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Logistics Governance of the 2024 General Election in Tegal Regency: A Sentiment Analysis of Distribution and Packaging Effectiveness

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ABSTRACT

The 2024 general election in Tegal Regency involved significant organizational complexity with 1,242,454 registered voters and 4,684 polling stations, necessitating effective logistics governance. Electoral success is determined not only by public participation but also by the effectiveness of logistics governance that ensures the availability of voting equipment in the right time, quantity, quality, and target. This study aims to analyze sentiment regarding the effectiveness of election logistics governance in the 2024 election at the Tegal Regency Election Commission through a multi-stakeholder perspective and identify supporting factors and constraints in the logistics distribution and packaging system. The research employs a qualitative approach with sentiment analysis methodology to examine the effectiveness of election logistics governance. Primary data were collected through in-depth interviews with representatives from four levels of election organizers: Tegal Regency Election Commission (KPU), District Election Committee (PPK), Polling Station Committee (PPS), and Polling Station Working Group (KPPS). Data analysis utilized NVivo 12 Pro software to classify sentiments into positive, negative, and neutral categories. The findings reveal a predominance of negative sentiment encompassing technical constraints in logistics procurement, distribution delays, inadequate supervision, and non-compliance with standard operating procedures. Positive sentiment was identified in distribution timeliness and inter-stakeholder coordination. This research contributes methodologically through the application of sentiment analysis in evaluating election logistics governance and recommends systematic improvements in quality control, human resource training, and time management to enhance the effectiveness of future electoral administration.

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1. INTRODUCTION

Indonesia is a country that employs a democratic system. Democracy is a system of government based on the principle of government from the people, by the people, and for the people (Feulner, 2024). To realize a democratic state, Indonesia divides power into three branches that separate powers: legislative, executive, and judicial. Indonesia has conducted general elections where elections are held to implement democratic principles through the election of parliamentary members (Petersen, 2023; Pietro Vanoni, 2020; Tushnet, 2021). The 2024 election in Tegal Regency involved enormous organizational complexity with a Fixed Voter List (DPT) of 1,242,454 voters and 4,684 polling stations (TPS) in Tegal Regency (KPU Tegal, 2023). This condition demonstrates that the required electoral logistics equipment would be substantial. Electoral success is determined not only by public participation but also by the effectiveness of logistics governance that ensures the availability of voting equipment in a timely manner, with the right quantity, quality, and targeting throughout the Tegal Regency area.

The function of electoral logistics is a component necessary to ensure that the general election process runs with proper timing, budget, technical specifications, quality, procedures, and targeting. Research on electoral logistics governance has become a significant academic concern in public administration studies. Previous research, such as that conducted by Rika Mariska and Heri Kusmanto on "Electoral Logistics Governance in 2019 and Electoral Malpractice," employed a descriptive qualitative approach. In its implementation, this research identified various logistical problems, including delays in logistics distribution, ballot paper mix-ups, and other issues. These problems resulted in repeat elections and supplementary elections in several areas (Mariska & Kusmanto, 2020). Meanwhile, research conducted by Amir, Tabah Maryanah, and Robi Cahyadi Kurniawan in 2024 with the title "Analysis of 2024 Electoral Logistics Management" also used a descriptive qualitative approach. This research discussed the management of state property, including electoral logistics at the General Election Commission (KPU) of Lampung Regency, which showed fairly good results (Amir et al., 2023). Additionally, General Election Commission Regulation Number 16 of 2023 concerning amendments to General Election Commission Regulation Number 14 of 2023, which regulates voting equipment, supporting equipment, and voting equipment in general elections, emphasizes the importance of professionalism in logistics management.

From a global perspective, previous research shows that electoral logistics is a field that is still underexplored and lacks established standard terminology. A systematic study conducted using a literature review approach reveals that the logistics domain in the context of electoral processes is relatively unexplored in depth and lacks a strong foundation, where the absence of standard terminology for 'electoral logistics' means that analogous concepts in various disciplines might be handled using diverse terminology or concepts (D. E. Apiri & Lim, 2025). Research shows that more than 40% of electoral costs are allocated to logistics, making it one of the most resource-intensive aspects of elections, with between 2023 and 2024, more than 85 countries holding general elections across various continents involving more than two billion people (D. Apiri & Lim, 2025). This research argues that electoral performance cannot be successfully achieved with traditional logistics components alone, which need to

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consider election-specific solutions, building secure logistics systems with technology used in the logistics field, appropriate safety and security management, human resource management, and appropriate measures for external disruptions (D. E. Apiri & Lim, 2025).

The experiences of various countries demonstrate challenges and innovations in electoral logistics management that vary according to local contexts. India, as the world's largest democracy with approximately 968.8 million registered voters, shows significant innovation through the implementation of electronic voting machines (EVMs) that require complex logistics management with strict security protocols, GPS tracking, and real-time communication systems to manage dynamic scenarios (Mathi, 2025). In Europe, analytical research on decentralization practices of electoral management bodies provides a comparative overview of experiences from countries such as Poland, Romania, Estonia, and North Macedonia, with the European Conference of Electoral Management Bodies held annually since 2002 serving as a forum for sharing knowledge and expertise on international standards and best practices in electoral affairs. Meanwhile, studies in Africa show that it is unrealistic to assume a comprehensive transfer of best practices from Europe and the United States to Africa, given specific challenges such as low to moderate social literacy levels and inadequate infrastructure, thus requiring contextual approaches suited to the specific conditions of each country (Kyiv, 2022; The Venice Commission, 2025).

Analysis of existing literature reveals significant methodological gaps in research on general election logistics governance, particularly regarding the use of sentiment analysis approaches. Based on the literature search conducted, no research has been found that uses sentiment analysis as the primary instrument to examine the effectiveness of general election logistics governance, despite this methodology having great potential to reveal emotional nuances, subjective perceptions, and in-depth evaluations from various stakeholders. The majority of previous research examining electoral logistics governance tends to adopt conventional descriptive qualitative approaches that focus on technical and procedural aspects but have limitations in capturing the complexity of subjective experiences and emotional evaluations from field implementers. The most striking gap lies in the absence of research that specifically uses sentiment analysis to evaluate the effectiveness of electoral logistics governance from a comprehensive multi-stakeholder perspective, ranging from the strategic level at the KPU to the operational level at the KPPS. This methodological gap results in a lack of deep understanding about the level of satisfaction, criticism, and diverse evaluations from electoral logistics implementers in the field, so that improvement recommendations tend to be generic and insensitive to the nuances of specific needs at each organizer level, and miss opportunities to develop monitoring and evaluation systems that are more responsive and adaptive to the dynamics of changing field conditions.

The novelty in this research lies in the use of sentiment analysis with the assistance of Nvivo 12 Pro software. This research studies the results of analysis from sources involved in electoral logistics management. Unlike previous research that typically uses descriptive and qualitative methods, this methodology allows for a deeper

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understanding of the KPU's role in organizing general elections, as explained by sources involved in the process. This methodological approach is capable of classifying perceptions and evaluations into positive, negative, and neutral categories systematically and objectively. This research also integrates data from four levels of election organizers (KPU, PPK, PPS, and KPPS) that provide a holistic picture of logistics governance implementation from upstream to downstream. This methodological innovation is expected to make a significant contribution to the development of more comprehensive and evidence-based electoral logistics governance evaluation instruments. The use of Nvivo 12 Pro software helps provide a platform, manage, help discover themes and sub-themes from all literature sources or interviews and perform coding, both mixed and manual, to discover themes and sub-themes from all sources (Priyatni et al., 2020).

This research aims to determine how the Tegal Regency KPU, as the organizer of general elections, has the authority to conduct effective logistics governance and distribution. Specifically, this research is designed to identify sentiments related to logistics governance conducted by the Tegal Regency KPU through sentiment analysis that integrates perspectives from all stakeholders. In sentiment analysis, evaluation is conducted from community assessment, namely committee evaluation of policies and work programs of the Tegal Regency KPU related to electoral logistics governance. Sentiment analysis takes data from evaluations by the General Election Commission (KPU), District Election Committee (PPK), Voting Committee (PPS), and Voting Organizer Groups (KPPS). Additionally, this research also aims to identify factors that constitute strengths and weaknesses in the applied logistics governance system, and provide strategic recommendations for improving electoral logistics management performance in the future. The results of this research are expected to provide practical contributions for the KPU in conducting evaluation and continuous improvement of democratic and quality electoral logistics governance systems.

2. METHODS

This study employs a qualitative approach with sentiment analysis methods to examine the effectiveness of electoral logistics governance in the 2024 elections at the Tegal Regency General Election Commission (KPU). The research design chosen is descriptive-evaluative with a focus on analyzing multi-stakeholder perceptions and evaluations of electoral logistics governance implementation. Sentiment analysis is an effective method for analyzing opinions and emotions contained in text, and can systematically classify data into positive, negative, and neutral categories (Medhat et al., 2014). The qualitative approach in sentiment analysis enables a deeper understanding of the context and specific functions of users' emotional expressions, beyond merely positive or negative assessments (Gaspar et al., 2016). Sentiment analysis is used as the primary instrument to systematically and objectively classify perceptions and evaluations into positive, negative, and neutral categories.

Research data were obtained from four levels of election organizers directly involved in logistics governance, namely the Tegal Regency General Election Commission (KPU), District Election Committee (PPK), Voting Station Committee (PPS), and Voting Station Organizing Group (KPPS). The selection of research subjects was conducted through purposive sampling with criteria of direct involvement in the

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2024 electoral logistics governance process. Primary data were collected through in-depth interviews with representatives from each level of organizers to obtain a holistic overview of logistics governance implementation from upstream to downstream. The integration of data from these four levels enables researchers to understand the dynamics and challenges faced at each stage of the electoral logistics process, in line with the principle of data source triangulation that can enhance the credibility and validity of research findings (Carter et al., 2014).

Data collection was conducted through structured and semi-structured interviews with key informants from each level of election organizers. Each interview focused on aspects of logistics governance including logistics needs planning, logistics procurement, ballot sorting, logistics packaging, and logistics distribution. The collected data were then analyzed using NVivo 12 Pro software, which is a Computer-Assisted Qualitative Data Analysis Software (CAQDAS) widely used in qualitative research due to its ability to facilitate systematic coding, organization, and analysis of qualitative data (Castleberry & Nolen, 2018; Zamawe, 2015). NVivo enables researchers to perform character-based coding, has rich text capabilities, and multimedia functions that are important for qualitative data management (Zamawe, 2015). The analysis process involved manual and automatic coding stages to identify themes and sub-themes from all data sources, as well as sentiment classification based on positive, negative, and neutral categories.

To ensure research validity and reliability, data source triangulation was conducted through information collection from multiple stakeholders at various levels of election organizers. Triangulation is a qualitative research strategy that uses multiple methods or data sources to develop comprehensive understanding of the phenomenon under study, while testing validity through convergence of information from various sources (Carter et al., 2014; Farquhar et al., 2020). The data verification process was conducted through member checking, which involves re-confirming analysis results with informants to ensure interpretation accuracy. The reliability of sentiment analysis was maintained through the use of NVivo 12 Pro software, which provides consistency in the data coding and categorization process (Auld et al., 2007). Additionally, peer review was conducted by involving other researchers to validate analysis results and reduce researcher subjectivity bias. Research credibility was also strengthened through comprehensive documentation of the entire research process, from data collection to interpretation of analysis results, as well as the application of trustworthiness principles including credibility, transferability, dependability, and confirmability (Shenton, 2004).

3. RESULTS AND DISCUSSION

Implementation of Election Logistics Management Stages 2024

Logistics Needs Planning

The initial stage of election logistics management in 2024 at the Tegal Regency Election Commission (KPU) commenced with comprehensive planning based on the calculation of the Permanent Voter List (DPT). Based on interviews with Nelly Fardilah Atiqoh, representative of the Tegal Regency KPU finance, general affairs, and

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logistics division, the planning process began by calculating logistics needs based on the number of permanent voters reaching 1,242,454 voters in Tegal Regency. According to her statement, "to calculate the Permanent Voter List, there is an application for permanent voters. The Permanent Voter List (DPT) will influence the amount of logistics, because the number of voters affects the number of ballots." This aligns with the principles of logistics planning that emphasize the importance of accurate data as the basis for needs calculation (D. E. Apiri & Lim, 2025).

The complexity of election logistics planning is evident from the interconnection between the number of voters and various logistics components. As explained by the KPU informant in the interview, "the number of voters affects the number of ballots, the number of ballots per polling station will affect the number of forms. The amount of logistics per polling station will have an impact. DPT is the earliest planning so that the logistics can be determined." This systematic approach reflects the application of integrated planning concepts in logistics management, where each variable correlates and influences total needs (Sheng & Lan, 2011). After the logistics needs calculation was completed, the KPU continued with budget calculation sourced from the State Budget 76 of 2024, demonstrating synchronization between technical planning and financial planning.

Logistics Procurement

The election logistics procurement process in 2024 in Tegal Regency implemented a tiered system involving three procurement levels: national consolidation (KPU RI), Provincial KPU, and Regency/City KPU. This tiered procurement structure was designed to optimize efficiency and ensure logistics standardization throughout Indonesia (Nurmandi & Kim, 2015; Sandi & Rohman, 2023). Based on interviews with representatives of the Tegal Regency KPU, "KPU RI conducts national consolidation and procurement of PPWP ballots, DPR member ballots, and assistive devices for visually impaired voters in PPWP elections. Provincial KPU procures logistics such as ballot boxes, DPD member ballots, Provincial DPRD member ballots, and Regency/City DPRD member ballots."

The Tegal Regency KPU has procurement authority for certain logistics components. According to the interview results, "Tegal Regency KPU procures several logistics items such as plastic seals, envelopes, copies of additional voter lists, ballot box number stickers, identification badges, DPT copies, stationery, forms, ballot box identity labels, candidate lists, and plastic bags." This procurement diversification demonstrates the application of decentralization principles that consider specific regional needs while maintaining national standards (Kyriacou & Roca-Sagalés, 2021). In its implementation, the Tegal Regency KPU uses the Logistics System Software (SILOG) for monitoring and reporting logistics stages, which facilitates transparency and accountability in the procurement process.

However, logistics procurement implementation faced significant challenges related to timeliness. Based on interviews with KPU informants, constraints were found in the form of procurement delays that impacted subsequent stages. As revealed in the interview, "if the procurement arrives late and if there are shortages when the stages are already tight, input and processing into the SILOG application

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will affect and hinder the process." This condition indicates the need for improvements in time management aspects and coordination with logistics providers to minimize delay risks (Farrell, 2017; Forsyth, 2007).

Ballot Sorting

The ballot sorting stage is a critical process involving large numbers of human resources. Based on interviews with the Tegal Regency KPU, "KPU involves PPK and the community. The secretariat is assisted by commitment-making officials and teams in activity coordinators for packaging. PPK has the task of supervising activities while the community serves as sorting officers numbering approximately 550 people per day for 15 working days at the Tegal Regency KPU logistics warehouse." The sorting process is conducted to separate types of good and damaged ballots, as well as perform classification based on quality and physical condition of ballots.

Based on interviews with Herman Marzuki as PPK of Margasari District, PPK involvement in this stage functions as a supervisor with specific tasks. According to him, "several tasks of the Sort-Fold supervisor are (1) ensuring sorting-folding officers match their identity (2) taking attendance of Sort-Fold officers (3) ensuring the sorting and folding process follows SOP." Sorting implementation faced significant operational constraints related to SOP compliance. As revealed by PPK in the interview, "the constraint faced is when there are sorting-folding officers who do not comply with SOP. Because of chasing targets, several sorting-folding officers were found folding several ballots simultaneously." This phenomenon reflects the conflict between quantitative targets and process quality, which often occurs in large-scale logistics operations (D. E. Apiri & Lim, 2025).

The complexity of sorting is also reflected in findings from interviews with KPU stating that "constraints in sorting officers. KPU has divided several groups but because many community members became sorting officers, it became less controlled during ballot sorting. Sorting has been done, ballots have been counted. During packing, there are still logistics that were miscounted, and those that should have been damaged were included instead." This condition indicates the implementation of sorting or checking processes twice, showing the ineffectiveness of the first-stage quality control system and the importance of strengthening training and supervision systems (Peterson, 2018).

Logistics Packaging

The logistics packaging process involves multi-stakeholder collaboration between KPU, PPK, and PPS as ad hoc bodies that understand logistics needs at the polling station level. Based on interviews with KPU informants, "during election packaging, KPU involves Ad Hoc Bodies namely PPK and PPS, because users of logistics at polling stations involve PPK and PPS so that logistics needs can be known." Herman Marzuki in his interview explained the packaging procedure in detail: "(1) All logistics are set by type and ensure all logistics are complete. (2) All logistics are put into large plastic bags and tied then put into their respective ballot boxes. (3) Ballot boxes are closed and locked with plastic seals/cable ties. (4) Paper seals are attached to the lock hole and upper hole of the ballot box, one piece each."

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Packaging implementation faced significant time constraints. Based on interviews with KPU, "packaging was carried out for more than a week. The short implementation time was scheduled per electoral district, one electoral district covers 3 districts in one day." PPK Herman Marzuki also confirmed similar issues in his interview, "PPK is tasked with packaging at the logistics warehouse for about 2 days at the warehouse. The existing constraint is that the packaging time target must be completed according to the determined schedule with insufficient rest. Because it starts from 08.00 until completion. This completion actually takes time exceeding working hours." This time limitation impacts process quality, as revealed by KPU informants that "in the 2024 election, there was a packaging process that failed, was not completed in electoral district 3, conducted for 2 days."

Other technical constraints were identified from interviews with KPU regarding logistics setting, where "double C-Plano sheet pages were found, in this case there were duplicate pages, so the setting process became ineffective and inefficient because the duplicate pages had to be separated. Certain pages were missing." Additionally, interview results revealed "incomplete logistics when entering the packaging stage is a factor that hinders the packaging process. Several logistics items that were not yet complete when entering the packaging stage include PPWP ballots, DPD ballots, results or Plano, and envelopes."

Human resource aspects also became a challenge based on findings from interviews with KPU stating "Ad Hoc Bodies' understanding of logistics goods, especially those put into PPWP boxes. This causes logistics goods not to be included during packaging because they lack knowledge about the types and functions of logistics." This was confirmed by Abdilah Riski Nabani as PPS of Adiwerna District in his interview revealing "lack of supervision from KPU officers for ballot distribution, so many ballots were switched between electoral districts."

Logistics Distribution

Logistics distribution implemented a tiered hierarchical system from Regency KPU to KPPS through the KPU → PPK → PPS → KPPS route. Based on interviews with Tegal Regency KPU, "after everything is completed in packaging, the logistics distribution process to PPK will be carried out. KPU cooperates with PT Pos Indonesia to send all logistics to PPK. Tegal Regency KPU is assisted by tight escort from police officers." The distribution strategy prioritizes the farthest and most difficult areas as explained in the interview, "KPU conducts distribution by prioritizing the farthest and most difficult areas in creating operational schedules for transportation modes according to their geographical location. To 3 district warehouses in one day. About 18 district warehouses are the destinations."

The distribution monitoring system uses the SILOG application that requires verification at each level. According to interview results with KPU, "after arriving at PPK, they must scan BTTB as proof of goods receipt from KPU and sign if it matches the needs after uploading to the SILOG application. By uploading to SILOG, Tegal Regency KPU can know if logistics have reached PPK." This mechanism enables real-time monitoring of logistics distribution status throughout the region.

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Based on interview results with various levels of organizers, logistics distribution was successfully implemented on time according to the schedule set by KPU. Herman Marzuki as PPK in his interview stated that "logistics delivery to PPK was on time, in accordance with the schedule that KPU gave to PPK." Similarly, Abdilah Riski Nabani as PPS confirmed in his interview "it was on time because we followed the schedule recommendations from KPU." KPPS Rahajeng Desti Ningrum also revealed in her interview that "logistics receipt from PPS to polling stations was on time where the logistics handover was according to the order of each polling station."

However, distribution implementation also faced external constraints in the form of weather factors. As explained by KPU informants in the interview, "distribution logistics constraints related to weather, because February is the rainy season. To minimize bad incidents for delivery to the highest areas, distribution was postponed until the next day." This adaptation to weather conditions shows flexibility in risk management, but also indicates the need for more robust contingency planning to anticipate external disruptions.

Multi-Stakeholder Sentiment Analysis on Governance Effectiveness

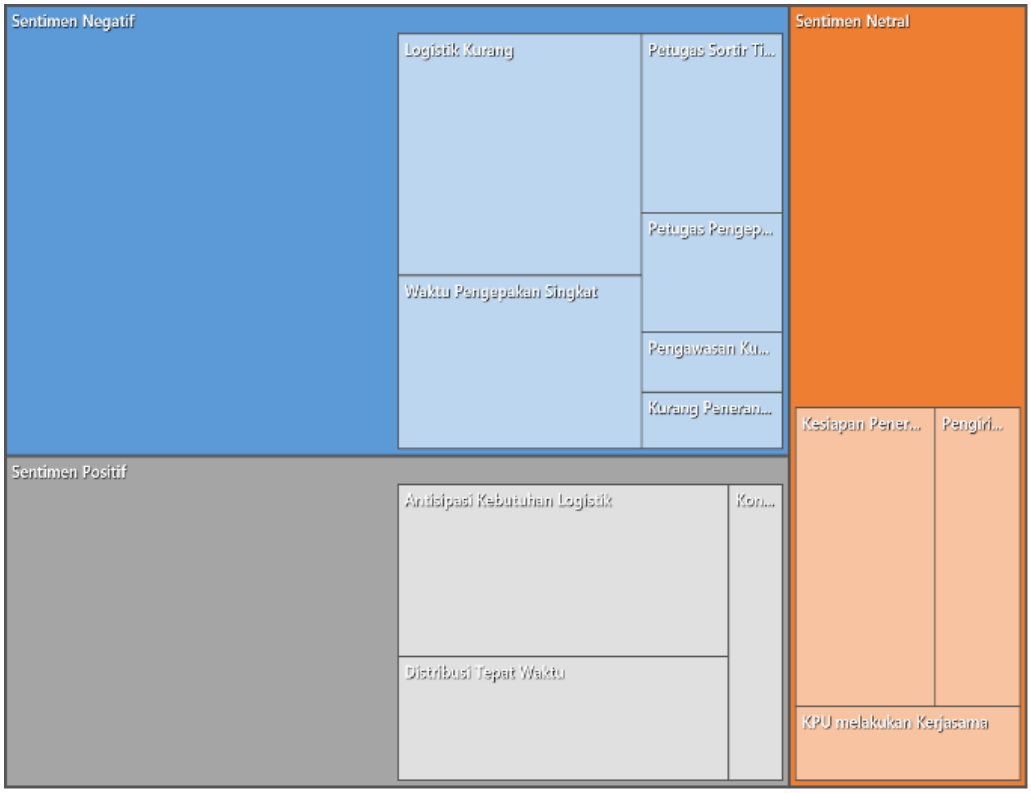

Figure 1. Hierarchy Chart Sentiment Analysis

Figure 1 presents a visualization of the hierarchy chart from sentiment analysis results using NVivo 12 Pro software, showing the distribution of sentiment toward election logistics governance in 2024 at the Tegal Regency Election Commission (KPU). Based on the analysis results, three main sentiment categories were identified, classified according to perceptions and evaluations from four levels of election organizers. This visualization shows the dominance of negative sentiment (blue color) occupying the largest proportion in the hierarchy chart, indicating significant

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challenges in logistics governance implementation that require special attention from management.

The dominant negative sentiment encompasses various operational aspects such as insufficient logistics, sorting-folding officers not complying with SOPs, short packaging time, inadequate supervision, and lack of lighting in logistics warehouses. This categorization reflects the complexity of challenges faced in election logistics management at the operational level. Meanwhile, positive sentiment (gray color) shows a smaller but still significant proportion, particularly related to distribution timeliness and inter-stakeholder coordination. Neutral sentiment (orange color) occupies a relatively balanced proportion, indicating aspects of logistics governance that operate according to minimum standards but have not yet reached the expected level of excellence.

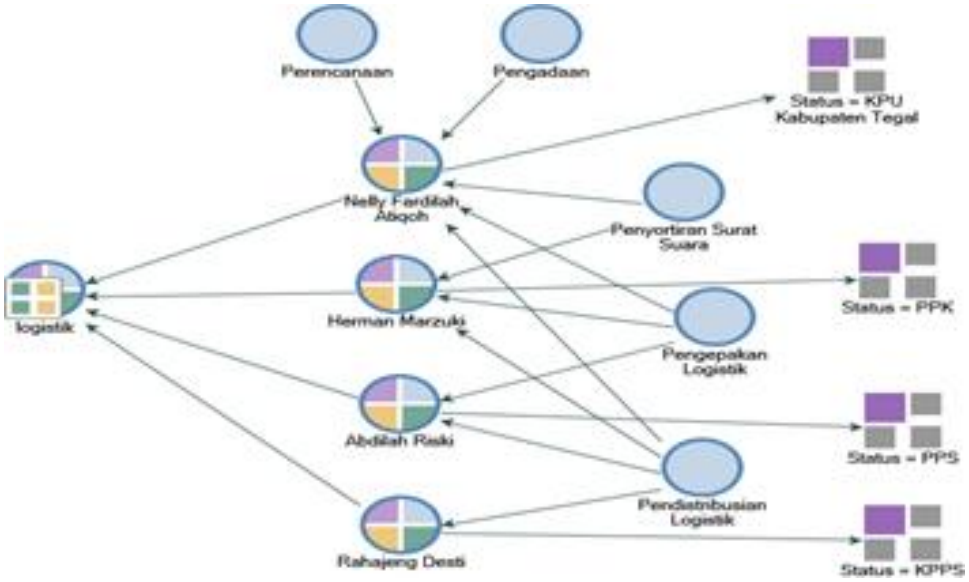

Figure 2. Multi-Stakeholder Network Relationship Chart

Figure 2 displays a network relationship chart that visualizes the interconnection and working relationships among stakeholders in the implementation of election logistics governance in 2024 in Tegal Regency. This chart shows four main nodes representing levels of election organizers: Tegal Regency KPU, PPK (Herman Marzuki), PPS (Abdilah Riski), and KPPS (Rahajeng Desti), with each node displaying a pie chart reflecting the sentiment distribution from each stakeholder. This network visualization enables identification of relationship patterns and flow of sentiment across different hierarchical levels in the election organization system.

The interconnectedness displayed in the network chart indicates that election logistics governance is a highly integrated system where performance and sentiment from one level can influence other levels. Each stakeholder node shows variation in sentiment distribution, with some stakeholders showing dominance of certain sentiments reflecting specific challenges or achievements at their respective operational levels. This network visualization also facilitates identification of critical nodes in the system, where sentiment patterns can indicate bottlenecks or success factors in the implementation of logistics governance. Relationship lines connecting nodes show dependency and collaboration patterns that are essential for

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understanding overall system dynamics in election logistics management (Agus, 2023).

The combination of both visualizations provides a comprehensive view of the sentiment landscape in election logistics governance, enabling decision-makers to identify priority areas for improvement and leverage successful practices for enhancing overall logistics governance effectiveness. This visual analytics approach aligns with modern data-driven decision making in public administration that emphasizes evidence-based policy formulation and implementation monitoring.

Tegal Regency KPU Perspective

Sentiment analysis from the Tegal Regency KPU perspective shows diverse evaluations of the implementation of election logistics governance in 2024. Based on interview results with Nelly Fardilah Atiqoh as representative of the finance, general affairs, and logistics division of Tegal Regency KPU, there is positive sentiment regarding the success of multi-level coordination in logistics procurement. The informant stated that "KPU provides logistics stage information using the Logistics System Software (SILOG)," which demonstrates efforts toward transparency and accountability in logistics management. The use of information technology reflects modernization in election logistics governance that aligns with good governance principles (Haryadi et al., 2022).

However, negative sentiment is also identified from the KPU perspective regarding operational challenges faced. In the interview, the KPU informant revealed "constraints in sorting officers. KPU has divided several groups but because many community members became sorting officers, it became less controlled during ballot sorting." This statement indicates a gap between planning and implementation in human resource management. Furthermore, the informant explained that "sorting has been done, ballots have been counted. During packing, there are still logistics that were miscounted, and those that should have been damaged were included instead," showing weaknesses in the quality control system that impact process efficiency.

Evaluative sentiment from KPU is also reflected in acknowledgment of the need for systemic improvement. The informant stated that "Tegal Regency KPU hopes that the evaluation stage does not only stop within the KPU scope but evaluation should also be conducted by logistics item providers, so that in the setting process, two checking or sorting processes are not performed, which ultimately becomes ineffective and inefficient." This statement shows a reflective attitude and orientation toward continuous improvement, while indicating awareness of the complexity of the election logistics supply chain involving multiple stakeholders (Fruchter et al., 2007).

District Election Committee (PPK) Perspective

Sentiment analysis from the PPK perspective shows evaluations that tend to be positive regarding coordination with KPU but identify operational challenges at the implementation level. Based on interview results with Herman Marzuki as PPK of Margasari District, there is positive sentiment regarding the timeliness of logistics distribution. The informant stated that "logistics delivery to PPK was on time, in

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accordance with the schedule that KPU gave to PPK," showing coordination effectiveness between KPU and PPK in temporal aspects (D. E. Apiri & Lim, 2025).

However, the PPK perspective also reveals negative sentiment regarding challenges in supervising the sorting process. In the interview, Herman Marzuki identified "the constraint faced is when there are sorting-folding officers who do not comply with SOP. Because of chasing targets, several sorting-folding officers were found folding several ballots simultaneously." This finding indicates a conflict between quantitative targets and process quality that requires special attention in operational management (D. E. Apiri & Lim, 2025). This condition aligns with performance management theory that emphasizes the importance of balance between efficiency and effectiveness in achieving organizational targets.

Evaluative sentiment from PPK is also reflected in acknowledgment of workload intensity in the packaging process. The informant explained that "PPK is tasked with packaging at the logistics warehouse for about 2 days at the warehouse. The existing constraint is that the packaging time target must be completed according to the determined schedule with insufficient rest. Because it starts from 08.00 until completion. This completion actually takes time exceeding working hours." This statement indicates pressure related to time management that impacts working conditions and potentially output quality.

Polling Station Committee (PPS) Perspective

Sentiment analysis from the PPS perspective shows complex evaluations with identified challenges specific to the operational level. Based on interview results with Abdilah Riski Nabani as PPS of Adiwerna District, there is positive sentiment regarding timeliness in the logistics distribution chain. The informant stated that "it was on time because we followed the schedule recommendations from KPU. KPU provided a schedule of what time we should implement simultaneously, distributed," showing the effectiveness of hierarchical coordination systems in logistics management (Choy et al., 2007).

However, the PPS perspective reveals significant negative sentiment regarding the quality of logistics received and operational coordination. In the interview, Abdilah Riski identified "ballots given to PPS from KPU were insufficient, so we had to wait again from KPU to provide the shortage of ballots. That became an obstacle to the packaging process." This finding indicates gaps in the quality assurance system and inventory management that impact process efficiency at the PPS level (Nugra et al., 2018).

Negative sentiment from PPS is also reflected in criticism of the supervision and coordination system. The informant stated "lack of supervision from KPU officers for ballot distribution, so many ballots were switched between electoral districts. Lack of lighting in logistics warehouses. There were switched ballots between electoral districts in the type of regency DPRD ballots in one village in Adiwerna district, causing several villages in Adiwerna district to have to make shift letters at each polling station." This statement indicates multiple layers of operational challenges including supervision, infrastructure, and error management (Oliveira et al., 2020).

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Reflective sentiment from PPS is also seen in evaluation of infrastructure preparation and risk management. The informant explained that "our preparation was surveying the warehouse to be used for logistics, we ensured because it was rainy season, maybe that place was at risk of being exposed to rainwater, also preparation for arranging schedules to guard boxes." This shows a proactive approach in risk management at the PPS level, while indicating awareness of potential risks that can affect logistics quality (Bouhadi et al., 2022).

Polling Station Working Group (KPPS) Perspective

Sentiment analysis from the KPPS perspective shows relatively positive evaluations but with identified concerns regarding internal communication and coordination. Based on interview results with Rahajeng Desti Ningrum as KPPS of Kalisapu Village, Slawi District, there is positive sentiment regarding the timeliness of logistics receipt from upper levels. The informant stated that "logistics receipt from PPS to polling stations was on time where the logistics handover was according to the order of each polling station," showing the effectiveness of the distribution system to the lowest level in the election organization hierarchy.

However, the KPPS perspective also identifies negative sentiment regarding the quality of logistics received. In the interview, Rahajeng Desti revealed "there were several polling stations where the ballots received were less than the number of DPT, but such cases were reported through Special Incident notes." This finding indicates systematic issues in inventory management that have reached the final implementation level, but shows an established reporting mechanism to handle irregularities (Sethi & Shi, 2013).

Evaluative sentiment from KPPS is also reflected in assessment of internal team dynamics and communication challenges. The informant stated that "regarding constraints, maybe it's more about miscommunication among KPPS members," indicating communication gaps within the KPPS team that could potentially affect coordination and task execution effectiveness. However, positive sentiment is also identified in evaluating operational conditions, where the informant stated "until the implementation of regional elections, polling station conditions were safe and there were no obstacles to the conduct of voting," showing success in maintaining security and operational stability at the polling station level.

Overall, multi-stakeholder sentiment analysis shows the complexity of implementing election logistics governance in 2024 in Tegal Regency, where each level of organizers has specific but interconnected perspectives and challenges in an integrated system. Identified patterns show trade-offs between efficiency and quality, as well as the importance of strengthening coordination mechanisms and quality assurance systems at all implementation levels (Shukla & Kumar, 2018).

Identification of Supporting Factors (Positive Sentiment)

Timeliness of Logistics Distribution

One of the main supporting factors identified from sentiment analysis is the success of Tegal Regency KPU in maintaining the timeliness of logistics distribution across all

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levels of election organizers. Based on interview results with Herman Marzuki as PPK of Margasari District, logistics distribution from KPU to PPK has been implemented according to the established schedule. The informant stated that "logistics delivery to PPK was on time, in accordance with the schedule that KPU gave to PPK." This consistency in timeliness reflects the effectiveness of planning and coordination designed by KPU in anticipating various possible technical and operational constraints (Putra et al., 2023).

Distribution timeliness is also confirmed by the PPS perspective, which shows appreciation for the structured scheduling system. Abdilah Riski Nabani as PPS of Adiwerna District stated in his interview "it was on time because we followed the schedule recommendations from KPU. KPU provided a schedule of what time we should implement simultaneously, distributed. The schedule was appropriate because coordination was shared." This statement indicates that the hierarchical coordination system implemented by KPU has successfully facilitated activity synchronization at various organizer levels. Success in time management aligns with supply chain management principles that emphasize the importance of punctuality in ensuring operational smoothness (Huchzermeier & Iyer, 2006).

Further confirmation comes from the KPPS level, which represents the end-user in the logistics distribution chain. Rahajeng Desti Ningrum as KPPS of Kalisapu Village stated in her interview "logistics receipt from PPS to polling stations was on time where the logistics handover was according to the order of each polling station." This consistency in timeliness down to the polling station level shows that the logistics system designed by KPU has successfully maintained reliability and predictability throughout the distribution chain, which is a key indicator of success in complex logistics management.

Coordination Among Organizer Levels

Another significant supporting factor is the effectiveness of coordination among organizer levels that creates synergy in logistics governance implementation. Based on interview results with Nelly Fardilah Atiqoh from Tegal Regency KPU, multi-stakeholder coordination in the packaging process has shown positive results. The informant explained that "during election packaging, KPU involves Ad Hoc Bodies namely PPK and PPS, because users of logistics at polling stations involve PPK and PPS so that logistics needs can be known. So KPU involves PPK and PPS along with their secretariat." This participatory approach enables integration of perspectives and needs from various levels in the decision-making process.

Effective coordination is also reflected in the clear division of tasks and responsibilities at each level. Herman Marzuki as PPK explained in his interview that "PPK received a mandate from Tegal Regency KPU to participate in the ballot sorting process. PPK's capacity in sorting is as a supervisor." Clarity in role definition helps reduce overlap and confusion in task execution, while ensuring accountability at every level. Organizational behavior theory confirms that clear role definition is a prerequisite for effective teamwork in complex operations.

Coordination is also strengthened through a structured communication system as revealed by PPS in the interview. Abdilah Riski stated "there are three PPS and three

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secretariats, each person provides coordination with one person handling several polling stations so it's on time." This tiered coordination system enables effective span of control and ensures that information flow can run efficiently from the upper level to field implementation.

Supervision and Monitoring System

Implementation of a comprehensive supervision and monitoring system is an important supporting factor in the success of logistics governance. Based on interview results with Tegal Regency KPU, the use of Logistics System Software (SILOG) has facilitated transparency and real-time monitoring in the distribution process. The informant explained that "after arriving at PPK, they must scan BTTB as proof of goods receipt from KPU and sign if it matches the needs after uploading to the SILOG application. By uploading to SILOG, Tegal Regency KPU can know if logistics have reached PPK." This digital tracking system enables real-time visibility of logistics distribution status throughout the region (Giménez et al., 2004; Zaini et al., 2016).

The supervision system is also strengthened through tiered verification mechanisms involving multiple checkpoints. Herman Marzuki as PPK explained specific supervision tasks in his interview: "several tasks of the Sort-Fold supervisor are (1) ensuring sorting-folding officers match their identity (2) taking attendance of Sort-Fold officers (3) ensuring the sorting and folding process follows SOP." This multi-layer verification provides assurance of process quality and compliance with standard procedures. This approach aligns with total quality management principles that emphasize the importance of prevention-based quality control.

Monitoring is also strengthened through collaborative oversight involving external stakeholders. Based on interviews with KPU, the destruction process of damaged ballots is conducted with "destruction witnessed by election supervisors and police entered into the application. Election supervisors and police will also upload the official report into SILOG." The involvement of multiple oversight bodies increases credibility and transparency in the logistics management process, while providing additional safeguards against potential irregularities.

Infrastructure Readiness and Polling Station Security

Another supporting factor is infrastructure readiness and maintenance of security at the polling station level that supports successful implementation of election logistics. Based on interview results with Rahajeng Desti Ningrum as KPPS, polling station conditions have been well-prepared to ensure logistics security. The informant stated that "until the implementation of regional elections, polling station conditions were safe and there were no obstacles to the conduct of voting." Maintenance of a secure environment is critical for protecting the integrity of election materials and ensuring smooth conduct of voting processes.

Infrastructure readiness is also reflected in proactive risk management conducted by PPS. Abdilah Riski explained in his interview the preparations made: "our preparation was surveying the warehouse to be used for logistics, we ensured because it was rainy season, maybe that place was at risk of being exposed to rainwater, also

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preparation for arranging schedules to guard boxes." These anticipatory measures show awareness of environmental risks and commitment to protecting the quality of election materials.

Security arrangements are also strengthened through collaborative security management involving various security stakeholders. Based on interviews with KPU, logistics distribution "Tegal Regency KPU is assisted by tight escort from police officers" and at the KPPS level, security is maintained through "logistics guarding in collaboration with Civil Defense." This multi-stakeholder security approach ensures comprehensive protection of election materials throughout the distribution chain.

Adaptive Distribution Strategy

Success in implementing an adaptive distribution strategy is another important supporting factor. Based on interview results with Tegal Regency KPU, logistics distribution is designed considering the geographical characteristics of the region. The informant explained that "KPU conducts distribution by prioritizing the farthest and most difficult areas in creating operational schedules for transportation modes according to their geographical location." This strategic prioritization enables optimal utilization of resources and minimization of risks related to geographical challenges.

Adaptability is also reflected in flexibility to make adjustments when facing external constraints. In facing weather constraints, KPU shows adaptive capacity as explained in the interview: "to minimize bad incidents for delivery to the highest areas, distribution was postponed until the next day." The ability to make real-time adjustments shows effective contingency planning and risk management capabilities.

Distribution strategy effectiveness is also supported by partnerships with reliable logistics providers. Collaboration with "PT Pos Indonesia to send all logistics to PPK" shows leveraging of established logistics networks to ensure reliable delivery. Strategic partnerships like this enable access to specialized logistics capabilities and established distribution networks that are essential for complex logistics operations.

Identification of Constraints and Challenges (Negative Sentiment)

Technical Constraints in Procurement and Logistics Quality

Negative sentiment analysis identifies various technical constraints that significantly impact the effectiveness of election logistics governance in 2024. Based on interview results with Nelly Fardilah Atiqoh from Tegal Regency KPU, delays in logistics procurement become a major challenge affecting the overall implementation timeline. The informant revealed that "if procurement arrives late and if there are shortages when the stages are already tight, input and processing into the SILOG application will affect and hinder the process." These delays create cascading effects that influence subsequent stages in the logistics chain and potentially compromise overall process quality.

Logistics quality problems are also identified through findings of defects in critical components. Based on interviews with KPU, "double C-Plano sheet pages were found, in this case there were duplicate pages, so the setting process became ineffective and inefficient because the duplicate pages had to be separated. Certain pages were

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missing." Defects like these not only slow operational processes but also require additional work for correction and potentially affect accuracy of final products (Citation 49, 2026). Quality control issues like these indicate gaps in supplier quality management and incoming inspection processes.

Incomplete logistics at critical junctures also becomes a significant technical challenge. KPU informants in their interviews identified "incomplete logistics when entering the packaging stage is a factor that hinders the packaging process. Several logistics items that were not yet complete when entering the packaging stage include PPWP ballots, DPD ballots, results or Plano, and envelopes." Incomplete inventory at critical stages forces postponement of operations and potentially affects overall project timeline. This indicates the need for strengthening inventory management systems and better coordination with suppliers.

Operational Constraints in Sorting and Packaging Processes

Significant operational constraints are identified in the ballot sorting process, particularly regarding compliance with Standard Operating Procedures (SOPs). Based on interview results with Herman Marzuki as PPK of Margasari District, "sorting-folding officers who do not comply with SOPs were found. Because of chasing targets, several sorting-folding officers were found folding several ballots simultaneously." This non-compliance creates trade-offs between speed and quality that can affect accuracy of sorting processes. Pressure to meet targets often drives shortcuts that can compromise quality standards.

Lack of adequate control in the sorting process also becomes a critical operational constraint. Based on interviews with Tegal Regency KPU, "KPU has divided several groups but because many community members became sorting officers, it became less controlled during ballot sorting. Sorting has been done, ballots have been counted. During packing, there are still logistics that were miscounted, and those that should have been damaged were included instead." This lack of control results in errors detected at subsequent stages, forcing rework and potentially compromising the integrity of the sorting process.

Time constraints in the packaging process also create significant operational pressures. Herman Marzuki revealed in his interview "the packaging time target must be completed according to the determined schedule with insufficient rest. Because it starts from 08.00 until completion. This completion actually takes time exceeding working hours." Extended working hours and insufficient rest periods can affect worker performance and potentially increase error rates. KPU informants also confirmed "in the 2024 election, there was a packaging process that failed, was not completed in electoral district 3, conducted for 2 days," indicating that time pressures have caused operational failures.

Infrastructure and Supporting Facility Constraints

Inadequate infrastructure support becomes a constraint affecting operational efficiency in logistics management. Based on interview results with Abdilah Riski Nabani as PPS of Adiwerna District, "lack of lighting in logistics warehouses" becomes

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a factor hindering officer productivity. Insufficient lighting can affect work accuracy and potentially increase error rates in sorting and packaging processes. Infrastructure deficiencies like these reflect gaps in facility management that need to be addressed for supporting optimal operations.

Environmental risks also become significant infrastructure challenges. Based on interviews with Tegal Regency KPU, "distribution logistics constraints related to weather, because February is the rainy season" affect distribution schedules and potentially affect quality of logistics materials. Weather-related disruptions show vulnerability of logistics operations to external environmental factors that require more robust contingency planning.

Storage and handling facilities also face challenges in maintaining optimal conditions for election materials. PPS in their preparation must "survey the warehouse to be used for logistics, we ensured because it was rainy season, maybe that place was at risk of being exposed to rainwater," indicating concerns about storage quality and protection of materials from environmental damage. Inadequate storage facilities can affect material integrity and potentially compromise election process quality.

Human Resource and Competency Constraints

Insufficient competency among temporary staff is a critical human resource constraint in election logistics implementation. Based on interview results with Tegal Regency KPU, "Ad Hoc Bodies' understanding of logistics goods, especially those put into PPWP boxes. This causes logistics goods not to be included during packaging because they lack knowledge about the types and functions of logistics." These knowledge gaps result in errors in packaging processes and potentially affect completeness of election materials at polling stations.

Supervision inadequacies also become challenges in human resource management. Abdilah Riski identified in his interview "lack of supervision from KPU officers for ballot distribution, so many ballots were switched between electoral districts." Insufficient supervision results in mix-ups in ballot distribution that require corrective actions and potentially disrupt election preparations in affected areas. Effective supervision is a critical component in ensuring quality and compliance in complex operations.

Communication challenges are also identified as human resource constraints. Rahajeng Desti Ningrum as KPPS revealed in her interview "regarding constraints, maybe it's more about miscommunication among KPPS members." Communication breakdowns can affect coordination and teamwork effectiveness, potentially leading to operational inefficiencies and errors. Internal communication problems indicate the need for better team building and communication protocols.

Coordination and Logistics Distribution Constraints

Coordination challenges in the distribution chain become constraints affecting logistics flow efficiency. Based on interview results with PPS, problems were found where "ballots given to PPS from KPU were insufficient, so we had to wait again from KPU to provide the shortage of ballots. That became an obstacle to the packaging

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process." Shortages in logistics supply result in delays and disruptions in downstream processes, affecting overall implementation timeline.

Distribution errors also create significant operational challenges. Abdilah Riski identified "switched ballots between electoral districts in the type of regency DPRD ballots in one village in Adiwerna district, causing several villages in Adiwerna district to have to make shift letters at each polling station." Mix-ups in ballot distribution not only require corrective redistributions but also potentially affect election preparations at multiple locations. Distribution errors like these indicate gaps in logistics management systems and quality control procedures.

Inventory management inadequacies are also identified at different levels of implementation. KPPS confirmed "there were several polling stations where the ballots received were less than the number of DPT, but such cases were reported through Special Incident notes." Inventory shortages at final distribution points indicate cumulative effects of upstream logistics management issues. Although exception reporting mechanisms have been established, persistent inventory issues show the need for fundamental improvements in logistics planning and execution.

Inefficiency in quality assurance processes also becomes a significant coordination constraint. KPU acknowledged that "in the setting process, two checking or sorting processes are not performed, which ultimately becomes ineffective and inefficient." Redundant quality control processes indicate inadequacies in first-pass quality systems and potentially reflect broader coordination issues between internal processes and supplier quality management. Double-handling like this not only increases costs but also extends processing times and potentially introduces additional error opportunities.

Evaluation of Distribution and Packaging Effectiveness

Time Effectiveness in Distribution and Packaging

Time effectiveness evaluation shows diverse achievements with significant success in distribution but facing challenges in packaging. Based on interview results with multiple stakeholders, logistics distribution successfully maintained timeliness across all hierarchy levels. Herman Marzuki as PPK of Margasari District confirmed in his interview "logistics delivery to PPK was on time, in accordance with the schedule that KPU gave to PPK." This temporal consistency is also confirmed by Abdilah Riski Nabani as PPS who stated "it was on time because we followed the schedule recommendations from KPU," and Rahajeng Desti Ningrum as KPPS who revealed "logistics receipt from PPS to polling stations was on time." Achievement of temporal targets across all levels indicates effectiveness of planning and coordination mechanisms that have been implemented (Vuorinen & Martinsuo, 2019).

However, time effectiveness in the packaging process shows suboptimal performance with identified significant time pressures. Based on interviews with Tegal Regency KPU, "packaging was carried out for more than a week. The short implementation time was scheduled per electoral district, one electoral district covers 3 districts in one day." These time constraints create operational pressures that impact

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quality of work and worker welfare. Herman Marzuki confirmed in his interview the intensity of time pressures: "the packaging time target must be completed according to the determined schedule with insufficient rest. Because it starts from 08.00 until completion. This completion actually takes time exceeding working hours."

Failure in meeting time targets is also identified in specific electoral districts, indicating variability in operational capacity and complexity. KPU informants revealed "in the 2024 election, there was a packaging process that failed, was not completed in electoral district 3, conducted for 2 days." Time overruns like this not only affect resource allocation but also potentially create cascading effects on subsequent operations (Nuna et al., 2024). Variability in time performance indicates the need for more sophisticated scheduling algorithms that consider complexity differences across different electoral districts.

Quality Effectiveness in Sorting and Packaging

Quality process evaluation shows mixed performance with achievements in final delivery quality but facing intermediate quality control challenges. Based on interview results, quality assurance systems face significant challenges in maintaining consistency. Tegal Regency KPU acknowledged in their interview "constraints in sorting officers. KPU has divided several groups but because many community members became sorting officers, it became less controlled during ballot sorting. Sorting has been done, ballots have been counted. During packing, there are still logistics that were miscounted, and those that should have been damaged were included instead." Quality control failures at intermediate stages indicate gaps in process design and supervision effectiveness.

Non-compliance with Standard Operating Procedures also affects quality consistency in sorting processes. Herman Marzuki as PPK identified in his interview "sorting-folding officers who do not comply with SOPs. Because of chasing targets, several sorting-folding officers were found folding several ballots simultaneously." Deviations from established procedures not only affect immediate output quality but also potentially compromise integrity of subsequent processes. Trade-offs between speed and quality indicate the need for rebalancing performance metrics to ensure sustainable quality standards.

Inefficiency in quality control processes is also identified through requirements for multiple verification cycles. KPU informants revealed that "in the setting process, two checking or sorting processes are not performed, which ultimately becomes ineffective and inefficient." Redundant quality processes indicate inadequacies in first-pass quality systems and potentially reflect broader systemic issues in process design. Double-checking requirements not only increase processing time and costs but also suggest fundamental weaknesses in initial quality control mechanisms.

Multi-Stakeholder Coordination Effectiveness

Coordination evaluation shows significant achievements in structural coordination but faces challenges in operational implementation. Based on interview results with Tegal Regency KPU, collaborative approaches in packaging processes have been successfully implemented: "during election packaging, KPU involves Ad Hoc Bodies

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namely PPK and PPS, because users of logistics at polling stations involve PPK and PPS so that logistics needs can be known." Multi-stakeholder involvement in decision-making processes enables integration of diverse perspectives and ensures alignment with field requirements. Participatory approaches like this are critical for ensuring that logistics preparations meet actual operational needs.

Coordination effectiveness is also reflected in successful role distribution and clear accountability mechanisms. Herman Marzuki as PPK explained in his interview "PPK received a mandate from Tegal Regency KPU to participate in the ballot sorting process. PPK's capacity in sorting is as a supervisor." Clear role definitions facilitate effective division of labor and reduce potential conflicts or overlaps in responsibilities. Abdilah Riski as PPS also confirmed effective coordination structures: "there are three PPS and three secretariats, each person provides coordination with one person handling several polling stations so it's on time."

However, coordination challenges are also identified in operational-level implementation, particularly in supervision and quality control. Abdilah Riski revealed in his interview "lack of supervision from KPU officers for ballot distribution, so many ballots were switched between electoral districts." Supervision inadequacies indicate gaps between coordination structures and actual implementation effectiveness. Communication challenges are also identified at the team level, as revealed by Rahajeng Desti as KPPS: "regarding constraints, maybe it's more about miscommunication among KPPS members." Internal coordination issues can affect team effectiveness and potentially compromise operational outcomes.

Supervision and Quality Control Effectiveness

Supervision system evaluation shows comprehensive implementations in technological monitoring but faces limitations in human-centered supervision. Based on interview results with Tegal Regency KPU, digital monitoring systems have been successfully implemented to ensure transparency and accountability: "after arriving at PPK, they must scan BTTB as proof of goods receipt from KPU and sign if it matches the needs after uploading to the SILOG application. By uploading to SILOG, Tegal Regency KPU can know if logistics have reached PPK." Real-time tracking capabilities enable immediate visibility of distribution status and facilitate prompt responses to potential issues.

Multi-layer oversight mechanisms have also been established to ensure comprehensive quality control. Herman Marzuki as PPK explained specific supervisory responsibilities in his interview: "several tasks of the Sort-Fold supervisor are (1) ensuring sorting-folding officers match their identity (2) taking attendance of Sort-Fold officers (3) ensuring the sorting and folding process follows SOP." Structured supervision protocols provide a framework for systematic quality assurance and ensure compliance with established procedures. External oversight is also strengthened through involvement of independent monitors in critical processes such as ballot destruction, as explained by KPU informants: "destruction witnessed by election supervisors and police entered into the application."

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However, supervision effectiveness faces challenges in implementation consistency, particularly in high-volume operations. Gaps between supervision design and actual implementation are reflected in persistent quality issues identified at multiple stages. Inadequate supervision also results in distribution errors as revealed by PPS: "lack of supervision from KPU officers for ballot distribution, so many ballots were switched between electoral districts." Supervision inadequacies indicate the need for strengthening supervisory capacity and potentially redesigning supervision protocols to better match operational realities.

Adaptation and Risk Management Effectiveness

Adaptability evaluation shows successful implementations in strategic risk management but faces reactive challenges in operational adjustments. Based on interview results with Tegal Regency KPU, strategic adaptations have been successfully implemented in distribution planning: "KPU conducts distribution by prioritizing the farthest and most difficult areas in creating operational schedules for transportation modes according to their geographical location." Geographical prioritization demonstrates sophisticated risk assessment and proactive planning to mitigate potential distribution challenges. Environmental risk management has also been demonstrated through adaptive responses: "to minimize bad incidents for delivery to the highest areas, distribution was postponed until the next day."

Proactive risk management is also identified at lower levels of implementation. Abdilah Riski as PPS explained preventive measures in his interview: "our preparation was surveying the warehouse to be used for logistics, we ensured because it was rainy season, maybe that place was at risk of being exposed to rainwater, also preparation for arranging schedules to guard boxes." Risk assessment and preventive planning at the operational level show awareness of potential threats and commitment to protecting election material integrity.

However, adaptability limitations are also identified in responses to operational challenges, particularly in quality control and error correction. Reactive approaches in addressing quality issues are reflected in requirements for multiple verification cycles and corrective redistributions. PPS faced situations requiring reactive adjustments: "switched ballots between electoral districts in the type of regency DPRD ballots in one village in Adiwerna district, causing several villages in Adiwerna district to have to make shift letters at each polling station." Reactive corrections indicate gaps in preventive quality management and suggest needs for more robust anticipatory systems.

Sentiment Patterns by Organizer Levels

Distribution of Positive, Negative, and Neutral Sentiment per Stakeholder

Analysis of sentiment distribution based on organizer levels shows distinct patterns that reflect different perspectives and responsibilities in the implementation of election logistics governance. At the Tegal Regency KPU level, positive sentiment is concentrated on strategic and coordinative aspects, as reflected in the successful implementation of technological systems. Based on interview results with Nelly Fardilah Atiqoh, positive sentiment is primarily related to "KPU provides logistics

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stage information using the Logistics System Software (SILOG)," which shows achievement in modernization and transparency of logistics management. However, negative sentiment at the KPU level predominantly focuses on systemic challenges such as "constraints in sorting officers. KPU has divided several groups but because many community members became sorting officers, it became less controlled during ballot sorting."

At the PPK level, sentiment distribution shows a balanced perspective with positive sentiments focused on coordination effectiveness and temporal achievements. Herman Marzuki as PPK expressed positive sentiment in his interview through confirmation that "logistics delivery to PPK was on time, in accordance with the schedule that KPU gave to PPK." However, negative sentiments at the PPK level predominantly concentrate on operational supervision challenges, particularly "sorting-folding officers who do not comply with SOPs. Because of chasing targets, several sorting-folding officers were found folding several ballots simultaneously." This pattern indicates that PPK, as middle management, has good visibility of both strategic successes and operational deficiencies.

The PPS level shows sentiment distribution that is skewed toward negative expressions, reflecting direct exposure to operational challenges and field-level difficulties. Abdilah Riski Nabani as PPS expressed limited positive sentiments, primarily related to temporal coordination: "it was on time because we followed the schedule recommendations from KPU." However, negative sentiments are very prominent with multiple concerns such as "ballots given to PPS from KPU were insufficient," "lack of supervision from KPU officers," and "switched ballots between electoral districts." The concentration of negative sentiments at the PPS level indicates that operational pressures and resource constraints are most intensely felt at the middle-operational level.

Analysis of Perception Differences Among Levels

Perception differences among organizer levels reflect distinct vantage points and operational realities faced by each level. In time management aspects, there are divergent perceptions between strategic and operational levels. KPU at the strategic level shows confidence in overall timeline achievement, while operational levels express significant concerns about time pressures. Herman Marzuki as PPK revealed "the packaging time target must be completed according to the determined schedule with insufficient rest. Because it starts from 08.00 until completion. This completion actually takes time exceeding working hours." This perceptual gap indicates potential disconnect between strategic planning and operational realities.

Quality perception also shows significant variations across hierarchical levels. The strategic level (KPU) acknowledges quality issues but frames them as manageable challenges that can be overcome through systemic improvements. As revealed by the KPU informant: "Tegal Regency KPU hopes that the evaluation stage does not only stop within the KPU scope but evaluation should also be conducted by logistics item providers." Meanwhile, operational levels express more immediate and specific quality concerns. The PPS level identifies concrete problems such as "lack of lighting

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in logistics warehouses" and "switched ballots between electoral districts." Differences in quality perception indicate varying exposure levels to day-to-day operational challenges.

Coordination perception also varies significantly across levels, with upper levels demonstrating confidence in structural coordination while lower levels express concerns about implementation gaps. KPU expresses positive sentiment about multi-stakeholder involvement: "KPU involves PPK and PPS along with their secretariat." However, field-level perspectives reveal coordination challenges, as expressed by KPPS: "regarding constraints, maybe it's more about miscommunication among KPPS members." This perceptual divergence indicates potential ineffectiveness in information flow and feedback mechanisms between strategic planning and operational implementation.

Identification of Areas Requiring Priority Improvement

Based on convergent negative sentiments across multiple stakeholder levels, quality control systems emerge as a priority area for improvement. Multiple levels identify quality-related issues, from strategic level acknowledgment of "logistics that were miscounted, and those that should have been damaged were included instead" to operational level concerns about "ballots switched between electoral districts." The consistency of quality concerns across levels indicates fundamental weaknesses in quality assurance systems that require systematic intervention. Priority improvements should focus on strengthening first-pass quality control mechanisms to reduce dependency on corrective measures.

Human resource competency development is also identified as a critical improvement area based on consistent concerns across stakeholder levels. The KPU level identifies "Ad Hoc Bodies' understanding of logistics goods, especially those put into PPWP boxes" as a significant concern. The PPK level expresses frustration with "sorting-folding officers who do not comply with SOPs," while the PPS level identifies "lack of supervision from KPU officers." Convergent concerns about human resource capabilities indicate systemic needs for comprehensive training programs and strengthened supervision mechanisms.

Time management and workload optimization also emerge as high-priority improvement areas based on extensive negative sentiments from operational levels. PPK reveals concerns about "the packaging time target must be completed according to the determined schedule with insufficient rest," while KPU acknowledges "packaging process that failed, was not completed in electoral district 3, conducted for 2 days." Time-related stresses not only affect worker welfare but also potentially compromise quality outcomes. Priority improvements should focus on realistic scheduling algorithms that consider operational complexity variations and adequate buffer times.

Patterns of Sentiment Expression Across Hierarchical Levels

Sentiment expression patterns show distinct communication styles and problem-framing approaches across hierarchical levels. The strategic level (KPU) tends to use systemic language and future-oriented framing when expressing concerns. For

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example, "Tegal Regency KPU hopes that the evaluation stage does not only stop within the KPU scope but evaluation should also be conducted by logistics item providers" shows solution-oriented framing that focuses on system-wide improvements. This approach reflects strategic responsibility for overall system optimization and long-term sustainability.

The middle management level (PPK) demonstrates balanced sentiment expression that combines appreciation for coordination successes with specific operational concerns. Expression patterns at this level show both upward accountability (reporting successes) and downward responsibility (acknowledging field challenges). Herman Marzuki expresses "logistics delivery to PPK was on time" but also identifies "sorting-folding officers who do not comply with SOPs." This balanced expression reflects the middle management position as an interface between strategic planning and operational implementation.

Operational levels (PPS and KPPS) show more direct and problem-focused sentiment expression, with emphasis on immediate challenges and concrete difficulties. The PPS level uses specific language in describing problems: "ballots given to PPS from KPU were insufficient" and "lack of lighting in logistics warehouses." This direct expression style reflects immediate exposure to operational realities and urgent needs for problem resolution. The KPPS level shows similar patterns with straightforward problem identification: "there were several polling stations where the ballots received were less than the number of DPT." This pattern indicates the importance of creating effective upward communication channels to ensure that field-level concerns reach strategic decision-makers.

Temporal framing in sentiment expression also varies across levels, with strategic levels focusing on long-term improvements while operational levels emphasize immediate concerns. Strategic level expressions reflect planning orientation and system optimization perspective, while operational level expressions reflect urgency and immediate problem-solving needs. Understanding these temporal differences is critical for developing communication strategies that effectively bridge hierarchical gaps and ensure that strategic planning incorporates operational realities.

4. CONCLUSION

Based on sentiment analysis of the effectiveness of election logistics governance in 2024 at Tegal Regency KPU, this research successfully identified multi-stakeholder sentiment that shows implementation complexity with dominance of negative sentiment but still demonstrates positive achievements in certain aspects. From the perspective of sentiment identification, Tegal Regency KPU has successfully implemented an effective hierarchical coordination system with timely logistics distribution down to the polling station level, use of transparent digital monitoring system SILOG, and adaptive distribution strategy that prioritizes the farthest areas. Main supporting factors include structured coordination among organizer levels, tiered supervision systems, and adequate polling station security infrastructure readiness.

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However, the research also identifies significant constraints and challenges that require serious attention, including technical constraints in logistics procurement such as procurement delays and inconsistent logistics quality, operational constraints in sorting and packaging processes including non-compliance with SOPs and excessive time pressures, as well as human resource constraints in the form of lack of competency among temporary staff and inadequate supervision. Sentiment distribution analysis based on organizer levels shows perception differences that reflect distinct operational realities, where the strategic level (KPU) shows confidence in overall achievement while operational levels (PPS and KPPS) express more specific concerns about field-level challenges. This sentiment pattern indicates the need for strengthening communication channels and feedback mechanisms between strategic planning and operational implementation to ensure alignment between policy design and ground realities in conducting democratic and quality elections.

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