting deadlines	Emerging awareness of planning, but not yet formally documented	Integrated into the RKAS, with defined schedules and budget allocations
Organizing	Responsibilities concentrated on a single operator	Responsibilities largely concentrated on the operator	Formal decree (SK) on the division of responsibilities involving multiple personnel
Actuating	Severely constrained by network limitations; synchronization conducted at night	Constrained by network limitations, affecting teachers' use of e-Rapor	Relatively smooth, supported by routine coordination
Controlling	No written evaluation mechanism in place	Evaluation conducted on an incidental basis	Scheduled weekly/monthly validation

Discussion

The comparison indicates that formal planning was more developed at School C, while Schools A and B approached digital administration primarily through immediate reporting demands. Within the POAC framework, this difference is consequential because planning converts externally imposed deadlines into internally coordinated work schedules, resources, and responsibilities. An RKAS allocation for operator training and a documented synchronization schedule at School C provide examples of that conversion, whereas responding to deadlines without corresponding organizational arrangements leaves adaptation largely to individual staff. This interpretation aligns with evidence that local conditions shape how national school digitalization policies are enacted (Gustafsson, 2022; McCarthy et al., 2023). Studies of school digital capacity also associate strategic planning with more coherent implementation, although their settings and methods differ from those of the present cases (Çebi et al., 2026; Wollscheid et al., 2025). Planning in this context is therefore better understood as the institutional coordination of recurring tasks than as the presence of a technology-related statement in a school document.

The organizing function revealed a tension between specialized operator expertise and institutional dependence on a single person. Schools A and B relied on their operators to manage several applications, whereas School C had a decree assigning responsibilities across staff roles. Specialization may simplify routine reporting, but the combination of multiple systems and limited role-sharing can also make interruptions and knowledge transfer more difficult. Research on digital school leadership describes the importance of institutional support and distributed participation, rather than restricting implementation to a technically proficient individual (Reis-Andersson, 2024; Ghamrawi et al., 2024; Shal et al., 2024). These arguments are compatible with the local accounts of operator workloads and staff reliance documented by Sofiana et al. (2025) and Mangerre et al. (2024). The cases do not establish that formal task allocation alone improves data accuracy, but they show why organizational responsibility is a relevant part of administrative integration.

Implementation exposed the difference between nominal access to a digital platform and the practical conditions needed to use it on schedule. At School A, reported nighttime synchronization and observed weak daytime connectivity indicate that staff adapted working periods to the availability of the network. At School B, teachers' difficulties entering grades into e-Rapor show that connectivity constraints were not confined to the operator role. Reviews of rural-school technology integration similarly treat infrastructure, institutional resources, and professional support as interconnected

barriers (Mustafa et al., 2024; Ahiaku et al., 2025), while studies from China document rural–urban differences in the conditions supporting teachers’ digital work (Zhao, 2024; Li, 2025). Related research has also examined the constraints and possibilities of technology use among rural-school teachers (Shambare & Jita, 2025). Such comparisons do not imply identical contexts, but they suggest that individual competence cannot compensate indefinitely for an unreliable technical environment. The practical implication is that administrative schedules and contingency arrangements should be designed around observed access conditions rather than assumed continuous connectivity.

The controlling function differentiated formal validation from informal responses to problems. School C combined weekly coordination with monthly data checks, while School A had no written evaluation or follow-up mechanism in the documents reviewed. From a POAC perspective, review arrangements matter because errors, late submissions, and changes in data need an accountable route back into planning and implementation. Research on data literacy emphasizes that using digital information requires routines for interpretation and judgement, not only collection or storage (Michos et al., 2023; Evenstein Sigalov et al., 2026; Stojanov & Daniel, 2024). The local findings on Dapodik management and data quality provide comparable concerns (Rodiyah et al., 2024; Bigovic et al., 2026), although they cannot establish the extent of errors in the three schools studied here. A reasonable implication is to document both the timing of checks and the actions taken following identified problems.

The cases also show that leadership support and operator initiative perform different functions. Principal involvement at School C was reflected in formal role assignments and a training budget, whereas operator initiative was most visible in adaptation to poor connectivity. Scholarship on leadership and technology integration points to strategic direction, staff development, and supportive organizational norms as conditions for sustainable digital change (AlAjmi, 2022; Karakose et al., 2021; Asante & Novak, 2024). Additional studies emphasize differences among principals in their preparedness and capacity to coordinate technology-related demands (Awodiji & Naicker, 2024; Chen & Kouhsari, 2025; Willermark et al., 2024). In Pulau Maya, such work suggests that individual improvisation should not be mistaken for evidence of a well-supported administrative system. Leadership becomes visible when adaptive practices are translated into shared schedules, responsibilities, and institutional follow-up.

A further issue concerns how administrative competence is distributed among teachers and non-teaching personnel. The School C evidence suggests that coordination across roles can accompany more formal management, while the account of School B describes dependence on the operator for several application tasks. Reviews of teachers’ digital competence identify training, access, and opportunities for professional learning as interacting conditions (Wohlfart & Wagner, 2023; Heine et al., 2023; Hathaway et al., 2024). Other studies show how agency, mentoring, and organizational communication can support participation in digital practices (Siddiq et al., 2024; Vandeyar & Adegoke, 2024; Neiroukh et al., 2024). Although much of that evidence concerns teaching technologies rather than administrative databases, it offers a useful distinction between staff knowing that a system exists and having sufficient support to perform tasks within it. In the three cases, an appropriately bounded response would be to share system-specific knowledge and clarify responsibilities, not to assume that all staff should become substitutes for operators.

The study’s conceptual contribution lies in applying the POAC cycle to administrative integration as work distributed across people, documents, platforms, and infrastructure. Under this interpretation, planning and controlling are not separate from operators’ data entry activities: they define the conditions under which entries are prepared, checked, and corrected. International research frames school digital leadership as an evolving organizational practice and cautions against approaches that focus solely on individual technical skills (Nagel et al., 2026; Freis & Schröer, 2024; Ghamrawi & Tamim, 2023). Related evidence on digital tools also shows that new technology can improve communication while generating new demands on staff and organizations (Durnali, 2025; Pambudi et al., 2024; Schmid et al., 2023). The Pulau Maya comparison extends that conversation to administrative operators, a role that remains central to the operation of national educational information systems in these cases. Its value is explanatory and contextual; it does not establish a universal sequence of management development across school levels.

These conclusions must be interpreted within the boundaries of a qualitative three-site comparison involving 15 purposively selected participants. Variation between School A, School B, and School C may reflect the circumstances of each institution, including leadership choices, available support, and infrastructure, rather than an effect of educational level. The evidence also summarizes interviews and observations rather than presenting a complete transcript-level audit trail, and the study did not measure service quality, system error rates, or the outcomes of proposed interventions. Longitudinal research on technology adoption suggests that institutional practices can evolve over time (Wohlfart & Wagner, 2025), while studies of school leadership and digital governance indicate that implementation requires ongoing collective learning (Ghamrawi et al., 2024; Nagel et al., 2026). For the schools studied, practical priorities include clear procedures for responsibility sharing, documented periodic validation, technical assistance, and feasible connectivity contingencies. Future multi-site research could examine whether such

arrangements improve administrative timeliness and service continuity, using explicit outcome indicators and a broader range of island-school settings.

CONCLUSION

This three-site qualitative study found uneven implementation of planning, organizing, actuating, and controlling in the management of digital school administration in Pulau Maya District. School C showed more formal planning, written allocation of responsibilities, and scheduled data review; Schools A and B relied more strongly on operators and faced difficulties related to connectivity, workload, and less formalized monitoring. These differences were observed within three particular institutions and should not be generalized as a necessary progression across educational levels. The evidence also shows that operators' practical adaptation, such as adjusting synchronization times, helped maintain administrative activity without resolving underlying infrastructure constraints.

The study contributes a context-specific account of how the POAC functions interact with the everyday work of operators in island schools. A more sustainable arrangement would involve shared responsibilities, documented administrative checks, targeted staff support, and work procedures suited to local network conditions. These are implications derived from the cases rather than tested outcomes of an intervention. Stronger comparative and longitudinal evidence would be needed to determine how such arrangements affect administrative service quality and data reliability.

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AUTHOR CONTRIBUTION STATEMENT

AR contributed to conceptualization, methodology, data collection, formal analysis, and original drafting. UR and MA provided academic supervision, methodological guidance, and critical manuscript review. EA and AH contributed to research validation, critical evaluation, and intellectual refinement of the manuscript. All authors reviewed and approved the final version of the manuscript.

AI DISCLOSURE STATEMENT

The authors used OpenAI's ChatGPT to assist with academic English editing, grammatical revision, and editorial organization during manuscript preparation. The authors remain responsible for evaluating the accuracy of all manuscript content, including citations, interpretations, and final statements.

Achmad Rivaie

Department Of Educational Sciences Faculty Of Teacher Training And Education
Universitas Tanjungpura Pontianak,
Jl. Prof. Dr. H. Hadari Nawawi, Pontianak, West Kalimantan, 78124, Indonesia.
Email: f2171251030@student.untan.ac.id

*** Usman Radiana (Corresponding Author)**

Department Of Educational Sciences Faculty Of Teacher Training And Education
Universitas Tanjungpura Pontianak,
Jl. Prof. Dr. H. Hadari Nawawi, Pontianak, West Kalimantan, 78124, Indonesia.
Email: usman.radiana@fkip.untan.ac.id

Muhammad Asrori

Department Of Educational Sciences Faculty Of Teacher Training And Education
Universitas Tanjungpura Pontianak,
Jl. Prof. Dr. H. Hadari Nawawi, Pontianak, West Kalimantan, 78124, Indonesia.
Email: muhammad.asrori@fkip.untan.ac.id

Eka Ariyati

Department Of Educational Sciences Faculty Of Teacher Training And Education
Universitas Tanjungpura Pontianak,
Jl. Prof. Dr. H. Hadari Nawawi, Pontianak, West Kalimantan, 78124, Indonesia.
Email: eka.ariyati@fkip.untan.ac.id

Agung Hartoyo

Department Of Educational Sciences Faculty Of Teacher Training And Education
Universitas Tanjungpura Pontianak,
Jl. Prof. Dr. H. Hadari Nawawi, Pontianak, West Kalimantan, 78124, Indonesia.
Email: agung.hartoyo@fkip.untan.ac.id
