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Implementation of Business Intelligence in Supporting Decision-Making for Population and Family Planning Programs: A Qualitative Study at the Population Control and Family Planning Office of Sorong City

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Abstract

This study examines the implementation of Business Intelligence (BI) in supporting decision-making for population and family planning programs at the Population Control and Family Planning Office of Sorong City. Using an empirical qualitative approach, the research explores how BI systems are utilized, how analytical outputs inform managerial decisions, and which organizational factors shape their effectiveness. Data were collected through in-depth interviews, observations, and document analysis involving policymakers, program managers, data analysts, and technical staff. The findings reveal that BI facilitates data integration across program units, enhances the timeliness and relevance of information, and supports evidence-based planning, monitoring, and evaluation. Dashboards and analytical reports enable decision-makers to identify demographic trends, assess program performance, and adjust interventions responsively. However, the effectiveness of BI is contingent upon data governance, human resource capacity, and institutional commitment to data-driven practices. The study highlights BI as a technological and managerial innovation that strengthens decision quality and institutional resilience in local public sector governance, particularly in population and family planning services..

Keywords: Business Intelligence, Decision-Making, Population Program, Family Planning, Public Sector, Qualitative Study**.**

INTRODUCTION

The global governance landscape has undergone a profound transformation as governments increasingly confront complex, multidimensional challenges driven by demographic change, technological acceleration, and rising public accountability demands. In population and family planning sectors, decision-making is no longer confined to routine administrative procedures but has evolved into a strategic function requiring the continuous interpretation of large, heterogeneous datasets related to fertility behavior, service accessibility, and program effectiveness. Advances in information systems and analytics have positioned Business Intelligence (BI) as a central enabler of data-driven governance, allowing organizations to convert dispersed data into actionable insights through integration, visualization, and real-time analysis capabilities (Chen et al., 2012; Azvine et al., 2005). Within public institutions, BI has become closely associated with broader digital transformation agendas, reflecting a global trend toward evidence-based policymaking where analytical capacity is treated as a strategic asset rather than a technical add-on (Yeoman, 2009).

Existing research has extensively documented the conceptual foundations and organizational value of BI and decision support systems, emphasizing their potential to enhance performance, transparency, and strategic alignment. Studies demonstrate that BI systems can strengthen the linkage between operational processes and organizational outcomes by improving the timeliness, relevance, and interpretability of information used by decision-makers (Elbashir et al., 2008). The evolution of BI from static reporting tools to advanced analytics services has further expanded its role across sectors, including public administration, where data, information, and analytics are increasingly delivered as integrated services supporting complex decision environments (Delen & Demirkan, 2013). At the same time, critical examinations of decision support systems research reveal a growing emphasis on contextual use, user interaction, and organizational embedding, underscoring that analytical

technologies derive value not merely from technical sophistication but from their alignment with decision-making practices (Arnott & Pervan, 2016).

Despite these advances, the literature also reveals persistent limitations and inconsistencies that constrain a comprehensive understanding of BI implementation in public sector contexts. Much of the empirical work remains dominated by private-sector case studies, with success metrics often grounded in financial performance rather than public value creation or policy effectiveness. Systematic reviews of BI and analytics capabilities indicate that while technological maturity has advanced significantly, empirical evidence regarding sustained organizational impact, particularly in government institutions, remains fragmented and uneven across regions (Jabraoui & Charkaoui, 2023). Furthermore, management information systems research has long highlighted the gap between system design and actual use in organizational settings, suggesting that technological adoption frequently outpaces institutional readiness, data governance capacity, and analytical literacy (Caldas, 2003).

These gaps become particularly salient in the domain of population and family planning programs, where decision-making environments are shaped by socio-cultural diversity, decentralized governance structures, and uneven data infrastructures. Although BI is theoretically well-suited to support monitoring of demographic trends and program outcomes, limited attention has been given to how BI systems are operationalized within local government agencies, how decision-makers interpret and trust BI outputs, and how analytical insights are translated into concrete policy actions. Methodological reviews further indicate that many BI studies prioritize quantitative performance assessment, leaving qualitative dimensions such as user perception, organizational learning, and implementation dynamics underexplored (Ragab & Arisha, 2018). This empirical and methodological imbalance restricts the ability to generalize findings to public-sector environments characterized by institutional complexity rather than market competition.

The unresolved issues identified in the literature generate both scientific and practical urgency. From a scientific perspective, the absence of context-sensitive studies limits theoretical refinement regarding the conditions under which BI supports effective decision-making in non-commercial settings. From a practical standpoint, local government agencies responsible for population and family planning face increasing pressure to justify interventions using reliable evidence while operating under constraints related to data fragmentation, limited analytical expertise, and organizational inertia. Without a deeper understanding of how BI systems are implemented and utilized in such contexts, investments in analytical technologies risk producing symbolic compliance rather than substantive improvements in governance quality and program responsiveness.

Positioned within this scholarly landscape, the present study addresses the intersection of Business Intelligence, decision-making, and public sector population governance by examining BI implementation within a local government institution responsible for population control and family planning. Rather than evaluating BI as a purely technical artifact, the study conceptualizes BI as a socio-technical system embedded within organizational routines, decision structures, and institutional constraints. By focusing on a local government agency in Sorong City, this research extends existing BI discourse beyond dominant private-sector narratives and contributes contextually grounded insights relevant to decentralized public administration in developing regions.

The purpose of this study is to explore how Business Intelligence is implemented, perceived, and utilized in supporting decision-making for population and family planning programs at the Population Control and Family Planning Office of Sorong City using a qualitative research approach. The study seeks to contribute theoretically by enriching understanding of BI as an organizational decision-support mechanism within public governance contexts and methodologically by demonstrating the value of qualitative inquiry in capturing implementation dynamics that are often overlooked by performance-centric evaluations. Ultimately, this research aims to inform more effective, context-sensitive BI adoption strategies that strengthen evidence-based policymaking and enhance the responsiveness of population and family planning programs at the local level.

RESEARCH METHOD

This study is empirical in nature and adopts a qualitative research strategy to investigate the implementation of Business Intelligence (BI) as a socio-technical innovation supporting decision-making in population and family planning programs at the Population Control and Family Planning Office of Sorong City. The empirical process focuses on examining BI not as a laboratory-based

technological artifact but as an organizational innovation embedded within real institutional workflows, decision structures, and data practices. The research procedure involved systematic field engagement through purposive selection of key actors directly involved in BI-related activities, including policymakers, program managers, data analysts, and technical staff. Data generation was conducted through in-depth interviews, non-participant observations of data processing and dashboard utilization, and analysis of institutional documents such as strategic plans, reporting formats, and internal BI outputs. This design enables the empirical capture of how BI is developed, operationalized, and integrated into routine decision-making processes, emphasizing innovation-in-use rather than technical system performance alone.

Methodological rigor was ensured through multi-layered validation and evaluation techniques appropriate for qualitative empirical research. Data credibility was strengthened through methodological and source triangulation by systematically comparing interview findings with observational evidence and documentary records. Analytical validation was achieved using iterative thematic coding, constant comparison, and pattern matching to identify stable relationships between BI functionalities, organizational practices, and decision outcomes. The robustness of findings was further supported by transparency in coding procedures, reflexive memoing, and peer debriefing to minimize interpretive bias. Rather than relying on quantitative performance indicators, evaluation metrics focused on analytical adequacy, decision relevance, usability of BI outputs, and perceived contribution to decision quality, allowing the study to capture nuanced impacts of BI that are often overlooked by metric-driven assessments. This methodological configuration provides a resilient and context-sensitive empirical foundation for understanding BI implementation within public-sector innovation ecosystems.

RESULTS AND DISCUSSION

Business Intelligence Implementation Architecture and Data Integration in Population and Family Planning Programs

The empirical findings indicate that the implementation of Business Intelligence at the Population Control and Family Planning Office of Sorong City is structurally positioned as a socio-technical architecture that integrates heterogeneous population and family planning data into a unified analytical environment. Qualitative evidence from interviews and document analysis shows that BI is not deployed as an isolated technological artifact but embedded within existing institutional workflows, reporting hierarchies, and decision routines. This embeddedness reflects the evolution of decision support systems from standalone tools toward organizational infrastructures that mediate between data production and policy formulation, as conceptualized in foundational DSS literature (Power, 2007; Mora et al., 2018). Informants consistently described BI as a mechanism that reorganizes how data circulate across units, rather than merely accelerating report generation. This finding aligns with critiques emphasizing that BI value emerges through organizational integration rather than technical sophistication alone (Arnott & Pervan, 2016).

At the architectural level, BI implementation involves the consolidation of demographic, service utilization, and program performance data previously dispersed across manual spreadsheets and semi-structured reporting systems. Field observations reveal that data pipelines are designed to aggregate inputs from program units responsible for contraceptive services, outreach activities, and monitoring functions, creating a centralized repository accessible through dashboards and summary analytics. This structural consolidation corresponds with the BI paradigm shift from fragmented management information systems toward integrated analytics platforms capable of supporting complex decision environments (Chen et al., 2012; Caldas, 2003). Interview data further indicate that the visibility of integrated indicators has altered managerial perceptions of data relevance, elevating operational statistics into strategic discussion points. Such transformations reflect the role of BI as an organizational sense-making device rather than a passive reporting instrument.

The integration of real-time or near–real-time data constitutes a critical dimension of BI implementation identified in this study. Although full real-time analytics remains constrained by field-level data submission practices, informants reported a significant reduction in reporting latency compared to pre-BI conditions. This partial real-time capability enhances managerial responsiveness by allowing emerging trends in population growth and family planning participation to be identified earlier within planning cycles. These findings resonate with conceptual models of real-time BI that emphasize incremental responsiveness rather than absolute immediacy (Azvine et al., 2005). From an

empirical standpoint, BI implementation demonstrates how temporal improvements in data availability can reshape decision horizons within public sector institutions.

Empirical evidence also suggests that BI functions as an analytics service layered upon existing institutional systems rather than replacing them entirely. Technical staff described BI as a mediating layer that extracts, transforms, and visualizes data without disrupting core administrative databases. This service-oriented configuration supports flexibility and scalability, characteristics emphasized in analytics-as-a-service frameworks within decision support research (Delen & Demirkan, 2013). The architectural choice reflects pragmatic adaptation to institutional constraints typical of public sector organizations, where legacy systems coexist with innovation initiatives. Such hybridity underscores that BI adoption in government contexts often proceeds through incremental integration rather than radical system overhaul.

Variations in data integration maturity across organizational units were identified as a salient empirical pattern. While central program units exhibit relatively stable data flows into the BI environment, field-level units continue to rely on semi-manual data submission mechanisms, introducing inconsistencies in update frequency and indicator completeness. This uneven integration reflects structural asymmetries commonly observed in public-sector analytics implementations, particularly in decentralized governance settings (OECD, 2020; Sivarajah et al., 2020). Informants acknowledged that these limitations constrain the analytical depth achievable through BI, especially for longitudinal and comparative analyses. The findings indicate that BI architecture is shaped as much by institutional capacity as by technical design considerations. To illustrate the structural characteristics of BI integration identified through empirical analysis, Table 1 summarizes the primary data domains, integration status, and analytical use observed during the study.

Table 1. Data Integration Structure and Analytical Utilization within the Business Intelligence System

Data Domain	Integration Status	Primary Analytical Use
Demographic Statistics	Fully Integrated	Trend analysis and population projections
Contraceptive Service Utilization	Partially Integrated	Coverage monitoring and targeting
Program Performance Indicators	Fully Integrated	Monitoring and evaluation
Field-Level Outreach Data	Semi-Integrated	Descriptive reporting

Source: Primary qualitative data derived from in-depth interviews, non-participant observations, and institutional document analysis conducted in this study

As shown in Table 1, integration maturity varies across data domains, influencing the types of analytical outputs available to decision-makers. Fully integrated domains support trend-based and comparative analysis, while semi-integrated domains remain confined to descriptive visualization. This empirical pattern reinforces arguments that BI effectiveness is contingent upon upstream data governance and standardization mechanisms (Elbashir et al., 2008; Jabraoui & Charkaoui, 2023). The table also clarifies how architectural design decisions translate into differentiated analytical capacities within the same BI environment.

From a decision-support perspective, the BI architecture facilitates multi-level decision-making by enabling differentiated access to aggregated and disaggregated indicators. Senior managers primarily interact with high-level dashboards that summarize program performance across districts, while operational managers access more granular views relevant to service delivery and outreach planning. This stratified access structure corresponds with theoretical models of decision support systems that emphasize role-based information delivery (Mora et al., 2018; Power, 2007). Interview narratives suggest that such differentiation enhances decision relevance by aligning analytical outputs with managerial responsibilities. The architecture thus operationalizes DSS principles within a contemporary BI framework.

The integration of BI into organizational routines also reflects broader institutional dynamics within Sorong City's governance environment. Prior studies on local governance and policy implementation in Sorong highlight the influence of organizational coordination and actor mobilization

on program effectiveness (Tajuddin & Ibrahim, 2025; Hasbullah et al., 2025). The present findings extend this perspective by demonstrating how BI architecture mediates coordination through shared data references. Informants noted that BI dashboards function as boundary objects that facilitate cross-unit dialogue during planning meetings. This mediating role reinforces the interpretation of BI as an infrastructural enabler of collective sense-making rather than an isolated analytical tool.

The empirical results further indicate that BI architecture contributes indirectly to accountability by stabilizing reference indicators used in reporting and evaluation processes. Document analysis shows increased consistency between internal monitoring reports and external accountability documents following BI adoption. This alignment supports arguments that analytics infrastructures can enhance institutional transparency when embedded within governance processes (OECD, 2020). However, informants cautioned that accountability gains remain dependent on data quality and institutional enforcement mechanisms. The architecture alone does not guarantee interpretive rigor without complementary organizational controls.

The findings demonstrate that BI implementation at the Population Control and Family Planning Office of Sorong City operates as an integrative architectural innovation that restructures data flows, decision routines, and organizational coordination. The architecture reflects a pragmatic balance between technical capability and institutional constraint, producing incremental yet meaningful analytical enhancements. This empirical configuration aligns with contemporary BI and DSS theories that emphasize socio-technical integration over technological determinism (Arnott & Pervan, 2016; Chen et al., 2012). The results establish a foundation for examining how such architectural arrangements influence decision behavior, analytical capacity, and governance outcomes in subsequent sections.

Business Intelligence and Evidence-Based Decision-Making Dynamics

Empirical findings indicate that Business Intelligence has substantially reshaped decision-making practices within the Population Control and Family Planning Office of Sorong City by embedding analytical reasoning into routine managerial deliberations. Interview data reveal that decisions concerning program prioritization, resource allocation, and service targeting are increasingly justified through BI-generated indicators rather than experiential judgment alone. This transformation reflects a broader shift from descriptive administrative reporting toward analytical decision support systems that emphasize evidence as the primary legitimizing resource for policy action (Power, 2007; Mora et al., 2018). Informants described BI dashboards as authoritative reference points during coordination meetings, functioning as shared cognitive frames for interpreting program performance. Such dynamics align with theoretical perspectives that conceptualize BI as an extension of decision support systems designed to enhance bounded rationality in complex organizational environments (Arnott & Pervan, 2016).

The empirical material further demonstrates that BI-supported decision-making operates across multiple organizational levels, with differentiated analytical engagement patterns observed among senior, middle, and technical managers. Senior officials tend to rely on aggregated indicators displayed through executive dashboards to assess strategic alignment with population control objectives, while middle managers focus on operational metrics related to service coverage and outreach efficiency. This stratified usage pattern reflects the role-based information delivery principles articulated in decision support systems theory, where analytical relevance is contingent upon managerial responsibility (Mora et al., 2018). Qualitative evidence suggests that BI enhances coherence between strategic intent and operational execution by synchronizing indicator interpretation across hierarchical layers. These findings reinforce arguments that effective BI systems must accommodate heterogeneous decision contexts rather than impose uniform analytical models (Arnott & Pervan, 2016).

A key empirical insight concerns the role of visualization in mediating analytical understanding and decision confidence. Informants consistently emphasized that graphical representations of trends, disparities, and temporal changes enabled faster comprehension compared to traditional tabular reports. This supports the proposition that BI visual analytics reduce cognitive load and facilitate sense-making in data-intensive environments, particularly within public sector organizations characterized by limited analytical specialization (Chen et al., 2012; Yeoman, 2009). Observational data indicate that visualization fosters more participatory discussion during meetings, as non-technical actors can engage

with data narratives more effectively. The findings underscore visualization as a critical epistemic bridge between raw data and collective decision-making.

Despite these gains, the depth of analytical reasoning enabled by BI remains uneven across decision contexts. While descriptive and diagnostic analyses are widely utilized, predictive and scenario-based reasoning are largely absent from routine practice. Informants attributed this limitation to both technical constraints and limited analytical confidence among users, highlighting that BI adoption does not automatically translate into advanced analytics usage. This pattern resonates with critiques in BI and analytics literature that caution against equating system availability with analytical maturity (Jabraoui & Charkaoui, 2023; Elbashir et al., 2008). The empirical evidence suggests that BI currently supports incremental rationalization of decisions rather than transformative analytical foresight.

The interaction between BI outputs and organizational decision norms also emerged as a salient theme. Document analysis indicates that formal decision protocols increasingly reference BI indicators as justification for programmatic adjustments, signaling institutionalization of evidence-based reasoning. However, interviews reveal that informal negotiation and contextual judgment continue to influence final decisions, particularly in politically sensitive or resource-constrained scenarios. This hybrid decision logic aligns with socio-technical views of decision support systems, where analytics inform but do not replace human judgment (Power, 2007; Caldas, 2003). The findings suggest that BI functions as a decision amplifier rather than a deterministic decision engine. To empirically illustrate patterns of BI-supported decision usage identified through thematic analysis, Table 2 summarizes decision domains, dominant BI functions, and observed analytical depth.

Table 2. Business Intelligence Utilization across Decision Domains

Decision Domain	Dominant BI Function	Observed Analytical Depth
Strategic Planning	Performance visualization	Descriptive–diagnostic
Resource Allocation	Comparative indicator review	Diagnostic
Program Monitoring	KPI tracking	Descriptive
Service Targeting	Geographic data analysis	Descriptive–diagnostic

Source: Primary qualitative data derived from interviews, observations, and institutional document analysis conducted in this study.

As indicated in Table 2, BI utilization remains concentrated at descriptive and diagnostic levels across most decision domains. Predictive or prescriptive analytics are not institutionalized, limiting BI's capacity to support anticipatory governance. This empirical pattern corresponds with findings in public sector analytics research that highlight structural and cultural barriers to advanced analytical adoption (Sivarajah et al., 2020; OECD, 2020). The table clarifies how decision domain characteristics condition the depth of BI-supported analysis.

Human analytical capacity emerged as a decisive mediating variable in the effectiveness of BI-supported decision-making. Interview data reveal that users with prior exposure to data analysis demonstrate greater confidence in exploring trends and correlations, while others restrict engagement to surface-level indicators. This disparity reinforces the argument that analytical competence is a core determinant of BI value realization, particularly in public organizations where formal analytics training is unevenly distributed (Ragab & Arisha, 2018). Observational evidence shows that limited data literacy constrains interpretive depth even when technically robust dashboards are available. The findings position human capability as an integral component of the BI decision ecosystem.

The influence of leadership practices on BI-mediated decisions is also evident in the empirical data. Informants reported that when senior leaders explicitly request data-based justifications, BI outputs become central to deliberative processes. Conversely, in situations where leadership signals ambivalence toward analytics, BI usage tends to revert to symbolic reporting. This finding corroborates governance studies emphasizing leadership commitment as a prerequisite for data-driven public sector transformation (OECD, 2020; Yeoman, 2009). Leadership behavior thus conditions whether BI serves as an authoritative decision reference or a peripheral informational resource.

From a theoretical perspective, the findings support the conceptualization of BI as a contemporary instantiation of decision support systems adapted to organizational and institutional complexity. The empirical evidence illustrates how BI mediates between data infrastructures and human judgment, reinforcing foundational DSS principles while incorporating modern analytics capabilities (Power, 2007; Mora et al., 2018). The study extends BI literature by demonstrating how evidence-based decision-making unfolds in a local government context shaped by administrative constraints and socio-political considerations. This contribution addresses gaps identified in DSS research concerning real-world usage beyond experimental or private-sector settings (Arnott & Pervan, 2016).

In synthesis this sub-section demonstrates that Business Intelligence substantively enhances evidence-based decision-making within population and family planning programs by improving information visibility, analytical coherence, and decision justification. The empirical findings reveal both enabling mechanisms and structural limitations that shape BI's practical influence on decisions. BI strengthens rational deliberation while coexisting with contextual judgment and institutional norms. These dynamics highlight BI's role as an adaptive decision support infrastructure rather than a purely technical solution, setting the stage for deeper analysis of organizational capacity and governance conditions in the subsequent section.

Organizational Capacity, Data Governance, and Institutional Conditions of BI Effectiveness

The empirical findings demonstrate that organizational capacity constitutes a decisive determinant of Business Intelligence effectiveness within the Population Control and Family Planning Office of Sorong City. Qualitative evidence indicates that BI tools are embedded within institutional processes that remain uneven in terms of data literacy, analytical competence, and role clarity. While technical infrastructure provides access to dashboards and integrated indicators, the ability of staff to interpret and operationalize analytical outputs varies considerably across functional units. This variation reflects longstanding insights from management information systems research that emphasize the co-evolution of technology and organizational capability (Caldas, 2003; Arnott & Pervan, 2016). BI effectiveness, in this context, emerges as an organizational accomplishment rather than a purely technical outcome.

Human resource capacity emerged as a recurrent theme across interviews, particularly concerning analytical reasoning and interpretive confidence. Informants consistently reported that many staff members engage BI outputs at a surface level, relying on descriptive visualizations without extending analysis toward causal inference or trend projection. This limitation constrains BI's role as an advanced decision support system and aligns with empirical findings that highlight skill gaps as a critical barrier to analytics maturity in public organizations (Ragab & Arisha, 2018; Sivarajah et al., 2020). Observational data further reveal that analytical exploration is often concentrated among a small subset of technically proficient staff, reinforcing dependency patterns. Such concentration increases institutional vulnerability when analytical expertise is not widely diffused.

Leadership commitment was identified as a pivotal institutional mechanism shaping BI utilization and organizational learning. Interview data suggest that when leaders actively reference BI indicators during deliberations, staff engagement with data increases and analytical norms become institutionalized. This dynamic corresponds with governance frameworks that position leadership as a catalyst for data-driven transformation in the public sector (OECD, 2020; Yeoman, 2009). Conversely, inconsistent leadership signaling weakens the normative authority of BI, relegating it to a supplementary reporting function. The findings indicate that BI adoption is inseparable from leadership practices that legitimize analytical reasoning within bureaucratic decision cultures.

Data quality and reliability emerged as structural constraints that directly affect trust in BI outputs. Informants described persistent challenges related to incomplete field-level data, inconsistent reporting formats, and delayed data submission cycles. These issues undermine confidence in dashboard indicators, particularly for decisions involving resource allocation or performance accountability. This empirical pattern reinforces theoretical assertions that BI systems amplify both the strengths and weaknesses of underlying data infrastructures (Chen et al., 2012; Elbashir et al., 2008). Without robust data governance mechanisms, BI risks institutionalizing uncertainty rather than mitigating it.

Document analysis reveals that data governance arrangements remain partially formalized, with standards for data validation and responsibility allocation still evolving. Although BI has introduced greater consistency in indicator definitions, enforcement mechanisms for data accuracy at the point of

collection remain limited. This gap reflects broader challenges identified in public-sector analytics literature regarding governance alignment across organizational layers (OECD, 2020; Jabraoui & Charkaoui, 2023). Informants acknowledged that BI visibility has increased awareness of data quality issues, even when corrective capacity remains constrained. The findings suggest that BI functions as both an analytical tool and a diagnostic mirror of institutional data practices. To illustrate the organizational and governance conditions shaping BI effectiveness, Table 3 summarizes key empirical dimensions identified through thematic analysis.

Table 3. Organizational and Data Governance Factors Influencing BI Effectiveness

Institutional Dimension	Observed Condition	Implication for BI Utilization
Data Literacy	Uneven across units	Limited analytical depth
Leadership Commitment	Variable	Inconsistent institutionalization
Data Quality Assurance	Partially formalized	Reduced trust in BI outputs
Governance Coordination	Developing	Fragmented accountability

Source: Primary qualitative data derived from interviews, observations, and institutional document analysis conducted in this study.

As shown in Table 3, BI effectiveness is mediated by a constellation of organizational and governance factors rather than a single dominant variable. The interaction between leadership, human capacity, and data governance produces differentiated analytical outcomes across decision contexts. This empirical configuration supports socio-technical perspectives that conceptualize BI as an embedded organizational system shaped by institutional arrangements (Power, 2007; Mora et al., 2018). The table clarifies how structural conditions translate into practical constraints on BI value realization.

The findings further indicate that BI contributes to organizational learning by stabilizing performance indicators and enabling longitudinal reflection. Informants noted that repeated exposure to trend visualizations facilitates gradual improvement in analytical interpretation, particularly among middle managers. This learning trajectory aligns with views of BI as an enabler of cumulative analytical competence rather than an instantaneous transformation tool (Delen & Demirkan, 2013). However, learning remains incremental and contingent upon sustained exposure and reinforcement. The absence of structured analytical training limits the scalability of this learning effect.

Contextual factors specific to Sorong City also shape BI implementation outcomes. Prior qualitative studies on governance and social programs in Sorong highlight the influence of institutional coordination, actor mobilization, and local capacity constraints on policy effectiveness (Hafid, 2025; Tajuddin & Ibrahim, 2025). The present findings extend this contextual understanding by demonstrating how BI interacts with these institutional characteristics. BI does not override contextual constraints but operates within them, amplifying both coordination gains and structural limitations. This contextual embeddedness distinguishes BI implementation in local government from private-sector analytics adoption.

The empirical evidence also reveals that BI supports accountability narratives without fully resolving accountability practices. While standardized indicators facilitate clearer reporting, accountability mechanisms remain dependent on organizational enforcement and political will. This finding aligns with critiques that caution against overestimating the governance impact of analytics in isolation (Arnott & Pervan, 2016). BI enhances visibility but does not automatically ensure corrective action. Accountability remains a socio-political process mediated by institutional authority structures.

From a theoretical standpoint, the findings reinforce integrative models of decision support systems that emphasize organizational readiness, governance alignment, and human capability as core determinants of effectiveness. The study corroborates foundational DSS theories while situating BI within contemporary public-sector innovation ecosystems (Power, 2007; Mora et al., 2018). Empirically, the research contributes nuanced insights into how BI operates under real-world institutional constraints rather than idealized analytical conditions. This perspective addresses gaps identified in BI literature concerning implementation in decentralized public administrations (Jabraoui & Charkaoui, 2023).

The effectiveness of Business Intelligence in supporting population and family planning decision-making is contingent upon organizational capacity, data governance maturity, and leadership practices. BI functions as an enabling infrastructure whose impact is shaped by institutional conditions rather than technological features alone. The findings highlight the necessity of aligning analytical systems with human, organizational, and governance dimensions to realize substantive decision support value. This integrated interpretation completes the empirical analysis of BI implementation within the Population Control and Family Planning Office of Sorong City.

CONCLUSION

This study demonstrates that the implementation of Business Intelligence (BI) at the Population Control and Family Planning Office of Sorong City plays a strategic role in strengthening decision-making for population and family planning programs. The integration of data from multiple sources enables the availability of accurate, relevant, and timely information, thereby supporting more effective planning, control, and program evaluation. The use of dashboards and analytical tools enhances the organization's capacity to identify demographic patterns, monitor performance indicators, and respond adaptively to field dynamics. The findings also indicate that the effectiveness of BI is strongly influenced by data governance mechanisms, human resource competencies, and institutional commitment to embedding data-driven insights into managerial processesThis study confirms that BI functions not merely as a technical system, but as a data-driven managerial innovation that reinforces evidence-based policy formulation and improves public sector governance at the local level.

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